

Specification Guide

MX Series

Indoor Modular Blowers

Electric Heat, Hot Water Heat, or No Heat



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Product Nomenclature

Series	MX	E	08	00	N	2	E	2	Revision
MX Series									
Blower Motor									
C = 3-speed PSC motor ^[1]									
E = 5-speed ECM motor ^[2]									
Size / Airflow									
08 = 800 CFM									
12 = 1200 CFM									
16 = 1600 CFM									
20 = 2000 CFM									
Hot Water Coil									
00 = No hot water coil									
WP = Hot water coil with pump									
WN = Hot water coil without pump									
AP = Hot water coil with 130°F aquastat & pump									
AN = Hot water coil with 130°F aquastat & without pump									
	Heat Size								
	B = 3 row hot water coil ^[1] (available on 08 and 20 models)								
	C = 4 row hot water coil ^[1] (available on 08, 12, and 16 models)								
	E = No heat (electric heat kits sold separately) ^[2]								
	Voltage								
	2 = 208/240 V, 60 Hz, 1 ph., with time delay ^[2]								
	4 = 120 V, 60 Hz, 1 ph., with time delay ^[1]								
	Line Voltage Connection								
	N = Stripped wires								

[1] Hot water heat models only available with 120V 3-speed PSC motor
[2] Electric heat & No heat models only available with 208/240V 5-speed ECM motor

Approved in state of Massachusetts

⚠ **WARNING** ⚠

To install the MX Series air handler in the horizontal position a (2") clearance must be maintained between the apex of the evaporator coil and the top of the coil's cabinet. Therefore, the ADP multi-position evaporator coils below cannot be used in horizontal applications with the MX Series air handler.

Slab numbers A07, A15, E27, E37, E48, E50, E55, E57, E87, and E88.
Slab numbers E25 and E35 in 21.5" cabinet, and slab number E54 in 29.5" cabinet.



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Standard Features All Models

- Easy Installation: "One-Man-Job"
- Cabinet lined with high quality 5/8" foil faced insulation.
- Available from factory as upflow, downflow, and horizontal.
- Only four screws to remove blower panel, making it easier to service.
- Embossed cabinet in heavy gauge galvanized steel to prevent corrosion.
- Factory installed fan time delay postpones blower shutoff 30 seconds in heating mode and 45 seconds in cooling mode.
- Electrical connections can be made on top or right side for 8,12,& 16 size models and top or left side for 20 size models.
- Dynamically balanced 3-speed PSC or 5-speed ECM motor with easy to adjust settings for fine tuning customer comfort.
- Approved for installation in manufactured housing and mobile homes.

Standard Features with Electric Heat

- Slide-out panel with one-point electrical connections.
- Electric heat kits with plug in connections available for field installation.

Standard Features with Hot Water Heat

- Suitable for potable water systems.
- Enhanced grommets - secure & tight.
- Easy to replace hot water coil. Remove one screw and slide out.
- Optional factory installed circulating pump fully encased in cabinet.
- Purge valve on hot water coil allows for manual release of any air trapped in coil during installation or servicing.
- Water connections 7/8" ODF (for 3/4" water pipe) on 08 & 12 models and 1 1/8" ODF (for 1" water pipe) on 16 & 20 models.
- Multi-function control board comes standard factory installed and includes the following features:

Features are compatible with both factory and field installed circulating pumps.

1. Pump timer- Activates pump for 1 minute every 6 hours eliminating stagnant water in hot water coil.
2. 24 VAC isolation valve control-allows for zoning control.
3. Auxiliary contacts for water heater or boiler activation.
4. Freeze protection- standard factory installed, activates at 40 deg. F and deactivates at 70 deg. F.
5. Thermostat connections
6. Time delay for blower activation:
 - 60 seconds (tap in OFF position)
 - 130 deg. F Aquastat (tap in ON position)
 - Note: Aquastat tap only included if ordered

Physical Data	3-speed PSC motor	Unit Size			
		08	12	16	20
Nominal CFM		800	1,200	1,600	2,000
Available Voltage		120 V, 60 Hz, 1 ph.			
Maximum Elec. Heat Kit Allowed for Field Installation (kW)		10	15	20	20
Transformer Size & Type		40 VA, Class 2			
Blower Wheel (dia." x width")		9 X 6	10 X 8	10 X 8	10 X 10
Hot Water Heat Blower/Pump Data	Blower Motor H. P.	1/3	1/2	3/4	3/4
	Blower F. L. A. @ 120 V	5.3	7.1	7.5	10.5
	Pump Conn. Size	7/8"			
	Pump Voltage	120 V			
	Pump Amps	.52			
Approximate Weight (lbs)		66	66	71	83

* Hot water heat only available in 120 V, 60 Hz.

