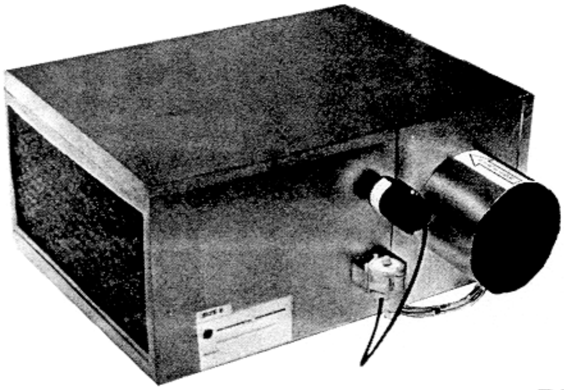
MODEL VVF-II



FEATURES

- Low cost, highly efficient waste heat recovery
- Available with electric, hot water or steam auxilliary heat
- Eliminates need for central warm air system
- Space saver design for use in tight interspaces
- Factory assembled package reduces expensive field labor
- Single discharge-no need for field fabricated mixing plenum
- Optional cooling/heating ratios maximize design flexibility
- Broad range of controls-pneumatic or electronic

DESCRIPTION

Model VVF-II Fan Induction Terminals are designed for use in low, medium or high pressure variable air volume, single duct systems requiring both cooling and periodic heating of exterior and/or certain interior zones of the building.

The primary air cooling side of the Model VVF-II incorporates a single damper blade, which operates through a 45° arc, providing throttling capability in all damper positions—a feature not possible with 90° arc single or multi-blade dampers used in other manufacturers' designs.

The fan induction, or heating side of the Model VVF-II provides an inexpensive means of using the waste heat generated in the core of the building by recirculating that energy from the ceiling space to those zones calling for heating. If additional heat is required to maintain zone temperature, the VVF-II can be provided with an optional hot water coil or electric heater (VVF-WC-II) or (VVF-EH-II), which may be activated by zone. This eliminates the expense of installing and operating a central warm air heating system. It also allows maximum design flexibility for buildings which experience periodic nighttime or weekend occupancy.

The Model VVF-II is a unitary design incorporating both the cooling and heating function in a single casing. Unlike some models offered by other manufacturers, the VVF-II requires no field assembly of components and no special fabrication of discharge plenums to eliminate air stratification. Both heated and cooled air pass through a single discharge to downstream ductwork.

Model VVF-II units are available with the following optional accessories: Hot Water Coil (WC), Electric Heater (EH), Multiple-Outlet Plenum (MOP), Induction Port Sound Baffle (ISB), Sound Attenuator (SA) and Filter Section (FS). Refer to the index, pages 2 and 3, for location of specific accessory information.

CONSTRUCTION

Model VVF-II Fan Induction Terminals are manufactured of zinc-coated steel: 22-gauge casing, 16-gauge damper, and 20-gauge damper seat. (Heavier casing gauges are available at extra cost.) Assembly of the casing is by means of a mechanical lock, insuring the tightest possible construction. The damper assembly provides an acoustically effective double-wall construction in the high pressure region of the Terminal, which substantially reduces radiated noise at the inlet. Maximum air valve leakage is 2% at 3″ w.g.

The basic Terminal casing has a low profile design, specifically to fit in limited ceiling interspaces. Units may be provided with round, oval or rectangular inlet and outlet collars. Round or oval inlets and rectangular outlets are standard, unless otherwise specified. Convenient access to the Terminal interior assembly is provided, for component maintenance. Access openings are clearly indicated on dimension drawings. Care should be exercised in maintaining these openings "clear", to insure convenient future access.

Pressure independent units are normally furnished with an inlet-mounted pressure differential sensor which may be removed without disconnecting the inlet duct or flex.

Model VVF-II casings are internally lined with ¾″ thick, 4# dual density coated fiberglass, complying with N.F.P.A. 90-A and UL 181. No raw edges are exposed to the air stream. Special insulation coatings are available for clean-room, hospital and laboratory applications.

Fan assemblies used in Model VVF-II units are specifically designed for fan induction Terminal application. Unlike other manufacturers, who use off-the-shelf fan assemblies, ETI fabricates its fan package using computer selected wheels for specific capacity (CFM) and external pressure requirements. This insures optimum quiet operation. All fan assemblies are mounted on reinforced casing panels with rubber-in-shear vibration isolators. Fan motors are equipped with spring isolators secured to the fan housing by means of rubber grommets, virtually eliminating vibration transfer.

Electrical components used in the Model VVF-II are UL rated and installed in accordance with UL and N.E.C. requirements. A single electrical connection is provided for main power. Standard voltages are 115 or 277, single phase. Special voltages can be provided.

Model VVF-II assemblies are UL listed-UL file no. 26H8.

PERFORMANCE

Model VVF-II Fan Induction Terminals have been designed with cooling valves and fan assemblies matched to provide a 100%-50% cooling-to-heating air ratio. For example, if a unit were selected to supply 1000 CFM of cooling, the induction fan would have the capability of delivering at least 500 CFM of heating at reasonable external static pressures. In most cases, this would be an ideal cooling/heating ratio. However, in situations where more or less air is required, this ratio can be changed by matching larger fan assemblies with smaller cooling valves, or vice-versa. Consult the performance section for proper matching selection procedure.

If additional heating capacity is required, the Model VVF-II can be provided with an integrally-mounted hot water coil or electric heater, which is energized on a call for additional heating through the unit control system. The Model VVF-II may also be interfaced with other auxilliary heating devices such as radiant ceiling panels, baseboard radiation, etc.

Model VVF-II units are available as system pressure-independent or system pressure-dependent. The thermostat controls the VVF-II in either case, providing desired temperature by varying the air volume to the space served. Pressure-independent models are equipped with minimum/maximum air volume dials for rapid field setting (may also be ordered factory pre-set); set points are maintained, regardless of system pressure fluctuations. Pressure-independent models are equipped with a differential pressure inlet averaging sensor to assist in overcoming inlet effect.

PERFORMANCE (continued)

However, when a poor inlet condition exists (other than straight), a shift in the controller set point may occur, requiring additional trim adjustment of the controller in the field. With the standard differential controller, flow taps are provided for field setting.

System pressure-dependent models operate only in response to the room thermostat demand, and may fluctuate through their range as the system pressure changes. System pressure-dependent control should be limited to smaller systems wherein pressures do not vary significantly due to load shedding.

Model VVF-II units will operate efficiently at pressures from as low as .03"ΔP (minimum pressure differential for pressure-independent control).

SELECTION

Model VVF-II Fan Induction Terminals should be selected for primary cooling in the mid to upper-mid range of the performance table (CFM) to insure maximum operating efficiency. Published performance values have been established by actual test with the maximum dial set for the rated value (CFM) and the damper in the full-open position. When selections are derated (selected below the middle CFM value shown in Performance Table), pressure drop and noise generation increase substantially as the air valve throttles in response to the thermostat signal. The recommended selection range will produce the quietest possible system.

When selecting the proper fan assembly, care should be exercised in determining external static pressure requirements. The fan curves give the external static pressure (Ps) available at the discharge for each listed size and CFM. If a larger than required fan assembly is applied, the fan discharge must be throttled to maintain the correct capacity (CFM) at the reduced external Ps requirement, and an excessively noisy fan terminal may result. Conversely, if a smaller than required fan assembly is selected, the unit in all probability will not produce the required external Ps, resulting in an under-aired condition, which is expensive to correct in the field.

Various options for fan/motor control are available to meet virtually all requirements. If a unit is properly selected, the standard fan/motor control package will produce the best result. The standard fan/motor control package recommended for the Model VVF-II includes a 3-speed switch (LOW-MEDIUM-HIGH) in combination with a volume control damper located at the fan discharge. The damper is field adjustable from the exterior of the Terminal casing. This package allows the flexibility of three different horsepower settings and the ability to add external static pressure for trim balancing, with the fan operating in its most efficient range. In a quick review of the fan selection curves, you can readily see the flexibility provided by the speed selector in combination with the ability to control external Ps.

The Model VVF-II is also available with an optional SCR speed controller which will provide non-incremental control to approximately ⅔ of the motor standard 1075 operating RPM. If the SCR controller is adjusted below the ⅔ level, an objectionable spike noise can result. This noise generally occurs in the second and third octave band, and is virtually impossible to attenuate. For this reason, care must be exercised during selection to insure that the unit will only be required to operate in a range above the ⅔ value. Care must also be observed in instructing the balancing contractor and building maintenance personnel on proper setting of SCR controllers, otherwise serious equipment damage may result.

When designing discharge configurations for downstream duct systems, care must be used in the application of the model VVF-II. Bull-head tee arrangements should be placed not less than six feet downstream of the discharge, to allow for proper equalization of air flow and temperature; this will reduce the possibility of stratification. Even though the VVF-II has a single discharge opening, air can build up on one side of the discharge, (particularly at low to medium flow), which can result in a stratification condition on one side of the tee, causing a shortage of supply air. Care should also be exercised in placing diffuser taps too close to the discharge; a similar condition of air shortage can result. It is highly recommended that duct work be designed to provide sufficient pressurization to allow equal flow in the downstream duct system. Splitter dampers in the tee arrangement can cause severe problems where stratification exists. If tee arrangements are employed, linear volume dampers should be used in each leg of the tee and balancing dampers should be provided at each diffuser tap. This arrangement allows maximum flexibility in accomplishing a proper balanced condition.

If you should have any doubt regarding proper discharge configurations, consult your local ETI Representative, or contact the factory.

CONTROLS

The Model VVF-II's many control sequences represent the broadest range of standard fan powered control options in the industry, providing infinite design flexibility to meet any system requirement.

Terminals are available with pneumatic or electronic controls. Control sequence descriptions and reproducible schematics are shown in Control Sequence Guide CSP 187-1(pneumatic) and CSE 287-1 (electronic).

INSTALLATION

Model VVF-II Fan Induction Terminals are equipped with vibration isolation type mountings for maximum reduction of vibration transmission. Improper mounting in the field, however, can cause these features to loose their effectiveness.

All VVF-II units should be installed in a manner to avoid contact with obstacles such as rigid conduit, sprinkler piping, greenfield, rigid pneumatic tubing, etc.; as such contact can transmit vibration to the building structure, causing objectional low frequency noise.

Fan terminal units should never be installed tight against concrete slabs or columns, as vibration transmission is amplified in this condition.

Recommended type hangers: sheetmetal straps securely attached to bar joist or mounting anchors properly secured to slab construction with lugs or poured-in-place hangers. Percussion nails are not considered to be a prudent anchor. Trapeeze hangers may also be used, provided rubber liners are used on the contact rails of the hangers, eliminating metal-to-metal contact.

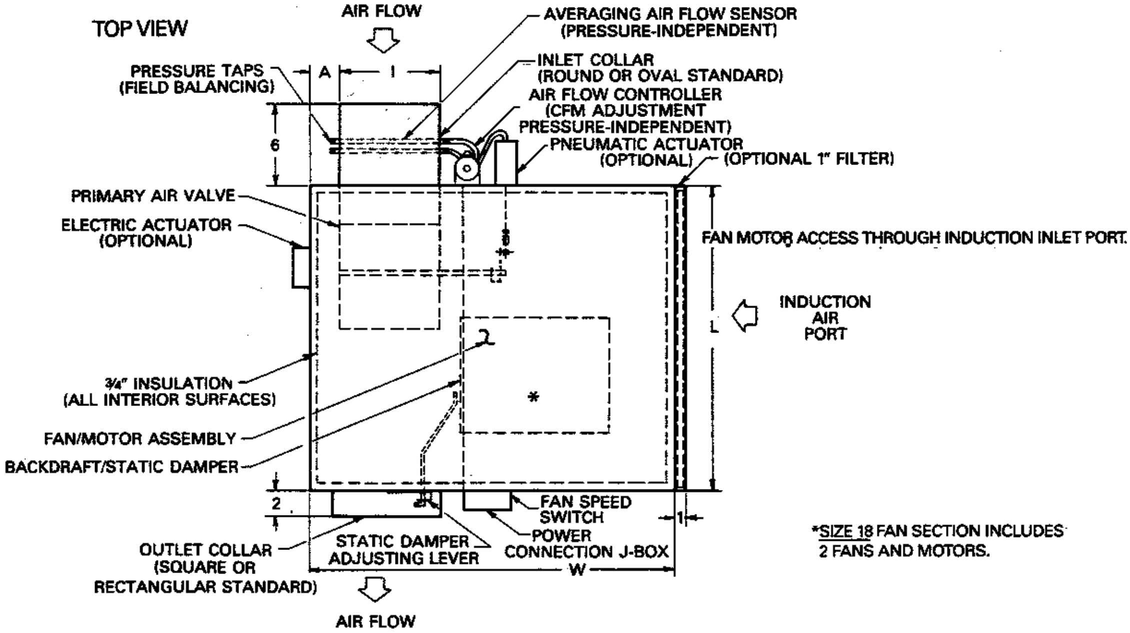
Inlet approaches to system pressure independent Model VVF-II units should be as straight as possible to eliminate inlet effect. Averaging probes are provided to offset mild inlet effect. If severe approaches are installed, field trim adjustment of the controller may be required to achieve acceptable air balance.

For maximum efficiency in controlling radiated noise in critical applications, we recommended that inlet ducts be fabricated of 24-gauge minimum sheet metal in lieu of flex connections. Flex duct is extremely transparent to radiated sound; consequently high inlet static's (Ps) or sharp bends with excessive pressure drop can cause a radiated noise problem in the space.

