CATALOG

CFRQ, Extra Quiet Series Flow, Constant Volume Fan Powered VAV Terminals

ENVIRO-TEC

TABLE OF CONTENTS

NOTES:

- All data herein is subject to change without notice. Some drawings are not shown in this catalog.
- Drawings not for installation purposes.
- Construction drawings and performance data contained herein should not be used for submittal purposes.
- ETL Listing Number 476203.

AHRI CERTIFIED® www.ahridirectory.org VAV Terminals AHRI Standard 880

INTERTEK ETL CM C US LISTED

FEATURES AND BENEFITS

Model CFRQ is designed for QUIET, EFFICIENT COMFORT. Model CFRQ fan terminals are specifically designed for extra quiet operation. They also offer improved space comfort and flexibility for a wide variety of HVAC systems.

CFRQ terminals take advantage of typical benefits provided by series fan terminal units, while performing at extremely low sound levels. This is critical in today's buildings, where occupants are placing more emphasis on indoor acoustics.

OCCUPANT-SENSITIVE DESIGN

Due to heightened interest in Indoor Air Quality, many HVAC system designers are focusing on the effects of particulate contamination within a building's occupied space. Often, HVAC system noise is overlooked as a source of occupied space contamination. The CFRQ terminal is specifically designed to eliminate obtrusive fan noise from reaching the occupants, while providing constant air motion in the space. Occupants will benefit from the CFRQ design that minimizes low frequency (125Hz-250Hz) sound levels that typically dominate the space sound level. The CFRQ also minimizes the fluctuation in sound levels that occur during VAV damper modulation.

FLEXIBILITY FOR THE BUILDING DESIGNER

Selection and Layout The CFRQ provides flexibility in system design. Reduced noise at the fan terminal allows the system designer to place properly sized units directly above occupied spaces. It is not necessary to use the crowded space above a hall or corridor to locate the equipment. This will reduce lengthy and expensive discharge duct runs. The standard shallow casing height (14" up to 1000 CFM) minimizes conflict with other systems competing for ceiling space. The FlowStar™ sensor ensures accurate control, even when space constraints do not permit long straight inlet duct runs to the terminal.

Sizes. Model CFRQ terminals are available in seven fan sizes to handle airflow capacities between 200 and 3100 CFM. Most fan sizes are available with three primary air valve sizes to optimize the unit fan and primary air valve combinations required by current industry needs.

The terminal is constructed to allow installation with standard metal hanging straps. Optional hanger brackets for use with all-thread support rods or wire hangers are also available.

Air Balance Finite fan speed adjustment is accomplished with an electronic SCR controller. The SCR fan speed controller is offered by ENVIRO-TEC and is compatible with the fan motor. This minimizes electronic interference and harmonic distortion that occurs from non- compatible motor and SCR components. Increased motor life and efficiency result from the compatible design.

A web-based Computer Selection Program, "Web-Select", is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

CONVENIENCE FOR THE CONTRACTOR

Quality All CFRQ terminals are thoroughly inspected during each step of the manufacturing process, including a comprehensive "pre-ship" inspection, to assure the highest quality product available. Each unit is also "run tested"

before leaving the factory to ensure trouble free field "start-up."

Quick Installation A standard single point electrical main power connection is provided. Electronic controls and electrical components are located on the same side of the casing for quick access, adjustment, and trouble-shooting. Installation time is minimized with the availability of factory calibrated ENVIRO-TEC controls.

Finite fan speed adjustment is accomplished with an electronic SCR controller. The SCR fan speed controller is compatible with the fan motor. This minimizes electronic interference and harmonic distortion that occurs from non-compatible motor and SCR components. Increased motor life and efficiency result from the compatible design.

CFRQ terminals utilize three tap motors that accommodate a broad range of flow and static pressure field conditions while dramatically increasing efficiency.

The FlowStar™ sensor ensures accurate airflow measurement, regardless of the field installation conditions. A calibration label and wiring diagram is located on the terminal for quick reference during start-up.

The terminal is constructed to allow installation with standard metal hanging straps. Optional hanger brackets for use with all-thread support rods or wire hangers are also available.

VALUE AND SECURITY FOR THE OWNER

Quality All metal components are fabricated from galvanized steel. Unlike most manufacturers' terminals, the steel used in the CFRQ is capable of withstanding a 125 hour salt spray test without showing any evidence of red rust.

Energy Efficiency In addition to quiet and accurate temperature control, the building owner will benefit from lower operating costs. The highly amplified velocity pressure signal from the FlowStar™ inlet sensor allows precise airflow control at low air velocities.

The FlowStar™ sensor's airfoil shape provides minimal pressure drop across the terminal. This allows the central fan to run at a lower pressure and with less brake horsepower. Energy efficient three-tap, three winding, permanent split capacitor fan motors are manufactured to ensure efficient, quiet, reliable, and low maintenance operation.

Three tap motors provide superior energy efficiency over single speed motors by delivering three separate horsepower outputs. For example, a nominal 1/2 HP motor delivers 1/3 HP on medium tap and 1/4 HP on low tap. This allows the motor to operate at a higher efficiency when at a reduced fan capacity.

Fan terminals that utilize a single speed motor must rely solely on an SCR controller to obtain the reduction in fan capacity. At minimum turndown, they suffer from excessive power consumption and high motor winding temperatures, significantly reducing the motor life.

As an option, Model CFRQ is available with an ECM fan motor, providing efficiency ratings between 70% and 80% for most applications.

Agency Certification Model CFRQ terminals, including those with electric heat, are listed with ETL as an assembly, and bear the ETL label.

CFRQ terminals comply with applicable NEC requirements, are tested in accordance with AHRI Standard 880, and are certified by AHRI.

Maintenance and Service CFRQ fan terminals require no periodic maintenance other than optional filter replacement. If component replacement becomes necessary, the unit is designed to minimize field labor. The bottom casing panels can be removed to provide easy access to the fan assembly, and the motor electrical leads are easily unplugged.

CONTROLS

Model CFRQ terminals are available with the Verasys® Zone Equipment Control Assembly (ZEC). The ZEC Series Direct Digital Control combines controller, pressure sensor, and actuator housed in one pre-assembled unit. The Mobile Access Portal (MAP) Gateway Tool (sold separately) allows for convenient configuration via direct connection to the ZEC.

From the most basic to the most sophisticated sequence of operation, the controls are designed by experts in VAV terminal operation. Refer to the Electronic Controls Selection Guide, and the Pneumatic Controls Selection Guide for a complete description of the sequences and schematic drawings that are available.

Standard features include the patented FlowStar™ airflow sensor, ETL Listing, NEMA 1 enclosure, 24 volt control transformer, floating modulating actuator, balancing tees and plenum rated tubing.

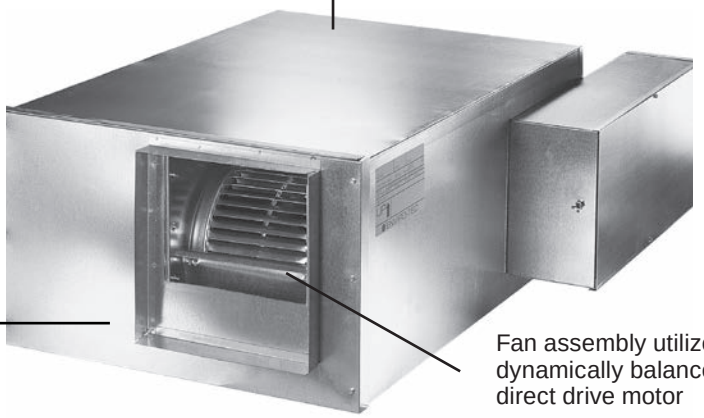
CONSTRUCTION FEATURES

MODEL CFRQ

The CFRQ terminal incorporates many standard features that are expensive options for other manufacturers.

All unit configurations listed with ETL for safety compliance with UL 1995

20 gauge galvanized steel casing withstands 125 hour salt spray test per ASTM B-117



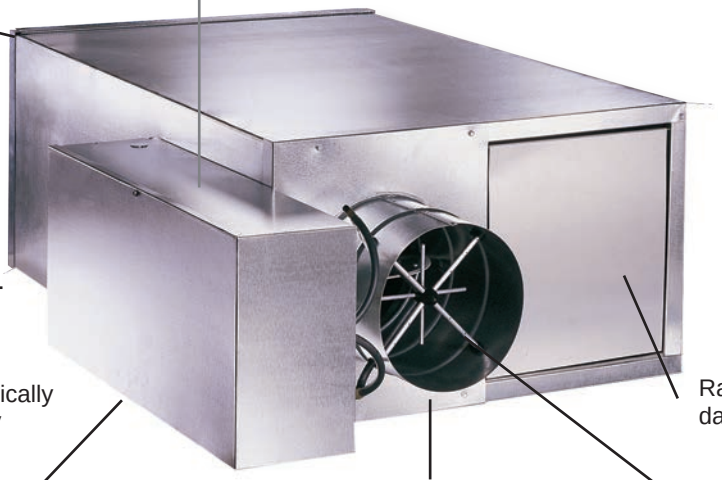
Electrical devices installed within a NEMA 1 enclosure, with single point power connection

Integral discharge collar simplifies field installation

Fan assembly utilizes a forward curved, dynamically balanced, galvanized wheel with a direct drive motor

Mechanical lock construction ensures lowest possible casing breakage

Fan assembly utilizes a forward curved, dynamically balanced, galvanized wheel with a direct drive motor



3/4" thick fiberglass insulation complying with UL 181, NFPA 90A, and ASTM C1071, mechanically fastened for added security

Radiated sound damper

Full bottom fan removable access panels

Round Inlets: 22 gauge galvanized steel, roll formed with integral stiffening ribs for added strength and rigidity

Patented FlowStar™ airflow sensor (Patent number 5,481,925)

OPTIONAL CONSTRUCTION FEATURES

- ECM fan motor
- Mounting brackets to accept all-thread hanging rods or wire hangers
- Double wall construction
- Scrim reinforced foil faced insulation meeting ASTM C1136 for mold, mildew, and humidity resistance
- Elastomeric closed cell foam insulation
- Filter located at induction inlet
- Hot water (CFR-WC), steam, or electric heating coils (CFR-EH) mounted at unit discharge. Access plate upstream of hydronic coil is standard.
- Low temperature construction for use in thermal storage applications. Includes thermally isolated primary air inlet and composite damper shaft.
- Factory control options: Verasys® ZEC Series DDC for BACnet, Pneumatic, or Consignment DDC Controls
- Factory piping packages (refer to Piping Packages catalog)

ACCURATE AND ENERGY-SAVING AIRFLOW CONTROL WITH THE PATENTED FLOWSTAR™ SENSOR

Many VAV terminals waste energy due to an inferior airflow sensor design that requires the minimum CFM setpoint to be much higher than the IAQ calculation requirement. This is common with interior spaces that will be effected year round. These interior VAV terminals waste energy in several ways. First, the primary air fan (e.g. AHU) supplies more CFM than the building requires. The higher minimum CFM setpoint over cools the zone with VAV terminals without integral heat. To maintain thermal comfort a building engineer would need to change the minimum setpoint to zero CFM compromising indoor air quality. Interior VAV terminals with integral heat provide adequate comfort in the space but waste significant energy as energy is consumed to mechanically cool the primary air only to have more energy consumed to heat the cooled primary air. Significant energy savings is obtained with proper sizing and by making sure approved VAV terminals are capable of controlling at low CFM setpoints, providing the minimum ventilation requirement.

Currently, most DDC controllers have a minimum differential pressure limitation between 0.015" and 0.05" w.g. The major DDC manufacturers can control down to 0.015" w.g. An airflow sensor that does not amplify, e.g., a Pitot tube, requires about 490 FPM to develop 0.015" w.g. differential pressure. The FlowStar™ develops 0.015" w.g. pressure with only 290 FPM on a size 6 terminal and less than 325 FPM for a size 16. Consequently, VAV terminals utilizing a non-amplifying type sensor could have minimum CFM's that are well over 50% higher than a ENVIRO-TEC terminal. Many airflow sensors provide some degree of amplification simply due to the decrease in free area of the inlet from large area of the sensor. These VAV terminals still require minimum CFM's up to 30% higher than an ENVIRO-TEC terminal, have higher sound levels, and higher pressure drop requiring additional energy consumption at the primary air fan.

A VAV system designed with ENVIRO-TEC terminals consumes significantly less energy than a comparable system with competitor's terminals. The FlowStar™ airflow sensor reduces energy consumption by allowing lower zone minimum CFM setpoints, greatly reducing or eliminating "reheat", and by imposing less resistance on the primary air fan.

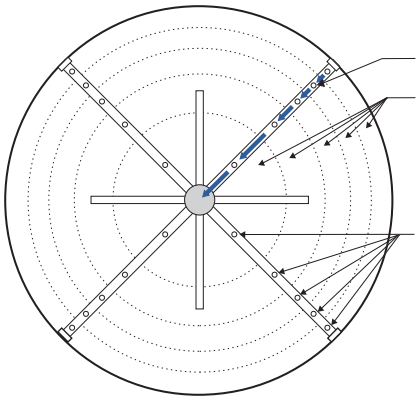
The ENVIRO-TEC air valve features the FlowStar™ airflow sensor which has brought new meaning to airflow control accuracy. The multi-axis design utilizes between 12 and 20 sensing points that sample total pressure at center points within equal concentric cross-sectional areas, effectively traversing the air stream in two planes. Each distinct pressure reading is averaged within the center chamber before exiting the sensor to the controlling device.

This sensor adds a new dimension to signal amplification. Most differential pressure sensors provide a signal between .5 and 2 times the equivalent velocity pressure signal. The FlowStar™ provides a differential pressure signal that is 2.5 to 3 times the equivalent velocity pressure signal. This amplified signal allows more accurate and stable airflow control at low airflow capacities. Low airflow control is critical for indoor air quality, reheat minimization, and preventing over cooling during light loads.

Unlike other sensors which use a large probe surface area to achieve signal amplification, the FlowStar™ utilizes an unprecedented streamline design which generates amplified signals unrivaled in the industry. The streamlined design also generates less pressure drop and noise.

The VAV schedule should specify the minimum and maximum airflow setpoints, maximum sound power levels, and maximum air pressure loss for each terminal. The specification for the VAV terminal must detail the required performance of the airflow sensor. For maximum building occupant satisfaction, the VAV system designer should specify the airflow sensor as suggested in the Guide Specifications of this catalog.

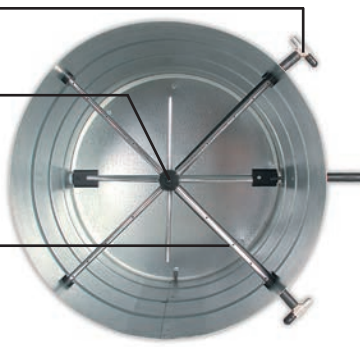
FlowStar™ Airflow Sensor Patent #5,481,925



Each pressure input signal is routed to the center averaging chamber

Equal concentric circular areas
- Sizes 6 & 8: 3 Circles
- Sizes 10 & 12: 4 Circles
- Sizes 14 & 16: 5 Circles (shown)

Total pressure measured at the center of each concentric circle for maximum accuracy, as outlined in ASHRAE Fundamentals Handbook.
- Sizes 6 & 8: 12 Sensing Points
- Sizes 10 & 12: 16 Sensing Points
- Sizes 14 & 16: 20 Sensing Points



Field pressure measuring tap

Airfoil shaped averaging chamber for low pressure loss and noise

Pressure output is routed behind probe to minimize pressure loss and noise

APPLICATION AND SELECTION

PURPOSE OF SERIES FLOW FAN TERMINALS

Series flow fan powered terminals offer improved space comfort and flexibility in a wide variety of applications. Substantial operating savings can be realized through the recovery of waste heat, reduced central fan horsepower requirements and night setback operation.

Heat Recovery The CFRQ recovers heat from lights and core areas to offset heating loads in perimeter zones. Additional heat is available at the terminal unit using electric, steam, or hot water heating coils. Controls are available to energize remote heating devices such as wall fin, fan coils, radiant panels, and roof load plenum unit heaters.

IAQ The CFRQ enhances the indoor air quality of a building by providing constant air motion, and higher air volumes in the heating mode than typically provided by straight VAV single duct terminals or parallel flow fan terminals. The higher air capacity provides continuous air motion in the space and lowers the heating discharge air temperature. This combination improves air circulation, preventing accumulation of CO_2 concentrations in stagnant areas. Increased air motion improves occupant comfort. The higher air capacity also improves the performance of diffusers and minimizes diffuser “dumping”.

ACOUSTICAL CONCEPTS

The focus on indoor air quality is also having an effect on proper selection of air terminal equipment with respect to acoustics.

Sound At the zone level, the terminal unit generates acoustical energy that can enter the zone along two primary paths. First, sound from the unit fan can propagate through the downstream duct and diffusers before entering the zone (referred to as Discharge or Airborne Sound). Acoustical energy is also radiated from the terminal casing and travels through the ceiling cavity and ceiling system before entering the zone (referred to as Radiated Sound).

To properly quantify the amount of acoustical energy emanating from a terminal unit at a specific operating condition (i.e. CFM and static pressure), manufacturers must measure and publish sound power levels.

The units of measurement, decibels, actually represent units of power (watts). The terminal equipment sound power ratings provide a consistent measure of the generated sound independent of the environment in which the unit is installed. This allows a straight forward comparison of sound performance between equipment manufacturers and unit models.

Noise Criteria (NC) The bottom line acoustical criteria for most projects is the NC (Noise Criteria) level. This NC level is derived from resulting sound pressure levels in the zone. These sound pressure levels are the effect of acoustical energy (sound power levels) entering the zone caused by the terminal unit and other sound generating sources (central fan system, office equipment, outdoor environment, etc.).

The units of measurement is once again decibels; however, in this case decibels represent units of pressure (Pascals), since the human ear and microphones react to pressure variations.

There is no direct relationship between sound power levels and sound pressure levels. Therefore, we must predict the resulting sound pressure levels (NC levels) in the zone based in part by the published sound power levels of the terminal equipment. The NC levels are totally dependent on the project specific design, architecturally and mechanically. For a constant operating condition (fixed sound power levels), the resulting NC level in the zone will vary from one project to another.

AHRI 885 A useful tool to aid in predicting space sound pressure levels is an application standard referred to as AHRI Standard 885. This standard provides information (tables, formulas, etc.) required to calculate the attenuation of the ductwork, ceiling cavity, ceiling system, and conditioned space below a terminal unit. These attenuation values are referred to as the “transfer function” since they are used to transfer from the manufacturer’s sound power levels to the estimated sound pressure levels resulting in the space below, and/or served by the terminal unit. The standard does not provide all of the necessary information to accommodate every conceivable design; however, it does provide enough information to approximate the transfer function for most applications. Furthermore, an Appendix is provided that contains typical attenuation values. Some manufacturers utilize different assumptions with respect to a "typical" project design; therefore, cataloged NC levels should not be used to compare acoustical performance. Only certified sound power levels should be used for this purpose.

GENERAL DESIGN RECOMMENDATIONS FOR A QUIET SYSTEM

The AHU Sound levels in the zone are frequently impacted by central fan discharge noise that either breaks out (radiates) from the ductwork or travels through the distribution ductwork and enters the zone

as airborne (discharge) sound. Achieving acceptable sound levels in the zone begins with a properly designed central fan system which delivers relatively quiet air to each zone.