	5-speed ECM motor	Unit Size			
		08	12	16	20
Nominal CFM		800	1,200	1,600	2,000
Available Voltage		208/240 V, 60 Hz, 1 ph.			
Maximum Elec. Heat Kit Allowed for Field Installation (kW)		10	15	20	20
Transformer Size & Type		40 VA, Class 2			
Blower Wheel (dia." x width")		9 X 6	10 X 8	10 X 8	10 X 10
Electric Heat Blower Data	Motor H. P.	1/3	1/2	3/4	1
	F. L. A. @ 240 V	2.8	4.1	6.0	7.6
Approximate Weight (lbs)		69	69	74	86

* Hot water heat only available in 120 V, 60 Hz.

Blower Performance

3-speed PSC motor in 120V (Hot Water Heat)

Unit Size	Speed	Airflow (CFM) vs. External Static Pressure (in W.C)				
		0.1	0.2	0.3	0.4	0.5
08	Low	749	705	658	614	558
	*Med	865	815	760	708	646
	High	904	836	801	740	681
12	Low	1198	1144	1086	1018	962
	*Med	1257	1198	1130	1072	1010
	High	1273	1215	1158	1094	1018
16	Low	1576	1514	1433	1338	1264
	Med	1643	1576	1490	1407	1320
	*High	1707	1606	1545	1441	1364
20	Low	1759	1691	1652	1580	1512
	Med	1838	1788	1729	1644	1555
	*High	1928	1867	1810	1729	1637

Speeds marked in **bold with an asterisk*** are the factory speed settings for both heating and cooling.

All data is given while air handler is operating with a dry DX coil and air filter installed.

These are nominal values and blower performance can vary higher or lower from these values based on the evaporator coil that is used.

Hot water heat airflow performance data includes associated air pressure drop across a 4 row hot water coil for Unit Size 08, 12, & 16;

air pressure drop across a 3 row hot water coil for Unit Size 20.

5-speed ECM motor in 240 V (Electric Heat & No Heat)

Unit Size	Tap	Airflow (CFM) vs. External Static Pressure (inches W.C.)				
		0.1	0.2	0.3	0.4	0.5
08	1	502	266	155	156	156
	2	667	668	636	597	562
	*3	1008	980	925	933	915
	+4	856	839	819	794	783
	5	790	758	740	734	696
12	1	839	658	320	258	220
	2	915	762	664	617	567
	*3	1315	1264	1227	1187	1151
	+4	1105	1060	1009	973	926
	5	1048	990	951	910	852
16	1	957	773	656	599	531
	2	1020	957	916	870	828
	*3	1617	1580	1544	1512	1480
	+4	1431	1391	1356	1325	1294
	5	1385	1342	1301	1267	1233
20	1	1113	900	757	678	595
	2	1360	1304	1249	1203	1145
	*3	1924	1857	1799	1738	1692
	+4	1557	1498	1427	1381	1321
	5	1778	1689	1604	1543	1478

Speeds marked with * denote cooling airflow. Speeds marked with + denote heating airflow.

All data is given while air handler is operating with a dry DX coil and air filter installed.

These are nominal values and blower performance can vary higher or lower from these values based on the evaporator coil that is used.