MODEL VVF-II

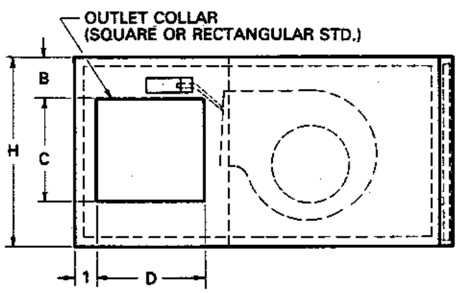
DIMENSIONS

TOP VIEW



*SIZE 18 FAN SECTION INCLUDES 2 FANS AND MOTORS.

END VIEW



TERMINAL SIZE	MAXIMUM PRIMARY (CFM)	MAXIMUM FAN IND. (CFM)	DIMENSIONAL DATA							
			L	W	H	I	D	A	B	C
6*	600	Refer to fan performance curves on pages 10-13; calculate external static prior to selection.	23⅜	24	14	6	6	1	3	8
8*	1000		23⅜	28	14	8	10	2	3	8
10**	1600		23⅜	30	14	11	12	1½	3	8
12**	2100		29⅜	37	17	14⅛	16	1½	4½	10
14**	2800		29⅜	41	17	17¼	20	2¼	4½	10
16**	3400		29⅜	45	17	20⅜	24	2¾	4½	10
18**	4300		48	51	17	23⁹⁄₁₆	28	4¾	2½	12

NOTES: All dimensions are in inches.
L — length
W — width
H — height
I — inlet diameter or oval width
D — discharge width
*Round inlet
**Oval inlet-8" × "I" dimension

PERFORMANCE DATA

MODEL VVF-II												
PRIMARY SIZE / FAN SIZE	PRIMARY CFM	MINIMUM *ΔPs	INDUCTION FAN CFM (NOTE 2)	EXTERNAL Ps (NOTES 2 & 3)	NC Lp (SEE NOTES 1, 2 & 4)							
					MIN ΔPs		1″ Ps		2″ Ps		3″ Ps	
					DISCH	RAD	DISCH	RAD	DISCH	RAD	DISCH	RAD
6	250	.04	125	.56	—	25	21	25	25	25	26	25
480	400	.14	200	.49	25	30	28	30	29	30	31	30
6A	600	.18	300	.34	31	32	36	32	45	32	45	32
8	400	.03	200	.88	24	30	29	30	33	30	36	30
900	600	.06	300	.84	27	32	33	32	36	32	42	32
8	1000	.17	500	.35	29	34	34	34	38	34	45	34
10	600	.04	300	.88	28	30	31	30	36	30	38	30
1,290	1100	.11	550	.63	30	33	33	33	38	33	41	33
10A	1600	.23	800	.60	33	35	35	35	41	35	43	35
12	1200	.08	600	.82	29	31	35	31	41	31	45	31
1,680	1800	.17	900	.70	31	34	36	34	42	34	47	34
12	2100	.24	1050	.58	35	38	37	38	48	38	48	38
14	1600	.09	800	1.0	34	32	37	32	42	32	46	32
2,240	2300	.18	1150	.85	36	37	41	37	44	37	47	37
14	2800	.27	1400	.67	37	39	42	39	47	39	50	39
16	2000	.10	1000	.95	33	35	37	35	42	35	47	35
2,770	2800	.22	1400	.76	36	37	43	37	46	37	51	37
16	3400	.34	1700	.55	39	40	45	40	51	40	54	40
18	2500	.097	1250	.85	35	35	39	35	43	35	48	35
3,440	3400	.220	1700	.73	37	38	43	38	47	38	53	38
18	4300	.410	2150	.56	40	40	46	40	51	40	54	40

*Min. ΔPs is the differential static pressure across the terminal. This value does not include any pressure requirements of the system. Minimum differential pressure requirement of pressure-independent controller is .03 inches w.g.

—Blank space indicates a value of less than 20. DISCH—indicates discharge sound level. RAD—indicates radiated sound level.

NOTE 1. NC Lp = NC Lw—10dB room absorption. All NC ratings are based on a single outlet and 10 feet of unlined duct downstream of the Terminal. Refer to page 15 Table 1-A for NC flow divisions and Table 1-B for lined duct NC reduction.

2. Fan induction CFM shown is 50% of primary cooling CFM (100-50% cooling-to-heating air ratio). External Ps given is maximum available with the fan motor on the high-speed tap for CFM shown and the fan control damper set to maintain a fully loaded fan condition. If a different ratio of cooling-to-heating air is required, consult fan curves shown on page 10, which give the full performance range of each size fan assembly. Radiated sound for a specific speed setting can be derived from the Radiated Sound Table. Fan and air valve assemblies may be selected for more or less capacity (CFM) by matching the cooling requirement valve size to a fan assembly best suited to the heating requirement. For example, a cooling requirement of 400 CFM and a heating requirement of 450 CFM (which would be unusual), with .60 external static pressure needed to satisfy downstream conditions, could not be handled with a standard matched assembly. Normally, based on 400 CFM of cooling, a size 6 unit would be selected. The standard size 6, however, will produce 450 CFM of fan induction air, but not at .60 external static pressure. We would select a size 8 fan assembly which will produce the 450 CFM (heating) required and the .60 external static pressure required. Therefore, our selection is a size 6/8, meaning a 6″ primary valve and an 8″ fan assembly. It is important to select a fan assembly with available external Ps close to the system requirement, as a derated fan becomes noisier if required to operate at reduced static pressure. Derated selections can also cause motor overloading, which increases normal amp draw and reduces motor life.

3. External Ps is the total pressure available at the terminal discharge. Downstream ducting and air distribution pressure losses must be less than the value shown to achieve the required CFM in the space served. If accessories are added, such as filters, water coils, sound baffles or attenuators, then the pressure loss of these devices must be deducted from the available external static pressure shown on either the fan curves or performance Table. See data for the specific accessory to determine pressure loss.

4. NC Lp values are derived from sound power data shown on Page 14 Discharge values indicated are for the primary air valve only, which under test is set in a full-open position with inlet static pressure held to the value indicated in the Performance Table. It should be noted, an increase in inlet static pressure will cause the valve to begin throttling, and noise generation will increase. If a cooling valve is selected on a derated basis (below mid-CFM value shown), the valve must throttle to maintain air flow as inlet pressure increases. This can cause excessive noise generation. For this reason we recommend cooling valves be selected from the mid-to-upper range published (⅔ of the published range is an optimum selection). Radiated sound values indicated are for the fan assembly only, as this is normally the critical noise path of concern in applying fan powered type terminals. For more critical applications, the Model VVF-II is available with an ISB (induction port sound baffle) which deflects radiated noise away from the space below the Terminal. In most cases, the ISB accessory will reduce the radiated noise value by more than 5 dB.

5. Model VVF-II units should not be run prior to installation of downstream ductwork. A minimum downstream static pressure of .20″ should be maintained to preclude motor overload. This may also be accomplished by throttling the fan control damper located inside the Terminal. Damper adjustment lever is located on the Terminal discharge end of the casing.

MODEL VVF-II

FAN PERFORMANCE CURVES

NOTES: 1. A minimum external static pressure of .2" w.g. must be maintained to avoid damage to the motor. If the terminal fan is run for temporary heat, and downstream ductwork is not connected to the terminal, the unit static damper may be adjusted to provide the required .2" w.g.

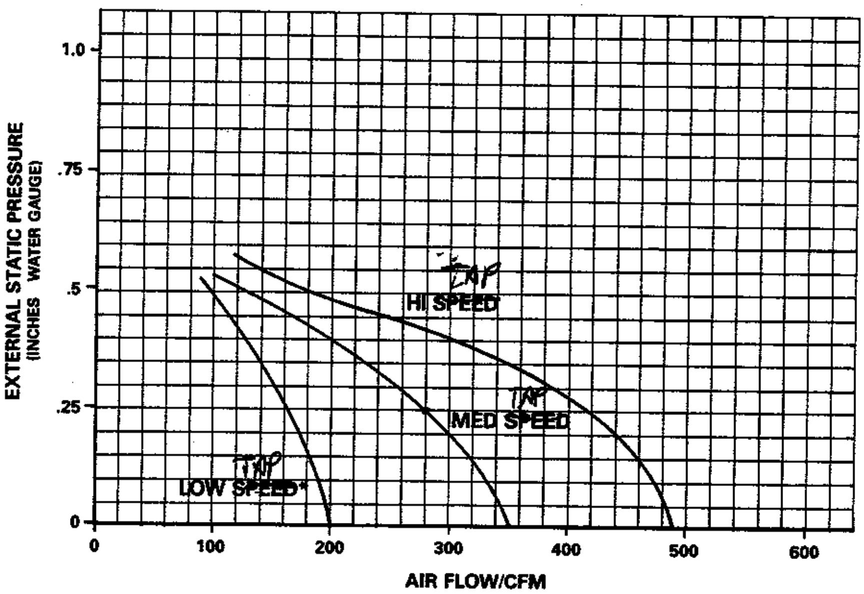
*2. The low speed fan performance curve is achieved with the fan speed switch set at low and the static damper trimmed. The speed switch alone cannot achieve the result shown.

IMPORTANT– Calculate total external static pressure requirements prior to selecting fan. Calculation must include pressure loss for addition of terminal accessories.

SIZE 6

1/6 1/9 1/10

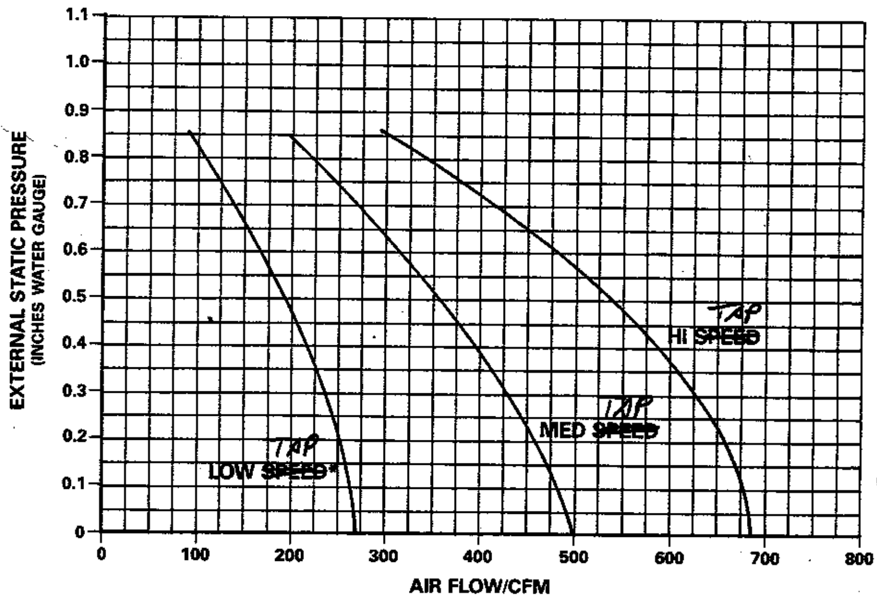
FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA04	1/6	120	2.62	1.67	1.34
FA05		277	~~.89~~	~~.66~~	~~.49~~
			.98	.7	.58



SIZE 8

1/4 1/5 1/8

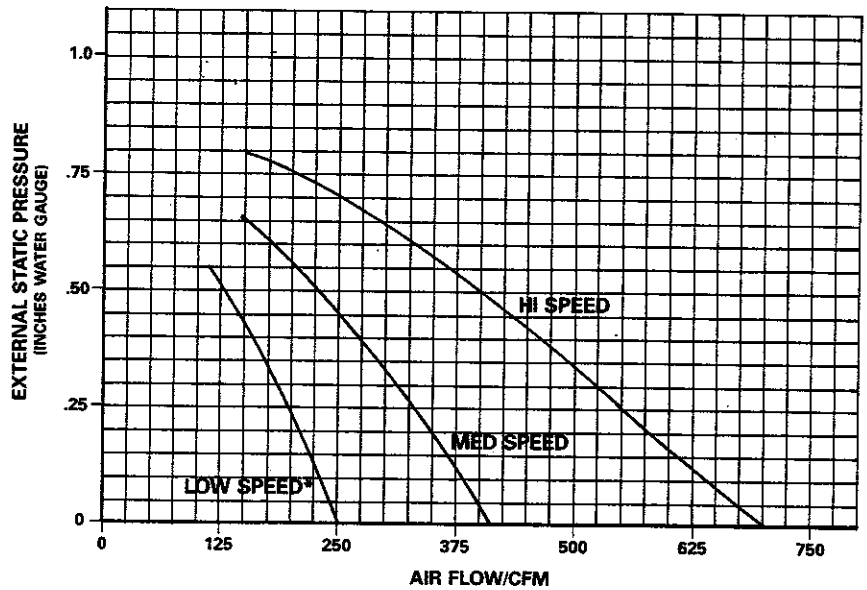
FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA06	1/4	120	4.99	~~2.24~~ 2.3	~~2.19~~ 2.0
FA07		277	1.98	~~1.17~~	~~.82~~
				1.2	.92



