

TECHNICAL GUIDE

MODELS: MV

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

1200 - 2000 CFM BLOWERS

3 - 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, downflow, 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 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 - Electric heater models are available to match any requirement. 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.

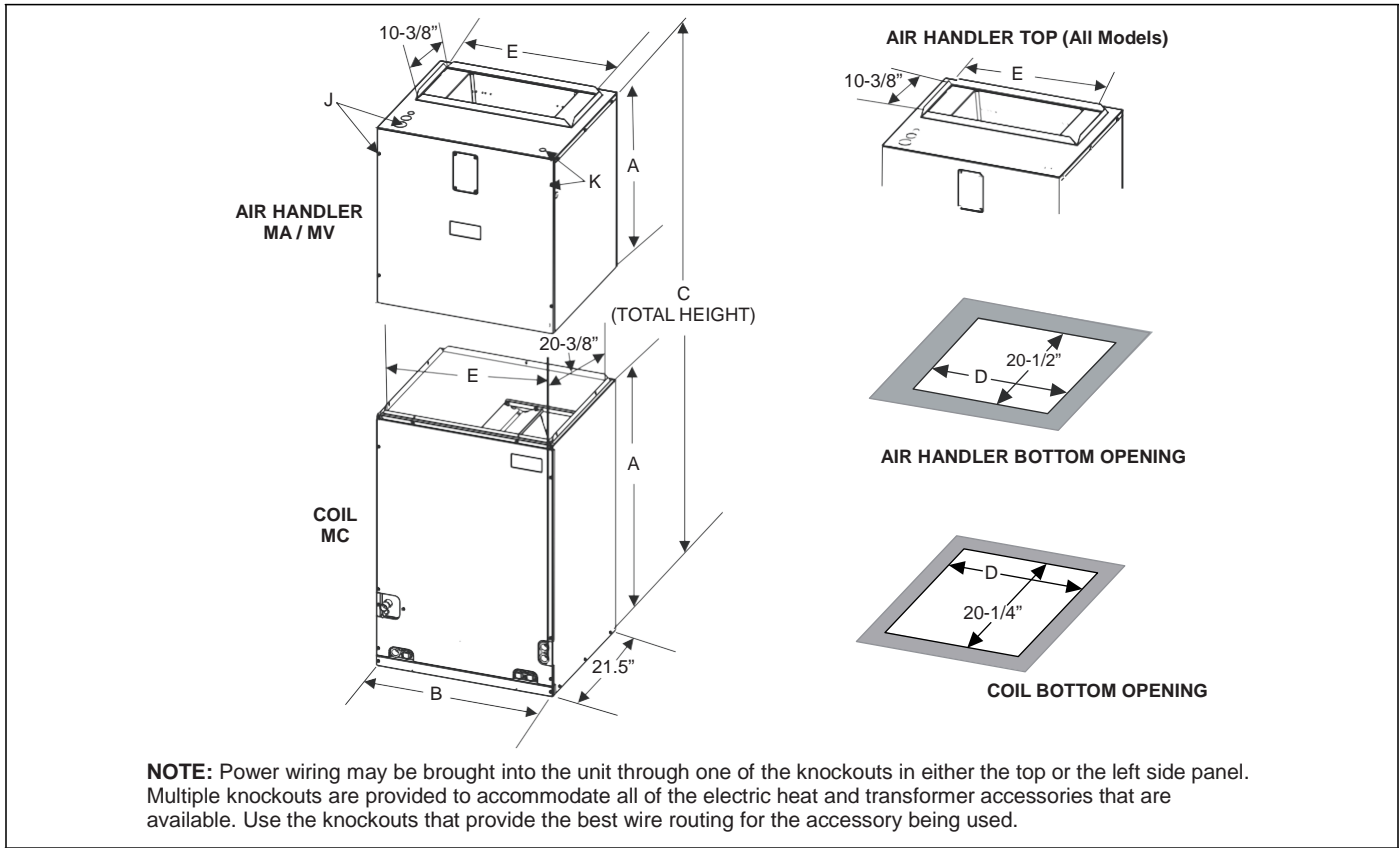
Voltage limits are as follows:

AIR HANDLER VOLTAGE	NORMAL OPERATING VOLTAGE RANGE*
208/230-1-60	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)



DIMENSIONS

Model	Dimensions					Wiring K.O.'s ¹		Refrigerant Connections	
	A	B	C	D	E	J	K	Line Size	
	Height	Width	Total Height					Liquid	Vapor
MV12B	25	17.5	47 to 57 Depending on combination	16.5	14-19/32	7/8" (1/2") 1-3/8" (1") 1-23/32" (1-1/4")	7/8" (1/2")	-	-
MV16C	25	21		20	18-3/32			-	-
MV20D	25	24.5		23.5	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	26.5	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

All MC coils include a factory installed horizontal drain pan.

(3X) = Models require field installed metering device.

1. Parenthesis indicate conduit size.

** 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.

"H" models are available with a factory installed horizontal drain pan.