Supply Duct Pressure One primary factor contributing to noisy systems is high static pressure in the primary air duct. This condition causes higher sound levels from the central fan and also higher sound levels from the terminal unit, as the primary air valve closes to reduce the pressure. This condition is compounded when flexible duct is utilized at the terminal inlet, which allows the central fan noise and air valve noise to break out into the ceiling cavity and then enter the zone located below the terminal.

Ideally, the system static pressure should be reduced to the point where the terminal unit installed on the duct run associated with the highest pressure drop has the minimum required inlet pressure to deliver the design airflow to the zone. Many of today's HVAC systems experience 0.5" w.g. pressure drop or less in the main trunk. For systems that will have substantially higher pressure variances from one zone to another, special attention should be paid to the proper selection of air terminal equipment.

To date, the most common approach has been to select (size) all of the terminals based on the worst case (highest inlet static pressure) condition. Typically, this results in 80% (or higher) of the terminal units being oversized for their application. This in turn results in much higher equipment costs, but more importantly, drastically reduced operating efficiency of each unit. This consequently decreases the ability to provide comfort control in the zone. In addition, the oversized terminals cannot adequately control the minimum ventilation capacity required in the heating mode.

A more prudent approach is to utilize a pressure reducing device upstream of the terminal unit on those few zones closest to the central fan. This device could simply be a manual quadrant type damper if located well upstream of the terminal inlet. In tight quarters, perforated metal can be utilized as a quiet means of reducing system pressure. This approach allows all of the terminal units to experience a similar (lower) inlet pressure. They can be selected in a consistent manner at lower inlet pressure conditions that will allow more optimally sized units.

Inlet duct that is the same size as the inlet collar and as straight as possible will achieve the best acoustical performance. For critical applications, flexible duct should not be utilized at the terminal inlet.

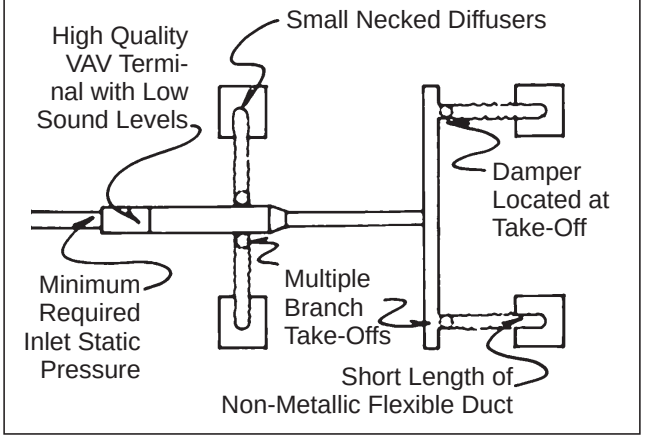
Zoning On projects where internal lining of the downstream duct is not permitted, special considerations should be made to assure acceptable noise levels will be obtained. In these cases, a greater number of smaller zones will help in reducing sound levels. Where possible, the first diffuser takeoff should be located after an elbow or tee and a greater number of small necked diffusers should be utilized, rather than fewer large necked diffusers.

The downstream ductwork should be carefully designed and installed to avoid noise regeneration. Bull head tee arrangements should be located sufficiently downstream of the terminal discharge to provide an established flow pattern downstream of the fan. Place diffusers downstream of the terminal after the airflow has completely developed.

Downstream splitter dampers can cause noise problems if placed too close to the terminal, or when excessive air velocities exist. If tee arrangements are employed, volume dampers should be used in each branch of the tee, and balancing dampers should be provided at each diffuser tap. This arrangement provides maximum flexibility in quiet balancing of the system. 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 to 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. Fan powered terminals should never be installed over small occupied spaces where the wall partitions extend from slab-to-slab (i.e. fire walls or privacy walls).

Fan Terminal Isolation Model CFRQ fan terminals are equipped with sufficient internal vibration dampening means to prevent the need for additional external

IDEAL DUCT DESIGN



APPLICATION AND SELECTION

isolation. Flexible duct connectors at the unit discharge typically do more harm than good. The sagging membrane causes higher air velocities and turbulence, which translates into noise. Furthermore, the discharge noise breaks out of this fitting more than with a hard sheet metal fitting.

SELECTION GUIDELINES

The CFRQ fan terminal has been designed to provide maximum flexibility in matching primary air valve capacities (cooling loads) with unit fan capacities. The overall unit size is dictated by the fan size. With each unit fan size, multiple primary air valve sizes are available to handle a wide range of cooling capacities.

The fan should be sized first to determine the unit size. The selection is made by cross plotting the specified fan capacity and external static pressure on the appropriate fan performance curves (see page 18). Terminals utilizing hot water heating coils require the summation of the coil air pressure drop and the design E.S.P. to determine the total E.S.P. It is common to have more than one fan size which can meet the design requirements. Typically, the selection begins with the smallest fan that can meet the capacity. Occasionally this selection may not meet the acoustical requirements and thus the next larger fan size should be selected. “Upsizing” may also occur when it is necessary to meet the design capacity on the medium or low motor tap.

Fan selections can be made anywhere in the non-shaded areas. Each fan performance curve depicts the actual performance of the relative motor tap without additional fan balance adjustment. Actual specified capacities which fall below a particular fan curve (low, medium or high) is obtained by adjustment of the electronic (SCR) fan speed controller. After the proper fan is selected, the unit size is fixed and then the appropriate primary air valve is selected. Most of the unit fan sizes have three air valve sizes to select from. The middle size will typically be utilized. It is the size that is matched with the unit fan to deliver 100% cooling capacity for the majority of fan selections.

The larger primary air valve will be used in applications where the system fan is undersized, requiring a larger air valve to take advantage of lower pressure losses. While helping in this fashion, a penalty is paid by having a higher controllable minimum airflow setpoint than could be achieved with a smaller inlet size.

The smaller primary air valve will most often be utilized with thermal storage systems where lower than normal primary air temperatures are utilized. In these cases, the maximum design primary airflow is less than the fan capacity (typically 60 to 80%), and therefore a smaller air valve may be appropriate.

SYSTEM PRESSURE CONSIDERATIONS

Since the terminal unit fan is selected to move 100% of the design airflow to the zone, all downstream pressure losses are neglected when determining minimum primary air inlet pressure to the unit. The central fan is only required to overcome the minimal loss through the unit air valve, reducing the central fan total pressure and horsepower requirements. Due to extremely low pressure drop of the air valve, central fan operating inlet static pressures may be as low as 0.5" w.g.

COMMON MISAPPLICATION

It should be noted that a conventional Series Flow Fan Terminal cannot 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 air from the plenum inlet which has less resistance.

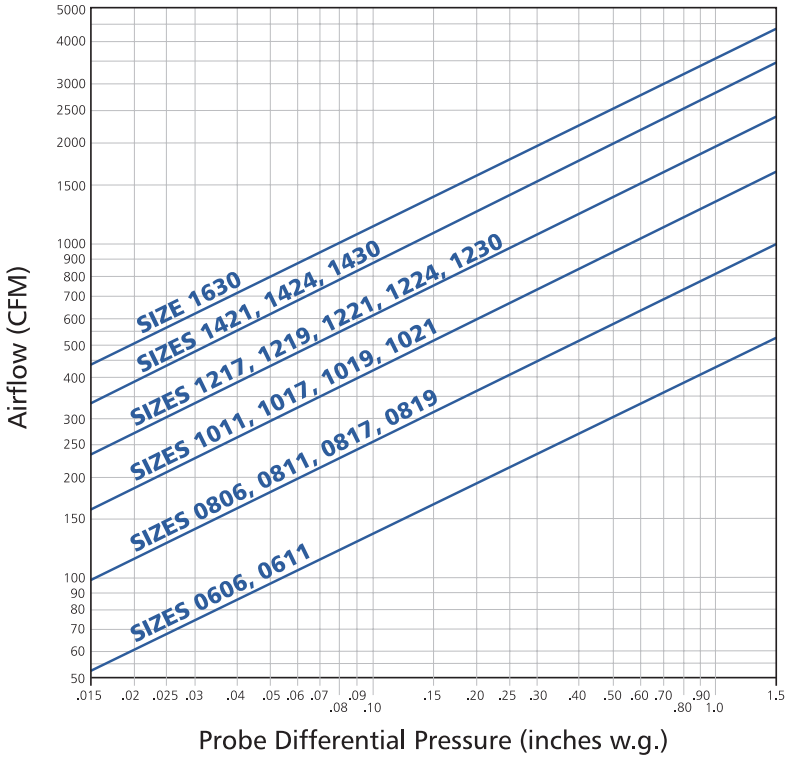
The induction opening should never be sealed, as this will cause problems should the primary airflow increase beyond the unit fan capacity. In this condition, the fan casing becomes pressurized which will eventually stall the fan motor and cause premature failure.

A web-based Computer Selection Program, "Web-Select", is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

PRIMARY AIRFLOW CALIBRATION

FLOWSTAR™ CALIBRATION CHART

(For dead-end differential pressure transducers)



NOTE: Maximum and minimum CFM limits are dependent on the type of controls that are utilized. Refer to the table below when factory provided pneumatic or analog electric controls are furnished by ENVIRO-TEC. When DDC controls are furnished by others, the CFM limits are dependent on the specific control vendor that is employed. After obtaining the differential pressure range from the control vendor, the maximum and minimum CFM limits can be obtained from the chart above (many controllers are capable of controlling minimum setpoint down to .015" w.g.).

AIRFLOW RANGES (CFM)

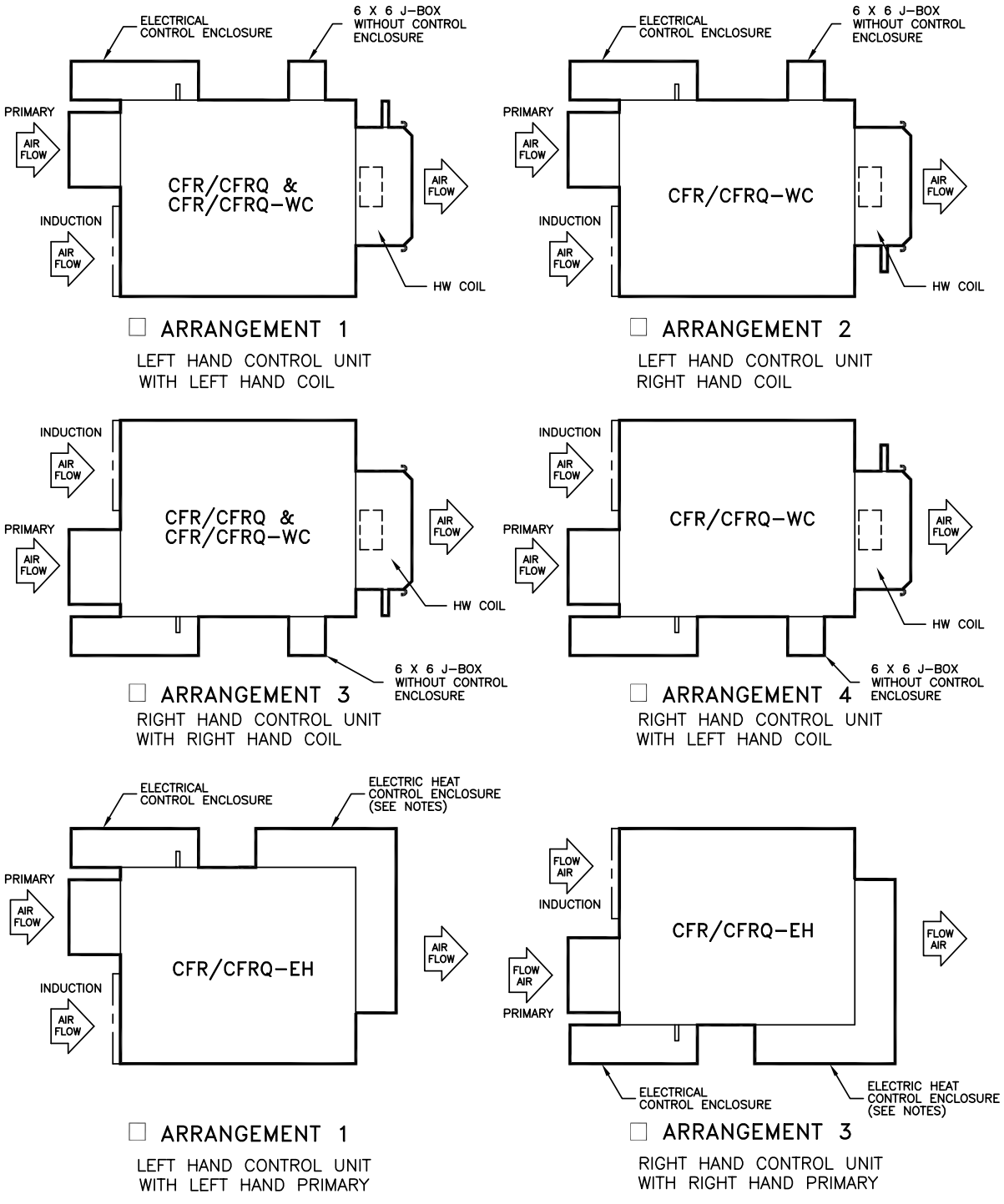
UNIT SIZE	400 SERIES (PNEUMATIC) STANDARD CONTROLLER		7000 SERIES ANALOG ELECTRONIC		DDC CONSIGNMENT CONTROLS (See Notes Below)				
					MIN.			MAX.	
	MIN.	MAX.	MIN.	MAX.	Min. transducer differential pressure (in.w.g.)			Max. transducer differential pressure (in.w.g.)	
					0.015	0.03	0.05	1.0	>=1.5
0606, 0611	75	490	60	550	53	75	97	435	530
0806, 0811, 0817, 0819	145	960	115	1000	105	145	190	840	1000
1011, 1017, 1019, 1021	235	1545	185	1600	165	235	305	1355	1600
1217, 1219, 1221, 1224, 1230	340	2250	285	2300	240	340	440	1975	2300
1421, 1424, 1430	475	3100	390	3100	335	475	615	2750	3100
1630	625	4100	520	4100	440	625	805	3595	4100

NOTES:

1. Minimum and maximum airflow limits are dependent on the specific DDC controller supplied. Contact the control vendor to obtain the minimum and maximum differential pressure limits (inches W.G.) of the transducer utilized with the DDC controller.
2. Maximum CFM is limited to value shown in General Selection Data.

UNIT ARRANGEMENTS

MODELS CFRQ, CFRQ-WC, AND CFRQ-EH



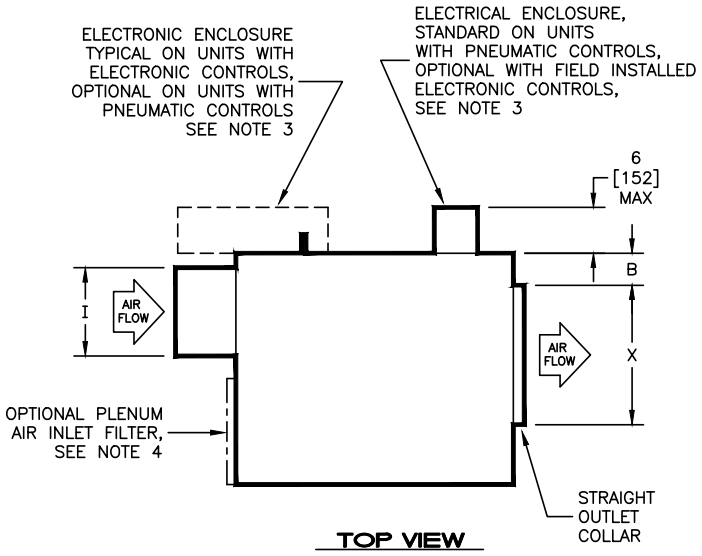
NOTES:
1. ELECTRIC HEAT CONTROL ENCLOSURE IS ON THE SAME SIDE AS STANDARD CONTROL ENCLOSURE.
2. ELECTRIC HEAT ONLY AVAILABLE ON ARRANGEMENTS 1 & 3.
3. ELECTRIC HEAT NOT AVAILABLE WITH HW COIL.

DIMENSIONAL DATA

MODEL CFRQ, ALL SIZES, ARRANGEMENT 1

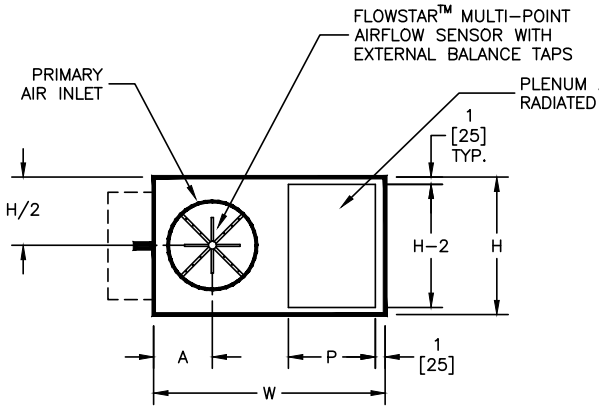
NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
4. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
5. Inlet and outlet collars must be externally insulated in the field "by others", if required.
6. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
7. See drawing 33–80015 for arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
0606 Thru 0811	13 X 14 X 1	[330 X 356 X 25]
1011	11 X 14 X 1	[279 X 356 X 25]
0817 Thru 1421	15 X 17 X 1	[381 X 432 X 25]
1224 & 1424	19 X 19 X 1	[483 X 483 X 25]
1230 Thru 1630	19 X 30 X 1	[483 X 762 X 25]

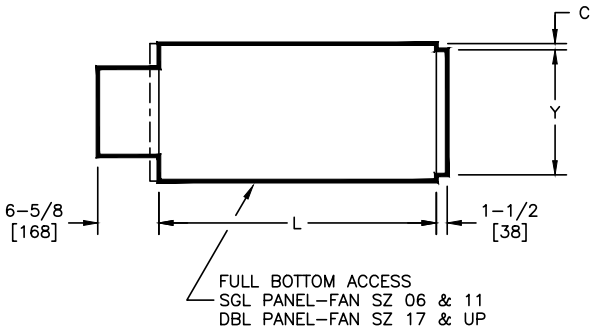


TOP VIEW

OPTION NOTES:
8. Double wall (DW) option increases "L" dim. 1–1/2" [38mm] and reduces inlet and discharge collar length by 3/4" [19mm].
9. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
10. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



INLET END VIEW
(Filter not shown this view)



SIDE VIEW

DIMENSIONS – In [mm]

UNIT SIZE	H	W	L	X	Y	A	B	C	P
0606, 0806, 0611, 0811	14 [356]	23–3/8 [594]	35 [889]	11 [279]	11 [279]	6 [152]	2–1/4 [57]	3/4 [19]	10–3/8 [264]
1011	14 [356]	23–3/8 [594]	35 [889]	11 [279]	11 [279]	7 [178]	2–1/4 [57]	3/4 [19]	8–3/8 [213]
0817, 1017, 1217 0819, 1019, 1219	17 [432]	29–3/8 [746]	40 [1016]	15 [381]	13–1/2 [343]	8 [203]	2–1/4 [57]	3/4 [19]	12–3/8 [314]
1021, 1221, 1421	17 [432]	35–3/8 [899]	40 [1016]	15 [381]	13–1/2 [343]	9 [229]	10–1/2 [267]	2–3/4 [70]	12–3/8 [314]
1224, 1424	19 [483]	47–3/8 [1203]	50 [1270]	28 [711]	15 [381]	9 [229]	4 [102]	3–1/4 [83]	17 [432]
1230	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	10 [254]	9–3/4 [248]	1–1/4 [32]	28 [711]
1430, 1630	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	11–1/2 [292]	9–3/4 [248]	1–1/4 [32]	28 [711]

UNIT SIZE	I
06XX	5–7/8 [149]
08XX	7–7/8 [200]
10XX	9–7/8 [251]
12XX	11–7/8 [302]
14XX	13–7/8 [352]
16XX	15–7/8 [403]

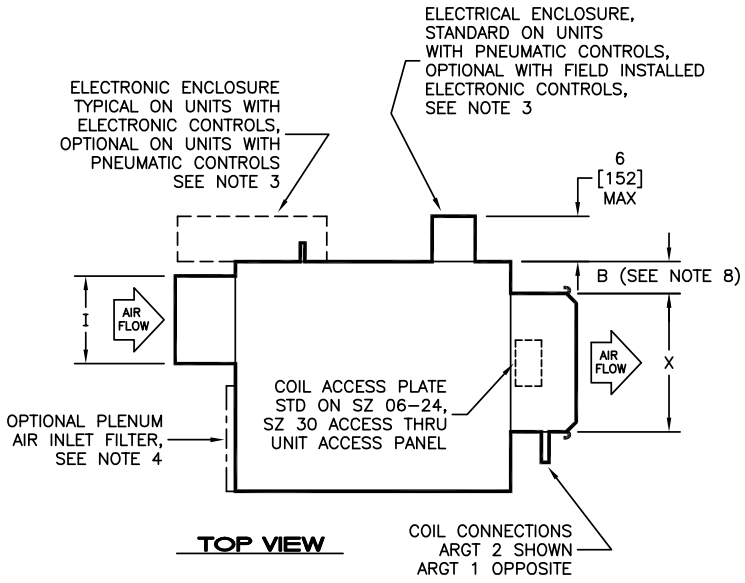
UNIT SIZE: FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

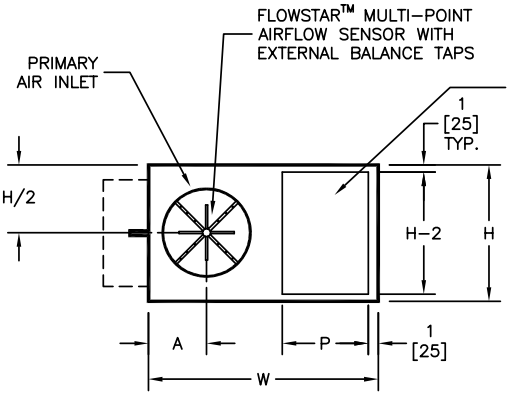
MODEL CFRQ-WC, ALL SIZES, ARRANGEMENTS 1 & 2

NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
4. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
5. Inlet and outlet collars must be externally insulated in the field "by others", if required.
6. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
7. See drawing 33–80015 for arrangement details.