SIZE 8A

1/6 1/8 1/10

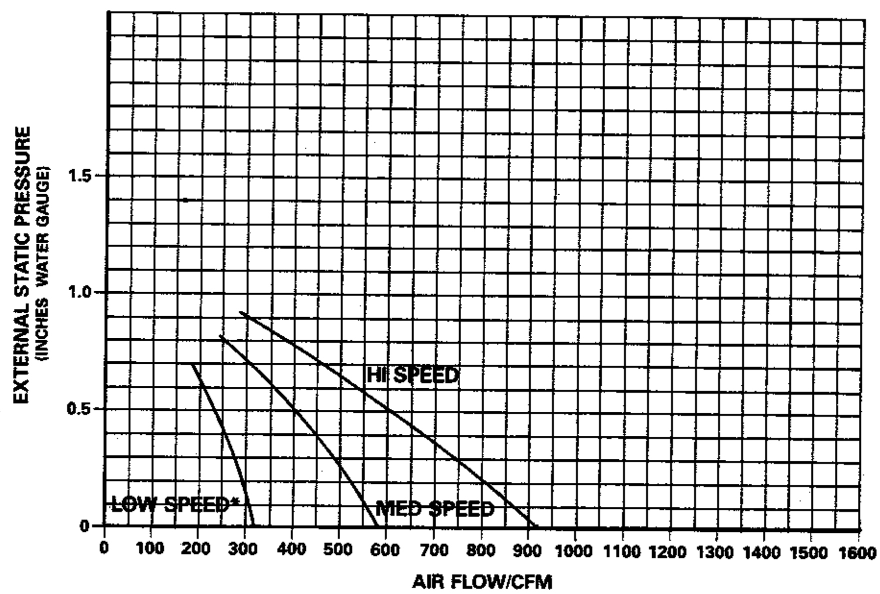
FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA04	1/6	120	2.53	1.67	1.24
FA05		277	.89	.66	.49



SIZE 10

1/4 1/5 1/8

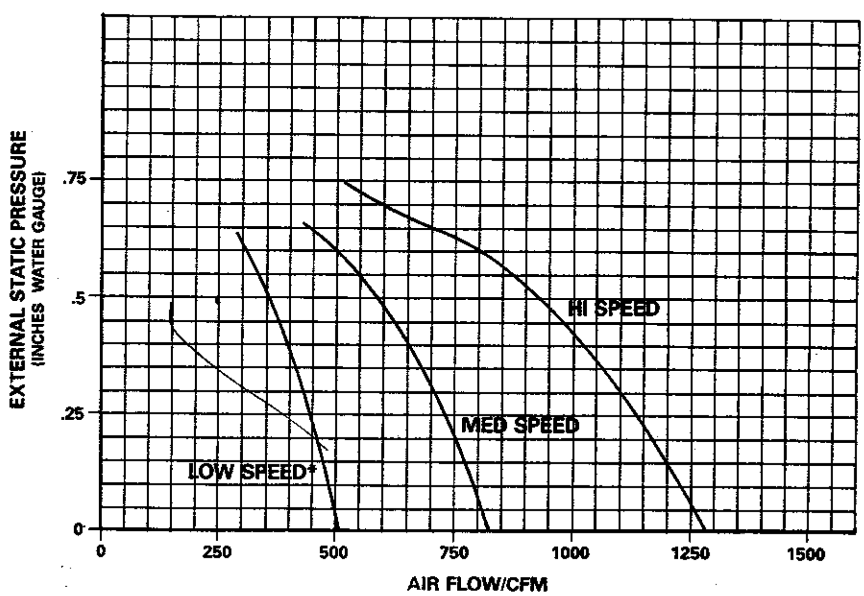
FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA08	1/4	120	4.99	~~3.24~~ 2.8	~~2.19~~ 2.0
FA09		277	1.93	1.17	.82



SIZE 10A

1/2 1/3 1/4

FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA36	1/2	120	8.[illegible]	6.[illegible]	5.0[illegible]
FA37		277	~~3.63~~ 3.2	2.5[illegible]	~~1.88~~ 1.9



MODEL VVF-II

FAN PERFORMANCE CURVES

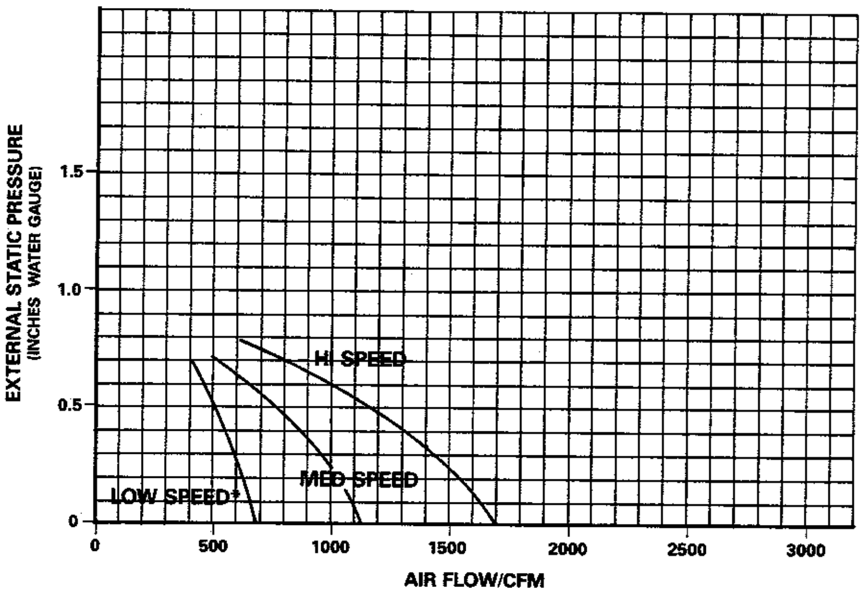
NOTES: 1. A minimum external static pressure of .2" w.g. must be maintained to avoid damage to the motor. If the terminal fan is run for temporary heat, and downstream ductwork is not connected to the terminal, the unit static damper may be adjusted to provide the required .2" w.g.

*2. The low speed fan performance curve is achieved with the fan speed switch set at low and the static damper trimmed. The speed switch alone cannot achieve the result shown.

IMPORTANT– Calculate total external static pressure requirements prior to selecting fan. Calculation must include pressure loss for addition of terminal accessories.

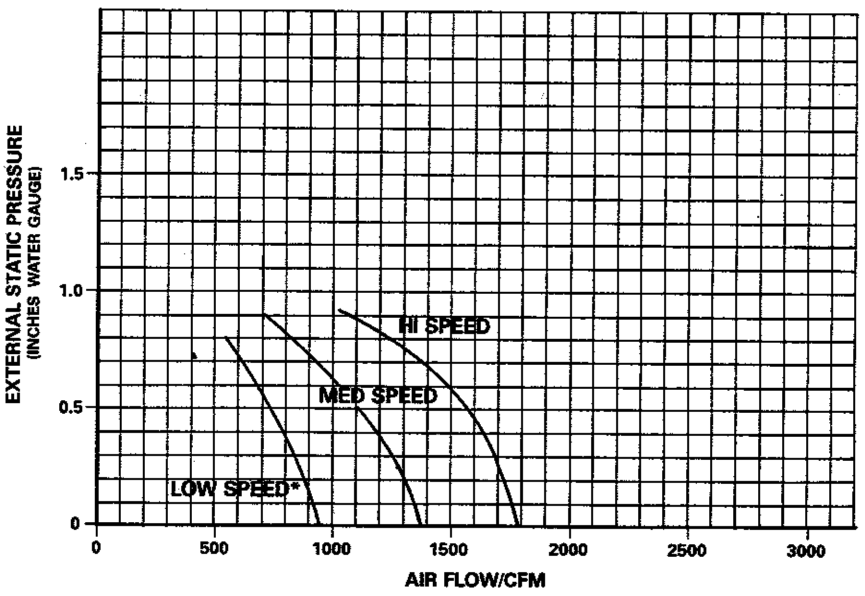
SIZE 12

FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA10	1/2	120	8.71	6.35	5.01
FA11		277	3.63	2.50	1.88



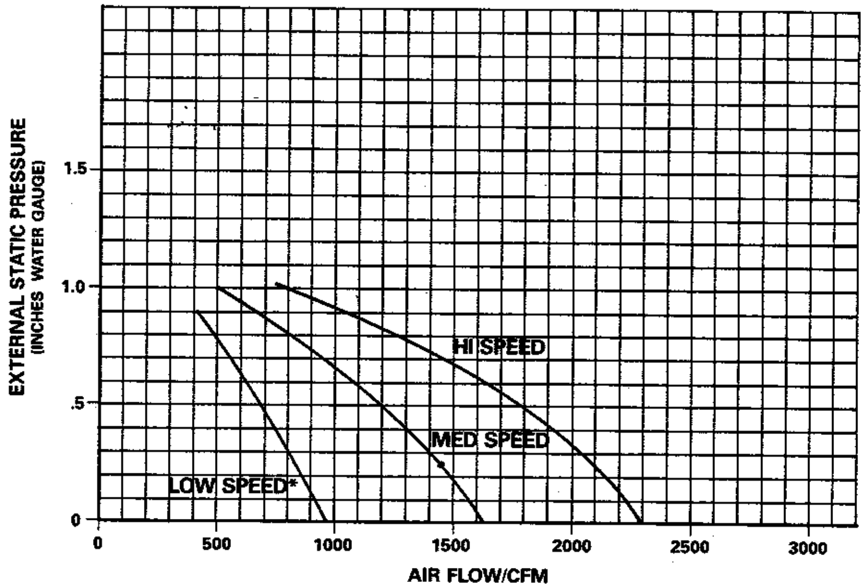
SIZE 14

FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA12	1/2	120	8.71	6.35	5.01
FA13		277	3.63	2.50	1.88



SIZE 16

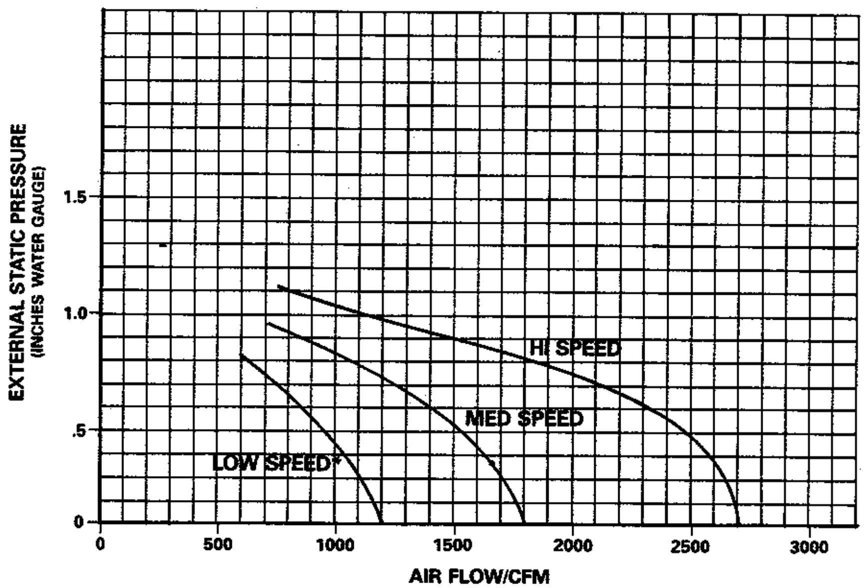
FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA14	3/4	120	9.63	6.98	5.39
FA15		277	3.79	2.54	1.91



SIZE 18

TWO FAN ASSEMBLIES PER UNIT

FAN NO.	HP	VOLTAGE	AMPS @ 1075 RPM		
			HI	MED	LO
FA12	1/2	120	17.54	12.7	10.02
FA13		277	7.26	5.00	3.76



MODEL VVF-II
PERFORMANCE DATA

Model VVF-II Discharge Sound Power Level Re: 10^{-12} Watt

Octave Bands NCLp Based on 10dB Room Absorption

PRIMARY SIZE	CFM	MIN. Δ Ps						1″ Ps						2″ Ps						3″ Ps					
		2	3	4	5	6	NC	2	3	4	5	6	NC	2	3	4	5	6	NC	2	3	4	5	6	NC
6	250	46	41	33	27	22	—	53	45	38	30	27	21	54	48	40	33	30	25	57	49	41	36	32	26
	400	53	42	40	33	32	25	54	47	44	35	37	28	53	49	45	37	37	29	58	49	46	41	40	31
	600	54	51	47	40	36	31	59	55	52	44	39	37	61	60	59	52	44	45	64	61	59	53	49	45
8	400	51	47	40	35	30	24	55	51	45	40	35	29	59	54	48	42	39	33	63	56	51	45	41	36
	600	56	47	41	36	35	27	56	53	49	42	37	33	60	56	51	47	42	36	64	59	57	49	46	42
	1000	57	48	45	40	37	29	57	54	49	46	39	34	62	58	53	49	43	38	65	61	59	53	48	45
10	600	55	50	44	37	32	28	59	53	46	40	36	31	60	57	51	42	40	36	65	51	53	48	44	38
	1100	56	51	46	40	35	30	60	54	48	42	38	33	62	59	53	47	43	38	67	62	56	50	47	41
	1600	57	52	48	42	36	33	60	55	50	44	40	35	63	61	56	50	45	41	68	63	57	53	48	43
12	1200	56	45	44	39	38	29	58	56	48	45	41	35	64	61	56	50	45	41	64	62	60	53	48	45
	1800	59	49	47	42	41	31	59	57	51	46	42	36	65	62	57	51	46	42	65	64	61	54	49	47
	2100	60	54	50	45	41	35	60	58	52	47	42	37	66	62	58	51	46	48	66	65	62	54	49	48
14	1600	57	54	49	43	37	34	59	57	52	47	41	37	64	61	57	53	47	42	70	63	62	58	51	46
	2300	58	55	51	46	44	36	60	59	56	50	46	41	65	62	58	53	48	44	71	64	63	58	52	47
	2800	58	55	52	49	44	37	62	61	58	54	52	42	66	64	62	57	52	47	72	68	65	60	54	50
16	2000	54	53	49	45	38	33	58	55	53	48	41	37	64	61	57	52	45	42	67	65	61	57	51	46
	2800	58	55	51	46	39	36	65	62	58	52	45	43	68	65	61	56	52	46	72	69	66	60	56	51
	3400	61	58	54	50	44	39	66	63	59	55	50	45	71	68	66	62	56	51	75	71	68	64	60	54
18	2500	54	54	50	45	39	35	59	55	54	47	42	39	66	62	58	52	46	43	69	66	62	58	51	48
	3400	59	55	52	47	42	37	66	63	58	53	46	43	69	66	62	56	53	47	73	69	67	61	56	53
	4300	63	59	55	50	46	40	68	63	60	56	51	46	73	69	66	62	58	51	75	72	68	64	61	54

