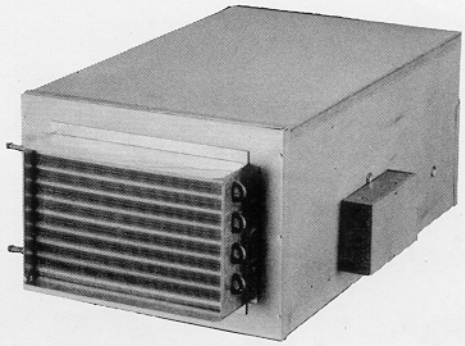
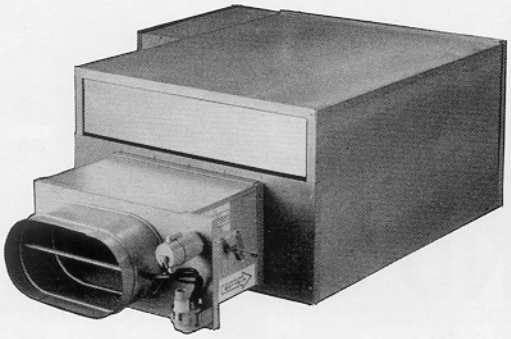
Model CVF-II

Model CVF-II Series Flow Fan Terminals provide the most economical application of Series Flow Fan Terminals.



CVF-WC-II
with Optional Hot Water Coil



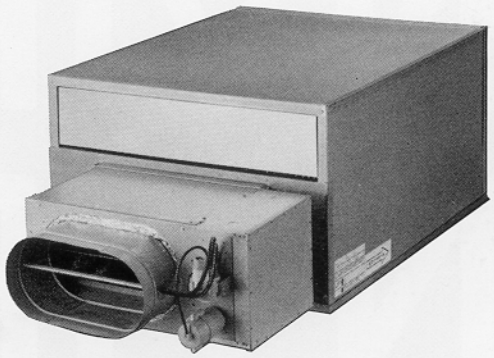
CVFQ-EH-II
with Optional Electric Heater

Model CVFQ-II

Model CVFQ-II Fan Terminals offer the lowest sound levels possible from a Series Flow Fan Terminal. Costing slightly more than the standard unit (Model CVF-II), the CVFQ-II should be utilized in areas where sound level considerations are critical.

Models CVF-LT-II & CVFQ-LT-II

Models CVF-LT-II and CVFQ-LT-II are designed specifically for low temperature primary air systems.



CVFQ-LT-II Basic Unit
with Low Temperature Construction

Application Guidelines

Why Fan Powered Terminals?

Fan Powered Terminals can offer improved operating performance and flexibility for a wide variety of HVAC systems. Depending on the system design selected, substantial operating savings can be realized through the efficient recovery of waste heat, reduced central fan horsepower requirements, and off-hour (set back) operation.

Fan Powered Terminals mix ceiling plenum return air with primary supply air to maintain a higher air supply volume to the space, providing a high induction mix of supply and room air by the room diffusers. The mix of plenum air and supply air has the effect of tempering the cold supply air at low loads, preventing over-cooling of the space. The increased air motion allows for a broader comfort range in the space by allowing locally higher air temperatures than with a straight VAV system. Recent ASHRAE research indicates that the combination of low air motion and higher space temperatures is the major complaint of newly constructed buildings.

There are two types of fan powered terminals, Parallel Flow and Series Flow

The **Parallel** Flow (sometimes known as the "side-pocket") has a fan and electric or hot water coil which is only energized during the heating mode. In the cooling mode, this unit becomes a simple VAV terminal. This unit is typically used in perimeter zones (See ENVIRO-TEC Catalog Model VVF-II).

The **Series** Flow terminal utilizes a continuous operation fan during occupied hours. This provides constant volume, variable temperature conditioned air to the zone. The central fan provides variable primary air volume to the fan terminal units. The primary air valve is in line with the unit fan, thus the term, "Series Flow".

All primary air passes through the unit fan; therefore, the unit fan must be sized to meet the design CFM for the zone. The maximum primary airflow must be equal to or less than the fan CFM. If the primary airflow exceeds the fan CFM, the fan casing becomes pressurized and the excess primary air spills into the ceiling plenum. Not only does this waste conditioned air, but also can decrease the average ceiling plenum temperature thus causing any auxiliary heat to be energized prematurely (further wasting energy). If the primary air is to be delivered below normal supply temperatures (as with Thermal Storage Systems), maximum air volume limits can be selected to induce some plenum air even at full cooling, assuring that air supplied to the space is within the design limits of the diffusers employed.

Pressure Loss Considerations

Since the unit fan is selected to move 100% of the design airflow to the zone, all downstream pressure losses are neglected when determining the minimum primary air inlet pressure requirements. The central fan is only required to overcome the minimal loss through the unit air valve thus reducing central fan total pressure and horsepower requirements (lowering system operating cost).

Due to the extremely low pressure drop of our 45 degree air valve, central fan operating pressures as low as 0.5 inches w.g. are realistic. This condition differs from Parallel Flow Fan Terminals and straight VAV terminals. With these units the central fan must overcome the pressure losses associated with heating coils, downstream ductwork, and diffusers.

Fan Motor Considerations

ENVIRO-TEC fan terminals are equipped with permanent split-capacitor motors (PSC) with three separate windings (High, Medium, and Low) which provide variable horsepower outputs. The low tap provides approximately 50% of the horsepower of high tap and also draws approximately 50% of the amperage. Most often terminal unit selections are conservative and actual CFM requirements and/or external static pressure requirements are lower than those specified. In this case the unit fan motor can be run at low or medium tap substantially reducing the operating cost to the owner. After the appropriate motor tap is selected, the electronic fan speed controller is adjusted to provide the precise capacity required.

Sound Considerations

Sound levels produced by Series Flow Terminals generally exceed those of Parallel Flow Terminals due to the larger fan (usually double size). To offset this condition an electronic fan speed controller is utilized to allow reduction in fan RPM's. Partially lining the downstream duct is strongly recommended with Series Flow Terminals. This will reduce discharge sound levels entering the zone through the diffusers. Casing radiated sound usually dictates the overall room sound levels directly below the terminal. Because of this, special consideration should be given to the location of these terminals as well as the size of the zone. Larger zones should have the terminal located over a corridor or open plan office space and not over a small confined private office. If the wall partitions extend from slab-to-slab, much of the sound generated in the ceiling plenum will travel through the ceiling into the occupied space.

Application Guidelines

There is often a misconception regarding the benefit of plenum inlet attenuators on Series Flow Fan Terminals. Generally speaking, they do not reduce radiated NC levels and often times will increase them. They effectively reduce higher frequency sound levels; however, the change at lower frequencies is negligible. The radiated NC level associated with a Series Flow Fan Terminal is controlled by the 2nd or 3rd octave band (125 Hz or 250 Hz) with few exceptions. Therefore by adding plenum inlet attenuation, the effective area of the casing has increased which could increase the radiated sound. ENVIRO-TEC terminals are equipped with a gravity damper in the plenum inlet which is much more effective than a lined sheet metal elbow.

Primary air pressure appreciably effects sound levels and should be designed as low as practical. Inlet static pressures ranging from 0.5 to 1.0 inches w.g. are recommended with Series Flow Terminals. The use of flexible duct, while convenient, can substantially increase the overall radiated sound levels in a zone. If utilized, flexible duct should be as short as possible, straight and tight. Sagging flex and elbows always generate excessive sound.

The CVFQ-II Series Flow Fan Terminal was developed to provide the consulting engineer with a means to achieve NC 35 performance in spaces typically requiring a quiet environment. Typical applications would be conference rooms, executive offices, and small private offices.

Operating Considerations

The terminal unit fan must operate whenever the air handling unit is supplying primary airflow; otherwise, conditioned air will spill into the ceiling plenum. This also causes the fan wheel to spin backwards decreasing the motor bearing life. If the fan motor is energized in this condition, it is possible for the fan to actually run backwards unnoticed. Under these conditions, the fan output is usually reduced 35 to 50 percent. ENVIRO-TEC Series Flow Terminals are equipped with a sufficiently over-sized capacitor to overcome minimal counter-rotation. Excessively over-sizing the capacitor, contrary to popular belief, is not the answer in overcoming this situation. First, this will not always guarantee proper starting rotation. Secondly, unlike split phase and capacitor start motors, the capacitor is continuously in line with permanent split capacitor motors. An excessively oversized capacitor could cause the motor to run warmer, thus decreasing the life. To summarize, an anti-backward rotation device is not a practical, viable, or necessary component to furnish. Proper unit fan rotation can be assured by initiating the fan terminals simultaneously with the air handling unit. An optional pressure switch is also available which will automatically energize the unit fan upon sensing primary air pressure.

Sequence of Operation

During occupied hours, the unit fan provides relatively constant airflow to the zone at all times. With a warm space temperature the thermostat positions the primary air valve to the maximum airflow limit. Since this is forced airflow, the unit fan draws 100% from the air valve. As the space temperature decreases, the thermostat closes the primary air valve as necessary and the unit fan draws warm plenum air to mix with the conditioned air. With a cold space temperature the primary air valve remains at the minimum airflow limit and additional electric or hot water heat is activated as required.

Controls Available

ENVIRO-TEC Series Flow Fan Terminals are available with pneumatic, analog electronic and direct digital electronic controls (DDC). Due to the extensive selection of control sequence options, they are bound separately as a control selection guide (pneumatic, electronic, and DDC), located under the controls section of the general catalog.

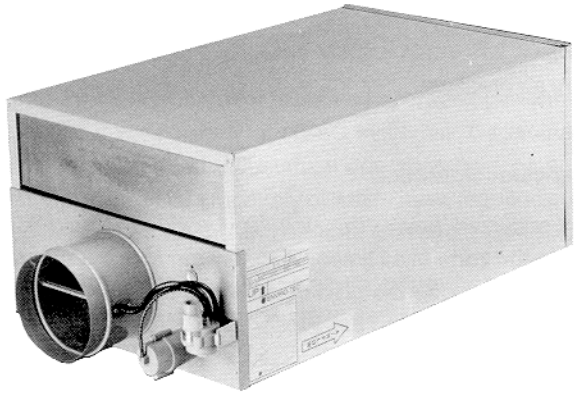
Avoid Mis-Application

Series Flow Fan Terminals should not be excessively over-sized. The fan motor has a minimum recommended rotational speed. If reduced below the minimum speed, bearing lubrication is reduced, shortening the motor life. The three-tap selector switch in conjunction with the electronic speed control allows the widest possible range of capacities in the industry. The electronic fan speed controller is equipped with a minimum stop to limit the reduction in motor RPM's to a safe value.

It should be noted that a conventional Series Flow Fan Terminal can not be applied as a booster fan. In problem areas where there is insufficient primary airflow capacity, this terminal will not aid in pulling more air from the primary duct. Instead the unit fan will draw from the plenum inlet which has less resistance. The plenum opening should never be sealed as this will cause problems should the primary airflow increase beyond the unit fan capacity. In this condition the fan casing becomes pressurized which will eventually stall the fan motor and cause premature failure. If such application is required - consult the factory.

CONSTANT VOLUME FAN POWERED TERMINALS

MODEL CVF-II



Features

- Low cost, highly efficient waste heat recovery
- Available with electric or hot water auxiliary heat
- Eliminates need for central warm air system
- Single discharge-no need for field fabricated mixing plenum
- Broad range of controls-pneumatic or electronic
- U.L., E.T.L., and C.S.A. listed as an assembly
- Special construction available for low temperature primary air applications (Model CVF-LT-II)

Description

Model CVF-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 function of the **Model CVF-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 function of the **Model CVF-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 **CVF-II** can be provided with an optional hot water coil or electric heater (**CVF-WC-II**) or (**CVF-EH-II**), which may be activated by the zone thermostat. 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 CVF-II** is a unitary design incorporating both the cooling and heating function in a single casing. Both heated and cooled air pass through a single discharge to downstream ductwork.

Model CVF-II units are available with an optional filter section located at the unit induction port

Construction

Model CVF-II Fan Induction Terminals are manufactured of zinc-coated steel: 22-gauge casing, 20 gauge bottom access door, 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.

Units may be provided with round, oval or rectangular inlet collars. Round or oval inlets and rectangular outlets are standard, unless otherwise specified. Convenient bottom 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 furnished with an inlet-mounted differential pressure sensor which may be removed without disconnecting the inlet duct.

Model CVF-II casings are internally lined with 3/4" 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 CVF-II** units are specifically designed for fan induction Terminal application. Unlike other manufacturers who use off-the-shelf fan assemblies, ENVIRO-TEC fabricates its fan package using computer selected wheels for specific capacity (CFM) and external static pressure requirements. This insures optimum quiet operation. All fan assemblies are mounted on reinforced casing panels. 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 CVF-II** are installed in accordance with UL and N.E.C. requirements. A single-point electrical connection is provided for main power. Standard voltages are 115 or 277, single phase. Special voltages can be provided upon special request.

For thermal storage applications, the construction is altered in three ways: First, the primary air valve is thermally isolated from the fan casing precluding conductance. Secondly, the interior casing insulation is wrapped with a vapor barrier. Finally, the entire bottom casing serves as the access panel. This version is designated as Model CVF-**LT**-II. Performance is not affected by these alterations. See page 31 for low temperature application information.

Model CVF-II assemblies are UL listed-UL control no. 26H8.
Model CVF-II assemblies are ETL listed-ETL report no. 476203.
Model CVF-II assemblies are CSA listed-CSA file no. LR82026-1.

Performance

Model CVF-II Fan Induction Terminals have been designed with cooling valve and fan assembly matched to provide a constant cooling-to-heating air ratio. If additional heating capacity is required, the **Model CVF-II** can be provided with an integrally mounted hot water

MODEL CVF-II

Performance Cont.

coil or electric heater, which is energized on a call for additional heating through the unit control system.

Model CVF-II units are available as system pressure independent or system pressure dependent. The thermostat controls the **CVF-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 by ordered factory pre-set). Pressure independent models are equipped with a differential pressure inlet averaging sensor to assist in overcoming inlet effect.

When a poor inlet condition exists (other than straight), a shift in the controller set point may occur (if factory set) 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 where pressures do not vary significantly due to load shedding.

Model CVF-II units will operate efficiently at differential pressures from as low as .03" (Pneumatic) and .015" (Electronic).

Selection

Model CVF-II Fan Induction Terminals should be selected for primary cooling in the mid-range of the performance table (CFM) to insure maximum operating efficiency.

When selecting the proper fan assembly, care should be exercised in determining external static pressure requirements. The fan curves give the external static pressure available at the discharge for each listed size vs. CFM. If an excessively oversized fan assembly is applied, the fan must be throttled to maintain the specified capacity (CFM) at the reduced external Ps requirement, and damaging low fan motor RPM's 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 CVF-II** includes a 3-tap switch (LOW-MEDIUM-HIGH) in combination with an electronic fan speed controller. This package allows the flexibility of three different horsepower settings and the ability to fine tune fan rpm's for the most efficient operation. In a quick review of the fan performance curves, you can readily see the flexibility provided by the three tap motor selector.

When designing discharge configurations for downstream duct systems, care must be used in the application of the model **CVF-II**. Bullhead tee arrangemets should not be placed 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. 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 properly balanced condition.

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

Controls

The **Model CVF-II's** many control sequences represent the broadest range of standard fan powered control options in the industry, providing infinite 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 CSP187-1(Pneumatic), CSE287-1(Electronic) and CSD1088-1 (Direct Digital), located under control section of the general catalog.

Installation

Model CVF-II Fan Induction Terminals are equipped with vibration isolation type motor mountings for maximum reduction of vibration transmission from the casing. Improper installation of the terminal, however, can cause these features to lose their effectiveness.

All **CVF-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 objectionable low frequency noise.

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

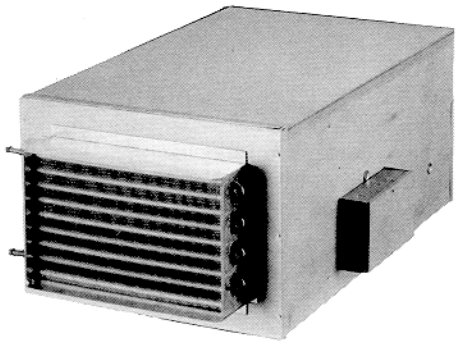
Recommended type hangers: sheetmetal straps securely attached to bar joist or mounting anchors properly secured to slab construction with lugs or poured-in-place hangers. Percussion nails are not considered to be a prudent anchor. Trapeze hangers may also be used, provided rubber liners are used on the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

Inlet approaches to system pressure independent **Model CVF-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 of factory pre-set terminals.

