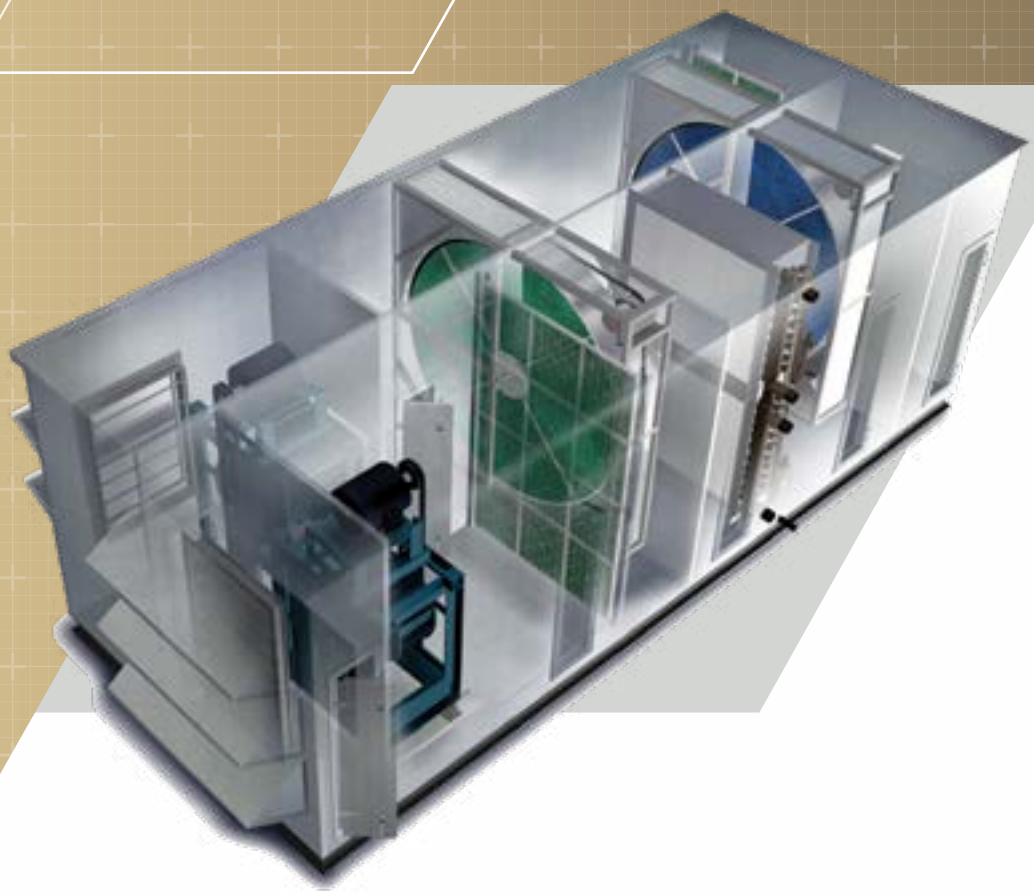
FläktGroup SEMCO

SPECIALIZED HEALTHY AIR SOLUTIONS

EP SERIES

PACKAGED ENERGY RECOVERY SYSTEM

TECHNICAL GUIDE



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DESIGNS FOR ENERGY EFFICIENCY AND INDOOR AIR QUALITY

Energy efficient design and indoor air quality are the two challenges facing mechanical engineers today in the field of heating, ventilating and air conditioning (HVAC.) To minimize the loss of energy, building envelopes have been made more energy efficient. This also reduces the cost associated with cooling or heating the building. By tightening the building envelopes, we reduce the amount of outside air entering the building. However, that outside air is needed to remove the air contaminants generated indoors. Flushing these pollutants from the indoors to the outdoors has been the most effective way of reducing the indoor air contaminant to acceptable levels. This ventilation concept is formalized in ASHRAE Standard 62.

What does this mean for an "average" building? First, it will have forms of mechanical ventilation to supply controlled amounts of outside air into the building. To balance the building pressure, a similar amount of air has to be exhausted from the building. This is a waste of energy for the sake of air quality. Imagine a building owner/operator sitting next to the exhaust air discharge and throwing dollar bills into the air stream. The exhaust air stream represents a revenue loss. Meanwhile, the building owner/operator is paying for the ventilation air to be cooled or heated.

Can this waste be stopped? Yes, it can! And that is exactly what total energy recovery will do. The heating or cooling energy contained in the exhaust air stream can be recovered and used to precondition the outdoor air being brought into the building.

Energy recovery systems are easy to apply if you separate the ventilation system from the air-conditioning system. This solution offers several advantages: easy to design, allows use of existing conventional equipment with no modifications and simple to control.

In addition, total energy recovery systems can be directly connected to individual or multiple air-conditioning units to provide a controlled minimum amount of fresh air at all times. This allows the conventional equipment to behave as if it were using re-circulated air year-round.

" ...The air-conditioning system doesn't know if it's summer or winter," stated a building operator. In other words, a building on the humid, muggy Gulf Coast would have the same fresh air intake as a building in Southern California.

USING THIS MANUAL

This design manual presents the FläktGroup® SEMCO® EP and EPD Series of packaged energy recovery systems, which are designed around the True 3Å® total energy (TE) and sensible only (TS) recovery wheels. These systems are designed to provide efficient, large amounts of outdoor air to all types of facilities. They can be applied as preconditioners to traditional HVAC equipment or as integrated systems that provide total space conditioning and precise humidity control. This manual explains the benefits provided by the technology, provides a detailed selection procedure and reviews specific guidelines to assure an effective system design. This material should be studied carefully before beginning the design process.

FläktGroup SEMCO also offers a computerized energy savings analysis and energy wheel selection program for frequent users, which simplifies this design process and cost justification.

For additional design support or to answer any technical questions, a list of the FläktGroup SEMCO representatives nearest you is located at FläktGroup SEMCO's website at www.semcohvac.com.

THE FLÄKTGROUP SEMCO SYSTEM

The FläktGroup SEMCO packaged energy recovery system offers the ultimate performance in the transfer of total energy (both latent and sensible). Pre-engineered and factory assembled, the FläktGroup SEMCO system also provides the air handling capability for the building's exhaust and supply air. The system can be selected to precondition outdoor air going to other conventional air handling systems or as an integrated system that provides total space conditioning with the additional heating and cooling options available.

The heart of this system is a technologically advanced True 3Å® desiccant wheel. In addition to providing superior performance, the wheel's 3Å molecular sieve-desiccant coating is selective in what it adsorbs from an exhaust air stream. The desiccant rejects airborne contaminants while it transfers water vapor, thus providing total energy transfer from the exhaust to the supply air stream. Selectivity allows True 3Å to be used in critical applications, including recovery from contaminated airstreams. In the past, energy recovery was avoided or limited to sensible-only energy exchange in applications like these.

The True 3Å wheel uses a fluted media with an aluminum backbone, which is coated with a fast-acting, adsorbent desiccant surface. As the transfer media slowly rotates between the outdoor and exhaust airstreams, the warmer air surrenders its sensible energy to the aluminum. This energy is then shifted to the cooler air stream during the second half of the revolution.

Just as the temperature is captured and released, so is the moisture. True 3Å's 3Å molecular sieve-desiccant coating has an enormous internal surface area and strong attraction to water vapor. Since the opposing airstreams have different temperatures and moisture contents, the vapor pressure will also be different. This pressure difference is the driving force in the transferring of latent energy.

By using the desiccant coating, True 3Å recovers the moisture from the exhaust air stream to the supply air stream without the airborne pollutants exchanging. This very important and unique feature has been well documented through independent laboratory and field-testing. (A copy of the Georgia Tech Research Institute study is available free of charge.)

Seven steps to fresh, cool air during the cooling season:

Step 1: Hot, humid outside air is drawn in.

Step 2: Fresh air is blown in through the slowly rotating True 3Å wheel. The desiccant-coated fluted media captures heat and moisture.

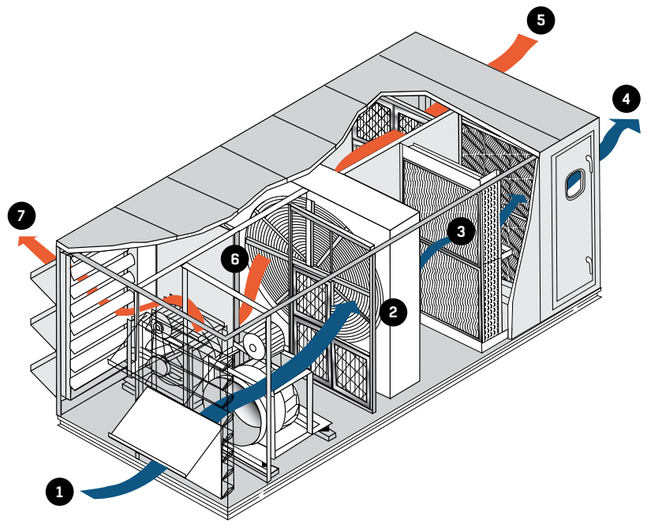
Step 3: The air can be further cooled or heated to space neutral conditions.

Step 4: The cooled and dehumidified air enters the HVAC system or is delivered directly to the occupied space.

Step 5: Cool, dry return air that is exhausted from the building enters the Total Energy Recovery System.

Step 6: As return air passes through the True 3Å wheel, it removes the heat and humidity captured by the wheel from the fresh air stream.

Step 7: Warm, humidified exhaust air is blown out.



THE PRODUCT LINE

FläktGroup SEMCO packaged energy recovery systems are available in nine cabinet sizes ranging in airflow capacity from 2,000 scfm to 40,000 scfm. The standard and optional features that are available with this system are discussed below. Equipment summaries are provided on pages 40 and 41. Individual equipment information, as well as their configurations, complete with typical flow schematics, is presented on pages 5 and 6.

Standard Features

1) The True 3Å® Total Energy Wheel

- Certified total energy recovery performance (sensible and latent) up to 90 percent efficient
- Patented 3Å molecular sieve-desiccant coating to avoid desiccant cross-contamination
- Wheel faces are coated to ensure long lasting corrosion protection
- Sensible-only wheel is polymer coated to avoid oxidation and future transferring of moisture
- All aluminum, structural spoke system eliminates mechanical fatigue and allows media replacement (sizes 13 and up)
- Non-wearing labyrinth seals (sizes 13 and up)

2) FläktGroup SEMCO Panel System

- Double-wall panel construction (2 inches thick with 18-gauge outer skin) eliminates exposed insulation and the associated risk of bacterial growth
- Double-wall removable panels provided for large internal components
- Gasketed double-wall access doors for all compartments
- Secondary roof of continuous standing-seam panels standard on units designed for outdoor installation
- Welded cabinet floor with integrated drain pan

3) Supply and Exhaust Air Fans

- AMCA rated fans sized for quiet and efficient operation, backward inclined (up to 16 inches diameter) and airfoil (18 inches diameter and greater)
- Mounted, balanced, tested and internally isolated for vibration
- Motors are NEMA frame, high-efficiency with a 1.15 service factor

4) Filter Sections

- Filters that are 30% (MERV 8) efficient are provided for the outdoor air and return airstreams

5) Hoods and Dampers

- Low-leakage motorized fresh air damper and gravity exhaust air damper
- Optional motorized exhaust damper available
- Outdoor units are provided with an intake and exhaust hood with bird screen

6) Electrical Package with Single Point Connection

- Power distribution panel with non-fused disconnect and branch circuit protection for each motor and transformer. Motors are wired to starters or VFDs.
- Custom control packages available
- 208 or 480 volt single-point connections are available.

Optional Features

7) Increased Filter Efficiency

- 65, 85 or 95 (MERV 11, MERV 13, MERV 14) percent cartridge filters can be provided in addition to the standard 30 percent filters

8) Reheat Options

- Hot water coil
- Steam coil, non-freeze type
- Electric coil (requires a separate electrical connection point)

9) Cooling Options

- Chilled water or direct expansion coil

10) Variable Speed Wheel Control Package

- Digital reading of temperatures
- Proportional heating control
- Automatic summer/winter changeover

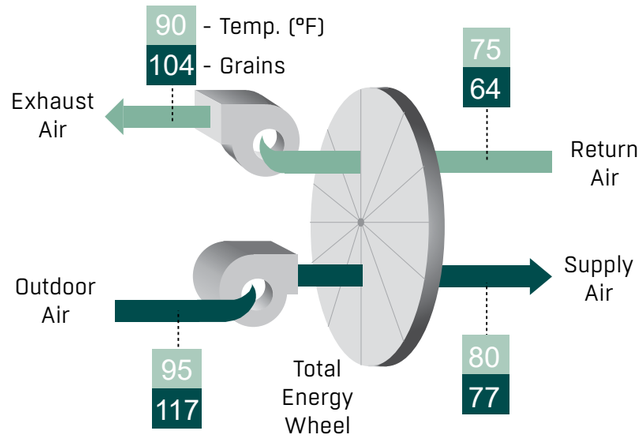
Key Benefits

- Standard, cataloged energy wheel products and wheel systems
- Independently certified wheel performance in accordance with ASHRAE Standard 84-91 and ARI Standard 1060 with regard to:
  - latent heat transfer efficiency
  - sensible heat transfer efficiency
  - pressure loss across wheel
- Equal latent and sensible heat transfer
- Highest performing wheel on the market
- Independently certified cross-contamination of less than 0.04 percent
- Field adjustable purge section
- Wheel media independently certified to pass NFPA 90A requirements for flame spread and smoke generation based upon ASTM E84 fire test method
- Reliable operation
- Minimal maintenance
- Many successful installations
- Extended 3 and 5-year service contract available for wheel
- Highest engineering expertise in the industry

AVAILABLE EQUIPMENT CONFIGURATIONS

EP

In addition to the SEMCO True 3Å energy recovery wheel, this dual-wall system contains backward curved supply and exhaust fans, outdoor air and return air filtration and an optional, full-electrical package with a single-point electrical connection. All EP family products are designed for either indoor or outdoor mounting.

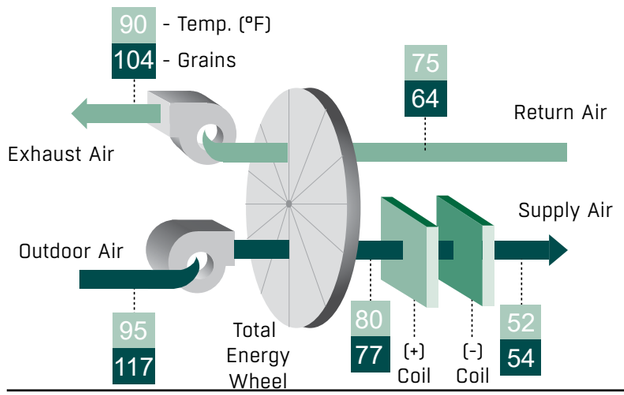


EP Product

- Suitable for new construction and can be retrofitted to most existing facilities.
- Precools and dehumidifies outdoor air during the cooling season.
- Preheats and pre-humidifies the outdoor air during the heating season.
- Supplies preconditioned outdoor air to conventional HVAC systems, allowing them to effectively increase outdoor air percentages.
- Preconditioned outdoor air can be introduced to the return air plenum serving a central HVAC system.
- It can also be supplied directly to the conditioned space since the system's recovery efficiency ranges between 74 and 85% (in balanced flow operation).

EPH, EPC, EPHC

These products build on the EP product mentioned above. However, unlike the EP, they integrate full heating and cooling options. The cooling options include either chilled water or DX cooling coils, with options regarding the number of fins per inch and the number of row options. The heating options include either hot water, steam or electric coils.

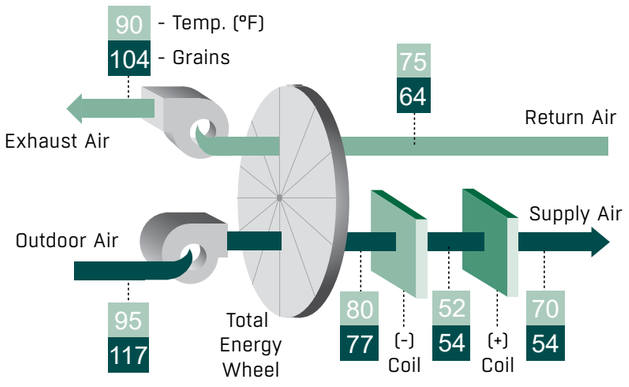


EPH, EPC, EPHC Products

These products are applied to installations where there is a need for 100 percent outdoor air. The FläktGroup SEMCO system is the primary source for temperature and/or humidity control. This includes hospitals, manufacturing areas, laboratories and casinos. These products are also used to precondition buildings where the outdoor air goes directly to the space, but requires additional post heating or cooling to supplement what is being provided by the energy recovery wheel.

EPCH

This product builds on the basic EP product, but integrates full cooling and reheating. The cooling options include either chilled water or direct expansion (DX) cooling coils, with options regarding the number of fins per inch and the number of row options. The heating options include either hot water, steam or electric coils.

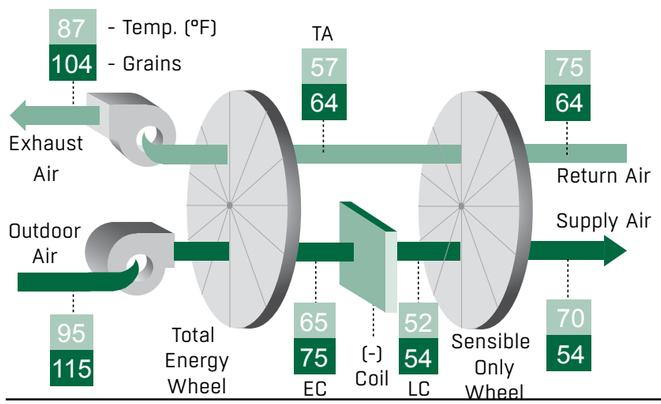


EPCH Product

Applications for this product include buildings that need high percentages of outdoor air for a humidity controlled environment, where the FläktGroup SEMCO system is the primary source. This product may be the sole source for temperature and humidity control. It also handles primarily latent loads by over-drying the outdoor air with the cooling coil and then reheating to a temperature that is comfortable to the occupants.