Electrical Data

208/240 V, 60 Hz, 1 phase

Unit Size	Total Heat Capacity	Heating Capacity per circuit		Circuit	Blower Amps (A)		Total Current, (A)		Minimum Circuit Ampacity (A)		Maximum Circuit Breaker size ^[2] (A)	
		kW	BTUH		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
		240 V ^[1]	240 V ^[1]									
08	0	0	0	1	2.40	2.40	2.4	2.4	3.0	3.0	15	15
	5	5	17,061	1	2.40	2.40	20.5	23.2	25.6	29.0	30	30
	7.5	7.5	25,591	1	2.40	2.40	29.5	33.7	36.9	42.1	40	45
	10	10	34,121	1	2.40	2.40	38.5	44.1	48.1	55.1	50	60
12	0	0	0	1	4.10	4.10	4.1	4.1	5.1	5.1	15	15
	5	5	17,061	1	4.10	4.10	22.2	24.9	27.7	31.2	30	35
	7.5	7.5	25,591	1	4.10	4.10	31.2	35.4	39.0	44.2	40	45
	10	10	34,121	1	4.10	4.10	40.2	45.8	50.3	57.2	60	60
	15	10	34,121	1	4.10	4.10	40.2	45.8	50.3	57.2	60	60
		5	17,061	2	0.00	0.00	18.1	20.8	22.6	26.0	25	30
16	0	0	0	1	6.00	6.00	6.0	6.0	7.5	7.5	15	15
	7.5	7.5	25,591	1	6.00	6.00	33.1	37.3	41.4	46.6	45	50
	10	10	34,121	1	6.00	6.00	42.1	47.7	52.6	59.6	60	60
	15	10	34,121	1	6.00	6.00	42.1	47.7	52.6	59.6	60	60
		5	17,061	2	0.00	0.00	18.1	20.8	22.6	26.0	25	30
	20	10	34,121	1	6.00	6.00	42.1	47.7	52.6	59.6	60	60
10		34,121	2	0.00	0.00	36.1	41.7	45.1	52.1	50	60	
20	0	0	0	1	6.10	6.10	6.1	6.1	7.6	7.6	15	15
	7.5	7.5	25,591	1	6.10	6.10	33.2	37.4	41.5	46.7	45	50
	10	10	34,121	1	6.10	6.10	42.2	47.8	52.8	59.7	60	60
	15	10	34,121	1	6.10	6.10	42.2	47.8	52.8	59.7	60	60
		5	17,061	2	0.00	0.00	18.1	20.8	22.6	26.0	25	30
	20	10	34,121	1	6.10	6.10	42.2	47.8	52.8	59.7	60	60
10		34,121	2	0.00	0.00	36.1	41.7	45.1	52.1	50	60	

kW packages in **bold italics** indicate that these heat packages require and include circuit breakers; circuit breakers are optional for all other models.

[1] For 208 Volts use 0.751 correction factor for kW & BTUH.

[2] Circuit breaker supplied with the electric heat kit may need to be changed.

Electrical Data

120 V, 60 Hz, 1 Phase

Unit Size	Electric Heat Capacity (kW)	Blower Amps (A)	Total Current, (A)	Minimum Circuit Ampacity (A)	Maximum Circuit Breaker size (A)
		120 V	120 V	120 V	120 V
08	0.0	5.0	5.0	6.3	15
12	0.0	7.4	7.4	9.3	15
16	0.0	8.4	8.4	10.5	15
20	0.0	11.1	11.1	13.9	15

Water Heating Capacity (BTUH)

Unit Size 08

Water Coil Size	Entering Water Temp	2 GPM			3 GPM			4 GPM		
		H ₂ O P.D. (in FT)	CFM		H ₂ O P.D. (in FT)	CFM		H ₂ O P.D. (in FT)	CFM	
			600	800		600	800		600	800
3 ROW	120°F	0.9	17,800	20,200	1.9	19,600	22,700	3.4	20,800	24,600
	140°F	0.9	25,200	28,500	1.9	27,700	32,000	3.4	29,300	34,700
	160°F	0.9	32,600	37,000	1.8	35,800	41,400	3.3	37,900	44,900
	180°F	0.9	40,100	45,500	1.8	44,000	50,900	3.3	46,500	55,100

Water Coil Size	Entering Water Temp	2 GPM				3 GPM				4 GPM			
		H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM		
			650	750	800		650	750	800		650	750	800
4 ROW	120°F	1.6	23,200	25,900	27,600	3.3	25,300	28,400	30,200	5.5	26,700	31,600	33,700
	140°F	1.5	32,300	29,200	31,100	3.2	37,200	37,300	39,700	5.4	39,300	38,100	40,600
	160°F	1.5	39,500	43,300	46,200	3.1	43,100	48,700	51,900	5.2	45,000	51,600	55,100
	180°F	1.4	48,400	53,100	56,700	3.0	52,900	59,700	63,700	5.0	55,100	63,300	67,500