For maximum efficiency in controlling radiated noise in critical applications, we recommend that inlet ducts be fabricated of not less than 24-gauge sheet metal in lieu of flexible duct connections. Flexible duct is extremely transparent to radiated sound; consequently high inlet static pressures (Ps) or sharp bends with excessive pressure drop can cause a radiated noise problem in the space.

Model CVF-WC-II

w/Hot Water Coil



Description

Model CVF-WC-II Terminals are of the same basic design as the Model CVF-II, except for the addition of an auxiliary hot water coil, which is mounted at the discharge of the terminal. The water coil is energized 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 ENVIRO-TEC representative for special factory coil selections.

Construction

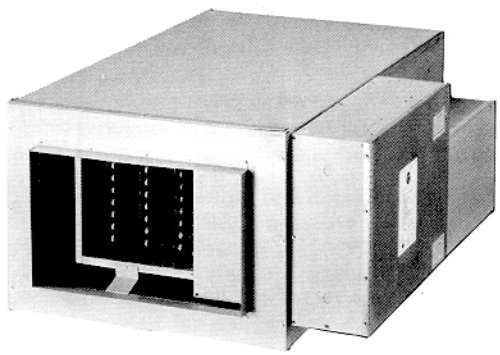
Water coils are constructed of pure aluminum fins of 0.005" to 0.010" thickness, with die-formed spacer collars to maintain uniform spacing. Fins are mechanically fixed to 0.018" copper tubes, insuring maximum heat transfer. All ENVIRO-TEC coils have been tested at 320 PSIG minimum pressure using air under warm water.

Selection

The selection tables appearing on page 27 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 ENVIRO-TEC 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. A computer selection program is also available from your ENVIRO-TEC representative (IBM compatible).

Model CVF-EH-II

w/Electric Heater



Description

Model CVF-EH-II Terminals are of the same basic design as the Model CVF-II, except for the addition of an auxiliary electric heater which is mounted downstream of the unit fan. The electric heater is energized 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 CVF-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

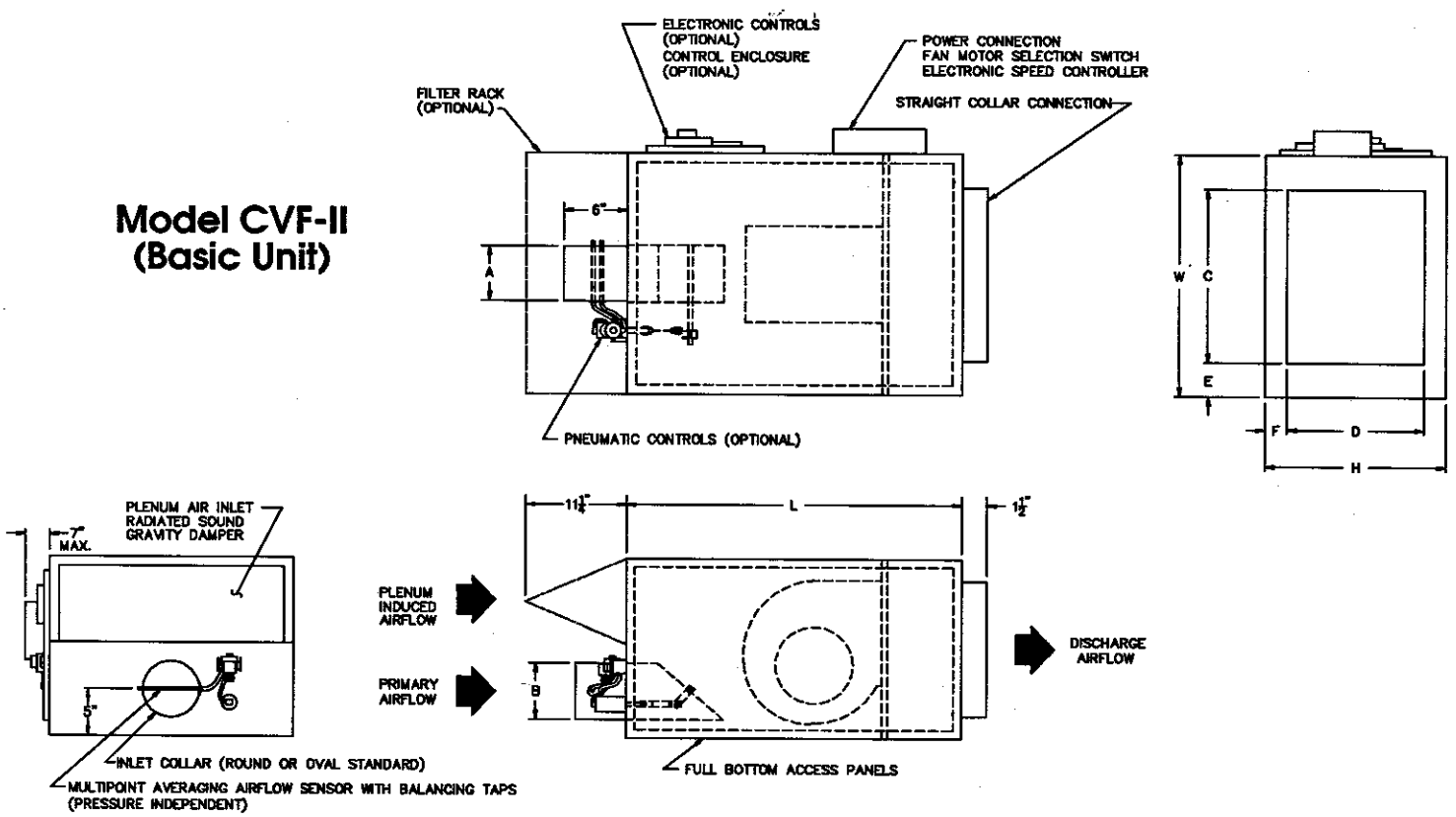
Electric heaters are E.T.L., and C.S.A. listed for zero clearance, with 20-gauge zinc coated heater rack and duct connecting collar. Heaters include as standard, primary disc-type automatic reset high temperature limit switch and fan interlock. Terminal connections for power and low voltage source, as 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. Power services of 208 volts and 480 volts (3 phase) require a neutral lead (4 wires) for 120 volt or 277 volt fan motors.

Selection

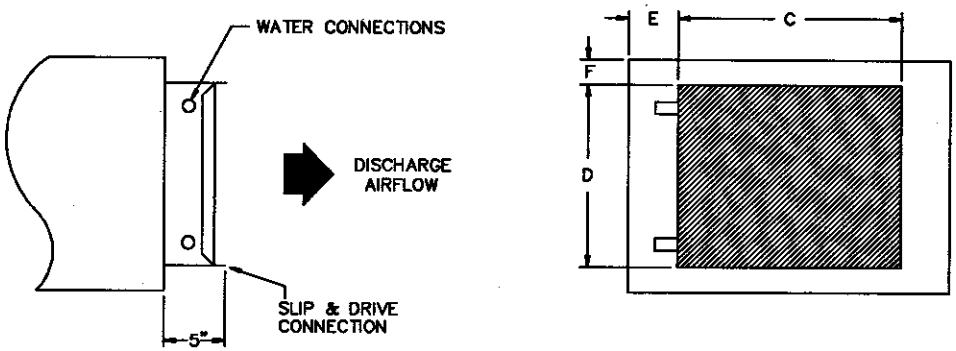
When selecting Heater capacities (KW) from the performance chart on page 26, it should be noted that any selection below 70 CFM per KW requires derated elements. An absolute minimum ratio of 50 CFM per KW should be maintained even with derated elements. Following this rule will reduce hazards and increase the life of the equipment. For descriptive instructions regarding proper use of the Electric Reheat Chart, read the selection procedure information on page 26, appearing below the chart. If you should encounter any difficulty in using the chart, contact your ENVIRO-TEC Representative.

Model CVF-II Dimensional Data

Model CVF-II (Basic Unit)

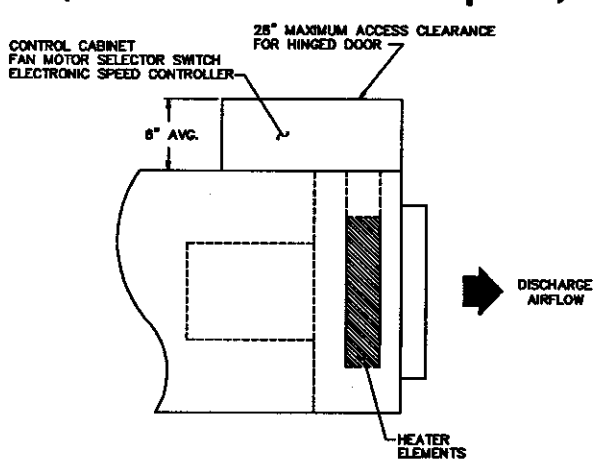


Model CVF-WC-II (with Hot Water Coil Option)



UNIT SIZE	A	B	C	D	E	F	H	L	W	FILTER SIZE	FILTER QTY
6	6"	6"	18"	11 1/4"	3"	2 7/8"	17"	40"	24"	12"x24"x1"	2
8	8"	8"	18"	11 1/4"	3"	2 7/8"	17"	40"	24"	12"x24"x1"	2
10	11	8"	26"	11 1/4"	2"	2 7/8"	17"	40"	30"	12"x30"x1"	2
12	14 1/8"	8"	26"	12 1/2"	2"	3 1/4"	19"	46"	30"	12"x30"x1"	2
14	17 1/4"	8"	36"	15"	6"	1"	17"	40"	48"	12"x24"x1"	4
16	20 3/8"	8"	40"	15"	6"	2"	19"	46"	52"	12"x26"x1"	4
18	23 9/16"	8"	40"	15"	6"	2"	19"	46"	52"	12"x26"x1"	4

Model CVF-EH-II (with Electric Heater Option)



Model CVF-II Performance Data

MODEL CVF-II PERFORMANCE DATA														
UNIT SIZE	CFM	MIN ΔP (IN. W.G.)	MAX E.S.P. (IN. W.G.)	PROJECTED ROOM NOISE CRITERION (NC)								MAX FAN HP	AMPERAGE	
				0.5" INLET Ps		1.0" INLET Ps		1.5" INLET Ps		2.0" INLET Ps			115V	277V
				DIS	RAD	DIS	RAD	DIS	RAD	DIS	RAD			
6	400	.08	.64	26	25	26	29	26	30	26	32	1/6	2.6	0.9
	500	.13	.60	28	31	28	34	28	36	28	38			
	600	.18	.54	33	36	33	39	33	41	33	42			
8	600	.06	.95	24	25	24	28	24	29	24	30	1/4	4.9	1.9
	800	.11	.84	30	33	30	35	30	37	30	38			
	1000	.17	.60	36	38	36	40	36	41	36	43			
10	700	.05	.94	25	20	25	21	25	22	25	23	1/2	8.0	3.2
	1100	.11	.89	33	35	33	36	33	37	33	38			
	1500	.20	.62	41	45	41	46	41	48	41	48			
12	1100	.07	1.0	35	33	35	34	35	35	35	35	3/4	9.7	3.8
	1500	.12	.96	41	41	41	43	41	43	41	43			
	2000	.22	.44	45	48	45	49	45	50	45	51			
14	1500	.08	.76	38	35	38	38	38	38	38	39	(2) 1/2	16.0	6.4
	2000	.13	.72	42	43	42	45	42	46	42	47			
	2500	.21	.68	46	48	46	50	46	51	46	53			
16	2000	.11	.96	35	31	35	35	35	37	35	38	(2) 3/4	19.4	7.6
	2600	.18	.78	42	40	42	43	42	45	42	47			
	3200	.34	.46	48	48	48	51	48	54	48	55			
18	2600	.13	.90	43	37	43	39	43	40	43	41	(2) 3/4	19.4	7.6
	3200	.20	.75	48	45	48	47	48	48	48	49			
	3800	.29	.44	53	52	53	54	53	55	53	56			

Performance data is based on tests conducted in accordance with Industry Standard 880.

MIN ΔP is the minimum pressure required at the terminal inlet to deliver design airflow to the zone. All downstream pressure losses (including optional hot water coil) are handled by the unit fan and need not be considered for primary air performance calculations.

MAX E.S.P. is the static pressure available between the terminal plenum inlet and discharge. Downstream ducting and air distribution pressure losses must be less than value shown to achieve the required CFM in the zone served. Hot water coil pressure loss must be considered if utilized.

DIS is the projected discharge (airborne) NC level and is derived from the discharge sound power data with standard allowances for room absorption, five feet of lined downstream duct, end reflection, and power splits assuming a maximum of 300 CFM per diffuser. If average CFM per diffuser is more than 300, the resultant NC will be higher than shown above.

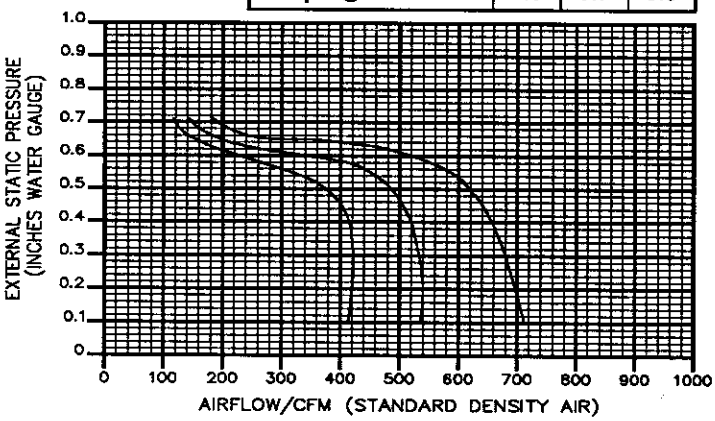
RAD is the projected radiated NC level and is derived from the radiated sound power data at 100% primary air with allowances for room absorption and ceiling transmission loss of an average room in accordance with the ASHRAE **Systems** Handbook, 1987, and the Industry Standard 885 Application recommendations (3000 ft^3 room @ 6' from source):

Octave Band	2	3	4	5	6	7
Allowance (dB)	15	17	20	23	25	26

Model CVF-II Fan Performance Curves

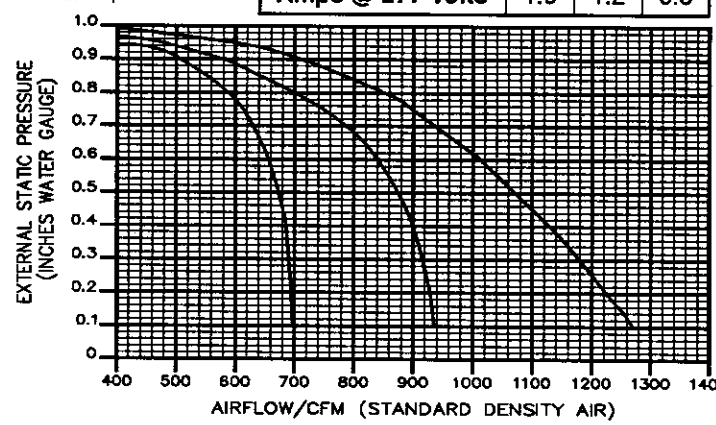
Size 06

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/6	1/8	1/10
Amps @ 115 Volts	2.6	1.7	1.3
Amps @ 277 Volts	0.9	0.7	0.5