EPD

This product builds on the EP product but integrates full cooling for humidity control and a sensible energy wheel to provide free reheat. This dual-wall system contains an True 3Å energy recovery wheel, a sensible energy wheel, backward curved, supply and exhaust fans, outdoor air and return air filtration, cooling coil, limited capacity reheat coil and an optional full-electrical package including a single-point electrical connection. The cooling options include either chilled water or DX cooling coils, with options regarding the number of fins per inch and the number of row options. The heating options include either hot water, steam or electric coils.



EPD Product

The applications for this product include buildings that need high percentages of outdoor air for a humidity controlled environment where the FläktGroup SEMCO system provides 45-55 grains of water/pound of dry air and a neutral temperature of 65-70 degrees to the space. This approach allows conventional HVAC systems to operate most efficiently by cycling on and off, while using all recirculated air and handling only sensible loads. Good applications for the EPD systems include classrooms, hotels, dormitories, casinos and laboratories. This approach to ventilation of humidity control is very energy efficient since the EPD system can generate up to 10 tons of latent cooling for every 3 tons input with no cost of reheating.

EP DETAILED SELECTION PROCEDURE

1) Select unit size from Table 1 based on the larger supply air (SA) or return air (RA) cfm required. Then select the smallest unit which meets the required task, since it will provide the most cost-effective selection.

ex. If 7000 cfm SA at 1-inch external static pressure and 6000 cfm RA at .5-inch external static pressure is required, then select size 9 based on 7000 cfm.

2) Select unit configuration (EP, EPH, EPC, EPCH or EPHC) based on project requirements (see pages 5 and 6 for guidance.)

ex. Select EPHC if a year-round controlled SA condition is desired.

3) Use Table 4 (page 22) to determine the internal static pressures (ISP) for both the SA and RA sides of the unit.

ex. In an indoor unit, the ISP for the SA side of the EPCH-9 at 7000 cfm is 2.54 inches. The ISP for the RA side of the EP-9 at 6000 cfm is 1.81 inches.

SA @ 7000 cfm	
OA opening	.11 in.wg.
SA opening	.11 in.wg.
Damper	.11 in.wg.
OA filter	.42 in.wg.
Wheel	.82 in.wg.
CHW coil	.61 in.wg.
HW Coil	.10 in.wg.
Casing	.30 in.wg.
ISP	2.58 in.wg.

RA @ 6000 cfm	
EA opening	.15 in.wg.
RA opening	.15 in.wg.
Damper	.08 in.wg.
RA filter	.49 in.wg.
Wheel	.67 in.wg.
Casing	.30 in.wg.
ISP	1.84 in.wg.

4) Determine fan total static pressure (TSP) by adding the ISP to the required external static pressure.

ex. SA side TSP is 2.58" + 1" = 3.58"
RA side TSP is 1.84" + .5" = 2.34"

5) Use Table 4 (page 22) again to determine purge/seal air volume to be added to each designed airflow to determine total fan airflow.

ex. EP-9 purge/seal volume is 906 cfm.
Total SA fan flow = 7906 cfm
Total RA fan flow = 6906 cfm

TABLE 1. System Capacities and Base Effectiveness

Model	Capacity	% Base Effectiveness
EP-3	Low 2,000 Mid 2,500 High 3,000	78 75 74
EP-5	Low 3,000 Mid 4,000 High 4,500	81 77 76
EP-9	Low 4,500 Mid 6,000 High 8,000	82 78 75
EP-13	Low 6,000 Mid 8,000 High 10,000	84 80 77
EP-18	Low 8,000 Mid 10,000 High 15,000	85 82 76
EP-24	Low 11,000 Mid 14,000 High 18,000	84 81 77
EP-28	Low 15,000 Mid 18,000 High 23,000	82 79 76
EP-35	Low 18,000 Mid 22,000 High 27,000	83 80 77
EP-43	Low 26,000 Mid 30,000 High 40,000	80 78 75

6) Determine motor horsepower based on the unit's size, total fan airflow and TSP from the fan data table on pages 24-27. The minimum motor horsepower is the fan brake horsepower plus 10 percent to allow for drive loss and safety factors. An optional extended range fan (shown as size X or XX) is offered for most model sizes. This fan offers horsepower savings depending on exact performance required. However, an increase in unit size is possible.

ex. Using a size 9 fan, the SA fan brake horsepower is 6.9 based on 7900 cfm at 3.58 in.wg. static pressure. This would require a minimum 10 hp motor. The RA fan brake horsepower is 4.0 based on 6900 cfm at 2.34 in.wg. static pressure. This would require a minimum of 5.0 hp motor.

7) Find the base wheel effectiveness percentage from Table 1 based on the model selected and the smaller SA or RA cfm.

ex. Base effectiveness for EP-9 based on 6000 cfm is 78 percent.

8) Determine SA efficiency from Table 2 and their cfm ratio.

ex. SA efficiency would be approximately 70 percent interpolating from Table 2 for a base wheel effectiveness of 78 percent and a SA/RA ratio of 7000 cfm/6000 cfm = 1.17.

9) Determine summer and winter SA conditions, based on design temperatures and SA efficiency by using Equation 1 from Figure 1. (See page 5 for EP configuration.)
ex. The following design condition example and a 70 percent SA efficiency are determined below:

Figure 1:

Equation 1:

$X_{SA} = X_{OA} - E_{SA}(X_{OA} - X_{RA})$

Equation 2:

$X_{EA} = X_{RA} + E_{SA}(X_{OA} - X_{RA})$

X = dry bulb temperature (°F) or moisture content (gr/lb) or enthalpy (BTU/lb).

Equation 1 for summer dry bulb:

$SA_{(DB\ TEMP)} = 95° - .70\ (95°-75°) = 81°F$

Equation 1 for summer humidity:

$SA_{(GRAINS)} = 117\ gr - .70\ (117gr - 63\ gr) = 79\ gr$

EXAMPLE 1

Condition	Temp. Dry Bulb	Temp. Wet Bulb	Abs. Humidity gr/lb
Summer OA	95°	78°	117
Summer RA	75°	61.9°	63
Summer SA	81°	62.7°	79
Winter OA	0°	-1°	4
Winter RA	70°	51.4°	27
Winter SA	49°	39.2°	20

TABLE 2. Supply Air Efficiency Chart

Airstream Flow Ratio	Base Effectiveness in %					
	75	77	79	81	83	85
0.70	81	83	86	88	90	92
0.80	79	81	83	85	87	90
0.90	77	79	81	83	85	87
1.00	75	77	79	81	83	85
1.10	69	71	73	75	77	78
1.25	63	65	67	69	71	72
1.40	57	58	60	61	63	64

Notes:
For SA efficiency use SA cfm/RA cfm.
For RA efficiency use RA cfm/SA cfm.

10) Estimate unit SA conditions using the cooling coil table (page 28) and the heating coil tables (page 31).

11) Determine the need for variable speed option on the wheel.

ex. If the 7000 cfm EP unit supplies preconditioned outdoor air directly to an air-conditioned space, the unit's full capacity will be required in the cooling season. On cool days, the unit may have the capacity to provide SA conditions above the desired setpoint design, such as 65°F, with a desired 55°F SA setpoint. To provide better control of the unit's SA conditions, the variable speed option should be selected. This option can also be used to provide frost protection for the wheel. (See also the FläktGroup SEMCO Energy Recovery Wheel Technical Guide for a complete discussion of wheel performance and controls.)

12) Select unit voltage and determine power requirements from the Electrical Data Table on page 35.

ex. For the EPCH-9, use a 10-hp SA fan, a 7.5-hp RA fan, a variable speed wheel, 208 volt/3 phase/60-cycle power, and a 500 VA control power transformer.

From Electrical Data Table:

Full Load Ampacity	
10-hp SA fan	30.8 amps
5-hp RA fan	16.7 amps
Wheel VFD	7.3 amps
Control power	2.4 amps
Total FLA's	**57.2 amps**

Minimum Circuit Ampacity	
FLA from above	57.2 amps
25% of largest motor	7.7 amps
Total MCA	**64.9 amps**

Maximum Overcurrent Protection(MOCP)	
FLA from above	57.2 amps
125% of largest motor	38.5 amps
MOCP*	**95.7 amps**

*Select the next smaller sized time delay fuse, per instructions in UL 1995.

EPD DETAILED SELECTION PROCEDURE

1) Select unit size from Table 3 based on larger SA or RA cfm required. Then select the smallest unit which meets the required task, since this will provide the most cost-effective selection.

ex. If 7000 cfm of SA at 1-inch external static pressure and 6000 cfm RA at .5-inch external static pressure is required, then select EP-9 based on 7000 cfm.

2) Select EPD unit configuration based on project requirements of high latent load and to provide year-round temperature of SA conditions. (See page 6 for EPD configuration.)

3) Use Table 5 (page 23) to determine the ISP for both the SA and RA sides of the unit.

ex. In an indoor unit, the ISP pressure for the SA side of EPD-9 at 7000 cfm is 3.46 inches. The ISP for the RA side of EPD-9 at 6000 cfm is 2.73 inches.

SA @ 7000cfm

OA opening	.04 in.wg.
SA opening	.04 in.wg.
Damper	.13 in.wg.
OA Filter	.55 in.wg.
E Wheel	.96 in.wg.
CHW Coil	.78 in.wg.
HW Coil	.13 in.wg.
S Wheel	.82 in.wg.
Casing	.30 in.wg.
ISP	**3.75 in.wg.**

RA @ 6000cfm

EA opening	.20 in.wg.
RA opening	.20 in.wg.
Damper	.10 in.wg.
RA Filter	.49 in.wg.
E Wheel	.80 in.wg.
S Wheel	.67 in.wg.
Casing	.30 in.wg.
ISP	**2.76 in.wg.**

4) Determine fan TSP by adding the ISP to the required external static pressure.

ex. SA side TSP is 3.75" + 1" = 4.75"
RA side TSP is 2.76" + .5" = 3.26"

5) Use Table 5 (page 23) again to determine purge/seal air volume to be added to each designed airflow to determine total fan airflow.

ex. EPD-9 sensible wheel purge/seal volume is 906 cfm and the enthalpy wheel purge/seal volume is 1119 cfm.
Total SA fan flow = 9025 cfm
Total RA fan flow = 8025 cfm

TABLE 3. System Capacities and Base Effectiveness

Model	Capacity		Effectiveness in %
EPD-3	Low Mid High	2,000 2,250 2,500	78 76 75
EPD-5	Low Mid High	3,000 3,500 4,000	81 79 77
EPD-9	Low Mid High	4,500 6,000 7,300	82 78 76
EPD-13	Low Mid High	6,000 7,500 8,800	84 81 79
EPD-18	Low Mid High	8,000 10,000 14,000	85 82 77
EPD-24	Low Mid High	11,000 13,000 15,000	84 82 80
EPD-28	Low Mid High	15,000 18,500 21,000	82 80 78
EPD-35	Low Mid High	18,000 21,000 24,000	83 80 79
EPD-43	Low Mid High	26,000 30,000 37,000	80 78 76

6) Determine motor horsepower based on the unit's basic fan size, total fan airflow and TSP from the fan performance tables (pages 24-27). The minimum motor horsepower is the fan brake horsepower listed in the chart plus 10 percent to allow for drive loss and safety factors. An optional extended range fan (shown as size X or XX) is offered for most model sizes. This fan offers horsepower savings depending on the exact performance required. However, an increase in unit size is possible.

ex. Using a size 9 fan, the SA fan brake horsepower is 10.2 based on 9025 cfm at 4.75-inches static pressure. This would require a minimum 15 hp motor. The RA fan brake horsepower is 6.4 based on 8025 cfm at 3.26-inches static pressure. This would require a minimum 7.5 hp motor.

7) Find the base wheel effectiveness from Table 3 (page 10) based on the model selected and using the smaller of the SA or RA cfm.

ex. The base wheel effectiveness for EPD-9 based on 6000 cfm is 78 percent.

8) Determine SA and RA efficiency from Table 3 and their cfm ratio.

ex. SA efficiency would be approximately 70 percent interpolating from Table 4 for a base wheel effectiveness of 78 percent and a SA/RA ratio of 7000 cfm/6000 cfm =1.17. The RA efficiency would be approximately 81 percent using 6000 cfm/7000 cfm.

9) Determine summer and winter SA conditions, based on design temperature and SA and RA efficiencies using equations 3 to 5 from Figure 2 (See page 6 for EPD configuration).

ex. By using Equation 4A with the design conditions shown in Example 2 and a 70 percent SA efficiency, the following leaving coil condition (LC) is determined.

FIGURE 2:

Equation 3: Enthalpy Wheel
$X_{EC} = X_{OA} - E_{SA} (X_{OA} - X_{TA})$

Equation 4A: Sensible Wheel (SA Side)
$T_{SA} = T_{LC} - E_{SA} (T_{LC} - T_{RA})$

Equation 4B: Sensible Wheel (SA Side)
$W_{SA}[gr/lb] = W_{LC}[gr/lb]$

Equation 5A: Sensible Wheel (RA Side)
$T_{TA} = T_{RA} - E_{SA} (T_{LC} - T_{RA})$

Equation 5B: Sensible Wheel (RA Side)
$W_{TA}[gr/lb] = W_{RA}[gr/lb]$

EC = entering coil condition

LC = leaving coil condition

TA = sensible wheel leaving EA condition

T = dry bulb temperature (ºF)

W= humidity (gr/lb)

X = dry bulb temperature (ºF) or, moisture content (gr/lb) or, enthalpy (Btu/lb)

Equation 4A for summer DB:
$SA_{(DB\ TEMP)}$ = 53°F - .70(53°F - 75°F) = 68.4°F

Equation 4B for Summer Humidity:
$SA_{(GRAINS)} = LC_{(GRAINS)}$ = 56 gr

The summer coil entering conditions can be calculated by using the remaining equations and working backwards through the exhaust air (EA) side of the unit. This will allow verification that the coil has adequate capacity to achieve the assumed LC condition.

When the temperature drops below 25°F, the sensible wheel will rotate at minimum speed to prevent frosting. In this mode, Equation 3 will yield the SA conditions for the unit.

10) Determine the need for variable speed option on the sensible wheel.

ex. If the EPD system is the only source for space-conditioning, a sensor located in the supply airstream can be used to vary the speed of the sensible wheel in order to control the SA temperature leaving the system.

In the cooling mode, the EPD's LC temperature is set to control the desired humidity level. However, by reducing the speed of the sensible wheel, the amount of reheat is altered. This allows the system to provide more or less sensible cooling. (Note: if the variable speed control option is used, the reduced sensible wheel efficiency must be taken into account when determining the tonnage for the EPD system.)

EXAMPLE 2

Condition	TDB	TWB	rh%	Grains
Summer OA	95.0°	78.0°	47	117
Summer RA	75.0°	62.3°	63	63
Summer LC	53.0°	52.1°	94	56
Summer TA	57.2°	55.5°	90	63
Summer EC	68.5°	63.2°	75	79
Summer SA	68.4°	58.0°	54	56
Winter OA	0.0°	-1.0°	70	4
Winter RA	70.0°	51.4°	25	27
Winter SA	49.0°	39.2°	38	20

In the heating mode, the sensible wheel speed is controlled to provide the desired SA condition. In rare cases, the supplemental heating is required if the two wheels in series are inefficient and cannot satisfy the load of the conditioned space. When the air temperature outside falls below 25°F, the sensible wheel is turned off to avoid condensation.

11) Select unit voltage and determine power requirements from the Electrical Data table on page 35.

ex. For the EPD-9, use a 15-hp SA fan, a 10-hp RA fan, 2 constant speed wheels, 208 volt/3 phase/60-cycle power, and a 500 VA control power transformer:

From Electrical Data Table:

Full Load Ampacity	
15-hp SA fan	46.2 amps
7.5-hp RA fan	24.2 amps
Wheels	7.3 amps
Control power	2.4 amps
Total FLA's	**80.1 amps**

Minimum Circuit Ampacity	
FLA from above	80.1 amps
25% of largest motor	11.55 amps
Total MCA	**91.65 amps**

Maximum Overcurrent Protection (MOCP)	
FLA from above	80.1 amps
125% of largest motor	57.75 amps
MOCP*	**137.85 amps**

*Select the next smaller sized time delay fuse, per instructions in UL 1995.