Model VVF-II Radiated Sound Power Level Re: 10^{-12} Watt

Octave Bands NCLp Based on 10dB Room Attenuation-⅓ of Ceiling Sound Transmission Class 35-39

FAN SIZE	CFM	HIGH SPEED							MEDIUM SPEED							LOW SPEED						
		2	3	4	5	6	NC	*Ps	2	3	4	5	6	NC	*Ps	2	3	4	5	6	NC	*Ps
6, 6A, 8A	125	60	55	48	46	40	25	.56	58	53	47	45	40	22	.47	55	51	44	43	38	21	.36
	200	63	56	49	48	42	30	.49	61	55	48	47	42	26	.35	—	—	—	—	—	—	—
	300	65	57	50	49	43	32	.38	63	56	49	48	43	30	.24	—	—	—	—	—	—	—
8	200	63	57	50	48	41	30	.88	60	55	48	46	41	26	.72	57	52	45	44	39	23	.40
	300	64	58	50	48	43	32	.84	63	56	48	47	42	30	.60	—	—	—	—	—	—	—
	500	66	59	51	49	43	34	.55	64	57	50	48	44	33	.20	—	—	—	—	—	—	—
10	300	63	58	52	48	43	30	.88	61	56	51	47	42	29	.53	—	—	—	—	—	—	—
	550	66	61	56	51	46	33	.62	64	59	54	49	44	32	.35	—	—	—	—	—	—	—
	800	68	63	57	52	47	35	.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10A, 12	600	64	60	55	51	47	31	.81	62	58	54	49	43	30	.65	60	56	51	47	44	27	.23
	900	66	62	56	52	48	34	.70	65	60	56	51	46	33	.40	—	—	—	—	—	—	—
	1150	70	66	60	57	51	38	.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14	800	65	60	56	51	47	32	1.0	63	59	54	49	46	31	.70	61	56	53	49	45	29	.20
	1150	69	65	61	57	51	37	.85	65	61	57	52	49	35	.40	—	—	—	—	—	—	—
	1500	71	67	63	60	57	39	.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16	1000	68	64	61	56	51	35	.94	66	62	57	52	48	34	.60	—	—	—	—	—	—	—
	1400	70	65	61	57	53	37	.75	69	66	62	58	55	36	.30	—	—	—	—	—	—	—
	1800	72	67	62	59	56	40	.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18	1250	68	64	60	54	50	35	.85	67	64	60	53	50	35	.60	—	—	—	—	—	—	—
	1700	70	66	61	56	54	38	.73	69	65	61	56	54	37	.20	—	—	—	—	—	—	—
	2150	74	67	62	58	56	40	.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE 1. *Available External Static Pressure with Motor Speed Setting as Indicated and Flow (CFM) Shown.
2. — Indicates Fan Speed Not Applicable to Flow Condition.

MODEL VVF-II

PERFORMANCE DATA

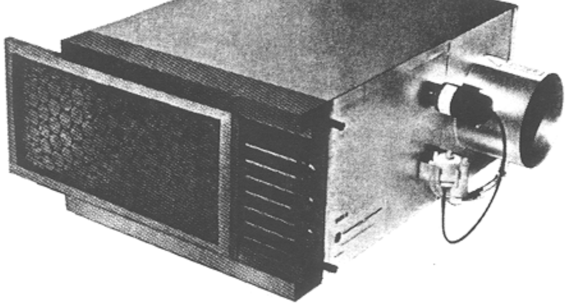
Table 1-A NC Reduction Chart										
% OF TOTAL AIR OF THE TERMINAL HANDLED BY EACH DIFFUSER	5	7	10	15	20	25	33	50	75	100
NUMBER OF DIFFUSERS PER TERMINAL	20	14	10	7	5	4	3	2	2	1
NC REDUCTION	13	12	10	8	7	6	5	3	1	0

Table 1-B dB Reduction per Foot of Lined Duct (Downstream)						
OCTAVE BAND	**2**	**3**	**4**	**5**	**6**	***NC REDUCTION**
UNIT SIZE						
4-5-6	.53	2.3	4.4	6.0	6.3	24
8	.4	1.8	3.3	4.5	4.8	18
10	.39	1.7	3.2	4.2	4.4	18
12	.35	1.5	2.8	3.8	4.0	15
14	.32	1.4	2.6	3.5	3.8	14
16	.32	1.4	2.6	3.5	3.8	14
18	.30	1.3	2.4	3.3	3.6	13

The data appearing above has been compiled through a combination of laboratory testing and extrapolation of empirical data published in the ASHRAE guide.

***NC REDUCTION** — is based on mid-frequency PWL – dB re 10^{-12} watts corrected for the addition of 5 feet of lined duct downstream of the Terminal of a size equal to the Terminal discharge. This method assumes the Designer has properly sized the downstream duct system and air outlets to the space served. If duct system and outlets are undersized, downstream lining may not correct for the system (downstream) or air distribution effect.

MODEL VVF-WC-II
W/HOT WATER COIL



DESCRIPTION

Model VVF-WC-II Terminals are of the same basic design as the Model VVF-II, except for the addition of an auxilliary hot water coil, which is mounted in the induction port of the Terminal. The water coil is energized after the induction fan is operating, and only if the waste heat provided by the fan is insufficient to temper the space or zone served or to provide heating when the central system is in the set-back mode for night or weekend operation.

Standard water coils have been computer-selected to provide maximum efficiency at the lowest possible cost. Consult water coil selection charts for specific performance requirements. If your specific requirement can not be satisfied by the standard selections shown, contact your ETI representative for special factory coil selections.

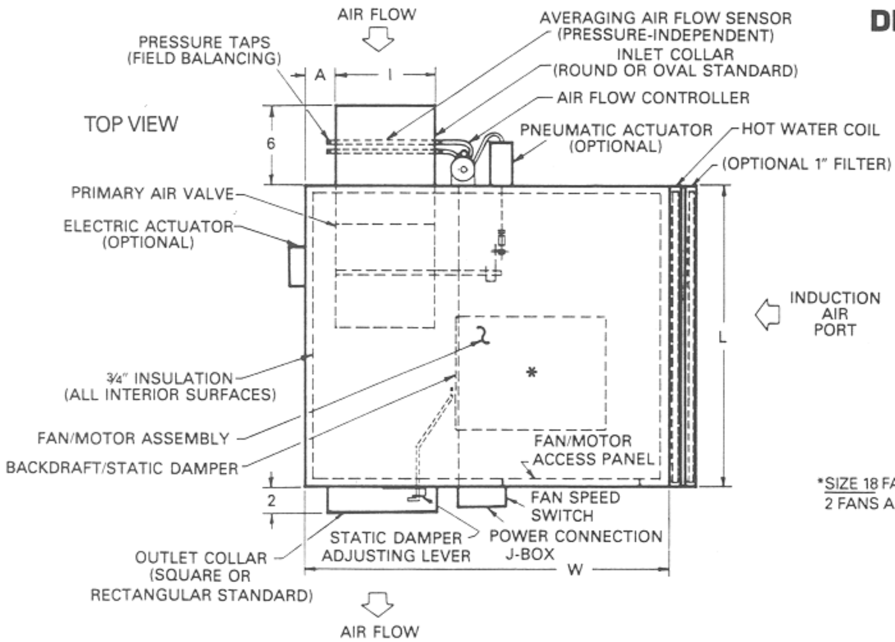
CONSTRUCTION

Water coils are constructed of pure aluminum fins of .005" to .010" thickness, with die-formed spacer collars to maintain uniform spacing. Fins are mechanically fixed to .018" copper tubes, insuring maximum heat transfer. All ETI coils are tested at 320 psig minimum pressure for leaks, using air under warm water.

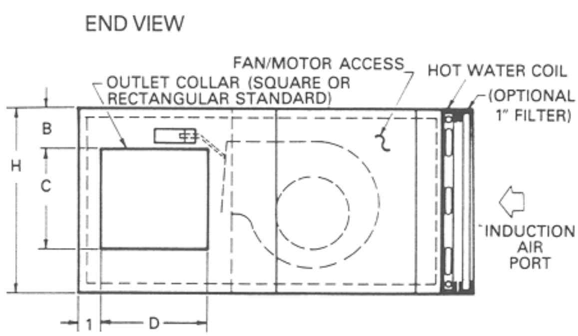
SELECTION

The selection graphs, appearing on page 17 are designed to cover a broad range of entering and leaving conditions most common to fan powered terminal applications. If, however, your heating requirements should exceed the range of the graphs shown, contact your ETI representative, or the factory. Special coil selections can be furnished within one working day.

The water coil selection graphs have been computer designed to eliminate time consuming calculations. To select a coil, you simply enter the graph in two areas (MBH and CFM), draw three lines, read from the intersect points and your coil selection is complete.



DIMENSIONS



*SIZE 18 FAN SECTION INCLUDES 2 FANS AND MOTORS.

TERMINAL SIZE	MAXIMUM PRIMARY (CFM)	MAXIMUM FAN IND. (CFM)	DIMENSIONAL DATA							
			L	W	H	I	D	A	B	C
6*	600	Refer to fan performance curves on pages 10-13; calculate external static prior to selection.	23⅜	24	14	6	6	1	3	8
8*	1000		23⅜	28	14	8	10	2	3	8
10**	1600		23⅜	30	14	11	12	1½	3	8
12**	2100		29⅜	37	17	14⅛	16	1½	4½	10
14**	2800		29⅜	41	17	17¼	20	2¼	4½	10
16**	3400		29⅜	45	17	20⅜	24	2¾	4½	10
18**	4300		48	51	17	23⁹⁄₁₆	28	4¾	2½	12

NOTES: All dimensions are in inches.
L — length
W — width
H — height
I — inlet diameter or oval width
D — discharge width
* round inlet
** oval inlet — 8" x "I" dimension

HOT WATER COIL SELECTION PROCEDURE

DEFINITION OF TERMS:

EAT — Entering Air Temperature (degrees F)
LAT — Leaving Air Temperature (degrees F)
EWT — Entering Water Temperature (degrees F)
LWT — Leaving Water Temperature (degrees F)
ATR — Air Temperature Rise (degrees F)
WTD — Water Temperature Drop (degrees F)
CFM — Air Volume (Cubic Feet Per Minute)
MBH — 1000 BTUH
BTUH — Coil Heating Capacity (British Thermal Units Per Hour)

SELECTION:

Tables are based on temperature difference of 115 degrees F between entering water and entering air. If this ΔT is suitable, proceed directly to tables for selection. All pertinent performance data is tabulated. FOR VARIABLE AIR VOLUME APPLICATIONS, THE AIR STATIC PRESSURE DROP MUST BE BASED ON THE MAXIMUM AIR VOLUME.