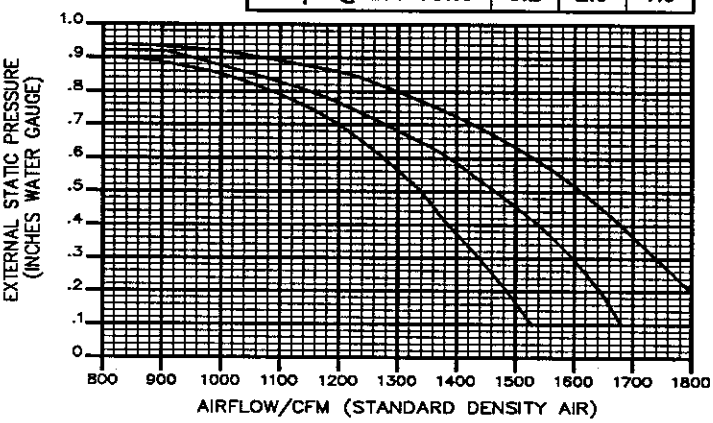
Size 08

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/4	1/5	1/8
Amps @ 115 Volts	4.9	2.8	2.0
Amps @ 277 Volts	1.9	1.2	0.8



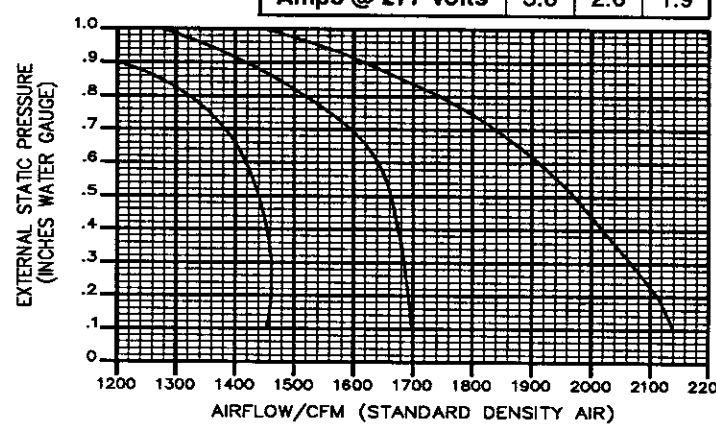
Size 10

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/2	1/3	1/4
Amps @ 115 Volts	8.0	6.4	5.0
Amps @ 277 Volts	3.2	2.5	1.9



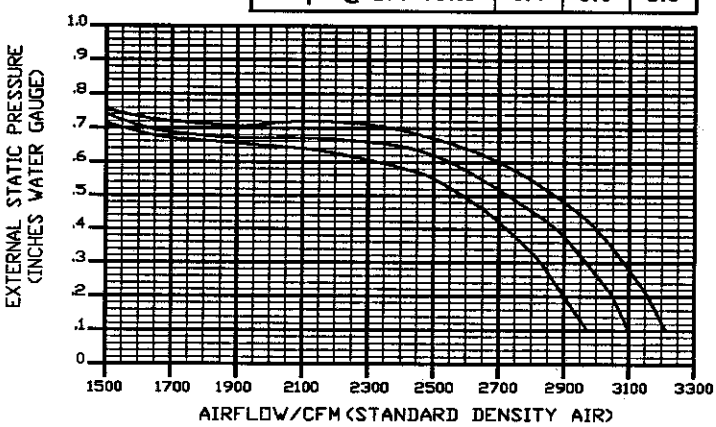
Size 12

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	3/4	1/2	1/3
Amps @ 115 Volts	9.7	7.0	5.4
Amps @ 277 Volts	3.8	2.6	1.9



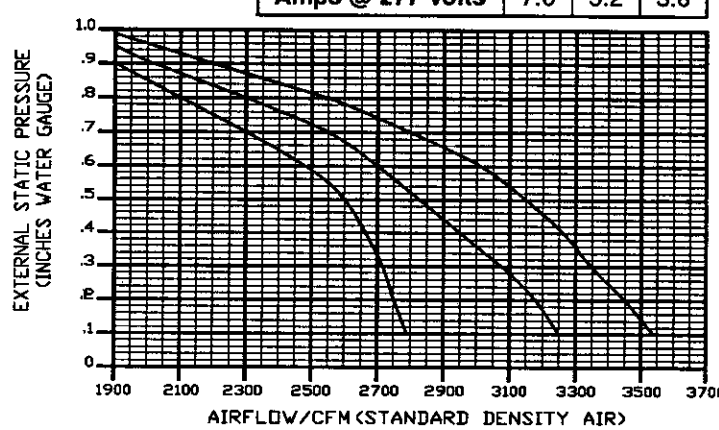
Size 14

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	(2)1/2	(2)1/3	(2)1/4
Amps @ 115 Volts	16.0	12.8	10.0
Amps @ 277 Volts	6.4	5.0	3.8



Size 16

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	(2)3/4	(2)1/2	(2)1/3
Amps @ 115 Volts	19.4	14.0	10.8
Amps @ 277 Volts	7.6	5.2	3.8



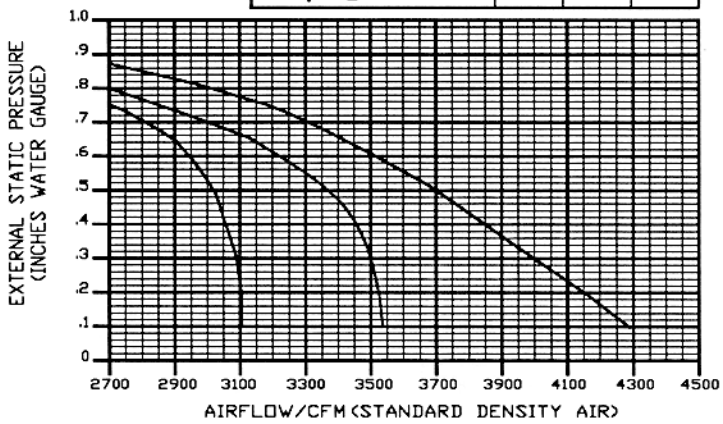
Fan curves depict actual performance of each motor tap without any adjustment of the electronic fan speed controller. Actual specified capacities which fall below a certain curve are obtained precisely by adjustment of the electronic fan speed controller.

Unit fans should not be run prior to installation of downstream duct; otherwise, damage to the fan motor may result. The minimum external static pressure requirement is 0.1 inches w.g.

Model CVF-II Fan Performance Curves (cont)

Size 18

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	(2)3/4	(2)1/2	(2)1/3
Amps @ 115 Volts	19.4	14.0	10.8
Amps @ 277 Volts	7.6	5.2	3.8



Model CVF-II Sound Performance Data

Model CVF-II **DISCHARGE** Sound Power Data

NOTES:

1. Sound power levels are expressed in decibels, dB re: 10^{-12} watts.
2. Data is based on 100% induction airflow.
3. Data is raw without any corrections or allowances of any kind.

UNIT SIZE	FAN CFM	OCTAVE BAND NUMBERS					
		2	3	4	5	6	7
6	400	60	49	49	46	50	49
	500	65	55	54	52	55	55
	600	68	60	59	58	59	60
8	600	59	50	49	50	51	49
	800	65	57	56	57	58	57
	1000	69	63	62	63	63	63
10	700	59	54	50	49	47	45
	1100	70	64	60	60	60	58
	1500	77	72	68	68	68	67
12	1100	68	66	63	63	59	55
	1500	75	72	68	68	65	60
	2000	81	77	73	73	71	65
14	1500	71	68	66	65	62	60
	2000	77	73	71	71	67	64
	2500	82	78	75	75	71	68
16	2000	68	66	64	64	61	60
	2600	77	74	71	71	68	65
	3200	84	80	77	76	73	69
18	2600	77	74	71	71	68	65
	3200	84	80	77	76	73	69
	3800	90	85	82	81	78	73

MODEL CVF-II **RADIATED** SOUND POWER DATA

100% PRIMARY AIRFLOW CAPACITY																								
UNIT SIZE	FAN CFM	OCTAVE BAND NUMBERS																						
		0.5" INLET Ps						1.0" INLET Ps						1.5" INLET Ps						2.0" INLET Ps					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
6	400	57	55	48	43	40	38	58	57	51	44	41	39	59	59	53	45	42	40	60	60	54	45	43	40
	500	61	59	54	47	43	39	63	62	56	48	44	40	63	64	58	49	45	40	64	65	59	50	45	41
	600	65	63	58	51	45	40	66	66	60	52	46	40	67	67	62	53	47	41	67	69	63	54	47	41
8	600	58	55	49	43	41	39	58	56	51	44	42	40	59	58	52	44	42	40	59	59	53	44	42	40
	800	64	60	55	47	43	40	64	62	57	48	44	41	65	64	58	48	44	41	65	65	59	49	44	41
	1000	68	65	59	51	45	41	69	67	61	51	46	41	69	68	63	52	46	41	69	69	63	52	46	41
10	700	50	50	46	43	40	36	52	51	47	44	40	36	53	52	48	44	40	35	54	52	48	44	40	35
	1100	63	62	56	50	45	41	64	64	57	50	46	41	65	64	57	51	46	41	66	65	58	51	46	41
	1500	71	71	62	55	49	45	73	72	63	55	50	45	74	73	64	56	50	45	75	74	65	56	50	45
12	1100	64	61	54	46	43	41	64	62	55	48	44	41	64	63	56	49	45	42	64	63	56	49	46	42
	1500	70	68	60	53	49	45	71	69	61	55	50	46	71	69	62	56	51	46	71	70	63	56	52	47
	2000	77	74	66	59	55	49	77	75	67	61	56	50	77	76	68	62	57	51	77	76	69	63	58	51
14	1500	67	63	55	49	47	46	69	65	56	50	48	46	70	66	57	51	48	46	70	66	57	51	48	47
	2000	73	69	61	54	50	49	75	71	62	55	51	49	75	72	63	55	51	50	76	72	63	56	51	50
	2500	77	74	66	57	53	51	79	75	67	58	53	52	80	76	68	59	54	52	81	77	68	59	54	52
16	2000	62	59	53	49	48	49	65	62	55	50	49	49	67	64	56	51	50	50	68	66	57	52	50	50
	2600	71	67	60	54	51	51	73	70	62	55	52	51	75	71	64	56	53	52	76	73	64	56	53	52
	3200	77	73	66	58	54	53	80	75	68	59	55	53	82	77	69	60	55	54	83	78	70	60	56	54
18	2600	68	64	58	53	49	51	70	66	59	54	50	51	71	67	59	55	50	52	71	68	60	55	51	52
	3200	75	71	64	57	52	52	76	72	65	58	52	53	77	73	66	58	53	53	78	74	66	59	53	54
	3800	80	76	69	60	54	54	82	77	70	61	55	54	83	78	71	62	55	55	83	79	71	62	55	55

NOTES:

1. Sound power levels are expressed in decibels, dB re: 10^{-12} watts.

2. Fan external static pressure (E.S.P.) is 0.3 inches w.g. in all cases. E.S.P. does not appreciably effect sound performance.

3. Data is raw without any corrections or allowances of any kind.

MODEL CVF-II **RADIATED** SOUND POWER DATA

50% PRIMARY AIRFLOW CAPACITY																								
UNIT SIZE	FAN CFM	OCTAVE BAND NUMBERS																						
		0.5" INLET Ps						1.0" INLET Ps						1.5" INLET Ps						2.0" INLET Ps					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
6	400	53	47	41	37	36	37	53	48	41	37	37	38	53	48	42	38	37	38	53	49	42	38	37	38
	500	56	52	46	42	38	38	56	52	47	42	39	38	57	53	47	42	39	39	57	54	48	42	39	39
	600	59	56	51	46	40	38	59	56	51	46	40	39	59	57	52	46	41	39	59	57	52	46	41	39
8	600	55	49	43	39	39	38	55	50	43	40	39	39	55	50	43	40	40	39	55	50	44	40	40	39
	800	60	55	49	44	41	39	60	55	49	44	41	39	60	56	50	44	41	40	60	56	50	44	41	40
	1000	64	60	54	47	42	40	64	60	54	47	42	40	64	60	54	47	43	40	65	60	55	47	43	40
10	700	44	43	39	38	36	32	44	43	39	38	36	32	44	43	40	38	36	32	44	43	40	38	36	32
	1100	56	55	49	45	42	38	56	55	49	45	42	38	56	55	49	45	42	38	56	55	49	45	42	38
	1500	63	63	55	49	45	42	64	63	55	50	46	42	64	63	55	50	46	42	64	63	55	50	46	42
12	1100	60	56	49	41	39	37	60	56	49	41	39	37	60	56	49	41	39	37	60	56	49	41	39	37
	1500	67	62	55	46	43	40	67	62	55	46	43	40	67	63	55	46	43	41	67	63	55	47	44	41
	2000	73	68	60	51	47	43	73	68	60	51	47	43	73	68	60	52	48	44	73	68	60	52	48	44
14	1500	61	56	50	45	44	44	62	57	50	45	44	44	62	57	50	45	44	44	62	57	50	45	44	44
	2000	67	63	56	50	47	47	67	63	57	50	48	47	68	63	57	50	48	47	68	64	57	50	48	47
	2500	72	68	61	54	50	49	72	68	61	54	50	50	72	69	62	54	51	50	72	69	62	54	51	50
16	2000	57	52	47	43	44	46	57	52	47	43	44	46	57	53	47	43	45	47	58	53	47	44	45	47
	2600	66	61	56	49	48	49	66	62	56	49	48	49	66	62	56	50	48	49	66	62	56	50	48	49
	3200	72	69	62	54	51	51	73	69	62	55	51	51	73	69	62	55	51	51	73	69	62	55	51	51
18	2600	66	61	55	49	47	49	66	61	55	49	47	49	66	61	55	49	47	49	66	61	55	49	48	49
	3200	72	69	62	54	50	51	72	69	62	54	50	51	72	69	62	54	51	51	72	69	62	55	51	51
	3800	78	75	68	59	53	53	78	75	68	59	53	53	78	75	68	59	53	53	78	75	68	59	53	53

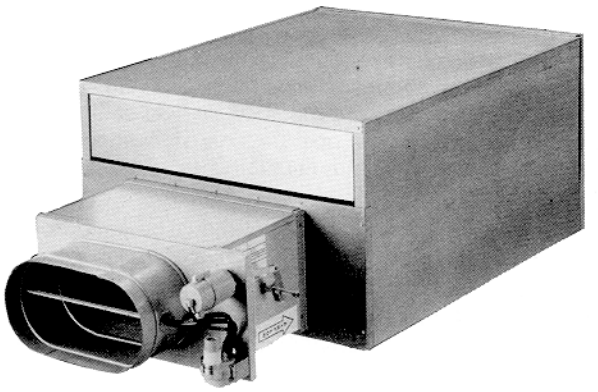
NOTES:

1. Sound power levels are expressed in decibels, dB re: 10^{-12} watts.

2. Fan external static pressure (E.S.P.) is 0.3 inches w.g. in all cases. E.S.P. does not appreciably effect sound performance.

3. Data is raw without any corrections or allowances of any kind.

MODEL CVFQ-II



Features

- **Extremely quiet operation**
- Low cost, highly efficient waste heat recovery
- Available with electric, hot water or steam auxiliary heat
- Eliminates need for central warm air system
- Single discharge-no need for field fabricated mixing plenum
- Broad range of controls-pneumatic or electronic
- E.T.L. and C.S.A. listed as an assembly
- Special construction available for low temperature primary air applications (Model CVFQ-LT-II)

Description

Model CVFQ-II Fan Induction Terminals are designed for use in low pressure variable air volume systems where **acoustical performance is of the utmost importance.** The unit is constructed with heavier gauge metal than the standard unit as well as special fan assemblies and primary air valve configurations. Numerous acoustical witness tests have proven the CVFQ-II Fan Terminals as the quietest in the industry.

The primary air cooling function of the **Model CVFQ-II** incorporates a single damper blade, which operates through a 45° arc and provides throttling capability in all damper positions. This feature is not possible with 90° arc single or multi-blade dampers used in other manufacturers' designs.

The fan induction or heating function of the **Model CVFQ-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 **CVFQ-II** can be provided with an optional hot water coil or electric heater (**CVFQ-WC-II**) or (**CVFQ-EH-II**), which may be activated by the zone thermostat. 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 CVFQ-II** is a unitary design incorporating both the cooling and heating function in a single casing. Unlike some models offered by other manufacturers, the **CVFQ-II** requires no special fabrication of discharge plenums to eliminate air stratification. Both heated and cooled air pass through a single discharge to downstream ductwork.

Model CVFQ-II units are available with an optional filter section located at the unit induction port.