PHYSICAL & ELECTRICAL DATA

Model		MV12B	MV16C	MV20D
Blower - Diameter x Width		10 x 7	10 x 10	10 x 10
Motor	HP	1/2	3/4	1
	Nominal RPM	1200	1200	1200
Voltage		208/230		
Amps	Full Load (230)	4.3	5.0	7.0
Permanent Filter ¹	Type	DISPOSABLE OR PERMANENT		
	Size	16 x 20 x 1	20 x 20 x 1	24 x 20 x 1
	Filter Bulk Kit	1PF0601BK	1PF0602BK	1PF0604BK
Shipping/Operating Weight (lbs.)		75/71	88/82	94/88

1. Field Supplied.

ELECTRICAL DATA - 208/230-1-60

Model	Heater Model*	Max. Static	Min. Speed Tap	Total Heat ¹				KW Staging					
				kW		MBH		W1 Only		W2 Only		W1 + W2	
				208V	230V	208V	230V	208V	230V	208V	230V	208V	230V
MV12B	4HK*6500506	0.5	Heat-C	3.6	4.8	12.3	16.4	3.6	4.8	3.6	4.8	3.6	4.8
	4HK*6500806	0.5	Heat-C	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK*6501006	0.5	Heat-B	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
	4HK16501306	0.5	Heat B	9.8	13	33.3	44.4	3.3	4.3	6.5	8.7	9.8	13.0
	4HK165N1506	0.5	Heat-B	10.8	14.4	36.9	49.1	3.6	4.8	7.2	9.6	10.8	14.4
MV16C	4HK*6500506	0.5	Heat-D	3.6	4.8	12.3	16.4	3.6	4.8	3.6	4.8	3.6	4.8
	4HK*6500806	0.5	Heat-D	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK*6501006	0.5	Heat-C	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
	4HK16501306	0.5	Heat C	9.8	13	33.3	44.4	3.3	4.3	6.5	8.7	9.8	13.0
	4HK16501506	0.5	Heat-C	10.8	14.4	36.9	49.1	3.6	4.8	7.2	9.6	10.8	14.4
	4HK16501806	0.5	Heat-B	13.2	17.6	45.1	60.1	3.3	4.4	6.6	8.8	13.2	17.6
	4HK16502006	0.5	Heat-B	14.4	19.2	49.2	65.5	3.6	4.8	7.2	9.6	14.4	19.2
MV20D	4HK*6500506	0.5	Heat-C	3.6	4.8	12.3	16.4	3.6	4.8	3.6	4.8	3.6	4.8
	4HK*6500806	0.5	Heat-C	5.6	7.5	19.2	25.6	2.8	3.75	5.6	7.5	5.6	7.5
	4HK*6501006	0.5	Heat-C	7.2	9.6	24.6	32.8	3.6	4.8	7.2	9.6	7.2	9.6
	4HK16501306	0.5	Heat C	9.8	13	33.3	44.4	3.3	4.3	6.5	8.7	9.8	13.0
	4HK16501506	0.5	Heat-C	10.8	14.4	36.9	49.1	3.6	4.8	7.2	9.6	10.8	14.4
	4HK16502006	0.5	Heat-C	14.4	19.2	49.2	65.5	3.6	4.8	7.2	9.6	14.4	19.2
	4HK16502506	0.5	Heat-C	18.0	24.0	61.5	81.9	3.6	4.8	10.8	14.4	18.0	24.0

1. See conversion table on Page 8.

* May be 0 (no breaker) or 1 (with breaker).

ELECTRICAL DATA (FOR SINGLE SOURCE POWER SUPPLY) - COPPER WIRE 208/230-1-60

Model	Heater Model ^{1,*}	Field Wiring						
		Heater Amps 240V	Ampacity Min. Circuit		Max. O.C.P. ² Amps/Type		Wire Size - AWG 75°C	
			208V	230V	208V	230V	208V	230V
MV12B	4HK*6500506	20.0	27.54	30.38	30	35	10	8
	4HK*6500806	31.3	39.73	44.50	40	45	8	8
	4HK*6501006	40.0	49.21	55.38	50	60	8	6
	4HK16501306	54.2	64.00	72.80	70	80	4	2
	4HK165N1506	60.0	70.88	80.38	90	90	4	3
MV16C	4HK*6500506	20.0	29.29	31.88	30	35	10	8
	4HK*6500806	31.3	41.48	46.00	45	50	8	8
	4HK*6501006	40.0	50.96	56.88	60	60	6	6
	4HK16501506	60.0	72.63	81.88	90	90	3	3
	4HK16502006	80.0	94.29	106.88	100	125	3	1
MV20D	4HK*6500506	20.0	29.29	31.88	30	35	10	8
	4HK*6500806	31.3	41.48	46.00	45	50	8	8
	4HK*6501006	40.0	53.08	58.75	60	60	6	6
	4HK16501506	60.0	74.75	83.75	90	90	3	3
	4HK16502006	80.0	96.42	108.75	100	125	3	1
	4HK16502506	100.0	118.08	133.75	125	150	1	1/0

- 30 kW 3 phase not approved for single source power supply.
 - OC.P = Over Current Protection device, must be HACR type Circuit Breaker or Time Delay fuse.
- * May be 0 (no breaker) or 1 (with breaker).

