

TECHNICAL GUIDE

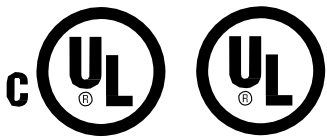
MODELS: MA

MODULAR AIR HANDLERS FOR USE WITH SPLIT SYSTEM COOLING & HEAT PUMP

600 - 2000 CFM BLOWERS

2 - 5 TON COILS

OPTIONAL ELECTRIC HEATERS



Due to continuous product improvement, specifications are subject to change without notice.

Additional rating information can be found at:

www.ahridirectory.org

DESCRIPTION

This unique modular system allows the flexibility to handle any application. These versatile coils and blowers may be used for upflow, down-flow, or horizontal left or right applications. They may be combined to function as a cooling only unit or with a heat pump including electric heat for 1 and 3 phase applications. The blower and electric heater could be used as stand alone electric furnaces.

FEATURES

Blowers - Models to match any air flow or voltage requirement. The compact size allows easy installation. Blowers are sized to deliver design air quantity both efficiently and quietly. The direct-drive, multi-speed blower motors provide a selection of air quantities to match any application. All models include a one-minute blower off delay as standard to enhance system efficiency ratings. The durable, pre-painted steel protects the unit against rust and corrosion. All models have 1 inch foil face fiber glass insulation, providing a thermal insulation value of R-4.2.

Coils - Staggered rows of rifled copper tubes are mechanically expanded into enhanced surface aluminum fins to provide high heat transfer and long-lasting quality. The MC multi-position coils may be used for upflow, downflow, and horizontal left or right applications. Coil cabinets are insulated with 3/4" foil face insulation to prevent sweating.

Thermal Expansion Valves - Air Handlers come as "Flex-coil" unit without a factory installed metering device. Flex-coil models allow for field installed R-22 or R-410A TXV's for added flexibility to meet refrigerant system choice.

Electric Heaters - All heaters include nickel-chromium elements with a 5-year limited warranty on 1 Ø heating elements. Sequential operation is provided to control heaters in all models. Circuit breakers are used in 208/230 volt, single-phase heaters of 15 KW and larger.

Models equipped with circuit breakers may be altered in the field to use multi-source power supply. Over-temperature limit switches provide protection from airflow loss with fusible link backup protection.

Accessories - A full line of matching accessories available for use with the blower and coils to allow any type application.

LIMITATIONS

These units must be wired and installed in accordance with all national and local safety codes.

Voltage limits are as follows:

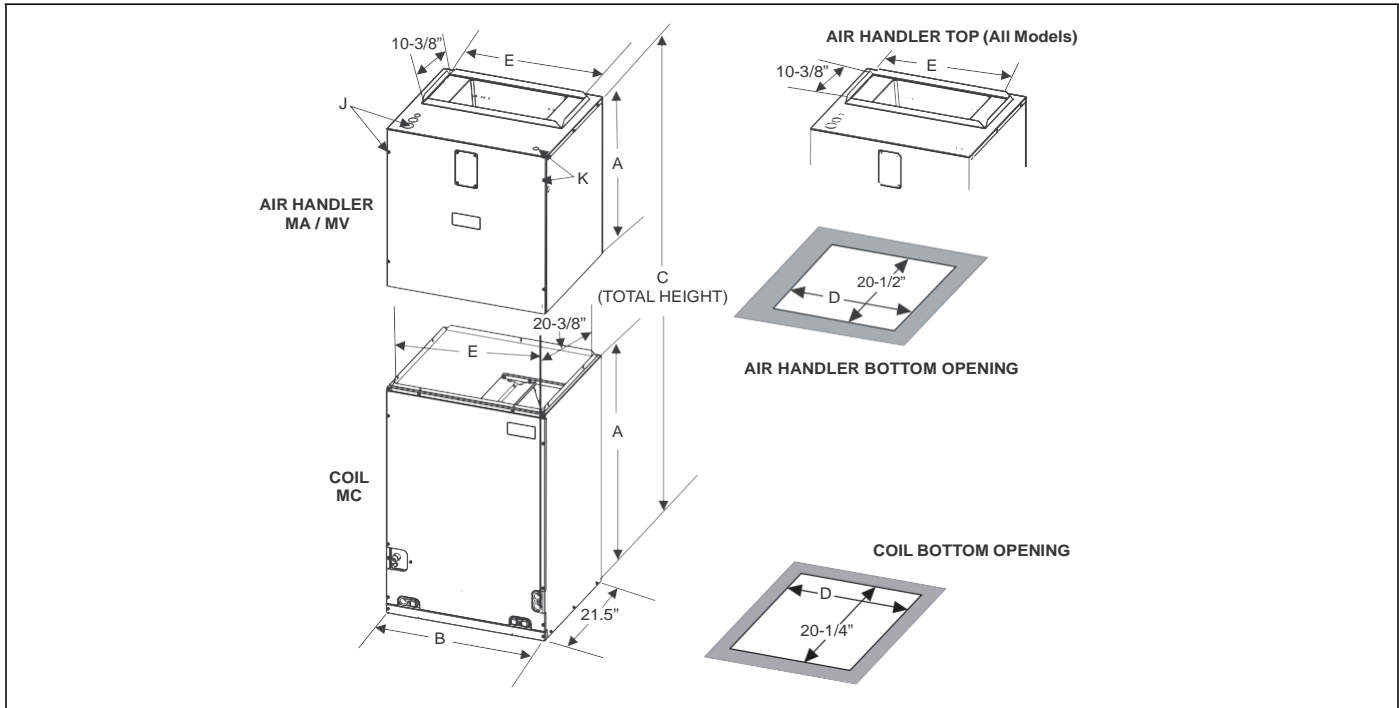
BLOWER VOLTAGE	VOLTAGE CODE	NORMAL OPERATING VOLTAGE RANGE*
208/230-1-60	21	187-253