Construction

Model CVFQ-II Fan Induction Terminals are manufactured of zinc-coated steel; Sizes 6 and 8: 22 gauge casing, 20 gauge bottom access door; Sizes 10 and larger: 20 gauge casing, 18 gauge bottom access door; 16 gauge damper, and 20 gauge damper seat. 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.

Units may be provided with round, oval or rectangular inlet collars. Round or oval inlets and rectangular outlets are standard, unless otherwise specified. Convenient bottom 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 differential pressure sensor which may be removed without disconnecting the inlet duct.

Model CVFQ-II casings are internally lined with 3/4" 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 CVFQ-II** units are specifically designed for fan induction Terminal application. Unlike other manufacturers who use off-the-shelf fan assemblies, ENVIRO-TEC fabricates its fan package using computer selected wheels for specific capacity (CFM) and external static 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 CVFQ-II** are installed in accordance with UL and N.E.C. requirements. A single-point electrical connection is provided for main power. Standard voltages are 115 or 277, single phase. Special voltages can be provided upon special request.

For thermal storage applications the construction is altered in three ways: First, the primary air valve is thermally isolated from the fan casing precluding conductance. Secondly, the interior casing insulation is wrapped with a vapor barrier. Finally, the entire bottom casing serves as the access panel. This version is designated as Model CVFQ-**LT**-II. Performance is not affected by these alterations. See page 31 for low temperature application information.

Model CVFQ-II assemblies are ETL listed-ETL report no. 476203.
Model CVFQ-II assemblies are CSA listed-CSA file no. LR82026-1

Performance

Model CVFQ-II Fan Induction Terminals have been designed with cooling valve and fan assemblies matched to provide a constant cooling-to-heating air ratio. If additional heating capacity is required, the **Model CVFQ-II** can be provided with an integrally mounted hot

MODEL CVFQ-II

Performance Cont.

water coil or electric heater, which is energized on a call for additional heating through the unit control system.

Model CVFQ-II units are available as system pressure independent or system pressure dependent. The thermostat controls the **CVFQ-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 by ordered factory pre-set). Pressure independent models are equipped with a differential pressure inlet averaging sensor to assist in overcoming inlet effect.

When a poor inlet condition exists (other than straight), a shift in the controller set point may occur (if factory set) 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 where pressures do not vary significantly due to load shedding.

Model CVFQ-II units will operate efficiently at differential pressure from as low as .03" (Pneumatic) and .015" (Electronic).

Selection

Model CVFQ-II Fan Induction Terminals should be selected for primary cooling in the mid-range to lower mid-range of the performance table (CFM) for super quiet operation (NC 35).

When selecting the proper fan assembly, care should be exercised in determining external static pressure requirements. The fan curves give the external static pressure available at the discharge for each listed size vs. CFM. If an excessively oversized fan assembly is applied, the fan must be throttled to maintain the specified capacity (CFM) at the reduced external Ps requirement, and damaging low fan motor RPM's 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 CVFQ-II** includes a 3-tap switch (LOW-MEDIUM-HIGH) in combination with an electronic fan speed controller. This package allows the flexibility of three different horsepower settings and the ability to fine tune fan rpm's for the most efficient operation. In a quick review of the fan performance curves, you can readily see the flexibility provided by the three tap motor selector.

When designing discharge configurations for downstream duct systems, care must be used in the application of the model **CVFQ-II.** Bull-head tee arrangements should not be placed 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. 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 properly balanced condition.

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

Controls

The **Model CVFQ-II**'s many control sequences represent the broadest range of standard fan powered control options in the industry, providing infinite 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 CSP187-1(Pneumatic), CSE287-1(Electronic) and CSD1088-1 (Direct Digital), located under controls section of the general catalog.

Installation

Model CVFQ-II Fan Induction Terminals are equipped with vibration isolation type motor mountings for maximum reduction of vibration transmission from the casing. Improper installation of the terminal, however, can cause these features to lose their effectiveness.

All **CVFQ-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 objectionable 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. Trapeze hangers may also be used, provided rubber liners are used on the contact rails of the hangers, eliminating metal-to-metal contact.

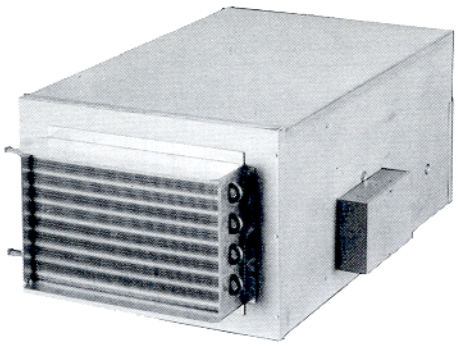
Inlet approaches to system pressure independent **Model CVFQ-II** units should be as straight as possible to eliminate inlet effect. Averaging probes are provided to offset mild inlet effect. If severe approaches are installed, field trim adjustment of the controller may be required to achieve acceptable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

For maximum efficiency in controlling radiated noise in critical applications, we recommend that inlet ducts be fabricated of not less than 24-gauge sheet metal in lieu of flexible duct connections. Flexible duct is extremely transparent to radiated sound; consequently high inlet static pressure (Ps) or sharp bends with excessive pressure drop can cause a radiated noise problem in the space.

The two largest sizes (14B and 14C) are usually shipped in two pieces which require field assembly.

Model CVFQ-WC-II

w/Hot Water Coil



Description

Model CVFQ-WC-II Terminals are of the same basic design as the Model CVFQ-II, except for the addition of an auxiliary hot water coil, which is mounted at the discharge of the terminal. The water coil is energized 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 ENVIRO-TEC representative for special factory coil selections.

Construction

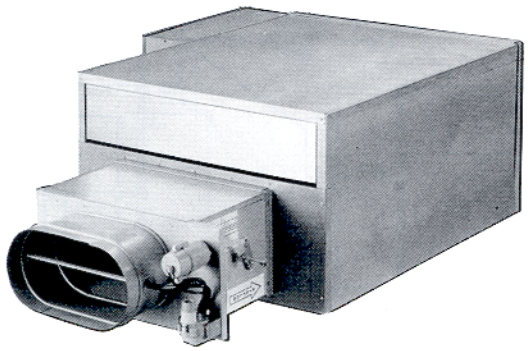
Water coils are constructed of pure aluminum fins of .005" to .010" thickness, with die-formed spacer collars to maintain uniform spacing. Fins are mechanically fixed to .018" copper tubes, insuring maximum heat transfer. All ENVIRO-TEC coils have been tested at 320 PSIG minimum pressure using air under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

Selection

The selection tables appearing on page 27 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 ENVIRO-TEC 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. A computer selection program is also available from your ENVIRO-TEC representative (IBM compatible).

Model CVFQ-EH-II

w/Electric Heater



Description

Model CVFQ-EH-II Terminals are of the same basic design as the Model CVFQ-II, except for the addition of an auxiliary electric heater, which is mounted downstream of the unit fan. The electric heater is energized 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 CVFQ-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

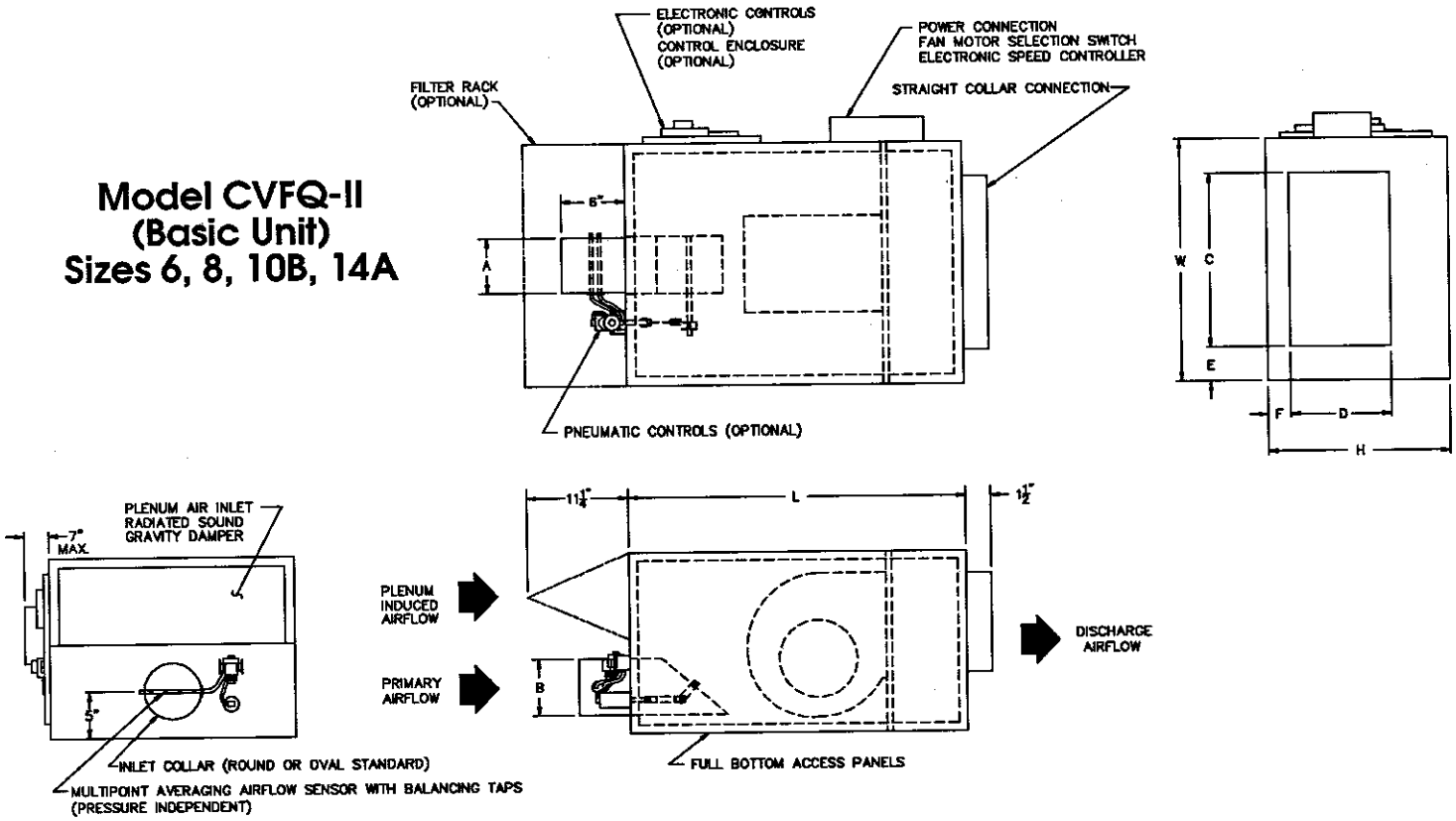
Electric heaters are E.T.L. and C.S.A. listed for zero clearance, with 20-gauge zinc coated heater rack and duct connecting collar. Heaters include as standard, primary disc-type automatic reset high temperature limit switch and fan interlock relay. Terminal connections for power and low voltage source, as 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. Power services of 208 volts and 480 volts (3 phase) require a neutral lead (4 wires) for 120 volt or 277 volt fan motors.

Selection

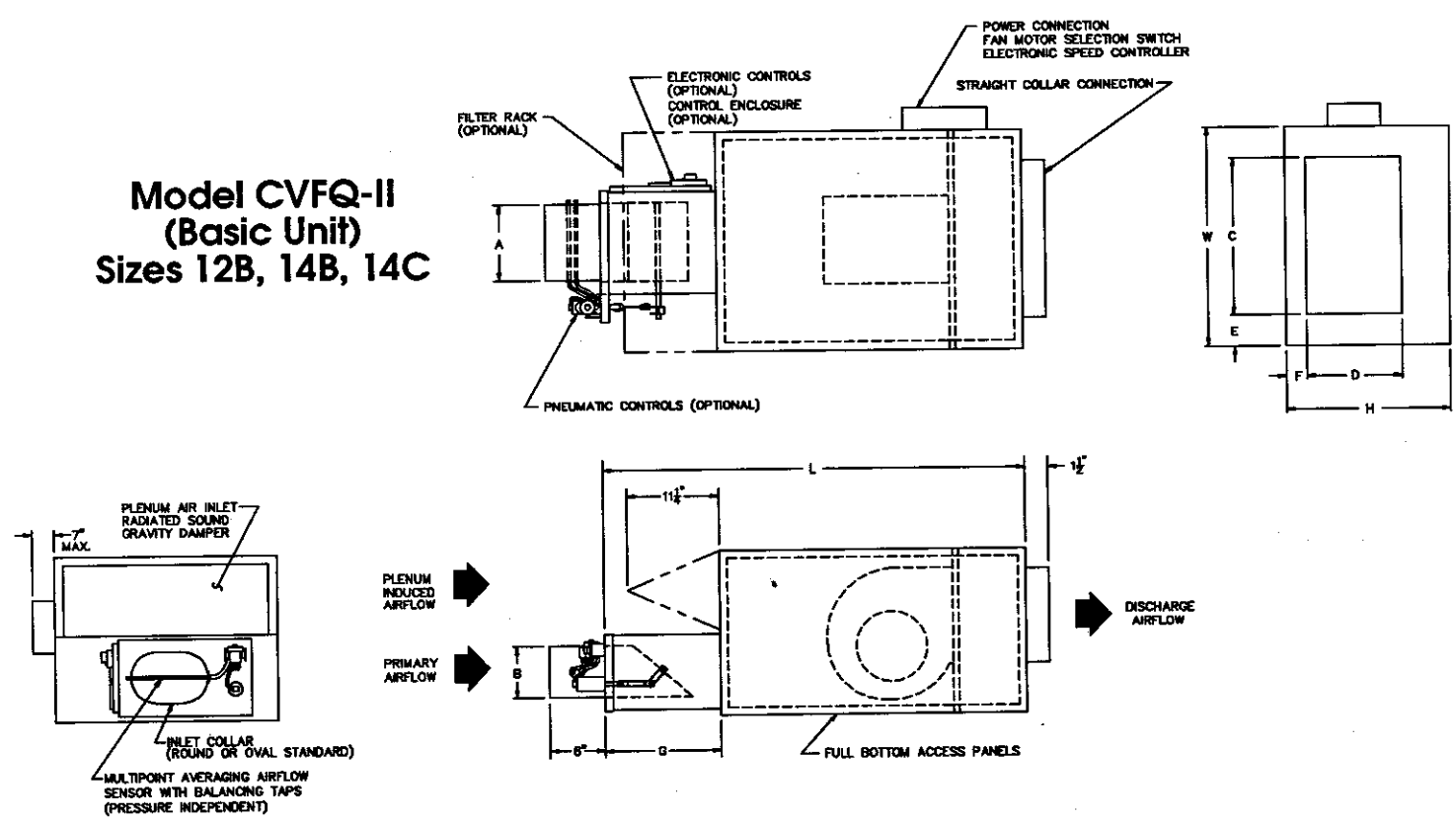
When selecting Heater capacities (KW) from the performance chart on page 26, it should be noted that any selection below 70 CFM per KW does require derated elements. An absolute minimum ratio of 50 CFM per KW should be maintained even with derated elements. Following this rule will reduce hazards and increase the life of the equipment. For descriptive instructions regarding proper use of the Electric Reheat Chart, read the selection procedure information on page 26, appearing below the chart. If you should encounter any difficulty in using the chart, contact your ENVIRO-TEC Representative.