Unit Size 12

Water Coil Size	Entering Water Temp	3 GPM				4 GPM				5 GPM			
		H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM		
			1000	1100	1200		1000	1100	1200		1000	1100	1200
4 ROW	120°F	3.3	33,500	35,000	36,300	5.5	36,200	38,100	39,800	6.9	37,900	40,100	42,000
	140°F	3.2	47,200	49,400	51,300	5.4	51,000	53,700	56,100	6.8	53,500	56,500	59,200
	160°F	3.1	61,100	63,900	66,400	5.2	66,000	69,400	72,500	6.5	69,100	73,000	76,600
	180°F	3.0	75,100	78,600	81,600	5.0	81,000	82,300	89,100	6.3	84,700	89,600	94,000

Unit Size 16

Water Coil Size	Entering Water Temp	3 GPM				4 GPM				5 GPM			
		H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM		
			1400	1500	1600		1400	1500	1600		1400	1500	1600
4 ROW	120°F	1.0	38,600	39,600	40,500	1.7	42,700	44,000	45,200	2.6	45,500	47,000	48,400
	140°F	1.0	54,600	56,000	57,300	1.7	60,300	62,100	63,800	2.6	64,100	66,300	68,300
	160°F	1.0	70,700	72,500	74,200	1.7	78,000	80,400	82,600	2.5	82,900	85,800	88,400
	180°F	1.0	86,900	89,200	91,300	1.6	95,900	98,900	101,600	2.4	101,800	105,300	108,600

Unit Size 20

Water Coil Size	Entering Water Temp	3 GPM				4 GPM				5 GPM			
		H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM			H ₂ O P.D. (in FT)	CFM		
			1800	1900	2000		1800	1900	2000		1800	1900	2000
3 ROW	120°F	1.1	43,700	44,400	45,100	1.9	49,100	50,100	51,100	2.9	52,900	54,100	55,300
	140°F	1.1	61,700	62,700	63,700	1.9	69,300	70,800	72,100	2.8	74,600	76,400	78,000
	160°F	1.1	79,900	81,200	82,500	1.8	89,700	91,600	93,300	2.8	96,500	78,800	100,900
	180°F	1.1	98,200	99,900	101,400	1.8	110,300	112,600	114,700	2.7	118,600	121,400	124,000

All capacities are based on 70°F entering air temperature.

For entering air temperatures other than 70°F use the following capacity correction factors:
 (72°F x .982), (68°F x 1.02), (66°F x 1.04).

Glycol correction factors: (10% X .98), (20% X .95), (30% X .92), (40% X .88)

Sample Hydronic System Design

Includes: Heating coil selection, line sizing and selected pump other than supplied by ADP

Sample Application

3 ton Cooling Load
 180° F Water Temp
 40% Glycol Mixture
 80,000 BTUH Heat Required

(1) From the Heating Capacity Tables select the Air Handler that supplies at least 80,000 BTUH at 1,200 CFM, 180° F water temperature.

The Unit Size 12 hot water coil supplies 94,000 BTUH @ 5 GPM, 6.3' pressure drop
 Correct capacity for 40% glycol (correction factors found below capacity chart)

	94,000
X	0.88
=	<u>82,720</u>

Corrected coil heating capacity (BTUH)

(2) Determine total equivalent line length

Note: Use the following line sizes as a guide for initial selection

1 - 3 GPM, 3/4"	4 - 5 GPM, 1"	6 - 8 GPM, 1 1/4"
-----------------	---------------	-------------------

Line size	1"		Equiv. ft. of pipe (Table 3)			
Total number of fittings	Quantity			=		
90° SR elbows	20	X	2.7'	=	54'	54'
90° LR elbows	0	X	0	=	0	+ 0
45° elbows	0	X	0	=	0	+ 0
gate valves	2	X	1.9'	=	3.8'	+ 3.8'
Total supply and return line length						+ 186'
Total equivalent line length						= 244'

(3) Determine total pump head required

			Press. Drop/ft (Table 1)			
Total equivalent line length	244'	X	0.023	=	5.61	5.61'
Total pressure drop through coil (found on capacity chart)						+ 6.3'
Line length correction factor for 40% glycol @ 180°F (Table 2)						X 1.12
Total pump head required						13.34'

(4) Now select a pump that supplies 5 GPM with at least 13.34' head capability.