ENTERING WATER-AIR TEMPERATURE DIFFERENTIAL [ΔT CORRECTION FACTORS]

ΔT	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
FACTOR	.15	.19	.23	.27	.31	.35	.39	.43	.47	.51	.55	.59	.63	.67	.71
ΔT	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155
FACTOR	.75	.79	.83	.88	.92	.96	1.00	1.04	1.08	1.13	1.17	1.21	1.25	1.29	1.33

The table above gives correction factors for various entering ΔT's (difference between entering water temperature and entering air temperature). Multiply MBH values obtained from selection tables by the appropriate correction factor above to obtain the actual MBH value. Air and water pressure drop can be read directly from the selection table. The leaving air temperature and leaving water temperature can be calculated from the following fundamental formulas:

$$LAT = EAT + \frac{BTUH}{1.08 \times CFM} \qquad LWT = EWT - \frac{BTUH}{500 \times GPM}$$

Model VVF-WC Sizes 6, 6A, 8, 8A

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.) 1ROW	WATER PD (FT. W.G.) 2ROW	LAT (DEGREES F) 1ROW	LAT (DEGREES F) 2ROW	LWT (DEGREES F) 1ROW	LWT (DEGREES F) 2ROW	CAPACITY (MBH) 1ROW	CAPACITY (MBH) 2ROW
100	1 Row 0.01	0.5	0.3	0.1	141.6	153.7	146.9	141.7	8.27	9.58
	2 Row 0.01	1.0	1.0	0.4	147.9	160.7	162.1	159.3	8.95	10.33
		2.0	3.3	1.3	151.3	164.1	170.7	169.3	9.32	10.71
		3.0	6.8	2.7	152.5	165.3	173.7	172.8	9.45	10.83
		5.0	16.9	6.7	153.5	166.2	176.2	175.6	9.56	10.93
150	1 Row 0.01	0.5	0.3	0.1	127.3	141.6	139.6	130.4	10.09	12.41
	2 Row 0.01	1.0	1.0	0.4	134.6	151.4	157.4	152.0	11.28	14.00
		2.0	3.3	1.3	138.8	156.6	168.0	165.2	11.96	14.85
		3.0	6.8	2.7	140.3	158.4	171.9	169.9	12.20	15.13
		5.0	16.9	6.7	141.6	159.9	175.0	173.9	12.41	15.37
200	1 Row 0.01	0.5	0.3	0.1	117.5	132.2	134.6	122.0	11.35	14.51
	2 Row 0.01	1.0	1.0	0.4	125.2	143.8	154.0	146.0	13.00	17.02
		2.0	3.3	1.3	129.7	150.3	166.0	161.6	13.98	18.43
		3.0	6.8	2.7	131.4	152.6	170.4	167.4	14.34	18.93
		5.0	16.9	6.7	132.8	154.6	174.1	172.3	14.64	19.34
250	1 Row 0.01	0.5	0.3	0.1	110.5	124.7	130.8	115.6	12.30	16.11
	2 Row 0.01	1.0	1.0	0.4	118.2	137.4	151.3	140.9	14.35	19.55
		2.0	3.3	1.3	122.8	145.0	164.4	158.4	15.61	21.60
		3.0	6.8	2.7	124.6	147.7	169.3	165.1	16.08	22.33
		5.0	16.9	6.7	126.0	150.0	173.4	170.8	16.48	22.95
300	1 Row 0.01	0.5	0.3	0.1	105.3	118.6	127.8	110.5	13.04	17.37
	2 Row 0.02	1.0	1.0	0.4	112.7	132.0	149.1	136.6	15.46	21.71
		2.0	3.3	1.3	117.4	140.4	163.0	155.6	16.98	24.42
		3.0	6.8	2.7	119.2	143.4	168.3	163.1	17.55	25.42
		5.0	16.9	6.7	120.7	146.1	172.8	169.5	18.05	26.26
350	1 Row 0.01	0.5	0.3	0.1	101.1	113.7	125.4	106.4	13.66	18.39
	2 Row 0.02	1.0	1.0	0.4	108.4	127.4	147.2	132.8	16.40	23.58
		2.0	3.3	1.3	113.0	136.3	161.8	153.0	18.16	26.96
		3.0	6.8	2.7	114.8	139.7	167.4	161.2	18.83	28.23
		5.0	16.9	6.7	116.3	142.6	172.2	168.3	19.41	29.32
400	1 Row 0.02	0.5	0.3	0.1	97.8	109.5	123.3	103.1	14.17	19.23
	2 Row 0.03	1.0	1.0	0.4	104.8	123.4	145.6	129.6	17.21	25.22
		2.0	3.3	1.3	109.4	132.7	160.8	150.7	19.19	29.27
		3.0	6.8	2.7	111.2	136.4	166.7	159.4	19.95	30.83
		5.0	16.9	6.7	112.7	139.5	171.8	167.1	20.62	32.17
450	1 Row 0.02	0.5	0.3	0.1	95.1	106.0	121.6	100.3	14.61	19.94
	2 Row 0.04	1.0	1.0	0.4	101.9	119.9	144.2	126.7	17.91	26.66
		2.0	3.3	1.3	106.4	129.6	159.9	148.6	20.10	31.38
		3.0	6.8	2.7	108.1	133.4	166.0	157.8	20.96	33.23
		5.0	16.9	6.7	109.7	136.7	171.3	166.1	21.70	34.84
500	1 Row 0.02	0.5	0.3	0.1	92.8	103.0	120.0	97.9	14.99	20.53
	2 Row 0.04	1.0	1.0	0.4	99.3	116.7	142.9	124.1	18.54	27.94
		2.0	3.3	1.3	103.8	126.7	159.1	146.7	20.93	33.32
		3.0	6.8	2.7	105.5	130.7	165.4	156.4	21.87	35.46
		5.0	16.9	6.7	107.0	134.2	170.9	165.1	22.69	37.34
550	1 Row 0.03	0.5	0.3	0.1	90.8	100.4	118.7	95.8	15.33	21.05
	2 Row 0.05	1.0	1.0	0.4	97.2	114.0	141.8	121.8	19.11	29.10
		2.0	3.3	1.3	101.5	124.1	158.3	144.9	21.68	35.11
		3.0	6.8	2.7	103.2	128.2	164.9	155.0	22.69	37.55
		5.0	16.9	6.7	104.7	131.8	170.6	164.1	23.59	39.70
600	1 Row 0.03	0.5	0.3	0.1	89.1	98.2	117.5	94.0	15.64	21.49
	2 Row 0.06	1.0	1.0	0.4	95.3	111.5	140.8	119.7	19.62	30.14
		2.0	3.3	1.3	99.5	121.7	157.6	143.2	22.37	36.77
		3.0	6.8	2.7	101.2	126.0	164.4	153.7	23.46	39.50
		5.0	16.9	6.7	102.7	129.7	170.2	163.2	24.42	41.94
650	1 Row 0.04	0.5	0.3	0.1	87.6	96.2	116.4	92.5	15.90	21.88
	2 Row 0.07	1.0	1.0	0.4	93.6	109.3	139.9	117.8	20.07	31.09
		2.0	3.3	1.3	97.7	119.6	157.0	141.7	22.98	38.32
		3.0	6.8	2.7	99.4	123.9	163.9	152.4	24.14	41.34
		5.0	16.9	6.7	100.9	127.8	169.9	162.4	25.17	44.06

ABOVE DATA IS BASED ON ENTERING WATER TEMPERATURE OF 180° F AND ENTERING AIR TEMPERATURE OF 65° F. SEE HOT WATER COIL SELECTION PROCEDURE FOR CORRECTION FACTORS IF ENTERING TEMPERATURES VARY FROM THESE.

Model VVF-WC Sizes 10, 10A

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.) 1ROW	WATER PD (FT. W.G.) 2ROW	LAT (DEGREES F) 1ROW	LAT (DEGREES F) 2ROW	LWT (DEGREES F) 1ROW	LWT (DEGREES F) 2ROW	CAPACITY (MBH) 1ROW	CAPACITY (MBH) 2ROW
200	1 Row 0.01	0.5	0.3	0.1	117.5	132.2	134.6	122.0	11.35	14.51
	2 Row 0.01	1.0	1.0	0.4	125.2	143.8	154.0	146.0	13.00	17.02
		2.0	3.3	1.3	129.7	150.3	166.0	161.6	13.98	18.43
		3.0	6.8	2.7	131.4	152.6	170.4	167.4	14.34	18.93
		5.0	16.9	6.7	132.8	154.6	174.1	172.3	14.64	19.34
300	1 Row 0.01	0.5	0.3	0.1	105.3	118.6	127.8	110.5	13.04	17.37
	2 Row 0.02	1.0	1.0	0.4	112.7	132.0	149.1	136.6	15.46	21.71
		2.0	3.3	1.3	117.4	140.4	163.0	155.6	16.98	24.42
		3.0	6.8	2.7	119.2	143.4	168.3	163.1	17.55	25.42
		5.0	16.9	6.7	120.7	146.1	172.8	169.5	18.05	26.26
400	1 Row 0.02	0.5	0.3	0.1	97.8	109.5	123.3	103.1	14.17	19.23
	2 Row 0.03	1.0	1.0	0.4	104.8	123.4	145.6	129.6	17.21	25.22
		2.0	3.3	1.3	109.4	132.7	160.8	150.7	19.19	29.27
		3.0	6.8	2.7	111.2	136.4	166.7	159.4	19.95	30.83
		5.0	16.9	6.7	112.7	139.5	171.8	167.1	20.62	32.17
500	1 Row 0.02	0.5	0.3	0.1	92.8	103.0	120.0	97.9	14.99	20.53
	2 Row 0.04	1.0	1.0	0.4	99.3	116.7	142.9	124.1	18.54	27.94
		2.0	3.3	1.3	103.8	126.7	159.1	146.7	20.93	33.32
		3.0	6.8	2.7	105.5	130.7	165.4	156.4	21.87	35.46
		5.0	16.9	6.7	107.0	134.2	170.9	165.1	22.69	37.34
600	1 Row 0.03	0.5	0.3	0.1	89.1	98.2	117.5	94.0	15.64	21.49
	2 Row 0.06	1.0	1.0	0.4	95.3	111.5	140.8	119.7	19.62	30.14
		2.0	3.3	1.3	99.5	121.7	157.6	143.2	22.37	36.77
		3.0	6.8	2.7	101.2	126.0	164.4	153.7	23.46	39.50
		5.0	16.9	6.7	102.7	129.7	170.2	163.2	24.42	41.94
700	1 Row 0.04	0.5	0.3	0.1	86.5	94.4	114.9	91.1	16.27	22.22
	2 Row 0.08	1.0	1.0	0.4	92.4	107.3	138.6	116.1	20.72	31.95
		2.0	3.3	1.3	96.5	117.6	156.2	140.2	23.85	39.77
		3.0	6.8	2.7	98.2	122.0	163.3	151.3	25.11	43.08
		5.0	16.9	6.7	99.7	126.0	169.5	161.6	26.23	46.08
800	1 Row 0.05	0.5	0.3	0.1	84.6	91.4	112.3	88.8	16.93	22.81
	2 Row 0.10	1.0	1.0	0.4	90.3	103.7	136.2	113.1	21.88	33.47
		2.0	3.3	1.3	94.5	114.1	154.6	137.6	25.45	42.40
		3.0	6.8	2.7	96.1	118.6	162.1	149.1	26.90	46.28
		5.0	16.9	6.7	97.6	122.7	168.7	160.1	28.21	49.84
900	1 Row 0.06	0.5	0.3	0.1	83.0	88.9	110.0	86.9	17.50	23.28
	2 Row 0.12	1.0	1.0	0.4	88.6	100.8	134.2	110.5	22.91	34.77
		2.0	3.3	1.3	92.7	111.0	153.1	135.3	26.90	44.74
		3.0	6.8	2.7	94.4	115.6	161.0	147.2	28.55	49.17
		5.0	16.9	6.7	95.9	119.8	168.0	158.7	30.03	53.29
1000	1 Row 0.08	0.5	0.3	0.1	81.7	86.9	108.0	85.3	18.00	23.67
	2 Row 0.15	1.0	1.0	0.4	87.1	98.2	132.3	108.2	23.84	35.89
		2.0	3.3	1.3	91.1	108.4	151.8	133.2	28.23	46.84
		3.0	6.8	2.7	92.8	113.0	160.0	145.5	30.06	51.80
		5.0	16.9	6.7	94.4	117.3	167.3	157.4	31.72	56.47
1100	1 Row 0.09	0.5	0.3	0.1	80.5	85.2	106.3	84.0	18.43	23.99
	2 Row 0.18	1.0	1.0	0.4	85.8	96.0	130.6	106.3	24.68	36.87
		2.0	3.3	1.3	89.8	106.0	150.5	131.3	29.46	48.73
		3.0	6.8	2.7	91.5	110.6	159.0	143.9	31.47	54.21
		5.0	16.9	6.7	93.0	115.0	166.7	156.2	33.30	59.41
1200	1 Row 0.11	0.5	0.3	0.1	79.5	83.7	104.7	82.9	18.82	24.27
	2 Row 0.20	1.0	1.0	0.4	84.6	94.1	129.1	104.5	25.45	37.73
		2.0	3.3	1.3	88.6	103.9	149.4	129.5	30.60	50.45
		3.0	6.8	2.7	90.3	108.5	158.1	142.4	32.78	56.42
		5.0	16.9	6.7	91.8	113.0	166.1	155.1	34.78	62.15
1300	1 Row 0.12	0.5	0.3	0.1	78.7	82.5	103.3	81.9	19.17	24.51
	2 Row 0.24	1.0	1.0	0.4	83.6	92.4	127.7	103.0	26.15	38.50
		2.0	3.3	1.3	87.5	102.1	148.3	128.0	31.65	52.02
		3.0	6.8	2.7	89.2	106.6	157.3	141.0	34.01	58.47
		5.0	16.9	6.7	90.8	111.1	165.5	154.1	36.18	64.72

ABOVE DATA IS BASED ON ENTERING WATER TEMPERATURE OF 180° F AND ENTERING AIR TEMPERATURE OF 65° F. SEE HOT WATER COIL SELECTION PROCEDURE FOR CORRECTION FACTORS IF ENTERING TEMPERATURES VARY FROM THESE.

