EPOVENT

Aluminum Plate Heat Recovery

EROVENT

Rotary Heat Recovery

Crossflow

Indoor air dispersion

Air handling Units - Textile Air Dispersion - Climatization

Index

EROVENT
Rotary Heat Recovery

- Components 4
- Performance Data 6
- Rotary Heat Exchanger 11
- Configuration 12
- Dimensions 13
- Control 14

EPOVENT
Aluminum Plate Heat Recovery

- Components 16
- Configuration 18
- Dimensions 19
- Heat Recovery Exchanger 20
- Control 21

Accessories

- Sound Attenuator 22
- By-Pass Module 23
- Filter 24
- Humidifier 24
- Electrical Heater 25
- Constant Flow Kit 25
- Ventilation on Demand 26
- Pressure Gauge 26
- Communication 26

Heating/Cooling Coils Capacity Chart

-ERO 055/090/125 27
-ERO 175/225 28
-EPO 055/090/125 29
-EPO 175/225 30

Heat Pump

The selection software is prepared for designers and is available with electronic documentation and further details in our website

EPOVENT
Plate Heat Exchanger

EROVENT
Rotary Heat Recovery

The units are used in places to extract stale indoor air outdoors and introduce fresh air to indoors. The units are applicable to HVAC systems where fresh air demand is high as a result of intense occupancy like cinemas, shopping malls, airports, office buildings, high-rise buildings, sport arenas, conference rooms and museums. With the help of hygroscopic rotor the unit is capable of transferring both heat and moisture between exhaust and supply air streams and increase energy savings in the HVAC system.

EROVENT units deliver a compact design for ventilation and air conditioning applications with direct drive plug fans with EC technology, hygroscopic rotor, exhaust and supply air filters and electronic control.

For applications like high humid areas, food warehouses where humidity transfer between air streams is not demanded Aluminum type heat exchanger installed EPO model is also available. EPOVENT units have the same energy efficient characteristic like EROVENT units, due to crossflow heat exchange the nominal efficiency of the unit is reduced. Summer cooling function is attained with by-pass ventilation module.

Electronic control is installed within the unit, no additional equipments are needed on site, only mains connection enhancing “Plug and Play” design. Microprocessor based control system operates the unit according to design conditions by checking temperature, air flow or indoor air quality. Electronic control concept is developed for several demand options of the designer, including various communication.

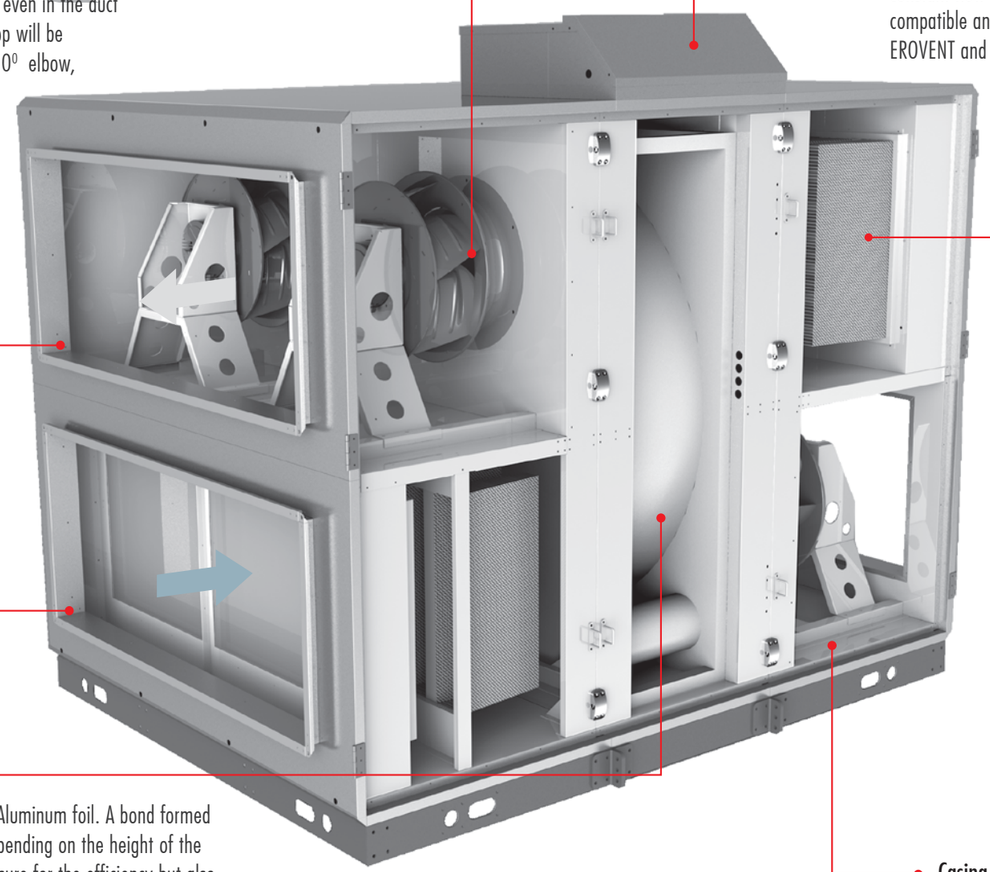
Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

Exhaust and Supply Air Fans

EROVENT and EPOVENT units are equipped with innovative Electronically Commutated (EC) motor technology. EC motors ensure the flexibility of connecting to AC mains with the efficiency and simple speed control of a DC motor. Fan blades are high aerodynamic efficient backward curved design. Compared to conventional standard units, EROVENT and EPOVENT series consume an average of 21% less energy at operating conditions.
With the new regulations, pressure drop in the ducting system shall also be minimized due to low energy consumption demand. Plug fan design also help reduce the ducting systems total pressure drop. As a result of the backward curved impellers with high hydraulic efficiency, uniform flow is reached even in the duct connection spigots of the unit. With a conventional fan more than 80 Pa of pressure drop will be measured because of the high speed of the air in unit's inlet/outlet with the usage of 90^0 elbow, with plug fans the pressure drop is reduced down to 10 Pa for the same case.
With EC Fans it is also possible to reduce maintenance costs as the fans are direct drive; free of V-belt wear and tear mechanism.

Duct Connections

EROVENT and EPOVENT units outlets are designed in rectangular shape. Adapters can be used after the unit to convert it into circular duct system. To reduce pressure drop in both inlet and outlet, face velocity is reduced (Maximum air velocity in the duct connection Vmax<4,5 m/s). Motorized or manual dampers are optionally available for both fresh air inlet and return air inlet.



Rotary Heat Recovery

The rotor consists of a) Heat Storing Matrix b) The Drive. The rotor matrix consists of Aluminum foil. A bond formed in waves is wrapped together with a straight bond on top of each other. In this way, depending on the height of the waves, flow-through channels are created of different size, the shape of which is a measure for the efficiency but also for the pressure drop. In EROVENT units the height of the waves are optimized for maximum efficiency and minimum pressure drop.
The drive consists of a three-phase motor that rotates the rotor ten times in a minute in the case of full efficiency. By reducing the number of rotations, a reduction of both heat and humidity can be achieved. The speed of the rotor is controlled between 0-20 rpms by the "Greenbox" control.
The rotor has a purge section to reduce the possible leakage between supply and exhaust air streams. Also with the help of the purge sector the rotor achieves high self cleaning on account of the continuously changing directions of air flow in the purge sector.

Control

EROVENT and EPOVENT units are equipped with a microprocessor based control system, "GreenBox" to meet various design needs. Both electrically and electronically control hardware comes with the unit that's why the unit is "Plug and Play". Rotor monitoring and speed control, filter monitoring, fan monitoring are standard. With the use of optional IAQ, CO_2 sensor or constant flow kit, fans regulate automatically according to user demand. The panel is BMS compatible and can handle various communication protocols like Modbus (standard protocol for EROVENT and EPOVENT units), Bacnet and Lonworks. Room control panel is supplied where no BMS protocol is demanded. GreenBox is also capable of controlling heating/cooling capacity when EROVENT and EPOVENT units are used with heating/cooling coils.

Exhaust and Supply Air Filters

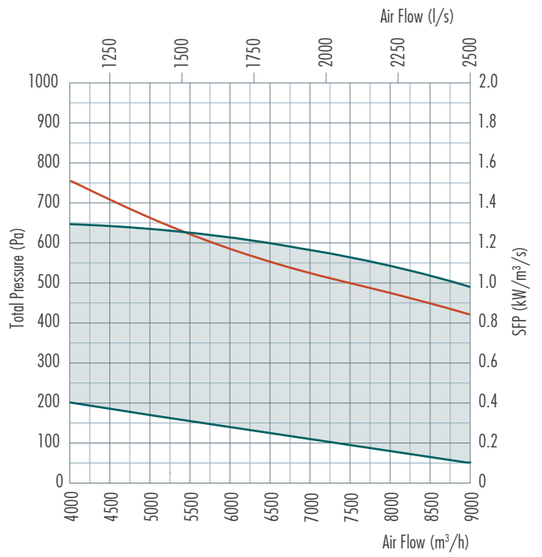
EROVENT and EPOVENT units come with G4 class pre-filter and F6 class final filter in supply air side and G4 class pre-filter in exhaust air side. A choice of pre-filters (G2-G4) and final filters (F6-F9) are available optionally. Pre-filters are washable and secured in rigid frames made of galvanized steel. Final filters are innovative compact filters with increased filtration surface area to reduce initial pressure drop over the filter and also reduce units' size. All the filters comply with EN 779 to meet the requirements of odor absorption and dust arrestment. Filter blockage is indicated in the control panel by standard installed differential pressure switches however pressure gauge is also available optionally to observe fouling. Filter sections are designed to ease filter service and changing.

Casing

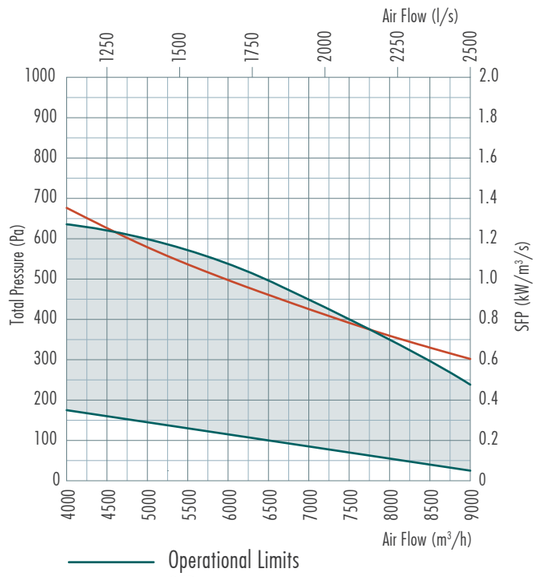
The unit is constructed in sections to ease transportation, mounting and commissioning. Every section has its own basis and transport slots. For both panels and service doors internal casing is galvanized steel and external casing is powder coated. 50 mm thickness of Rockwool is used in between for thermal and sound insulation. Each service door has locking mechanism to ensure safe service. To prevent thermal and fluid leakage through the casing appropriate gaskets are designed.