Model CVFQ-II Dimensional Data

Model CVFQ-II (Basic Unit) Sizes 6, 8, 10B, 14A

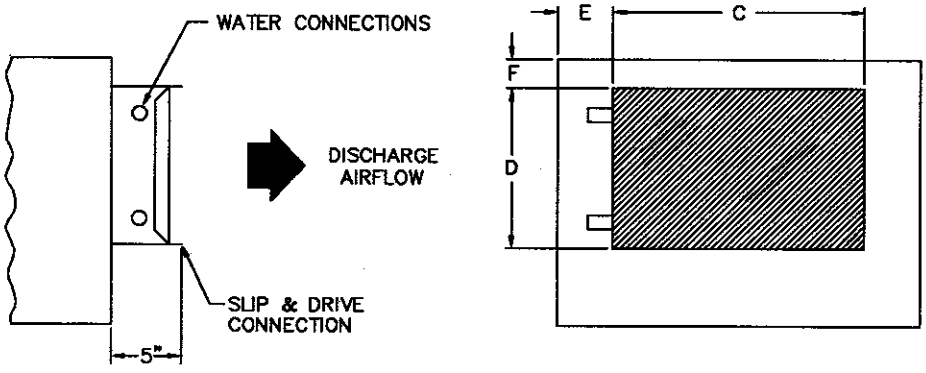


Model CVFQ-II (Basic Unit) Sizes 12B, 14B, 14C



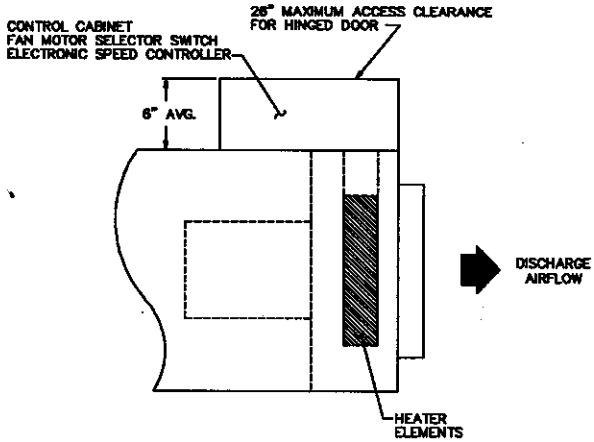
Model CVFQ-II Dimensional Data

UNIT SIZE	A	B	C	D	E	F	G	H	L	W	FILTER SIZE	FILTER QTY
6	6"	6"	18"	$11\frac{1}{4}$"	3"	$2\frac{7}{8}$"	--	17"	40"	24"	12"x24"x1"	2
8	8"	8"	18"	$11\frac{1}{4}$"	3"	$2\frac{7}{8}$"	--	17"	40"	24"	12"x24"x1"	2
10B	11	8"	26"	$11\frac{1}{4}$"	1"	2"	--	19"	40"	30"	12"x30"x1"	2
12B	$14\frac{1}{8}$"	8"	26"	$12\frac{1}{2}$"	2"	2"	13"	19"	53"	30"	12"x30"x1"	2
14A	$17\frac{1}{4}$"	8"	26"	$12\frac{1}{2}$"	1"	2"	--	19"	46"	42"	12"x21"x1"	4
14B	$17\frac{1}{4}$"	8"	26"	$12\frac{1}{2}$"	2"	2"	30"	19"	76"	42"	12"x21"x1"	4
14C	$17\frac{1}{4}$"	8"	36"	15"	6"	2"	30"	19"	76"	52"	12"x26"x1"	4



Model CVFQ-WC-II (with Hot Water Coil Option)

Model CVFQ-EH-II (with Electric Heater Option)



Model CVFQ-II Performance Data

MODEL CVFQ-II PERFORMANCE DATA													
UNIT SIZE	CFM	MIN ΔP (IN. W.G.)	MAX E.S.P. (IN. W.G.)	PROJECTED ROOM NOISE CRITERION (NC)								MAX FAN HP	AMPERAGE	
				0.5" INLET Ps		1.0" INLET Ps		1.5" INLET Ps		2.0" INLET Ps				
				DIS	RAD	DIS	RAD	DIS	RAD	DIS	RAD		115V	277V
6	400	.08	.64	26	25	26	29	26	30	26	32	1/6	2.6	0.9
	500	.13	.60	28	31	28	34	28	36	28	38			
	600	.18	.54	33	36	33	39	33	41	33	42			
8	600	.06	.95	24	25	24	28	24	29	24	30	1/4	4.9	1.9
	800	.11	.84	30	33	30	35	30	37	30	38			
	1000	.17	.60	36	38	36	40	36	41	36	43			
10B	1000	.09	.60	30	31	30	33	30	33	30	34	1/2	8.0	3.2
	1200	.13	.44	34	34	34	35	34	37	34	38			
	1400	.18	.25	38	38	38	39	38	39	38	40			
12B	1200	.08	.46	33	31	33	33	33	33	33	34	1/2	8.0	3.2
	1400	.11	.35	34	34	34	35	34	36	34	37			
	1600	.14	.20	38	37	38	39	38	40	38	41			
14A	1400	.07	.56	24	30	24	31	24	32	24	33	(2) 1/4	9.8	3.8
	1600	.09	.44	28	33	28	34	28	35	28	37			
	1800	.11	.32	31	36	31	38	31	39	31	40			
14B	1600	.09	.44	28	27	28	28	28	29	28	30	(2) 1/4	9.8	3.8
	1800	.11	.32	31	33	31	34	31	35	31	36			
	2000	.13	.16	35	38	35	40	35	41	35	42			
14C	1800	.11	.58	30	28	30	31	30	33	30	35	(2) 1/2	16.0	6.4
	2000	.13	.52	33	32	33	35	33	38	33	39			
	2200	.16	.44	36	35	36	39	36	41	36	43			

Performance data is based on tests conducted in accordance with Industry Standard 880.

MIN ΔP is the minimum pressure required at the terminal inlet to deliver design airflow to the zone. All downstream pressure losses (including optional hot water coil) are handled by the unit fan and need not be considered for primary air performance calculations.

MAX E.S.P. is the static pressure available between the terminal plenum inlet and discharge. Downstream ducting and air distribution pressure losses must be less than value shown to achieve the required CFM in the zone served. Hot water coil pressure loss must be considered if utilized.

DIS is the projected discharge (airborne) NC level and is derived from the discharge sound power data with standard allowances for room absorption, five feet of lined downstream duct, end reflection, and power splits assuming a maximum of 300 CFM per diffuser. If average CFM per diffuser is more than 300, the resultant NC will be higher than shown above.

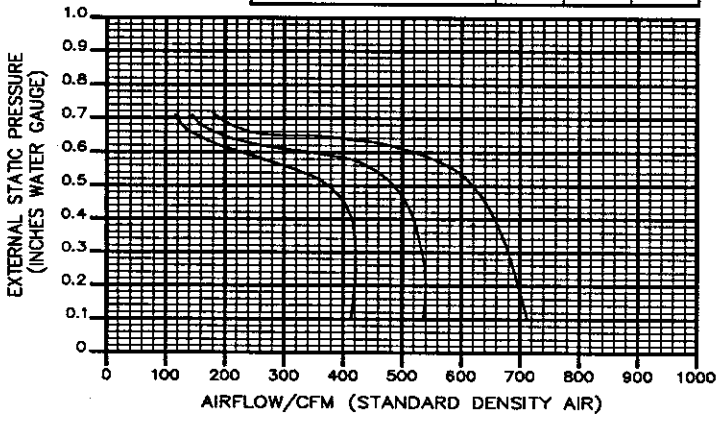
RAD is the projected radiated NC level and is derived from the radiated sound power data at 100% primary air with allowances for room absorption and ceiling transmission loss of an average room in accordance with the ASHRAE **Systems** Handbook, 1987, and the Industry Standard 885 Application recommendations (3000 ft^3 room @ 6' from source):

Octave Band	2	3	4	5	6	7
Allowance (dB)	15	17	20	23	25	26

Model CVFQ-II Fan Performance Curves

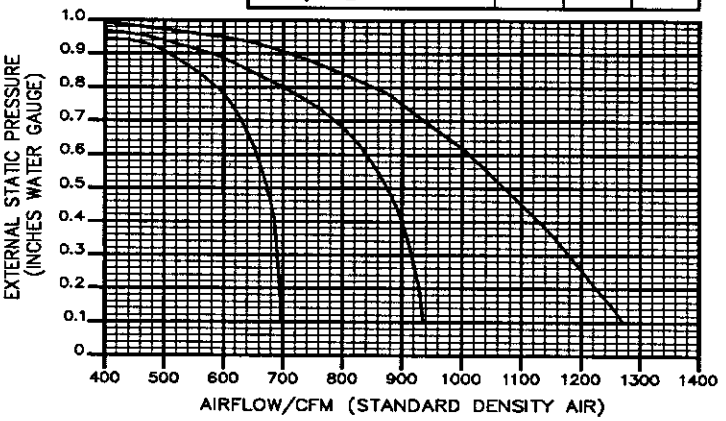
Size 06

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/6	1/8	1/10
Amps @ 115 Volts	2.6	1.7	1.3
Amps @ 277 Volts	0.9	0.7	0.5



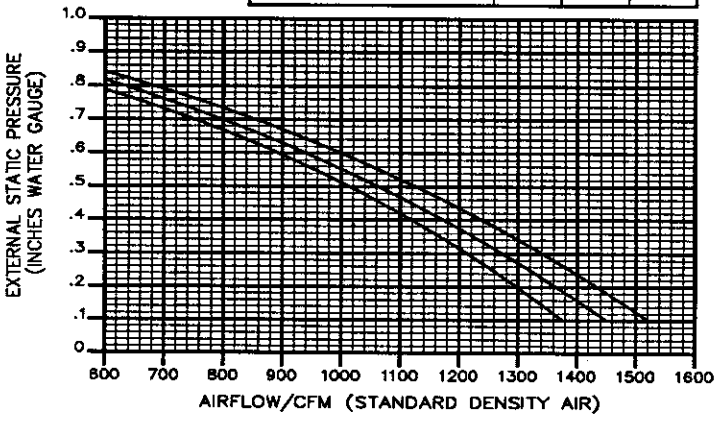
Size 08

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/4	1/5	1/8
Amps @ 115 Volts	4.9	2.8	2.0
Amps @ 277 Volts	1.9	1.2	0.8



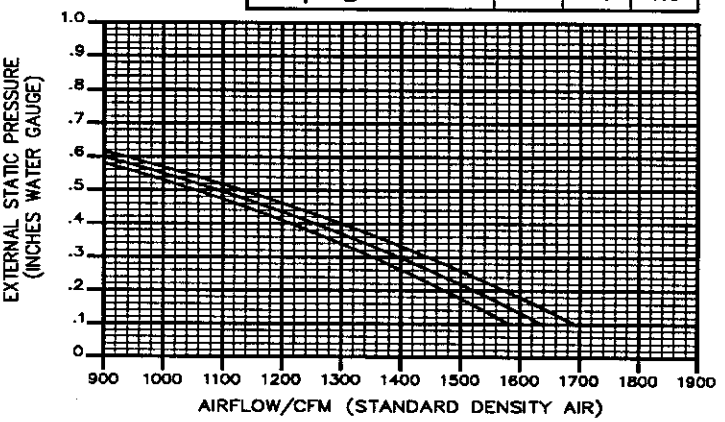
Size 10B

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/2	1/3	1/4
Amps @ 115 Volts	8.0	6.4	5.0
Amps @ 277 Volts	3.2	2.5	1.9



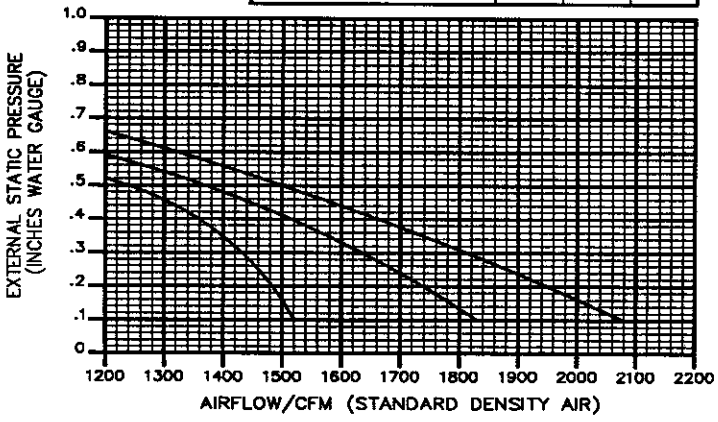
Size 12B

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	1/2	1/3	1/4
Amps @ 115 Volts	8.0	6.4	5.0
Amps @ 277 Volts	3.2	2.5	1.9



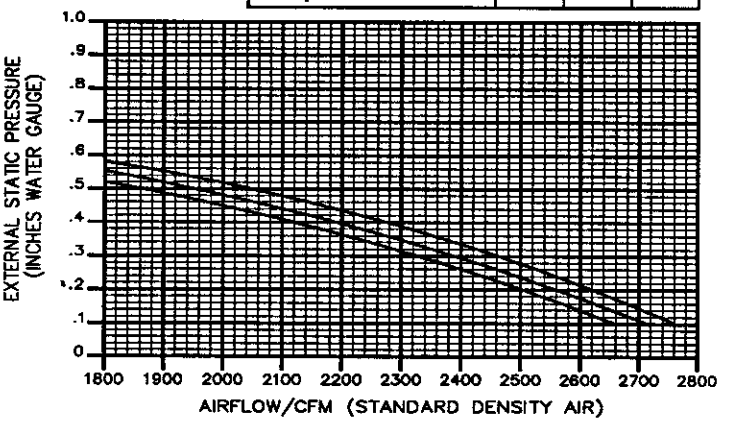
Sizes 14A, 14B

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	(2)1/4	(2)1/5	(2)1/8
Amps @ 115 Volts	9.8	5.6	4.0
Amps @ 277 Volts	3.8	2.4	1.6



Size 14C

Fan Motor Tap	HI	MD	LO
Horsepower (HP)	(2)1/2	(2)1/3	(2)1/4
Amps @ 115 Volts	16.0	12.8	10.0
Amps @ 277 Volts	6.4	5.0	3.8



Fan curves depict actual performance of each motor tap without any adjustment of the electronic fan speed controller. Actual specified capacities which fall below a certain curve are obtained precisely by adjustment of the electronic fan speed controller.

Unit fans should not be run prior to installation of downstream duct; otherwise, damage to the fan motor may result. The minimum external static pressure requirement is 0.1 inches w.g.

MODEL CVFQ-II **RADIATED** SOUND POWER DATA

100% PRIMARY AIRFLOW CAPACITY																								
UNIT SIZE	FAN CFM	OCTAVE BAND NUMBERS																						
		0.5" INLET Ps						1.0" INLET Ps						1.5" INLET Ps						2.0" INLET Ps					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
6	400	57	55	48	43	40	38	58	57	51	44	41	39	59	59	53	45	42	40	60	60	54	45	43	40
	500	61	59	54	47	43	39	63	62	56	48	44	40	63	64	58	49	45	40	64	65	59	50	45	41
	600	65	63	58	51	45	40	66	66	60	52	46	40	67	67	62	53	47	41	67	69	63	54	47	41
8	600	58	55	49	43	41	39	58	56	51	44	42	40	59	58	52	44	42	40	59	59	53	44	42	40
	800	64	60	55	47	43	40	64	62	57	48	44	41	65	64	58	48	44	41	65	65	59	49	44	41
	1000	68	65	59	51	45	41	69	67	61	51	46	41	69	68	63	52	46	41	69	69	63	52	46	41
10B	1000	61	59	52	47	41	38	62	61	54	48	42	39	63	61	55	49	42	39	63	62	56	49	43	39
	1200	64	62	55	50	43	40	65	64	56	51	44	41	66	64	58	52	44	41	67	65	58	52	45	41
	1400	67	65	57	53	44	42	68	66	59	54	45	42	69	67	60	55	46	43	70	67	60	55	46	43
12B	1200	64	56	50	45	42	40	65	58	53	46	43	41	66	59	54	47	43	41	66	59	55	47	43	41
	1400	66	60	55	49	45	42	67	62	57	50	45	42	68	63	59	51	46	42	68	64	60	51	46	42
	1600	68	64	58	52	47	43	69	66	61	53	47	43	70	67	62	54	48	43	70	68	64	55	48	44
14A	1400	63	57	52	48	44	42	64	59	54	51	46	43	65	60	56	52	47	43	65	61	57	54	48	44
	1600	65	60	55	51	46	43	67	62	58	54	48	44	67	63	59	55	49	44	68	64	60	56	50	45
	1800	68	63	59	54	47	44	69	65	61	56	49	45	69	66	62	58	50	46	70	67	63	59	51	46
14B	1600	61	54	50	48	44	40	62	56	51	49	44	41	63	57	52	50	45	41	63	58	53	50	45	41
	1800	65	59	53	50	45	43	67	61	55	51	45	43	67	62	56	52	46	43	68	63	57	53	46	43
	2000	70	63	56	52	46	44	71	65	58	53	47	45	72	67	59	54	47	45	72	68	60	55	47	45
14C	1800	61	52	48	46	45	43	64	56	50	48	46	43	66	58	52	49	46	44	67	60	54	50	47	44
	2000	64	56	52	48	46	44	67	60	55	51	47	44	69	62	57	52	47	45	70	64	58	53	48	45
	2200	67	59	55	51	47	45	70	63	59	53	48	45	72	66	61	55	48	46	73	68	62	56	49	46

NOTES:

1. Sound power levels are expressed in decibels, dB re: 10^{-12} watts.

2. Fan external static pressure (E.S.P.) is 0.3 inches w.g. in all cases. E.S.P. does not appreciably effect sound performance.

