

# Make-Up Air with Packaged Cooling & Heating Model MPX

• Commercial • Industrial • Institutional

- **100% Outdoor Air**
- **1,000 - 9,000 cfm**
- **3.0 in. wg external static pressure**



# Model MPX

## Product Overview

### 100% Outdoor Air System with Packaged DX Cooling

The thermal comfort of employees in kitchens, industrial and commercial facilities, and light-duty laboratories is becoming a growing concern among building owners and specifying engineers. Uncomfortable work environments can lead to lost productivity or increased employee turnover. The model MPX is a solution to uncomfortable work environments with its integral packaged air-cooled refrigeration system. The MPX provides comfort cooling and dehumidification control with the quality you would expect from a world-class manufacturer.

## MPX Features

- Up to 9,000 cfm and 3 in. wg external static pressure
- Standard 2-inch double-wall construction
- Integral packaged air-cooled refrigeration system
  - ◆ R410a refrigerant
  - ◆ Modulating hot gas reheat
  - ◆ Hot gas bypass
  - ◆ Nominal 5 tons up to 30 tons
  - ◆ 2 stages of cooling under 20 tons
  - ◆ 4 stages of cooling over 20 tons
- QEM centrifugal airfoil wheel supply fan
- Full DDC control capability
- G90 galvanized with paint options
- Blower vibration isolation
- Integral control center
- Outdoor air filters

## MPX Benefits

### • Indoor Air Quality (IAQ)

Introducing fresh outdoor air to a building is a key component to sustaining excellent IAQ. The model MPX can be provided with up to MERV 15 (90-95%) rated filters for superior air quality.

### • Thermal Comfort

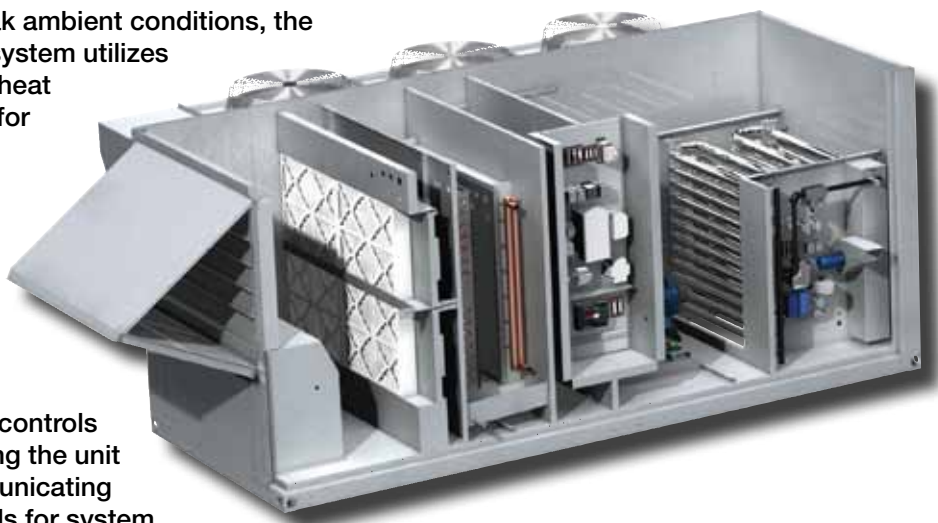
In addition to comfort cooling peak ambient conditions, the integral packaged DX air-cooled system utilizes an optional modulating hot gas reheat to control the supply air humidity for improved indoor comfort.

### • Reduced Installation Costs

The MPX packages the entire refrigeration system at the factory for lower installed costs.

### • Controllability

Factory supplied microprocessor controls offer you the capability of operating the unit as a stand alone system or communicating with BACnet and LonTalk protocols for system operation and monitoring.



*Greenheck takes pride in offering a high quality, reliable product. We invest a great percentage of our resources into designing, testing and manufacturing products to ensure customer satisfaction.*

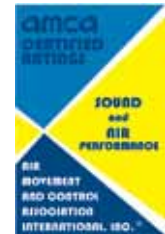
## Extensive Testing and Industry Certification

- ETL Listed for electrical and overall unit safety
- AMCA licensed QEM belt drive fans
- AHRI Certified coils



## Quality and Consistency in Manufacturing

Greenheck utilizes an efficient, automated manufacturing process that maintains Greenheck's consistent high standard of quality.



Greenheck Fan Corporation certifies that the Model QEM belt drive plenum fans shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



*Every unit is tested at the factory before it is shipped to the jobsite.*



*To guarantee your coil is going to perform as required, check for AHRI Certification.*



## Leading Edge Service and Support



Our products are supported by the industry's best product literature, electronic media, and Greenheck's Computer Aided Product Selection (CAPS) program. You'll also find this information on our Web site at [www.greenheck.com](http://www.greenheck.com)

Our national and international representative organization provides personal service and expertise. To locate your nearest Greenheck representative, call 715-359-6171 or visit our Web site at [www.greenheck.com](http://www.greenheck.com)

# MPX Standard and Optional Features

The MPX comes with a multitude of options and accessories to meet your application requirements.

## 1 Plenum Supply Fan

- QEM backward inclined airfoil centrifugal wheel
- Neoprene isolation
- 1-inch spring isolation
- 12-bladed design for quiet operation



## 2 Double-Wall Construction

- 2-inch insulation secured in place between solid inner and outer panels
- Insulation density of 1.5 lbs/cu. ft.