Model VVF-WC Sizes 12, 14

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.) 1ROW	WATER PD (FT. W.G.) 2ROW	LAT (DEGREES F) 1ROW	LAT (DEGREES F) 2ROW	LWT (DEGREES F) 1ROW	LWT (DEGREES F) 2ROW	CAPACITY (MBH) 1ROW	CAPACITY (MBH) 2ROW
425	1 Row 0.01	0.5	0.4	0.2	102.4	112.3	111.3	93.1	17.17	21.73
	2 Row 0.02	1.0	1.4	0.5	111.7	128.6	137.1	121.6	21.43	29.19
		2.0	4.7	1.8	117.7	139.2	155.8	146.0	24.18	34.05
		3.0	9.6	3.6	119.9	143.1	163.2	156.1	25.22	35.84
		5.0	23.7	9.0	121.9	146.3	169.6	165.1	26.12	37.34
550	1 Row 0.01	0.5	0.4	0.2	95.8	104.1	106.9	87.0	18.27	23.24
	2 Row 0.02	1.0	1.4	0.5	104.4	120.3	133.1	114.3	23.43	32.87
		2.0	4.7	1.8	110.3	132.0	153.1	140.2	26.92	39.77
		3.0	9.6	3.6	112.6	136.5	161.2	151.7	28.27	42.44
		5.0	23.7	9.0	114.6	140.3	168.2	162.1	29.45	44.73
675	1 Row 0.02	0.5	0.4	0.2	91.2	98.3	103.7	83.0	19.08	24.25
	2 Row 0.04	1.0	1.4	0.5	99.3	113.9	130.1	108.6	24.97	35.68
		2.0	4.7	1.8	104.9	126.1	150.9	135.5	29.10	44.54
		3.0	9.6	3.6	107.2	131.0	159.5	147.9	30.74	48.11
		5.0	23.7	9.0	109.1	135.3	167.1	159.5	32.18	51.24
800	1 Row 0.03	0.5	0.4	0.2	87.8	93.9	101.2	80.1	19.70	24.96
	2 Row 0.05	1.0	1.4	0.5	95.3	108.9	127.6	104.2	26.22	37.90
		2.0	4.7	1.8	100.8	121.2	149.1	131.4	30.92	48.59
		3.0	9.6	3.6	103.0	126.4	158.1	144.6	32.82	53.07
		5.0	23.7	9.0	104.9	131.0	166.2	157.2	34.49	57.06
925	1 Row 0.03	0.5	0.4	0.2	85.1	90.5	99.7	78.0	20.08	25.49
	2 Row 0.06	1.0	1.4	0.5	92.1	104.7	125.9	100.6	27.03	39.69
		2.0	4.7	1.8	97.2	117.1	147.9	127.9	32.15	52.08
		3.0	9.6	3.6	99.3	122.5	157.2	141.7	34.23	57.44
		5.0	23.7	9.0	101.1	127.4	165.6	155.1	36.09	62.31
1050	1 Row 0.04	0.5	0.4	0.2	83.3	87.8	97.1	76.4	20.72	25.89
	2 Row 0.08	1.0	1.4	0.5	90.0	101.3	123.3	97.7	28.36	41.17
		2.0	4.7	1.8	95.1	113.6	145.9	124.9	34.14	55.12
		3.0	9.6	3.6	97.2	119.1	155.7	139.1	36.52	61.35
		5.0	23.7	9.0	99.1	124.2	164.5	153.2	38.67	67.09
1175	1 Row 0.05	0.5	0.4	0.2	81.8	85.7	95.0	-75.2	21.26	26.21
	2 Row 0.09	1.0	1.4	0.5	88.3	98.4	120.9	95.2	29.53	42.40
		2.0	4.7	1.8	93.3	110.6	144.1	122.2	35.94	57.81
		3.0	9.6	3.6	95.4	116.1	154.2	136.8	38.63	64.87
		5.0	23.7	9.0	97.4	121.3	163.6	151.4	41.05	71.48
1300	1 Row 0.06	0.5	0.4	0.2	80.5	83.9	93.1	74.1	21.72	26.47
	2 Row 0.11	1.0	1.4	0.5	86.8	95.9	118.9	93.1	30.57	43.45
		2.0	4.7	1.8	91.8	107.9	142.4	119.8	37.59	60.20
		3.0	9.6	3.6	93.9	113.5	153.0	134.6	40.57	68.07
		5.0	23.7	9.0	95.8	118.8	162.7	149.8	43.27	75.52
1425	1 Row 0.07	0.5	0.4	0.2	79.4	82.3	91.5	73.3	22.12	26.68
	2 Row 0.13	1.0	1.4	0.5	85.5	93.8	117.0	91.3	31.51	44.36
		2.0	4.7	1.8	90.4	105.5	140.9	117.7	39.11	62.34
		3.0	9.6	3.6	92.5	111.1	151.8	132.7	42.37	70.98
		5.0	23.7	9.0	94.5	116.5	161.9	148.3	45.35	79.27
1550	1 Row 0.08	0.5	0.4	0.2	78.4	81.0	90.1	72.6	22.47	26.85
	2 Row 0.15	1.0	1.4	0.5	84.3	92.0	115.3	89.7	32.37	45.14
		2.0	4.7	1.8	89.2	103.4	139.5	115.7	40.51	64.28
		3.0	9.6	3.6	91.3	109.0	150.6	130.9	44.05	73.65
		5.0	23.7	9.0	93.3	114.4	161.1	146.9	47.30	82.76
1675	1 Row 0.09	0.5	0.4	0.2	77.6	79.9	88.9	72.0	22.78	27.00
	2 Row 0.18	1.0	1.4	0.5	83.3	90.3	113.7	88.3	33.14	45.83
		2.0	4.7	1.8	88.1	101.5	138.2	114.0	41.82	66.03
		3.0	9.6	3.6	90.2	107.1	149.6	129.3	45.62	76.11
		5.0	23.7	9.0	92.2	112.5	160.3	145.6	49.15	86.02
1800	1 Row 0.11	0.5	0.4	0.2	76.9	79.0	87.7	71.5	23.06	27.12
	2 Row 0.20	1.0	1.4	0.5	82.4	88.9	112.3	87.1	33.85	46.44
		2.0	4.7	1.8	87.1	99.8	137.0	112.4	43.04	67.63
		3.0	9.6	3.6	89.2	105.3	148.6	127.7	47.10	78.39
		5.0	23.7	9.0	91.2	110.8	159.6	144.4	50.89	89.07

ABOVE DATA IS BASED ON ENTERING WATER TEMPERATURE OF 180° F AND ENTERING AIR TEMPERATURE OF 65° F. SEE HOT WATER COIL SELECTION PROCEDURE FOR CORRECTION FACTORS IF ENTERING TEMPERATURES VARY FROM THESE.

Model VVF-WC Size 16

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.) 1ROW	WATER PD (FT. W.G.) 2ROW	LAT (DEGREES F) 1ROW	LAT (DEGREES F) 2ROW	LWT (DEGREES F) 1ROW	LWT (DEGREES F) 2ROW	CAPACITY (MBH) 1ROW	CAPACITY (MBH) 2ROW
500	1 Row 0.01	0.5	0.4	0.2	98.1	107.1	108.5	89.1	17.87	22.71
	2 Row 0.02	1.0	1.4	0.5	107.0	123.4	134.6	117.0	22.70	31.52
		2.0	4.7	1.8	113.0	134.7	154.1	142.4	25.90	37.61
		3.0	9.6	3.6	115.2	138.9	161.9	153.4	27.13	39.93
		5.0	23.7	9.0	117.2	142.6	168.7	163.2	28.20	41.89
650	1 Row 0.02	0.5	0.4	0.2	92.0	99.3	104.3	83.7	18.93	24.08
	2 Row 0.03	1.0	1.4	0.5	100.2	115.1	130.6	109.6	24.69	35.18
		2.0	4.7	1.8	105.9	127.2	151.3	136.4	28.70	43.65
		3.0	9.6	3.6	108.1	132.0	159.8	148.6	30.28	47.04
		5.0	23.7	9.0	110.1	136.2	167.3	160.0	31.67	50.00
800	1 Row 0.03	0.5	0.4	0.2	87.8	93.9	101.2	80.1	19.70	24.96
	2 Row 0.05	1.0	1.4	0.5	95.3	108.9	127.6	104.2	26.22	37.90
		2.0	4.7	1.8	100.8	121.2	149.1	131.4	30.92	48.59
		3.0	9.6	3.6	103.0	126.4	158.1	144.6	32.82	53.07
		5.0	23.7	9.0	104.9	131.0	166.2	157.2	34.49	57.06
950	1 Row 0.03	0.5	0.4	0.2	84.7	89.9	99.1	77.7	20.22	25.58
	2 Row 0.06	1.0	1.4	0.5	91.6	104.0	125.4	100.0	27.31	40.01
		2.0	4.7	1.8	96.7	116.4	147.4	127.3	32.56	52.72
		3.0	9.6	3.6	98.8	121.8	156.9	141.2	34.71	58.26
		5.0	23.7	9.0	100.7	126.7	165.4	154.7	36.62	63.30
1100	1 Row 0.04	0.5	0.4	0.2	82.6	86.9	96.2	75.9	20.94	26.03
	2 Row 0.08	1.0	1.4	0.5	89.3	100.1	122.3	96.6	28.84	41.69
		2.0	4.7	1.8	94.4	112.3	145.1	123.8	34.88	56.24
		3.0	9.6	3.6	96.5	117.9	155.1	138.1	37.39	62.80
		5.0	23.7	9.0	98.4	123.0	164.1	152.4	39.64	68.89
1250	1 Row 0.06	0.5	0.4	0.2	81.0	84.5	93.8	74.5	21.54	26.37
	2 Row 0.11	1.0	1.4	0.5	87.3	96.9	119.7	93.9	30.17	43.05
		2.0	4.7	1.8	92.4	108.9	143.1	120.7	36.95	59.28
		3.0	9.6	3.6	94.5	114.5	153.5	135.5	39.81	66.82
		5.0	23.7	9.0	96.4	119.8	163.0	150.4	42.40	73.94
1400	1 Row 0.07	0.5	0.4	0.2	79.6	82.6	91.8	73.5	22.04	26.64
	2 Row 0.13	1.0	1.4	0.5	85.7	94.2	117.3	91.6	31.33	44.19
		2.0	4.7	1.8	90.7	106.0	141.2	118.1	38.81	61.93
		3.0	9.6	3.6	92.8	111.6	152.0	133.1	42.02	70.42
		5.0	23.7	9.0	94.7	116.9	162.0	148.6	44.95	78.54
1550	1 Row 0.08	0.5	0.4	0.2	78.4	81.0	90.1	72.6	22.47	26.85
	2 Row 0.15	1.0	1.4	0.5	84.3	92.0	115.3	89.7	32.37	45.14
		2.0	4.7	1.8	89.2	103.4	139.5	115.7	40.51	64.28
		3.0	9.6	3.6	91.3	109.0	150.6	130.9	44.05	73.65
		5.0	23.7	9.0	93.3	114.4	161.1	146.9	47.30	82.76
1700	1 Row 0.10	0.5	0.4	0.2	77.4	79.7	88.6	71.9	22.84	27.02
	2 Row 0.18	1.0	1.4	0.5	83.1	90.0	113.4	88.1	33.29	45.96
		2.0	4.7	1.8	87.9	101.1	137.9	113.6	42.07	66.36
		3.0	9.6	3.6	90.0	106.7	149.4	128.9	45.92	76.58
		5.0	23.7	9.0	92.0	112.2	160.2	145.3	49.50	86.64
1850	1 Row 0.11	0.5	0.4	0.2	76.6	78.6	87.3	71.3	23.17	27.17
	2 Row 0.21	1.0	1.4	0.5	82.1	88.4	111.8	86.7	34.12	46.67
		2.0	4.7	1.8	86.8	99.2	136.5	111.8	43.50	68.23
		3.0	9.6	3.6	88.9	104.7	148.2	127.2	47.67	79.25
		5.0	23.7	9.0	90.8	110.2	159.4	143.9	51.56	90.24
2000	1 Row 0.13	0.5	0.4	0.2	75.9	77.6	86.2	70.8	23.45	27.29
	2 Row 0.24	1.0	1.4	0.5	81.1	86.9	110.3	85.4	34.87	47.28
		2.0	4.7	1.8	85.8	97.4	135.2	110.1	44.83	69.92
		3.0	9.6	3.6	87.8	102.8	147.1	125.5	49.30	81.71
		5.0	23.7	9.0	89.8	108.3	158.6	142.6	53.50	93.59
2150	1 Row 0.14	0.5	0.4	0.2	75.2	76.8	85.2	70.4	23.70	27.39
	2 Row 0.28	1.0	1.4	0.5	80.3	85.6	108.9	84.4	35.56	47.82
		2.0	4.7	1.8	84.8	95.8	133.9	108.5	46.06	71.46
		3.0	9.6	3.6	86.9	101.2	146.1	124.0	50.83	83.96
		5.0	23.7	9.0	88.8	106.7	157.9	141.3	55.33	96.72

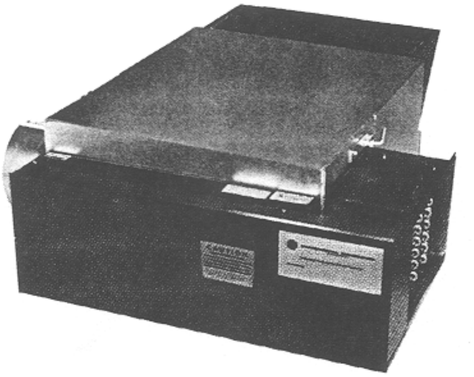
ABOVE DATA IS BASED ON ENTERING WATER TEMPERATURE OF 180° F AND ENTERING AIR TEMPERATURE OF 65° F. SEE HOT WATER COIL SELECTION PROCEDURE FOR CORRECTION FACTORS IF ENTERING TEMPERATURES VARY FROM THESE.