3. Data is raw without any corrections or allowances of any kind.

MODEL CVFQ-II **RADIATED** SOUND POWER DATA

50% PRIMARY AIRFLOW CAPACITY																								
UNIT SIZE	FAN CFM	OCTAVE BAND NUMBERS																						
		0.5" INLET Ps						1.0" INLET Ps						1.5" INLET Ps						2.0" INLET Ps					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
6	400	53	47	41	37	36	37	53	48	41	37	37	38	53	48	42	38	37	38	53	49	42	38	37	38
	500	56	52	46	42	38	38	56	52	47	42	39	38	57	53	47	42	39	39	57	54	48	42	39	39
	600	59	56	51	46	40	38	59	56	51	46	40	39	59	57	52	46	41	39	59	57	52	46	41	39
8	600	55	49	43	39	39	38	55	50	43	40	39	39	55	50	43	40	40	39	55	50	44	40	40	39
	800	60	55	49	44	41	39	60	55	49	44	41	39	60	56	50	44	41	40	60	56	50	44	41	40
	1000	64	60	54	47	42	40	64	60	54	47	42	40	64	60	54	47	43	40	65	60	55	47	43	40
10B	1000	57	56	47	42	38	36	57	56	48	43	38	36	57	56	48	43	38	36	57	56	49	43	39	36
	1200	62	60	51	46	40	38	62	60	51	46	40	38	62	60	52	46	41	38	62	60	52	46	41	39
	1400	66	63	54	49	42	40	66	63	54	49	42	40	66	63	55	49	43	40	66	64	55	50	43	40
12B	1200	62	49	43	40	39	38	62	50	43	40	39	38	62	50	43	40	40	38	62	50	43	40	40	38
	1400	63	54	47	43	41	39	63	54	47	43	41	39	63	54	47	44	41	39	64	54	47	44	41	39
	1600	64	57	51	46	42	40	65	58	51	46	42	40	65	58	51	46	42	40	65	58	51	46	42	40
14A	1400	58	50	44	40	40	38	58	50	44	41	41	39	58	50	45	42	42	39	58	50	45	42	42	40
	1600	60	53	48	44	42	40	60	54	49	45	43	40	61	54	49	45	43	41	61	54	49	46	44	41
	1800	63	57	52	48	43	41	63	57	53	48	44	42	63	57	53	49	45	42	63	57	53	49	45	42
14B	1600	55	45	44	42	40	36	55	45	44	42	40	36	55	45	44	43	40	36	55	45	44	43	41	37
	1800	59	49	46	44	42	39	59	49	46	45	42	39	59	49	46	45	42	39	59	49	46	45	42	39
	2000	62	52	48	47	43	41	62	52	48	47	43	41	62	52	48	47	43	41	62	52	48	47	44	41
14C	1800	59	47	44	42	41	39	59	47	44	42	41	39	59	48	44	42	42	39	59	48	44	42	42	40
	2000	62	52	46	43	42	40	62	52	46	43	43	41	62	52	46	43	43	41	62	52	46	43	43	41
	2200	65	56	48	44	44	42	65	56	48	44	44	42	65	56	48	44	44	42	65	56	48	45	44	42

MODEL CVFQ-II **DISCHARGE** SOUND POWER DATA

OCTAVE BAND NUMBERS	UNIT SIZE / CFM																				
	6			8			10B			12B			14A			14B			14C		
	400	500	600	600	800	1000	1000	1200	1400	1200	1400	1600	1400	1600	1800	1600	1800	2000	1800	2000	2200
2	60	65	68	59	65	69	60	66	71	68	71	74	58	59	60	60	60	61	59	61	64
3	49	55	60	50	57	63	53	59	65	62	65	69	46	49	53	49	53	57	52	56	60
4	49	54	59	49	56	62	54	59	64	58	61	63	53	57	60	57	61	65	59	63	66
5	46	52	58	50	57	63	54	60	66	58	61	64	50	54	57	55	57	60	54	57	60
6	50	55	59	51	58	63	56	61	65	60	63	66	52	55	58	56	58	60	54	57	60
7	49	55	60	49	57	63	55	61	65	59	62	65	50	54	57	54	57	59	53	56	59

NOTES:

1. Sound power levels are expressed in decibels, dB re: 10-12 watts.
2. Data is based on 100% induction airflow.
3. Data is raw without any corrections or allowances of any kind.

Models CVF-II & CVFQ-II
Electric Heater Selection Procedure

Model CVF-EH-II	
Unit Size	Maximum KW
6	6
8	12
10	18
12	26
14	33
16	40
18	44

Model CVFQ-EH-II	
Unit Size	Maximum KW
6	6
8	12
10B	18
12B	18
14A	26
14B	26
14C	30

Standard heater design requires a minimum of 70 CFM per KW. For applications requiring less than 70 CFM per KW or more capacity than shown above, consult your ENVIRO-TEC representative or the factory.

Basic Equations (Standard Air):

$$KW = \frac{CFM \times \Delta T \times 1.085}{3413} \qquad CFM = \frac{KW \times 3413}{\Delta T \times 1.085} \qquad \Delta T = \frac{KW \times 3413}{CFM \times 1.085}$$

To correct for elevations greater than sea level, the standard density component (1.085) must be reduced by 0.036 per thousand feet of elevation (e.g. 5000 feet elevation = 1.085 — (5 x 0.036) = 0.905.

Models CVF-II & CVFQ-II 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. THE AIR STATIC PRESSURE DROP MUST BE BASED ON THE UNIT FAN CAPACITY.

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	90	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:

$$LAT = EAT + \frac{BTUH}{1.085 \times CFM} \qquad LWT = EWT - \frac{BTUH}{500 \times GPM}$$

A computer program is available through your ENVIRO-TEC representative for complete hot water coil performance data. This program includes data up to four rows deep. (MS-DOS operating systems only)

Models CVF-II & CVFQ-II Hot Water Coil Performance Tables

Model CVF-WC-II & CVFQ-WC-II Size 6

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.)		LAT (DEGREES F)		LWT (DEGREES F)		CAPACITY (MBH)	
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
		0.5	0.2	0.1	117.0	133.4	144.0	132.8	8.99	11.81
	1 ROW 0.01	1.0	0.6	0.2	123.5	143.4	159.8	152.9	10.11	13.55
160		2.0	2.1	0.6	127.3	149.2	169.2	165.6	10.77	14.54
	2 ROW 0.01	3.0	4.2	1.2	128.7	151.2	172.7	170.1	11.01	14.90
		5.0	10.5	3.0	130.0	153.0	175.5	173.9	11.22	15.20
		0.5	0.2	0.1	110.3	126.2	140.9	127.1	9.78	13.23
	1 ROW 0.01	1.0	0.6	0.2	116.7	137.3	157.7	148.8	11.16	15.61
200		2.0	2.1	0.6	120.6	143.9	168.0	163.0	12.01	17.04
	2 ROW 0.02	3.0	4.2	1.2	122.1	146.3	171.8	168.3	12.33	17.57
		5.0	10.5	3.0	123.3	148.4	175.0	172.8	12.60	18.01
		0.5	0.2	0.1	105.2	120.5	138.4	122.5	10.41	14.38
	1 ROW 0.01	1.0	0.6	0.2	111.4	132.1	155.9	145.2	12.03	17.39
240		2.0	2.1	0.6	115.3	139.4	167.0	160.7	13.05	19.28
	2 ROW 0.02	3.0	4.2	1.2	116.8	142.1	171.0	166.7	13.43	19.98
		5.0	10.5	3.0	118.1	144.4	174.5	171.8	13.77	20.58
		0.5	0.2	0.1	101.1	115.7	136.3	118.7	10.93	15.33
	1 ROW 0.01	1.0	0.6	0.2	107.2	127.7	154.5	142.1	12.77	18.95
280		2.0	2.1	0.6	111.1	135.4	166.1	158.7	13.95	21.30
	2 ROW 0.03	3.0	4.2	1.2	112.6	138.4	170.4	165.2	14.39	22.19
		5.0	10.5	3.0	113.9	140.9	174.1	170.8	14.79	22.97
		0.5	0.2	0.1	97.9	111.7	134.5	115.5	11.37	16.13
	1 ROW 0.02	1.0	0.6	0.2	103.8	123.8	153.2	139.3	13.41	20.33
320		2.0	2.1	0.6	107.6	132.0	165.3	156.9	14.73	23.14
	2 ROW 0.04	3.0	4.2	1.2	109.1	135.1	169.8	163.8	15.24	24.23
		5.0	10.5	3.1	110.4	137.9	173.7	169.9	15.69	25.18
		0.5	0.2	0.1	95.2	108.2	133.0	112.7	11.75	16.81
	1 ROW 0.02	1.0	0.6	0.2	101.0	120.5	152.0	136.9	13.98	21.56
360		2.0	2.1	0.6	104.7	128.9	164.6	155.2	15.43	24.83
	2 ROW 0.04	3.0	4.2	1.3	106.2	132.2	169.3	162.6	16.00	26.12
		5.0	10.5	3.1	107.4	135.1	173.4	169.1	16.50	27.25
		0.5	0.2	0.1	93.0	105.3	131.6	110.4	12.09	17.41
	1 ROW 0.03	1.0	0.6	0.2	98.5	117.5	151.0	134.7	14.48	22.67
400		2.0	2.1	0.6	102.2	126.1	163.9	153.6	16.07	26.40
	2 ROW 0.05	3.0	4.2	1.3	103.6	129.5	168.9	161.4	16.69	27.88
		5.0	10.5	3.1	104.9	132.6	173.1	168.3	17.23	29.20
		0.5	0.2	0.1	90.9	102.7	130.8	108.3	12.29	17.93
	1 ROW 0.03	1.0	0.6	0.2	96.1	114.8	150.4	132.7	14.79	23.67
440		2.0	2.1	0.6	99.6	123.6	163.5	152.2	16.46	27.84
	2 ROW 0.06	3.0	4.2	1.3	101.0	127.2	168.6	160.3	17.12	29.53
		5.0	10.5	3.1	102.2	130.3	172.9	167.6	17.70	31.04
		0.5	0.2	0.1	89.5	100.5	129.3	106.5	12.69	18.38
	1 ROW 0.04	1.0	0.6	0.2	94.7	112.4	149.2	130.8	15.40	24.58
480		2.0	2.1	0.6	98.2	121.3	162.8	150.8	17.23	29.19
	2 ROW 0.07	3.0	4.2	1.3	99.6	125.0	168.0	159.3	17.95	31.09
		5.0	10.5	3.1	100.9	128.2	172.6	166.9	18.59	32.78
		0.5	0.2	0.1	88.2	98.5	127.8	104.8	13.05	18.79
	1 ROW 0.04	1.0	0.6	0.2	93.4	110.3	148.1	129.2	15.96	25.42
520		2.0	2.1	0.6	97.0	119.2	162.1	149.5	17.95	30.45
	2 ROW 0.08	3.0	4.2	1.3	98.4	123.0	167.5	158.3	18.74	32.55
		5.0	10.5	3.1	99.6	126.3	172.2	166.2	19.44	34.44
		0.5	0.2	0.1	87.1	96.7	126.4	103.4	13.39	19.15
	1 ROW 0.05	1.0	0.6	0.2	92.3	108.3	147.0	127.6	16.49	26.19
560		2.0	2.1	0.6	95.8	117.3	161.4	148.4	18.63	31.64
	2 ROW 0.09	3.0	4.2	1.3	97.2	121.1	167.0	157.4	19.49	33.93
		5.0	10.5	3.1	98.5	124.5	171.9	165.6	20.26	36.01
		0.5	0.2	0.1	86.1	95.1	125.2	102.1	13.70	19.48
	1 ROW 0.06	1.0	0.6	0.2	91.2	106.5	146.0	126.2	16.99	26.90
600		2.0	2.1	0.6	94.8	115.5	160.7	147.2	19.28	32.75
	2 ROW 0.11	3.0	4.2	1.3	96.2	119.4	166.5	156.5	20.21	35.24
		5.0	10.5	3.1	97.5	122.9	171.6	165.0	21.03	37.51

Model CVF-WC-II & CVFQ-WC-II Size 8

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.)		LAT (DEGREES F)		LWT (DEGREES F)		CAPACITY (MBH)	
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
		0.5	0.2	0.1	90.5	102.1	130.4	107.8	12.39	18.04
	1 ROW 0.03	1.0	0.6	0.2	95.8	114.2	150.1	132.2	14.95	23.91
450		2.0	2.1	0.6	99.3	123.0	163.3	151.8	16.66	28.19
	2 ROW 0.06	3.0	4.2	1.3	100.7	126.6	168.4	160.0	17.33	29.93
		5.0	10.5	3.1	101.9	129.8	172.8	167.4	17.93	31.49
		0.5	0.2	0.1	88.8	99.4	128.5	105.6	12.87	18.59
	1 ROW 0.04	1.0	0.6	0.2	94.0	111.3	148.6	130.0	15.68	25.01
500		2.0	2.1	0.6	97.6	120.2	162.4	150.2	17.59	29.83
	2 ROW 0.08	3.0	4.2	1.3	99.0	123.9	167.8	158.8	18.35	31.83
		5.0	10.5	3.1	100.2	127.3	172.4	166.6	19.02	33.62
		0.5	0.2	0.1	87.4	97.1	126.6	103.7	13.31	19.07
	1 ROW 0.05	1.0	0.6	0.2	92.5	108.8	147.3	128.0	16.36	26.00
550		2.0	2.1	0.6	96.1	117.8	161.5	148.7	18.46	31.35
	2 ROW 0.09	3.0	4.2	1.3	97.5	121.5	167.1	157.6	19.31	33.59
		5.0	10.5	3.1	98.8	125.0	172.0	165.7	20.06	35.63
		0.5	0.2	0.1	86.1	95.1	125.2	102.1	13.70	19.48
	1 ROW 0.06	1.0	0.6	0.2	91.2	106.5	146.0	126.2	16.99	26.90
600		2.0	2.1	0.6	94.8	115.5	160.7	147.2	19.28	32.75
	2 ROW 0.11	3.0	4.2	1.3	96.2	119.4	166.5	156.5	20.21	35.24
		5.0	10.5	3.1	97.5	122.9	171.6	165.0	21.03	37.51
		0.5	0.2	0.1	85.0	93.3	123.8	100.6	14.06	19.85
	1 ROW 0.06	1.0	0.6	0.2	90.0	104.5	144.9	124.6	17.57	27.72
650		2.0	2.1	0.6	93.6	113.5	160.0	145.9	20.05	34.06
	2 ROW 0.12	3.0	4.2	1.3	95.0	117.4	166.0	155.5	21.05	36.78
		5.0	10.5	3.1	96.3	121.0	171.2	164.3	21.96	39.30
		0.5	0.2	0.1	84.0	91.7	122.4	99.3	14.39	20.18
	1 ROW 0.07	1.0	0.6	0.2	89.0	102.7	143.8	123.1	18.11	28.46
700		2.0	2.1	0.6	92.5	111.7	159.2	144.7	20.77	35.27
	2 ROW 0.14	3.0	4.2	1.3	93.9	115.6	165.4	154.5	21.86	38.24
		5.0	10.5	3.1	95.2	119.2	170.9	163.6	22.84	40.99
		0.5	0.2	0.1	83.1	90.3	121.2	98.1	14.69	20.48
	1 ROW 0.08	1.0	0.6	0.2	88.0	101.0	142.8	121.7	18.62	29.15
750		2.0	2.1	0.6	91.5	110.0	158.5	143.6	21.46	36.41
	2 ROW 0.16	3.0	4.2	1.3	92.9	113.9	164.9	153.6	22.62	39.61
		5.0	10.5	3.1	94.2	117.6	170.5	163.0	23.68	42.60
		0.5	0.2	0.1	82.3	89.0	120.1	97.0	14.97	20.74
	1 ROW 0.09	1.0	0.6	0.2	87.1	99.5	141.8	120.4	19.10	29.78
800		2.0	2.1	0.6	90.6	108.4	157.9	142.5	22.11	37.48
	2 ROW 0.18	3.0	4.2	1.3	92.0	112.4	164.4	152.7	23.35	40.91
		5.0	10.5	3.1	93.3	116.1	170.2	162.3	24.48	44.13
		0.5	0.2	0.1	81.6	87.9	119.1	96.1	15.24	20.98
	1 ROW 0.10	1.0	0.6	0.2	86.3	98.1	140.9	119.3	19.55	30.37
850		2.0	2.1	0.6	89.8	106.9	157.3	141.5	22.73	38.49
	2 ROW 0.20	3.0	4.2	1.3	91.2	110.9	164.0	151.9	24.05	42.14
		5.0	10.5	3.1	92.5	114.7	169.9	161.8	25.25	45.60
		0.5	0.2	0.1	80.9	86.8	118.1	95.2	15.48	21.20
	1 ROW 0.12	1.0	0.6	0.2	85.5	96.8	140.1	118.2	19.97	30.92
900		2.0	2.1	0.6	89.0	105.6	156.7	140.6	23.32	39.44
	2 ROW 0.22	3.0	4.2	1.3	90.4	109.6	163.5	151.1	24.71	43.32
		5.0	10.5	3.1	91.7	113.3	169.6	161.2	25.99	47.00
		0.5	0.2	0.1	80.3	85.9	117.2	94.4	15.71	21.41
	1 ROW 0.13	1.0	0.6	0.2	84.9	95.6	139.3	117.1	20.37	31.43
950		2.0	2.1	0.6	88.3	104.3	156.1	139.7	23.88	40.34
	2 ROW 0.24	3.0	4.2	1.3	89.7	108.3	163.1	150.4	25.35	44.43
		5.0	10.5	3.1	91.0	112.1	169.3	160.7	26.70	48.34
		0.5	0.2	0.1	79.7	85.0	116.3	93.6	15.92	21.59
	1 ROW 0.14	1.0	0.6	0.2	84.2	94.5	138.5	116.2	20.76	31.90
1000		2.0	2.1	0.6	87.6	103.1	155.6	138.8	24.42	41.20
	2 ROW 0.26	3.0	4.2	1.3	89.0	107.1	162.7	149.7	25.97	45.49
		5.0	10.5	3.1	90.4	110.9	169.0	160.2	27.38	49.62