Basic cooling coil performance is given in the Cooling Coil Tables on pages 28-30. The amount of dehumidification capacity is related to the LC air temperature. To calculate the amount of cooling capacity required, use the following equations:

EQUATION 6:
$BTU/H = 4.5 \times cfm \ (EC_{ENTHALPY} - LC_{ENTHALPY})$

EQUATION 7A:
$BTU/H_{SENSIBLE} = 1.08 \times cfm \ (EC_{DB\ TEMP} - LC_{DB\ TEMP})$

EQUATION 7B:
$BTU/H_{LATENT} = .68 \times cfm \ (EC_{GRAINS} - LC_{GRAINS})$

ex. For the 7000 cfm EPD unit, calculate the cooling capacity with and without the EPD unit at the outside air condition of 95°F DB and 78°F WB and with a 53°F DB and 52°F WB leaving coil condition. Use a psychrometric chart to obtain either the enthalpies or the humidity in grains at each condition:

For the cooling capacity without the EPD unit, use Equation 6:

BTU/H = 4.5 x 7000 x (41.3 - 21.4) = 626,850 BTU/H or 626,850/12,000 = 52.2 tons of cooling

Condition	Dry Bulb	Wet Bulb	Humidity	Enthalpy
OA	95.0°	78.0°	117gr	41.3
EC	68.5°	63.2°	79gr	28.8
LC	53.0°	52.1°	56gr	21.4

Use equations 7A and 7B for the cooling capacity with the EPD unit:

$BTU/H_{SENSIBLE} = 1.08 \times 7000 \times (68.5 - 53) = 117{,}180$ BTU/H

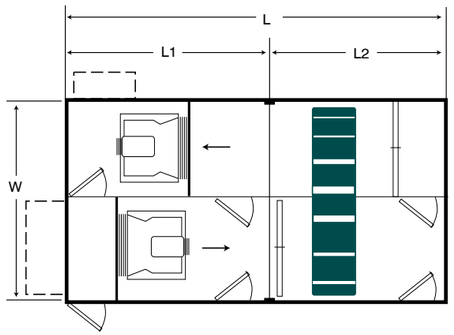
$BTU/H_{LATENT} = .68 \times 7000 \times (79 - 56) = 109{,}480$ BTU/H

BTU/H = 117,180 + 109,480 = 226,660 BTU/H or 226,660/12,000 = 18.9 tons of cooling

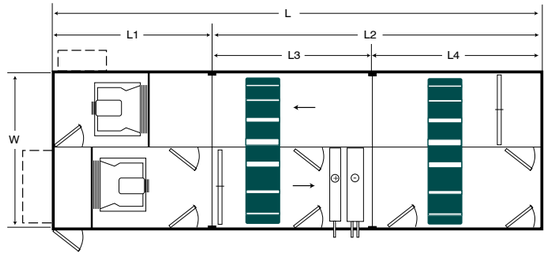
UNIT WEIGHTS AND DIMENSIONS

EP

EP Model	W (in.)	L (in.)	L1 (in.)	L2 (in.)	H (in.)	Weight Mod#1 (lbs)	Weight Mod#2 (lbs)	Notes (See pg 14)
EP-3	86	163	-	-	48	4,950	-	5
EP-5	86	167	-	-	60	5,750	-	5
EP-9	98	171	-	-	72	7,350	-	2,4
EP-13	98	182	-	-	86	9,400	-	2,4
EP-18	122	190	-	-	98	12,150	-	2,4
EP-24	122	204	-	-	110	14,250	-	2,4
EP-28	146	215	119	96	122	10,100	7,750	2,4
EP-35	146	231	129	102	134	11,700	8,650	2,4
EP-43	182	245	137	108	146	15,100	10,500	3



EPD



EPD Model	W (in.)	L (in.)	L1 (in.)	L2 (in.)	L3 (in.)	L4 (in.)	H (in.)	Weight Mod#1 (lbs)	Weight Mod#2 (lbs)	Weight Mod#3 (lbs)	Weight Mod#4 (lbs)	Notes (See pg 14)
EPD-3	86	263	-	-	-	-	48	7,100	-	-	-	1,5
EPD-5	86	267	-	-	-	-	60	8,300	-	-	-	1,5
EPD-9	98	271	-	-	-	-	72	10,450	-	-	-	1,4
EPD-13	98	295	-	-	-	-	86	13,700	-	-	-	1,4
EPD-18	122	308	108	200	-	-	98	7,150	10,000	-	-	1,4
EPD-24	122	321	115	206	-	-	110	8,450	11,450	-	-	1,4
EPD-28	146	334	119	-	113	102	122	10,100	-	7,800	7,750	1,4
EPD-35	146	350	129	-	113	108	134	11,700	-	8,500	8,650	1,4
EPD-43	182	364	137	-	113	113	146	15,100	-	10,150	10,500	1

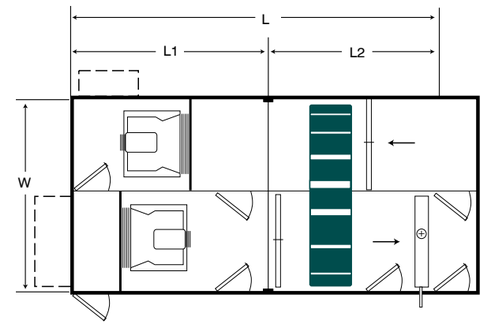
FOR ALL EP MODELS

Notes:

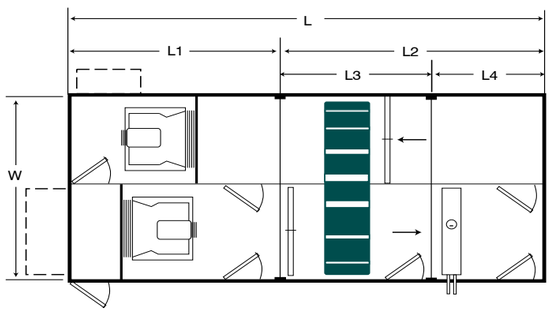
1. Electric heating coil will add 12” to unit length.
2. 12” wider EA side available for increased capacity.
3. 24” wider EA side available for increased capacity.
4. Add 12” to width for X and XX size EA fan.
5. Add 18” to unit length for X and XX size SA or EA fan.
6. Right handed units shown. For left hand unit, mirror down centerline.

EPH

EPH Model	W (in.)	L (in.)	L1 (in.)	L2 (in.)	H (in.)	Weight Mod#1 (lbs)	Weight Mod#2 (lbs)	Notes (See pg 14)
EPH-3	86	182	-	-	48	5,300	-	1,5
EPH-5	86	186	-	-	60	6,150	-	1,5
EPH-9	98	190	-	-	72	7,850	-	1,4
EPH-13	98	208	-	-	86	10,150	-	1,4
EPH-18	122	216	-	-	98	13,000	-	1,4
EPH-24	122	230	-	-	110	15,200	-	1,4
EPH-28	146	241	119	121	122	10,100	8,750	1,4
EPH-35	146	256	129	127	134	11,700	9,750	1,4
EPH-43	182	270	137	133	146	15,100	11,850	1

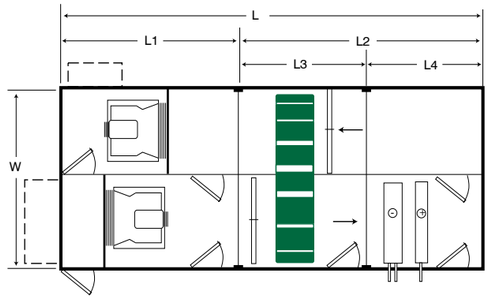


EPC



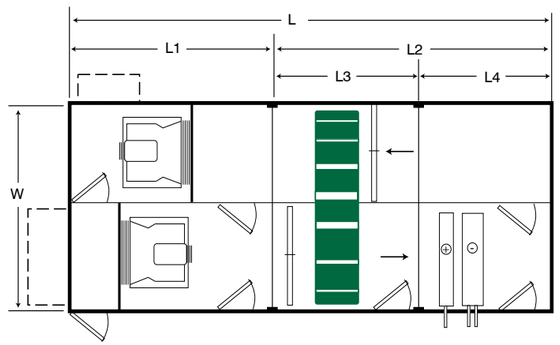
EPC Model	W (in.)	L (in.)	L1 (in.)	L2 (in.)	L3 (in.)	L4 (in.)	H (in.)	Weight Mod#1 (lbs)	Weight Mod#2 (lbs)	Weight Mod#3 (lbs)	Weight Mod#4 (lbs)	Notes (See pg 14)
EPC-3	86	198	-	-	-	-	48	5,650	-	-	-	5
EPC-5	86	202	-	-	-	-	60	6,600	-	-	-	5
EPC-9	98	206	-	-	-	-	72	8,350	-	-	-	4
EPC-13	98	224	-	-	-	-	86	10,800	-	-	-	4
EPC-18	122	232	-	-	-	-	98	13,900	-	-	-	4
EPC-24	122	250	115	135	-	-	110	8,450	7,700	-	-	4
EPC-28	146	256	119	137	-	-	122	10,100	9,950	-	-	4
EPC-35	146	272	129	143	-	-	134	11,700	11,050	-	-	4
EPC-43	182	291	137	-	74	80	146	15,100	-	6,750	7,350	1

EPCH



Model	W	L	L1	L2	L3	L4	H	Weight Mod#1	Weight Mod#2	Weight Mod#3	Weight Mod#4	Notes (See pg 14)
	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)	(lbs)	(lbs)	(lbs)	(lbs)	
EPCH-3	86	210	-	-	-	-	48	5,850	-	-	-	1,5
EPCH-5	86	214	-	-	-	-	60	6,850	-	-	-	1,5
EPCH-9	98	218	-	-	-	-	72	8,700	-	-	-	1,4
EPCH-13	98	236	-	-	-	-	86	11,200	-	-	-	1,4
EPCH-18	122	243	-	-	-	-	98	14,400	-	-	-	1,4
EPCH-24	122	262	115	147	-	-	110	8,450	8,200	-	-	1,4
EPCH-28	146	273	119	-	74	80	122	10,100	-	5,400	5,600	1,4
EPCH-35	146	289	129	-	74	86	134	11,700	-	5,900	6,200	1,4
EPCH-43	182	303	137	-	74	92	146	15,100	-	6,750	8,150	1

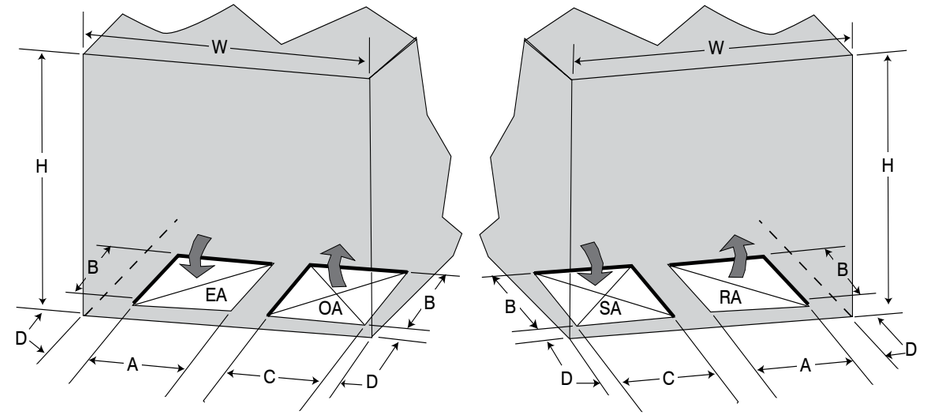
EPHC



Model	W	L	L1	L2	L3	L4	H	Weight Mod#1	Weight Mod#2	Weight Mod#3	Weight Mod#4	Notes (See pg 14)
	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)	(in.)	(lbs)	(lbs)	(lbs)	(lbs)	
EPHC-3	86	210	-	-	-	-	48	5,850	-	-	-	1,5
EPHC-5	86	214	-	-	-	-	60	6,850	-	-	-	1,5
EPHC-9	98	218	-	-	-	-	72	8,700	-	-	-	1,4
EPHC-13	98	236	-	-	-	-	86	11,200	-	-	-	1,4
EPHC-18	122	243	-	-	-	-	98	14,400	-	-	-	1,4
EPHC-24	122	262	115	147	-	-	110	8,450	8,200	-	-	1,4
EPHC-28	146	273	119	-	74	80	122	10,100	-	5,400	5,600	1,4
EPHC-35	146	289	129	-	74	86	134	11,700	-	5,900	6,200	1,4
EPHC-43	182	303	137	-	74	92	146	15,100	-	6,750	8,150	1

STANDARD ROOF & FLOOR OPENINGS

Standard Floor Openings

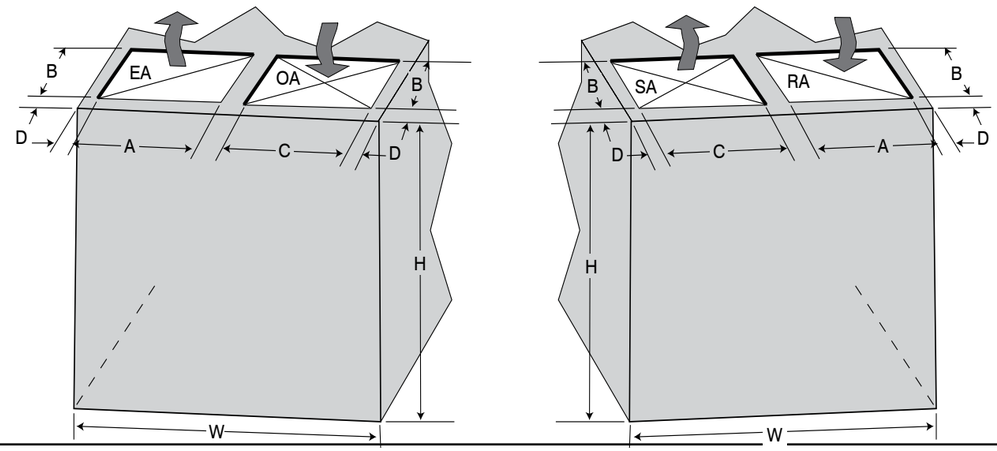


SIZE	H	W	A	B	C	D
3	48.25	86.25	24	20	24	6.25
5	60.25	86.25	24	20	34	6.25
9	72.25	98.25	34	20	46	6.25
13	86.25	98.25	34	26	46	6.25
18	98.25	122.25	46	26	58	6.25
24	110.25	122.25	46	32	58	6.25
28	122.25	146.25	58	32	70	6.25
35	134.25	146.25	58	37	70	6.25
43	146.25	182.25	70	44	94	6.25

Notes:

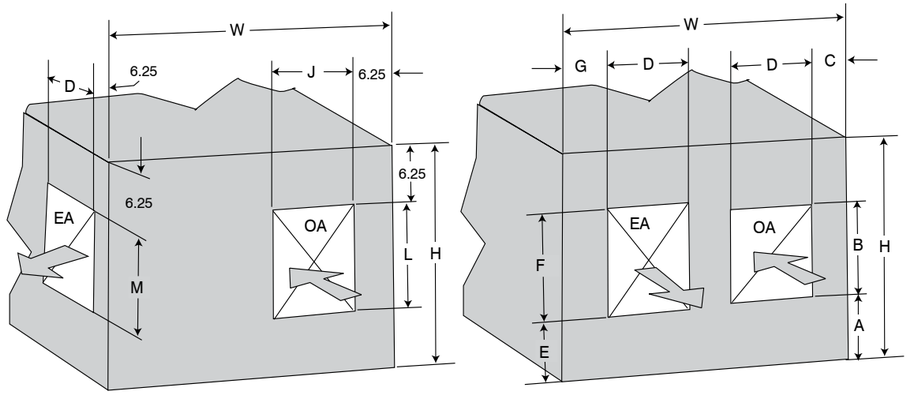
1. All dimensions are in inches.
2. Height includes structural steel base.
3. Roof openings only available on interior units.

Standard Roof Openings



STANDARD END WALL AND SIDE WALL OPENINGS

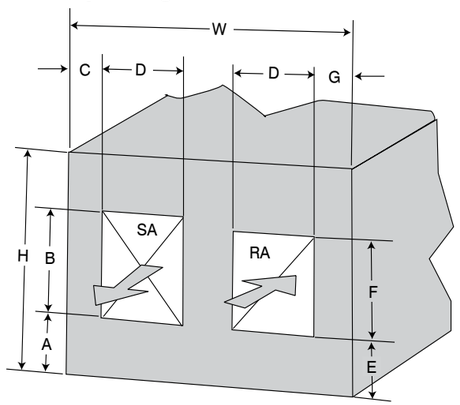
Standard OA/EA Openings



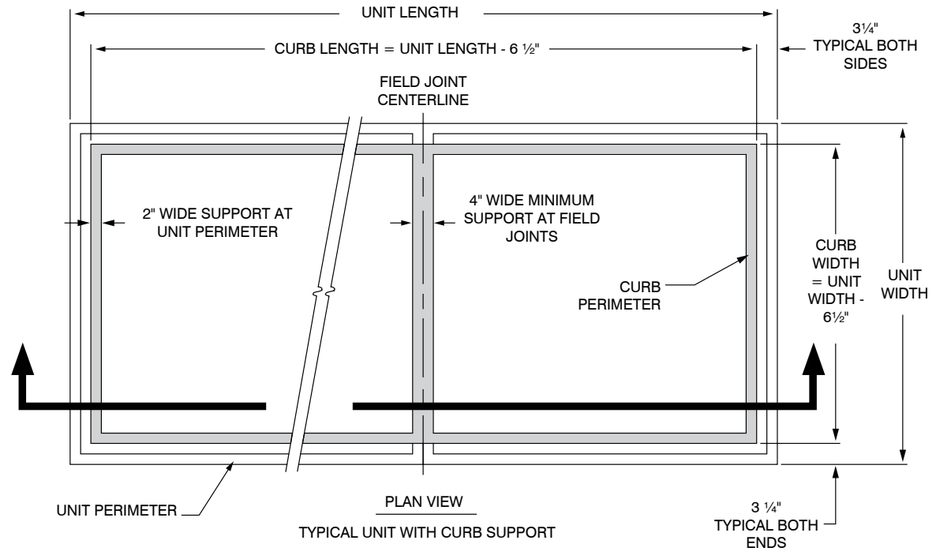
Size	H	W	A	B	C	D	E	F	G	J	L	M
3	48.25	86.25	14.25	24	12.25	20	14.25	24	12.25	30	23	23
5	60.25	86.25	15.25	34	14.25	20	20.25	24	14.25	30	47	47
9	72.25	98.25	15.25	46	20.25	20	21.25	34	14.25	42	47	47
13	86.25	98.25	23.25	46	17.25	26	29.25	34	11.25	42	71	71
18	98.25	122.25	23.25	58	23.25	26	29.25	46	17.25	54	71	71
24	110.25	122.25	29.25	58	20.25	32	35.25	46	14.25	54	95	95
28	122.25	146.25	29.25	70	26.25	32	35.25	58	20.25	66	95	95
35	134.25	146.25	35.25	70	22.75	37	41.25	58	16.75	66	119	119
43	146.25	182.25	29.25	94	32.25	44	41.25	70	20.25	90	119	119

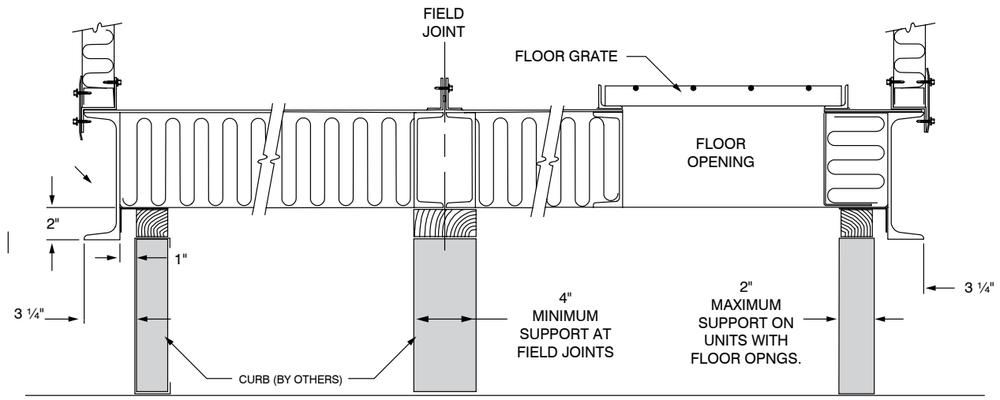
Notes:
1. All dimensions are in inches.
2. Height includes structural steel base.