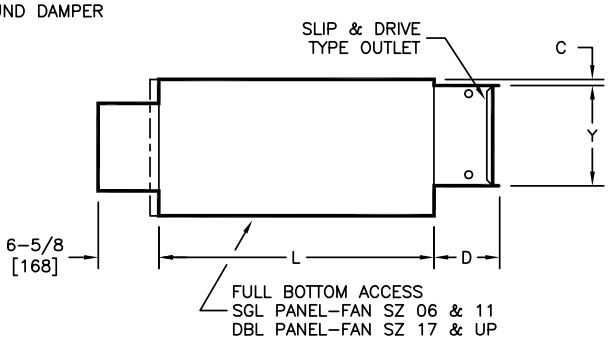
UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
0606 Thru 0811	13 X 14 X 1	[330 X 356 X 25]
1011	11 X 14 X 1	[279 X 356 X 25]
0817 Thru 1421	15 X 17 X 1	[381 X 432 X 25]
1224 & 1424	19 X 19 X 1	[483 X 483 X 25]
1230 Thru 1630	19 X 30 X 1	[483 X 762 X 25]



OPTION NOTES:
8. Double wall (DW) option increases "L" dim. by 1–1/2" [38mm], reduces "B" dim. by 7/8" [22mm], and reduces inlet and discharge collar length by 3/4" [19mm].
9. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
10. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



INLET END VIEW
(Filter not shown this view)



SIDE VIEW

DIMENSIONS – In [mm]

UNIT SIZE	H	W	L	X	Y	A	B	C	D	P
0606, 0806, 0611, 0811	14 [356]	23–3/8 [594]	35 [889]	16 [406]	12–1/2 [318]	6 [152]	3 [76]	3/4 [19]	10 [254]	10–3/8 [264]
1011	14 [356]	23–3/8 [594]	35 [889]	16 [406]	12–1/2 [318]	7 [178]	3 [76]	3/4 [19]	10 [254]	8–3/8 [213]
0817, 1017, 1217, 0819, 1019, 1219	17 [432]	29–3/8 [746]	40 [1016]	22 [559]	12–1/2 [318]	8 [203]	3 [76]	3/4 [19]	10 [254]	12–3/8 [314]
1021, 1221, 1421	17 [432]	35–3/8 [899]	40 [1016]	22 [559]	12–1/2 [318]	9 [229]	7 [178]	3–3/4 [95]	10 [254]	12–3/8 [314]
1224, 1424	19 [483]	47–3/8 [1203]	50 [1270]	28 [711]	17–1/2 [445]	9 [229]	4 [102]	3/4 [19]	10 [254]	17 [432]
1230	19 [483]	52 [1321]	62 [1575]	40 [1016]	17–1/2 [445]	10 [254]	8–3/4 [248]	3/4 [19]	6 [152]	28 [711]
1430, 1630	19 [483]	52 [1321]	62 [1575]	40 [1016]	17–1/2 [445]	11–1/2 [292]	8–3/4 [248]	3/4 [19]	6 [152]	28 [711]

UNIT SIZE	I
06XX	5–7/8 [149]
08XX	7–7/8 [200]
10XX	9–7/8 [251]
12XX	11–7/8 [302]
14XX	13–7/8 [352]
16XX	15–7/8 [403]

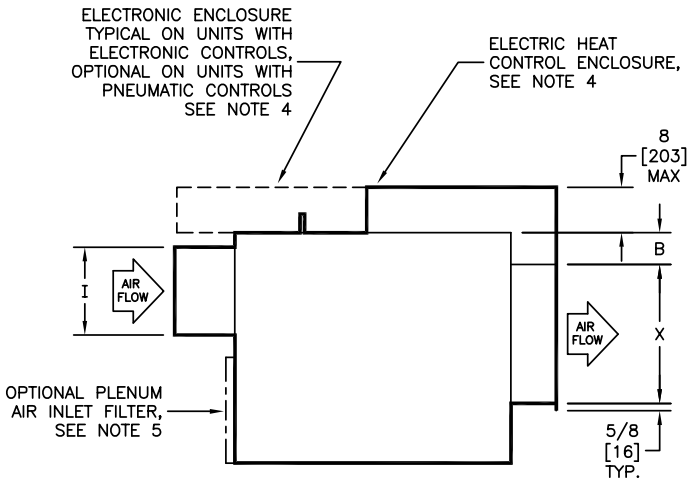
UNIT SIZE: FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

MODEL CFRQ-EH, SIZES 06-24, ARRANGEMENT 1

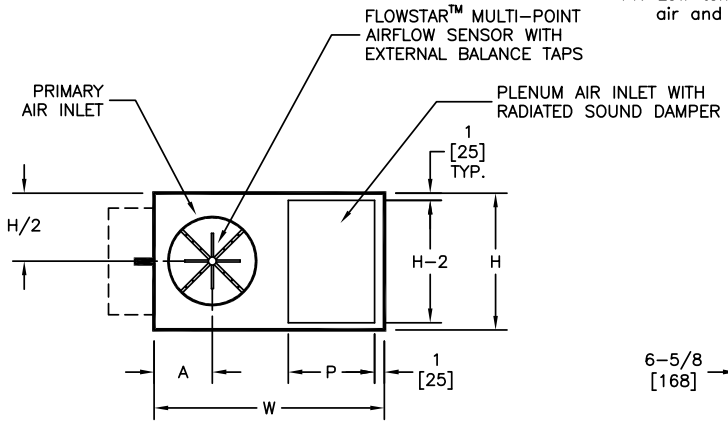
NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Electric heater may extend to a total of 12" (305mm) depending on options.
4. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
5. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
6. Inlet collar and electric heater must be externally insulated in the field "by others", if required.
7. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
8. See drawing 33-80015 fr arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
0606 Thru 0811	13 X 14 X 1	[330 X 356 X 25]
1011	11 X 14 X 1	[279 X 356 X 25]
0817 Thru 1421	15 X 17 X 1	[381 X 432 X 25]
1224 & 1424	19 X 19 X 1	[483 X 483 X 25]

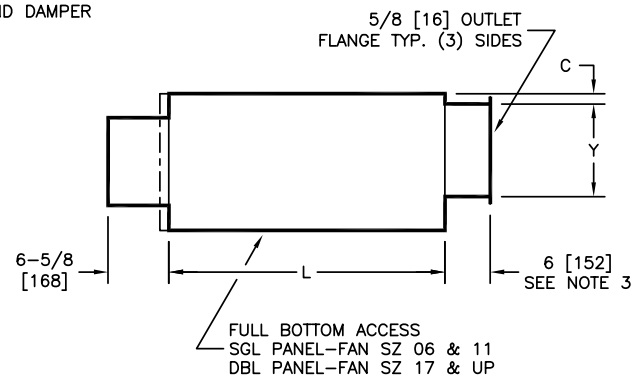


TOP VIEW

OPTION NOTES:
9. Double wall (DW) option increases "L" dim. 1-1/2" [38mm] and reduces inlet and discharge collar length by 3/4" [19mm].
10. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
11. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



INLET END VIEW
(Filter not shown this view)



SIDE VIEW

DIMENSIONS - In [mm]

UNIT SIZE	H	W	L	X	Y	A	B	C	P
0606, 0806, 0611, 0811	14 [356]	23-3/8 [594]	35 [889]	11 [279]	11 [279]	6 [152]	3-1/4 [83]	3/4 [19]	10-3/8 [264]
1011	14 [356]	23-3/8 [594]	35 [889]	11 [279]	11 [279]	7 [178]	3-1/4 [83]	3/4 [19]	8-3/8 [213]
0817, 1017, 1217	17 [432]	29-3/8 [746]	40 [1016]	15 [381]	13-1/2 [343]	8 [203]	3-7/8 [98]	3/4 [19]	12-3/8 [314]
0819, 1019, 1219	17 [432]	29-3/8 [746]	40 [1016]	15 [381]	13-1/2 [343]	8 [203]	3-1/2 [89]	3/4 [19]	12-3/8 [314]
1021, 1221, 1421	17 [432]	35-3/8 [899]	40 [1016]	15 [381]	13-1/2 [343]	9 [229]	11-1/2 [292]	2-3/4 [70]	12-3/8 [314]
1224, 1424	19 [483]	47-3/8 [1203]	50 [1270]	28 [711]	15 [381]	9 [229]	12 [305]	3-1/4 [83]	17 [432]

UNIT SIZE	I
06XX	5-7/8 [149]
08XX	7-7/8 [200]
10XX	9-7/8 [251]
12XX	11-7/8 [302]
14XX	13-7/8 [352]

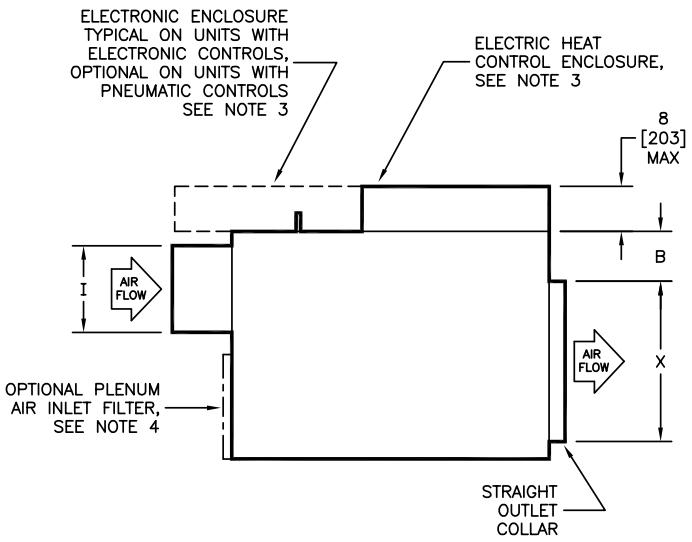
UNIT SIZE: FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

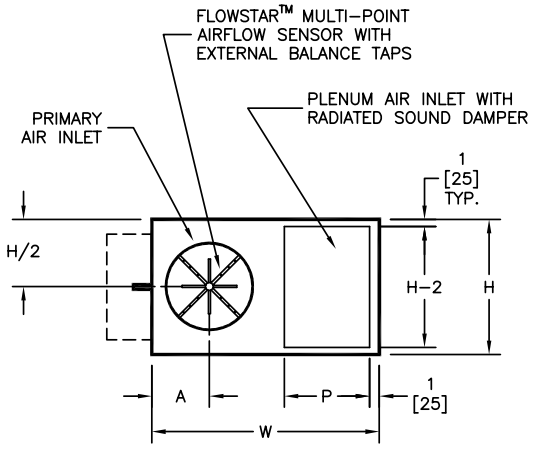
MODEL CFRQ-EH, SIZE 30, ARRANGEMENT 1

NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
4. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
5. Inlet and outlet collars must be externally insulated in the field "by others", if required.
6. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
7. See drawing 33–80015 for arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
1230 Thru 1630	19 X 30 X 1	[483 X 762 X 25]

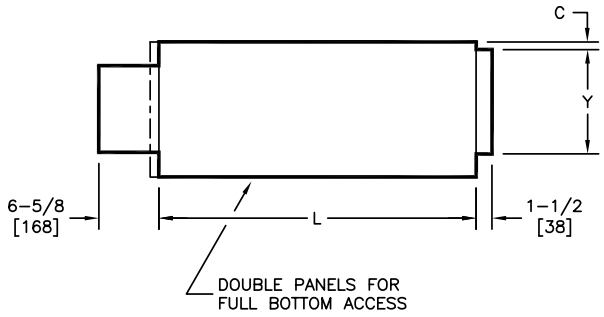


TOP VIEW



INLET END VIEW
(Filter not shown this view)

OPTION NOTES:
8. Double wall (DW) option increases "L" dim. 1–1/2" [38mm] and reduces inlet and discharge collar length by 3/4" [19mm].
9. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
10. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



SIDE VIEW

DIMENSIONS – In [mm]

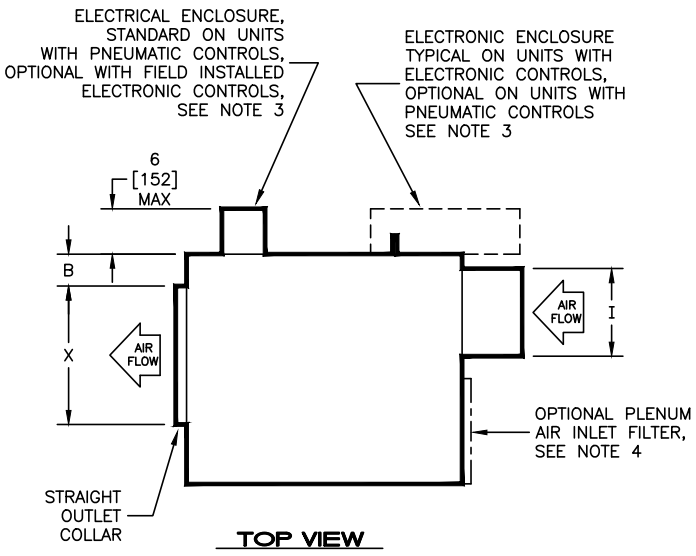
UNIT SIZE	H	W	L	X	Y	A	B	C	P
1230	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	10 [254]	9–3/4 [248]	1–1/4 [32]	28 [711]
1430, 1630	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	11–1/2 [292]	9–3/4 [248]	1–1/4 [32]	28 [711]

UNIT SIZE	I
12XX	11–7/8 [302]
14XX	13–7/8 [352]
16XX	15–7/8 [403]

UNIT SIZE:
FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

MODEL CFRQ, ALL SIZES, ARRANGEMENT 3

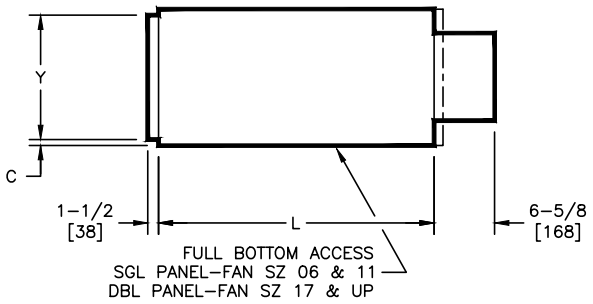


TOP VIEW

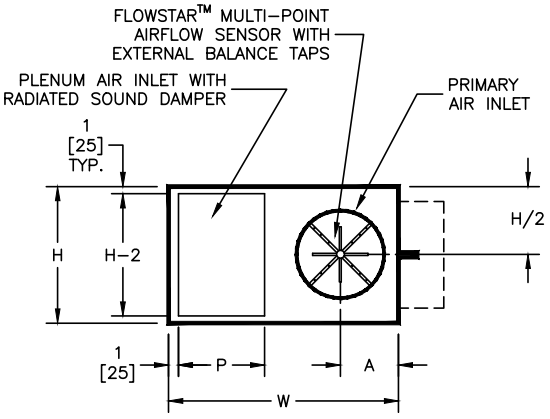
NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
4. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
5. Inlet and outlet collars must be externally insulated in the field "by others", if required.
6. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
7. See drawing 33–80015 for arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
0606 Thru 0811	13 X 14 X 1	[330 X 356 X 25]
1011	11 X 14 X 1	[279 X 356 X 25]
0817 Thru 1421	15 X 17 X 1	[381 X 432 X 25]
1224 & 1424	19 X 19 X 1	[483 X 483 X 25]
1230 Thru 1630	19 X 30 X 1	[483 X 762 X 25]

OPTION NOTES:
8. Double wall (DW) option increases "L" dim. 1–1/2" [38mm] and reduces inlet and discharge collar length by 3/4" [19mm].
9. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
10. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



SIDE VIEW



INLET END VIEW
(Filter not shown this view)

DIMENSIONS – In [mm]