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.

Models CVF-II & CVFQ-II Hot Water Coil Performance Tables

ENVIRO-TEC™

Model CVF-WC-II Size 10 & CVFQ-WC-II Size 10B

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.)		LAT (DEGREES F)		LWT (DEGREES F)		CAPACITY (MBH)	
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
675	1 ROW 0.04	0.5	0.2	0.1	87.4	95.5	114.8	90.9	16.30	22.27
		1.0	0.8	0.2	93.4	108.8	138.6	116.2	20.69	31.90
	2 ROW 0.07	2.0	2.7	0.8	97.6	119.2	156.2	140.5	23.76	39.54
		3.0	5.6	1.7	99.3	123.6	163.3	151.5	24.99	42.75
		5.0	13.8	4.0	100.8	127.6	169.6	161.7	26.09	45.63
750	1 ROW 0.04	0.5	0.2	0.1	85.8	93.1	112.7	89.0	16.83	22.74
		1.0	0.8	0.2	91.7	105.9	136.8	113.7	21.62	33.13
	2 ROW 0.08	2.0	2.7	0.8	95.9	116.4	155.0	138.3	25.04	41.65
		3.0	5.6	1.7	97.6	120.9	162.4	149.8	26.42	45.29
		5.0	13.8	4.0	99.1	125.0	168.9	160.6	27.65	48.60
825	1 ROW 0.05	0.5	0.2	0.1	84.4	91.0	110.8	87.4	17.30	23.14
		1.0	0.8	0.2	90.2	103.4	135.1	111.6	22.47	34.22
	2 ROW 0.10	2.0	2.7	0.8	94.4	113.9	153.8	136.4	26.22	43.57
		3.0	5.6	1.7	96.1	118.5	161.5	148.2	27.74	47.64
		5.0	13.8	4.0	97.7	122.7	168.4	159.4	29.11	51.38
900	1 ROW 0.06	0.5	0.2	0.1	83.2	89.2	109.1	86.1	17.72	23.49
		1.0	0.8	0.2	88.9	101.2	133.5	109.6	23.25	35.18
	2 ROW 0.12	2.0	2.7	0.8	93.1	111.6	152.7	134.7	27.31	45.33
		3.0	5.6	1.7	94.8	116.3	160.7	146.8	28.99	49.82
		5.0	13.8	4.0	96.4	120.5	167.8	158.4	30.49	53.99
975	1 ROW 0.07	0.5	0.2	0.1	82.2	87.6	107.6	84.9	18.10	23.78
		1.0	0.8	0.2	87.8	99.2	132.1	107.9	23.96	36.05
	2 ROW 0.13	2.0	2.7	0.8	91.9	109.6	151.7	133.0	28.34	46.95
		3.0	5.6	1.7	93.6	114.2	159.9	145.4	30.16	51.86
		5.0	13.8	4.0	95.2	118.6	167.3	157.4	31.80	56.45
1050	1 ROW 0.08	0.5	0.2	0.1	81.3	86.2	106.2	83.8	18.45	24.04
		1.0	0.8	0.2	86.7	97.5	130.7	106.3	24.63	36.83
	2 ROW 0.15	2.0	2.7	0.8	90.8	107.7	150.7	131.5	29.31	48.45
		3.0	5.6	1.7	92.6	112.4	159.2	144.2	31.27	53.76
		5.0	13.8	4.0	94.1	116.8	166.8	156.5	33.04	58.76
1125	1 ROW 0.09	0.5	0.2	0.1	80.4	85.0	104.9	82.9	18.76	24.27
		1.0	0.8	0.2	85.8	95.9	129.5	104.9	25.24	37.54
	2 ROW 0.17	2.0	2.7	0.8	89.9	106.0	149.8	130.2	30.22	49.85
		3.0	5.6	1.7	91.6	110.7	158.5	143.0	32.31	55.54
		5.0	13.8	4.0	93.2	115.2	166.3	155.6	34.22	60.96
1200	1 ROW 0.10	0.5	0.2	0.1	79.7	83.9	103.8	82.1	19.05	24.48
		1.0	0.8	0.2	84.9	94.5	128.4	103.6	25.82	38.18
	2 ROW 0.19	2.0	2.7	0.8	89.0	104.5	148.9	128.9	31.08	51.14
		3.0	5.6	1.7	90.7	109.2	157.8	141.9	33.31	57.22
		5.0	13.8	4.1	92.3	113.6	165.9	154.8	35.35	63.04
1275	1 ROW 0.11	0.5	0.2	0.1	79.0	82.9	102.7	81.4	19.32	24.66
		1.0	0.8	0.2	84.1	93.2	127.3	102.5	26.36	38.77
	2 ROW 0.21	2.0	2.7	0.8	88.2	103.0	148.1	127.6	31.90	52.36
		3.0	5.6	1.7	89.9	107.7	157.2	140.8	34.26	58.80
		5.0	13.8	4.1	91.5	112.2	165.4	154.0	36.43	65.02
1350	1 ROW 0.12	0.5	0.2	0.1	78.4	82.0	101.8	80.7	19.56	24.82
		1.0	0.8	0.2	83.4	92.0	126.3	101.4	26.87	39.32
	2 ROW 0.24	2.0	2.7	0.8	87.4	101.7	147.3	126.5	32.67	53.49
		3.0	5.6	1.7	89.1	106.4	156.6	139.8	35.17	60.30
		5.0	13.9	4.1	90.7	110.9	165.0	153.2	37.46	66.91
1425	1 ROW 0.14	0.5	0.2	0.1	77.9	81.2	100.8	80.1	19.79	24.97
		1.0	0.8	0.2	82.8	90.9	125.3	100.4	27.35	39.82
	2 ROW 0.26	2.0	2.7	0.8	86.7	100.5	146.6	125.4	33.41	54.56
		3.0	5.6	1.7	88.4	105.1	156.0	138.9	36.03	61.71
		5.0	13.9	4.1	90.0	109.6	164.6	152.5	38.46	68.71
1500	1 ROW 0.15	0.5	0.2	0.1	77.3	80.5	100.0	79.6	20.00	25.11
		1.0	0.8	0.2	82.2	89.9	124.4	99.4	27.80	40.28
	2 ROW 0.28	2.0	2.7	0.8	86.1	99.3	145.9	124.4	34.11	55.57
		3.0	5.6	1.7	87.8	103.9	155.4	138.0	36.86	63.06
		5.0	13.9	4.1	89.3	108.5	164.2	151.8	39.41	70.43

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 CVF-WC-II Size 12 & CVFQ-WC-II Sizes 12B, 14A and 14B

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.)		LAT (DEGREES F)		LWT (DEGREES F)		CAPACITY (MBH)	
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
900	1 ROW 0.05	0.5	0.3	0.1	83.9	89.8	106.5	83.7	18.37	24.08
		1.0	0.9	0.3	89.9	102.4	131.5	107.2	24.23	36.40
	2 ROW 0.10	2.0	3.1	0.9	94.4	113.4	151.5	132.9	28.54	47.07
		3.0	6.2	1.9	96.2	118.2	159.8	145.5	30.31	51.75
		5.0	15.4	4.5	97.8	122.7	167.2	157.6	31.89	56.07
1000	1 ROW 0.06	0.5	0.3	0.1	82.5	87.6	104.5	82.2	18.88	24.46
		1.0	0.9	0.3	88.4	99.8	129.6	104.9	25.22	37.57
	2 ROW 0.11	2.0	3.1	0.9	92.8	110.7	150.0	130.7	29.98	49.32
		3.0	6.2	1.9	94.6	115.5	158.7	143.6	31.95	54.59
		5.0	15.4	4.5	96.2	120.1	166.5	156.2	33.73	59.50
1100	1 ROW 0.07	0.5	0.3	0.1	81.3	85.9	102.7	80.9	19.33	24.78
		1.0	0.9	0.3	87.0	97.5	127.8	102.8	26.12	38.59
	2 ROW 0.14	2.0	3.1	0.9	91.3	108.2	148.7	128.7	31.30	51.35
		3.0	6.2	1.9	93.2	113.1	157.7	141.9	33.47	57.19
		5.0	15.4	4.5	94.8	117.8	165.8	154.9	35.44	62.69
1200	1 ROW 0.08	0.5	0.3	0.1	80.2	84.3	101.1	79.8	19.73	25.05
		1.0	0.9	0.3	85.8	95.5	126.1	101.0	26.93	39.49
	2 ROW 0.16	2.0	3.1	0.9	90.1	106.0	147.5	126.8	32.53	53.19
		3.0	6.2	1.9	91.9	111.0	156.7	140.3	34.89	59.58
		5.0	15.4	4.5	93.6	115.7	165.2	153.7	37.05	65.66
1300	1 ROW 0.10	0.5	0.3	0.1	79.3	83.0	99.7	78.9	20.08	25.28
		1.0	0.9	0.3	84.7	93.7	124.6	99.4	27.68	40.29
	2 ROW 0.18	2.0	3.1	0.9	89.0	104.1	146.3	125.1	33.67	54.87
		3.0	6.2	1.9	90.8	109.0	155.8	138.8	36.23	61.79
		5.0	15.4	4.5	92.5	113.7	164.6	152.6	38.57	68.44
1400	1 ROW 0.11	0.5	0.3	0.1	78.5	81.8	98.4	78.1	20.40	25.48
		1.0	0.9	0.3	83.8	92.1	123.3	98.0	28.37	41.00
	2 ROW 0.21	2.0	3.1	0.9	88.0	102.3	145.3	123.6	34.74	56.42
		3.0	6.2	1.9	89.8	107.2	155.0	137.4	37.48	63.85
		5.0	15.4	4.5	91.5	112.0	164.0	151.6	40.01	71.06
1500	1 ROW 0.12	0.5	0.3	0.1	77.8	80.8	97.2	77.4	20.69	25.65
		1.0	0.9	0.3	82.9	90.7	122.0	96.7	29.00	41.64
	2 ROW 0.24	2.0	3.1	0.9	87.1	100.7	144.3	122.2	35.74	57.85
		3.0	6.2	1.9	88.9	105.6	154.2	136.2	38.67	65.76
		5.0	15.4	4.5	90.5	110.4	163.5	150.6	41.37	73.52
1600	1 ROW 0.14	0.5	0.3	0.1	77.1	79.9	96.2	76.8	20.96	25.80
		1.0	0.9	0.3	82.1	89.4	120.8	95.6	29.59	42.22
	2 ROW 0.26	2.0	3.1	0.9	86.2	99.2	143.3	120.8	36.69	59.17
		3.0	6.2	1.9	88.0	104.1	153.5	135.0	39.79	67.56
		5.0	15.4	4.5	89.7	108.9	162.9	149.7	42.67	75.85
1700	1 ROW 0.15	0.5	0.3	0.1	76.5	79.1	95.2	76.2	21.20	25.94
		1.0	0.9	0.3	81.4	88.3	119.7	94.5	30.14	42.74
	2 ROW 0.29	2.0	3.1	0.9	85.5	97.9	142.4	119.5	37.58	60.39
		3.0	6.2	1.9	87.3	102.7	152.8	133.8	40.86	69.24
		5.0	15.4	4.5	88.9	107.5	162.4	148.8	43.91	78.05
1800	1 ROW 0.17	0.5	0.3	0.1	76.0	78.4	94.3	75.7	21.42	26.06
		1.0	0.9	0.3	80.8	87.2	118.7	93.6	30.65	43.22
	2 ROW 0.33	2.0	3.1	0.9	84.8	96.7	141.6	118.5	38.42	61.53
		3.0	6.2	1.9	86.5	101.4	152.1	132.8	41.87	70.83
		5.0	15.4	4.5	88.2	106.2	162.0	147.9	45.10	80.14
1900	1 ROW 0.19	0.5	0.3	0.1	75.5	77.8	93.5	75.3	21.63	26.17
		1.0	0.9	0.3	80.2	86.3	117.7	92.7	31.14	43.66
	2 ROW 0.36	2.0	3.1	0.9	84.1	95.5	140.8	117.4	39.23	62.60
		3.0	6.2	1.9	85.9	100.2	151.4	131.8	42.84	72.32
		5.0	15.4	4.5	87.5	105.0	161.5	147.1	46.23	82.13
2000	1 ROW 0.21	0.5	0.3	0.1	75.1	77.2	92.7	74.9	21.81	26.27
		1.0	0.9	0.3	79.6	85.4	116.8	91.9	31.59	44.07
	2 ROW 0.39	2.0	3.1	0.9	83.5	94.4	140.0	116.4	39.99	63.60
		3.0	6.2	1.9	85.3	99.1	150.8	130.8	43.76	73.73
		5.0	15.4	4.5	86.9	103.9	161.1	146.4	47.32	84.03