Standard SA/RA Openings



MOUNTING DETAILS, CURB SUPPORT





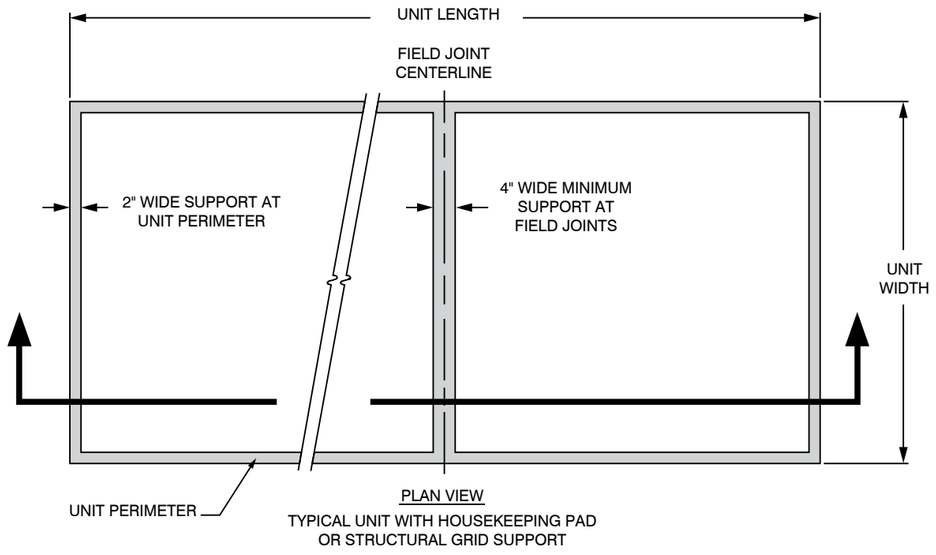
NOTES

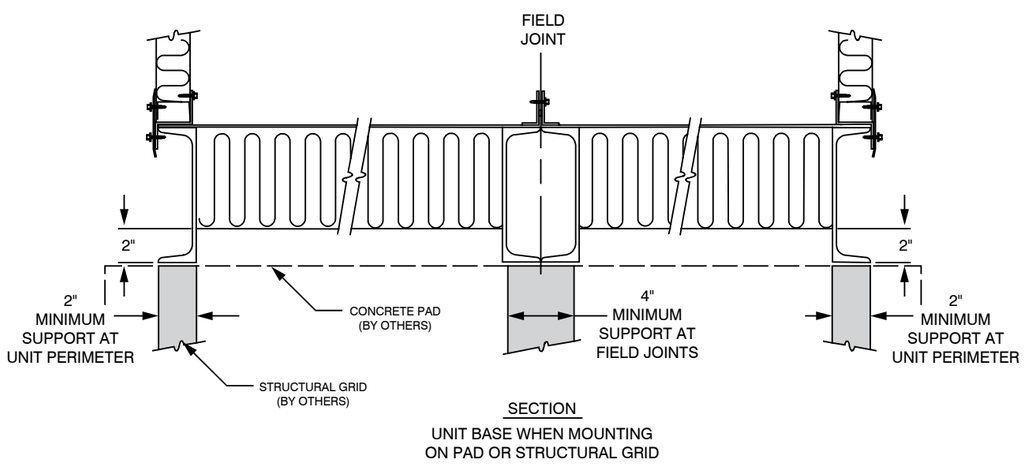
1. ROOF CURB SHOULD BE SIZED TO ALLOW UNIT TO HANG OVER CURB.
2. CURB SIZE:
   WIDTH = UNIT WIDTH - 6.5"
   LENGTH = UNIT LENGTH -6.5"
3. UNIT SUPPORT IS REQUIRED AROUND THE ENTIRE PERIMETER AND ALONG BOTH SIDES OF ANY FIELD JOINTS.
4. WHEN UNITS REQUIRE FIELD JOINTS, SUPPORT SHOULD BE LEVEL TO 1/16" BETWEEN FIELD JOINTS.
5. BASES ARE MADE WITH C6 PERIMITER AND C4 CROSS MEMBERS FOR SIZES 3-9 AND

SECTION

SELF FLASHING UNIT BASE
SHOWING CURB SUPPORT REQUIREMENTS

MOUNTING DETAILS, GRID OR PAD SUPPORT





Notes

1. Unit support is required around the entire perimeter and along both sides of any field joints.
2. When units require field joints, support should be level to 1/16" between field joints.
3. Bases are made with c6 perimiter and c4 cross members for sizes 3-9 and c8 perimiter and c6 cross members for sizes 13-43

INSTALLATION

Lifting and Rigging

The units are designed to be lifted from lifting eyes attached to the unit base structure. Spreader bars must be used to hoist sections to avoid damaging the enclosure. The unit must not be lifted with a forklift.

Chokers need to be adjustable so that the unit is level when it is picked up and, more importantly, set down. Setting the unit down on one corner could cause the unit to rack. Lever chain pullers are useful for this purpose.

Field Joints

Units may be split into multiple shipping modules, if size or weight dictates. These units will include factory matched field joints for reassembly at the site. All fasteners, gaskets and caulk are included with the unit.

Coil Piping

Hot water coils and chilled water coils have supply and return connections extended through the casing wall to the unit exterior. Drain and vent connections are not extended.

DX refrigerant coils have liquid lines extended to the unit exterior. Suction line connections are inside the unit.

Steam coils have supply and condensate connection extended through the casing wall to the unit exterior. The condensate connection for the lower steam coil is approximately at floor level. Accommodations for the drip leg will need to be made to the exterior of the unit.

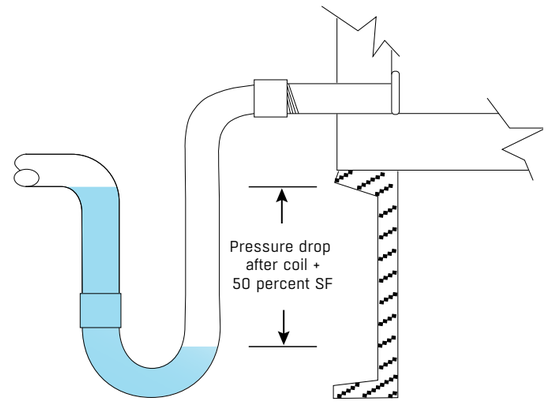
Cooling Coil Condensate Connections

The centerline of the connections is 8.75 inches above the bottom of the base steel. The connections are 1.5 inches MPT.

The plenum containing the condensate pan will be subject to a positive pressure drop on the downstream side of the cooling coil, including the external losses.

The height of water in the trap should be about 50 percent greater than the downstream air pressure drop to prevent air from being blown through the trap.

The unit must be mounted at a sufficient height above the floor or roof to permit installation of the required height P-trap.



COMPONENT PRESSURE DROP TABLES

TABLE 4: Single Wheel Unit Pressure Drops

Size	EP-3			EP-5			EP-9			EP-13			EP-18		
CFM	2000	2500	3000	3000	4000	4500	4500	6000	8000	6000	8000	10000	8000	10000	15000
Enthalpy wheel purge	582	582	582	786	786	786	1027	1027	1027	1329	1329	1329	1646	1646	1646
Fan cfm	2513	3013	3513	3695	4695	5195	5406	6906	8906	7168	9168	11168	9440	11440	16440
OA opening (w/hood)	0.02	0.04	0.05	0.02	0.03	0.03	0.01	0.02	0.03	0.01	0.02	0.30	0.01	0.01	0.03
EA opening (w/hood)	0.09	0.11	0.13	0.05	0.08	0.12	0.10	0.17	0.28	0.05	0.08	0.12	0.08	0.12	0.25
RA or EA opening	0.10	0.14	0.19	0.09	0.15	0.19	0.09	0.15	0.24	0.09	0.15	0.22	0.09	0.13	0.26
SA or OA opening	0.06	0.10	0.14	0.06	0.11	0.14	0.05	0.08	0.14	0.05	0.08	0.13	0.04	0.06	0.14
EA Damper	0.18	0.22	0.26	0.10	0.16	0.23	0.21	0.34	0.56	0.10	0.16	0.23	0.17	0.24	0.50
OA filter	0.26	0.38	0.51	0.25	0.41	0.50	0.19	0.32	0.53	0.24	0.39	0.58	0.19	0.28	0.59
RA filter	0.17	0.26	0.37	0.17	0.30	0.37	0.27	0.49	0.87	0.30	0.52	0.82	0.22	0.34	0.76
Enthalpy wheel	0.69	0.92	1.18	0.52	0.74	0.86	0.48	0.67	0.97	0.42	0.57	0.75	0.47	0.51	0.83
Cooling coil	0.26	0.40	0.58	0.31	0.56	0.70	0.25	0.44	0.79	0.30	0.53	0.82	0.23	0.36	0.80
Heating coil	0.04	0.07	0.09	0.05	0.09	0.11	0.04	0.07	0.13	0.05	0.09	0.13	0.04	0.06	0.13
Casing losses	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Int. static pressure															
Ext. static pressure															
Total static pressure															

Size	EP-24			EP-28			EP-35			EP-43		
CFM	11000	14000	18000	15000	18500	23000	18000	22500	27000	26000	30000	40000
Enthalpy wheel purge	1992	1992	1992	2257	2257	2257	2654	2654	2654	3088	3088	3088
Fan cfm	12735	15735	19735	16961	20461	24961	20297	24797	29297	28662	32662	42662
OA opening (w/hood)	0.20	0.02	0.04	0.01	0.02	0.03	02	0.02	0.03	0.02	0.02	0.04
EA opening (w/hood)	0.06	0.09	0.13	0.10	0.14	0.21	0.07	0.10	0.14	0.13	0.17	0.29
RA or EA opening	0.16	0.24	0.38	0.11	0.17	0.25	0.11	0.17	0.24	0.12	0.15	0.26
SA or OA opening	0.05	0.08	0.13	0.06	0.09	0.15	0.06	0.10	0.14	0.06	0.08	0.14
EA Damper	0.11	0.17	0.27	0.20	0.29	0.43	0.14	0.20	0.28	0.26	0.34	0.59
OA filter	0.27	0.41	0.65	0.26	0.38	0.57	0.30	0.45	0.63	0.28	0.37	0.62
RA filter	0.31	0.50	0.84	0.30	0.45	0.69	0.34	0.54	0.77	0.41	0.55	0.98
Enthalpy wheel	0.42	0.55	0.74	0.49	0.62	0.81	0.47	0.60	0.75	0.56	0.67	0.98
Cooling coil	0.32	0.53	0.87	0.33	0.51	0.78	0.38	0.60	0.86	0.35	0.47	0.83
Heating coil	0.05	0.09	0.14	0.05	0.08	0.13	0.06	0.10	0.14	0.06	0.08	0.13
Casing losses	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Int. static pressure												
Ext. static pressure												
Total static pressure												

Notes:

1. Filter pressure drops based on 2 inches thick, 30% efficient Class II filters.
2. Cooling coil pressure drops based on 6 row, 10 fins per inch single-circuited coil.
3. Heating coil pressure drops based on 1 row, 6 fins per inch.
4. Purge volumes based on 4 inches P_{OA}-P_{RA} for wheel.
5. Casing losses include fan inlet losses.

TABLE 5: Dual Wheel Unit Pressure Drops

Size	EPD-3			EPD-5			EPD-9			EPD-13			EPD-18		
CFM	2000	2250	2500	3000	4000	4500	4500	6000	8000	6000	8000	10000	8000	10000	15000
Sensible wheel purge	520	520	520	669	669	669	837	837	837	1039	1039	1039	1245	1245	1245
Enthalpy wheel purge	721	721	721	956	956	956	1228	1228	1228	1564	1564	1564	1911	1911	1911
Fan cfm	3176	3676	4176	4572	5572	6072	6525	8025	10025	8583	10583	12583	11158	13158	18158
OA opening (w/hood)	0.04	0.05	0.07	0.03	0.04	0.05	0.02	0.03	0.04	0.02	0.03	0.04	0.01	0.02	0.04
EA opening (w/hood)	0.13	0.16	0.18	0.07	0.10	0.12	0.14	0.21	0.34	0.06	0.10	0.14	0.10	0.15	0.29
RA or EA opening	0.16	0.21	0.27	0.14	0.22	0.26	0.13	0.20	0.31	0.13	0.19	0.27	0.12	0.17	0.32
SA or OA opening	0.06	0.10	0.14	0.06	0.11	0.14	0.05	0.08	0.14	0.05	0.08	0.13	0.04	0.06	0.14
EA Damper	0.26	0.31	0.36	0.13	0.20	0.24	0.27	0.42	0.67	0.12	0.19	0.27	0.21	0.29	0.58
OA filter	0.42	0.56	0.72	0.39	0.57	0.68	0.28	0.43	0.67	0.34	0.52	0.73	0.27	0.38	0.71
RA filter	0.17	0.26	0.37	0.17	0.30	0.37	0.27	0.49	0.87	0.30	0.52	0.82	0.22	0.34	0.76
Enthalpy wheel	0.93	1.19	1.46	0.67	0.91	1.05	0.59	0.80	1.13	0.50	0.67	0.86	0.48	0.59	0.94
Sensible wheel	0.69	0.92	1.18	0.52	0.74	0.86	0.48	0.67	0.97	0.42	0.57	0.75	0.41	0.51	0.83
Cooling coil	0.41	0.59	0.80	0.47	0.77	0.94	0.36	0.59	0.98	0.42	0.69	1.03	0.32	0.47	0.97
Heating coil	0.07	0.10	0.13	0.08	0.13	0.15	0.06	0.110	0.16	0.07	0.11	0.17	0.05	0.08	0.16
Casing losses	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Int. static pressure															
Ext. static pressure															
Total static pressure															

Size	EPD-24			EPD-28			EPD-35			EPD-43		
CFM	11000	14000	18000	15000	18500	23000	18000	22500	27000	26000	30000	40000
Sensible wheel purge	1465	1465	1465	1631	1631	1631	1875	1875	1875	2138	2138	2138
Enthalpy wheel purge	2288	2288	2288	2575	2575	2575	3002	3002	3002	3466	3466	3466
Fan cfm	14779	17779	21779	19252	22752	27252	22954	27454	31954	31714	35714	45714
OA opening (w/hood)	0.02	0.03	0.04	0.02	0.02	0.04	0.02	0.03	0.04	0.02	0.03	0.04
EA opening (w/hood)	0.07	0.10	0.15	0.12	0.17	0.24	0.08	0.12	0.16	0.15	0.19	0.32
RA or EA opening	0.21	0.31	0.46	0.15	0.21	0.30	0.15	0.21	0.28	0.14	0.18	0.30
SA or OA opening	0.05	0.08	0.13	0.06	0.09	0.50	0.06	0.10	0.14	0.06	0.08	0.14
EA Damper	0.14	0.20	0.31	0.23	0.33	0.48	0.16	0.23	0.32	0.30	0.38	0.64
OA filter	0.36	0.52	0.79	0.34	0.47	0.68	0.39	0.56	0.75	0.34	0.44	0.74
RA filter	0.31	0.51	0.84	0.30	0.45	0.69	0.34	0.54	0.77	0.41	0.55	0.98
Enthalpy wheel	0.49	0.63	0.83	0.56	0.70	0.91	0.53	0.68	0.84	0.63	0.74	1.07
Sensible wheel	0.42	0.55	0.74	0.49	0.62	0.81	0.47	0.60	0.75	0.56	0.67	0.98
Cooling coil	0.43	0.66	1.04	0.43	0.62	0.92	0.49	0.73	1.01	0.42	0.55	0.94
Heating coil	0.07	0.11	0.17	0.07	0.10	0.15	0.08	0.12	0.17	0.07	0.09	0.15
Casing losses	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Int. static pressure												
Ext. static pressure												
Total static pressure												

Notes:

1. Filter pressure drops based on 2 inches thick, 30% efficient Class II filter.
2. Cooling coil pressure drops based on 6 row, 10 fins per inch single-circuited coil.
3. Heating coil pressure drops based on 1 row, 6 fins per inch.
4. Purge volumes based on 4 inches P_{OA}-P_{RA} for enthalpy wheel and 7 inches for sensible wheel.
5. Casing losses include fan inlet losses.

FAN DATA TABLES

Max motor size assumes the motor is mounted on top of the fan. A larger motor may be provided by mounting the motor and the fan on a common base. This will add length to the unit.