## 3 Filters

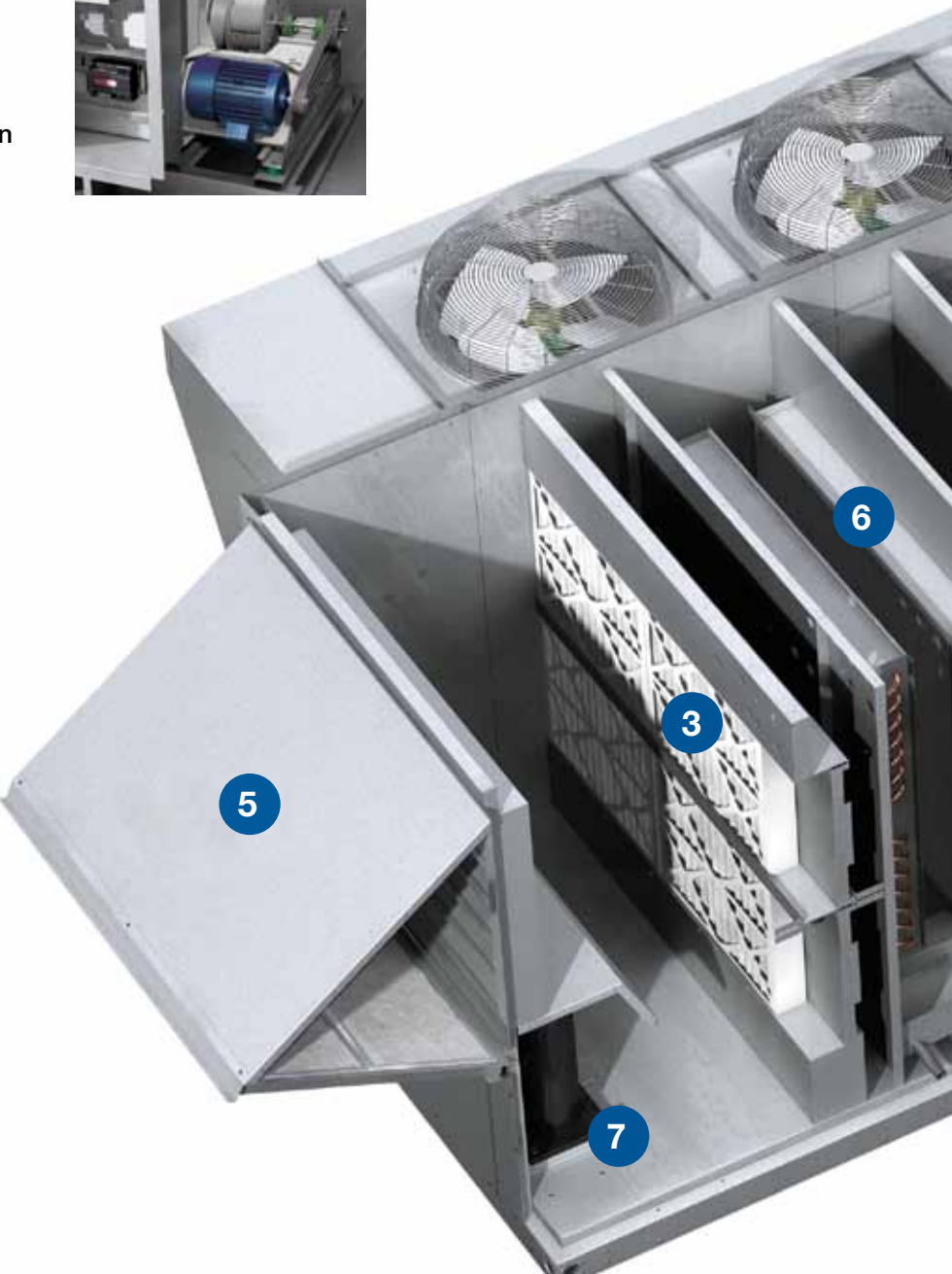
- 2-inch aluminum mesh filters
- MERV 8 pre-filters
- 2-inch MERV 13, 4-inch MERV 13, and 4-inch MERV 15 post-filters

## Hinged Access Doors

- Provides access for maintenance
- Easy lift-off removable doors (Not shown)

## 4 Control Center

- 24 VAC control voltage
- Magnetic supply motor starter with solid state overload protection
- Up to (2) exhaust fan starters
- Control transformer
- Disconnect switch
- UL Listed, Recognized, or Classified electrical components
- Factory prewired for single point power connection