Models CVF-II & CVFQ-II Hot Water Coil Performance Tables

Model CVF-WC-II Size 14 & CVFQ-WC-II Size 14C

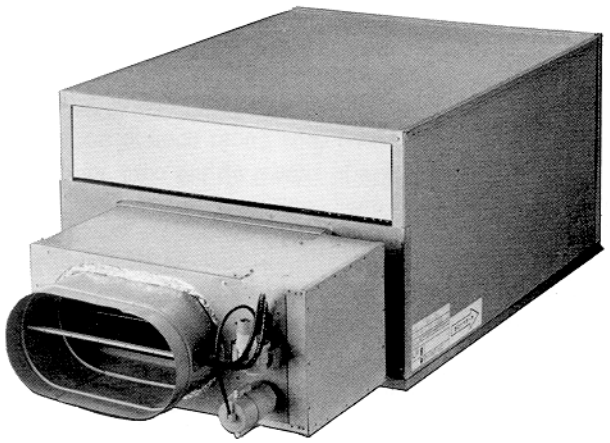
AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.)		LAT (DEGREES F)		LWT (DEGREES F)		CAPACITY (MBH)	
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
1150	1 ROW 0.03	0.5	0.4	0.1	83.2	86.7	89.6	72.1	22.60	26.99
	2 ROW 0.06	1.0	1.5	0.4	90.8	101.0	115.9	90.7	32.03	44.67
		2.0	4.8	1.5	96.7	114.6	140.6	118.4	39.38	61.58
		3.0	9.8	2.9	99.2	120.7	151.7	133.9	42.44	69.22
		5.0	24.1	7.1	101.4	126.4	161.9	149.5	45.19	76.22
1300	1 ROW 0.04	0.5	0.4	0.1	81.4	84.4	87.9	71.0	23.01	27.26
	2 ROW 0.07	1.0	1.5	0.4	88.6	97.7	113.8	88.1	33.08	45.96
		2.0	4.8	1.5	94.3	111.1	138.9	115.3	41.11	64.75
		3.0	9.8	2.9	96.7	117.4	150.3	131.0	44.51	73.51
		5.0	24.1	7.1	98.9	12.2	161.0	147.3	47.58	81.70
1450	1 ROW 0.05	0.5	0.4	0.1	80.0	82.5	86.1	70.2	23.48	27.45
	2 ROW 0.09	1.0	1.5	0.4	86.9	95.0	111.4	85.9	34.28	47.03
		2.0	4.8	1.5	92.5	108.1	136.9	112.5	43.12	67.51
		3.0	9.8	2.9	95.0	114.4	148.7	128.4	46.92	77.35
		5.0	24.1	7.1	97.2	120.4	159.8	145.3	50.38	86.71
1600	1 ROW 0.06	0.5	0.4	0.1	78.8	81.0	84.5	69.6	23.88	27.61
	2 ROW 0.11	1.0	1.5	0.4	85.5	92.7	109.3	84.2	35.34	47.92
		2.0	4.8	1.5	91.0	105.5	135.0	110.0	44.96	69.95
		3.0	9.8	2.9	93.4	111.8	147.2	126.1	49.14	80.82
		5.0	24.1	7.1	95.7	117.8	158.8	143.5	52.99	91.32
1750	1 ROW 0.07	0.5	0.4	0.1	77.8	79.7	83.1	69.1	24.22	27.73
	2 ROW 0.13	1.0	1.5	0.4	84.2	90.8	107.4	82.7	36.29	48.67
		2.0	4.8	1.5	89.7	103.2	133.4	107.9	46.64	72.12
		3.0	9.8	2.9	92.1	109.4	145.9	124.0	51.20	83.97
		5.0	24.1	7.1	94.3	115.6	157.8	141.8	55.43	95.59
1900	1 ROW 0.08	0.5	0.4	0.1	76.9	78.6	82.0	68.7	24.51	27.84
	2 ROW 0.15	1.0	1.5	0.4	83.1	89.0	105.7	81.4	37.14	49.32
		2.0	4.8	1.5	88.5	101.1	131.8	105.9	48.19	74.06
		3.0	9.8	2.9	90.9	107.3	144.6	122.1	53.12	86.84
		5.0	24.1	7.1	93.1	113.5	156.9	140.2	57.72	99.54
2050	1 ROW 0.09	0.5	0.4	0.1	76.2	77.6	80.9	68.3	24.77	27.92
	2 ROW 0.17	1.0	1.5	0.4	82.1	87.5	104.2	80.3	37.91	49.87
		2.0	4.8	1.5	87.4	99.2	130.4	104.2	49.63	75.81
		3.0	9.8	2.9	89.8	105.4	143.4	120.4	54.92	89.47
		5.0	24.1	7.1	92.0	111.6	156.0	138.7	59.88	103.23
2200	1 ROW 0.10	0.5	0.4	0.1	75.5	76.8	80.0	68.0	25.00	27.99
	2 ROW 0.19	1.0	1.5	0.4	81.3	86.2	102.8	79.3	38.61	50.36
		2.0	4.8	1.5	86.5	97.6	129.0	102.6	50.97	77.39
		3.0	9.8	2.9	88.8	103.7	142.3	118.7	56.61	91.90
		5.0	24.1	7.1	91.1	109.9	155.2	137.3	61.93	106.68
2350	1 ROW 0.11	0.5	0.4	0.1	74.9	76.1	79.2	67.8	25.20	28.06
	2 ROW 0.21	1.0	1.5	0.4	80.5	85.0	101.5	78.4	39.26	50.79
		2.0	4.8	1.5	85.6	96.1	127.8	101.2	52.22	78.83
		3.0	9.8	2.9	87.9	102.1	141.2	117.2	58.20	94.14
		5.0	24.1	7.1	90.2	108.3	154.5	136.0	63.87	109.92
2500	1 ROW 0.12	0.5	0.4	0.1	74.4	75.4	78.5	67.6	25.38	28.11
	2 ROW 0.24	1.0	1.5	0.4	79.8	84.0	100.3	77.7	39.85	51.17
		2.0	4.8	1.5	84.8	94.7	126.6	99.9	53.39	80.15
		3.0	9.8	2.9	87.1	100.6	140.2	115.9	59.70	96.22
		5.0	24.1	7.1	89.3	106.8	153.7	134.8	65.71	112.96
2650	1 ROW 0.14	0.5	0.4	0.1	73.9	74.8	77.8	67.4	25.54	28.15
	2 ROW 0.26	1.0	1.5	0.4	79.1	83.0	99.2	77.0	40.39	51.51
		2.0	4.8	1.5	84.0	93.4	125.5	98.6	54.49	81.36
		3.0	9.8	2.9	86.4	99.3	139.3	114.6	61.12	98.16
		5.0	24.1	7.1	88.6	105.5	153.0	133.7	67.47	115.83
2800	1 ROW 0.15	0.5	0.4	0.1	73.5	74.3	77.2	67.2	25.69	28.19
	2 ROW 0.29	1.0	1.5	0.4	78.5	82.1	98.2	76.4	40.90	51.82
		2.0	4.8	1.5	83.4	92.3	124.5	97.5	55.53	82.47
		3.0	9.8	2.9	85.7	98.1	138.4	113.4	62.47	99.97
		5.0	24.1	7.1	87.9	104.2	152.3	132.6	69.15	118.55

Model CVF-WC-II Size 16 and 18

AIR VOLUME (CFM)	AIR PD (IN. W.G.)	FLOW RATE (GPM)	WATER PD (FT. W.G.)		LAT (DEGREES F)		LWT (DEGREES F)		CAPACITY (MBH)	
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
1550	1 ROW 0.04	0.5	0.5	0.1	79.5	81.6	82.9	68.8	24.28	27.80
	2 ROW 0.08	1.0	1.6	0.5	86.6	94.1	107.7	82.7	36.16	48.66
		2.0	5.3	1.6	92.6	107.6	133.9	108.7	46.12	71.32
		3.0	10.7	3.2	95.1	114.2	146.4	125.1	50.44	82.41
		5.0	26.4	7.8	97.5	120.6	158.2	142.8	54.39	93.01
1700	1 ROW 0.05	0.5	0.5	0.1	78.4	80.2	81.5	68.3	24.62	27.92
	2 ROW 0.10	1.0	1.6	0.5	85.2	91.9	105.7	81.1	37.17	49.43
		2.0	5.3	1.6	91.1	105.1	132.1	106.4	47.93	73.64
		3.0	10.7	3.2	93.7	111.7	144.9	122.8	52.68	85.80
		5.0	26.4	7.8	96.1	118.2	157.2	141.0	57.02	97.61
1850	1 ROW 0.06	0.5	0.5	0.1	77.5	79.0	80.3	67.9	24.92	28.02
	2 ROW 0.12	1.0	1.6	0.5	84.1	90.1	103.9	79.8	38.07	50.09
		2.0	5.3	1.6	89.8	102.9	130.4	104.3	49.59	75.71
		3.0	10.7	3.2	92.4	109.5	143.5	120.7	54.72	88.88
		5.0	26.4	7.8	94.8	116.0	156.2	139.3	59.49	101.87
2000	1 ROW 0.07	0.5	0.5	0.1	76.7	78.0	79.3	67.6	25.18	28.10
	2 ROW 0.13	1.0	1.6	0.5	83.0	88.5	102.2	78.7	38.88	50.66
		2.0	5.3	1.6	88.7	100.9	128.9	102.4	51.13	77.56
		3.0	10.7	3.2	91.2	107.5	142.2	118.9	56.65	91.70
		5.0	26.4	7.8	93.6	114.0	155.3	137.7	61.82	105.84
2150	1 ROW 0.08	0.5	0.5	0.1	75.9	77.1	78.4	67.4	25.41	28.16
	2 ROW 0.15	1.0	1.6	0.5	82.1	87.0	100.8	77.7	39.62	51.15
		2.0	5.3	1.6	87.6	99.1	127.4	100.8	52.56	79.23
		3.0	10.7	3.2	90.2	105.6	141.0	117.1	58.47	94.29
		5.0	26.4	7.8	92.6	112.2	154.4	136.2	64.02	109.55
2300	1 ROW 0.09	0.5	0.5	0.1	75.3	76.4	77.6	67.1	25.61	28.21
	2 ROW 0.17	1.0	1.6	0.5	81.2	85.8	99.4	76.8	40.29	51.58
		2.0	5.3	1.6	86.7	97.5	126.1	99.3	53.90	80.75
		3.0	10.7	3.2	89.2	103.9	139.9	115.5	60.17	96.68
		5.0	26.4	7.8	91.6	110.5	153.6	134.8	66.11	113.02
2450	1 ROW 0.10	0.5	0.5	0.1	74.7	75.7	76.8	67.0	25.79	28.26
	2 ROW 0.19	1.0	1.6	0.5	80.5	84.6	98.2	76.1	40.90	51.96
		2.0	5.3	1.6	85.8	96.0	124.9	97.9	55.15	82.13
		3.0	10.7	3.2	88.3	102.4	138.8	114.1	61.78	98.90
		5.0	26.4	7.8	90.7	108.9	152.8	135.5	68.09	116.29
2600	1 ROW 0.11	0.5	0.5	0.1	74.2	75.1	76.2	66.8	25.95	28.30
	2 ROW 0.21	1.0	1.6	0.5	79.8	83.6	97.1	75.4	41.47	52.29
		2.0	5.3	1.6	85.1	94.7	123.7	96.6	56.32	83.39
		3.0	10.7	3.2	87.5	101.0	137.8	112.7	63.30	100.96
		5.0	26.4	7.8	89.9	107.5	152.0	132.3	69.98	119.37
2750	1 ROW 0.12	0.5	0.5	0.1	73.8	74.5	75.6	66.7	26.09	28.34
	2 ROW 0.23	1.0	1.6	0.5	79.1	82.7	96.0	74.8	41.99	52.59
		2.0	5.3	1.6	84.3	93.5	122.6	95.4	57.43	84.55
		3.0	10.7	3.2	86.8	99.6	136.8	111.4	64.74	102.87
		5.0	26.4	7.8	89.2	106.2	151.3	131.1	71.79	122.28
2900	1 ROW 0.13	0.5	0.5	0.1	73.4	74.1	75.1	66.5	26.22	28.36
	2 ROW 0.26	1.0	1.6	0.5	78.6	81.9	95.0	74.3	42.48	52.85
		2.0	5.3	1.6	83.7	92.3	121.5	94.4	58.47	85.62
		3.0	10.7	3.2	86.1	98.4	135.9	110.2	66.12	104.66
		5.0	26.4	7.8	88.5	104.9	150.6	130.0	73.51	125.03
3050	1 ROW 0.15	0.5	0.5	0.1	73.0	73.6	74.6	66.4	26.34	28.39
	2 ROW 0.28	1.0	1.6	0.5	78.0	81.1	94.1	73.8	42.93	53.09
		2.0	5.3	1.6	83.0	91.3	120.5	93.4	59.45	86.61
		3.0	10.7	3.2	85.5	97.3	135.1	109.1	67.42	106.34
		5.0	26.4	7.8	87.8	103.7	149.9	128.9	75.17	127.64
3200	1 ROW 0.16	0.5	0.5	0.1	72.7	73.2	74.2	66.3	26.45	28.41
	2 ROW 0.30	1.0	1.6	0.5	77.5	80.4	93.3	73.4	43.35	53.31
		2.0	5.3	1.6	82.5	90.3	119.6	92.5	60.39	87.53
		3.0	10.7	3.2	84.9	96.2	134.2	108.1	68.67	107.91
		5.0	26.4	7.8	87.2	102.6	149.3	128.0	76.76	130.12

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.

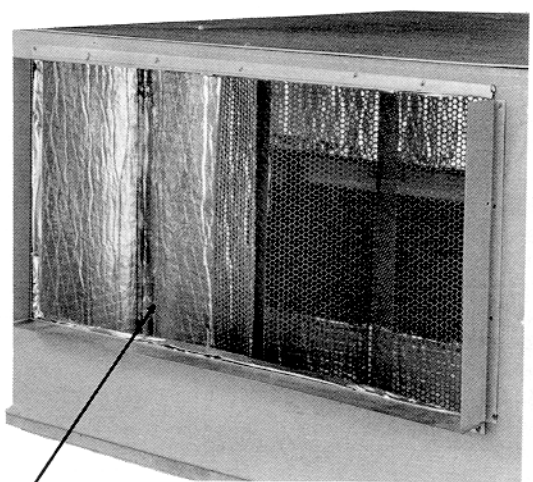
Models CVF-LT-II & CVFQ-LT-II
Low Temperature Primary Air Applications



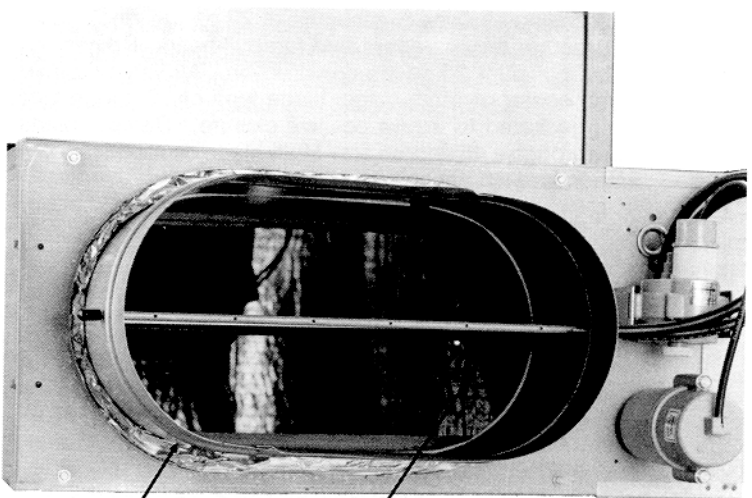
Responding to pressure for off peak power use, engineers and architects are designing many facilities with thermal storage systems. To take full advantage of the storage media to reduce electrical demand and cost, it may be desirable to size and operate cooling coils with ice water and to supply airflow at low, dehumidified temperatures. In general, this application favors a Fan Powered Terminal to distribute airflow to the zone at the proper temperature.

The mixing and tempering characteristics of Series Flow Fan Powered Terminals make them a viable choice for thermal storage and low temperature primary air systems. Sizing the primary air valve capacity less than the unit fan capacity allows mixing of warm ceiling plenum air with extremely cold primary air during all operating conditions. Reasonable leaving air temperatures can therefore be provided which reduces concern for condensation of downstream ductwork and diffusers. This also reduces concern with diffuser performance and zone comfort due to the distribution of extremely low temperature air.

ENVIRO-TEC manufactures several **high induction** linear type diffusers well suited for low temperature primary air systems. These diffusers are capable of inducing high ratios of zone air to supply air which rapidly increases the supply air temperature before entering the zone of occupancy. Refer to the Diffuser brochure of the ENVIRO-TEC general catalog for more application and performance data.



Thermal — Vapor Seal
Discharge Plenum



Thermal — Vapor Seal
Fan Plenum

Thermally Isolated Floating
Inlet Collar