ERO-EPO 055

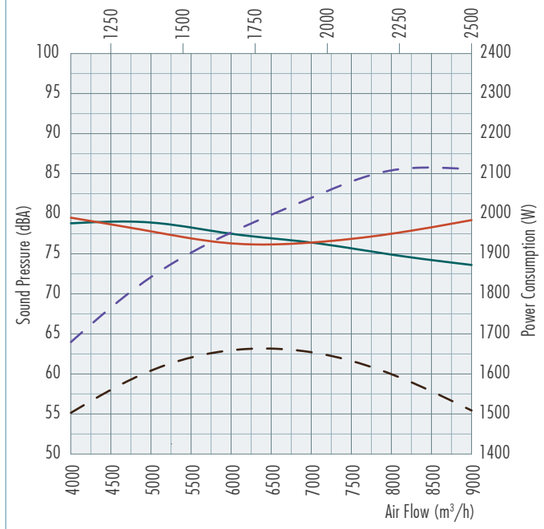
SUPPLY FAN



EXHAUST FAN



SOUND & POWER CONSUMPTION



SUPPLY FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
4000	55	82.5	79.9	76.3	72.2	71.2	64.4	58.8	78.8
5000	205	79.7	78	74.8	72.1	71	64.6	59.1	77.9
6000	355	76.7	75.6	73.5	72.4	71.2	64.9	59.4	77.5
7000	515	74.4	73.6	72.2	71.3	70.3	64.7	59.4	76.4
8000	675	72.5	71.8	71	69.4	68.7	64.1	59.3	74.9
9000	840	71.4	72.5	70.6	66.7	66.9	63.3	59.2	73.6

EXHAUST FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
4000	75,2	79,4	79.4	75,7	73,3	73	68,3	63,1	79,5
5000	68,3	74,9	75,4	73,3	71,8	72	67,2	62,8	77,8
6000	65,7	71,9	71,7	71,4	70,1	71,2	65,6	62,1	76,3
7000	66,9	72,4	72,1	72,8	70	70,9	64,9	61,5	76,4
8000	69,4	74,2	75,1	75,9	70,9	70,8	65,1	61,3	77,5
9000	70,5	76,6	78,1	78,3	72,3	71,3	65,7	62,4	79,2

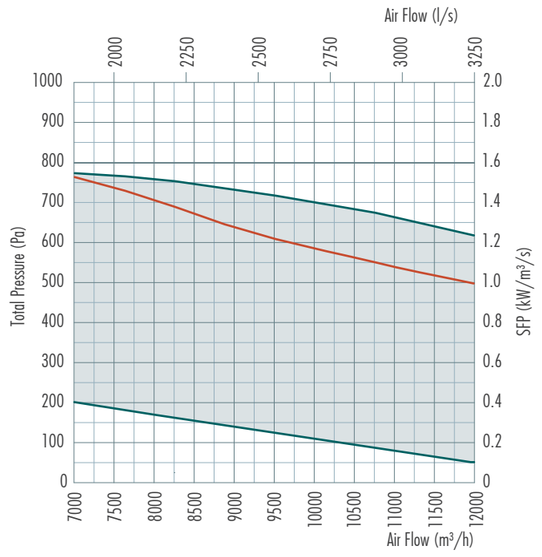
The electrical energy consumption of ventilation fans and air handling units (AHU) plays an increasing role in the energy demand for buildings. With proper design and usage of modern components it is possible to reduce power consumption in AHU's.
Specific Fan Power value; expressed in kW/m³s; is denoted in European Norm 13779 (EN 13779 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems) as follows;

SFP = Specific Fan Power

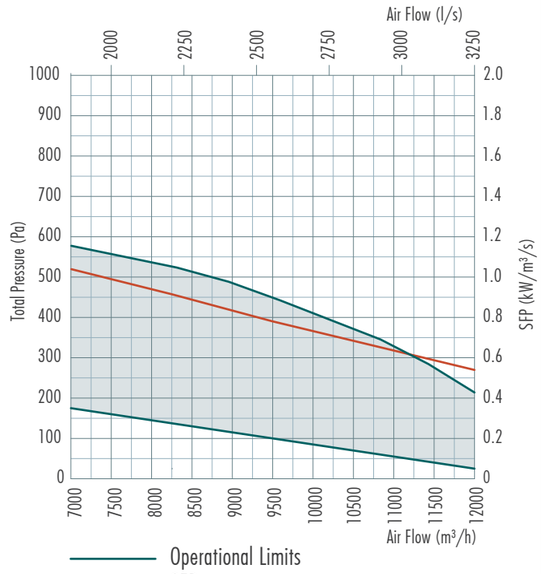
$$SFP = \frac{\text{Total Power Consumption (kW)}}{\text{Air Flow (m}^3\text{/s)}}$$

ERO-EPO 090

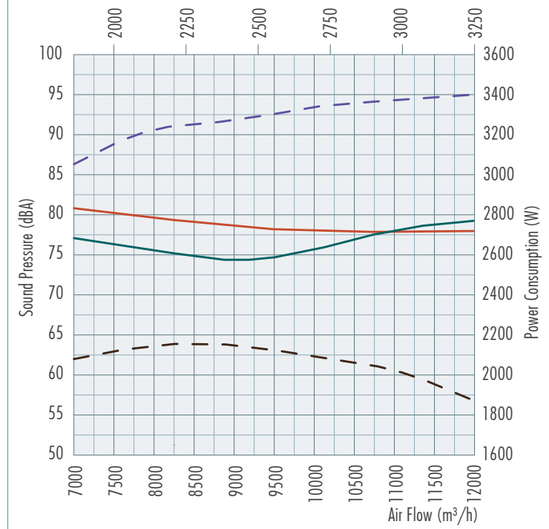
SUPPLY FAN



EXHAUST FAN



SOUND & POWER CONSUMPTION



SUPPLY FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
7000	81,1	88,6	81,8	77,2	72,4	71,3	66,3	63,1	80,2
8000	75,5	88,2	79,7	74,9	71,5	70,5	66,2	63	79
9000	71,9	83,7	78,4	74,3	71,1	70,3	66,5	62,9	77,9
10000	68,5	79,3	77,2	73,7	70,8	70,2	66,9	62,9	77,3
11000	66,2	74,5	76,6	73,1	70,5	70,3	68,5	62,9	77,2
12000	64	69,9	76	72,5	70,3	70,4	70,3	63	77,3

EXHAUST FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
7000	71,3	74,4	73,6	72,2	71,3	70,3	64,7	59,4	76,4
8000	70,8	72,5	71,8	71	69,4	68,7	64,1	59,3	74,9
9000	71,3	71,4	72,5	70,6	66,7	66,9	63,3	59,2	73,6
10000	69,6	72,3	75	73,1	65,9	66,1	67,5	57,1	74,9
11000	67,9	74,6	77,7	77,4	67,9	67,8	65,4	61,2	77,4
12000	69,7	76,1	78,4	77,4	69,1	70,3	69,7	64,3	78,6

The electrical energy consumption of ventilation fans and air handling units (AHU) plays an increasing role in the energy demand for buildings. With proper design and usage of modern components it is possible to reduce power consumption in AHU's.
Specific Fan Power value; expressed in kW/m³s; is denoted in European Norm 13779 (EN 13779 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems) as follows;

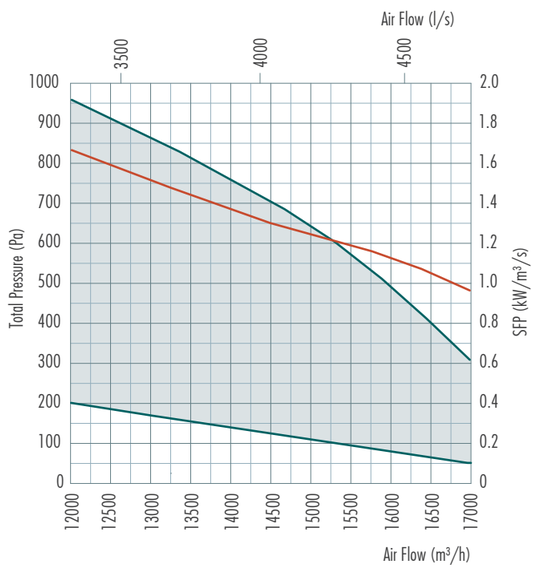
SFP = Specific Fan Power

$$SFP = \frac{\text{Total Power Consumption (kW)}}{\text{Air Flow (m}^3\text{/s)}}$$

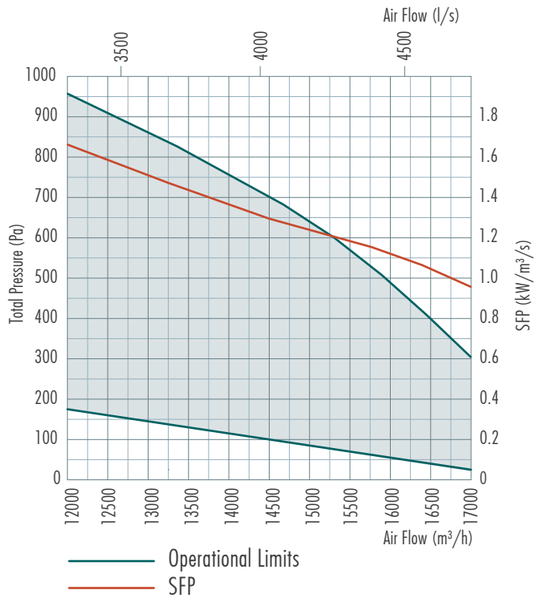
ERO-EPO 125

Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

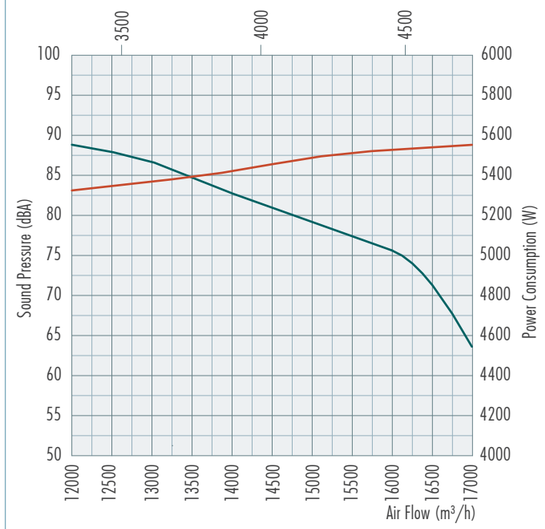
SUPPLY FAN



EXHAUST FAN



SOUND & POWER CONSUMPTION



SUPPLY FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
12000	77,2	77,9	81,4	80,7	76,2	75	73,8	71,4	83
13000	75,8	78	82,4	82,2	76,1	74,4	76	75,4	84,1
14000	74,7	79,2	84,3	84,3	77,3	75,5	74,8	77,6	85,4
15000	74	80,9	86,3	86,6	79,1	77,5	73	78	87,1
16000	73,8	81,9	87,2	87,7	80,2	79,1	73,6	77,7	88,1
17000	74,7	81,3	87	88	80,6	79,7	75,2	80,5	88,7

EXHAUST FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
12000	77,2	77,9	81,4	80,7	76,2	75	73,8	71,4	83
13000	75,8	78	82,4	82,2	76,1	74,4	76	75,4	84,1
14000	74,7	79,2	84,3	84,3	77,3	75,5	74,8	77,6	85,4
15000	74	80,9	86,3	86,6	79,1	77,5	73	78	87,1
16000	73,8	81,9	87,2	87,7	80,2	79,1	73,6	77,7	88,1
17000	74,7	81,3	87	88	80,6	79,7	75,2	80,5	88,7

The electrical energy consumption of ventilation fans and air handling units (AHU) plays an increasing role in the energy demand for buildings. With proper design and usage of modern components it is possible to reduce power consumption in AHU's.
Specific Fan Power value; expressed in kW/m³s; is denoted in European Norm 13779 (EN 13779 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems) as follows;

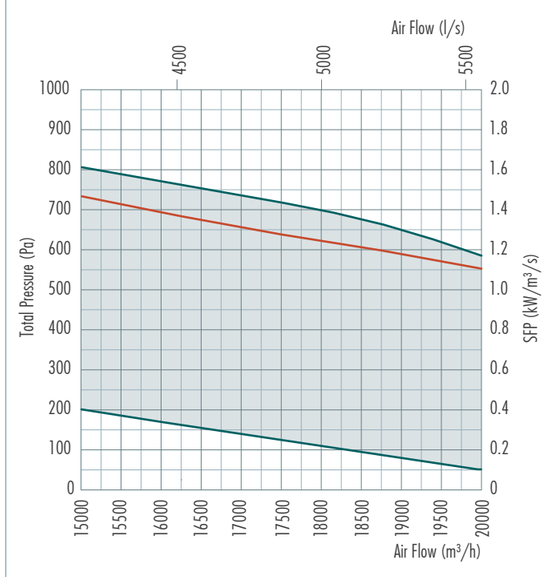
SFP = Specific Fan Power

$$SFP = \frac{\text{Total Power Consumption (kW)}}{\text{Air Flow (m}^3\text{/s)}}$$