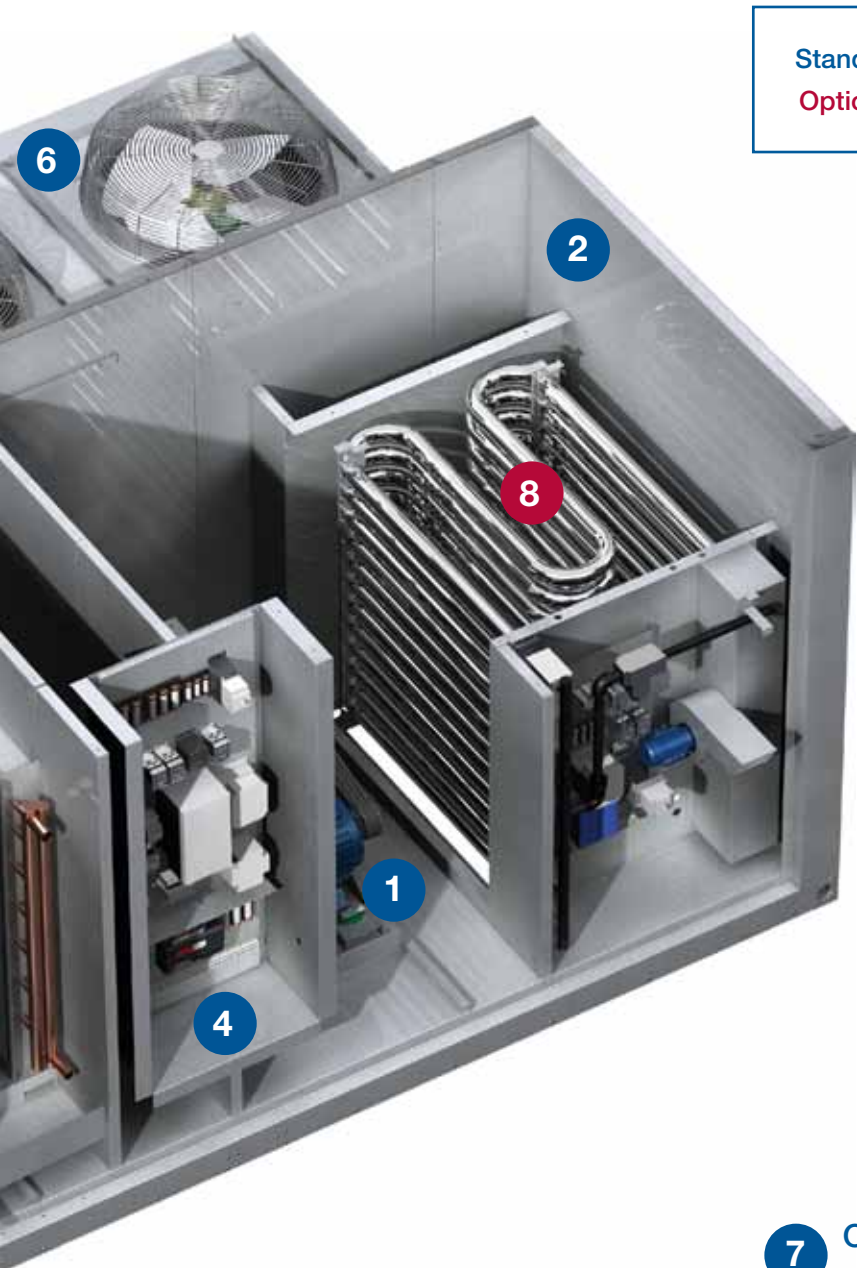
## 5 Weatherhood

- 1/2-inch birdscreen intake weatherhood
- 2-inch aluminum mesh filters (mist eliminating)



Intake Weatherhood





Standard Feature  
Optional Feature

## Accessories

- Roof curbs
- DDC controls with BACnet or LonTalk control interface
- Remote panel
- Painted exteriors
- Dirty filter sensors
- Room temperature sensor
- Room humidity sensor

## 8 Heating Options

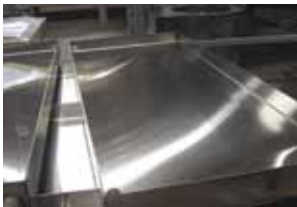
- Indirect gas-fired furnace
  - Optional stainless steel heat exchanger – 5 or 10 years extended warranty available
- Electric heater
  - SCR control
  - Single-point power connection
  - ETL Certification



IG Heater

## 6 Packaged DX Cooling

- Packaged direct expansion [PDX]
- R410a refrigerant
- All coils with copper tubes with permanently expanded aluminum fins
- Mounted on an insulated stainless steel drain pan



Drain Pan



PDX & Hot Gas Reheat Coils

## 7 Compressors

- Quiet operating hermetic, scroll-type
- 5 to 30 tons of mechanical cooling
- 2 circuits up to 20 tons
- 4 circuits over 20 tons



Compressors

## Reheat

- Modulating hot gas reheat
- 6-inch separation between evaporator and reheat coil components

# State-of-the-Art Controls

All MPX units will come standard with a programmable controller and a space mounted display. These controls are responsible for managing the sequence of operations, heating and cooling outputs, compressor timing operations and hot gas reheat control.

## Standard control features include:

- Freeze protection
- Auto-changeover based on outdoor air conditions
- High temperature interlock
- Inlet damper with end switch
- Heating and cooling temperature lockouts
- Airflow proving pressure switch
- Modulating hot gas reheat (hot gas reheat must be selected)



## Optional controls:

- Dirty filter switch
- Auxiliary contacts on supply fan and exhaust fan contactor
- BACnet MS/TP or LonTalk BMS interfacing

## Unit control sequences options:

- Discharge temperature control with auto changeover
- Space temperature control
- Space temperature and humidity control