* Rated in accordance with ARI Standard 110, utilization range "A".

Air flow must be within the minimum and maximum limits approved for electric heat, evaporator coils and outdoor units.

DIMENSIONS - (BLOWER WITH MC COILS)

NOTE: Power wiring may be brought into the unit through one of the knockouts in either the top or the left side panel. Multiple knockouts are provided to accommodate all of the electric heat and transformer accessories that are available. Use the knockouts that provide the best wire routing for the accessory being used.



DIMENSIONS

Models	Dimensions					Wiring K.O.'s ¹		Refrigerant Connections	
	A	B	C	D	E	J	K	Line Size	
	Height	Width	Total Height					Power	Control
MA08B	25	17-1/2	47 to 57 Depending on combination	16-1/2	14-19/32	7/8 (1/2), 1-3/8(1) 1-23/32, (1-1/4) 1-31/32, (1-1/2)	7/8 (1/2)	-	-
MA12B ²	25	17-1/2		16-1/2	14-19/32			-	-
MA16C ²	25	21		20	18-3/32			-	-
MA20D ²	25	24-1/2		23-1/2	21-19/32			-	-
MC18B3XC1	22	17.5		16.5	16 3/8	-	-	3/8	3/4
MC35B3XC1	22	17.5		16.5	16 3/8	-	-	3/8	3/4
MC43B3XC1	26	17.5		16.5	16 3/8	-	-	3/8	7/8
MC43C3XC1	26.5	21		20	19 7/8	-	-	3/8	7/8
MC48C3XC1	32	21		20	19 7/8	-	-	3/8	7/8
MC60D3XC1	32	24.5		23.5	23 3/8	-	-	3/8	7/8
MC62D3XC1	36	24.5	23.5	23 3/8	-	-	3/8	7/8	

1. Parenthesis indicate conduit size.

2. May be either 115-1-60, 208/230-1-60 or 460-3-60.

** Thermal Expansion Device Indicators - "2" indicates R-22 TXV is factory installed, "3X" indicates unit is a flex-coil model with a field installed R-22 or R-410A TXV, and "4" indicates R-410A TXV is factory installed. Letter indicates TXV size as required, see outdoor unit technical information for proper matches and requirements.