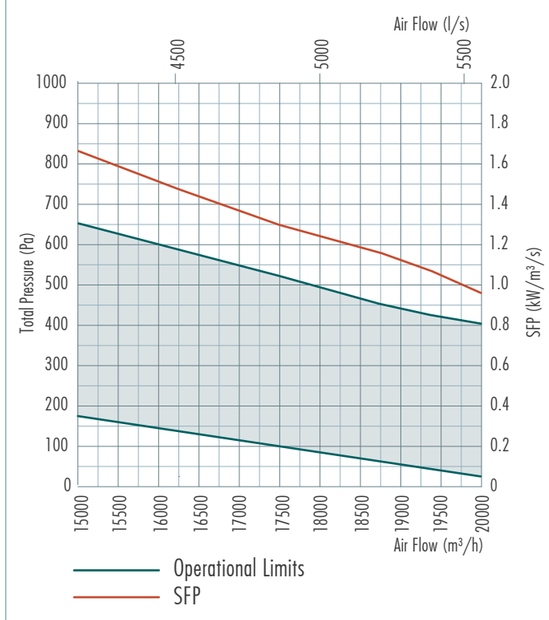
ERO-EPO 175

Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

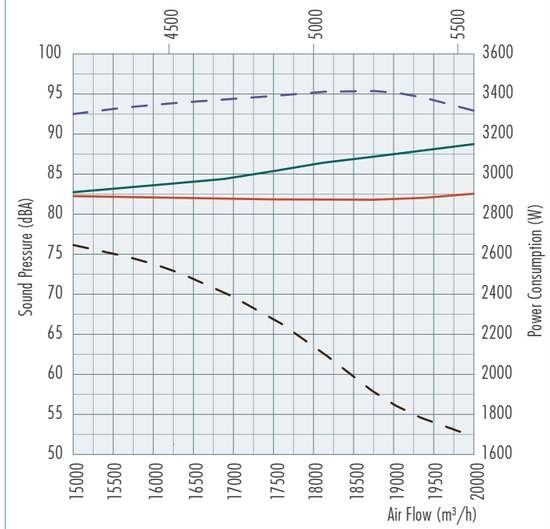
SUPPLY FAN



EXHAUST FAN



SOUND & POWER CONSUMPTION



SUPPLY FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
15000	81,2	82,1	81,3	77,5	76,5	76,2	71,2	67,1	82,3
16000	80,8	80	80,7	77,6	76,4	75,9	71,3	67	82,1
17000	80,5	77,9	80,1	77,7	76,2	75,6	71,3	66,9	81,9
18000	80	76,9	80,1	78,2	76,2	75,4	71,5	66,7	81,9
19000	79,4	76,8	80,7	79	76,3	75,4	71,9	66,4	82,2
20000	78,6	77,2	81,6	79,8	76,5	75,3	72,1	66,1	82,6

EXHAUST FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
15000	73,7	76,9	82,4	80	75	75	74,8	67,7	82,8
16000	73,3	77,3	83,5	80,7	75,5	75,7	76,4	68	83,7
17000	73,6	78,8	84,4	81,4	76,1	76,3	78,2	68,5	84,6
18000	74,6	79,7	85,7	82,5	76,9	77	81,1	68,8	86,3
19000	76,2	80,3	86,5	83,3	77,7	77,8	83,2	70,2	87,6
20000	77,3	80,6	87,2	84,1	78,6	78,7	84,8	73,1	88,8

The electrical energy consumption of ventilation fans and air handling units (AHU) plays an increasing role in the energy demand for buildings. With proper design and usage of modern components it is possible to reduce power consumption in AHU's.
Specific Fan Power value; expressed in kW/m³s; is denoted in European Norm 13779 (EN 13779 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems) as follows;

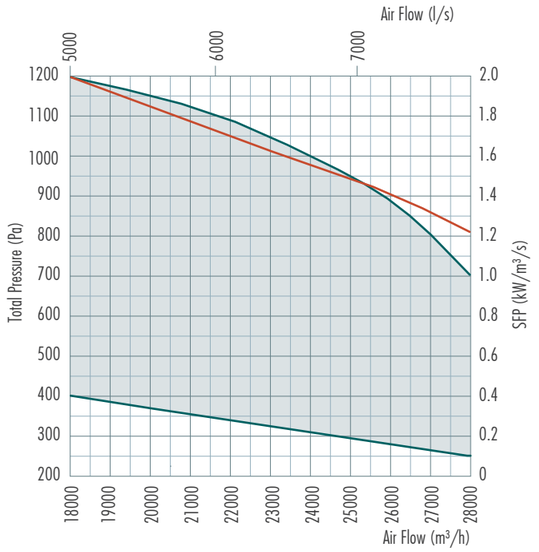
SFP = Specific Fan Power

$$SFP = \frac{\text{Total Power Consumption (kW)}}{\text{Air Flow (m}^3\text{/s)}}$$

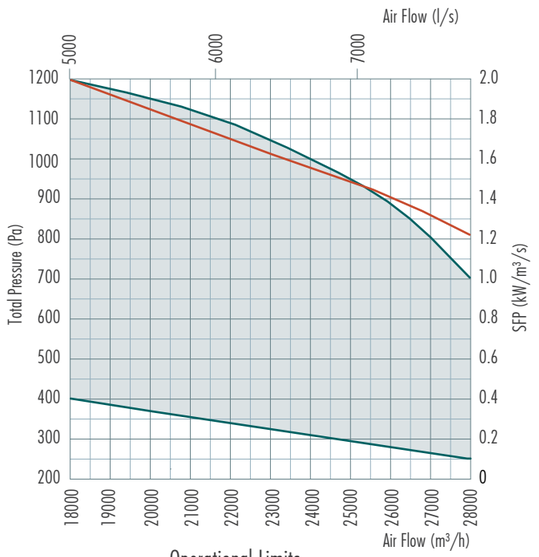
ERO-EPO 225

Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

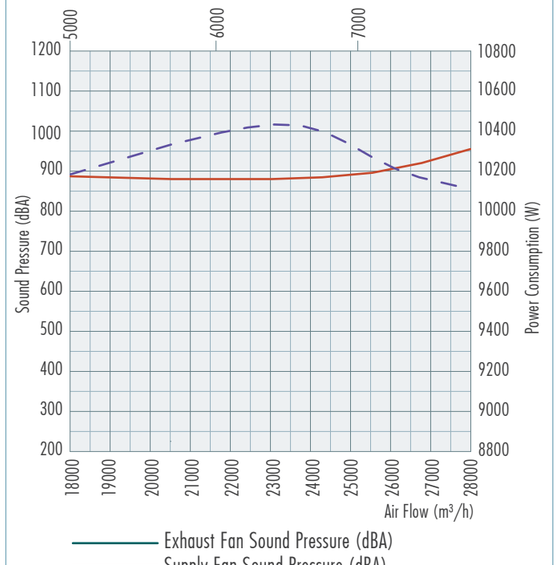
SUPPLY FAN



EXHAUST FAN



SOUND & POWER CONSUMPTION



SUPPLY FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
18000	75,9	84	83,9	79	79,3	77,1	73	70,6	84,2
20000	71,7	80,4	82,7	77,9	79	77,3	73	71,4	83,9
22000	68,8	77,2	82,4	77,4	78,6	77,7	72,9	72,4	83,8
24000	67,4	73,6	82,6	77,7	78	78,4	72,7	74,1	84
26000	67,6	71,4	82	78,4	77,9	80	73	76,5	84,9
28000	71	73,8	83,3	79,8	78,4	83,2	75,3	71,6	87,6

EXHAUST FAN

Air Flow	Sound Pressure Suction Side								
m³/h	63	125	250	500	1000	2000	4000	8000	Lwa
18000	75,9	84	83,9	79	79,3	77,1	73	70,6	84,2
20000	71,7	80,4	82,7	77,9	79	77,3	73	71,4	83,9
22000	68,8	77,2	82,4	77,4	78,6	77,7	72,9	72,4	83,8
24000	67,4	73,6	82,6	77,7	78	78,4	72,7	74,1	84
26000	67,6	71,4	82	78,4	77,9	80	73	76,5	84,9
18000	71	73,8	83,3	79,8	78,4	83,2	75,3	71,6	87,6

The electrical energy consumption of ventilation fans and air handling units (AHU) plays an increasing role in the energy demand for buildings. With proper design and usage of modern components it is possible to reduce power consumption in AHU's.
Specific Fan Power value; expressed in kW/m³s; is denoted in European Norm 13779 (EN 13779 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems) as follows;

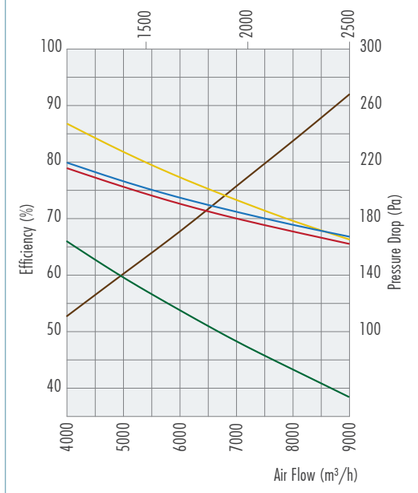
SFP = Specific Fan Power

$$SFP = \frac{\text{Total Power Consumption (kW)}}{\text{Air Flow (m}^3\text{/s)}}$$

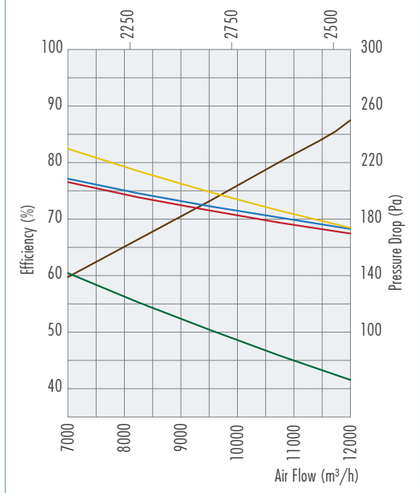
Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

Rotary Heat Exchanger

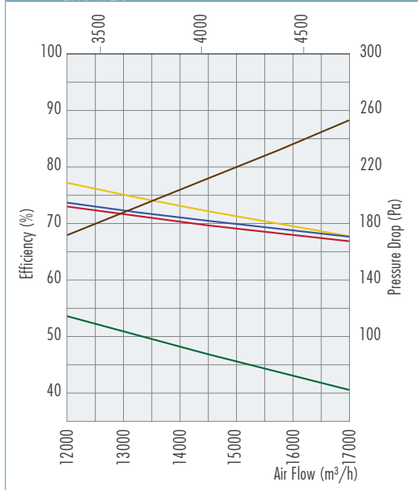
ERO 055



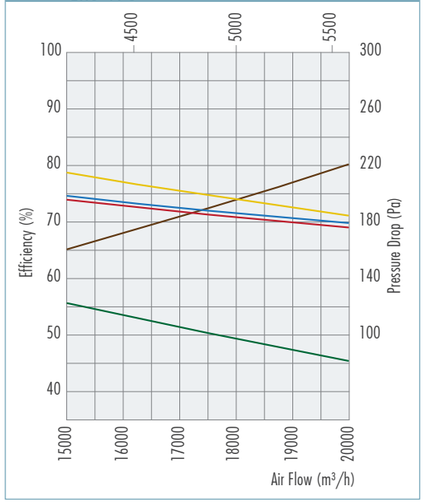
ERO 090



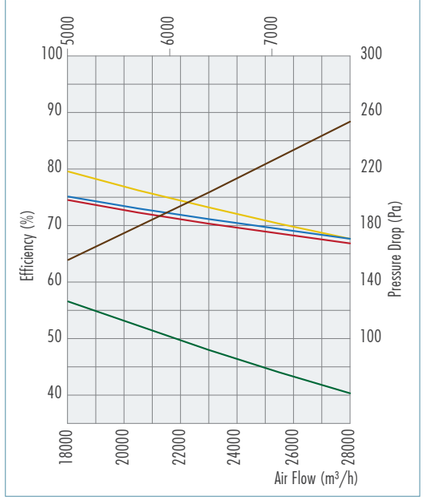
ERO 125

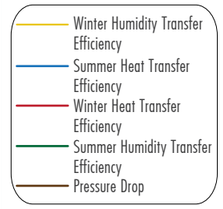


ERO 175



ERO 225





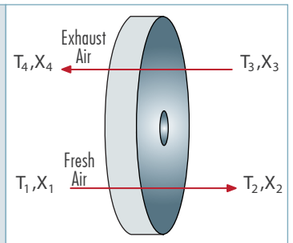
Heat Recovery Efficiencies are given according to;
Winter - Supply Air : -3°C, 75% RH Exhaust Air : 22°C, 45% RH
Summer - Supply Air : 37°C, 35% RH Exhaust Air : 26°C, 50% RH

The formulas are given as follows;