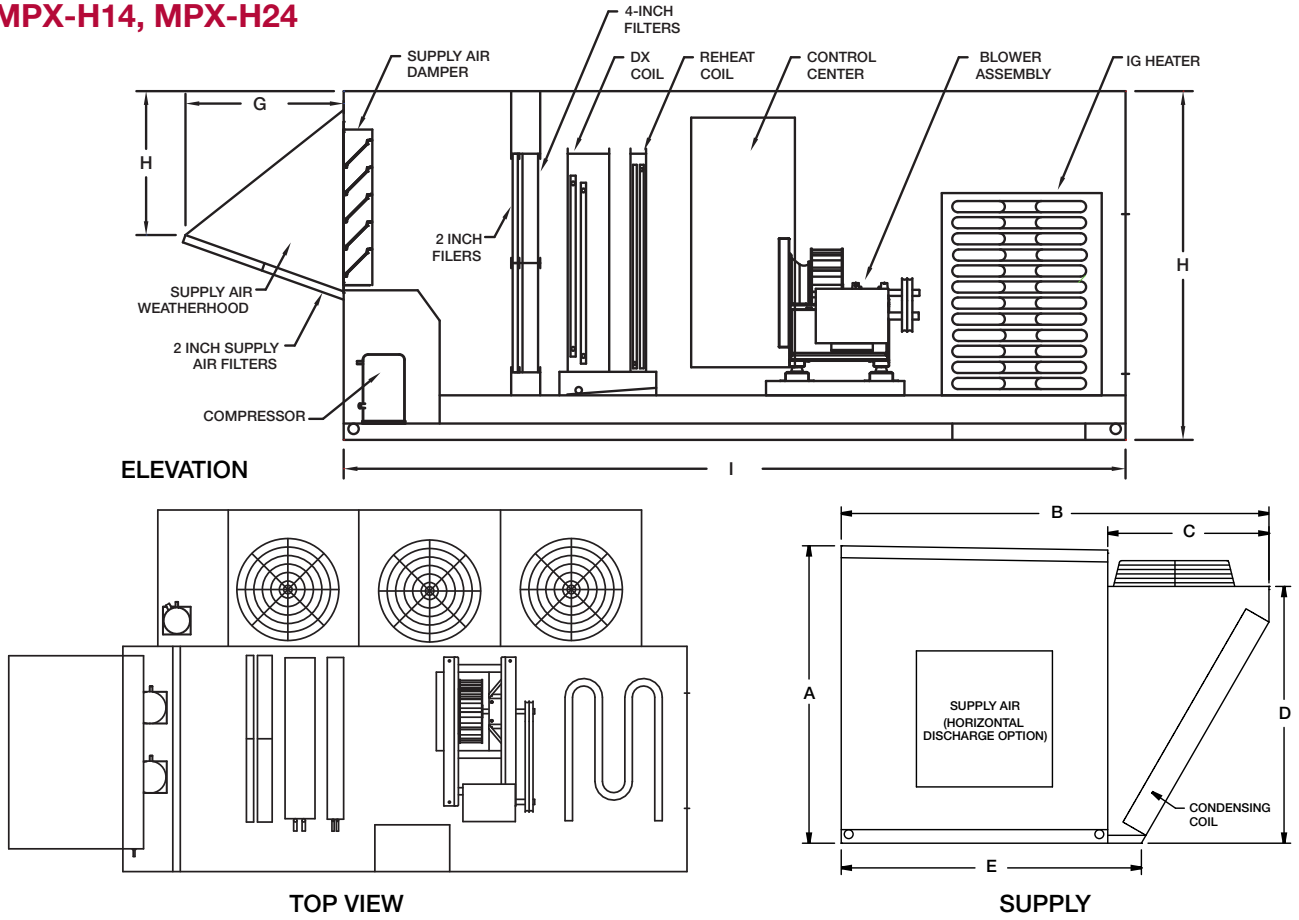
## MPX Weights and Dimensions

Unit Size	Dimensions															
	MPX-H14				MPX-H24				MPX-H34				MPX-H34			
Furnaces	Single Furnace								Double Furnace							
A	54.3				67.2				72.2				76.2			
B	86.6				96.7				97.7				97.7			
C	34.0				36.4				33.2				33.2			
D	48.1				58.1				72.7				72.7			
E	62.6				67.9				70.8				70.8			
F	21.6				27.7				38.8				38.8			
G	23.5				30.5				37.0				37.0			
H	54.3				67.2				76.2				76.2			
I	132.4				150.8				148.0				182.7			
Nominal tonnage (tons)	5	6	8	10	11	13	16	18	20	23	26	30	20	23	26	30
Nominal weight (lbs)*	3096	3133	3253	3295	3300	3500	3700	3800	4557	4731	4981	5053	5294	5468	5853	5926