COOLING CAPACITY - Coil Only

Blower Models	Coil Models	Rated CFM	Entering Air °F (Dry/Wet Bulb)	MBH @ Evaporator Temperature and Corresponding Pressure °F/PSIG			
				35/61.5	40/68.5	45/76.0	50/84.0
Multi-Position - Upflow/Downflow/Horizontal							
MA08B	MC18B**C	650	85/72	28.7	26.1	23.3	20.2
			80/67	26.4	23.9	21.1	18.2
			75/62	21.6	19.2	16.6	14.0
			70/57	17.5	15.2	12.8	10.0
			70/57	22.2	19.3	16.2	12.6
			85/72	41.5	37.8	33.7	29.5
			80/67	36.2	32.4	28.6	24.5
			75/62	29.1	25.3	24.0	19.2
			70/57	24.1	21.5	18.7	15.8
			85/72	59.9	51.5	42.9	33.9
			80/67	48.0	40.3	32.8	25.1
			75/62	37.4	29.8	24.3	20.3
			70/57	32.1	28.1	22.9	19.2
			85/72	52.0	47.3	42.3	37.3
			80/67	41.7	36.8	32.3	27.4
			75/62	32.5	27.3	29.8	22.2
			70/57	27.9	25.8	23.8	22.2
			85/72	59.9	51.5	42.9	33.9
			80/67	48.0	40.3	32.8	25.1
			75/62	37.4	29.8	24.3	20.3
			70/57	32.1	28.1	22.9	19.2
			85/72	78.3	67.4	56.1	44.3
			80/67	62.7	52.6	42.9	32.8
			75/62	48.9	38.9	31.7	26.5
			70/57	42.0	36.8	29.9	25.1
			85/72	83.9	72.1	60.1	47.4
			80/67	67.2	56.4	45.9	35.1
			75/62	52.4	41.7	33.9	28.4
			70/57	45.0	39.4	33.0	27.0
			85/72	83.9	72.1	60.1	47.4
			80/67	67.2	56.4	45.9	35.1
			75/62	52.4	41.7	33.9	28.4
			70/57	45.0	39.4	33.0	27.0
			85/72	102.9	86.7	70.3	53.3
			80/67	82.4	68.0	53.7	39.4
			75/62	64.2	50.3	39.6	31.8
			70/57	55.1	47.5	38.1	30.3
			85/72	107.0	90.2	73.1	55.5
			80/67	85.7	70.7	55.8	40.9
			75/62	66.7	52.3	41.2	33.1
			70/57	57.4	49.4	39.7	31.6

Physical & Electrical Data

MA Models		MA08BN21	MA12BN21	MA16CN21	MA20DN21	
Blower - Diameter x Width		10 x 9	10 x 9	10 x 10	11 x 10	
Motor	HP	3/4 HP	1 HP	1 HP	3/4 HP	
	Nominal RPM	1075	1075	1075	1075	
Voltage		208/230	208/230	208/230	208/230	
Amps	Full Load	3.5	4.0	7.4	2.3	
Permanent Filter ¹	Type	DISPOSABLE OR PERMANENT				
	Size	16 x 20 x 1	16 x 20 x 1	20 x 20 x 1	24 x 20 x 1	
	Filter Bulk Pack	1PF0601BK	1PF0601BK	1PF0602BK	1PF0604BK	
Shipping/Operating Weight (lbs.)		75/71	82/78	90/84	97/91	

1. Field Supplied.

Full Cased "A" Type Multi-Postion

Model	Application	Refrig. Conn. Types	Face Area (Sq. Ft.)	Rows Deep	Fin Per In.	Coil Size	Tube Geometry	Tube Dia.	Fin Type	TXV	Operating Weight (Lbs.)
MC18B3XC1	Cooling/Heat Pump	Sweat	3.40	2	14	(2) 14 x 17.5	1 x 0.866	3/8	Enhanced	None	53
MC35B3XC2	Cooling/Heat Pump	Sweat	3.9	3	12	(2) 16 x 17.5	1 x 0.866	3/8	Enhanced	None	57
MC43B3XC1	Cooling/Heat Pump	Sweat	4.86	3	12	(2) 20 x 17.5	1 x 0.866	3/8	Enhanced	None	73
MC43C3XC1	Cooling/Heat Pump	Sweat	4.86	3	12	(2) 20 x 17.5	1 x 0.866	3/8	Enhanced	None	75
MC48C3XC1	Cooling/Heat Pump	Sweat	5.35	3	12	(2) 22 x 17.5	1 x 0.866	3/8	Enhanced	None	82
MC60D3XC1	Cooling/Heat Pump	Sweat	5.83	3	12	(2) 24 x 17.5	1 x 0.866	3/8	Enhanced	None	86
MC62D3XC1	Cooling/Heat Pump	Sweat	6.80	3	12	(2) 28 x 17.5	1 x 0.866	3/8	Enhanced	None	98

Note: MC coils available with a factory installed horizontal drain pan option (H)