Model VVF-WC Size 18

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.) 1ROW	WATER PD (FT. W.G.) 2ROW	LAT (DEGREES F) 1ROW	LAT (DEGREES F) 2ROW	LWT (DEGREES F) 1ROW	LWT (DEGREES F) 2ROW	CAPACITY (MBH) 1ROW	CAPACITY (MBH) 2ROW
950	1 Row 0.01	0.5	0.7	0.2	89.2	92.0	80.9	69.2	24.79	27.69
	2 Row 0.02	1.0	2.4	0.8	100.6	110.4	106.9	86.9	36.56	46.57
		2.0	8.1	2.9	109.5	127.0	134.3	116.4	45.68	63.59
		3.0	16.7	5.9	113.1	133.9	147.1	132.9	49.39	70.66
		5.0	41.3	14.5	116.3	139.8	158.9	149.3	52.65	76.75
1100	1 Row 0.01	0.5	0.7	0.2	86.2	88.5	79.2	68.2	25.20	27.95
	2 Row 0.03	1.0	2.4	0.8	96.9	105.6	104.3	83.5	37.86	48.27
		2.0	8.1	2.9	105.5	122.3	131.9	112.0	48.06	68.04
		3.0	16.7	5.9	109.0	129.5	145.1	128.9	52.30	76.66
		5.0	41.3	14.5	112.2	135.9	157.6	146.3	56.07	84.26
1250	1 Row 0.02	0.5	0.7	0.2	83.9	85.8	77.9	67.5	25.52	28.12
	2 Row 0.03	1.0	2.4	0.8	93.9	101.7	102.1	80.8	38.95	49.60
		2.0	8.1	2.9	102.1	118.2	129.9	108.2	50.11	71.83
		3.0	16.7	5.9	105.6	125.7	143.4	125.4	54.84	81.96
		5.0	41.3	14.5	108.8	132.5	156.4	143.6	59.08	91.10
1400	1 Row 0.02	0.5	0.7	0.2	82.1	83.7	76.9	67.0	25.79	28.25
	2 Row 0.04	1.0	2.4	0.8	91.4	98.5	100.3	78.7	39.87	50.64
		2.0	8.1	2.9	99.3	114.7	128.1	104.9	51.89	75.10
		3.0	16.7	5.9	102.8	122.3	141.9	122.2	57.08	86.68
		5.0	41.3	14.5	105.9	129.4	155.3	141.1	61.78	97.36
1550	1 Row 0.02	0.5	0.7	0.2	80.5	81.9	76.0	66.6	26.00	28.34
	2 Row 0.05	1.0	2.4	0.8	89.3	95.8	98.7	77.0	40.66	51.48
		2.0	8.1	2.9	96.9	111.6	126.5	102.1	53.48	77.94
		3.0	16.7	5.9	100.3	119.3	140.6	119.4	59.09	90.91
		5.0	41.3	14.5	103.4	126.6	154.3	138.8	64.21	103.1
1700	1 Row 0.03	0.5	0.7	0.2	79.3	80.5	75.3	66.4	26.19	28.41
	2 Row 0.05	1.0	2.4	0.8	87.5	93.4	97.3	75.7	41.35	52.17
		2.0	8.1	2.9	94.9	108.8	125.1	99.6	54.90	80.43
		3.0	16.7	5.9	98.2	116.6	139.4	116.8	60.90	94.73
		5.0	41.3	14.5	101.2	124.1	153.4	136.6	66.43	108.4
1850	1 Row 0.03	0.5	0.7	0.2	78.2	79.2	74.9	66.2	26.29	28.46
	2 Row 0.06	1.0	2.4	0.8	85.9	91.4	96.5	74.5	41.75	52.74
		2.0	8.1	2.9	92.9	106.4	124.2	97.4	55.77	82.63
		3.0	16.7	5.9	96.1	114.1	138.6	114.5	62.04	98.20
		5.0	41.3	14.5	99.0	121.7	152.9	134.6	67.85	113.4
2000	1 Row 0.04	0.5	0.7	0.2	77.3	78.2	74.0	66.0	26.50	28.50
	2 Row 0.07	1.0	2.4	0.8	84.7	89.6	94.8	73.6	42.59	53.22
		2.0	8.1	2.9	91.6	104.2	122.5	95.4	57.51	84.59
		3.0	16.7	5.9	94.8	111.9	137.1	112.4	64.28	101.4
		5.0	41.3	14.5	97.7	119.6	151.8	132.8	70.60	118.0
2150	1 Row 0.04	0.5	0.7	0.2	76.5	77.3	73.2	65.9	26.69	28.54
	2 Row 0.08	1.0	2.4	0.8	83.7	88.1	93.3	72.7	43.34	53.63
		2.0	8.1	2.9	90.5	102.2	120.9	93.7	59.12	86.33
		3.0	16.7	5.9	93.6	109.9	135.7	110.5	66.38	104.2
		5.0	41.3	14.5	96.5	117.7	150.7	131.1	73.20	122.3
2300	1 Row 0.05	0.5	0.7	0.2	75.8	76.5	72.6	65.7	26.85	28.56
	2 Row 0.09	1.0	2.4	0.8	82.7	86.7	91.9	72.1	44.03	53.97
		2.0	8.1	2.9	89.4	100.4	119.4	92.1	60.62	87.90
		3.0	16.7	5.9	92.5	108.0	134.4	108.7	68.35	106.9
		5.0	41.3	14.5	95.5	115.8	149.7	129.5	75.66	126.3
2450	1 Row 0.05	0.5	0.7	0.2	75.2	75.8	72.0	65.7	27.00	28.59
	2 Row 0.10	1.0	2.4	0.8	81.9	85.5	90.7	71.5	44.65	54.27
		2.0	8.1	2.9	88.4	98.8	118.0	90.7	62.02	89.32
		3.0	16.7	5.9	91.5	106.3	133.2	107.1	70.21	109.3
		5.0	41.3	14.5	94.5	114.2	148.8	128.0	78.01	130.1
2600	1 Row 0.06	0.5	0.7	0.2	74.7	75.2	71.5	65.6	27.12	28.60
	2 Row 0.12	1.0	2.4	0.8	81.1	84.4	89.6	70.9	45.21	54.53
		2.0	8.1	2.9	87.6	97.3	116.7	89.4	63.33	90.61
		3.0	16.7	5.9	90.6	104.7	132.0	105.6	71.97	111.6
		5.0	41.3	14.5	93.6	112.6	147.9	126.5	80.25	133.7

ABOVE DATA IS BASED ON ENTERING WATER TEMPERATURE OF 180° F AND ENTERING AIR TEMPERATURE OF 65° F. SEE HOT WATER COIL SELECTION PROCEDURE FOR CORRECTION FACTORS IF ENTERING TEMPERATURES VARY FROM THESE.

MODEL VVF-EH-II
W/ELECTRIC HEATER



DESCRIPTION

Model VVF-EH-II Terminals are of the same basic design as the Model VVF-II, except for the addition of an auxiliary electric heater, which is mounted on the discharge opening of the Terminal. The electric heater is energized after the induction fan is operating, and only if the waste heat provided by the fan is insufficient to temper the space or zone served or to provide heating when the central system is in the set-back mode for night or weekend operation.

Simplified heater selection and performance charts have been computer calculated to provide an optimum match range for all Terminal sizes. This optimum match insures the best possible operating efficiency and safety.

Electric heaters for the Model VVF-EH-II are E.T.L. and C.S.A. approved and listed, including all optional control components. A wide range of accessories are available to satisfy virtually all applications requiring an electric heat source.

CONSTRUCTION

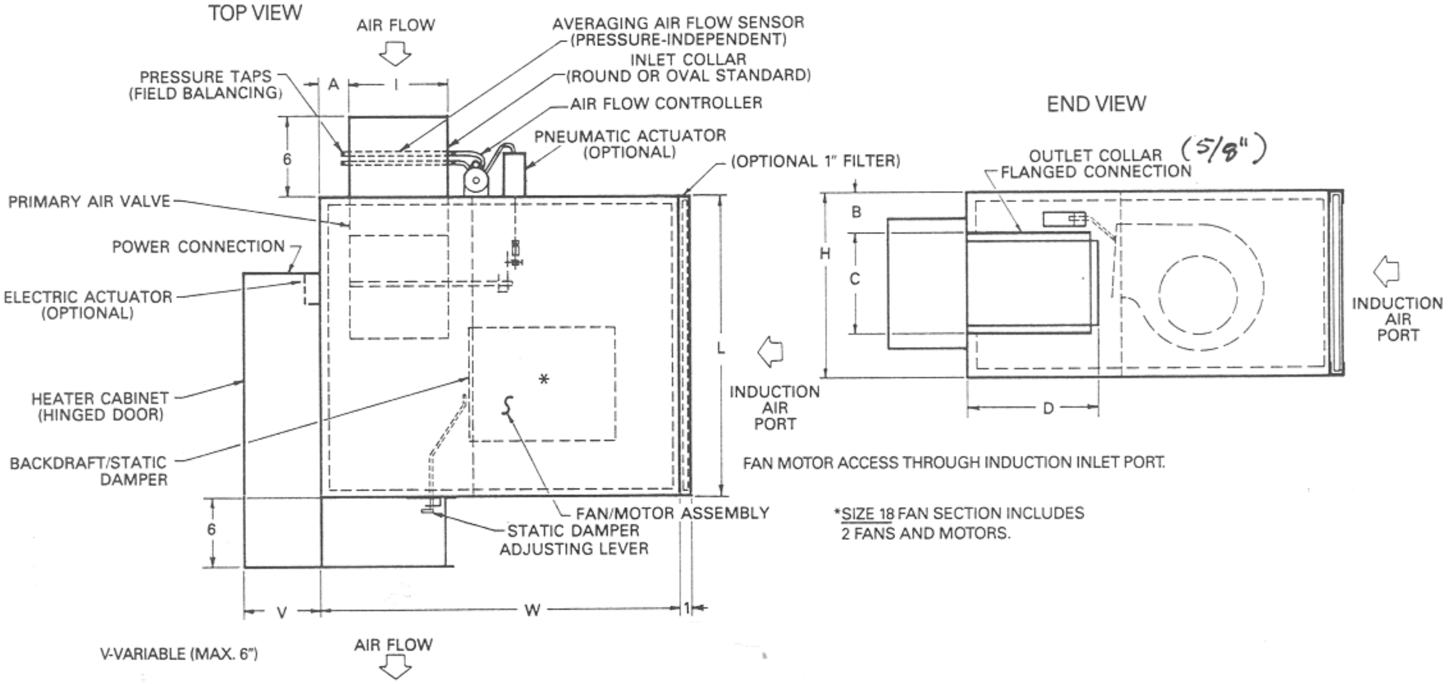
Electric heaters are UL approved construction, with 24-gauge zinc-coated heater rack and duct connecting collar. Heaters include as standard, primary disc-type automatic reset high temperature limit switch, a secondary high-limit with replaceable fusible links and an air flow switch or fan interlock relay. Terminal connections for power and low voltage source (low voltage-if required) are provided within an enclosed panel. A single-point electrical connection only is required. When connecting the source of power, care should be taken in verifying the power voltage and phase required. A common error is the connection of 480 volt-3 phase power to a unit wired for 277 volt-1 phase power; a neutral must be provided for all 277 volt-1 phase circuiting.

SELECTION

When selecting Heater capacities (KW) from the Performance Chart on page 21, it should be noted that any selection below 70 CFM per KW does require derated elements. An absolute minimum ratio of 50 CFM per KW should be maintained even with derated elements. Following this rule will reduce hazards and increase the life of the equipment.

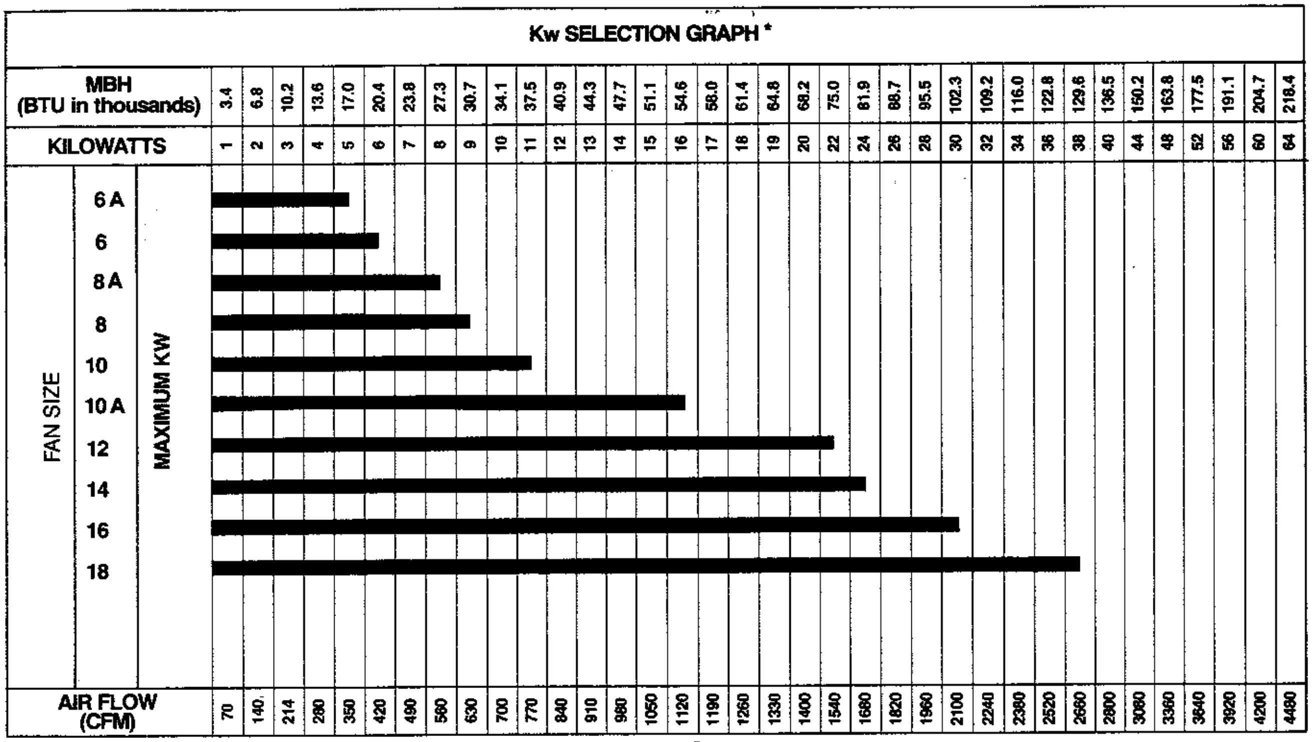
For descriptive instructions regarding proper use of the Electric Reheat Chart, read the selection procedure information on page 21, appearing below the chart. If you should encounter any difficulty in using the chart, contact your ETI representative.