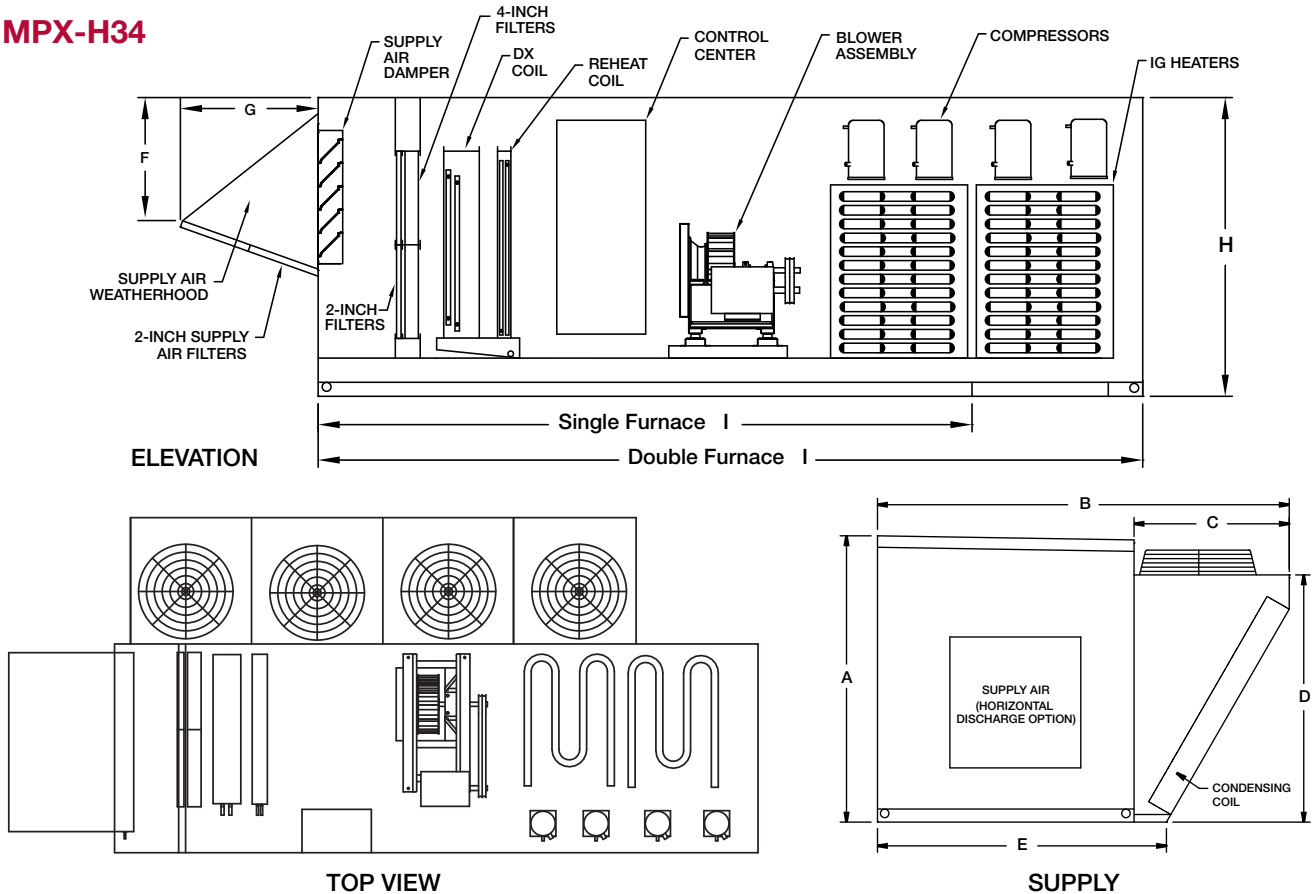
*Dimensions are shown in inches.*

*\*Average unit weights are represented in this table. Actual weights will vary based on the unit configuration.*

## MPX-H14, MPX-H24



## MPX-H34



# Plenum Supply Fan Performance Data

## MPX 14: QEM-12 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	FRPM	BHP	FRPM	BHP	FRPM	BHP	FRPM	BHP	FRPM	BHP	FRPM	BHP	FRPM	BHP	FRPM	BHP
1200	1408	0.29	1755	0.58												
1300	1462	0.32	1799	0.63												
1400	1518	0.34	1846	0.67	2120	1.03										
1500	1575	0.38	1894	0.72	2163	1.09										
1600	1639	0.41	1942	0.77	2207	1.16	2441	1.57								
1700	1704	0.45	1992	0.82	2254	1.23	2483	1.66	2691	2.10						
1800	1770	0.49	2047	0.87	2302	1.30	2527	1.75	2733	2.21						
1900	1837	0.54	2102	0.93	2350	1.37	2573	1.83	2776	2.32	2964	2.81				
2000	1904	0.58	2158	0.99	2399	1.44	2620	1.92	2820	2.43	3006	2.94				
2100	1971	0.64	2214	1.05	2450	1.52	2668	2.01	2865	2.54	3049	3.07	3222	3.61		
2200	2040	0.69	2278	1.12	2504	1.60	2716	2.11	2912	2.65	3093	3.20	3264	3.76	3425	4.34
2300	2109	0.75	2342	1.19	2559	1.68	2765	2.21	2960	2.76	3139	3.33	3307	3.92	3467	4.51
2400	2178	0.81	2407	1.27	2615	1.77	2815	2.32	3008	2.88	3186	3.46	3351	4.08	3510	4.68
2500	2248	0.88	2473	1.35	2671	1.86	2870	2.42	3056	3.00	3233	3.60	3398	4.22		
2600	2319	0.95	2539	1.44	2729	1.95	2924	2.53	3105	3.13	3281	3.74	3445	4.38		
2700	2391	1.03	2606	1.53	2793	2.06	2980	2.64	3157	3.26	3329	3.89	3492	4.54		
2800	2464	1.11	2673	1.63	2858	2.17	3035	2.75	3211	3.39	3378	4.04				
2900	2537	1.19	2741	1.73	2923	2.28	3092	2.87	3266	3.52	3427	4.19				
3000	2610	1.28	2809	1.83	2988	2.40	3150	3.00	3321	3.66	3481	4.35				
3100	2684	1.38	2877	1.94	3054	2.53	3214	3.14	3376	3.80						
3200	2758	1.48	2946	2.06	3121	2.66	3278	3.29	3433	3.95						