Temperature Efficiency; $\eta_T = \frac{T_2 - T_1}{T_3 - T_1} \times 100\%$

Humidity Efficiency; $\eta_X = \frac{X_2 - X_1}{X_3 - X_1} \times 100\%$

Supply Temperature; $T_2 = T_1 + \frac{\eta_T \times T_3 - T_1}{100}$

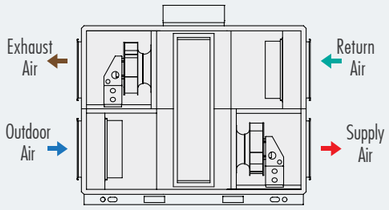


T, Temperature (°C)
X, Absolute Humidity (g humidity/kg dry air)

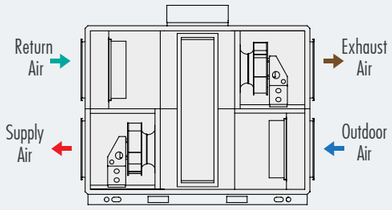
Configuration

Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

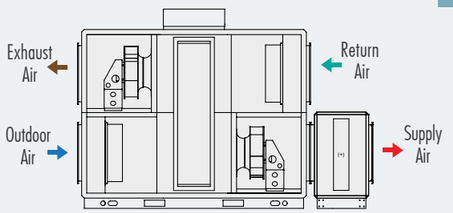
Right-Hand Type

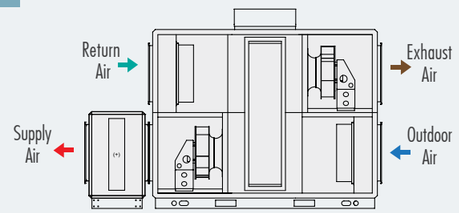


Left-Hand Type

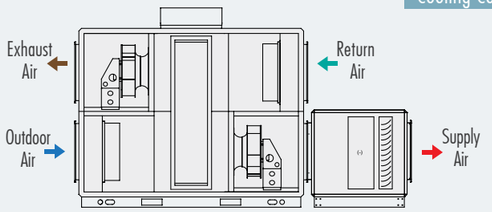


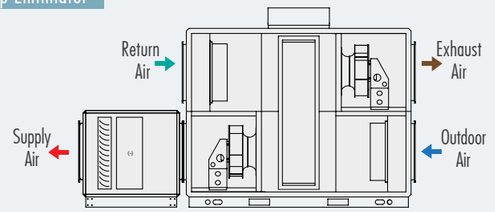
Heating Coil



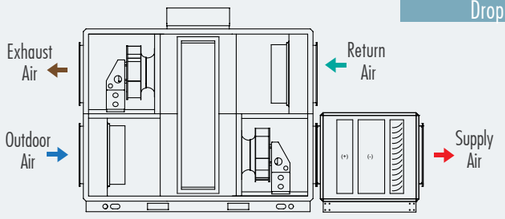


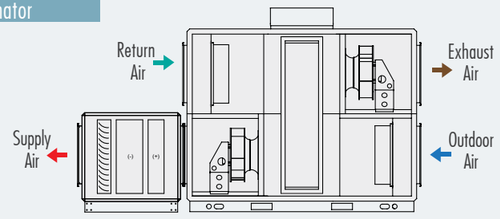
Cooling Coil + Drop Eliminator



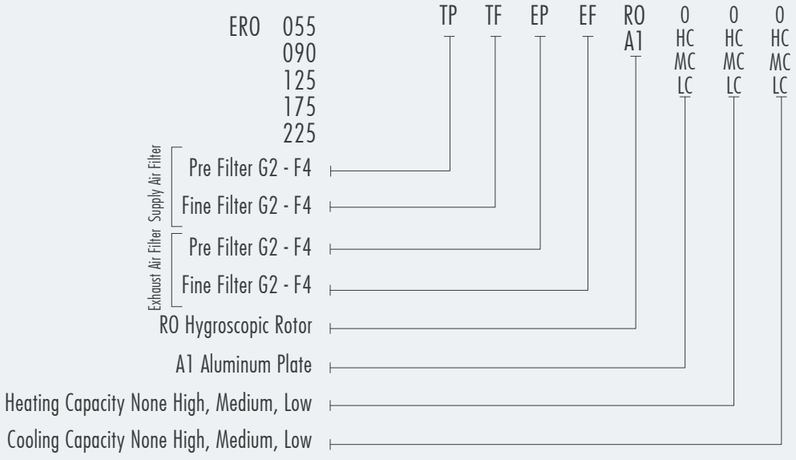


Heating Coil + Cooling Coil + Drop Eliminator



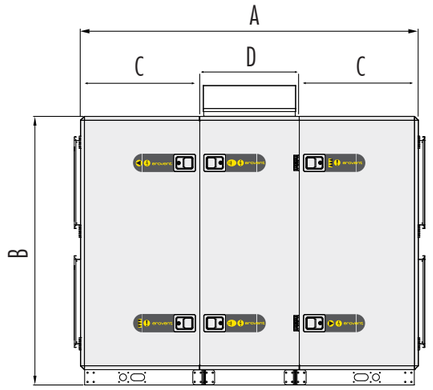


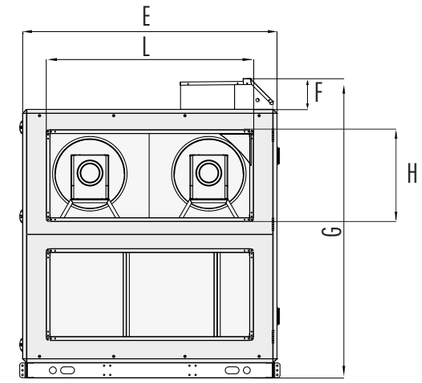
EROVENT Rotary Heat Recovery



Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

Dimensions & Configuration



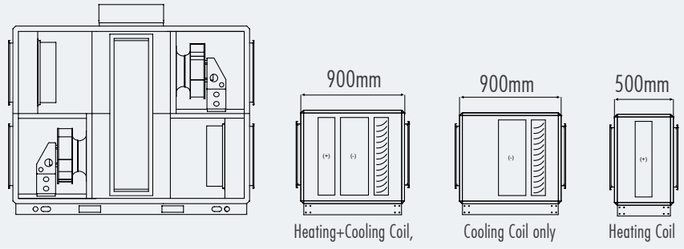


Dimensions

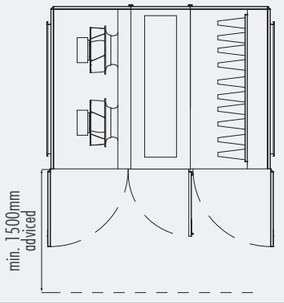
Units	A	B	C	D	E	F	G	LxH
ERO 055	2200	1750	775	650	1650	200	1950	1300x550
ERO 090	2200	1750	775	650	1650	200	1950	1300x550
ERO 125	2200	2100	775	650	1950	200	2300	1600x725
ERO 175	2300	2460	825	650	2160	200	2660	1700x900
ERO 225	2440	2460	875	690	2530	200	2660	2080x900

Electrical Connections

ERO 055: 400V, 6.8A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
ERO 090: 400V, 9.2A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
ERO 125: 400V, 21A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
ERO 175: 400V, 20A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
ERO 225: 400V, 32A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
*Connection between room control panel and GreenBox should be RJ11 socket connection both ways.



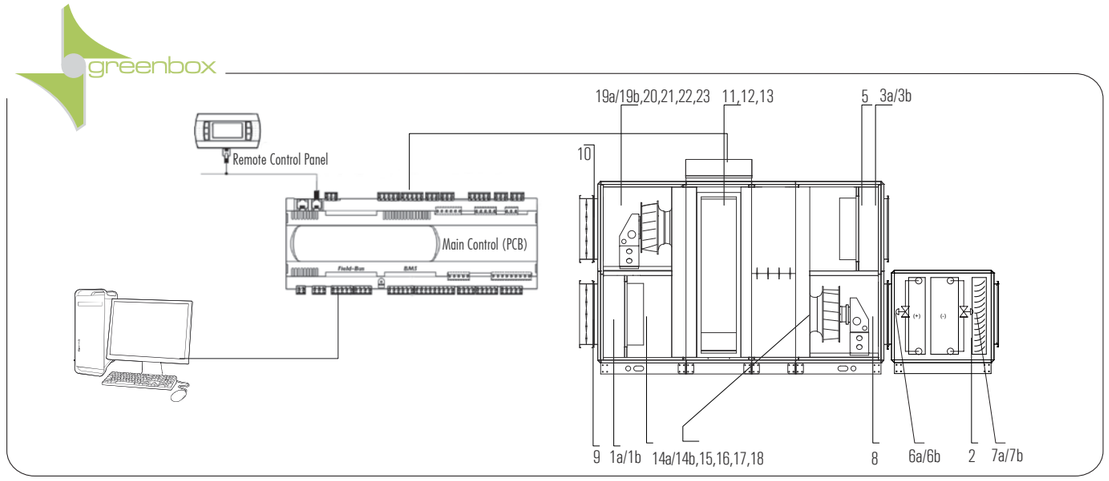
Service Space



A clear space of 1500 mm must be provided in front of the unit for service.

Control

- User friendly remote control panel for user input and monitor unit status.
- Remote control with panel, BMS or ModBUS (Other protocols like Bacnet, Lonworks are also available)
- Programming page for the user to change parameters in the remote control.
- Enhancing maximum energy efficiency of the heat recovery according to design demand and indoor/outdoor temperature and/or humidity.
- Smoke extraction scenario in case of fire inside the building.
- Monitoring fault/alarm/filter occupancy in the remote control.
- Capacity control of the heating/cooling coils according to room/return air temperature.
- Introducing energy savings with EC fans speed control according to IAQ or CO_2 level.
- Fresh air electrical heater control in cold/extreme climates.
- Continuous efficiency monitoring from the panel.



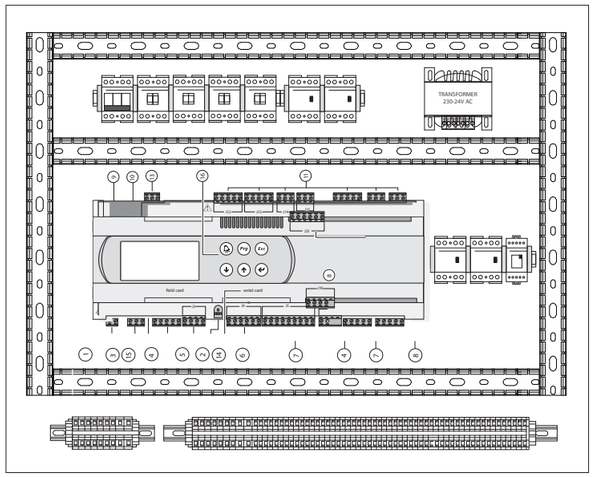
Greenbox Z

1-Outdoor Air Temperature
2-Supply Air Temperature
3-Return Air Temperature
4-Supply Air Filter Status
5-Exhaust Air Filter Status
6a/6b- Heating Coil Capacity Control
7a/7b-Cooling Coil Capacity Control
8-Frost Control
11-Heat Wheel Capacity Control
12-Heat Wheel Status
13-Heat Wheel Fault
14a/14b-EC Supply Fan Control
15-Supply Fan 1 Status
16-Supply Fan 1 Fault
17-Supply Fan 2 Status
18-Supply Fan 2 Fault
19a/19b-EC Return Fan Control
20-Return Fan 1 Status
21-Return Fan 1 Fault
22-Return Fan 2 Status
23-Return Fan 2 Fault

Greenbox A

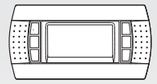
1a-Outdoor Air Temperature
1b-Outdoor Air Humidity
2-Supply Air Temperature
3a-Return Air Temperature
3b-Return Air Humidity
4-Supply Air Filter Status
5-Exhaust Air Filter Status
6a/6b- Heating Coil Capacity Control
7a/7b-Cooling Coil Capacity Control
8-Frost Control
9-Supply Air Motorized Damper Control
10-Return Air Motorized Damper Control
11-Heat Wheel Capacity Control
12-Heat Wheel Status
14a/14b-EC Supply Fan Control
15-Supply Fan 1 Status
16-Supply Fan 1 Fault
17-Supply Fan 2 Status
18-Supply Fan 2 Fault
19a/19b-EC Return Fan Control
20-Return Fan 1 Status
21-Return Fan 1 Fault
22-Return Fan 2 Status
23-Return Fan 2 Fault

1. power supply connector (input: 24 V);
2. yellow power LED and 3 status LEDs;
3. additional power supply for terminal and 0/5 V ratiometric probes;
4. universal analogue inputs (NTC, 0/1 V, 0/5 V ratiometric, 0/10 V, 4/20 mA);
5. passive analogue inputs (NTC, PT1000, ON/OFF);
6. 0 to 10 V analogue outputs;
7. 24 Vac/Vdc digital inputs;
8. 230 Vac or 24 Vac/Vdc digital inputs;
9. connector for the display terminal (external panel with direct signals);
10. connector for all standard pCO series terminals and for downloading the application program;
11. relay digital outputs;
12. I/O expansion board connector;
13. pLAN network connector;
14. cover for inserting the supervisor and telemaintenance option;
15. cover for inserting the field card option;
16. Built-In terminal (LCD, buttons and LEDs).