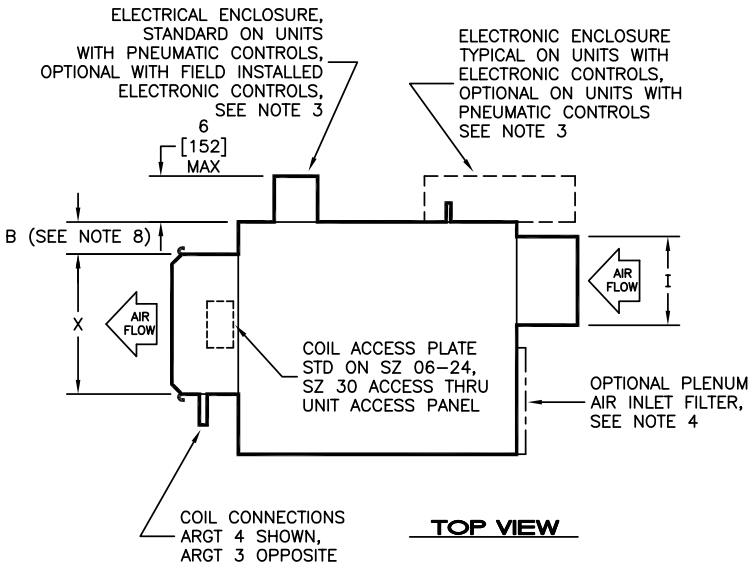
UNIT SIZE	H	W	L	X	Y	A	B	C	P
0606, 0806, 0611, 0811	14 [356]	23–3/8 [594]	35 [889]	11 [279]	11 [279]	6 [152]	2–1/4 [57]	3/4 [19]	10–3/8 [264]
1011	14 [356]	23–3/8 [594]	35 [889]	11 [279]	11 [279]	7 [178]	2–1/4 [57]	3/4 [19]	8–3/8 [213]
0817, 1017, 1217 0819, 1019, 1219	17 [432]	29–3/8 [746]	40 [1016]	15 [381]	13–1/2 [343]	8 [203]	2–1/4 [57]	3/4 [19]	12–3/8 [314]
1021, 1221, 1421	17 [432]	35–3/8 [899]	40 [1016]	15 [381]	13–1/2 [343]	9 [229]	10–1/2 [267]	2–3/4 [70]	12–3/8 [314]
1224, 1424	19 [483]	47–3/8 [1203]	50 [1270]	28 [711]	15 [381]	9 [229]	4 [102]	3–1/4 [83]	17 [432]
1230	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	10 [254]	9–3/4 [248]	1–1/4 [32]	28 [711]
1430, 1630	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	11–1/2 [292]	9–3/4 [248]	1–1/4 [32]	28 [711]

UNIT SIZE	I
06XX	5–7/8 [149]
08XX	7–7/8 [200]
10XX	9–7/8 [251]
12XX	11–7/8 [302]
14XX	13–7/8 [352]
16XX	15–7/8 [403]

UNIT SIZE: FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

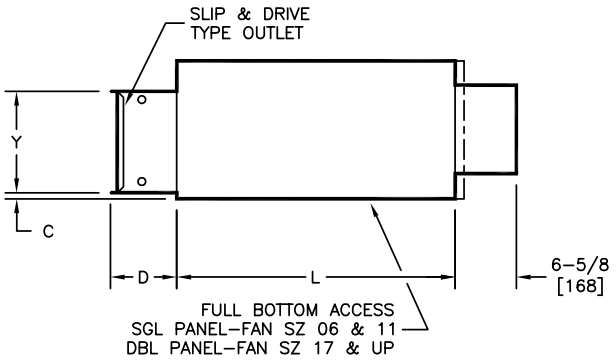
MODEL CFRQ-WC, ALL SIZES, ARRANGEMENTS 3 & 4



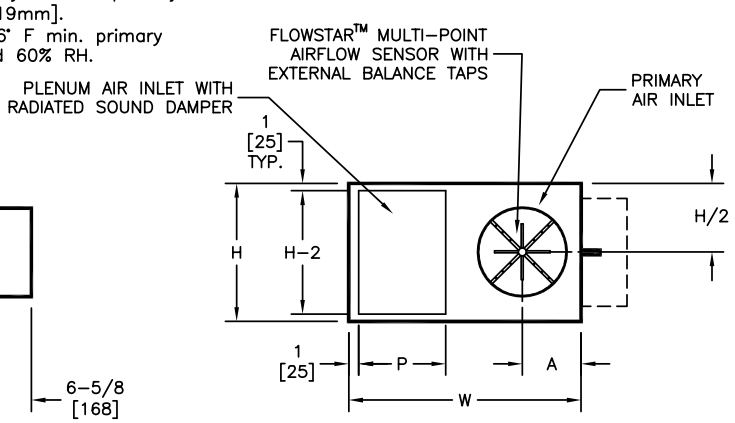
NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
4. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
5. Inlet and outlet collars must be externally insulated in the field "by others", if required.
6. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
7. See drawing 33–80015 for arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
0606 Thru 0811	13 X 14 X 1	[330 X 356 X 25]
1011	11 X 14 X 1	[279 X 356 X 25]
0817 Thru 1421	15 X 17 X 1	[381 X 432 X 25]
1224 & 1424	19 X 19 X 1	[483 X 483 X 25]
1230 Thru 1630	19 X 30 X 1	[483 X 762 X 25]

OPTION NOTES:
8. Double wall (DW) option increases "L" dim. by 1–1/2" [38mm], reduces "B dim. by 7/8" [22mm], and reduces inlet and discharge collar length by 3/4" [19mm].
9. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
10. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



SIDE VIEW



INLET END VIEW
(Filter not shown this view)

DIMENSIONS – In [mm]

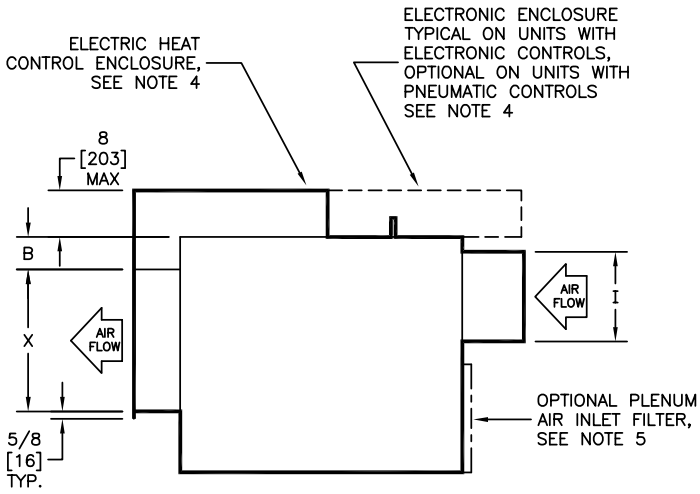
UNIT SIZE	H	W	L	X	Y	A	B	C	D	P
0606, 0806, 0611, 0811	14 [356]	23–3/8 [594]	35 [889]	16 [406]	12–1/2 [318]	6 [152]	3 [76]	3/4 [19]	10 [254]	10–3/8 [264]
1011	14 [356]	23–3/8 [594]	35 [889]	16 [406]	12–1/2 [318]	7 [178]	3 [76]	3/4 [19]	10 [254]	8–3/8 [213]
0817, 1017, 1217, 0819, 1019, 1219	17 [432]	29–3/8 [746]	40 [1016]	22 [559]	12–1/2 [318]	8 [203]	3 [76]	3/4 [19]	10 [254]	12–3/8 [314]
1021, 1221, 1421	17 [432]	35–3/8 [899]	40 [1016]	22 [559]	12–1/2 [318]	9 [229]	7 [178]	3–3/4 [95]	10 [254]	12–3/8 [314]
1224, 1424	19 [483]	47–3/8 [1203]	50 [1270]	28 [711]	17–1/2 [445]	9 [229]	4 [102]	3/4 [19]	10 [254]	17 [432]
1230	19 [483]	52 [1321]	62 [1575]	40 [1016]	17–1/2 [445]	10 [254]	8–3/4 [248]	3/4 [19]	6 [152]	28 [711]
1430, 1630	19 [483]	52 [1321]	62 [1575]	40 [1016]	17–1/2 [445]	11–1/2 [292]	8–3/4 [248]	3/4 [19]	6 [152]	28 [711]

UNIT SIZE	I
06XX	5–7/8 [149]
08XX	7–7/8 [200]
10XX	9–7/8 [251]
12XX	11–7/8 [302]
14XX	13–7/8 [352]
16XX	15–7/8 [403]

UNIT SIZE:
FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

MODEL CFRQ-EH, SIZES 06-24, ARRANGEMENT 3

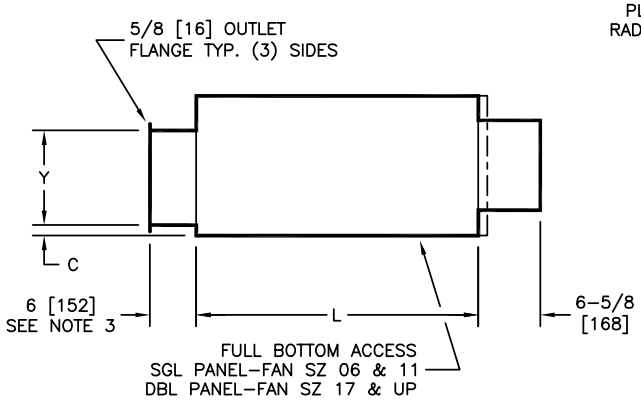


TOP VIEW

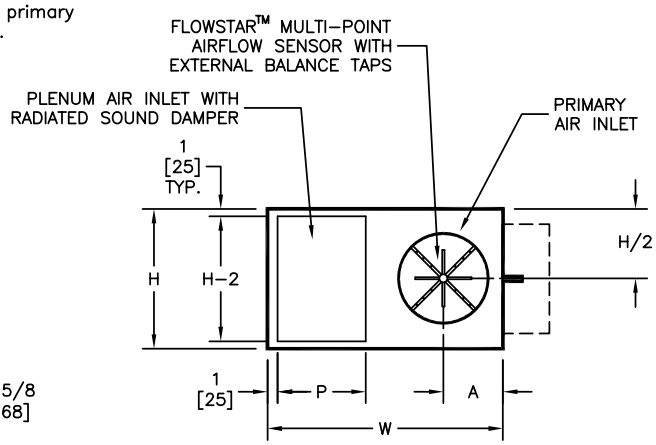
NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Electric heater may extend to a total of 12" (305mm) depending on options.
4. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
5. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
6. Inlet collar and electric heater must be externally insulated in the field "by others", if required.
7. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
8. See drawing 33–80015 for arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
0606 Thru 0811	13 X 14 X 1	[330 X 356 X 25]
1011	11 X 14 X 1	[279 X 356 X 25]
0817 Thru 1421	15 X 17 X 1	[381 X 432 X 25]
1224 & 1424	19 X 19 X 1	[483 X 483 X 25]

OPTION NOTES:
9. Double wall (DW) option increases "L" dim. 1–1/2" [38mm] and reduces inlet and discharge collar length by 3/4" [19mm].
10. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
11. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



SIDE VIEW



INLET END VIEW
(Filter not shown this view)

DIMENSIONS – In [mm]

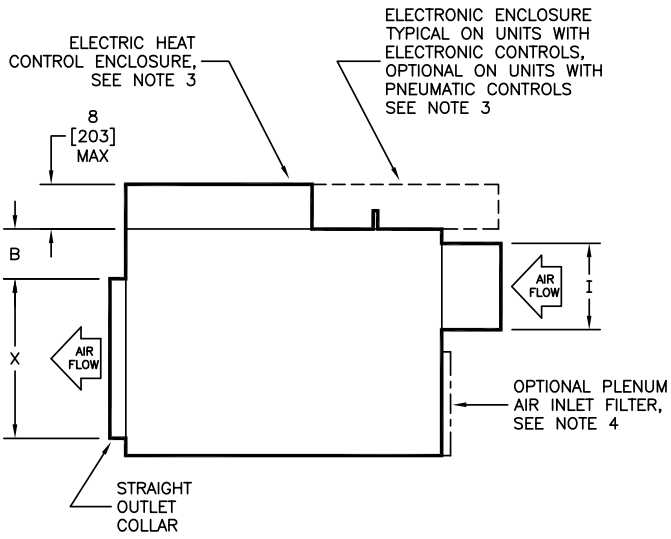
UNIT SIZE	H	W	L	X	Y	A	B	C	P
0606, 0806, 0611, 0811	14 [356]	23–3/8 [594]	35 [889]	11 [279]	11 [279]	6 [152]	3–1/4 [83]	3/4 [19]	10–3/8 [264]
1011	14 [356]	23–3/8 [594]	35 [889]	11 [279]	11 [279]	7 [178]	3–1/4 [83]	3/4 [19]	8–3/8 [213]
0817, 1017, 1217	17 [432]	29–3/8 [746]	40 [1016]	15 [381]	13–1/2 [343]	8 [203]	3–7/8 [98]	3/4 [19]	12–3/8 [314]
0819, 1019, 1219	17 [432]	29–3/8 [746]	40 [1016]	15 [381]	13–1/2 [343]	8 [203]	3–1/2 [89]	3/4 [19]	12–3/8 [314]
1021, 1221, 1421	17 [432]	35–3/8 [899]	40 [1016]	15 [381]	13–1/2 [343]	9 [229]	11–1/2 [292]	2–3/4 [70]	12–3/8 [314]
1224, 1424	19 [483]	47–3/8 [1203]	50 [1270]	28 [711]	15 [381]	9 [229]	12 [305]	3–1/4 [83]	17 [432]

INLET	I
06XX	5–7/8 [149]
08XX	7–7/8 [200]
10XX	9–7/8 [251]
12XX	11–7/8 [302]
14XX	13–7/8 [352]

UNIT SIZE:
FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

DIMENSIONAL DATA

MODEL CFRQ-EH, SIZE 30, ARRANGEMENT 3

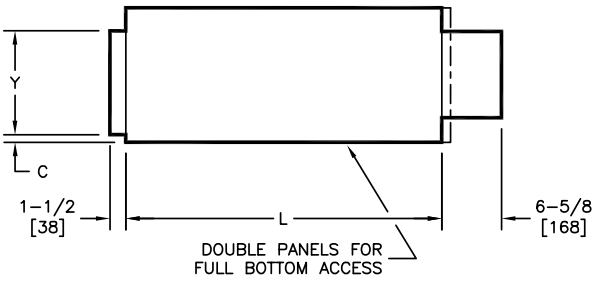


TOP VIEW

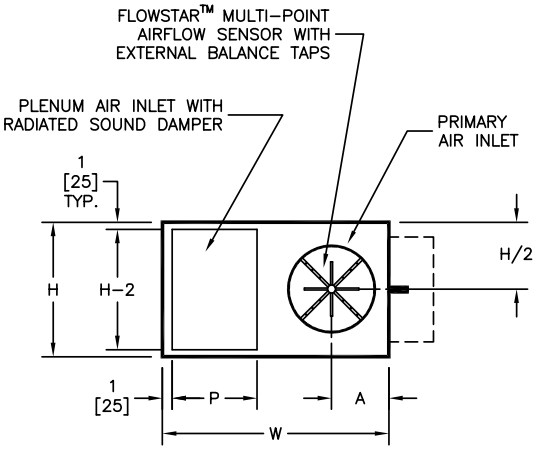
NOTES:
1. All dimensions are Inches [millimeters]. All dimensions are ±1/4" [6mm]. Metric values are soft conversion.
2. All drawings subject to change without prior notice.
3. Provide sufficient clearance to permit access to controls and comply with applicable codes and ordinances.
4. 1" [25mm] thick fiberglass TAW filter. See chart for sizes.
5. Inlet and outlet collars must be externally insulated in the field "by others", if required.
6. Units with internal insulation in the downstream ductwork should have insulation secured with no raw edges exposed to the airstream.
7. See drawing 33–80015 for arrangement details.

UNIT SIZE	FILTER SIZE	
	INCHES	[MM]
1230 Thru 1630	19 X 30 X 1	[483 X 762 X 25]

OPTION NOTES:
8. Double wall (DW) option increases "L" dim. 1–1/2" [38mm] and reduces inlet and discharge collar length by 3/4" [19mm].
9. Low temperature (LT) option provides a thermally isolated primary inlet. Inlet collar length is reduced by 3/4" [19mm].
10. Low temperature (LT) option is suitable for 46° F min. primary air and max. ambient conditions of 78° F and 60% RH.



SIDE VIEW



INLET END VIEW
(Filter not shown this view)

DIMENSIONS – In [mm]

UNIT SIZE	H	W	L	X	Y	A	B	C	P
1230	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	10 [254]	9–3/4 [248]	1–1/4 [32]	28 [711]
1430, 1630	19 [483]	52 [1321]	62 [1575]	40 [1016]	15 [381]	11–1/2 [292]	9–3/4 [248]	1–1/4 [32]	28 [711]

INLET	I
12XX	11–7/8 [302]
14XX	13–7/8 [352]
16XX	15–7/8 [403]

UNIT SIZE:
FIRST 2 DIGITS DENOTE PRIMARY INLET SIZE, SECOND 2 DIGITS DENOTE FAN AND CASING SIZE.

GENERAL SELECTION, PSC MOTOR

UNIT SIZE	CFM	MIN. ΔPs (IN. W.G.)	MAX E.S.P. (IN. W.G.)	ROOM NOISE CRITERIA (NC) DIS. RADIATED FAN ONLY	INLET ΔPs 0.5"	INLET ΔPs 1.0"	INLET ΔPs 3.0"
0606	200	0.07	0.86	--	20	22	28
	300	0.10	0.77	21	23	25	33
	350	0.14	0.71	27	25	27	35
	400	0.19	0.65	30	28	31	36
	450	0.23	0.58	32	30	32	38
	550	0.34	0.41	33	34	36	40
0806	300	0.03	0.77	21	23	25	33
	350	0.04	0.71	27	25	27	35
	400	0.05	0.65	30	28	31	36
	450	0.06	0.58	32	30	32	38
	550	0.09	0.41	33	34	36	40
0611	400	0.27	0.89	--	24	28	35
	500	0.40	0.87	21	28	33	37
0811	400	0.03	0.89	--	20	24	33
	500	0.05	0.87	21	23	27	35
	600	0.07	0.85	24	27	31	37
	800	0.11	0.80	25	32	35	40
1011	600	0.03	0.85	24	26	30	37
	800	0.06	0.80	25	33	36	41
0817	600	0.10	1.28	21	25	27	34
	700	0.14	1.26	24	26	28	35
	800	0.20	1.24	24	30	31	37
	1000	0.34	1.15	25	31	33	40
1017	600	0.04	1.28	21	23	25	34
	800	0.08	1.24	24	26	28	37
	1000	0.12	1.15	25	30	31	38
	1200	0.16	1.03	28	35	37	40
	1400	0.21	0.85	30	38	40	43
	1600	0.26	0.62	33	40	43	45
1217	800	0.04	1.24	24	27	28	37
	1000	0.07	1.15	25	28	30	39
	1200	0.10	1.03	28	32	33	40
	1400	0.13	0.85	30	37	38	41
	1600	0.16	0.62	33	41	41	43
	1800	0.18	0.34	36	45	45	46
0819	800	0.16	1.19	23	26	30	37
	900	0.21	1.18	25	28	31	38
	1000	0.27	1.18	26	30	32	40
1019	800	0.07	1.19	23	26	28	38
	1000	0.11	1.17	26	30	31	39
	1200	0.16	1.13	29	33	35	40
	1400	0.21	1.06	31	37	39	42
	1600	0.27	0.96	33	42	42	45
1219	800	0.04	1.19	23	22	26	36
	1000	0.07	1.17	26	26	27	38
	1200	0.11	1.13	29	31	32	40
	1400	0.14	1.06	31	36	36	41
	1600	0.18	0.96	33	39	40	43
	1800	0.23	0.84	35	42	42	45

UNIT SIZE	FAN HP LOW	FAN HP MED	FAN HP HI	AMPERAGE 115V LOW	AMPERAGE 115V MED	AMPERAGE 115V HI	AMPERAGE 208V LOW	AMPERAGE 208V MED	AMPERAGE 208V HI	AMPERAGE 277V LOW	AMPERAGE 277V MED	AMPERAGE 277V HI
0606	1/10	1/8	1/6	2.2	2.4	2.7	.55	.90	1.4	.8	.9	1.0
0806												
0611	1/8	1/5	1/4	3.7	4.1	4.9	1.1	1.5	2.2	1.4	1.7	2.0
0811												
1011												
0817	1/4	1/3	1/2	8.8	9.3	9.6	2.3	2.7	4.0	2.8	2.9	3.6
1017												
1217												
0819	1/3	1/2	3/4	9.4	10.3	10.5	2.5	3.2	4.2	3.6	3.7	4.3
1019												
1219												