MA Models	Heater Models*	Max. Static	Min. Speed Tap	Total Heat ¹				KW Staging					
				KW		MBH		W1 Only		W2 Only		W1 + W2	
				208V	240V	208V	240V	208V	240V	208V	240V	208V	240V
MA08BN2	4HK16500506	0.5	Lo	3.6	4.8	12.3	16.4	3.6	4.8	3.6	4.8	3.6	4.8
	4HK16500806	0.5	Med	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK16501006	0.5	Hi	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
MA12BN2	4HK16500506	0.5	Lo	3.6	4.8	12.3	16.4	3.6	4.8	3.6	4.8	3.6	4.8
	4HK16500806	0.5	Med	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK16501006	0.5	Med	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
MA16CN2	4HK165N1506	0.5	Med	10.8	14.4	36.9	49.1	3.6	4.8	7.2	9.6	10.8	14.4
	4HK16500506	0.5	Lo	3.6	4.8	12.3	16.4	3.6	4.8	3.6	4.8	3.6	4.8
	4HK16500806	0.5	Lo	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK16501006	0.5	Med	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
MA20DN2	4HK16501506	0.5	Med	10.8	14.4	36.9	49.1	3.6	4.8	7.2	9.6	10.8	14.4
	4HK16502006	0.5	Hi	14.4	19.2	49.2	65.5	3.6	4.8	7.2	9.6	14.4	19.2
	4HK16500806	0.5	Lo	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK16501006	0.5	Lo	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
MA20DN2	4HK16501506	0.5	Med	10.8	14.4	36.9	49.1	3.6	4.8	7.2	9.6	10.8	14.4
	4HK16502006	0.5	Med	14.4	19.2	49.2	65.5	3.6	4.8	7.2	9.6	14.4	19.2
	4HK16502506	0.5	Med	18.0	24.0	61.5	81.9	3.6	4.8	10.8	14.4	18.0	24.0

1. See conversion below.

KW & MBH Conversions

FOR	208-VOLT	OPERATION MULTIPLY	240-VOLT	TABULATED KW & MBH BY	.751
	230-VOLT		240-VOLT		.918
	220-VOLT		240-VOLT		.840

ELECTRICAL DATA (For Single Source Power Supply) - Copper Wire 208/230-1-60

MA Models	Heater Models*	Field Wiring							
		Heater Amps	Ampacity Min. Circuit			Max. O.C.P. ¹ Amps/Type		Wire Size - AWG 75°C	
		240V	208V	240V	208V	240V	208V	240V	
MA08B	4HK16500506	20.0	23.42	26.88	30	30	10	10	
	4HK16500806	31.3	35.60	41.00	40	45	8	8	
	4HK16501006	40.0	45.08	51.88	50	60	8	6	
MA12B	4HK16500506	20.0	25.79	29.38	30	30	10	10	
	4HK16500806	31.3	37.98	43.50	40	45	8	8	
	4HK16501006	40.0	47.46	54.38	50	60	8	6	
	4HK165N1506	60.0	69.13	79.38	70	90	4	3	
MA16C	4HK16500506	20.0	26.17	30.00	30	30	8	8	
	4HK16500806	31.3	38.35	44.13	40	45	8	8	
	4HK16501006	40.0	47.83	55.00	50	60	8	6	
	4HK16501506	60.0	69.50	80.00	70	90	4	3	
	4HK16502006	80.0	91.17	105.00	100	110	3	2	
MA20D	4HK16500806	31.3	42.60	48.38	45	50	8	8	
	4HK16501006	40.0	52.08	59.25	60	60	8	6	
	4HK16501506	60.0	73.75	84.25	90	90	3	3	
	4HK16501806	73.3	88.19	100.88	90	110	3	2	
	4HK16502006	80.0	95.42	109.25	100	125	3	2	
	4HK16502506	100.0	117.08	134.25	125	150	1	1/0	

1. OCP = Over Current Protection device, must be HACR type Circuit Breaker or Time Delay fuse.

ELECTRICAL DATA (For Multi Source Power Supply) - Copper Wire 208/230-1-60

MA Models	Heater Models	Min. Circuit Ampacity			Max. O.C.P. ¹ Amps/Type			75°C Wire Size - AWG		
		Circuit			Circuit			Circuit		
		1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
		208/240	208/240	208/240	208/240	208/240	208/240	208/240	208/240	208/240
MA12BN2	4HK16501306	41.8/49.5	19.5/22.5	–	45/50	20/25	–	8/8	10/10	–
	4HK165N1506	47.5/54.4	21.7/25.0	–	50/60	25/25	–	8/6	10/10	–
MA14DN2	4HK16501506	47.8/55.0	21.7/25.0	–	50/60	25/25	–	8/6	10/10	–
	4HK16501806	44.2/50.8	39.7/45.8	–	50/60	40/50	–	8/6	8/8	–
	4HK16502006	47.8/55.0	43.3/50.0	–	50/60	45/50	–	8/6	8/8	–
MA16CN2	4HK16501306	42.2/48.9	22.9/26.0	–	50/50	30/30	–	6/6	12/10	–
	4HK16501506	47.8/55.0	21.7/25.0	–	50/60	25/25	–	8/6	10/10	–
	4HK16501806	44.2/50.8	39.7/45.8	–	50/60	40/50	–	8/6	8/8	–
	4HK16502006	47.8/55.0	43.3/50.0	–	50/60	45/50	–	8/6	8/8	–
MA20DN2	4HK16501306	43.5/49.9	24.2/27.0	–	50/50	30/30	–	6/6	10/10	–
	4HK16501506	49.3/56.5	21.7/25.0	–	50/60	25/25	–	8/6	10/10	–
	4HK16501806	45.7/52.3	39.7/45.8	–	50/60	40/50	–	8/6	8/8	–
	4HK16502006	49.3/56.5	43.3/50.0	–	50/60	45/50	–	8/6	8/8	–
	4HK16502506	49.3/56.5	43.3/50.0	21.7/25.0	50/60	45/50	25/25	8/6	8/8	10/10