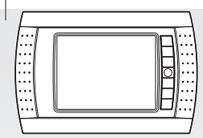
COMMUNICATION

J10 CONNECTION



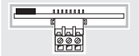
PGD0-1:
graphic display

J11 CONNECTION

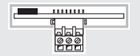


PGD2-3: touch screen graphic display for panel and wall mounting

SERIAL CARD CONNECTION



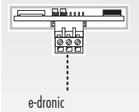
PCOS004850:
RS485 serial board



PCO1000BA0: BACnet RS485 interface board

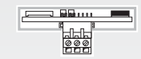
PCO100MDM0:
modem board

PCO1000WB0:
pCO Web - Ethernet™ interface board



e-dronic

PCOS00HBB0:
CANbus board

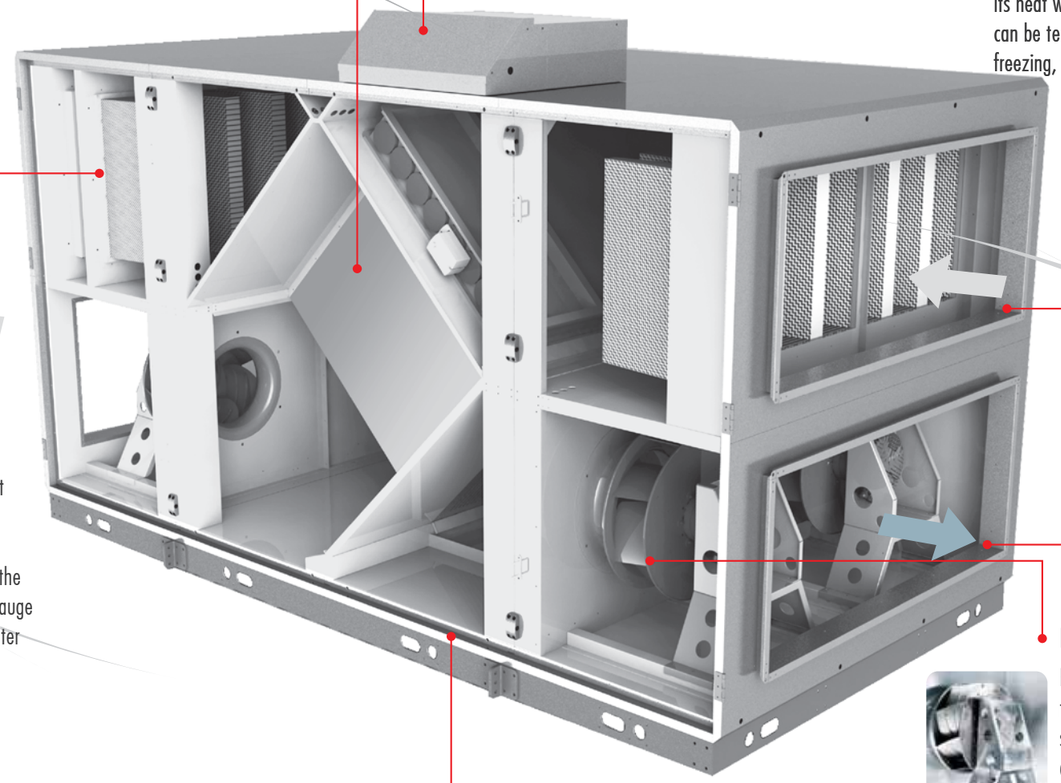


PCO10000F0:
LON board

Crossflow
Indoor air dispersion
Air handling Units - Textile Air Dispersion - Climatization

Control

EROVENT and EPOVENT units are equipped with a microprocessor based control system, "GreenBox" to meet various design needs. Both electrically and electronically control hardware comes with the unit that's why the unit is "Plug and Play". Rotor monitoring and speed control, filter monitoring, fan monitoring are standard. With the use of optional IAQ, CO_2 sensor or constant flow kit, fans regulate automatically according to user demand. The panel is BMS compatible and can handle various communication protocols like Modbus (standard protocol for EROVENT and EPOVENT units), Bacnet and Lonworks. Room control panel is supplied where no BMS protocol is demanded. GreenBox is also capable of controlling heating/cooling capacity when EROVENT and EPOVENT units are used with heating/cooling coils.



Exhaust and Supply Air Filters

EROVENT and EPOVENT units come with G4 class pre-filter and F6 class final filter in supply air side and G4 class pre filter in exhaust air side. A choice of pre-filters (G2-G4) and final filters (F6-F9) are available optionally. Pre-filters are washable and secured in rigid frames made of galvanized steel. Final filters are innovative compact filters with increased filtration surface area to reduce initial pressure drop over the filter and also reduce units' size. All the filters comply with EN 779 to meet the requirements of odor absorption and dust arrestment. Filter blockage is indicated in the control panel by standard installed differential pressure switches however pressure gauge is also available optionally to observe fouling. Filter sections are designed to ease filter service and changing.

Casing

The unit is constructed in sections to ease transportation, mounting and commissioning. Every section has its own basis and transport slots. For both panels and service doors internal casing is galvanized steel and external casing is powder coated. 50 mm thickness of Rockwool is used in between for thermal and sound insulation. Each service door has locking mechanism to ensure safe service. To prevent thermal and fluid leakage through the casing appropriate gaskets are designed.

Aluminium Plate Heat Exchanger

The Aluminum plate heat recovery exchanger consists of flat Aluminum plates sewed together on the edge. The plates have a unique design to enhance heat exchange surface and also stability. The sewing progress ensures leakage free design (Maximum leakage between air streams is 0,3 %). The exchanger comes in various edge size and plate distance. As the edge dimension increases the efficiency of the heat exchanger increases and pressure drop across the heat exchanger decreases. Increasing plate distance reduces both efficiency and the pressure drop. EPOVENT units are designed with the optimized Aluminum heat exchanger considering efficiency, pressure drop and cost effectiveness. There exists a by-pass section as standard in EPOVENT units. According to indoor air conditions, outdoor air conditions and desired conditions that is set in the room control panel or main controller PC(via Communication protocols like Modbus, Bacnet, Lonworks and similar) bypass module is opened to let fresh air get inside without changing its heat with return air or the module is closed to ensure heat exchange. The conditions that will be checked can be temperature and humidity or temperature only. In extreme climates to protect the exchanger from freezing, fresh air electrical heaters must be used.

Duct Connections

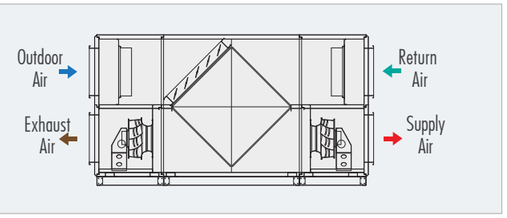
EROVENT and EPOVENT units outlets are designed in rectangular shape. Adapters can be used after the unit to convert it into circular duct system. To reduce pressure drop in both inlet and outlet, face velocity is reduced (Maximum air velocity in the duct connection V_{max}<4,5 m/s). Motorized or manual dampers are optionally available for both fresh air inlet and return air inlet.

Exhaust and Supply Air Fans

EROVENT and EPOVENT units are equipped with innovative Electronically Commutated (EC) motor technology. EC motors ensure the flexibility of connecting to AC mains with the efficiency and simple speed control of a DC motor. Fan blades are high aerodynamic efficient backward curved design. Compared to conventional standard units, EROVENT and EPOVENT series an average of 21% less energy at operating conditions.
With the new regulations, pressure drop in the ducting system shall also be minimized due to low energy consumption demand. Plug fan design also help reduce the ducting systems total pressure drop. As a result of the backward curved impellers with high hydraulic efficiency, uniform flow is reached even in the duct connection spigots of the unit. With a conventional fan more than 80 Pa of pressure drop will be measured because of the high speed of the air in unit's inlet/outlet with the usage of 90° elbow, with plug fans the pressure drop is reduced down to 10 Pa for the same case. With EC Fans it is also possible to reduce maintenance costs as the fans are direct drive; free of V-belt wear and tear mechanism.

Configuration

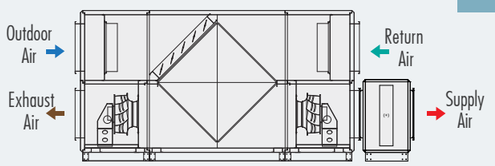
Standard Type

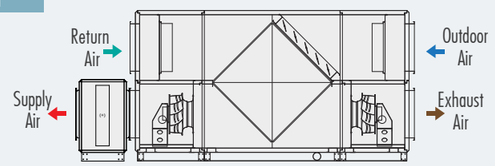


Right-Hand Type

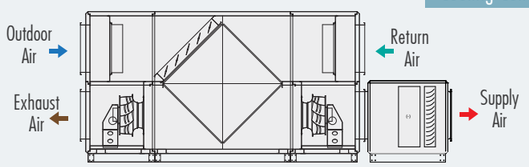
Left-Hand Type

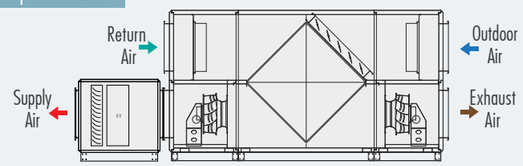
Heating Coil



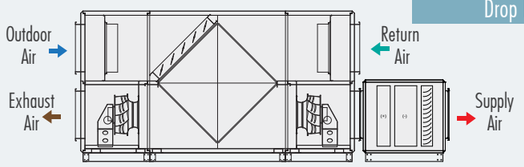


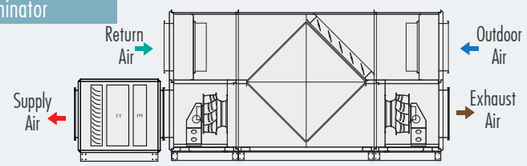
Cooling Coil + Drop Eliminator



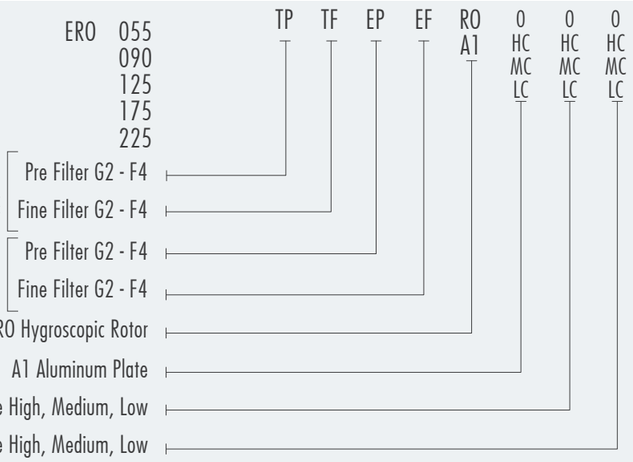


Heating Coil + Cooling Coil + Drop Eliminator

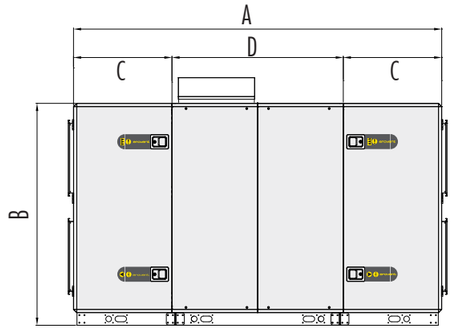


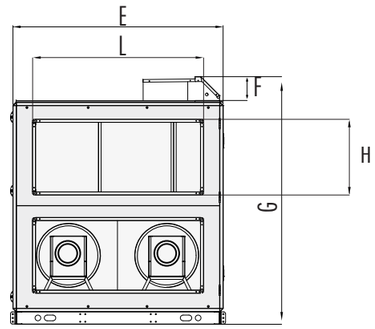


EPOVENT Aluminum Plate Heat Recovery



Dimensions & Configuration



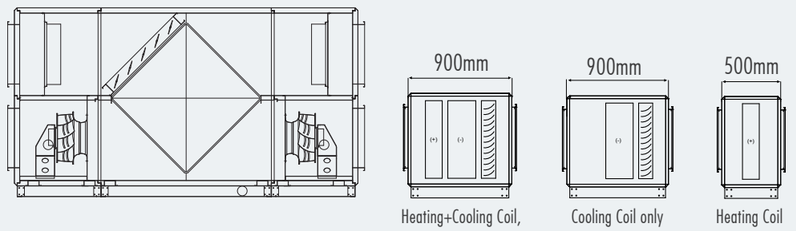


Dimensions

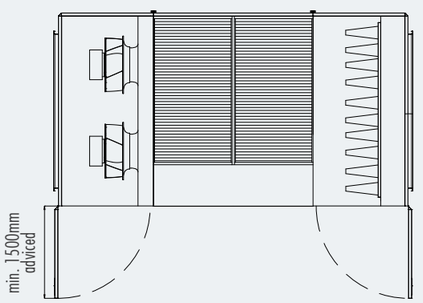
Units	A	B	C	D	E	F	G	LxH
EPO 055	2900	1750	775	1350	1650	200	1950	1300x550
EPO 090	3180	1750	775	1630	1650	200	1950	1300x550
EPO 125	3565	2100	825	1915	1960	200	2300	1600x725
EPO 175	3565	2460	825	1925	2160	200	2660	1700x900
EPO 225	3950	2460	875	2200	2530	200	2660	2080x900

Electrical Connections

EPO 055: 400V, 6.8A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
EPO 090: 400V, 9.2A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
EPO 125: 400V, 21A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
EPO 175: 400V, 20A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
EPO 225: 400V, 32A, 3 phase, 50Hz, 5 wire (R,S,T,N,Ground)
*Connection between room control panel and GreenBox should be RJ11 socket connection both ways.