SIZE 3

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1464	.32																		
1400	1563	.38	1933	.74																
1600	1670	.45	2025	.86	2323	1.28														
1800	1786	.52	2120	.97	2406	1.44	2667	1.92												
2200	2029	.71	2327	1.21	2594	1.78	2835	2.36	3051	2.93	3265	3.53								
2600	2285	.96	2558	1.53	2799	2.14	3025	2.81	3235	3.50	3427	4.17	3608	4.48	3789	5.54				
3000	2548	1.27	2801	1.90	3024	2.57	3231	3.29	3428	4.05	3615	4.85	3792	5.65						
3400	2818	1.65	3052	2.36	3262	3.09	3455	3.86	3637	4.67	3813	5.53								
3800	3092	2.10	3311	2.90	3508	3.70	3691	4.53	3862	5.40										
4200	3370	2.65	3576	3.53	3761	4.40														
4600	3650	3.28	3844	4.25																
5000																				

Maximum 5 hp Motor Class I = Max. 3006 RPM Class II = Max. 3909 RPM

SIZE 5

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2500	1101	.59	1420	1.20																
2800	1157	.68	1449	1.32	1721	2.06														
3100	1217	.77	1487	1.45	1742	2.22														
3400	1281	.88	1534	1.60	1772	2.40	1998	3.29												
4000	1416	1.14	1644	1.94	1852	2.81	2054	3.76	2249	4.78	2436	5.88								
4600	1551	1.43	1767	2.34	1956	3.29	2135	4.31	2312	5.39	2484	6.53	2650	7.74	2811	9.02				
5200	1689	1.78	1899	2.81	2073	3.85	2238	4.94	2396	6.09	2553	7.30	2707	8.56	2858	9.88	**3004**	**11.27**	**3147**	**12.71**
5800	1833	2.20	2034	3.35	2200	4.48	2353	5.66	2500	6.89	2642	8.17	2783	9.51	2922	10.88	**3059**	**12.30**	**3194**	**13.79**
7000	2135	3.28	2306	4.61	2468	6.00	2607	7.37	2735	8.75	2861	10.20	**2983**	**11.68**	**3102**	**13.21**	**3219**	**14.77**	**3335**	**16.38**
8200	2448	4.74	2592	6.22	2739	7.83	2876	9.46	**2998**	**11.07**	**3110**	**12.67**	**3219**	**14.30**	**3327**	**16.00**	**3432**	**17.72**	**3535**	**19.48**
9400			2892	8.28	**3019**	**10.04**	**3147**	**11.90**	**3268**	**13.78**	**3378**	**15.63**	**3479**	**17.45**	**3277**	**19.31**	**3672**	**21.18**	**3766**	**23.10**
10600			**3201**	**10.84**	**3312**	**12.76**	**3426**	**14.78**	**3539**	**16.88**	**3648**	**19.00**	**3749**	**21.10**						

Maximum 10 hp Motor Class I = Max. 2302 RPM Class II = Max. 2930 RPM Class III = Max. 3767 RPM

SIZE 5X

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	1004	.71	1295	1.44																
3400	1061	.82	1326	1.60	1572	2.50														
3800	1123	.96	1366	1.78	1595	2.71	1810	3.76												
4200	1189	1.11	1415	1.98	1627	2.96	1829	4.03	2021	5.21										
4600	1257	1.27	1470	2.20	1667	3.23	1858	4.34	2040	5.55	2214	6.85								
5400	1394	1.66	1592	2.72	1767	3.84	1934	5.06	2098	6.34	2258	7.70	2411	9.14	2560	10.67				
6200	1533	2.11	1725	3.34	1885	4.58	2036	5.88	2181	7.26	2325	8.71	2467	10.22	2604	11.79	**2738**	**13.45**	**2869**	**15.17**
7000	1679	2.67	1862	4.05	2013	5.42	2152	6.84	2286	8.32	2415	9.86	2543	11.47	2670	13.13	**2794**	**14.83**	**2917**	**16.62**
7800	1831	3.34	1999	4.85	2148	6.39	2278	7.93	2402	9.51	2523	11.17	2639	12.86	**2754**	**14.61**	**2869**	**16.43**	**2982**	**18.28**
9400	2144	5.09	2282	6.81	2422	8.68	2548	10.54	2659	12.37	**2765**	**14.23**	**2868**	**16.14**	**2970**	**18.12**	**3068**	**20.12**	**3164**	**22.15**
11000			2583	9.40	**2703**	**11.48**	**2822**	**13.67**	**2933**	**15.86**	**3033**	**18.02**	**3126**	**20.15**	**3216**	**22.32**	**3305**	**24.55**	**3393**	**26.82**
12600			**2895**	**12.71**	**2998**	**15.00**	**3102**	**17.40**	**3207**	**19.91**	**3307**	**22.44**	**3399**	**24.93**						

Maximum 10 hp Motor Class I = Max. 2101 RPM Class II = Max. 2674 RPM Class III = Max. 3438 RPM

SIZE 9, 5XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3500	868	.79	1130	1.61																
4000	912	.92	1156	1.82																
4500	962	1.06	1191	2.03	1393	3.09														
5000	1016	1.22	1231	2.26	1422	3.40	1600	4.61												
6000	1133	1.60	1324	2.79	1498	4.07	1657	5.43	1809	6.86	1954	8.31								
7000	1256	2.07	1429	3.40	1587	4.83	1735	6.33	1874	7.91	2006	9.53	2135	11.22	2259	12.90				
8000	1383	2.64	1544	4.13	1688	5.70	1825	7.34	1955	9.06	2078	10.83	2196	12.65	2311	14.54	**2424**	**16.47**	**2533**	**18.38**
9000	1514	3.33	1665	4.98	1798	6.69	1924	8.48	2046	10.34	2162	12.25	2274	14.23	2381	16.25	**2485**	**18.31**	**2587**	**20.43**
10000	1647	4.14	1788	5.95	1915	7.83	2032	9.76	2145	11.76	2254	13.81	2360	15.93	**2463**	**18.11**	**2562**	**20.33**	**2657**	**22.56**
12000	1917	6.20	2046	8.37	2159	10.55	2266	12.81	2365	15.09	**2461**	**17.43**	**2555**	**19.83**	**2648**	**22.30**	**2737**	**24.78**	**2825**	**27.32**
14000	2192	8.92	2310	11.46	**2415**	**14.00**	**2511**	**16.54**	**2604**	**19.16**	**2692**	**21.82**	**2776**	**24.50**	**2858**	**27.23**	**2939**	**30.02**	**3019**	**32.85**
16000			**2579**	**15.34**	**2677**	**18.24**	**2767**	**21.14**	**2852**	**24.06**	**2934**	**27.02**	**3013**	**30.03**	**3088**	**33.04**				

Maximum 20 hp Motor Class I = Max. 1888 RPM Class II = Max. 2403 RPM Class III = Max. 3090 RPM

SIZE 13, 9X

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4400	804	.99																		
5000	849	1.15	1057	2.20																
5600	898	1.34	1094	2.49	1270	3.71														
6200	950	1.55	1135	2.79	1299	4.10														
7400	1058	2.05	1227	3.45	1376	4.98	1515	6.55	1647	8.15										
8600	1171	2.64	1328	4.26	1466	5.94	1593	7.73	1714	9.55	1828	11.35	1942	13.28						
9800	1289	3.36	1436	5.22	1564	7.05	1683	9.00	1794	11.04	1902	13.12	2004	15.16	2104	17.25	**2204**	**19.45**		
11000	1409	4.22	1546	6.30	1668	8.36	1780	10.45	1885	12.64	1985	14.93	2081	17.23	2175	19.55	**2266**	**21.87**	**2355**	**24.21**
12200	1533	5.27	1660	7.52	1776	9.83	1882	12.11	1981	14.43	2077	16.88	2167	19.37	**2255**	**21.93**	**2342**	**24.53**	**2426**	**27.10**
14600	1787	7.94	1896	10.51	2001	13.28	2098	16.05	**2189**	**18.77**	**2275**	**21.49**	**2358**	**24.28**	**2439**	**27.18**	**2516**	**30.11**	**2592**	**33.15**
17000			2142	14.43	**2234**	**17.50**	**2324**	**20.74**	**2408**	**23.96**	**2489**	**27.18**	**2565**	**30.32**	**2639**	**33.49**	**2711**	**36.72**	**2781**	**40.01**
19400			**2394**	**19.40**	**2477**	**22.81**	**2557**	**26.35**	**2636**	**30.05**	**2711**	**33.74**	**2783**	**37.40**						

Maximum 20 hp Motor Class I = Max. 1715 RPM Class II = Max. 2183 RPM Class III = Max. 2806 RPM

SIZE 13X, 9XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	716	1.13	943	2.37																
5800	756	1.33	961	2.65																
6600	803	1.56	991	2.98	1163	4.59														
7400	854	1.82	1028	3.34	1187	5.04	1338	6.91												
8200	909	2.12	1070	3.76	1219	5.55	1358	7.48	1495	9.60										
9000	966	2.47	1115	4.20	1256	6.10	1388	8.14	1514	10.31	1638	12.63								
10600	1082	3.28	1217	5.24	1341	7.35	1460	9.58	1574	11.95	1683	14.41	1789	16.99	1895	19.72	**1999**	**22.55**		
12200	1203	4.30	1328	6.50	1439	8.83	1547	11.29	1651	13.85	1751	16.51	1848	19.27	1942	22.12	**2034**	**25.07**	**2126**	**28.16**
13800	1326	5.54	1443	7.99	1547	10.56	1643	13.21	1738	15.99	1831	18.87	1921	21.83	**2009**	**24.90**	**2094**	**28.03**	**2177**	**31.24**
17000	1576	8.74	1682	11.81	1774	14.83	1861	17.98	1941	21.17	**2019**	**24.47**	**2096**	**27.86**	**2173**	**31.36**	**2248**	**34.90**	**2321**	**38.49**
20200	1831	13.12	1928	16.84	**2013**	**20.45**	**2090**	**24.01**	**2165**	**27.72**	**2235**	**31.46**	**2303**	**35.31**	**2368**	**39.18**	**2433**	**43.15**	**2499**	**47.26**
23400			**2178**	**23.25**	**2258**	**27.52**	**2330**	**31.67**	**2397**	**35.79**	**2462**	**40.00**	**2526**	**44.34**						

Maximum 30 hp Motor Class I = Max. 1556 RPM Class II = Max. 1981 RPM Class III = Max. 2546 RPM

Legend:

Class I = First white section
Class II = Green shaded section
Class III = White section after green section
Underlined figures indicate Maximum Static Efficiency

Legend:

Class I = First white section
Class II = Green shaded section
Class III = White section after green section
Underlined figures indicate Maximum Static Efficiency

SIZE 18, 13XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	639	1.33																		
7000	675	1.56	860	3.20																
8000	717	1.84	888	3.58	1041	5.56														
9000	761	2.14	921	3.99	1064	6.11	1198	8.40												
10000	809	2.50	959	4.48	1094	6.69	1219	9.13	1339	11.70										
11000	858	2.89	1000	5.02	1128	7.33	1246	9.87	1358	12.57	14.67	15.41								
13000	960	3.89	1090	6.26	1205	8.83	1313	11.55	1415	14.48	1512	17.58	1607	20.83	1699	24.14	**1790**	**27.60**		
15000	1066	5.15	1186	7.73	1292	10.60	1391	13.58	1485	16.69	1575	19.97	1662	23.45	1746	27.07	**1828**	**30.78**	**1909**	**34.60**
17000	1174	6.66	1287	9.53	1386	12.63	1477	15.90	1565	19.30	1649	22.80	1730	26.44	**1808**	**30.22**	**1884**	**34.16**	**1958**	**38.22**
21000	1399	10.60	1496	14.27	1585	17.77	1667	21.52	1744	25.50	**1817**	**29.55**	**1889**	**33.72**	**1959**	**37.98**	**2026**	**42.26**	**2092**	**46.69**
25000	1629	15.97	1714	20.50	**1794**	**24.77**	**1869**	**28.93**	**1940**	**33.30**	**2007**	**37.89**	**2071**	**42.62**	**2133**	**47.44**	**2194**	**52.36**	**2254**	**57.33**
29000			**1938**	**28.38**	**2010**	**33.57**	**2078**	**38.45**	**2143**	**43.24**	**2206**	**48.20**	**2266**	**53.37**						

Maximum 50 hp Motor Class I = Max. 1401 RPM Class II = Max. 1783 RPM Class III = Max. 2291 RPM

SIZE 24, 18X

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7000	574	1.56																		
8000	600	1.77	774	3.70																
9000	630	2.03	792	4.06	939	6.39														
11000	696	2.63	841	4.89	969	7.44	1091	10.26												
13000	769	3.38	899	5.89	1017	8.66	1126	11.71	1230	14.96	1330	18.33								
15000	845	4.31	965	7.09	1073	10.09	1174	13.32	1269	16.80	1360	20.46	1449	24.27	1536	28.22				
17000	923	5.47	1036	8.46	1136	11.77	1230	15.23	1319	18.88	1403	22.73	1485	26.82	1565	31.06	**1643**	**35.38**	**1720**	**39.84**
19000	1003	6.83	1110	10.07	1204	13.65	1291	17.37	1375	21.27	1455	25.33	1532	29.61	1606	34.05	**1678**	**38.63**	**1749**	**43.35**
23000	1169	10.25	1264	14.18	1350	18.17	1428	22.46	1502	26.94	1573	31.47	**1642**	**36.15**	**1709**	**40.97**	**1774**	**45.93**	**1838**	**51.13**
27000	1340	14.75	1424	19.53	1502	24.01	1575	28.71	**1643**	**33.71**	**1707**	**38.84**	**1769**	**44.08**	**1831**	**49.51**	**1890**	**54.92**	**1948**	**60.46**
31000	1514	20.52	1589	26.12	**1661**	**31.48**	**1728**	**36.61**	**1792**	**41.97**	**1852**	**47.59**	**1909**	**53.36**	**1965**	**59.34**	**2019**	**65.36**	**2073**	**71.52**
35000			**1758**	**34.14**	**1823**	**40.36**	**1886**	**46.32**	**1945**	**52.09**	**2002**	**58.05**	**2057**	**64.35**						

Maximum 50 hp Motor Class I = Max. 1273 RPM Class II = Max. 1620 RPM Class III = Max. 2083 RPM

SIZE 28, 24X, 18XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8000	496	1.73																		
9200	518	2.00																		
10400	541	2.28	689	4.55																
11600	568	2.60	707	5.04																
14000	628	3.34	751	6.11	862	9.11	968	12.42												
16400	693	4.25	803	7.35	906	10.73	999	14.21	1089	17.97										
18800	762	5.37	862	8.78	954	12.45	1043	16.36	1126	20.42	1203	24.51	1282	29.02						
23600	906	8.32	992	12.37	1070	16.67	1145	21.24	1218	25.98	1289	30.90	1357	35.95	1421	41.00	**1483**	**46.15**	**1544**	**51.45**
28400	1053	12.27	1131	17.14	1201	22.10	1266	27.23	1329	32.63	1390	38.13	1451	43.85	**1511**	**49.74**	**1569**	**55.72**	**1625**	**61.76**
33200	1204	17.52	1275	23.22	1339	28.93	1398	34.70	1455	40.71	**1509**	**46.84**	**1562**	**53.14**	**1615**	**59.66**	**1667**	**66.25**	**1719**	**73.06**
38000	1357	24.22	1423	30.84	**1482**	**37.35**	**1536**	**43.81**	**1588**	**50.43**	**1638**	**57.19**	**1687**	**64.19**	**1734**	**71.26**	**1780**	**78.45**	**1826**	**85.81**
42800			**1572**	**40.05**	**1627**	**47.40**	**1678**	**54.70**	**1726**	**61.99**	**1773**	**69.48**	**1818**	**77.02**	**1862**	**84.75**				

Maximum 50 hp Motor Class I = Max. 1151 RPM Class II = Max. 1465 RPM Class III = Max. 1884 RPM

Legend:

Class I = First white section
Class II = Green shaded section
Class III = White section after green section
Underlined figures indicate Maximum Static Efficiency

SIZE 35, 28X, 24XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
10000	454	2.18																		
11500	474	2.50																		
13000	497	2.87	628	5.66																
16000	549	3.71	667	6.98	770	10.45														
19000	609	4.78	712	8.42	808	12.38	895	16.52	981	21.07										
22000	672	6.09	765	10.13	852	14.51	934	19.13	1010	23.89	1083	28.87								
25000	738	7.70	824	12.15	901	16.85	978	21.97	1050	27.21	1118	32.59	1182	38.01	1247	43.87	1314	50.25		
28000	805	9.59	885	14.45	957	19.60	1026	25.03	1094	30.75	1159	36.61	1221	42.62	1279	48.57	**1337**	**54.86**	**1394**	**61.32**
34000	943	14.45	1014	20.26	1078	26.20	1138	32.43	1195	38.84	1251	45.45	1307	52.33	**1362**	**59.43**	**1415**	**66.61**	**1466**	**73.87**
40000	1083	20.84	1148	27.73	1206	34.58	1260	41.56	1312	48.83	**1361**	**56.20**	**1410**	**63.90**	**1458**	**71.71**	**1506**	**79.75**	**1553**	**87.90**
46000	1226	29.16	1285	37.08	**1339**	**44.99**	**1388**	**52.80**	**1436**	**60.90**	**1481**	**69.04**	**1525**	**77.44**	**1568**	**86.05**	**1610**	**94.77**	**1652**	**103.72**
52000			**1425**	**48.66**	**1475**	**57.61**	**1521**	**66.45**	**1564**	**75.24**	**1607**	**84.39**	**1648**	**93.58**	**1688**	**103.00**				

Maximum 50 hp Motor Class I = Max. 1044 RPM Class II = Max. 1329 RPM Class III = Max. 1708 RPM

SIZE 43, 35X, 28XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
12000	408	2.60																		
13800	426	3.00																		
15600	446	3.44	566	6.82																
17400	468	3.91	581	7.54																
21000	518	5.03	618	9.17	709	13.67	794	18.53												
24600	572	6.41	661	11.02	745	16.07	822	21.35	894	26.84										
28200	629	8.11	710	13.18	786	18.73	859	24.63	926	30.63	989	36.75	1053	43.45						
35400	748	12.57	819	18.69	883	25.16	943	31.90	1003	39.04	1061	46.42	1116	53.90	1168	61.40	**1219**	**69.16**	**1269**	**77.13**
42600	871	18.66	934	25.91	991	33.33	1044	41.01	1095	49.03	1145	57.30	1195	65.91	**1244**	**74.74**	**1291**	**83.61**	**1337**	**92.71**
49800	996	26.65	1054	35.22	1105	43.65	1154	52.40	1200	61.32	**1244**	**70.47**	**1287**	**79.88**	**1330**	**89.59**	**1373**	**99.58**	**1415**	**109.67**
57000	1122	36.80	1176	46.74	**1224**	**56.49**	**1268**	**66.17**	**1310**	**76.00**	**1352**	**86.34**	**1391**	**96.62**	**1429**	**107.13**	**1467**	**117.99**	**1505**	**129.14**
64200			**1300**	**60.84**	**1345**	**71.91**	**1386**	**82.76**	**1425**	**93.66**	**1463**	**104.8**	**1500**	**116.15**	**1536**	**127.73**				

Maximum 50 hp Motor (up to 75 hp motor on C-III fan) Class I = Max. 944 RPM Class II = Max. 1202 RPM Class III = Max. 1545 RPM