DIMENSIONS



TERMINAL SIZE	MAXIMUM PRIMARY (CFM)	MAXIMUM FAN IND. (CFM)	DIMENSIONAL DATA							
			L	W	H	I	D	A	B	C
6*	600	Refer to fan performance curves on pages 10-13; calculate external static prior to selection.	23⅜	24	14	6	6	1	3	8
8*	1000		23⅜	28	14	8	10	2	3	8
10**	1600		23⅜	30	14	11	12	1½	3	8
12**	2100		29⅜	37	17	14⅛	16	1½	4½	10
14**	2800		29⅜	41	17	17¼	20	2¼	4½	10
16**	3400		29⅜	45	17	20⅜	24	2¾	4½	10
18**	4300		48	51	17	23 9/16	28	4¾	2½	12

NOTES: All dimensions are in inches.
L — length
W — width
H — height
I — inlet diameter or oval width
D — discharge width
* round inlet
** oval inlet — 8" x "I" dimension



*Based on maximum fan capacity at 0.2" E.S.P. and zero primary air volume.

SELECTION PROCEDURE

The KW Selection Chart above indicates the maximum safe limit electric heater capacity for each size VVF-EH-II Terminal and the minimum airflow (CFM) required for a given KW throughout the units operating range. To exceed the limits given can result in nuisance cycling of the heater safety limits. If an application requires these limits be exceeded, contact your ENVIRO-TEC Representative or the factory for selection assistance.

MBH (BTUH in thousands) listed in the selection graph has been calculated at sea level. To correct for elevations greater than sea level the standard air density componet of 1.085 must be reduced by 0.036 per thousand feet of elevation above sea level (refer to selection equations shown).

SELECTION EQUATIONS

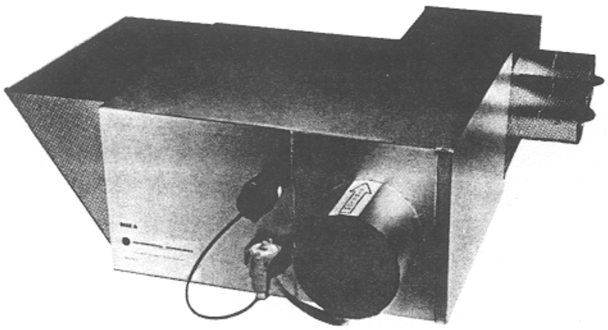
$$KW = \frac{CFM x \Delta T x 1.085^*}{3413} \qquad CFM = \frac{KW x 3413}{\Delta T x 1.085^*} \qquad \Delta T = \frac{KW x 3413}{CFM x 1.085^*}$$

*air density at sea level — reduce by 0.036 for each 1000 ft. of altitude above sea level. (eg.: 5000 ft. elevation: 5000 ÷ 1000 = 5).

5x0.036 = .18. 1.085 – .18 = .905.

$$KW = \frac{CFM x \Delta T x .905}{3413}$$

MODEL VVF-MOP-II
W/MULTIPLE OUTLET PLENUM



DESCRIPTION

Model VVF-MOP-II Terminals are of the same basic design as the Model VVF-II, except for the addition of an auxiliary multiple-outlet plenum section for applications requiring connections to more than one air diffuser in close proximity to the Terminal. This option can save substantial field fabrication costs, in most applications. An optional (recommended) balancing damper can be provided in each outlet, eliminating the requirement of a damper in the air diffuser.

The MOP option may be used in conjunction with all other accessories offered for the VVF-II. It should be noted that the MOP also offers discharge attenuation properties equal to an SA sound attenuator.

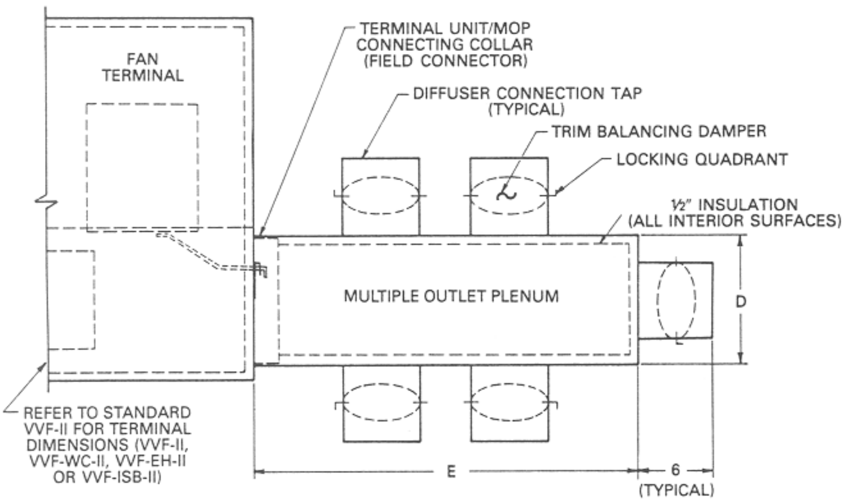
CONSTRUCTION

The MOP is manufactured of 24-gauge zinc-coated steel, mechanically locked to insure the tightest possible construction: maximum casing air leakage—2% at 1" water gauge.

The MOP casing is internally lined with ½" thick, 4# dual density, coated fiberglass, complying with N.F.P.A. 90-A and UL 181. No raw edges are exposed to the air stream. Special insulation coatings are available for clean-room, hospital and laboratory applications.

DIMENSIONS

TOP VIEW



SPECIFY NUMBER OF OUTLETS (TOTAL AND PER PLENUM SIDE)

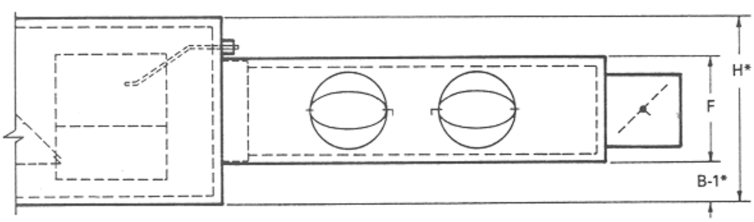
All dimensions are in inches.

6" ROUND OUTLETS							
Terminal Size	**6**	**8**	**10**	**12**	**14**	**16**	**18**
Max. Outlets per Side	2	3	4	4	5	5	5
Max. Outlets per End	1	1	1	2	2	3	4
"D" Dimension	8"	12"	14"	18"	22"	26"	32"
"E" Dimension	30"	30"	47"	47"	47"	47"	47"
"F" Dimension	10"	10"	10"	10"	10"	10"	12½"
Max. Outlets per Term.	5	7	9	10	12	13	14

8" ROUND OUTLETS							
Terminal Size	**6**	**8**	**10**	**12**	**14**	**16**	**18**
Max. Outlets per Side	2	2	3	3	3	3	3
Max. Outlets per End	—	1	1	1	2	2	3
"D" Dimension	8"	12"	14"	18"	22"	26"	32"
"E" Dimension	30"	30"	47"	47"	47"	47"	47"
"F" Dimension	10"	10"	10"	10"	10"	10"	12½"
Max. Outlets per Term.	4	5	7	7	8	8	9

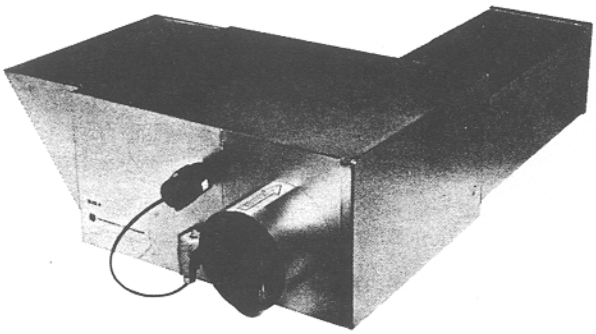
10" OVAL OUTLETS							
Terminal Size	**6**	**8**	**10**	**12**	**14**	**16**	**18**
Max. Outlets per Side	N.A.		3	3	3	3	3
Max. Outlets per End			1	1	1	2	2
"D" Dimension			14"	18"	22"	26"	32"
"E" Dimension			47"	47"	47"	47"	47"
"F" Dimension			10"	10"	10"	10"	12½"
Max. Outlets per Term.			7	7	7	8	8

SIDE VIEW



*SEE BASIC TERMINAL DRAWING FOR DIMENSION

MODEL VVF-SA-II
W/SOUND ATTENUATOR



DESCRIPTION

Model VVF-SA-II Terminals are of the same basic design as the Model VVF-II, except for the addition of a sound attenuator section, which is field installed on the Terminal discharge collar. (May be factory installed at extra cost, but not recommended due to the packing configuration. As a factory assembled package, the unit is highly subject to damage in transit).

The SA sound attenuator is generally not required for most VVF-II applications, primarily due to the Terminal's acoustically effective double-wall air valve construction, casing density and special insulation, and the fact that discharge sound is normally not the dominant sound path for this type equipment.

The SA sound attenuator should only be applied to situations requiring extremely low sound levels and in those applications using very short, unlined downstream duct runs. If an application dictates the use of an attenuator, an ISB induction port sound baffle should also be added to the basic equipment.

CONSTRUCTION

The SA is manufactured of 24-gauge zinc-coated steel, mechanically locked to insure the tightest possible construction: maximum casing air leakage—2% at 1″ water gauge.

The SA casing is internally lined with ¾″ thick, 4# dual density, coated fiberglass, complying with N.F.P.A. 90-A.

SOUND ATTENUATION (DISCHARGE)

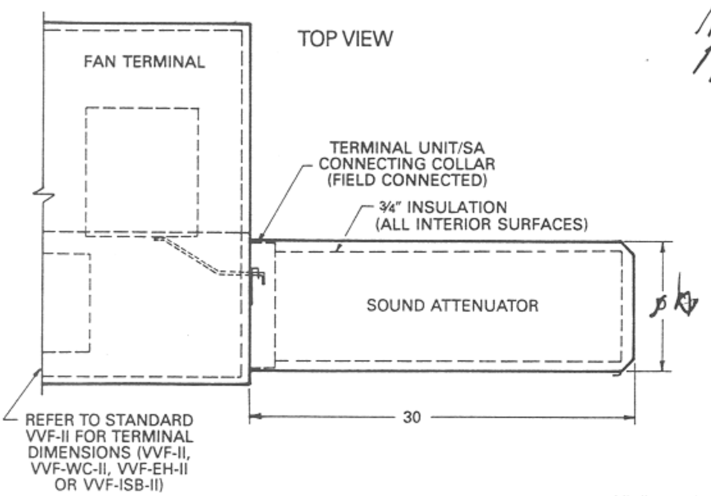
TERMINAL SIZE	OCTAVE BANDS				
	2	3	4	5	6
6	4.4	8.9	17	36	40
8	3.9	7.7	16	31	40
10	3.7	7.4	15	29	40
12	3.5	7.0	15	28	40
14	3.3	6.8	13	27	40
16	3.3	6.7	13	27	40

12.5″

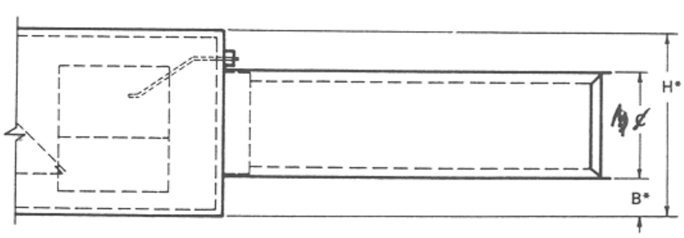
DIMENSIONS

12.5″ →

Terminal Size	6	8	10	12	14	16	18
“[illegible]” Dimension C	10″	10″	10″	~~10″~~	~~10″~~	~~10″~~	12½″
“[illegible]” Dimension D	8″	12″	14″	18″	22″	26″	32″



SIDE VIEW



All dimensions are in inches.

*SEE BASIC TERMINAL DRAWING FOR DIMENSION