Service Space

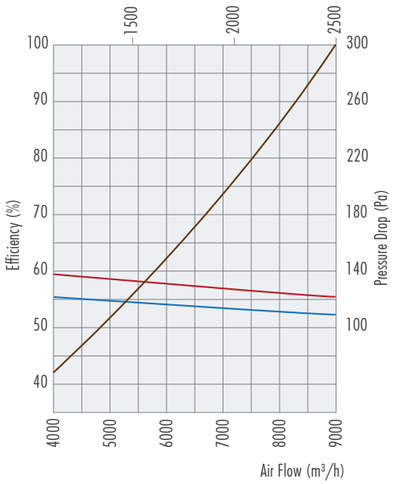


A clear space of 1500 mm must be provided in front of the unit for service.

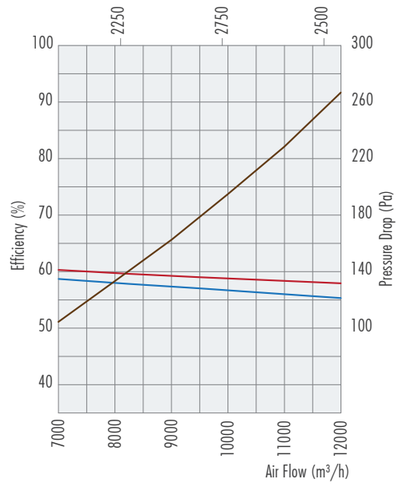
(View from top)

Heat Recovery Exchanger

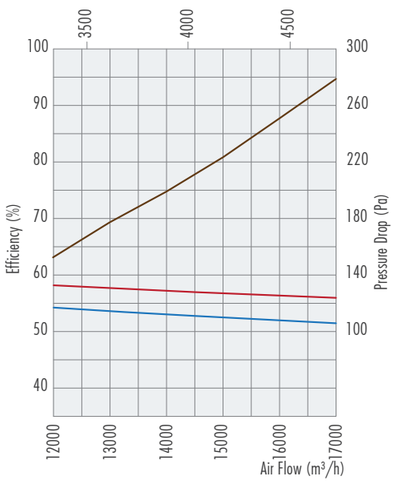
ERO 055



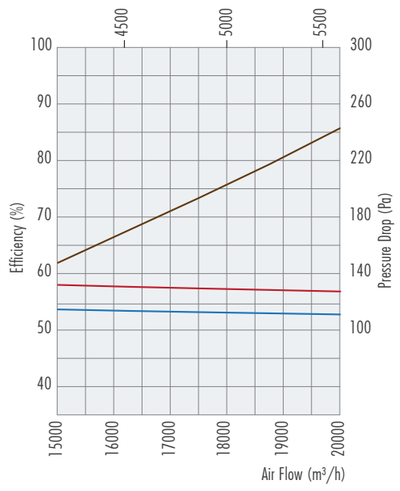
ERO 090



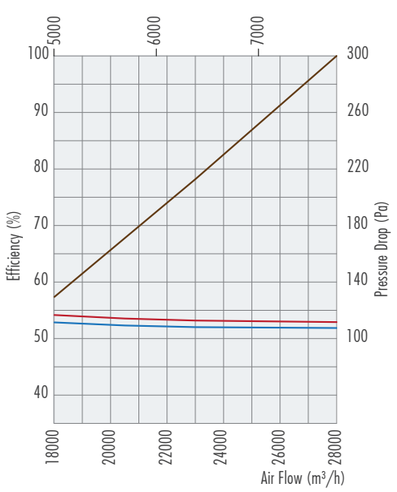
ERO 125

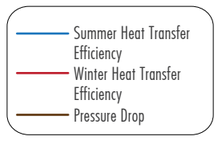


ERO 175



ERO 225



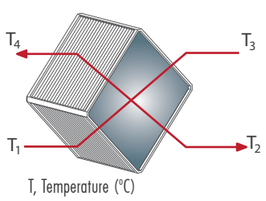


Heat Recovery Efficiencies are given according to;
Winter - Supply Air : -3°C, 75% RH Exhaust Air : 22°C, 45% RH
Summer - Supply Air : 37°C, 35% RH Exhaust Air : 26°C, 50% RH

The formulas are given as follows;

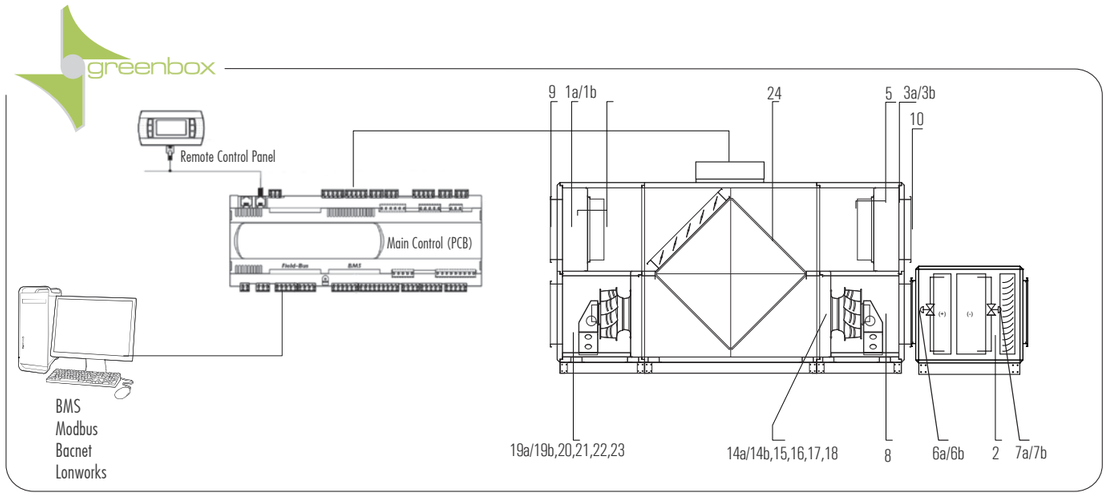
Temperature Efficiency; $\eta_T = \frac{T_2 - T_1}{T_3 - T_1} \times 100\%$

Supply Temperature; $T_2 = T_1 + \frac{\eta_T \times T_3 - T_1}{100}$



Control

- User friendly remote control panel for user input and monitor unit status.
- Remote control with panel, BMS or ModBUS (Other protocols like Bacnet, Lonworks are also available)
- Programming page for the user to change parameters in the remote control.
- Enhancing maximum energy efficiency of the heat recovery according to design demand and indoor/outdoor temperature and/or humidity.
- Smoke extraction scenario in case of fire inside the building.
- Monitoring fault/alarm/filter occupancy in the remote control.
- Capacity control of the heating/cooling coils according to room/return air temperature.
- Introducing energy savings with EC fans speed control according to IAQ or CO_2 level.
- Fresh air electrical heater control in cold/extreme climates.
- Continious efficiency monitoring from the panel.



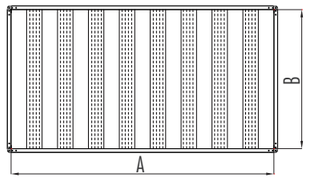
Greenbox Z

1-Outdoor Air Temperature
2-Supply Air Temperature
3-Return Air Temperature
4-Supply Air Filter Status
5-Exhaust Air Filter Status
6a/6b- Heating Coil Capacity Control
7a/7b-Cooling Coil Capacity Control
8-Frost Control
14a/14b-EC Supply Fan Control
15-Supply Fan 1 Status
16-Supply Fan 1 Fault
17-Supply Fan 2 Status
18-Supply Fan 2 Fault
19a/19b-EC Return Fan Control
20-Return Fan 1 Status
21-Return Fan 1 Fault
22-Return Fan 2 Status
23-Return Fan 2 Fault

Greenbox A

1a-Outdoor Air Temperature
1b-Outdoor Air Humidity
2-Supply Air Temperature
3a-Return Air Temperature
3b-Return Air Humidity
4-Supply Air Filter Status
5-Exhaust Air Filter Status
6a/6b- Heating Coil Capacity Control
7a/7b-Cooling Coil Capacity Control
8-Frost Control
9-Supply Air Motorized Damper Control
10-Return Air Motorized Damper Control
14a/14b-EC Supply Fan Control
15-Supply Fan 1 Status
16-Supply Fan 1 Fault
17-Supply Fan 2 Status
18-Supply Fan 2 Fault
19a/19b-EC Return Fan Control
20-Return Fan 1 Status
21-Return Fan 1 Fault
22-Return Fan 2 Status
23-Return Fan 2 Fault
24-By-pass Control

Sound Attenuator



	A	B
ERO-EPO 055	1300	550
ERO-EPO 090	1300	550
ERO-EPO 125	1600	725
ERO-EPO 175	1700	900
ERO-EPO 225	2080	900

Notation

ABS 080/100/120 055/090/125/175/225 0600/1000/1500/2000

- Product Type
- Pod Distance (mm)
- Unit Type
- Sound Attenuator Lenght (mm)

Characteristics (Pod width 200 mm)

Length mm	63	125	250	500	1k	2k	4k	8k	Pressure drop coefficient,ß
600	3	4	11	16	23	19	14	9	2,8
1000	4	9	20	30	42	36	23	17	3,3
1500	5	14	29	44	50	50	35	22	4,2
2000	8	22	48	50	50	50	48	31	5

*Pod distance 80 mm

Length mm	63	125	250	500	1k	2k	4k	8k	Pressure drop coefficient,ß
600	2	5	10	14	20	15	9	7	1,6
1000	3	8	18	27	37	29	19	14	1,9
1500	5	12	26	40	50	44	27	18	2,4
2000	6	16	34	50	50	50	33	22	2,9

*Pod distance 100 mm

Length mm	63	125	250	500	1k	2k	4k	8k	Pressure drop coefficient,ß
600	2	4	9	13	17	12	9	6	1
1000	3	7	16	25	32	24	16	11	1,3
1500	4	11	23	36	50	36	22	15	1,5
2000	5	14	31	48	50	47	28	18	1,8

*Pod distance 120 mm

Pressure drop of the sound attenuator is calculated with ß, Pressure drop coefficient $\Delta P = ß \times V^2$.
V face velocity (m/s), is calculated by dividing Air Flow (m^3/s) to the areaof the connected duct spigot.(m^2)

$$\text{Face Velocity, } V(m/s) = \frac{\text{Air Flow } (m^3/s)}{\text{Spigot Area } (m^2)}$$

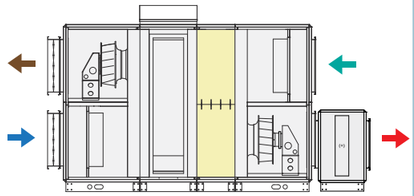
	ERO 055	ERO 090	ERO 125	ERO 175	ERO 225
Spigot Dimensions mm	1300 X 550	1300 X 550	1600 X 725	1700 X 900	2080 X 900
Spigot Area m^2	0,715	0,715	1,160	1,530	1,872

By-Pass Module

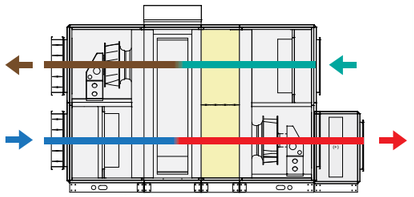
EPOVENT / EROVENT units are designed for 100% fresh air operation. But for some operation, period user can demand for conditioning indoor space before meeting IAQ demands. For example the period before the conference hall, before the people starts to work in their offices, before a concert in a concert hall, disco etc.