Note: If desired, recalculation can be done with another line size to vary pump requirement.

Nominal Pipe Size	Piping Pressure Loss, ft/1 ft. (type K copper)																	
	GPM																	
	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.25	3.5	3.75	4	4.5	5	6	7	8
1/2"	.030	.048	.065	.083	.100	.125	.150	.175	.200	-	-	-	-	-	-	-	-	-
3/4"	.005	.009	.012	.016	.019	.024	.029	.034	.039	.045	.050	.056	.062	.077	.092	.130	-	-
1"	-	-	-	-	.005	.006	.007	.008	.009	.011	.012	.014	.015	.019	.023	.033	.042	.053
1 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	.005	.007	.008	.011	.015	.018

% Glycol	Pressure Drop Correction		
	140°F	160°F	180°F
10	1.04	1.04	1.02
20	1.08	1.07	1.04
30	1.13	1.11	1.08
40	1.19	1.16	1.12
50	1.24	1.21	1.17

Pipe Size	Equivalent ft. of pipe			
	90° SR el	90° LR el	45° el	gate valve
1/2"	1.5	0.8	1	1
3/4"	2	1	1.4	1.4
1"	2.7	1.3	1.9	1.9
1 1/4"	3.6	1.8	2.5	2.5

Maximum Line Lengths for Heating Coils

Using factory installed circulator

All line lengths are total for supply and return

Model Size	Nominal Pipe Size (ID)	Maximum Supply Pipe Length (ft.) type K copper																		
		GPM																		
		1	1.3	1.5	1.8	2	2.3	2.5	2.8	3	3.3	3.5	3.8	4	4.3	4.5	4.8	5	6	7
8	1/2"	256	148	98	70	51	33	20	12	5	-	-	-	-	-	-	-	-	-	-
	3/4"	-	-	-	454	351	251	186	140	105	-	-	-	-	-	-	-	-	-	-
12	3/4"	-	-	-	-	-	-	-	-	126	97	75	57	43	30	19	11	4	-	-
	1"	-	-	-	-	-	-	-	-	-	497	397	319	257	200	156	120	90	-	-
	1 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	514	405	315	-	-
16	3/4"	-	-	-	-	-	-	-	-	126	97	75	57	43	30	19	11	4	-	-
	1"	-	-	-	-	-	-	-	-	-	497	397	319	257	200	156	120	90	-	-
	1 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	514	405	315	-	-
20	3/4"	-	-	-	-	-	-	-	-	123	94	72	54	40	27	16	8	-	-	-
	1"	-	-	-	-	-	-	-	-	-	485	382	306	244	187	143	106	77	-	-
	1 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	476	367	278	-	-

Notes:

- Line lengths are based on water only. To adjust maximum line lengths for glycol, divide length by the factors shown in **Table 2**.
- IMPORTANT:** Glycol should never be used in a potable water system.
- All lengths are based on closed loop systems.
- Line lengths within the shaded areas should not be used when a water heater is the source of heat. For these line lengths, excessive line temperature loss will occur and must be accounted for.
- Supply and return lines must be properly insulated to reduce temperature loss and to prevent freezing when passing through an unconditioned space.
- All lengths include (12) 90° short radius elbows. To adjust for extra or fewer fittings, use the factors in **Table 1**.
- Always use full flow ball or gate valves to minimize pressure drop.

Pipe size	Equivalent ft. of pipe			
	90° SR el	90° LR el	45° el	gate valve
1/2"	1.5	0.8	1	1
3/4"	2	1	1.4	1.4
1"	2.7	1.3	1.9	1.9
1 1/4"	3.6	1.8	2.5	2.5

% Glycol	Fluid Temperature		
	140° F	160° F	180° F
10	1.04	1.04	1.02
20	1.08	1.07	1.04
30	1.13	1.11	1.08
40	1.19	1.16	1.12
50	1.24	1.21	1.17

Dimensions

Unit Size	A (in)	B (in)	C (in)	Supply Duct Opening		Return Duct Opening	
				Depth (in)	Width (in)	Depth (in)	Width (in)
08 & 12	27	20 1/2	17 1/2	16	15 1/2	19 1/4	16
16	28	20 1/2	21	16	19	19 1/4	19 1/2
20	28	20 1/2	24 1/2	16	22 1/2	19 1/4	23