SIZE 43X, 35XX

STATIC PRESSURE IN INCHES OF WATER																				
	1" SP		2" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP		9" SP		10" SP	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
16000	381	3.47																		
18000	397	3.93	510	7.95																
20000	414	4.42	520	8.67																
24000	454	5.59	550	10.46	634	15.65														
28000	499	7.05	583	12.37	663	18.29	734	24.33	805	31.07										
32000	545	8.75	622	14.63	695	21.09	763	27.86	825	34.71	887	42.18								
36000	593	10.79	665	17.24	730	24.10	794	31.48	855	39.21	910	46.79	965	54.94	1020	63.59				
44000	693	16.04	756	23.59	813	31.53	867	39.90	920	48.64	972	57.75	1022	67.09	1069	76.42	**1114**	**85.81**	**1159**	**95.68**
52000	795	22.92	853	31.88	904	40.86	952	50.22	998	59.97	1043	70.02	1088	80.46	**1132**	**91.14**	**1175**	**102.05**	**1217**	**113.23**
60000	899	31.77	952	42.11	999	52.33	1043	62.77	1086	73.74	**1126**	**84.77**	**1165**	**96.07**	**1204**	**107.73**	**1243**	**119.72**	**1282**	**132.10**
68000	1005	42.97	1054	54.77	**1098**	**66.40**	**1138**	**77.89**	**1177**	**89.76**	**1215**	**102.02**	**1251**	**114.41**	**1286**	**127.04**	**1321**	**140.08**	**1355**	**153.12**
76000			**1156**	**69.75**	**1198**	**82.94**	**1236**	**95.83**	**1272**	**108.78**	**1307**	**122.01**	**1341**	**135.50**	**1374**	**149.26**				

Maximum 50 hp Motor Class I = Max. 857 RPM Class II = Max. 1091 RPM Class III = Max. 1403 RPM

Legend:

Class I = First white section
Class II = Green shaded section
Class III = White section after green section
Underlined figures indicate Maximum Static Efficiency

COIL DATA TABLES

Standard EPC, EPCH, EPHC Chilled Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Face Velocity (fpm)	Standard Chilled Water Coils			
					Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db/wb	Connection Size MPT
EP-3	Low 2000 Med 2500 High 3000	33 in	30 in	291 364 436	9.3 13.4 18.8	17 21 26	51.6 / 51.3 52.4 / 52 53.1 / 52.6	1.5"
EP-5	Low 3000 Med 4000 High 4500	45 in	30 in	320 427 480	10.8 17.7 21.5	26 34 38	51.9 / 51.6 52.9 / 52.5 53.5 / 52.9	2"
EP-9	Low 4500 Med 6000 High 8000	54 in	42 in	286 381 508	3.8 6.5 10.9	38 51 68	52.1 / 51.8 52.9 / 52.6 54.1 / 53.5	1.5"
EP-13	Low 6000 Med 8000 High 10000	66 in	42 in	312 416 519	5 8.3 12.4	51 68 85	52.3 / 52 53.3 / 52.8 54.2 / 53.5	1.5"
EP-18	Low 8000 Med 10000 High 15000	78 in	54 in	274 342 513	6 8.9 18.2	68 85 128	51.4 / 51.2 52.2 / 51.8 53.8 / 53.1	2"
EP-24	Low 11000 Med 14000 High 18000	90 in	54 in	326 415 533	8.5 13 20.3	94 119 153	52 / 51.7 52.9 / 52.5 53.9 / 53.3	2"
EP-28	Low 15000 Med 18500 High 23000	99 in	66 in	331 408 507	4.9 7.1 10.5	128 158 196	52.4 / 52.1 53.1 / 52.7 53.9 / 53.3	2.5"
EP-35	Low 18000 Med 22500 High 27000	111 in	66 in	354 442 531	5.5 8.2 11.6	153 191 232	52.6 / 52.3 53.5 / 53 54.2 / 53.5	2.5"
EP-43	Low 26000 Med 30000 High 40000	123 in	90 in	338 390 520	5.9 7.7 13	221 256 341	52.5 / 52.1 53 / 52.6 54.1 / 53.4	2.5"

Design basis: Entering air temperature: 73°Fdb/66°F wb; entering water temperature: 45°F; water temperature rise: 11°±2°F. 10 fins per inch, 6 rows per coil.

Standard EPC, EPCH, EPHC DX Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Face Velocity (fpm)	Standard Chilled DX Coils		
					Leaving Air Temp. °F db / wb	Suction Line Connection Size MPT	Liquid Line Connection Size MPT
EP-3	Low 2000 Med 2500 High 3000	33 in	30 in	291 364 436	53.2 / 53.2 54.4 / 54.3 55.2 / 55	(1) 1-5/8 (1) 1-5/8 (1) 1-5/8	(1) 1-3/8 (1) 1-3/8 (1) 1-3/8
EP-5	Low 3000 Med 4000 High 4500	45 in	30 in	320 427 480	53.6 / 53.5 55.2 / 54.9 55.6 / 55.3	(1) 1-5/8 (1) 1-5/8 (1) 1-5/8	(1) 1-3/8 (1) 1-3/8 (1) 1-3/8
EP-9	Low 4500 Med 6000 High 8000	54 in	42 in	286 381 508	51.7 / 51.7 53.4 / 53.2 54.8 / 54.6	(2) 1-5/8 (2) 1-5/8 (2) 1-5/8	(2) 1-1/8 (2) 1-1/8 (2) 1-1/8
EP-13	Low 6000 Med 8000 High 10000	66 in	42 in	312 416 519	52.2 / 52.2 53.5 / 53.5 54.8 / 54.6	(2) 1-5/8 (2) 1-5/8 (2) 1-5/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EP-18	Low 8000 Med 10000 High 15000	78 in	54 in	274 342 513	51.1 / 51.1 52.1 / 52.1 54.6 / 54.2	(2) 2-1/8 (2) 2-1/8 (2) 2-1/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EP-24	Low 11000 Med 14000 High 18000	90 in	54 in	326 415 533	51.7 / 51.7 53.1 / 53.1 54.7 / 54.6	(2) 2-1/8 (2) 2-1/8 (2) 2-1/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EP-28	Low 15000 Med 18500 High 23000	99 in	66 in	331 408 507	52.1 / 51.8 53.1 / 53.1 54.7 / 54.2	(3) 2-1/8 (3) 2-1/8 (3) 2-1/8	(3) 1-3/8 (3) 1-3/8 (3) 1-3/8
EP-35	Low 18000 Med 22500 High 27000	111 in	66 in	354 442 531	52.3 / 52.2 53.9 / 53.5 54.9 / 54.6	(3) 2-1/8 (3) 2-1/8 (3) 2-1/8	(3) 1-3/8 (3) 1-3/8 (3) 1-3/8
EP-43	Low 26000 Med 30000 High 40000	123 in	90 in	338 390 520	52 / 51.8 52.7 / 52.5 54.4 / 54.2	(3) 2-5/8 (3) 2-5/8 (3) 2-5/8	(3) 1-5/8 (3) 1-5/8 (3) 1-5/8

Design basis standard: Entering air temperature: 73°Fdb/66°Fwb; entering water temperature: 45°F; water temperature rise: 11°±2°F. DX coil suction temp.: 45°F; refrigerant: R-22. 10 fins per inch, 6 rows per coil.

Increased Capacity EPC, EPCH, EPHC Chilled Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Face Velocity (fpm)	Standard Chilled Water Coils			
					Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db/wb	Connection Size MPT
EP-3	Low 2000 Med 2500 High 3000	33 in	30 in	291 364 436	9.1 13.7 18.8	35 44 52	51.9 / 51.8 53.1 / 52.9 54.3 / 53.9	1.5"
EP-5	Low 3000 Med 4000 High 4500	45 in	30 in	320 427 480	9.6 16 19.7	52 70 78	50.8 / 50.7 52.3 / 52.2 53 / 52.8	2"
EP-9	Low 4500 Med 6000 High 8000	54 in	42 in	286 381 508	6.1 10.2 17	78 105 139	50.4 / 50.3 51.7 / 51.6 53.4 / 53.2	2"
EP-13	Low 6000 Med 8000 High 10000	66 in	42 in	312 416 519	7 11.7 17.4	105 139 174	50.8 / 50.7 52.2 / 52.1 53.5 / 53.3	2.5"
EP-18	Low 8000 Med 10000 High 15000	78 in	54 in	274 342 513	5.4 8.1 16.9	139 174 261	50.4 / 50.3 51.4 / 51.3 53.6 / 53.4	2.5"
EP-24	Low 11000 Med 14000 High 18000	90 in	54 in	326 415 533	6.9 10.7 16.9	192 244 314	51.2 / 51.1 52.4 / 52.2 53.8 / 53.6	3"
EP-28	Low 15000 Med 18500 High 23000	99 in	66 in	331 408 507	5.3 7.8 11.7	261 322 401	51.8 / 51.7 52.9 / 52.7 54.1 / 53.9	2.5"
EP-35	Low 18000 Med 22500 High 27000	111 in	66 in	354 442 531	6.6 10 14.1	313 392 470	52.2 / 52.1 53.4 / 53.2 54.4 / 54.1	2.5"
EP-43	Low 26000 Med 30000 High 40000	123 in	90 in	338 390 520	6.4 8.5 14.8	453 523 697	56.9 / 56.5 57.7 / 57.3 59.4 / 58.7	3"

Design basis: Entering air temperature: 95°Fdb/78°Fwb; entering water temperature: 45°F; water temperature rise: 11°±2°F. 10 fins per inch, 8 rows per coil.

Increased Capacity EPC, EPCH, EPHC DX Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Face Velocity (fpm)	Standard DX Coils		
					Leaving Air Temp. °F db / wb	Suction Line Connection Size MPT	Liquid Line Connection Size MPT
EP-3	Low 2000 Med 2500 High 3000	33 in	30 in	291 364 436	51.5 / 51.5 52.2 / 52.2 54.3 / 54.3	(1) 1-5/8 (1) 2-1/8 (1) 2-1/8	(1) 1-3/8 (1) 1-3/8 (1) 1-3/8
EP-5	Low 3000 Med 4000 High 4500	45 in	30 in	320 427 480	52.1 / 52.1 54.2 / 54.2 55 / 55	(1) 2-1/8 (1) 2-1/8 (1) 2-5/8	(1) 1-3/8 (1) 1-3/8 (1) 1-3/8
EP-9	Low 4500 Med 6000 High 8000	54 in	42 in	286 381 508	51.3 / 51.3 53.4 / 53.4 56.3 / 56.3	(2) 2-1/8 (2) 2-1/8 (2) 2-1/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EP-13	Low 6000 Med 8000 High 10000	66 in	42 in	312 416 519	52.1 / 52.1 54.3 / 54.3 56.5 / 56.5	(2) 2-1/8 (2) 2-1/8 (2) 2-5/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EP-18	Low 8000 Med 10000 High 15000	78 in	54 in	274 342 513	51.6 / 51.6 52.9 / 52.9 55.8 / 55.8	(2) 2-1/8 (2) 2-5/8 (2) 2-5/8	(2) 1-5/8 (2) 1-5/8 (2) 1-5/8
EP-24	Low 11000 Med 14000 High 18000	90 in	54 in	326 415 533	52.3 / 52.3 54.1 / 54.1 56.1 / 56	(2) 2-5/8 (2) 2-5/8 (2) 2-1/8	(2) 1-5/8 (2) 1-5/8 (2) 1-5/8
EP-28	Low 15000 Med 18500 High 23000	99 in	66 in	331 408 507	52.1 / 52.1 53.5 / 53.5 55.4 / 55.4	(3) 2-5/8 (3) 2-5/8 (3) 2-5/8	(3) 1-5/8 (3) 1-5/8 (3) 1-5/8
EP-35	Low 18000 Med 22500 High 27000	111 in	66 in	354 442 531	52.5 / 52.5 54.2 / 54.2 55.8 / 55.8	(3) 2-5/8 (3) 2-5/8 (3) 2-5/8	(3) 1-5/8 (3) 1-5/8 (3) 1-5/8
EP-43	Low 26000 Med 30000 High 40000	123 in	90 in	338 390 520	52.6 / 52.6 53.7 / 53.7 56.5 / 56.5	* (3) 2-5/8 (3) 2-5/8	(3) 1-5/8 (3) 1-5/8 (3) 1-5/8

Design basis: Entering air temperature: 95°Fdb/78°Fwb; entering water temperature: 45°F; water temperature rise: 11°±2°F. DX coil suction temperature: 45°F; refrigerant: R-22. *(2) 2-5/8 & (1) 2-1/8. 10 fins per inch, 8 rows per coil.

Standard EPD Chilled Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Standard Chilled Water Coils				
				Face Velocity (fpm)	Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db/wb	Connection Size MPT
EPD-3	Low 2,513 Med 2,763 High 3,013	33 in	30 in	366 402 438	10.9 12.8 14.9	19 21 22	52.9 / 52.7 53.2 / 52.9 53.5 / 53.2	1.5 ”
EPD-5	Low 3,695 Med 4,695 High 5,195	45 in	30 in	394 501 554	13.9 16.4 19.5	30 33 36	52.8 / 52.6 54.2 / 54.0 54.5 / 54.2	2 ”
EPD-9	Low 5,406 Med 6,906 High 8,906	54 in	42 in	343 438 565	5.5 8.5 11.5	46 59 70	53.5 / 52.3 53.3 / 53.0 54.5 / 54.2	1.5 ”
EPD-13	Low 7,168 Med 9,168 High 11,168	66 in	42 in	372 476 580	5.1 8.0 13.8	52 66 88	53.5 / 53.3 54.3 / 54.0 54.6 / 54.3	1.5 ”
EPD-18	Low 9,440 Med 11,440 High 16,440	78 in	54 in	323 391 562	7.0 9.8 18.5	74 90 129	52.3 / 52.1 52.9 / 52.7 54.1 / 53.8	2 ”
EPD-24	Low 12,735 Med 15,735 High 19,735	90 in	54 in	377 466 585	11.1 16.2 17.9	109 134 143	52.4 / 52.2 53.1 / 52.8 54.6 / 54.2	2 ”
EPD-28	Low 16,961 Med 20,461 High 24,961	99 in	66 in	374 451 550	10.6 14.8 18.3	103 125 141	52.0 / 51.4 52.5 / 51.8 53.4 / 52.5	1.5 ”
EPD-35	Low 20,297 Med 24,797 High 29,297	111 in	66 in	399 487 576	6.5 9.3 10.7	170 206 224	52.9 / 52.7 53.6 / 53.3 54.5 / 54.2	2.5 ”
EPD-43	Low 28,662 Med 32,662 High 42,662	123 in	90 in	373 425 555	10.8 16.0 19.0	230 287 317	52.6 / 52.4 52.6 / 52.4 54.3 / 53.9	2.5 ”

Design basis: Entering air temperature: 73°Fdb/66°Fwb; entering water temperature: 45°F; water temperature rise: 11°±2°F. 10 fins per inch, 6 rows per coil. Note 1: CFM capacity includes typical values for sensible wheel purge volume.

Standard EPD DX Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Standard DX Coils			
				Face Velocity (fpm)	Leaving Air Temp. °F db / wb	Suction Line Connection Size MPT	Liquid Line Connection Size MPT
EPD-3	Low 2,513 Med 2,763 High 3,013	33 in	30 in	366 402 438	54.5 / 54.4 54.9 / 54.9 55.3 / 55.2	(1) 1-5/8 (1) 1-5/8 (1) 1-5/8	(1) 1-3/8 (1) 1-3/8 (1) 1-3/8
EPD-5	Low 3,695 Med 4,695 High 5,195	45 in	30 in	394 501 554	54.9 / 54.8 55.9 / 55.8 56.4 / 56.2	(1) 1-5/8 (1) 1-5/8 (1) 1-5/8	(1) 1-3/8 (1) 1-3/8 (1) 1-3/8
EPD-9	Low 5,406 Med 6,906 High 8,906	54 in	42 in	343 438 565	52.7 / 52.7 53.9 / 53.8 55.2 / 55.0	(2) 1-5/8 (2) 1-5/8 (2) 1-5/8	(2) 1-1/8 (2) 1-1/8 (2) 1-1/8
EPD-13	Low 7,168 Med 9,168 High 11,168	66 in	42 in	372 476 580	53.1 / 53.1 54.5 / 54.2 55.4 / 55.2	(2) 1-5/8 (2) 1-5/8 (2) 1-5/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EPD-18	Low 9,440 Med 11,440 High 16,440	78 in	54 in	323 391 562	51.8 / 51.8 52.8 / 52.8 54.8 / 54.7	(2) 2-1/8 (2) 2-1/8 (2) 2-1/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EPD-24	Low 12,735 Med 15,735 High 19,735	90 in	54 in	377 466 585	52.6 / 52.6 53.8 / 53.7 55.1 / 54.9	(2) 2-1/8 (2) 2-1/8 (2) 2-1/8	(2) 1-3/8 (2) 1-3/8 (2) 1-3/8
EPD-28	Low 16,961 Med 20,461 High 24,961	99 in	66 in	374 451 550	52.6 / 52.6 53.7 / 53.6 54.9 / 54.7	(3) 2-1/8 (3) 2-1/8 (3) 2-1/8	(3) 1-3/8 (3) 1-3/8 (3) 1-3/8
EPD-35	Low 20,297 Med 24,797 High 29,297	111 in	66 in	399 487 576	52.9 / 52.9 54.1 / 54.0 55.2 / 55.0	(3) 2-1/8 (3) 2-1/8 (3) 2-1/8	(3) 1-3/8 (3) 1-3/8 (3) 1-3/8
EPD-43	Low 28,662 Med 32,662 High 42,662	123 in	90 in	373 425 555	52.4 / 52.4 53.2 / 53.1 54.7 / 54.6	(3) 2-5/8 (3) 2-5/8 (3) 2-5/8	(3) 1-5/8 (3) 1-5/8 (3) 1-5/8

Design Basis: Entering air temperature: 73°Fdb/66°Fwb; DX coil suction temperature: 45°F; refrigerant: R-22. 10 fins per inch, 6 rows per coil.
Note 1: CFM capacity includes typical values for sensible wheel purge volume.