## MPX 14, MPX 24: QEM-15 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	1910	0.90	2154	1.46	2371	2.05	2570	2.67	2750	3.33						
3200	2002	1.01	2238	1.61	2448	2.22	2641	2.87	2819	3.55						
3400	2096	1.13	2324	1.76	2528	2.41	2713	3.09	2889	3.79	3051	4.52				
3600	2191	1.27	2411	1.92	2608	2.61	2790	3.31	2961	4.04						
3800	2287	1.41	2500	2.10	2691	2.82	2869	3.55	3033	4.31						
4000	2385	1.56	2590	2.29	2776	3.04	2949	3.81								
4200	2483	1.73	2681	2.49	2862	3.27	3029	4.08								
4400	2582	1.91	2773	2.71	2949	3.52										
4600	2682	2.11	2867	2.94	3038	3.78										
4800	2782	2.32	2960	3.19												
5000	2883	2.55	3055	3.45												
5200	2984	2.79														

## MPX 24, MPX 34: QEM-16 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3600	1726	1.07	1949	1.75	2146	2.46	2328	3.20								
4000	1865	1.30	2076	2.04	2264	2.81	2435	3.61	2596	4.45	2744	5.32				
4400	2007	1.56	2207	2.36	2384	3.21	2549	4.06	2703	4.95						
4800	2153	1.86	2341	2.73	2511	3.63	2669	4.56								
5200	2301	2.20	2478	3.14	2641	4.10										
5600	2451	2.59	2618	3.60	2773	4.62										
6000	2602	3.02	2759	4.11												
6400	2754	3.51														

Performance certified is for installation type A: Free inlet, Free outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). Complete performance information for the QEM fan can be found in Greenheck's catalog: QEM and QEP, Rev. 2, September 2008 SP. You may request a catalog or view electronically at [www.greenheck.com](http://www.greenheck.com).



# Plenum Supply Fan Performance Data

## MPX 24, MPX 34: QEM-18 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	1563	1.51	1739	2.32	1906	3.18	2063	4.07								
5000	1699	1.88	1860	2.74	2014	3.68	2162	4.65	2301	5.65						
5500	1836	2.32	1984	3.23	2127	4.24	2266	5.30	2399	6.37	2525	7.46				
6000	1976	2.84	2113	3.80	2248	4.86	2376	5.99	2501	7.16	2623	8.32				
6500	2117	3.43	2247	4.46	2371	5.57	2492	6.77	2611	8.00						
7000	2260	4.12	2383	5.21	2497	6.35	2613	7.62								
7500	2403	4.90	2520	6.05	2629	7.26										
8000	2548	5.78	2658	7.00												

## MPX 34: QEM-20 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	1428	1.86	1602	2.96	1759	4.11	1908	5.37								
6500	1517	2.16	1682	3.34	1832	4.57	1970	5.85	2108	7.27						
7000	1609	2.51	1763	3.77	1907	5.06	2041	6.41	2168	7.84	2295	9.40				
7500	1703	2.90	1847	4.23	1986	5.60	2114	7.02	2236	8.50						
8000	1797	3.34	1934	4.73	2066	6.19	2190	7.69	2308	9.22						
8500	1892	3.83	2022	5.27	2147	6.83	2268	8.39								
9000	1988	4.37	2111	5.87	2230	7.51										

## MPX 34: QEM-22 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7000	1229	2.07	1392	3.36	1537	4.73	1678	6.27								
7800	1332	2.52	1483	3.94	1620	5.42	1747	6.99	1874	8.73						
8600	1438	3.06	1577	4.61	1707	6.20	1828	7.86	1943	9.63	2058	11.6				
9000	1493	3.38	1626	4.98	1753	6.64	1871	8.35	1983	10.17	2093	12.1	2232	14.7		

## MPX 34: QEM-24 Plenum Fan

CFM	STATIC PRESSURE (in. wg)															
	1		2		3		4		5		6		7		8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8000	1087	2.08	1245	3.59	1389	5.22	1520	6.88	1644	8.62						
9000	1180	2.54	1329	4.18	1463	5.98	1587	7.81	1703	9.68	1815	11.6				

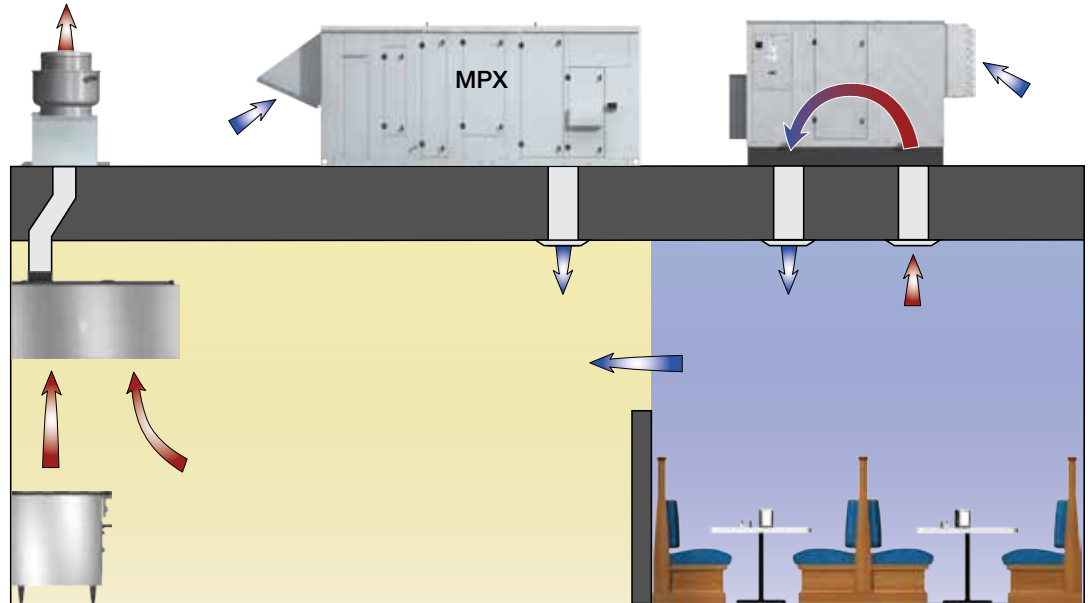
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# MPX Applications