For applications similar to these HVAC installations, by-pass module is designed for each capacity for both EROVENT and EPOVENT units. By-Pass module is controlled with Remote Control Panel between 0-100 % opening.

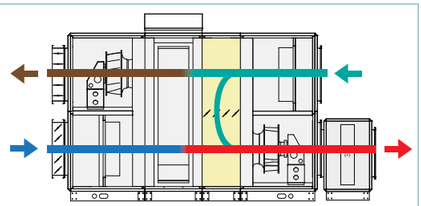
Damper 100% Open:
The unit operates with 100% of return air. Indoor air is by-passed before entering the heat recovery exchanger. By-passed air is conditioned with heating/cooling coils and blown indoors. Only supply air fans and heating/cooling coils are operating in this mode. The rotor and exhaust fans are switched off


Damper 100% Open

Damper Closed:
The unit operates with 100% of fresh air. Indoor air is introduced to the heat recovery exchanger to exchange heat and humidity (only in the rotary model) and then exhausted to outdoors. Fresh air enters the heat recovery exchanger to deliver the heat and humidity of the exhausted air, then supplied indoors after heating/cooling process over the coils. Both supply air and exhaust air fans and the heat recovery exchanger is operating in this mode.


Damper Closed

Damper Modulation:
The unit operates with mixture of supply and return air. Some portion of the return air is mixed with fresh air after the heat recovery exchanger and introduces indoors after heating /cooling process over the coils. Both supply air and exhaust air fans and the heat recovery exchanger is operating in this mode, but exhaust air fan speed is modulated.

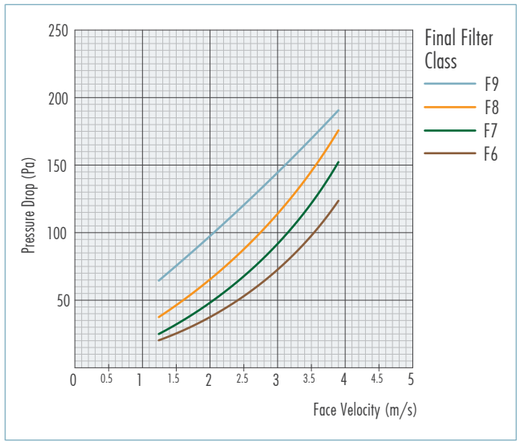

Damper Modulation

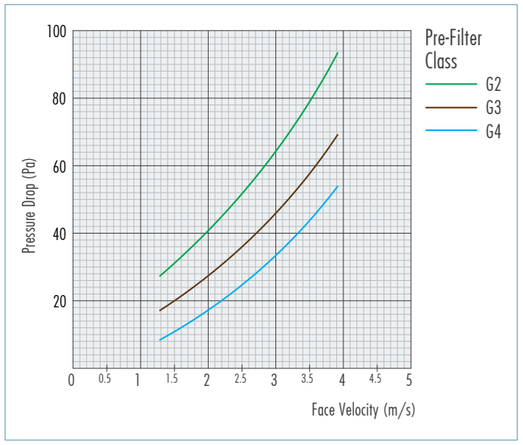
Notation

BM 055/090/125/175/225

- By-Pass Module
- Unit Model

Filter





Model	Filter Area (m^2)
ERO/EPO 055	0,87
ERO/EPO 090	0,87
ERO/EPO 125	1,21
ERO/EPO 175	2,32
ERO/EPO 225	2,8

For EROVENT/EPOVENT units a variety of filters can be used optionally. To have an idea of the initial pressure drop across the filter, pressure drops are given in the chart.To make a quick calculation, face velocity shall be determined first.

For F6-F9 class filters the formula is as follows ;

$$V_{fine} = \frac{Q\left(\frac{m^3}{h}\right)}{A\ (m^2)}$$

For G2-G4 class filters the Formula is as follows;

$$V_{fine} = \frac{Q\left(\frac{m^3}{h}\right)}{1.41 \times A(m^2)}$$

Q= Air Flow of the unit (m^3/h)
A= Filter Area (m^2), to be used from the Table.

After V is determined, the initial pressure drop is attained from the pressure drop chart for the filters. To have an accurate design, not only initial pressure drop but also final pressure drop shall be taken into account and a mean value must be calculated by using both values. For pre-filters final pressure drop is 150 Pa, whereas for final filters 200 Pa. For an easy calculation for the unit, EroSelect software can be downloaded from www.eneko.com.tr to have the design data of the unit, including heat recovery calculation, coils capacity, filter pressure drop and fan data.

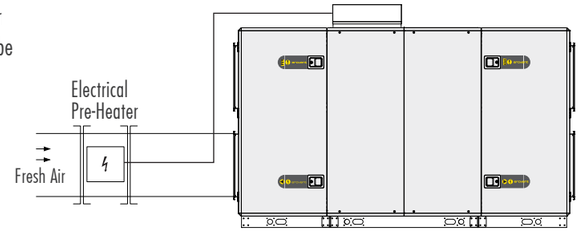
Humidifier

Electrode steam humidifiers are available for EROVENT/EPOVENT units. The humidifiers are installed in a separate section with stainless steel drain pan. Standard control turns on or off the humidifier where Close Control Model modulates the capacity between 8% to 100% according to the demand indoors. Standard capacities are designed for each model.

Unit Model	Humidifer Model/Notation	Capacity (kg/h)	Maximum Power (kW)	Maximum Current (A)	QTY
ERO-EPO 055	LE45	45	33.9	54	1
ERO-EPO 090	LE45	45	33.9	54	1
ERO-EPO 125	LE60	60	45	71	2
ERO-EPO 175	LE90	90	67.8	108	2
ERO-EPO 225	LE90	90	67.8	108	2

Electrical Heater

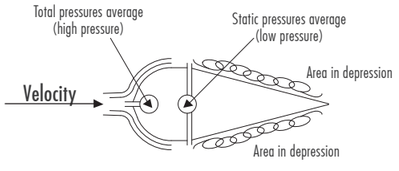
For extreme climates where outdoor air can be lower than -8°C, fresh air electrical heaters are advised to be used with EROVENT/EPOVENT units against freezing in both rotary wheels and Aluminum plate heat exchangers. The capacity is controlled with 3 steps according to outdoor air temperature.
Stainless steel resistances are used for heating elements. 2 different thermostats are installed to protect the heating elements against overheating. The control ensures safety by operating the fans for additional 2 minutes even after the unit is turned off to cool down heating elements.



Unit Model	Heater Model/Notation	Nominal Air Flow (m^3/h)	Maximum Power (kW)	Maximum Current (A)	Steps
ERO-EPO 055	FAEH 21	5500	21	36	3
ERO-EPO 090	FAEH 36	9000	36	60	3
ERO-EPO 125	FAEH 48	12500	48	80	3
ERO-EPO 175	FAEH 72	17500	72	120	3
ERO-EPO 225	FAEH 96	22500	96	160	3

Constant Flow Kit

In HVAC applications mostly the design pressure drop of the ducting system and the actual pressure drop is different. For applications where appropriate air flow is a demand, Constant Flow Kits are used. Constant Flow kit consists of a) Pressure measurement blades to measure the difference between static and Total Pressure b)Pressure Transmitter to calculate air velocity from the pressure difference. The blades pressure intakes are distributed by the TCHEBYCHEFF method. The blades are available according to the ducting diameter between 630 and 1500 mm. The pressure difference between total and static pressure are received from the blades installed to the ducting system and the velocity is calculated with given formula;



$$\text{Velocity}\ \left(\frac{m}{s}\right) = K_L \times \sqrt{P_T - P_S}$$

$$\text{Air Flow}\ \left(\frac{m^3}{h}\right) = K_L \times \sqrt{P_d} \times S \times 3600$$

K_L= Blade Factor
P_T=Total Pressure
P_S=Static Pressure
S=Duct Section (m^2)
P_d=P_T-P_S=Dynamic Pressure
Factor of Velocity Calculation K_L=1

According to the set air flow, Constant Flow Kit regulated the EC fans automatically. Even the filters become contaminated, or the duct pressure drop is higher the user ensures adequate air flow to the system.

Notation

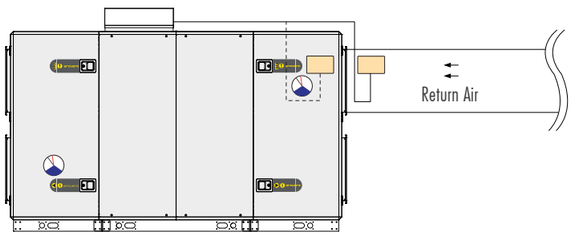
EFC ----
Constant Flow Kit
Diameter;
630~1500 mm

Accessories

Ventilation on Demand

Ventilation on Demand is available with EROVENT/EPOVENT units by means of Air Quality Sensor, CO_2 sensor or RH% sensor. Air Quality Sensor measures volatile organic compounds in the air. VOC, volatile organic compounds, is the common name for organic substances suspended in the air like gases or vapors. VOCs include scent and taste particles, tobacco smoke, building chemicals, solvents, disintegrating gases and products of oxidation.

Air Quality Sensor is mounted to the return air duct and is connected to Eneko GreenBox control. The set point for the desired indoor air quality is set during the installation. According to the demand indoors, EROVENT/EPOVENT units are modulated automatically by the sensor. Annual energy consumption of the unit is reduced as a result of the modulation, ending in reduction in energy costs.



Notation

EVO — Ventilation on Demand Sensor

CO_2 — CO_2 Sensor
IAQ — IAQ Sensor
RH — RH Sensor

For Ventilation on Demand function the sensors (IAQ,CO_2 or RH%) can be mounted both to the return air duct or to the unit. 5 meters of wiring for powering the sensor and data transfer is delivered with the sensors. The sensor transmits 0-10V output signal according to the set value and the measured value. The signal is received by the GreenBox control and both supply and exhaust air fans speed regulates according indoor air demands.

Pressure Gauge

Pressure Gauge is used as an accessory in EROVENT/EPOVENT units to monitor differential pressure of filters or fans. Ingrid protection is IP54 standard. Pressure Gauge cam measure between 0-500Pa.

Notation

EPG — Pressure Gauge

Communication

The GREENBOX can communicate in modbus protocol that enables to be communicated between the Building Management System and the EROVENT/EPOVENT.
BMS is let to control and monitor the parameters of the EROVENT/EPOVENT units. It's possible to activate or deactivate room control panel in modbus. In addition to Modbus, GREENBOX supports also LonWorks, BACnet, METASYS, Konnex, TREND protocols.