Standard EPH, EPCH, EPHC Hot Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Standard Hot Water Coils				
				Face Velocity (fpm)	Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db/wb	Connection Size MPT
EP-3	Low 2000 Med 2250 High 2500	33 in	30 in	291 327 364	0.2 0.2 0.3	8 9 10	66.7 65.3 64	1.5 ”
EP-5	Low 3000 Med 4000 High 4500	45 in	30 in	320 427 480	0.1 0.2 0.3	12 16 17	65.6 62.1 60	2 ”
EP-9	Low 4500 Med 6000 High 8000	54 in	42 in	286 381 508	0.3 0.5 0.9	17 23 31	68.4 65 61	1.5 ”
EP-13	Low 6000 Med 8000 High 10000	66 in	42 in	312 416 519	0.4 0.7 1.1	23 31 39	67.4 64 61	1.5 ”
EP-18	Low 8000 Med 10000 High 15000	78 in	54 in	274 342 513	0.6 1 2.2	31 39 58	70.1 67 61.5	1.5 ”
EP-24	Low 11000 Med 14000 High 18000	90 in	54 in	326 415 533	0.5 0.8 1.3	43 54 70	68 64.2 61	2 ”
EP-28	Low 15000 Med 18500 High 23000	99 in	66 in	331 408 507	1.3 1.9 2.9	58 72 89	68 65.4 32.1	1.5 ”
EP-35	Low 18000 Med 22500 High 27000	111 in	66 in	354 442 531	1.6 2.5 3.6	70 87 105	67.1 63.9 61.5	1.5 ”
EP-43	Low 26000 Med 30000 High 40000	123 in	90 in	338 390 520	3.1 4.1 7.3	101 116 155	68.4 66.3 62.3	1.5 ”

Design Basis: Entering air temperature: 30°Fwb; entering water temperature: 180°F; leaving water temperature: 160±3°F. 6 fins per inch, 1 row per coil.

Increased Capacity EPH, EPCH, EPHC Hot Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Standard Hot Water Coils				
				Face Velocity (fpm)	Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db/wb	Connection Size MPT
EP-3	Low 2000 Med 2250 High 2500	33 in	30 in	291 327 364	0.7 0.9 1.2	14 16 18	76.6 73.6 71	1.5 ”
EP-5	Low 3000 Med 4000 High 4500	45 in	30 in	320 427 480	0.6 1 1.3	22 29 32	74.3 67.1 64	2 ”
EP-9	Low 4500 Med 6000 High 8000	54 in	42 in	286 381 508	1.3 2.3 4.1	32 43 58	78.7 71.1 64	1.5 ”
EP-13	Low 6000 Med 8000 High 10000	66 in	42 in	312 416 519	1.8 3.2 4.9	43 58 72	76.4 69 63.1	1.5 ”
EP-18	Low 8000 Med 10000 High 15000	78 in	54 in	274 342 513	1.6 2.4 5.2	58 72 108	81 74.8 64.1	2 ”
EP-24	Low 11000 Med 14000 High 18000	90 in	54 in	326 415 533	2.4 3.8 6	79 101 130	76.1 69.6 63	2 ”
EP-28	Low 15000 Med 18500 High 23000	99 in	66 in	331 408 507	5.5 8.3 12.7	108 134 166	76.3 70.6 64.8	1.5 ”
EP-35	Low 18000 Med 22500 High 27000	111 in	66 in	354 442 531	5.8 8.9 12.7	130 162 195	74.5 68.4 64	2 ”
EP-43	Low 26000 Med 30000 High 40000	123 in	90 in	338 390 520	2.6 3.5 6.2	188 216 289	80.6 76.6 68.7	2.5 ”

Design Basis: Entering air temperature: 0°F; entering water temperature: 180°F; leaving water temperature: 160±3°F. 7 fins per inch, 2 rows per coil.

Standard EPD Hot Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Standard Hot Water Coils				
				Face Velocity (fpm)	Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db	Connection Size MPT
EPD-3	Low 2,513 Med 2,763 High 3,013	33 in	30 in	366 402 438	0.39 0.57 0.57	8 10 10	62.3 61.9 60.5	1.5"
EPD-5	Low 3,695 Med 4,695 High 5,195	45 in	30 in	394 501 554	0.52 0.87 0.97	12 16 17	61.6 59.0 57.9	1.5"
EPD-9	Low 5,406 Med 6,906 High 8,906	54 in	42 in	343 438 565	0.34 0.58 0.99	17 23 31	62.2 59.8 57.3	1.5"
EPD-13	Low 7,168 Med 9,168 High 11,168	66 in	42 in	372 476 580	0.67 0.90 1.00	28 33 35	62.4 59.3 56.6	1.5"
EPD-18	Low 9,440 Med 11,440 High 16,440	78 in	54 in	323 391 562	0.87 1.06 2.18	35 39 58	65.1 61.9 58.0	1.5"
EPD-24	Low 12,735 Med 15,735 High 19,735	90 in	54 in	377 466 585	0.61 0.92 1.28	43 54 65	62.2 59.9 57.3	2"
EPD-28	Low 16,961 Med 20,461 High 24,961	99 in	66 in	374 451 550	1.31 1.93 2.83	58 72 89	62.9 60.7 58.6	1.5"
EPD-35	Low 20,297 Med 24,797 High 29,297	111 in	66 in	399 487 576	2.24 2.62 2.78	83 90 93	62.9 60.2 60.3	1.5"
EPD-43	Low 28,662 Med 32,662 High 42,662	123 in	90 in	373 425 555	3.55 3.99 4.94	113 120 135	64.0 62.2 58.5	1.5"

Design Basis: Entering air temperature: 0°F; entering water temperature: 180°F; leaving water temperature: 160±3°F.
6 fins per inch, 1 row per coil. Note 1: CFM capacity includes typical values for sensible wheel purge volume.

Increased Capacity EPD Hot Water Coils

Model	Capacity (cfm)	Finned Height	Finned Width	Standard Hot Water Coils				
				Face Velocity (fpm)	Water Pressure Drop, ft.	GPM	Leaving Air Temp. °F db	Connection Size MPT
EPD-3	Low 2,513 Med 2,763 High 3,013	33 in	30 in	366 402 438	1.43 1.70 1.99	20 22 24	74.1 72.0 70.1	1.5"
EPD-5	Low 3,695 Med 4,695 High 5,195	45 in	30 in	394 501 554	1.87 2.48 2.74	30 35 37	72.6 66.7 64.3	2"
EPD-9	Low 5,406 Med 6,906 High 8,906	54 in	42 in	343 438 565	2.54 3.50 4.73	46 55 65	77.4 71.4 65.2	1.5"
EPD-13	Low 7,168 Med 9,168 High 11,168	66 in	42 in	372 476 580	3.12 4.24 5.39	59 70 80	75.3 69.2 64.5	1.5"
EPD-18	Low 9,440 Med 11,440 High 16,440	78 in	54 in	323 391 562	4.67 6.38 8.86	84 100 120	79.9 75.3 66.1	2"
EPD-24	Low 12,735 Med 15,735 High 19,735	90 in	54 in	377 466 585	6.38 8.03 9.85	110 125 140	76.1 70.7 65.0	2"
EPD-28	Low 16,961 Med 20,461 High 24,961	99 in	66 in	374 451 550	8.06 10.24 13.27	140 160 185	76.5 71.9 67.1	1.5"
EPD-35	Low 20,297 Med 24,797 High 29,297	111 in	66 in	399 487 576	10.51 12.21 14.97	173 188 210	75.4 70.1 66.1	1.5"
EPD-43	Low 28,662 Med 32,662 High 42,662	123 in	90 in	373 425 555	2.65 3.27 4.69	240 270 330	75.4 72.4 66.0	2.5"

Design Basis: Entering air temperature: 0°F; entering water temperature: 180°F; leaving water temperature: 160±3°F.
7 fins per inch, 2 rows per coil. Note 1: CFM capacity includes typical values for sensible wheel purge volume.

Standard EPH, EPCH, EPHC Electric Coils

Model	Capacity (cfm)	Electric Heater kW	Nominal Temp Rise at Rated Capacity	FLA @ 208 Volts 3Ø / 60 hz	FLA @ 480 Volts 3Ø / 60 hz
EPH-3	Low 2000 Med 2250 High 3000	10	15.8 14.0 12.6	27.8	12.0
EPH-5	Low 3000 Med 4000 High 4500	15	15.8 11.9 10.5	41.6	18.0
EPH-9	Low 4500 Med 6000 High 8000	20	14.0 10.5 7.9	55.5	24.1
EPH-13	Low 6000 Med 8000 High 10000	25	13.2 9.9 7.9	69.4	30.1
EPH-18	Low 8000 Med 10000 High 15000	35	13.8 11.1 7.4	97.2	42.1
EPH-24	Low 11000 Med 14000 High 18000	45	12.9 10.2 7.9	124.9	54.1
EPH-28	Low 15000 Med 18500 High 23000	60	12.6 10.2 8.2	-	72.2
EPH-35	Low 18000 Med 22500 High 27000	75	13.2 10.5 8.8	-	90.2
EPH-43	Low 26000 Med 30000 High 40000	100	12.2 10.5 7.9	-	120.3

Increased Capacity EPH, EPCH, EPHC Electric Coils

Model	Capacity (cfm)	Electric Heater kW	Nominal Temp Rise at Rated Capacity	FLA @ 208 Volts 3Ø / 60 hz	FLA @ 480 Volts 3Ø / 60 hz
EPH-3	Low 2000 Med 2250 High 3000	30	47.4 42.1 37.9	83.3	36.1
EPH-5	Low 3000 Med 4000 High 4500	45	47.4 35.6 31.6	124.9	54.1
EPH-9	Low 4500 Med 6000 High 8000	60	42.1 31.6 23.7	166.5	72.2
EPH-13	Low 6000 Med 8000 High 10000	75	39.5 29.6 23.7	208.2	90.2
EPH-18	Low 8000 Med 10000 High 15000	105	41.5 33.2 22.1	291.5	126.3
EPH-24	Low 11000 Med 14000 High 18000	135	38.8 30.5 23.7	374.7	162.4
EPH-28	Low 15000 Med 18500 High 23000	180	37.9 30.7 24.7	-	216.5
EPH-35	Low 18000 Med 22500 High 27000	225	39.5 31.6 26.3	-	270.6
EPH-43	Low 26000 Med 30000 High 40000	300	36.5 31.6 23.7	-	360.8

Note 1: Electric heating coils require a separate power connection.
Note 2: To determine Minimum Ampacity use 125% of the listed full load amps.
Note 3: Fuse Recommendation: Use 125% of the listed full load amps and select the next larger size Dual-Element Time-Delay Fuses.

Note 4: $kw = \frac{cfm \times \triangle T}{360}$

Standard EPD Electric Coils

Model	Capacity (cfm)	Electric Heater kW	Nominal Temp Rise at Rated Capacity	FLA @ 208 Volts 3Ø / 60 hz	FLA @ 480 Volts 3Ø / 60 hz
EPD-3	Low 2,513 Med 2,763 High 3,013	10	15.8 14.0 12.6	27.8	12.0
EPD-5	Low 3,695 Med 4,695 High 5,195	15	15.8 11.9 10.5	41.6	18.0
EPD-9	Low 5,406 Med 6,906 High 8,906	20	14.0 10.5 7.9	55.5	24.1
EPD-13	Low 7,168 Med 9,168 High 11,168	25	13.2 9.9 7.9	69.4	30.1
EPD-18	Low 9,440 Med 11,440 High 16,440	35	13.8 11.1 7.4	97.2	42.1
EPD-24	Low 12,735 Med 15,735 High 19,735	45	12.9 10.2 7.9	124.9	54.1
EPD-28	Low 16,961 Med 20,461 High 24,961	60	12.6 10.2 8.2	-	72.2
EPD-35	Low 20,297 Med 24,797 High 29,297	75	13.2 10.5 8.8	-	90.2
EPD-43	Low 28,662 Med 32,662 High 42,662	100	12.2 10.5 7.9	-	120.3

Increased Capacity EPD Electric Coils

Model	Capacity (cfm)	Electric Heater kW	Nominal Temp Rise at Rated Capacity	FLA @ 208 Volts 3Ø / 60 hz	FLA @ 480 Volts 3Ø / 60 hz
EPD-3	Low 2,513 Med 2,763 High 3,013	30	37.7 34.3 31.5	83.3	36.1
EPD-5	Low 3,695 Med 4,695 High 5,195	45	38.5 30.3 27.4	124.9	54.1
EPD-9	Low 5,406 Med 6,906 High 8,906	60	35.1 27.5 21.3	166.5	72.2
EPD-13	Low 7,168 Med 9,168 High 11,168	75	33.1 25.9 21.2	208.2	90.2
EPD-18	Low 9,440 Med 11,440 High 16,440	105	35.1 29.0 20.2	291.5	126.3
EPD-24	Low 12,735 Med 15,735 High 19,735	135	33.5 27.1 21.6	374.7	162.4
EPD-28	Low 16,967 Med 20,461 High 24,961	180	33.5 27.8 22.8	-	216.5
EPD-35	Low 20,297 Med 24,797 High 29,297	225	35.0 28.7 24.3	-	270.6
EPD-43	Low 28,662 Med 32,662 High 42,662	300	33.1 29.0 22.2	-	360.8

Note 1: Electric heating coils require a separate power connection.

Note 2: To determine Minimum Ampacity use 125% of the listed full load amps.

Note 3: Fuse Recommendation: Use 125% of the listed full load amps and select the next larger size Dual-Element Time-Delay Fuses.

Note 4: CFM capacity includes typical values for sensible wheel purge volume.

Note 5: $kw = \frac{cfm \times \triangle T}{360}$

ELECTRICAL DATA

HP	3 Phase Full Load Amps		Minimum Efficiency Std. Motors	Minimum Efficiency High Eff. Motors
	208V	480V		
1/6	0.6	0.3	-	-
1/4	1.0	0.5	-	-
1/2	2.4	1.1	-	-
3/4	3.5	1.6	73	-
1	4.6	2.1	76.6	82.5
1-1/2	6.6	3.0	80	84
2	7.5	3.4	79.9	84
3	10.6	4.8	83.1	86.5
5	16.7	7.6	83.4	87.5
7-1/2	24.2	11	86.6	88.5
10	30.8	14	88.2	89.5
15	46.2	21	89.3	90.2
20	59.4	27	90.4	91
25	74.8	34	90.5	92.4
30	88.0	40	89.3	93
40	114	52	90	93
50	-	65	91.2	94.1
60	-	77	92	93.6
75	-	96	92.4	94.1
100	-	124	92.5	94.1
HP	**3Ø Variable Frequency Drive (VFD)**		**Yaskawa Model #**	
1	7.3	-	CIMR-VU-2A0006FAA	
1	-	2.1	CIMR-VU-4A0002FAA	
	Control Power Transformer (CPT)			
150 VA	0.7	0.4		
500 VA	2.4	1.0		
3 KVA	14.4	6.25		

All EP units have SCCR 10k.

Note 1: To determine Minimum Circuit Ampacity, add the FLA's for each fan motor, the FLA of the constant speed wheel motor or the Variable Frequency Drive. Then add the CPT amps and 25 percent of the largest motor FLA.

Note 2: Maximum Overcurrent Protection (MOCP) is 125% of largest motor plus FLA, per instructions in UL 1995.

Note 3: Use a 3KVA transformer for units with 120 volt lights. Use a 500 VA transformer if controls are included, otherwise use 150 VA transformer.

SAMPLE SPECIFICATIONS

Energy recovery units shall be FläktGroup SEMCO standard 'EP' series with components as follows:

A. Casing - Wall and roof panels shall consist of 2 inch thick dual wall 18 gauge galvanized solid exterior skins and 22 gauge galvanized steel solid interior skins enclosing 2 inch thick 3 pcf mineral wool insulation. The housing shall be supported by a painted structural steel base. The base includes a solid welded floor with unfaced blanket insulation. The bottom face of the insulation shall be protected with a 22 gauge galvanized steel cover. The base shall be self-flashing when set on a properly sized curb. Floor openings shall have perimeter lips turned up into unit and be covered by a protective grate. Lifting lugs shall be welded to the structural base.

Access - Access shall be provided through large hinged, tightly sealed doors or removable access panels. Access doors shall be constructed of the same materials as the unit casing. Each door shall be provided with two cam type handles and two heavy duty hinges to achieve maximum sealing. Handles shall be internal and external for opening from the inside or outside of the unit. All doors shall open against the air pressure. Removable panels shall be provided for heating and cooling coils.

Outdoor Installation - Units shall have a factory-installed, 24 gauge galvanized steel standing seam sheet metal sloped roof. Roof field joints will consist of tapered expanded polystyrene filler panels and standing seam metal roof that must be installed and crimped by the contractor. Outdoor air intake and exhaust air discharge openings shall have galvanized steel sheet metal hoods with openings covered with bird screen. Hoods may ship loose for field installation depending on shipping width restrictions.

B. Fans - Fans shall be centrifugal plenum type. Fans shall incorporate a wheel, heavy gauge reinforced steel inlet plate with removable spun inlet cone, structural steel frame, and shaft and bearings in the AMCA Arrangement 3HA configuration to form a heavy duty integral unit. All fan wheels shall be tapered spun wheel cones or shrouds providing stable flow and high rigidity. The wheels shall be nonoverloading type. The blades shall be securely welded, die-formed backward curved (16" and smaller) or airfoil (18" and larger) type. Fan wheels shall be statically and dynamically balanced. Fan shafts shall be sized for first critical speed of at least 1.43 times the maximum speed for the class. Fan wheel bearings shall be heavy duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum class RPM. Fan ratings shall be based on tests made in accordance with AMCA Standard 210 and shall bear the AMCA Seal.

Airflow Measurement - A Piezometer Ring Airflow Measuring System will be included for the supply and exhaust plenum fans. The system consists of a Piezometer ring mounted at the throat and a static pressure tap mounted on the face of the inlet cone. A differential pressure transducer and airflow calculation may also be provided to meet the requirements set forth by the control sequence of operation. The system is to be accurate within +/-5%. See Control Sequence for further definition of operation.