See notes on following page. A web-based Computer Selection Program, "Web-Select", is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

GENERAL SELECTION, PSC MOTOR

UNIT SIZE	CFM	MIN. ΔPs (IN. W.G.)	MAX E.S.P. (IN. W.G.)	ROOM NOISE CRITERIA (NC) DIS. FAN ONLY	RADIATED INLET ΔPs 0.5"	RADIATED INLET ΔPs 1.0"	RADIATED INLET ΔPs 3.0"
1021	1000	0.09	1.14	28	25	28	38
	1200	0.12	1.09	31	27	31	40
	1400	0.16	1.02	34	31	35	41
	1600	0.21	0.93	35	33	36	43
1221	1000	0.05	1.14	28	23	26	38
	1200	0.08	1.09	31	27	28	40
	1400	0.11	1.02	34	30	32	41
	1600	0.15	0.93	35	33	36	42
	1800	0.20	0.82	38	35	37	42
1421	1200	0.09	1.09	31	26	30	39
	1400	0.11	1.02	34	28	32	40
	1600	0.14	0.93	35	32	33	41
	1800	0.18	0.82	38	35	36	41
	2000	0.21	0.67	39	37	38	42
1224	1200	0.06	1.20	31	31	32	38
	1400	0.08	1.16	34	33	33	40
	1600	0.10	1.06	35	35	36	41
	1800	0.13	0.90	36	37	38	42
	2000	0.16	0.72	39	40	41	45
1424	1400	0.09	1.16	34	27	30	40
	1600	0.11	1.06	35	30	32	40
	1800	0.14	0.90	36	32	35	41
	2000	0.17	0.72	39	36	37	42
	2200	0.20	0.54	41	38	39	43
	2400	0.25	0.35	43	41	41	46
1230	1500	0.05	0.85	20	30	31	38
	1900	0.09	0.78	22	33	35	40
	2300	0.12	0.68	26	38	38	43
1430	1500	0.05	0.85	20	30	31	38
	1900	0.07	0.78	22	35	36	41
	2300	0.10	0.68	26	37	38	43
	2700	0.13	0.56	30	40	40	46
	3100	0.18	0.40	35	42	43	50
1630	1500	0.02	0.85	20	30	31	38
	1900	0.04	0.78	22	32	35	40
	2300	0.06	0.68	26	36	38	42
	2700	0.08	0.56	30	38	40	45
	3100	0.10	0.40	35	41	42	47

UNIT SIZE	FAN HP LOW	FAN HP MED	FAN HP HI	AMPERAGE 115V LOW	AMPERAGE 115V MED	AMPERAGE 115V HI	AMPERAGE 208V LOW	AMPERAGE 208V MED	AMPERAGE 208V HI	AMPERAGE 277V LOW	AMPERAGE 277V MED	AMPERAGE 277V HI
1021	1/2	3/4	1.0	8.9	11.0	12.3	1.8	2.8	5.3	3.4	3.8	4.5
1221												
1421												
1224	1/2	3/4	1.0	8.9	11.3	12.3	1.8	2.8	5.3	3.4	3.8	4.5
1424												
1230	1/4 (2)	1/3 (2)	1/2 (2)	17.6	18.6	19.2	4.6	5.4	8.0	5.6	5.8	7.2
1430												
1630												

NOTES:

1. Min. ΔPs is the static pressure difference across the primary air valve with the damper wide open. All downstream losses (including optional hot water coil) are handled by the unit fan and need not be considered for primary air performance calculations.
2. Max. E.S.P. is the external static pressure available on high tap at the airflow capacity indicated. Optional hot water coil pressure loss is not included with these values.
3. Performance data obtained from tests conducted in accordance with AHRI Standard 880.
4. Dash (-) indicates NC level less than 20.
5. NC values are calculated using attenuation values provided in appendix E of AHRI 885-2008, as shown on the right.

DISCHARGE ATTENUATION VALUES	OCTAVE BAND 2	3	4	5	6	7
Small Box (< 300 CFM)	24	28	39	53	59	40
Medium Box (300-700 CFM)	27	29	40	51	53	39
Large Box (> 700 CFM)	29	30	41	51	52	39

RADIATED ATTENUATION VALUES	OCTAVE BAND 2	3	4	5	6	7
Type 2 - Mineral Fiber Ceiling	18	19	20	26	31	36

A web-based Computer Selection Program, "Web-Select", is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

SOUND POWER DATA

UNIT SIZE	CFM	DISCHARGE						RADIATED																					
		FAN ONLY						0.5" INLET ΔPs						1.0" INLET ΔPs						1.5" INLET ΔPs						3.0" INLET ΔPs					
		OCTAVE BAND NUMBER						OCTAVE BAND NUMBER						OCTAVE BAND NUMBER						OCTAVE BAND NUMBER						OCTAVE BAND NUMBER					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
0606	200	63	55	51	47	43	40	53	49	46	42	37	41	54	51	48	43	40	41							57	56	54	51	47	46
	300	68	57	54	52	48	45	56	53	49	42	38	41	58	56	51	44	40	41							62	60	58	51	47	46
	350	73	63	58	56	53	50	58	55	51	44	40	42	60	58	53	46	41	42							64	62	60	53	48	46
	400	75	66	61	59	56	54	60	58	54	47	41	42	62	60	56	48	42	43							66	64	61	54	48	47
	450	76	68	62	60	57	56	62	60	55	49	42	43	63	62	57	50	43	44							67	66	63	55	49	48
	550	77	70	64	63	59	58	65	63	59	52	46	44	66	65	60	53	47	45							69	68	65	57	51	49
0806	300	68	57	54	52	48	45	56	53	49	42	38	41	58	56	51	44	40	41	60	58	54	47	43	43	62	60	58	51	47	46
	350	73	63	58	56	53	50	58	55	51	44	40	42	60	58	53	46	41	42	62	60	56	49	44	44	64	62	60	53	48	46
	400	75	66	61	59	56	54	60	58	54	47	41	42	62	60	56	48	42	43	64	62	58	50	44	44	66	64	61	54	48	47
	450	76	68	62	60	57	56	62	60	55	49	42	43	63	62	57	50	43	44	64	64	59	52	45	44	67	66	63	55	49	48
	550	77	70	64	63	59	58	65	63	59	52	46	44	66	65	60	53	47	45	68	67	63	55	49	47	69	68	65	57	51	49
0611	400	66	56	55	53	49	48	59	55	50	44	33	29	61	58	54	46	40	37							65	62	60	54	49	47
	500	68	59	58	57	53	53	62	59	54	48	38	33	63	62	58	49	42	39							68	65	62	56	50	48
0811	400	66	56	55	53	49	48	56	52	46	38	32	32	58	55	50	43	37	37							62	59	58	53	47	47
	500	68	59	58	57	53	53	58	55	48	40	33	33	61	58	52	45	39	38							65	62	60	55	48	48
	600	70	61	60	57	54	53	60	58	51	43	35	35	63	61	54	47	40	39							67	65	62	56	49	49
	800	73	65	64	62	58	58	65	62	56	50	40	40	66	64	58	51	43	42							72	69	64	57	50	50
	900	77	68	66	65	62	62	68	66	59	54	45	46	70	68	61	56	47	47							74	72	67	60	52	52
1011	600	70	61	60	57	54	53	61	57	51	44	34	32	64	60	55	47	38	37	65	62	58	50	41	40	67	65	62	54	47	46
	800	73	65	64	62	58	58	66	63	57	50	40	40	69	65	59	51	42	41	70	67	61	53	45	44	72	70	65	57	49	48
	900	77	68	66	65	62	62	69	66	60	52	43	42	70	68	62	54	45	44	71	68	62	55	46	46	73	72	66	58	50	49
0817	600	68	58	57	54	49	45	59	56	48	43	37	34	61	58	51	45	40	36							65	63	59	53	47	45
	700	70	60	58	56	51	48	60	57	49	45	38	35	62	59	52	47	42	38							66	64	60	54	48	47
	800	71	61	60	57	53	51	62	60	52	48	41	37	64	61	54	49	44	40							68	66	62	55	50	48
	1000	73	64	63	60	57	56	63	61	55	51	43	39	68	63	57	52	47	43							70	69	64	57	51	50
1017	600	68	58	57	54	49	45	56	55	47	42	36	35	60	56	50	44	38	36							64	63	59	50	45	44
	800	71	61	60	57	53	51	59	57	49	45	38	36	62	59	52	47	41	39							66	66	59	51	47	45
	1000	73	64	63	60	57	56	62	60	52	48	41	37	63	61	54	49	43	40							67	67	61	53	48	47
	1200	75	68	66	63	60	60	66	64	56	51	44	40	67	66	57	52	46	43							69	69	63	55	50	49
	1400	77	70	68	66	63	63	68	67	59	55	47	43	70	69	61	56	48	44							72	72	65	59	52	51
	1600	79	73	70	69	66	66	69	69	61	56	49	45	71	72	63	57	50	46							73	73	66	60	53	51
1217	800	71	61	60	57	53	51	59	58	49	45	36	32	62	59	51	45	40	36	63	62	55	48	43	39	65	66	61	53	48	45
	1000	73	64	63	60	57	56	61	59	51	47	39	35	64	60	53	48	42	39	65	63	57	51	45	42	67	68	62	54	49	48
	1200	75	68	66	63	60	60	64	62	54	49	42	38	65	63	55	50	44	41	66	65	58	52	46	44	69	69	63	55	50	49
	1400	77	70	68	66	63	63	68	66	57	53	47	41	69	67	59	54	47	43	70	69	62	55	49	49	71	70	64	57	52	50
	1600	79	73	70	69	66	66	71	70	60	57	50	45	72	70	61	57	50	46	72	71	62	58	52	48	73	72	65	59	54	52
	1800	80	76	72	72	69	69	74	73	63	60	54	50	74	73	64	60	54	50	74	73	65	61	55	52	75	74	67	62	56	54
0819	800	71	61	60	57	54	52	62	57	51	46	40	38	63	60	53	48	44	41							68	66	61	54	50	48
	900	73	62	61	59	55	54	63	59	53	48	42	38	65	61	56	50	45	42							69	67	62	55	51	49
	1000	74	63	63	61	58	57	65	60	54	50	44	40	67	62	57	51	46	43							71	69	63	56	52	50
1019	800	71	61	60	57	54	52	60	57	48	44	37	32	62	59	52	46	41	38							65	67	61	52	48	47
	1000	74	63	63	61	58	57	63	60	52	46	40	34	63	61	54	48	44	40							68	68	62	54	49	49
	1200	76	66	66	64	61	61	65	63	54	49	42	38	66	64	56	50	45	41							70	69	63	56	50	50
	1400	78	69	68	67	64	64	68	66	57	51	45	43	70	68	59	53	48	44							72	71	64	57	51	51
	1600	79	72	70	70	67	68	71	71	60	56	49	47	73	71	62	56	50	48							74	73	67	60	54	53
1219	800	71	61	60	57	54	52	58	54	46	44	37	32	61	57	50	46	41	37	62	60	54	49	44	41	64	65	61	53	49	47
	1000	74	63	63	61	58	57	60	57	48	45	38	33	62	58	51	47	42	39	64	61	55	49	45	42	66	67	62	54	50	48
	1200	76	66	66	64	61	61	63	61	52	47	41	35	65	62	54	48	44	41	66	65	57	51	47	44	69	69	63	55	51	49
	1400	78	69	68	67	64	64	67	65	55	50	45	39	66	65	56	50	46	43	68	67	59	52	48	46	70	70	64	56	52	50
	1600	79	72	70	70	67	68	69	68	58	53	47	42	70	69	59	53	49	47	71	70	61	54	50	49	72	72	65	57	53	52
	1800	81	74	72	73	69	71	72	71	61	57	50	43	73	71	61	58	51	48	73	72	63	58	52	50	73	73	66	58	54	53

NOTES:

- Data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10^{12} Watts.
- Fan external static pressure is 0.25 inches w.g.
- Duct end corrections included in sound power levels per AHRI Standard 880.
- Certified AHRI data is highlighted blue. Application data (not highlighted blue) is outside the scope of the certification program.

SOUND POWER DATA

UNIT SIZE	CFM	DISCHARGE						RADIATED																					
		FAN ONLY						0.5" INLET ΔPs						1.0" INLET ΔPs						1.5" INLET ΔPs						3.0" INLET ΔPs					
		OCTAVE BAND NUMBER						OCTAVE BAND NUMBER						OCTAVE BAND NUMBER						OCTAVE BAND NUMBER						OCTAVE BAND NUMBER					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1021	1000	75	63	63	61	57	55	61	56	49	45	37	32	63	59	52	47	40	37							68	67	62	55	49	49
	1200	78	68	67	65	62	61	63	58	52	47	40	34	66	61	54	49	43	38							70	69	63	55	50	50
	1400	80	71	69	69	66	65	65	61	55	50	43	38	67	64	57	52	45	42							72	70	63	56	51	52
	1600	81	73	72	71	69	69	66	63	57	52	46	42	69	65	59	54	48	45							74	72	64	58	52	53
1221	1000	75	63	63	61	57	55	60	54	49	45	39	32	61	57	51	47	41	39							66	67	62	55	49	49
	1200	78	68	67	65	62	61	63	58	50	47	41	37	64	59	53	48	44	41							68	69	63	55	50	50
	1400	80	71	69	69	66	65	64	60	53	49	43	39	66	62	55	50	46	43							69	70	63	56	51	52
	1600	81	73	72	71	69	69	67	63	56	52	46	42	69	65	57	53	48	44							70	71	64	57	52	53
	1800	83	76	74	74	71	71	68	64	58	53	48	44	70	66	59	55	49	46							72	71	65	58	54	54
1421	1200	78	68	67	65	62	61	62	57	50	46	40	36	63	60	53	48	43	40	64	63	56	51	46	43	66	68	62	55	50	49
	1400	80	71	69	69	66	65	63	59	52	48	42	39	64	62	56	50	46	42	65	65	59	52	48	45	67	69	63	56	51	50
	1600	81	73	72	71	69	69	65	62	55	51	45	42	66	63	56	51	47	44	67	66	59	53	49	47	69	70	64	57	52	51
	1800	83	76	74	74	71	71	68	64	57	53	48	44	68	65	58	54	49	46	69	67	61	56	50	48	70	70	65	58	53	52
	2000	84	79	76	76	74	74	70	66	60	55	50	47	71	67	60	56	51	49	72	68	62	57	52	50	73	71	65	58	54	53
	2100	85	80	77	77	74	74	70	66	60	56	50	48	71	68	61	56	51	50	73	70	64	61	54	51	73	71	65	58	54	53
1224	1200	78	66	65	64	61	60	67	55	50	45	40	35	68	58	53	46	42	39							70	67	62	54	49	49
	1400	80	69	68	68	65	64	69	58	53	48	43	38	69	60	55	50	45	41							72	69	63	56	51	50
	1600	81	72	71	71	68	68	70	61	56	52	47	40	71	63	57	53	48	42							73	70	64	57	52	51
	1800	82	75	73	73	70	70	72	64	58	54	49	42	73	66	59	55	50	45							76	71	65	59	54	52
	2000	84	76	74	75	72	72	74	66	60	56	51	44	75	68	61	57	53	47							78	73	66	61	56	53
1424	1400	80	69	68	68	65	64	64	57	52	48	41	35	66	60	54	50	43	38							69	69	63	56	49	48
	1600	81	72	71	71	68	68	66	60	54	51	44	38	67	62	56	52	46	40							70	69	63	57	50	48
	1800	82	75	73	73	70	70	68	62	56	53	47	42	69	64	57	54	48	43							72	70	64	58	52	49
	2000	84	76	74	75	72	72	70	65	59	56	50	44	71	66	60	57	51	45							74	71	64	59	53	49
	2200	86	78	76	77	74	74	72	67	61	59	53	47	73	68	62	59	53	48							76	72	65	60	55	50
	2400	87	80	77	79	76	76	74	70	63	61	56	50	75	70	63	61	56	51							77	74	66	62	57	53
1230	1500	64	63	60	57	52	49	64	60	52	43	35	34	65	61	54	45	39	35							73	66	62	52	44	40
	1900	67	65	63	60	56	55	65	63	54	47	39	35	67	64	56	46	41	38							74	68	64	54	47	43
	2300	70	68	66	63	60	60	70	67	59	51	43	39	71	67	60	52	44	40							77	71	66	56	50	46
1430	1500	64	63	60	57	52	49	65	60	52	44	35	34	66	61	53	45	35	33							73	66	60	50	39	35
	1900	67	65	63	60	56	55	68	64	55	47	36	35	70	65	57	48	38	34							75	68	62	52	40	36
	2300	70	68	66	63	60	60	69	66	57	50	42	38	71	67	59	51	43	39							77	71	66	56	46	43
	2700	73	71	70	68	64	65	72	69	60	53	45	41	74	69	62	54	48	44							79	73	67	58	51	48
	3100	76	75	73	72	68	69	76	71	63	56	49	46	76	72	64	57	50	46							82	76	69	60	53	50
1630	1500	64	63	60	57	52	49	62	60	49	42	34	31	64	61	52	45	40	37	67	63	56	48	43	41	72	67	62	53	49	48
	1900	67	65	63	60	56	55	67	62	54	46	35	32	69	64	56	48	42	38	71	66	59	50	45	42	74	69	63	54	50	49
	2300	70	68	66	63	60	60	69	65	57	50	40	35	71	67	58	51	44	39	73	68	61	53	47	43	76	71	66	56	51	49
	2700	73	71	70	68	64	65	71	67	59	52	45	40	73	69	61	53	46	42	75	70	63	54	49	45	78	72	66	57	53	50
	2800	75	73	71	70	66	66	72	68	60	52	46	42	74	70	62	54	48	44	76	71	64	56	49	45	78	73	66	58	53	50
	3100	76	75	73	72	68	69	73	70	61	54	48	44	75	71	63	55	49	44	77	72	65	56	51	47	80	75	68	59	54	51

See notes on previous page.

AHRI STANDARD RATINGS

SIZE	PRIMARY AIRFLOW RATE (CFM)	FAN AIRFLOW RATE (CFM)	ELECTRICAL POWER INPUT (WATTS)	MINIMUM SUPPLY OPERATING PRESSURE (IN. W.G.)	STANDARD RATINGS - SOUND POWER LEVEL, DB RE: 1 X 10-12 WATTS																	
					RADIATED												DISCHARGE					
					FAN ONLY						1.5" WTR. STATIC PRESSURE						FAN ONLY					
					HZ OCTAVE BAND CENTER FREQUENCY						HZ OCTAVE BAND CENTER FREQUENCY						HZ OCTAVE BAND CENTER FREQUENCY					
					125	250	500	1000	2000	4000	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
0806	550	550	175	0.09	65	61	55	49	42	42	68	67	63	55	49	47	77	70	64	63	59	58
1011	900	900	370	0.11	68	65	60	54	46	47	71	68	62	55	46	46	77	68	66	65	62	62
1217	1400	1400	720	0.13	69	64	58	56	50	48	70	69	62	55	49	49	77	70	68	66	63	63
1219	1600	1600	800	0.18	69	69	60	58	54	52	71	70	61	54	50	49	79	72	70	70	67	68
1421	2100	2100	1050	0.25	75	73	64	62	57	58	73	70	64	61	54	51	85	80	77	77	74	74
1630	2800	2800	960	0.09	72	69	61	55	51	49	76	71	64	56	49	45	75	73	71	70	66	66

NOTE: Based on standard PSC motor.