ELECTRICAL DATA (FOR MULTI SOURCE POWER SUPPLY) - COPPER WIRE 208/230-1-60

Model	Heater Model	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
		208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
MV12B	4HK16501306	41.7/47.9	22.4/25.0	–	50/50	30/30	–	6/6	12/10	–
	4HK165N1506	49.2/55.4	21.7/25.0	–	50/60	25/25	–	8/6	10/10	–
MV16C	4HK16501306	42.9/49.1	23.6/26.2	–	50/50	30/30	–	6/6	12/10	–
	4HK16501506	51.0/56.9	21.7/25.0	–	50/60	25/25	–	8/6	10/10	–
	4HK16501806	17.3/52.7	39.7/45.8	–	50/60	40/50	–	8/6	8/8	–
	4HK16502006	51.0/56.9	43.3/50.0	–	50/60	45/50	–	8/6	8/8	–
MV20D	4HK16501506	53.1/58.8	21.7/25.0	–	60/60	25/25	–	6/6	10/10	–
	4HK16502006	53.1/58.8	43.3/50.0	–	60/60	45/50	–	6/6	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

- OC.P = Over Current Protection device, must be HACR type Circuit Breaker or Time Delay fuse.

KW & MBH CONVERSIONS

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

ELECTRICAL DATA - COOLING UNIT ONLY (60 Hz)

MODEL	Total Motor Amps		Minimum Circuit Ampacity		Amps/Type ¹	Minimum Wire Size AWG @ 75°C
	60 Hertz		60 Hertz			
	208V	230V	208V	230V		
MV12B	4.7	4.3	5.9	5.4	15	14
MV16C	6.1	5.0	7.6	6.9	15	14
MV20D	7.8	7.0	9.7	8.8	15	14

- OC.P = Over Current Protection device, must be HACR type Circuit Breaker or Time Delay fuse.

AIR HANDLER AIR FLOW DATA

HIGH/LOW SPEED COOLING AND HEAT PUMP AIRFLOW					
CFM				JUMPER SETTINGS	
12B				COOL Tap	ADJ Tap
High	Low				
1385	896			A	B
1137	745			B	B
1203	777			A	A
1019	650			B	A
1085	690			A	C
943	615			C	B
889	585			B	C
746	493			D	B
817	537			C	A
646	467			D	A
738	481			C	C
580	465			D	C
16C		20D		JUMPER SETTINGS	
High	Low	High	Low	COOL Tap	ADJ Tap
2005	1433	2404	1579	A	B
1768	1145	2022	1313	B	B
2009	1299	2167	1388	A	A
1615	1040	1801	1159	B	A
1787	1159	1924	1256	A	C
1524	988	1818	1175	C	B
1445	940	1620	1024	B	C
1350	883	1638	1049	D	B
1384	906	1628	1030	C	A
1215	800	1442	929	D	A
1236	810	1434	911	C	C
1086	716	1305	859	D	C
HIGH/LOW SPEED ELECTRIC HEAT AIRFLOW					
CFM				JUMPER SETTINGS	
12B				HEAT Tap	ADJ Tap
High	Low				
1385	900			A	N/A
1228	795			B	N/A
1137	748			C	N/A
917	603			D	N/A
16C		20D		JUMPER SETTINGS	
High	Low	High	Low	HEAT Tap	ADJ Tap
2006	1411	2408	1515	A	N/A
1868	1243	2218	1285	B	N/A
1468	983	1902	1070	C	N/A
1248	840	1407	823	D	N/A

AIR HANDLER AIR FLOW DATA

1. Airflow at nominal voltage, bottom return at 0.5 external static pressure, tested without filter installed, dry coil conditions.
2. These units have variable speed motors that automatically adjust to provide constant CFM from 0.0" to 0.6" w.c. static pressure.
3. From 0.6" to 1.0" static pressure, CFM is reduced by 2% per 0.1" increase in static.
4. Operation on duct systems with greater than 1.0" w.c. external static pressure is not recommended.
5. Both the COOL and the ADJUST tap must be set to obtain the cooling airflow desired (CFM).
6. The ADJ tap does not affect the HEAT tap setting.
7. Low speed cooling used only with two stage outdoor units. (Speed is preset to 65% of high speed).
8. Dehumidification speed is 85% of jumper selected COOL tap and ADJUST tap.
9. When operating in both heat pump and electric heat modes, the airflow (CFM) will be per HEAT Tap CFM values only.
10. At some settings, LOW COOL and/or LOW HEAT airflow may be lower than what is required to operate an airflow switch on certain models of electronic air cleaners. Consult the instructions for the electronic air cleaner for further details.
11. Airflow (CFM) indicator light (LED2) flashes once for every 100 CFM (i.e.: 12 Flashes is 1200 CFM) – blinks are approximate +/- 10% of actual CFM.