Coil Capacity Chart
ERO 055/090/125

		Heating Coil					Cooling Coil		
		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
ERO 055	4000	16,64	36,16	1,13	28,45	0,73	71,2	33,01	23,04
	5000	24,21	42,14	1,51	33,36	0,98	105,2	38,81	30,66
	6000	32,88	47,59	1,9	37,85	1,25	144,44	44,07	38,38
	7000	42,61	52,72	2,31	42,1	1,53	188,71	48,93	46,22
	8000	53,34	57,52	2,73	46,06	1,81	237,8	53,53	54,22
	9000	65,02	62,03	3,15	49,79	2,1	291,64	57,96	62,48

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
ERO 090	7000	21,66	58,3	2,8	47,03	1,89	99,95	54,39	23,72
	8000	27,11	63,79	3,32	51,6	2,25	126,1	59,74	28,01
	9000	33,03	68,78	3,83	55,72	2,6	154,7	64,78	32,34
	10000	39,4	73,7	4,36	59,83	2,97	185,67	69,57	36,71
	11000	46,29	78,33	4,9	63,67	3,34	218,96	74,17	41,15
	12000	53,58	82,82	5,44	67,42	3,72	254,52	78,63	45,67
	13000	61,31	87,18	6	71,1	4,12	292,43	83,02	50,31

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
ERO 125	10000	24,3	90,75	2,58	73,92	1,77	104,41	76,58	23,42
	11000	28,51	96,79	2,91	78,95	2,01	123,22	81,88	26,4
	12000	32,99	102,45	3,24	83,64	2,24	143,32	86,94	29,39
	13000	37,75	108,14	3,58	88,38	2,48	164,6	91,81	32,41
	14000	42,75	113,47	3,93	92,83	2,72	187,14	96,52	35,45
	15000	48	118,68	4,27	97,18	2,96	210,84	101,1	38,52
	16000	53,5	123,78	4,62	101,45	3,21	235,76	105,57	41,64
	17000	59,24	128,79	4,98	105,66	3,47	261,7	109,97	44,81
	18000	65,21	133,49	5,33	109,57	3,72	289,07	114,31	48,05

Coil Capacity Chart
ERO 175/225

Heating Coil / Cooling Coil

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
ERO 175	13000	19,75	120,54	6,17	99,9	4,42	89,29	100,45	15,6
	14000	22,36	126,72	6,77	105,11	4,86	101,58	105,91	17,15
	15000	25,11	132,75	7,38	110,19	5,3	114,52	111,17	18,7
	16000	27,98	138,63	7,99	115,17	5,75	128,08	116,27	20,26
	17000	30,98	144,12	8,59	119,79	6,19	142,26	121,22	21,83
	18000	34,1	149,76	9,23	124,58	6,65	157,03	126,03	23,41
	19000	37,34	155,02	9,84	128,98	7,09	172,4	130,72	24,99
	20000	40,7	160,18	10,46	133,34	7,55	188,37	135,31	26,59
	21000	44,17	165,25	11,08	137,63	8	204,91	139,81	28,2
	22000	47,76	170,24	11,71	141,86	8,46	222,04	144,24	29,82
	23000	51,46	175,16	12,35	146,03	8,93	239,79	148,6	31,46
	24000	55,28	180,02	12,99	150,16	9,4	258,08	152,92	33,13

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
ERO 225	17000	21,39	157,62	10,97	131,12	7,93	99,13	134,98	27,25
	18000	23,55	164	11,81	136,54	8,54	109,53	140,57	29,31
	19000	25,79	169,95	12,61	141,56	9,13	120,32	146,01	31,37
	20000	28,1	175,79	13,43	146,49	9,73	131,55	151,32	33,44
	21000	30,5	181,52	14,25	151,34	10,33	143,18	156,5	35,53
	22000	32,98	187,15	15,08	156,11	10,94	155,22	161,56	37,62
	23000	35,54	192,69	15,92	160,81	11,56	167,66	166,52	39,72
	24000	38,17	198,14	16,77	165,44	12,18	180,47	171,39	41,83
	25000	40,88	203,52	17,62	169,99	12,81	193,71	176,18	43,96
	26000	43,66	208,37	18,41	174,15	13,39	207,32	180,89	46,09
	27000	46,52	213,61	19,28	178,63	14,04	221,3	185,54	48,25
	28000	49,45	218,8	20,16	183,06	14,69	235,7	190,13	50,42
	29000	52,45	223,55	20,98	187,08	15,29	250,45	194,67	52,62
	30000	55,53	228,65	21,85	191,44	15,96	265,62	199,18	54,83

Coil Capacity Chart
EPO 055/090/125

Heating Coil / Cooling Coil

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
EPO 055	4000	18,23	42,53	1,54	34,29	1,04	55,87	34,39	20,57
	5000	26,46	49,04	2,02	39,61	1,36	82,32	40,09	27
	6000	35,88	54,92	2,5	44,38	1,69	112,81	45,21	33,43
	7000	46,42	60,32	2,98	48,79	2,02	147,11	49,91	39,9
	8000	58,02	65,23	3,46	52,78	2,34	185,16	54,35	46,46
	9000	70,66	70,01	3,95	56,67	2,68	226,86	58,64	53,22

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
EPO 090	7000	25,32	71,91	4,17	58,89	2,88	78,8	56,2	20,93
	8000	31,64	78,14	4,88	63,99	3,37	98,52	61,42	24,64
	9000	38,51	83,97	5,59	68,76	3,87	120,69	66,31	28,11
	10000	45,92	89,47	6,3	73,28	4,36	144,69	70,94	31,72
	11000	53,84	94,71	7,02	77,57	4,86	170,49	75,38	35,37
	12000	62,26	99,47	7,74	81,67	5,35	198,03	76,69	39,07
	13000	71,18	104,59	8,47	85,65	5,86	227,35	83,92	42,87

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
EPO 125	10000	28,19	105,03	3,39	85,65	2,34	101,8	79,3	22,235
	11000	33,08	112,28	3,85	91,67	2,66	120,06	84,39	24,85
	12000	38,27	119,08	4,3	97,31	2,97	139,52	89,27	27,475
	13000	43,78	125,91	4,78	103,02	3,31	160,21	93,96	30,12
	14000	49,58	132,34	5,25	108,37	3,64	182,09	98,53	32,79
	15000	55,66	138,62	5,73	113,6	3,98	205,16	103	35,51
	16000	62,04	144,78	6,21	118,75	4,32	229,42	107,4	38,28
	17000	68,7	150,84	6,71	123,83	4,68	254,87	11,78	41,13
	18000	75,6	156,51	7,2	128,54	5,02	281,51	116,15	44,07

Coil Capacity Chart
EPO 175/225

Heating Coil / Cooling Coil

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
EPO 175	13000	40,53	147,09	4,5	123,73	3,3	118,63	96,33	26,02
	14000	45,86	153,8	4,9	129,34	3,58	134,78	101,03	28,33
	15000	51,45	160,26	5,29	134,73	3,87	151,76	105,58	30,65
	16000	57,29	166,49	5,68	139,93	4,15	169,58	110,01	32,99
	17000	63,39	172,53	6,08	144,97	4,44	188,24	114,35	35,36
	18000	69,73	178,39	6,47	149,87	4,72	207,75	118,63	37,76
	19000	76,32	184,11	6,87	154,64	5,01	228,06	122,86	40,21
	20000	83,14	189,7	7,26	159,31	5,29	249,2	127,06	42,72
	21000	90,2	195,18	7,66	163,88	5,58	271,21	131,27	45,29
	22000	97,48	200,57	8,07	168,38	5,87	294,05	135,49	47,93
	23000	105	205,89	8,48	172,81	6,17	317,75	139,74	50,67
	24000	112,74	211,14	8,89	177,2	6,46	342,32	144,03	53,51

		Fresh Air Side Pressure Drop (Pa)	90°C/70°C Water		80°C/60°C Water		Fresh Air Side Pressure Drop (Pa)	7°C/12°C Water	
			Capacity (kW)	Fluid Side Pressure Drop(kPa)	Capacity (kW)	Fluid Side Pressure Drop(kPa)		Capacity (kW)	Fluid Side Pressure Drop(kPa)
EPO 225	17000	44,94	192,6	7,84	162,74	5,79	129,1	121,56	22,62
	18000	49,42	199,22	8,36	168,38	6,17	142,42	126,08	24,16
	19000	54,07	205,75	8,88	173,86	6,56	156,29	130,49	25,7
	20000	58,88	212,1	9,4	179,2	6,94	170,68	134,82	27,26
	21000	63,86	218,3	9,92	184,39	7,32	185,62	139,08	28,84
	22000	69	224,35	10,44	189,47	7,7	201,08	143,29	30,43
	23000	74,3	230,09	10,97	194,45	8,08	217,08	147,45	32,05
	24000	79,76	236,09	11,49	199,33	8,47	233,62	151,59	33,69
	25000	85,37	241,8	12,02	204,12	8,85	250,68	155,72	35,37
	26000	91,14	247,43	12,55	208,84	9,24	268,27	159,85	37,09
	27000	97,05	252,99	13,09	213,5	9,63	286,27	163,99	38,85
	28000	103,12	258,48	13,63	218,11	10,02	305,14	168,15	40,65
	29000	109,33	263,91	14,17	222,67	10,42	324,41	172,35	42,51
	30000	115,69	269,31	14,72	227,19	10,82	344,24	176,58	44,42

EROVENT and EPOVENT DX

In order to ensure indoor air quality in buildings, stale indoor air must be exhausted and conditioned fresh air must be supplied. With the modern approach in energy consumption for HVAC applications, fresh air must be conditioned by consuming minimum electrical and thermal energy.
DX Heat Pump systems are available for EROVENT/EPOVENT units with very low energy consumption and higher COP than traditional systems to condition fresh air to design temperature.
ERO/EPO DX systems have the heat pump cycle integrated inside the unit so no additional outdoor units are needed. Because of the high temperature and humidity efficiency of the rotor, compressor powers are minimized. As a result of the humidity transfer of the rotor, the power consumption due to latent heat of the fresh air is also minimized.
Especially for VRF/VRV systems and roof-top systems ERO/EPO DX units help to remove the need for cooling water demand to condition fresh air to design temperature.

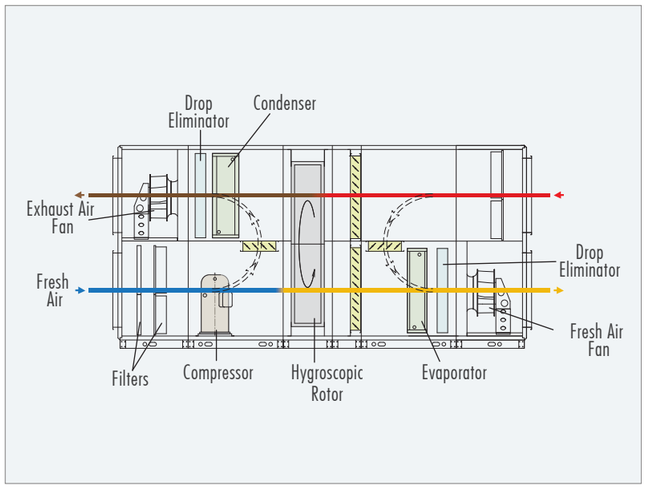
	EROVENT DX					EPOVENT DX				
	055 DX	090 DX	125 DX	175 DX	225 DX	055 DX	090 DX	125 DX	175 DX	225 DX
Nominal Air Flow (m^3/h)	5500	9000	12500	17500	22500	5500	9000	12500	17500	22500
Total Cooling Capacity (kW)*	62,2	98,8	129,4	169,3	243,2	50,2	82,2	104,9	136,3	204,3
Total Heating Capacity (kW)*	84,9	135,8	180,2	236,9	335,4	72,7	120,4	155,8	204,1	298,9
Cooling COP (HR included)*	5,92	6,06	6,41	7,02	6,02	4,78	5,04	5,19	5,66	5,06
Heating COP (HR included)*	8,09	8,33	8,92	9,83	8,30	6,92	7,39	7,71	8,47	7,40
Compressor Power (kW)	10,5	16,3	20,2	24,1	40,4	10,5	16,3	20,2	24,1	40,4
Electric Heater (Freeze protection) (kW)	15	24	33	45	54	15	24	33	45	54
Unit Dimensions (L x W x H) (mm)	4850 1650 1750	4850 1650 1750	4850 1950 2100	4950 2160 2460	5100 2530 2460	5550 1650 1750	5830 1650 1750	6215 1960 2100	6215 2160 2460	6600 2530 2460

*Heat Recovery is included

Design Conditions

Winter - Supply Air : -7°C, 70% RH Exhaust Air : 20°C, 30% RH
Summer - Supply Air : 37°C, 35% RH Exhaust Air : 25°C, 50% RH

Fresh air is filtered according to the design demands and introduced to the heat recovery exchanger to transfer heat and humidity (only in EROVENT) from/to the exhaust air stream. In the DX coil, fresh air is conditioned to design temperature and blown indoors. Return air from the building is filtered and then introduced to the heat recovery exchanger to transfer heat and humidity (only in EROVENT) from/to the fresh air stream. In summer, return air is still cooler and in winter is still warmer than outdoor air.
Instead of fulfilling the heat pump cycle with outdoor air, return air is introduced to the DX coil, as the temperature of return air is more attractive than outdoor air, heat pump cycle operates with lower condensation temperature resulting in significant power demand reduction of the compressor. That's also one major reason for the system to have higher COP's and lower power consumption.



CROSSFLOW BVBA

Begoniastraat 17/2
B-9810 EKE

www.crossflow.be
info@crossflow.be

www.kosgeb.gov.tr

D22011ERO