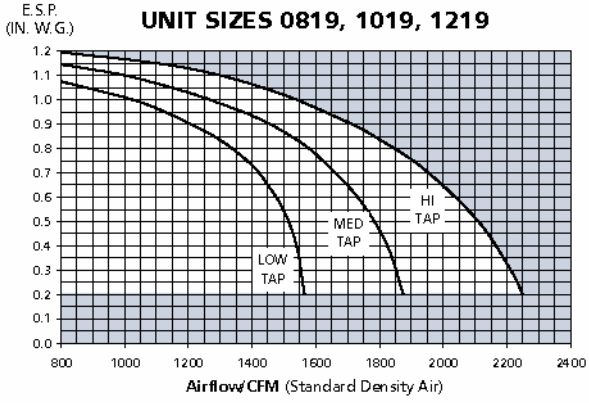
- Duct end corrections included in sound power levels per AHRI Standard 880.

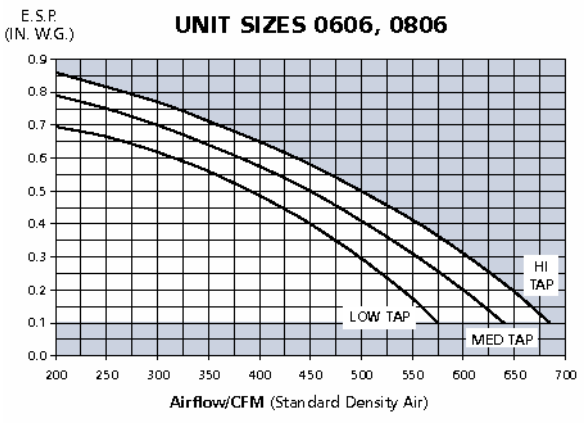
AHRI CERTIFIED®
www.ahridirectory.org
VAV Terminals
AHRI Standard 880

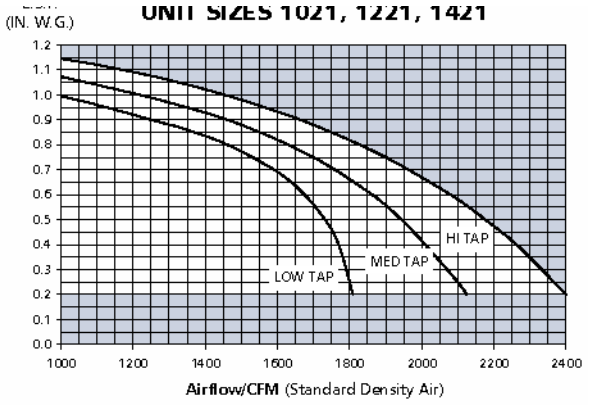
FAN PERFORMANCE, PSC MOTOR

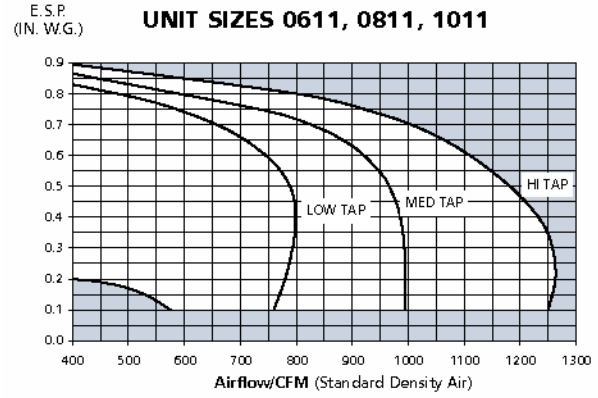
General Fan Note

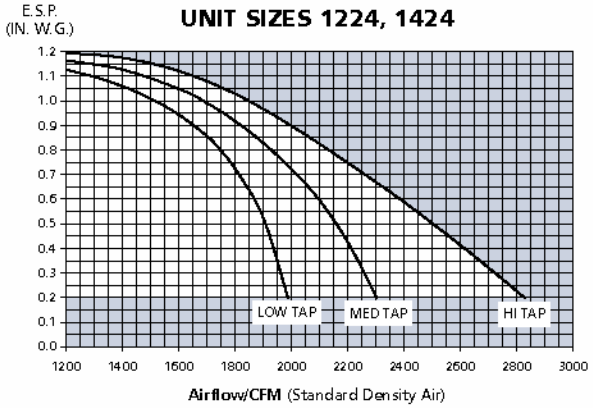
The fan curves depicted on this page are for PSC type motors. Each fan curve depicts the actual performance for the relative motor tap without any additional fan balance adjustment. Actual specified capacities which fall below a particular fan curve (LOW, MED or HI) can be obtained by adjustment of the electronic fan speed controller. Selections should only be made in the non-shaded areas. The minimum external static pressure requirement is shown for each fan assembly. The unit fan should not be energized prior to realizing this minimum external static pressure.

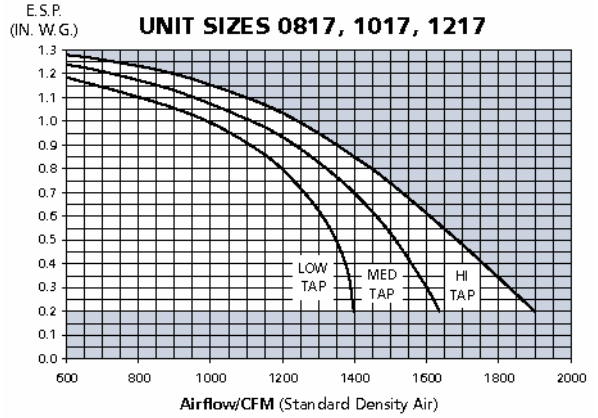


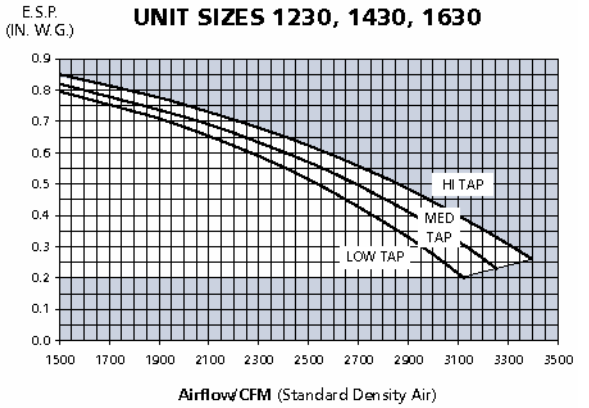












NOTE:
Terminals equipped with a hot water heating coil require the addition of the coil pressure drop to the specified external static pressure before making the fan selection.

EC FAN MOTOR OPTION

ENVIRO-TEC® offers an alternative to the PSC motor that significantly increases the operating efficiency of fan terminal units. This motor is frequently referred to as an ECM (electronically commutated motor). It is a brushless DC (BLDC) motor utilizing a permanent magnet rotor. The motor has been in production for years and is commonly used in residential HVAC units. Fan speed control is accomplished through a microprocessor based variable speed controller (inverter) integral to the motor. The motor provides peak efficiency ratings between 70 & 80% for most applications.

ECM FEATURES AND BENEFITS

Ultra-High Motor & Controller Energy Efficiency DC motors are significantly more efficient than AC motors. At full load the ECM is typically 20% more efficient than a standard induction motor. Due to acoustical considerations, the fan motor on a fan powered terminal typically operates considerably less than full load. At this condition the overall motor/controller (SCR) efficiency can be cut in half. Due to the permanent magnet, DC design, the ECM maintains a high efficiency at low speeds. Most fan powered unit selections will have an overall efficiency greater than 75%. Furthermore, the motor heat gain is greatly reduced providing additional energy savings by reducing the cold primary air requirement.

Pressure Independent Fan Volume
The integral microprocessor based controller includes a feature that provides sensorless (no external feedback) constant airflow operation by automatically adjusting the speed and torque in response to system pressure changes. This breakthrough will no doubt have far reaching benefits and endless applications. For starters, the fan volume supplied to the space will not significantly change as a filter becomes loaded. This provides new opportunities for medical applications where space pressurization and HEPA filters are applied. The air balance process will become simpler and more accurate since the fan volume will not need to be re-adjusted after the diffuser balance is accomplished.

Factory Calibrated Fan Volume
Due to the pressure independent feature, the fan capacity can now be calibrated at the factory. Within the published external pressure limits, the fan motor will automatically adjust to account for the varying static pressure requirements associated with different downstream duct configurations. This feature should not preclude the final field air balance verification process during the commissioning stage of a project. An electronic (PWM) speed control device is provided to allow field changes of the fan capacity as the need arises. Fan volume can be field calibrated in two fashions. First, a potentiometer is provided allowing manual adjustment using an instrument type screwdriver. In addition, the fan volume can be calibrated through the BMS using an analog output (2 to 10VDC typical) to the speed controller. A fan volume verses DC volts calibration chart is provided.

Designer / Owner Flexibility
The ECM incorporates ball bearings in lieu of sleeve bearings typically utilized with an induction motor. Unlike a sleeve bearing motor, the ECM does not have a minimum RPM requirement for bearing lubrication. This allows it to operate over a much wider speed range. One motor can handle the capacity range previously handled by two motors, allowing simplification of the product line and considerable flexibility to the designer. The owner also benefits since equipment changes are much less likely with tenant requirement changes. A reduced spare parts inventory is another plus.

Custom Applications — Programmable Fan Operation
Boundless control opportunities arise due to the controllability of a DC motor combined with an integral microprocessor. Various input signals can direct the motor to behave in an application specific mode. For instance, multiple discrete fan capacities can be achieved. In addition, the fan speed can be varied in response to the space temperature load. The fan can also be programmed for a soft start. The motor starts at a very low speed and slowly ramps up to the required speed. This is especially beneficial for parallel flow fan terminals since the perceived change in space sound levels is lessened.

Extended Motor Life
The high motor efficiency provides a significantly reduced operating temperature compared to an induction motor. The lower temperature increases the longevity of all electrical components and therefore the life of the motor. The ball bearings do not require lubrication and do not adversely impact the motor life. Most fan powered applications will provide a motor life between 60,000 and 100,000 hours. A motor life of twenty five years will not be uncommon for a series flow fan terminal and a longer life can be expected for a parallel flow unit.

GENERAL SELECTION EC MOTOR

UNIT SIZE	CFM	MIN. ΔPs[1] (IN W.G.)	PROJECTED ROOM NOISE CRITERION (NC)[2] DIS. FAN ONLY	RADIATED 0.5" INLET ΔPs	RADIATED 1.0" INLET ΔPs	RADIATED 3.0" INLET ΔPs	FAN HP	VOLTS	FLA[3]	3-PHASE[4] NEUTRAL AMPS
0611	400	0.27	19	24	28	35	1/3	120	5.0	N/A
	500	0.40	22	28	33	37				
0811	400	0.03	19	20	24	33				
	500	0.05	21	23	27	35				
	600	0.07	24	27	31	37				
	800	0.11	25	32	35	40				
	900	0.14	33	35	37	42		277	2.6	5.4
1011	600	0.03	24	26	30	37				
	800	0.06	25	33	36	41				
	900	0.08	33	35	38	43				
0819	800	0.16	23	26	30	37	1/2	120	7.7	N/A
	900	0.21	25	28	31	38				
	1000	0.27	26	30	32	40				
1019	800	0.07	23	26	28	38				
	1000	0.11	26	30	31	39				
	1200	0.16	29	33	35	40				
	1400	0.21	31	37	39	42				
1219	800	0.04	23	22	26	36		277	4.1	7.2
	1000	0.07	26	26	27	38				
	1200	0.11	29	31	32	40				
	1400	0.14	31	36	36	41				
1021	1200	0.12	31	27	31	40	3/4	120[5]	9.6	N/A
	1400	0.16	34	31	35	41				
	1600	0.21	35	33	36	43				
1221	1200	0.08	31	27	28	40				
	1400	0.11	34	30	32	41				
	1600	0.15	35	33	36	42				
	1800	0.20	38	35	37	42				
1421	1200	0.09	31	26	30	39		277	5.5	10.9
	1400	0.11	34	28	32	40				
	1600	0.14	35	32	33	41				
	1800	0.18	38	35	36	41				
	2000	0.21	39	37	38	42				
1224	1400	0.08	34	33	33	40	1	120[5]	12.8	N/A
	1600	0.10	35	35	36	41				
	1800	0.13	38	37	38	42				
	2000	0.16	39	40	41	45				
1424	1400	0.09	34	27	30	40				
	1600	0.11	35	30	32	40				
	1800	0.14	38	32	35	41				
	2000	0.17	39	36	37	42		277	6.9	13.3
	2200	0.20	41	38	39	43				
	2350	0.24	43	40	41	45				

Most variable speed electronic devices, including the ECM™ operate with a rectified and filtered AC power. As a result of the power conditioning, the input current draw is not sinusoidal; rather, the current is drawn in pulses at the peaks of the AC voltage. This pulsating current includes high frequency components called harmonics.

Harmonic currents circulate on the delta side of a Delta-Wye distribution transformer. On the Wye side of the transformer, these harmonic currents are additive on the neutral conductor. A transformer used in this type of application must be sized to carry the output KVA that will include the KVA due to circulating currents.

Careful design must be provided when connecting single-phase products to three-phase systems to avoid potential problems such as overheating of neutral wiring conductors, connectors, and transformers. In addition, design consideration must be provided to address the degradation of power quality by the creation of wave shape distortion.

In summary, proper consideration must be given to the power distribution transformer selection and ground neutral conductor design to accommodate the 3-phase neutral AMPs shown in the adjacent table. Specific guidelines are available from the factory.

NOTES:

1. Min. ΔPs is the static pressure difference across the primary air valve with the damper wide open. All downstream losses (including optional hot water coil) are handled by the unit fan and need not be considered for primary air performance calculations. Data is certified in accordance with the AHRI 880 certification program.
2. NC values are calculated using attenuation values provided in appendix E of AHRI 885-2008, as shown on the right.
3. Calculate wire feeder size and maximum over-current protective device per NEC and local code requirements. Recommended fuse type shall be UL Class RK5, J, CC or other motor rated fuse.
4. Neutral harmonic current contribution for each 3-phase balanced load of motors at full speed.
5. Includes factory provided 2mH choke for power factor correction.

DISCHARGE ATTENUATION VALUES	OCTAVE BAND 2	3	4	5	6	7
Small Box (< 300 CFM)	24	28	39	53	59	40
Medium Box (300-700 CFM)	27	29	40	51	53	39
Large Box (> 700 CFM)	29	30	41	51	52	39

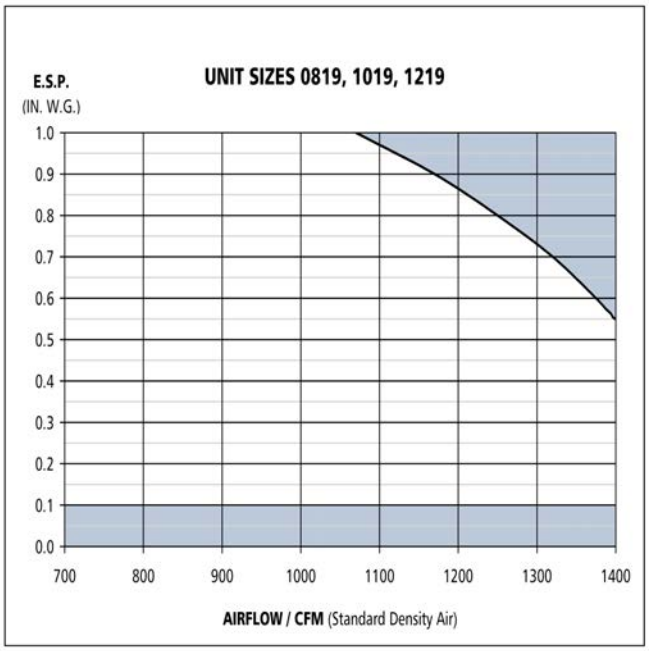
RADIATED ATTENUATION VALUES	OCTAVE BAND 2	3	4	5	6	7
Type 2 - Mineral Fiber Ceiling	18	19	20	26	31	36

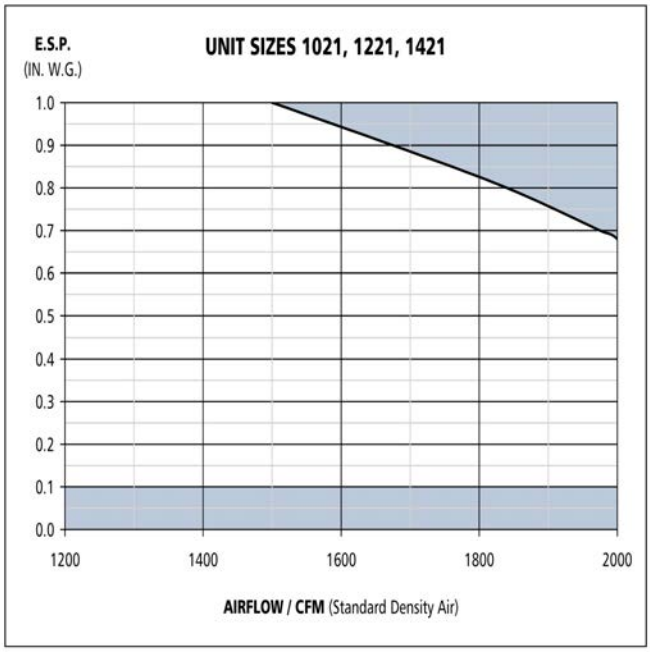
FAN PERFORMANCE EC MOTOR

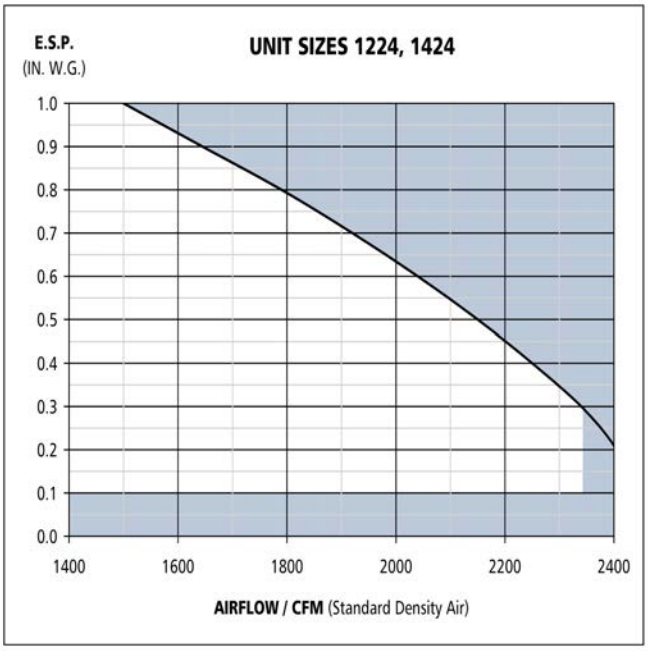
General Fan Note

The fan curves depicted on this page are for ECM type motors. Actual specified capacities which fall below the fan curve can be obtained by adjustment of the fan speed controller. Selections should only be made in the non-shaded areas. The minimum external static pressure requirement is shown for each fan assembly. The unit fan should not be energized prior to realizing this minimum external static pressure.