The MPX unit is designed to supply 100% tempered outdoor air to comfortably condition the work space for employees working in kitchens, industrial and commercial facilities, and light-duty laboratory applications. The MPX provides the following benefits for these types of applications.

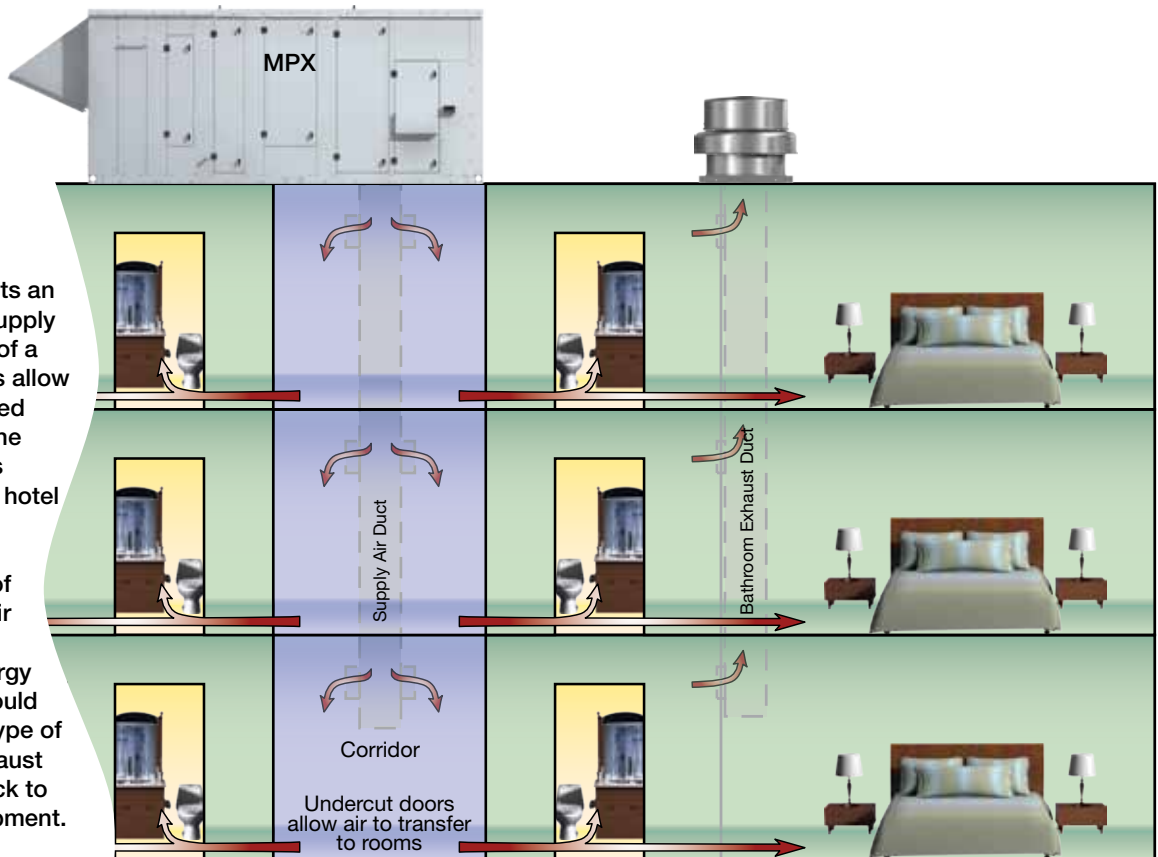
- Temperature control
- Humidity control
- State-of-the-art controls
- Energy efficiency
- Easy maintenance

This illustration depicts an ideal kitchen application where the MPX is supplying tempered air to the kitchen, replacing a portion of the air being exhausted through the kitchen hood.



## Corridor Supply Air

This illustration depicts an MPX being used to supply air to a corridor area of a hotel. Undercut doors allow the air to be transferred from the corridor to the hotel rooms and air is exhausted from each hotel room through the bathroom exhaust system. This is one of many ways outside air can be supplied to a corridor area. An energy recovery ventilator could also be used in this type of application if the exhaust air can be ducted back to the air handling equipment.



**General:** Make-up air unit shall be as manufactured by Greenheck or approved provided all specifications are met. Greenheck model MPX is used as the basis of design. Performance shall be as scheduled on plans.