Motors, Drives and Guards - Fan motors shall be standard NEMA frame, high efficiency, with 1.15 service factor and open drip-proof enclosures. Belt drives shall be designed for a minimum 1.4 service factor. Drives shall be fixed pitch. Rotating fan and drive parts shall be enclosed by protective guards.

Fan Vibration Isolation - Fans assemblies shall have adjustable motor bases, motors and V-belt drives mounted with the assembly mounted on 1-inch deflection spring isolators with flexible connections between fan and fan wall.

C. Enthalpy Recovery Wheel - The rotor media shall be made of aluminum, which is coated to prohibit corrosion. All media surfaces shall be coated with a non-migrating solid adsorbent layer prior to being formed into the honeycomb media structure to ensure that all surfaces are coated and that adequate latent capacity is provided. The media shall have a flame spread of less than 25 and a smoke developed of less than 50 when rated in accordance with ASTM E84.

The faces of the total energy recovery wheel shall be sealed with a two-part polymer acid resistant coating to limit surface oxidation. The media face coating shall also include a proprietary Teflon-based anti-stick additive shown, by independent testing, to effectively limit the collection of dust or smoke particulate and to aid in the surface cleaning process should cleaning be required.

The entire recovery wheel media face shall be treated with Avron46, and shall exhibit effective antimicrobial action, supported by independent test data. Any antimicrobial agent used must, by law, carry an EPA registration for use in duct systems. All desiccant surfaces within the transfer media shall also exhibit bacteria-static properties as supported by independent testing.

The desiccant shall be inorganic and specifically developed for the selective adsorption of water vapor. The desiccant shall utilize a 3A molecular sieve certified by the manufacturer to have an internal pore diameter distribution which limits adsorption to materials not larger than the critical diameter of a water molecule (2.8 angstroms.)

Submit certification by a qualified independent organization - documenting equal sensible and latent recovery efficiencies conducted in accordance with ASHRAE 84-78P and the results presented in accordance with ARI 1060 standards.

An independent wheel test from a credible test laboratory shall document that the desiccant material utilized does not transfer pollutants typically encountered in the indoor air environment. The cross-contamination and performance certification reports shall be provided upon written request for engineering review.

Sensible Recovery Wheel (For EPD only) - The rotor media shall be made of aluminum, which is coated to prohibit corrosion. The media shall have a flame spread of less than 25 and a smoke developed of less than 50 when rated in accordance with ASTM E-84.

Media Cleaning - The media shall be cleanable with low-pressure steam (less than 5 PSI,) hot water or light detergent, without degrading the latent recovery. Dry particles up to 800 microns shall pass freely through the media.

Purge Sector - The unit shall be provided with a factory set, field adjustable purge sector designed to limit cross-contamination to less than .04 percent of that of the exhaust air stream concentration when operated under appropriate conditions.

Rotor Seals - The rotor shall be supplied with labyrinth seals only, which at no time shall make contact with any rotating surface of the exchanger rotor face. These multi-pass seals shall utilize four labyrinth stages for optimum performance.

Rotor Support System (Unit Sizes 13 and up) - The rotor media shall be provided in segmented fashion to allow for field erection or replacement of one section at a time without requiring side access. The media shall be rigidly held in place by a structural spoke system made of extruded aluminum.

Rotor Support System (Unit sizes 3-5-9) - The rotor media is provided as a single piece while maintaining a size and weight to allow for field replacement of the rotor assembly without requiring side access. The media is rigidly held by an aluminum spoke and rim system.

Rotor Housing (Unit Sizes 13 and up) - The rotor housing shall be a structural framework which limits the deflection of the rotor due to air pressure loss to less than 1/32 inch. The housing is made of galvanized steel to prevent corrosion. The rotor is supported by two pillow block bearings which can be maintained or replaced without the removal of the rotor from its casing or the media from its spoke system.

Rotor Housing (Unit sizes 3-5-9) - The rotor housing is a structural sheet metal framework, which limits the deflection of the rotor due to air pressure. The housing is made of galvanized steel to prevent corrosion. The rotor is supported by two flange bearings which can be maintained or replaced without the removal of the rotor from its casing.

(EP) Wheel Speed Control - Variable speed control of the Enthalpy wheel shall be accomplished by the use of an A/C inverter. The inverter shall include all digital programming with a manual speed adjustment on the front of the inverter. The drive system shall allow for a turndown ratio of 80:1 (20 rpm to 1/4 rpm). Control of the inverter shall be as described in the sequence of operation.

(EPD) Wheel Speed Control - Variable speed control of both Enthalpy and Sensible type wheels shall be accomplished by the use of an A/C inverter. The inverter shall include all digital programming with a manual speed adjustment on the front of the inverter. The drive system shall allow for a turndown ratio of 80:1 (20 rpm to 1/4 rpm). Control of the inverter shall be as described in the sequence of operation.

D. Chilled Water, DX and Hot Water Coils - Primary surface shall be round seamless 5/8 inch O.D. by .020 inch thick copper tube on 1.5 inch centers, staggered in the direction of airflow. All joints shall be brazed.

Secondary surface shall consist of .006 (.0075 for heating coils) inch rippled aluminum plate fins for higher capacity and structural strength. Fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Bare copper tube shall not be visible between fins and the fins shall have no openings punched in them to prevent the accumulation of lint and dirt. Tubes shall be mechanically expanded into the fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates.

Casings shall be constructed of continuous galvanized steel. Coil side plates shall be of reinforced flange type.

Coils shall have equal pressure drop through all circuits. Coils shall be circuited for counter flow heat transfer to provide the maximum heat transfer rates.

Headers on coils shall be seamless copper tubing. The headers shall have intruded tube holes to provide a large brazing surface for maximum strength and inherent flexibility. Supply and return connections on water coils shall be steel with male pipe threads. DX coils shall have copper sweat connections.

The complete coil core shall be tested with 315 psig air pressure under warm water and be suitable for operation at 250 psig working pressures.

Individual tube tests and core tests before installation of headers shall not be considered satisfactory. Water cooling coils shall be circuited for drainability. Use of internal restrictive devices to obtain turbulent flow shall not be acceptable. Vents and drains shall be furnished on all water coils. Coils shall be rated in accordance with ARI.

Coils shall be mounted in galvanized holding racks. Water coil supply and return connections shall be extended to the unit exterior. Water coil drain and vent connections are accessible from the interior of the unit and are not extended. Cooling coils shall be mounted in an insulated pitched 304 stainless steel condensate pan.

Optional Electric Heating Coil - Where scheduled, heater shall be the finned tubular or open coil electric resistance type. Heater shall include, door interlocking non-fused disconnect switch, magnetic de-energizing contactors, control circuit transformer, pressure type air flow interlock switch and manual and auto reset thermal cutout over current protection. The electric heater shall require a separate power feeder connection in addition to the power connection to the main unit electrical panel.

Optional Indirect Gas Furnace - The Duct Furnace module will be indirect fired and comply with the current edition of ANSI Z83.8 Standard for Gas-Fired Duct Furnaces and be a Recognized Component by Intertek Testing Services (ITS / ETL).

The Duct Furnace module will employ patented inshot gas burners with integral carryovers, a tubular heat exchanger assembly, a two speed draft inducer to provide for positive venting of flue gases, air pressure switches to provide proof of air supply for combustion, direct spark ignition of the gas burners with remote flame sensor to prove carryover across all burners, an automatic reset type high limit switch to limit maximum outlet air temperature to less than 250ºF, manual reset flame rollout switches and a two stage redundant safety shut-off gas valve which regulates gas pressure to burner supply manifold.

Duct Furnace modules will be Listed for application downstream of refrigeration and cooling systems and will provide means for removal of condensate that occurs in the tubes during cooling operation.

Heat exchanger tubes will have the dimpled restrictors formed to provide for an unobstructed drainage path and tubes will be formed to provide a positive pitch to promote condensate drainage. Drainage will be configured so that burners and burner surfaces are not exposed to condensate.

Duct Furnace will incorporate a Direct Spark Ignition control module which is design certified by a recognized national testing agency. The control will incorporate a 30 second minimum pre-purge period prior to trial for ignition and a 0.8 second flame failure response time. The control will provide for up to 3 ignition retrials, each preceded by an interpurge period. Control will provide for automatic reset after one hour, to initiate additional ignition trials if lockout occurs during a call for heat. The control will incorporate an LED indicator light to provide a flash code to identify the operating condition of the control and conditions preventing normal operation of the ignition system should they occur.

Controls, modulating - The Duct Furnace may employ a full modulation system capable of continuous modulation over a range of 25% to 100% of full input, as required to maintain a constant outlet air temperature in the supply duct as determined by a duct mounted temperature control or building system controller. Room thermostat override is available as an option. The modulation system will employ the low fire start ignition sequence as noted above.

Controls, two-stage - The Duct Furnace will employ a two-stage control system capable of a proven low-fire ignition sequence that minimizes the noise associated with cold start conditions. On a call for heat by the two-stage room thermostat, the control system will initiate a low fire start sequence at 55% of its maximum input rating.

E. Pre-Filters (Return & Outside Air) - Air filters shall be 2" thick, pleated, disposable type. Each filter shall consist of a non-woven cotton and synthetic fabric media, media support grid and enclosing frame. Filter media shall be a cotton and synthetic blend with at least 15 pleats per linear foot. The filter media shall have a Minimum Efficiency Reporting Value of MERV 8 when evaluated under guidelines of ASHRAE Standard 52.2-1999 and an average dust spot efficiency of 25-30% when evaluated under ASHRAE Standard 52.1-1992. The filter shall be listed by Underwriters' Laboratories as Class 2. A bank of galvanized universal holding frames shall be arranged for upstream access. Provisions shall be made on the downstream side of the frames to prevent filter blowout from moisture or overloading. Filter pressure indicators shall be on every bank and shall be Dwyer Magnehelic - std. model 2001LT.

Optional Secondary High Efficiency Filters (65%, 85%, 95%) - Mounted in the same filter bank with the Pre-filters shall be 12" deep high performance filters, which shall be high lofted supported media disposable type. Media support contour stabilizers shall be mechanically fastened to diagonal support members of the same construction to create a rigid and durable filter enclosure. There shall be a minimum of four contour stabilizers on the air entering side and six on the air exiting side. The media shall have a Minimum Efficiency Reporting Value of MERV 14 when evaluated under guidelines of ASHRAE Standard 52.2-1999 and an average dust spot efficiency of either 60-65%, 80-85%, or 90-95% when evaluated under ASHRAE Standard 52.1-1992. The filter is listed by Underwriters' Laboratories as Class 2.

F. Outdoor Air Dampers - Dampers shall have galvanized steel frames and blades, with blade and jamb seals for low leakage performance. Dampers shall have 24 volt electric actuators with an integral limit switch.

G. Exhaust Air Dampers - Dampers shall be gravity operated back draft type. Dampers shall have aluminum frames and blades, with blade seals for low leakage performance.

H. Electrical - Unit shall require a 480 or 208 volt (as scheduled,) 3 phase, 60 cycle power connection at the main electrical panel. The electrical panel shall be NEMA 4 rated and mounted on the unit exterior as shown on the General Arrangement drawings. The electric panel shall consist of a non-fused disconnect, fused IEC full voltage starters for each fan and constant speed wheel, control power transformer and HOA switch for the unit. Electrical panels shall bear an ETL label.

All 120 and high volt wiring up through size #2 will be run in MC cable. Plenum cable is used for low voltage wiring and is not run in conduit. All wire size #1 and larger wire is run in EMT. Fan motors requiring wire run in EMT will have less than 48" of flexible metal conduit between the EMT and the motor junction box. Starter coils will be 24 volt AC for contactors rated 75 amps or less and 120 volt AC for contactors rated greater than 75 amps.

Optional Lights & GFI Receptacle - Vapor tight lights with compact LED lamps shall be provided in access compartments as shown on the General Arrangement drawing. Lights shall be wired to a single switch on the unit exterior. A GFI receptacle shall be mounted next to the light switch. A separate 120-volt power connection shall be required at the GFI receptacle to provide power for the lights and receptacle.

I. Warranty - The unit manufacturer shall warrant to the Buyer, for a period of eighteen months from the date of shipment, that goods delivered to the Buyer should in all respects be free from defects in material and workmanship when used in a proper and normal manner. In the event of equipment failure, prompt notification during the Warranty Period must first be made by the Buyer, in addition to there being confirmation to the unit manufacturer's satisfaction that the goods have been stored, installed, operated and maintained properly and in accordance with standard industry practice. If such confirmation is granted and it is established that the equipment failed to be free from defects within the eighteen months of shipment, the unit manufacturer shall correct the nonconformity at the unit manufacturer's option of either:

(1) repairing any defective part or parts, or

(2) making available at the unit manufacturer's plant a repaired or replacement part.

Misc. - Field Joints. Units shipped in more than one section will require both mechanical and electrical field joints be made by the installing contractor. Material for making up these joints are included with the unit.

Loose Shipped Items such as filters and outdoor and exhaust air hoods may require field installation. Other project specific items such as duct sensors, duct mounted air flow stations and other items to be installed outside the unit will be boxed and tagged and shipped with the unit for field installation.

Packing List and IOM manual are included with the shipment and should be referenced before installation.

EP EQUIPMENT SUMMARY

Model Size	3	5	9	13	18	24	28	35	43
Width	86.25	86.25	98.25	98.25	122.25	122.25	146.25	146.25	182.25
Height	48.25	60.25	72.25	86.25	98.25	110.25	122.25	134.25	146.25
Supply Air CFM Range[1]	2,000-3,000	3,000-4,500	4,500-8,000	6,000-10,000	8,000-15,000	11,000-18,000	15,000-23,000	18,000-27,000	26,000-40,000
Return Air CFM Range[1]									
Purge volume (single wheel)[3]	582	786	1027	1329	1646	1992	2257	2654	3088
Heat/cool coil total fin height	33 in	45 in	54 in	66 in	78 in	90 in	99 in	111 in	123 in
Heat/cool coil total fin length	30 in	30 in	42 in	42 in	54 in	54 in	66in	66 in	90 in
Number of stacked coils (height)	(1) 33 in	(1) 45 in	(2) 27 in	(2) 33 in	(2) 39 in	(2) 45 in	(3) 33 in	(2) 36 in	(2) 42 in
	-	-	-	-	-	-	-	(1) 39 in	(1) 39 in
Supply filter	(1) 24x24	(2) 24x24	(4) 24x24	(6) 24x24	(3) 20x24	(12) 20x24	(12) 24x24	(15) 24x24	(20) 24x24
	(2) 12x24	(2) 12x24	(2) 12x24	-	(9) 20x20	-	(3) 12x24	-	(4) 12x24
Return filter	(1) 24x24	(2) 24x24	(2) 24x24	(3) 24x24	(6) 24x24	(8) 24x24	(6) 20x24	(15) 20x24	(15) 24x24
	(2) 12x24	(2) 12x24	(3) 12x24	(3) 12x24	(2) 12x24	-	(9) 20x20	-	(3) 12x24
Door size (inches)	13x31	13x43	13x55	18x66	18x66	18x66	18x66	18x66	18x66

Notes:

1. Maximum airflow limitations vary. Consult SEMCO before laying out unit with velocities greater than 525 fpm on 2" filters, 525 fpm on cooling coils, and 1100 fpm on wheels.

2. For optional wide RA side, RA side components will be the same as the SA side components.

3. Single wheel purge volume based on 4" P_{OA}-P_{RA}.

EPD EQUIPMENT SUMMARY

Model Size	3	5	9	13	18	24	28	35	43
Width	86.25	86.25	98.25	98.25	122.25	122.25	146.25	146.25	182.25
Height	48.25	60.25	72.25	86.25	98.25	110.25	122.25	134.25	146.25
Supply Air CFM Range[1]	2,000-3,000	3,000-4,500	4,500-8,000	6,000-10,000	8,000-15,000	11,000-18,000	15,000-23,000	18,000-27,000	26,000-40,000
Return Air CFM Range[1]									
Purge volume (dual wheel)[3]	1240	1625	2065	2603	3156	3753	4205	4878	5604
Heat/cool coil total fin height	33 in	45 in	54 in	66 in	78 in	90 in	99 in	111 in	123 in
Heat/cool coil total fin length	30 in	30 in	42 in	42 in	54 in	54 in	66 in	66 in	90 in
Number of stacked coils (height)	(1) 33 in	(1) 45 in	(2) 27 in	(2) 33 in	(2) 39 in	(2) 45 in	(3) 33 in	(2) 36 in	(2) 42 in
	-	-	-	-	-	-	-	(1) 39 in	(1) 39 in
Supply filter	(1) 24x24	(2) 24x24	(4) 24x24	(6) 24x24	(3) 20x24	(12) 20x24	(12) 24x24	(15) 24x24	(20) 24x24
	(2) 12x24	(2) 12x24	(2) 12x24	-	(9) 20x20	-	(3) 12x24	-	(4) 12x24
Return filter	(1) 24x24	(2) 24x24	(2) 24x24	(3) 24x24	(6) 24x24	(8) 24x24	(6) 20x24	(15) 20x24	(15) 24x24
	(2) 12x24	(2) 12x24	(3) 12x24	(3) 12x24	(2) 12x24	-	(9) 20x20	-	(3) 12x24
Door size (inches)	13x31	13x43	13x55	18x66	18x66	18x66	18x66	18x66	18x66

Notes:

1. Maximum airflow limitations vary. Consult SEMCO before laying out unit with velocities greater than 525 fpm on 2" filters, 525 fpm on cooling coils, and 1100 fpm on wheels.

2. For optional wide RA side, RA side components will be the same as the SA side components.

3. Dual wheel purge volume based on 7" P_{OA}-P_{RA} on Enthalpy wheel, 4" P_{OA}-P_{RA} on Sensible wheel.

FläktGroup SEMCO

EXCELLENCE IN SOLUTIONS

FläktGroup SEMCO delivers smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than fifty years of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

FläktGroup SEMCO
Corporate Headquarters
1800 East Pointe Drive
Columbia, Missouri 65201 USA
573.443.1481
sales.semco@flaktgroup.com

To learn more about FläktGroup SEMCO offerings and to contact your nearest representative please visit **www.semcohvac.com**