Terminals equipped with a hot water heating coil require the addition of the coil pressure drop to the specified external static pressure before making the fan selection.







ELECTRIC HEAT

MODEL CFRQ-EH

Standard Features
- cETL Listed as an assembly for safety compliance per UL 1995
- Primary auto-reset high limit
- Secondary high limit
- Hinged control panel
- Ni-Chrome elements
- Primary/secondary power terminations
- Fusing per NEC
- Wiring diagram and ETL label
- Fan interlock device (relay or P.E. switch)
- Single point power connection
- Available kW increments are as follows: 0.5 to 5.0 kW - .25 kW; 5.0 to 10.0 kW - .50 kW; Above 10 kW - 1.0 kW.

Optional Features
- Disconnect (toggle or door interlocking)
- P.E. switches
- Magnetic contactors
- Manual reset secondary limit
- Proportional control (SSR)
- 24 volt control transformer
- Airflow switch

UNIT SIZE	MAX CFM	MAX KW
0606, 0611	550	7
0806	700	10
0811, 0817, 0819	1000	14
1011	1200	17
1017, 1019, 1021	1600	20
1217, 1219, 1221	1800	20
1224	2000	20
1421	2000	25
1424	2400	25
1230	2300	20
1430, 1630	3100	30

Selection Procedure

With standard heater elements, the maximum capacity (KW) is obtained by dividing the heating (fan) SCFM by 70. In other words, the terminal must have at least 70 SCFM per KW. In addition, each size terminal has a maximum allowable KW based upon the specific heater element configuration (i.e. voltage, phase, number of steps, etc.). Contact your ENVIRO-TEC representative or refer to the web-based Computer Selection Program, "Web-Select."

Heaters require a minimum of 0.07" w.g. downstream static pressure to ensure proper operation.

For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity which provides higher air motion in the space increasing thermal comfort. The electric heater should be selected with this in mind, keeping the LAT as low as possible.

Selection Equations

$$kW = \frac{SCFM \times \Delta T \times 1.085^*}{3413}$$

$$CFM = \frac{kW \times 3413}{\Delta T \times 1.085^*}$$

$$\Delta T = \frac{kW \times 3413}{SCFM \times 1.085^*}$$

** Air density at sea level - reduce by 0.036 for each 1000 feet of altitude above sea level.*

Calculating Line Amperage

$$\text{Single Phase Amps} = \frac{kW \times 1000}{Volts}$$

$$\text{Three Phase Amps} = \frac{kW \times 1000}{Volts \times 1.73}$$

HOT WATER COIL DATA

MODEL CFRQ-WC

Standard Features
- Coils are designed, manufactured and tested by ENVIRO-TEC
- Aluminum fin construction with die-formed spacer collars for uniform spacing
- Mechanically expanded copper tubes, leak test ed to 450 PSIG air pressure and rated at 450 PSIG working pressure at 200°F
- 1, 2, 3 and 4 row configurations
- Male sweat type water connections
- Top and bottom access plates in coil casing for fan sizes 06 through 24. Coil access through bottom casing panel for fan size 30.

Optional Features
- Steam coils
- Multi-circuit coils for reduced water pressure drop
- Opposite hand water connections

Definition of Terms

EAT Entering Air Temperature (°F)
LAT Leaving Air Temperature (°F)
EWT Entering Water Temperature (°F)
LWT Leaving Water Temperature (°F)
CFM Air Capacity (Cubic Feet per Minute)
GPM Water Capacity (Gallons per Minute)
MBH 1,000 BTUH
BTUH Coil Heating Capacity (British Thermal Units per Hour)
ΔT EWT minus EAT

Selection Procedure

Hot Water Coil Performance Tables are based upon a temperature difference of 115°F between entering water and entering air. If this ΔT is suitable, proceed directly to the performance tables for selection. All pertinent performance data is tabulated.

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	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.47	0.51	0.55	0.59	0.63	0.67	0.71
ΔT	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155
FACTOR	0.75	0.79	0.83	0.88	0.92	0.96	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 and entering air temperatures). 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 and leaving water temperatures 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 web-based Computer Selection Program, "Web-Select", is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

HOT WATER COIL DATA

MODEL CFRQ - WC UNIT SIZES 0606, 0806, 0611, 0811, 1011

AIRFLOW		WATER FLOW			LAT (°F)		LWT (°F)		CAPACITY (MBH)	
RATE (CFM)	AIR PD (IN. W.G.)	RATE (GPM)	WATER PD (FT. W.G.)							
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
200	1 ROW 0.01 2 ROW 0.02	0.5	0.4	0.1	107.4	124.1	142.5	127.8	9.2	12.8
		1	1.2	0.4	114.1	136.1	158.2	148.5	10.6	15.4
		2	4.4	1.2	118.4	143.5	168.1	162.5	11.6	17.0
		3	9.2	2.6	120.0	146.3	171.8	167.9	11.9	17.6
		4	15.5	4.4	120.9	147.7	173.8	170.8	12.1	17.9
		5	-	6.6	-	148.6	-	172.6	-	18.1
300	1 ROW 0.02 2 ROW 0.03	0.5	0.4	0.1	98.5	111.3	135.5	118.7	10.9	15.1
		1	1.2	0.4	105.3	124.0	153.2	140.8	13.1	19.2
		2	4.4	1.2	109.7	132.6	165.1	157.5	14.5	22.0
		3	9.2	2.6	111.5	136.0	169.6	164.2	15.1	23.1
		4	15.5	4.4	112.5	137.8	172.1	167.8	15.4	23.7
		5	-	6.6	-	139.0	-	170.1	-	24.0
400	1 ROW 0.03 2 ROW 0.06	0.5	0.4	0.1	93.0	103.2	130.5	112.7	12.1	16.5
		1	1.2	0.4	99.5	115.6	149.4	135.2	14.9	21.9
		2	4.4	1.2	104.0	124.8	162.7	153.5	16.9	25.9
		3	9.2	2.6	105.8	128.5	167.9	161.2	17.7	27.5
		4	15.5	4.4	106.8	130.5	170.7	165.4	18.1	28.4
		5	-	6.6	-	131.8	-	168.1	-	28.9
500	1 ROW 0.04 2 ROW 0.08	0.5	0.4	0.1	89.1	97.5	126.7	108.5	13.1	17.6
		1	1.2	0.4	95.4	109.4	146.4	130.9	16.4	24.0
		2	4.4	1.2	99.8	118.7	160.6	150.2	18.9	29.1
		3	9.2	2.6	101.7	122.6	166.4	158.7	19.9	31.2
		4	15.5	4.4	102.7	124.8	169.5	163.4	20.4	32.4
		5	-	6.6	-	126.2	-	166.4	-	33.1
600	1 ROW 0.06 2 ROW 0.12	0.5	0.4	0.1	86.2	93.3	123.7	105.3	13.8	18.4
		1	1.2	0.4	92.2	104.6	143.8	127.5	17.7	25.7
		2	4.4	1.2	96.6	113.9	158.9	147.5	20.6	31.8
		3	9.2	2.6	98.5	117.9	165.1	156.5	21.7	34.4
		4	15.5	4.4	99.5	120.2	168.5	161.6	22.4	35.9
		5	-	6.6	-	121.6	-	164.9	-	36.8
700	1 ROW 0.08 2 ROW 0.15	0.5	0.4	0.1	84.0	90.1	121.2	102.8	14.4	19.0
		1	1.2	0.4	89.7	100.8	141.7	124.7	18.7	27.1
		2	4.4	1.2	94.0	110.0	157.4	145.1	22.0	34.1
		3	9.2	2.6	95.9	114.1	164.0	154.6	23.4	37.2
		4	15.5	4.4	96.9	116.4	167.6	160.0	24.2	38.9
		5	-	6.6	-	117.9	-	163.5	-	40.1
800	1 ROW 0.10 2 ROW 0.19	0.5	0.4	0.1	82.2	87.5	119.1	100.8	14.9	19.5
		1	1.2	0.4	87.7	97.7	139.8	122.3	19.7	28.3
		2	4.4	1.2	91.9	106.7	156.1	143.1	23.3	36.1
		3	9.2	2.6	93.7	110.8	163.0	152.9	24.9	39.7
		4	15.5	4.4	94.7	113.1	166.8	158.6	25.8	41.7
		5	-	6.6	-	114.6	-	162.3	-	43.0
900	1 ROW 0.12 2 ROW 0.24	0.5	0.4	0.1	80.8	85.4	117.4	99.1	15.4	19.9
		1	1.2	0.4	86.0	95.1	138.1	120.3	20.5	29.3
		2	4.4	1.2	90.1	103.9	154.9	141.3	24.5	37.9
		3	9.2	2.6	91.9	108.0	162.0	151.4	26.2	41.9
		4	15.5	4.4	92.9	110.3	166.0	157.4	27.2	44.2
		5	-	6.6	-	111.9	-	161.3	-	45.7
1000	1 ROW 0.14 2 ROW 0.29	0.5	0.4	0.1	79.6	83.7	115.8	97.7	15.8	20.3
		1	1.2	0.4	84.6	92.9	136.7	118.5	21.2	30.2
		2	4.4	1.2	88.6	101.5	153.8	139.6	25.6	39.5
		3	9.2	2.6	90.4	105.5	161.2	150.0	27.5	43.9
		4	15.5	4.4	91.4	107.9	165.3	156.2	28.6	46.5
		5	-	6.6	-	109.4	-	160.3	-	48.1
1100	1 ROW 0.17 2 ROW 0.34	0.5	0.4	0.1	78.5	82.3	114.4	96.5	16.1	20.6
		1	1.2	0.4	83.3	91.0	135.4	116.9	21.9	31.0
		2	4.4	1.2	87.3	99.4	152.8	138.2	26.6	40.9
		3	9.2	2.6	89.0	103.4	160.4	148.8	28.6	45.7
		4	15.5	4.4	90.0	105.7	164.7	155.1	29.8	48.5
		5	-	6.6	-	107.3	-	159.3	-	50.4

NOTES:

1. Data is based on 180°F entering water and 65°F entering air temperature at sea level. See selection procedure for other conditions.
2. For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the LAT as low as possible.

HOT WATER COIL DATA

MODEL CFRQ - WC UNIT SIZES 0817, 1017, 1217, 0819, 1019, 1219, 1021, 1221, 1421

AIRFLOW		WATER FLOW			LAT (°F)		LWT (°F)		CAPACITY (MBH)	
RATE (CFM)	AIR PD (IN. W.G.)	RATE (GPM)	WATER PD (FT. W.G.)							
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
700	1 ROW 0.04 2 ROW 0.09	0.5	0.4	0.1	86.4	92.7	113.8	94.8	16.3	21.0
		1	1.4	0.4	93.2	105.2	136.3	118.0	21.4	30.5
		2	4.9	1.4	98.4	115.7	154.1	140.7	25.3	38.5
		3	10.3	2.9	100.5	120.4	161.6	151.3	26.9	42.0
		4	17.4	4.9	101.7	122.9	165.7	157.5	27.8	43.9
		5	-	7.4	-	124.6	-	161.5	-	45.2
800	1 ROW 0.05 2 ROW 0.11	0.5	0.4	0.1	84.4	89.8	111.5	92.6	16.8	21.5
		1	1.4	0.4	91.0	101.7	134.1	115.2	22.5	31.8
		2	4.9	1.4	96.0	112.2	152.5	138.2	26.9	40.9
		3	10.3	2.9	98.2	116.9	160.4	149.3	28.7	44.9
		4	17.4	4.9	99.3	119.5	164.7	155.8	29.8	47.2
		5	-	7.4	-	121.2	-	160.0	-	48.7
1000	1 ROW 0.08 2 ROW 0.16	0.5	0.4	0.1	81.4	85.6	107.7	89.4	17.8	22.3
		1	1.4	0.4	87.4	96.4	130.4	110.9	24.3	34.0
		2	4.9	1.4	92.3	106.5	149.7	134.1	29.6	44.9
		3	10.3	2.9	94.4	111.2	158.2	145.9	31.9	50.0
		4	17.4	4.9	95.6	113.9	163.0	152.9	33.1	53.0
		5	-	7.4	-	115.7	-	157.5	-	54.9
1200	1 ROW 0.11 2 ROW 0.23	0.5	0.4	0.1	79.2	82.6	104.8	87.1	18.5	22.9
		1	1.4	0.4	84.8	92.4	127.4	107.5	25.8	35.7
		2	4.9	1.4	89.5	102.1	147.4	130.8	31.9	48.2
		3	10.3	2.9	91.6	106.7	156.4	143.0	34.5	54.2
		4	17.4	4.9	92.7	109.5	161.5	150.4	36.1	57.8
		5	-	7.4	-	111.3	-	155.3	-	60.1
1400	1 ROW 0.15 2 ROW 0.30	0.5	0.4	0.1	77.6	80.4	102.5	85.3	19.1	23.4
		1	1.4	0.4	82.8	89.4	124.9	104.9	27.0	37.0
		2	4.9	1.4	87.3	98.6	145.4	128.1	33.8	50.9
		3	10.3	2.9	89.3	103.1	154.8	140.6	36.9	57.9
		4	17.4	4.9	90.5	105.9	160.2	148.3	38.6	62.0
		5	-	7.4	-	107.7	-	153.5	-	64.7
1600	1 ROW 0.19 2 ROW 0.38	0.5	0.4	0.1	76.3	78.7	100.6	83.9	19.5	23.7
		1	1.4	0.4	81.2	87.0	122.9	102.7	28.0	38.0
		2	4.9	1.4	85.5	95.7	143.7	125.7	35.5	53.2
		3	10.3	2.9	87.5	100.2	153.4	138.5	38.9	61.0
		4	17.4	4.9	88.6	102.9	159.0	146.4	40.9	65.7
		5	-	7.4	-	104.7	-	151.8	-	68.8
1800	1 ROW 0.23 2 ROW 0.47	0.5	0.4	0.1	75.2	77.3	99.0	82.8	19.9	24.0
		1	1.4	0.4	79.8	85.0	121.0	100.9	28.9	38.9
		2	4.9	1.4	84.0	93.3	142.2	123.7	37.0	55.2
		3	10.3	2.9	85.9	97.7	152.2	136.6	40.8	63.7
		4	17.4	4.9	87.0	100.3	158.0	144.8	42.9	68.9
		5	-	7.4	-	102.1	-	150.3	-	72.4
2000	1 ROW 0.28 2 ROW 0.56	0.5	0.4	0.1	74.4	76.2	97.7	81.9	20.3	24.2
		1	1.4	0.4	78.7	83.3	119.4	99.4	29.7	39.7
		2	4.9	1.4	82.7	91.3	140.8	121.9	38.4	57.0
		3	10.3	2.9	84.6	95.5	151.0	134.9	42.4	66.2
		4	17.4	4.9	85.7	98.2	157.0	143.3	44.8	71.9
		5	-	7.4	-	99.9	-	149.0	-	75.7

NOTES:

1. Data is based on 180°F entering water and 65°F entering air temperature at sea level. See selection procedure for other conditions.
2. For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the LAT as low as possible.

A web-based Computer Selection Program, “Web-Select”, is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

HOT WATER COIL DATA

MODEL CFRQ - WC UNIT SIZES 1224, 1424

AIRFLOW		WATER FLOW			LAT (°F)		LWT (°F)		CAPACITY (MBH)	
RATE (CFM)	AIR PD (IN. W.G.)	RATE (GPM)	WATER PD (FT. W.G.)							
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
1000	1 ROW 0.03 2 ROW 0.06	0.5	0.6	0.2	84.5	88.3	94.4	77.7	21.1	25.3
		1	2.0	0.6	92.7	102.2	118.9	98.1	30.0	40.3
		2	7.1	2.0	99.4	115.5	141.9	124.3	37.3	54.7
		3	14.6	4.2	102.4	121.5	152.4	138.3	40.5	61.2
		4	24.5	7.0	104.0	125.0	158.3	146.8	42.2	65.0
		5	-	10.5	-	127.2	-	152.4	-	67.3
1200	1 ROW 0.04 2 ROW 0.08	0.5	0.6	0.2	81.8	84.8	91.2	75.6	21.9	25.8
		1	2.0	0.6	89.5	97.5	115.2	94.3	31.8	42.2
		2	7.1	2.0	96.0	110.3	138.8	120.0	40.3	58.9
		3	14.6	4.2	98.9	116.5	149.9	134.5	44.1	66.9
		4	24.5	7.0	100.6	120.0	156.3	143.4	46.3	71.5
		5	-	10.5	-	122.3	-	149.5	-	74.5
1400	1 ROW 0.05 2 ROW 0.11	0.5	0.6	0.2	79.8	82.2	88.7	74.2	22.5	26.2
		1	2.0	0.6	87.0	93.8	112.1	91.3	33.4	43.7
		2	7.1	2.0	93.3	106.2	136.1	116.5	43.0	62.4
		3	14.6	4.2	96.2	112.3	147.7	131.2	47.3	71.7
		4	24.5	7.0	97.8	115.9	154.5	140.6	49.8	77.2
		5	-	10.5	-	118.3	-	146.9	-	80.8
1600	1 ROW 0.07 2 ROW 0.13	0.5	0.6	0.2	78.3	80.2	86.7	73.1	23.0	26.4
		1	2.0	0.6	85.0	90.9	109.6	89.0	34.6	44.9
		2	7.1	2.0	91.1	102.7	133.8	113.5	45.2	65.4
		3	14.6	4.2	93.9	108.8	145.8	128.4	50.1	75.9
		4	24.5	7.0	95.6	112.4	152.9	138.0	53.0	82.2
		5	-	10.5	-	114.8	-	144.7	-	86.3
1800	1 ROW 0.08 2 ROW 0.17	0.5	0.6	0.2	77.0	78.7	85.1	72.2	23.4	26.6
		1	2.0	0.6	83.3	88.5	107.3	87.0	35.7	45.9
		2	7.1	2.0	89.2	99.8	131.8	110.9	47.3	67.9
		3	14.6	4.2	92.0	105.8	144.1	125.9	52.7	79.6
		4	24.5	7.0	93.6	109.4	151.4	135.8	55.8	86.6
		5	-	10.5	-	111.8	-	142.6	-	91.3
2000	1 ROW 0.10 2 ROW 0.20	0.5	0.6	0.2	76.0	77.4	83.7	71.5	23.8	26.8
		1	2.0	0.6	81.9	86.5	105.4	85.4	36.7	46.7
		2	7.1	2.0	87.7	97.4	129.9	108.7	49.1	70.1
		3	14.6	4.2	90.4	103.2	142.5	123.7	55.0	82.8
		4	24.5	7.0	92.0	106.8	150.1	133.7	58.4	90.6
		5	-	10.5	-	109.3	-	140.8	-	95.9
2200	1 ROW 0.12 2 ROW 0.24	0.5	0.6	0.2	75.1	76.3	82.6	71.0	24.0	27.0
		1	2.0	0.6	80.8	84.9	103.7	84.1	37.5	47.3
		2	7.1	2.0	86.3	95.2	128.3	106.8	50.7	72.0
		3	14.6	4.2	89.0	101.0	141.1	121.8	57.1	85.7
		4	24.5	7.0	90.5	104.5	148.9	131.9	60.8	94.2
		5	-	10.5	-	107.0	-	139.1	-	100.0
2400	1 ROW 0.14 2 ROW 0.28	0.5	0.6	0.2	74.3	75.4	81.6	70.5	24.3	27.1
		1	2.0	0.6	79.7	83.4	102.2	82.9	38.3	47.9
		2	7.1	2.0	85.1	93.4	126.8	105.0	52.2	73.8
		3	14.6	4.2	87.7	99.0	139.8	120.0	59.0	88.3
		4	24.5	7.0	89.3	102.5	147.7	130.3	63.1	97.5
		5	-	10.5	-	104.9	-	137.6	-	103.8

NOTES:

1. Data is based on 180°F entering water and 65°F entering air temperature at sea level. See selection procedure for other conditions.
2. For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the LAT as low as possible.