1. OCP = Over Current Protection device, must be HACR type Circuit Breaker or Time Delay fuse.

ELECTRICAL DATA - Cooling Only (60 Hz) - 208/230 - (Copper Wire)

Models MA	Total Motor Amps		Minimum Circuit Ampacity		Max. O.C.P. ¹ Amps/Type	Minimum Wire Size A.W.G.
	60 Hertz		60 Hertz			
	208V	230V	208V	230V		
MA08BN21	1.4	1.5	1.8	1.9	15	14
MA12BN21	2.1	3.5	2.6	3.0	15	14
MA14DN21	3.3	2.4	4.1	4.4	15	14
MA16CN21	3.6	4.0	4.5	5.0	15	14
MA20DN21	4.8	7.4	6.0	6.5	15	14

1. OCP = Over Current Protection device, must be HACR type Circuit Breaker or Time Delay fuse.

EXTENDED AIRFLOW DATA¹ - MA Models - 115/230/460 Volt - 60 Hz

MA Models	MC Models	Blower Motor Speed	CFM ¹ @ External Static Pressure - IWC									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
MA08B	MC18B	High	1102	986	870	754	638	521	405	289	173	57
		Med.	831	737	644	551	457	364	271	178	84	N/A
		Low	615	537	458	379	300	221	142	63	N/A	N/A
MA12B	MC35B	High	1429	1363	1290	1212	1133	1037	929	670	534	375
		Med.	1213	1153	1097	1037	977	896	697	549	453	220
		Low	1075	1032	990	927	873	770	611	494	405	212
	MC43B	High	1462	1396	1322	1254	1172	1067	941	693	585	464
		Med.	1205	1154	1102	1046	980	897	704	560	441	220
		Low	1075	1020	969	906	842	735	592	470	364	190
MA16C	MC43C	High	1825	1742	1660	1578	1486	1396	1306	1187	802	577
		Med.	1637	1572	1507	1431	1361	1276	1171	1043	722	493
		Low	1510	1456	1403	1341	1278	1202	1088	785	684	456
	MC48C	High	2018	1895	1772	1649	1525	1402	1279	1156	1033	910
		Med.	1684	1595	1506	1417	1328	1240	1151	1062	973	884
		Low	1561	1476	1392	1308	1223	1139	1055	970	896	801
MA20D	MC48D	High	2226	2190	2103	2035	1931	1845	1683	1541	1465	1328
		Med.	2115	2087	2017	1951	1851	1744	1542	1466	1406	1254
		Low	N/A	N/A	N/A	1716	1643	1554	1451	1379	1292	1151
	MC60D	High	2326	2235	2192	2107	2027	1906	1786	1538	1469	1368
		Med.	2150	2089	2036	2008	1944	1852	1692	1499	1416	1295
		Low	2012	1923	1834	1718	1676	1600	1447	1389	1311	1200
	MC62D	High	2357	2321	2254	2191	2139	1951	1859	1656	1556	1472
		Med.	2212	2144	2111	2069	1986	1862	1727	1566	1498	1369
		Low	2066	1934	1910	1817	1723	1646	1514	1442	1381	1245

NOTE: Air flow data shown above 0.50" W.C. external static pressure is for REFERENCE ONLY. Maximum allowable external static when electric heat is used is limited to 0.50" W.C. Maximum allowable external static pressure may also be limited by minimum CFM requirements for proper Heat Pump operation.

1. Includes Return Air Filter and Largest Electric Heater.

All AH, AV, MA, MV, SHP, SV series air handler units are UL Listed up to 0.50" w.c. external static pressure, including air filter, wet coil, and largest KW size heater.