**Unit Casing and Frames:** Unit shall be of internal frame type construction of G90 galvanized steel. Where top panels are joined there shall be a standing seam to ensure positive weather protection. All metal-to-metal surfaces exposed to the weather shall be sealed requiring no caulking at the jobsite. All components shall be easily accessible through hinged access doors with tooled, cam-lock style latches. 2-inch double-wall with fiberglass insulation.

**Blowers:** Centrifugal fans shall be AMCA certified airfoil type design with 12 blades for quiet operation. Fan and motor shall be mounted on a common base and shall be internally isolated. All blower wheels shall be statically and dynamically balanced. Ground and polished steel fan shafts shall be mounted in ball bearing pillow blocks.

**Motors and Drives:** Motors shall be energy efficient, complying with EPACT standards, for single speed ODP and TE enclosures. Motors shall be permanently lubricated, heavy-duty type, matched to the fan load and furnished at the specified voltage, phase, and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be cast and have machined surfaces. Motors of 15 horsepower and less shall have an adjustable drive pulley.

**Electrical:** All internal electrical components shall be prewired for single point power connection. All electrical components shall be UL Listed, Recognized, or Classified where applicable and wired in compliance with the National Electric Code. Control center shall include motor starter, control circuit fusing, control transformer for 24 VAC circuit, integral disconnect switch with separate motor fusing and terminal strip. Contactors, Class 20 adjustable overload protection and single phase protection shall be standard.

**Packaged DX Cooling System:** Standard features include: liquid-line filter drier, high pressure manual reset cutout, low pressure auto-reset cutout, built-in time delay relay for compressor protection, service/charging valves, and moisture indicating sight glass. Optional features include hot gas bypass and hot gas reheat.

**Compressors:** Quiet-running hermetic, scroll-type. Compressors shall be located in an isolated compartment to be serviceable without affecting airflow and mounted on neoprene isolators to minimize vibration and noise.

**Condenser, Evaporator, and Reheat Coils:** Coils shall be factory tested and rated in accordance with AHRI 410. Copper tube with permanently expanded aluminum fins. Evaporator coils and reheat coils to be mounted on a stainless steel drain pan that extends 12-inches downstream of coil and be sloped toward a condensate connection. Evaporator and reheat coils shall be separated by six (6) inches.

**Condenser Fans:** Direct-drive, statically and dynamically balanced condenser fans. Multiple fans shall be provided for improved efficiency.

**Heating:** Indirect gas-fired furnace shall be 80% efficient, ETL Listed and have a blow-through fan design. Furnace shall be capable of operation with natural or LP gas and have a power venting system. Double furnace units shall be mounted in series with each other. Heat exchanger shall be constructed of aluminized steel or stainless steel. Standard furnace features shall include main gas pressure regulator, main gas valve, electronic staged or electronic modulating controls, direct spark ignition system, high limit and a low voltage control transformer. Furnace shall be insulated and have double-wall construction. Electric heaters shall single-point power connection with SCR control below 80 amps and Vernier SCR control above 80 amps.

**Filters:** Filters shall be arranged in a straight-bank orientation. Face velocities shall not exceed 550 ft/min. Filters shall be easily accessible through access doors.

**Weatherhood:** Weatherhood shall be constructed of G90 galvanized steel and include ½-inch birdscreen or 2-inch aluminum mesh filters.

**Damper:** Low-leakage inlet damper with 24 VAC actuator. Damper shall have vinyl blade seals and stainless steel jamb seals.

# Make-Up Air Quick Selection Guide

	Model	Performance			Heating Options						Airflow Options		Cooling Options			Mounting Options	
		Minimum Volume (cfm)	Maximum Volume (cfm)	Maximum Static Pressure (in. wg)	Direct Gas	Indirect Gas	Steam	Hot Water	Electric	None	VAV / 2-speed	Recirculation	Evaporative	Direct Expansion (DX)	Chilled Water	Indoor	Outdoor
<b>MAKE-UP AIR</b>																	
<b>DIRECT GAS-FIRED</b>	DGK	1,000	8,500	2	✓											✓	
	DG	800	15,000	2	✓							✓			✓	✓	✓
	DGX	800	48,000	3	✓						✓	✓	✓	✓	✓	✓	✓
	TSU	30,000	64,000	3	✓						✓	✓	✓			✓	✓
	VSU	800	64,000	3	✓						✓	✓			✓	✓	✓
<b>INDIRECT GAS-FIRED</b>	IGK	1,500	5,000	2		✓										✓	
	IG	800	7,000	2		✓					✓	✓			✓	✓	✓
	IGX	800	15,000	3		✓				✓	✓	✓	✓	✓	✓	✓	✓
	IGX-HV	800	15,000	3		✓					✓	✓	✓		✓	✓	✓
<b>COIL HEATING NO HEAT</b>	MSX	800	40,000	3			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	KSFD	400	2,100	2.5						✓						✓	✓
	KSFB	1,000	10,500	2.5						✓	✓					✓	✓
	TSF	30,000	64,000	3						✓	✓		✓		✓	✓	
	MPX	1,000	9,000	3		✓			✓	✓	✓		✓			✓	✓



DGK



DG



DGX



TSU



VSU



IGK



IG



IGX



IGX-HV



MSX



KSF



MPX

## Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the shipment date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

*As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.*



Prepared to Support  
Green Building Efforts