A web-based Computer Selection Program, “Web-Select”, is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

HOT WATER COIL DATA

MODEL CFRQ - WC UNIT SIZES 1230, 1430, 1630

AIRFLOW		WATER FLOW			LAT (°F)		LWT (°F)		CAPACITY (MBH)	
RATE (CFM)	AIR PD (IN. W.G.)	RATE (GPM)	WATER PD (FT. W.G.)							
			1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW	1 ROW	2 ROW
1500	1 ROW 0.03 2 ROW 0.06	0.5	0.7	0.1	80.1	81.8	80.9	69.5	24.5	27.3
		1	2.5	0.7	88.3	94.4	103.2	83.2	37.8	47.8
		2	8.7	2.5	95.9	108.6	128.8	107.9	50.2	70.9
		3	17.9	5.2	99.4	115.9	141.9	123.8	55.9	82.7
		4	29.9	8.6	101.4	120.1	149.7	134.3	59.2	89.6
		5	--	12.8	--	122.9	--	141.5	--	94.2
1700	1 ROW 0.04 2 ROW 0.08	0.5	0.7	0.1	78.5	79.9	79.2	68.8	24.9	27.5
		1	2.5	0.7	86.2	91.5	100.6	81.1	39.1	48.8
		2	8.7	2.5	93.6	105.2	126.3	104.9	52.6	73.9
		3	17.9	5.2	97.1	112.3	139.8	120.8	59.1	87.2
		4	29.9	8.6	99.1	116.7	147.9	131.5	62.8	95.1
		5	--	12.8	--	119.5	--	139.0	--	100.4
1900	1 ROW 0.05 2 ROW 0.10	0.5	0.7	0.1	77.3	78.4	77.8	68.3	25.2	27.6
		1	2.5	0.7	84.5	89.1	98.4	79.5	40.2	49.6
		2	8.7	2.5	91.7	102.2	124.1	102.3	54.9	76.5
		3	17.9	5.2	95.1	109.3	137.8	118.1	61.9	91.1
		4	29.9	8.6	97.1	113.6	146.2	129.0	66.1	100.1
		5	--	12.8	--	116.5	--	136.7	--	106.0
2100	1 ROW 0.06 2 ROW 0.12	0.5	0.7	0.1	76.2	77.2	76.7	67.8	25.5	27.7
		1	2.5	0.7	83.1	87.1	96.5	78.1	41.1	50.3
		2	8.7	2.5	90.0	99.6	122.1	100.0	56.8	78.8
		3	17.9	5.2	93.4	106.6	136.1	115.8	64.5	94.7
		4	29.9	8.6	95.4	110.9	144.7	126.7	69.1	104.5
		5	--	12.8	--	113.9	--	134.6	--	111.1
2300	1 ROW 0.07 2 ROW 0.14	0.5	0.7	0.1	75.3	76.2	75.7	67.5	25.8	27.8
		1	2.5	0.7	81.8	85.4	94.8	77.0	42.0	50.9
		2	8.7	2.5	88.5	97.4	120.3	98.0	58.6	80.7
		3	17.9	5.2	91.9	104.3	134.5	113.7	66.9	97.8
		4	29.9	8.6	93.8	108.6	143.3	124.7	71.8	108.5
		5	--	12.8	--	111.5	--	132.7	--	115.8
2500	1 ROW 0.08 2 ROW 0.16	0.5	0.7	0.1	74.6	75.3	74.9	67.2	26.0	27.9
		1	2.5	0.7	80.8	84.0	93.3	76.0	42.7	51.4
		2	8.7	2.5	87.3	95.5	118.6	96.3	60.3	82.5
		3	17.9	5.2	90.5	102.2	133.0	111.8	69.1	100.6
		4	29.9	8.6	92.5	106.4	142.0	122.8	74.4	112.2
		5	--	12.8	--	109.4	--	131.0	--	120.1
2700	1 ROW 0.09 2 ROW 0.18	0.5	0.7	0.1	73.9	74.6	74.2	67.0	26.1	27.9
		1	2.5	0.7	79.8	82.7	92.0	75.2	43.4	51.8
		2	8.7	2.5	86.1	93.7	117.1	94.8	61.8	84.0
		3	17.9	5.2	89.3	100.3	131.6	110.0	71.1	103.2
		4	29.9	8.6	91.3	104.5	140.8	121.1	76.8	115.5
		5	--	12.8	--	107.4	--	129.4	--	124.1
2900	1 ROW 0.10 2 ROW 0.21	0.5	0.7	0.1	73.4	73.9	73.6	66.8	26.3	28.0
		1	2.5	0.7	79.0	81.6	90.8	74.5	44.0	52.1
		2	8.7	2.5	85.1	92.2	115.7	93.4	63.1	85.4
		3	17.9	5.2	88.2	98.6	130.3	108.5	73.0	105.5
		4	29.9	8.6	90.2	102.8	139.6	119.6	79.0	118.6
		5	--	12.8	--	105.7	--	127.9	--	127.8

NOTES:

1. Data is based on 180°F entering water and 65°F entering air temperature at sea level. See selection procedure for other conditions.
2. For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the LAT as low as possible.

A web-based Computer Selection Program, “Web-Select”, is available to facilitate the selection process. Contact your representative to obtain access to this powerful and time-saving program.

GUIDE SPECIFICATIONS

GENERAL

Furnish and install ENVIRO-TEC Model CFRQ, or equal, Extra Quiet Series Flow Constant Volume Fan Powered Terminals of the sizes and capacities scheduled. Units shall be ETL listed. Terminals with electric heat shall be listed as an assembly. Separate listings for the terminal and electric heater are not acceptable. Terminals shall include a single point electrical connection. Terminal units shall be AHRI certified and bear the AHRI 880 seal.

The entire unit shall be designed and built as a single unit. Field-assembled components or built-up terminals employing components from multiple manufacturers are not acceptable.

CONSTRUCTION

Terminals shall be constructed of not less than 22 gauge galvanized steel, able to with-stand a 125 hour salt spray test per ASTM B-117. Stainless steel casings, or galvannealed steel casings with a baked enamel paint finish, may be used as an alternative. The terminal casing shall be mechanically assembled (spot-welded casings are not acceptable).

Casing shall be internally lined with 3/4" thick fiberglass insulation, rated for a maximum air velocity of 5000 f.p.m. Maximum thermal conductivity shall be .24 (BTU • in) / (hr • ft2 • °F). Insulation must meet all requirements of ASTM C1071 (including C665), UL 181 for erosion, and carry a 25/50 rating for flame spread/ smoke developed per ASTM E-84, UL 723 and NFPA 90A. Raw insulation edges on the discharge of the unit must be covered with metal liner to eliminate flaking of insulation during field duct connections. Simple "buttering" of raw edges with an approved sealant is not acceptable.

Casing shall have full bottom access to gain access to the primary air valve and fan assembly. The opening shall be sufficiently large to allow complete removal of the fan if necessary. The casing shall be constructed in a manner to provide a single rectangular discharge collar. Multiple discharge openings are not acceptable. All appurtenances including control assemblies, control enclosures, hot water heating coils, and electric heating coils shall not extend beyond the top or bottom of the unit casing.

SOUND

The terminal manufacturer shall provide AHRI certified sound power data for radiated and discharge sound. The sound levels shall not exceed the octave band sound power levels indicated on the schedule. If the sound data does not meet scheduled criteria, the contractor shall be responsible for the provision and installation of any additional equipment or material necessary to achieve the scheduled sound performance.

PRIMARY AIR VALVE

The primary air valve shall consist of a minimum 22 gauge cylindrical body that includes embossment rings for rigidity. The damper blade shall be connected to a solid shaft by means of an integral molded sleeve which does not require screw or bolt fasteners. The shaft shall be manufactured of a low thermal conducting composite material, and include a molded damper position indicator visible from the exterior of the unit. The damper shall pivot in nylon bearings. The damper actuator shall be mounted on the exterior of the terminal for ease of service. The valve assembly shall include internal mechanical stops for both full open and closed positions. The damper blade seal shall be secured without use of adhesives. The air valve leakage shall not exceed 1% of maximum inlet rated airflow at 3" W.G. inlet pressure.

PRIMARY AIRFLOW SENSOR

Differential pressure airflow sensor shall traverse the duct along two perpendicular diameters. Cylindrically shaped inlets shall utilize the equal cross sectional area or log-linear traverse method. Single axis sensor shall not be acceptable. A minimum of 12 total pressure sensing points shall be utilized. The total pressure inputs shall be averaged using a pressure chamber located at the center of the sensor. A sensor that delivers the differential pressure signal from one end of the sensor is not acceptable. The sensor shall output an amplified differential pressure signal that is at least 2.3 times the equivalent velocity pressure signal obtained from a conventional pitot tube. The sensor shall develop a differential pressure of 0.015" W.G. at an air velocity of < 325 FPM. Documentation shall be submitted which substantiates this requirement. Balancing taps and airflow calibration charts shall be provided for field airflow measurements.

FAN ASSEMBLY

The unit fan shall utilize a forward curved, dynamically balanced, galvanized wheel with a direct drive motor. The motor shall be permanent split capacitor type with three separate horsepower taps. Single speed motors with electronic speed controllers are not acceptable.

The fan motor shall be unpluggable from the electrical leads at the motor case for simplified removal (open frame motors only). The motor shall utilize perma-

nently lubricated sleeve type bearings, include thermal overload protection and be suitable for use with electronic and/or mechanical fan speed controllers. The motor shall be mounted to the fan housing using torsion isolation mounts properly isolated to minimize vibration transfer.

The terminal shall utilize an electronic (SCR) fan speed controller for aid in balancing the fan capacity. The speed controller shall have a turn down stop to prevent possibility of harming motor bearings.

HOT WATER COIL

Terminal shall include an integral hot water coil where indicated on the plans. The coil shall be manufactured by the terminal unit manufacturer and shall have a minimum 22 gauge galvanized sheet metal casing. Stainless steel casings, or galvannealed steel casings with a baked enamel paint finish, may be used as an alternative. Coil to be constructed of pure aluminum fins with full fin collars to assure accurate fin spacing and maximum tube contact. Fins shall be spaced with a minimum of 10 per inch and mechanically fixed to seamless copper tubes for maximum heat transfer.

Each coil shall be hydrostatically tested at a minimum of 450 PSIG under water, and rated for a maximum 450 PSIG working pressure at 200°F. Coils shall incorporate a built in, flush mounted access plate, allowing top and bottom access to coil.

ELECTRIC HEATERS

Terminal shall include an integral electric heater where indicated on the plans. The heater cabinet shall be constructed of not less than 20 gauge galvanized steel. Stainless steel cabinets, or galvannealed steel casings with a baked enamel paint finish, may be used as an alternative. Heater shall have a hinged access panel for entry to the controls.

A power disconnect shall be furnished to render the heater non-operational. Heater shall be furnished with all controls necessary for safe operation and full compliance with UL 1995 and National Electric Code requirements.

Heater shall have a single point electrical connection. It shall include a primary disc-type automatic reset high temperature limit, secondary high limit(s), Ni-Chrome elements, and fusing per UL and NEC. Heater shall have complete wiring diagram with label indicating power requirement and KW output. Heater shall be interlocked with fan terminal so as to preclude operation of the heater when the fan is not running.

OPTIONS

FOIL FACED INSULATION

Insulation shall be covered with scrim backed foil facing. All insulation edges shall be covered with foil or metal nosing. Insulation shall meet ASTM C1136 and ASTM C665 for mold, mildew and humidity resistance.

ELASTOMERIC CLOSED CELL FOAM INSULATION

Provide Elastomeric Closed Cell Foam Insulation in lieu of standard. Insulation shall conform to UL 181 for erosion and NFPA 90A for fire, smoke and melting, and comply with a 25/50 Flame Spread and Smoke Developed Index per ASTM E-84 or UL 723. Additionally, insulation shall comply with Antimicrobial Performance Rating of 0, no observed growth, per ASTM G- 21. Polyethylene insulation is not acceptable.

DOUBLE WALL CONSTRUCTION

The terminal casing shall be double wall construction using a 22 gauge galvanized metal liner covering all insulation.

LOW TEMPERATURE CONSTRUCTION

Terminals shall be designed for use with primary airflow temperatures as low as 46°F and maximum ceiling plenum conditions of 78°F and 60% R.H. In addition to other design criteria, the primary air valve shall be thermally isolated from the terminal casing. The damper shaft shall be made from non-conducting thermoplastic composite material. Metal shafts will not be acceptable.

FILTERS

Terminals shall include a 1" thick disposable fiberglass filter. Filter shall be secured with quick release clips, allowing removal without horizontal sliding.

ECM FAN MOTOR

Fan motor shall be ECM™. Motor shall be brushless DC controlled by an integral controller / inverter that operates the wound stator and senses rotor position to electronically commutate the stator. Motor shall be permanent magnet type with near-zero rotor losses designed for synchronous rotation. The motor shall utilize permanently lubricated ball bearings. Motor shall maintain minimum 70% efficiency over the entire operating range. Motor speed control shall be accomplished through a PWM (pulse width modulation) controller specifically designed for compatibility with the ECM. The speed controller shall have terminals for field verification of fan capacity utilizing a digital volt meter. A calibration graph shall be supplied indicating Fan CFM verses DC Volts.

GUIDE SPECIFICATIONS

PIPING PACKAGES

Provide a standard factory assembled non-insulated valve piping package to consist of a 2 way, on/off, motorized electric control valve and two ball isolation valves. Control valves are piped normally closed to the coil. Maximum entering water temperature on the control valve shall be 200°F. The maximum close-off pressure is 40 PSIG (1/2") or 20 PSIG (3/4"). Maximum operating pressure shall be 450 PSIG.

Option: Provide 3-wire floating point modulating control valve (fail-in-place) in lieu of standard 2-position control valve with factory assembled valve piping package.

Option: Provide high pressure closeoff actuators for 2-way, on/off control valves. Maximum close-off pressure is 50 PSIG (1/2") or 25 PSIG (3/4)".

Option: Provide either a fixed or adjustable flow control device for each piping package.

Option: Provide unions and/or pressure-temperature ports for each piping package.

Piping package shall be completely factory assembled, including interconnecting pipe, and shipped separate from the unit for field installation on the coil, so as to minimize the risk of freight damage.

CONTROLS

DDC for BACnet

Each VAV terminal unit shall be bundled with a digital controller. The controller shall be compatible with a MS/TP (Master-Slave/Token-Passing) BACnet system network. A unique network address and a BACnet site address shall be assigned to each controller, and referenced to the tagging system used on the drawings and in the schedules provided by the Project Engineer. All controllers shall be factory mounted and wired, with the controller's hardware address set, and all of the individual terminal's data pre-loaded into the controller. The terminal's data shall include, but not be limited to Max CFM, Min CFM, Heating CFM, and terminal K factor. Heating system operating data shall also be factory installed for all terminals with heat. Communications with the digital controller shall be accomplished through the MS/TP BACnet network or through a Bluetooth connector. The digital controller shall have hardware input and output connections to facilitate the specified sequence of operation in either the network mode, or on a stand-alone basis. The terminal unit manufacturer shall coordinate, where necessary, with the Temperature Control Contractor.

Pneumatic Controls

Units shall be controlled by a pneumatic differential pressure reset volume controller. Controller shall be capable of pressure independent operation down to 0.03 inches W.G. differential pressure and shall be factory set to the specified airflow (CFM). Controller shall not exceed 11.5 scim (Standard Cubic Inches per Minute) air consumption @ 20 PSIG. Unit primary air valve shall modulate in response to the room mounted thermostat and shall maintain airflow in relation to thermostat pressure regardless of system static pressure changes. An airflow (CFM) curve shall be affixed to the terminal unit expressing differential pressure vs. CFM. Pressure taps shall be provided for field use and ease of balancing. Terminal unit manufacturer shall supply and manufacture a 5 to 10 PSIG pneumatic actuator capable of a minimum of 45 in. lbs. of torque. Actual sequence of operation is shown on the contract drawings. Terminal unit manufacturer shall coordinate, where necessary, with the Temperature Control Contractor.

STANDARD & OPTIONAL FEATURES

STANDARD FEATURES

Construction
- AHRI 880 certified and labeled
- 22 gauge galvanized steel casing and valve
- 3/4" thick fiberglass insulation
- Large access opening allowing removal of complete fan assembly for all heating coil options
- Radiated sound damper

Fan Assembly
- Forward curved, dynamically balanced, direct drive, galvanized fan wheel
- 115 or 277 volt single-phase, three tap PSC motor
- SCR fan speed controller
- Quick-select motor speed terminal
- Permanently lubricated motor bearings
- Thermally protected motor
- Vibration isolation motor mounts
- Single point wiring

Primary Air Valve
- Embossed rigidity rings
- Low thermal conductance damper shaft
- Position indicator on end of damper shaft
- Mechanical stops for open and closed position
- FlowStar™ center averaging airflow sensor
- Balancing tees
- Plenum rated sensor tubing

Hot Water Coils
- Coils are designed, manufactured, and tested by ENVIRO-TEC
- AHRI 410 certified and labeled
- 1, 2, 3, 4 row coils
- Tested at a minimum of 450 PSIG under water and rated at 450 PSIG working pressure at 200°F
- Left or right hand connections

Electrical
- cETL listed for safety compliance
- NEMA 1 wiring enclosure

Electric Heat
- cETL listed as an assembly for safety compliance per UL 1995
- Integral electric heat assembly
- Automatic reset primary and back-up secondary thermal limits
- Single point power connection
- Hinged electrical enclosure door
- Fusing per NEC

Controls
- Verasys® ZEC Series DDC for BACnet
- Pneumatic Controls

OPTIONAL FEATURES

Construction
- 20 gauge galvanized steel construction
- 1" insulation
- Foil faced scrim backed insulation
- 1/2" thick elastomeric closed cell foam insulation
- Double wall construction with 22 gauge liner
- 1" throwaway filter

Fan Assembly
- 208-230 volt single-phase PSC motor
- 220-240 volt 50Hz single-phase PSC motor
- 120, 208, 240, and 277 volt single-phase ECM motors

Electrical
- Full unit toggle disconnect
- Inline motor fusing
- Primary and secondary transformer fusing

Electric Heat
- Proportional (SSR) heater control
- Magnetic contactors
- Door interlocking disconnect switches

Controls
- Consignment DDC controls (factory mount and wire controls provided by others)

Piping Packages
- Factory assembled – shipped loose for field installation
- 1/2" and 3/4", 2 way, normally closed, two position electric motorized valves
- Isolation ball valves with memory stop
- Fixed and adjustable flow control devices
- Unions and P/T ports
- Floating point modulating control valves
- High pressure close-off actuators (1/2" = 50 PSIG; 3/4" = 25 PSIG)

NOTES

Form: ET130.13-EG9 (0221) Supersedes: ET130.13-EG9 (1119)

www.enviro-tec.com

ENVIRO-TEC