



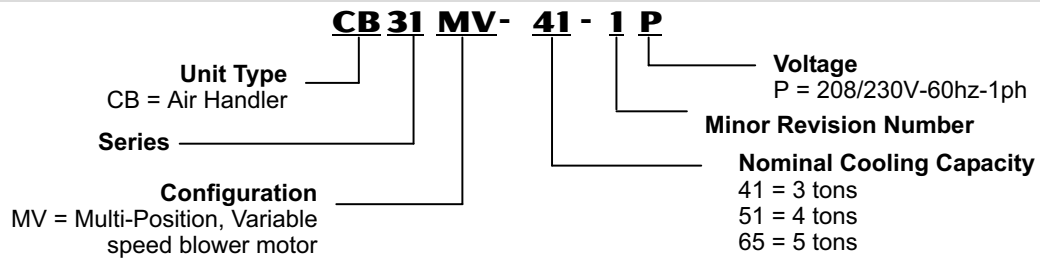
**DAVE LENNOX SIGNATURE™ COLLECTION**  
**Multi-Position - Variable Speed Blower**

Bulletin No. 210107  
 July 2007  
 Supersedes January 2007



**Nominal Capacity - 3 to 5 Tons**  
**Optional Electric Heat - 5 to 25 kW**

**MODEL NUMBER IDENTIFICATION**



## FEATURES

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### WARRANTY

All covered components - ten years in residential applications, one year in non-residential applications. Refer to Lennox Limited Warranty Certificate included with each unit for additional details.

### APPROVALS

Tested with matching air conditioners and heat pump units in the Lennox Research Laboratory environmental test room in

accordance with ARI Standard 210/240.

Optional electric heaters are rated in accordance with US Department of Energy (DOE) test procedures and Federal Trade Commission (FTC) labeling regulations. Blower performance data according to unit tests conducted in Lennox air test chamber.

Air handlers are UL Listed to US and Canadian safety standards and components within are bonded for grounding to meet safety standards for servicing required by CEC and NEC.

ISO 9001 Registered Manufacturing Quality System.

### APPLICATIONS

3 to 5 ton nominal sizes.

Multi-position (up-flow, down-flow or horizontal) applications.

Applicable to expansion valve systems in cooling applications and check and expansion valve systems in heat pump applications.

Applicable to Lennox Harmony III™ zone control system. Wide-range check and expansion valve is factory installed.

See bulletins in section Air Conditioners for cooling capacities.

See bulletins in section Heat Pump Outdoor Units for cooling and heating capacities.

Optional field installed electric heaters available in several sizes for additive heating capacity.

#### Zoning Applications

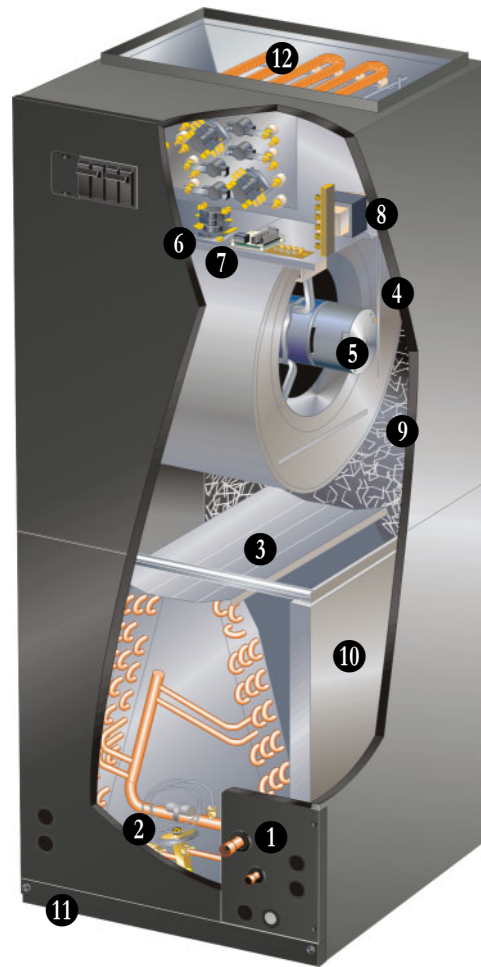
Units may be used with certain zoning systems. Zone control panel must be able to interface and communicate with the variable speed blower motor in the unit. Lennox Harmony III™ Zone Control Panel has this capability.

### REFRIGERANT SYSTEM

#### 1 Refrigerant Line Connections

Suction (vapor) and liquid lines have sweat connections that extended outside of the cabinet for ease of connection.

See dimension drawings for locations.



#### 2 Check and Expansion Valve Furnished

Wide range valve.  
Chatleff style fitting.  
Factory installed on all models internal to cabinet.

#### 3 Copper Tube/Enhanced Fin Evaporator Coil

Lennox designed and fabricated twin coils.  
Assembled in "A" configuration.  
Provides extra large surface and contact area, excellent heat transfer and low air resistance for maximum efficiency.  
Precise circuiting for uniform refrigerant distribution.  
Precisely spaced ripple-edged aluminum fins fitted to durable seamless copper tubes.  
Fins are strengthened to resist bending and are equipped with collars that grip tubing for maximum contact area.  
Lanced fins provide maximum exposure of fin surface to air stream.  
Long life copper tubing is easy to service.  
Rifled tubing provides superior heat transfer.  
Flared shoulder tubing joints and silver soldering provide tight, leakproof joints.  
Coil thoroughly factory tested under high pressure to insure leakproof construction.

## FEATURES

### **BLOWER**

#### **Variable-Speed Blower Motor**

- 4 High efficiency variable speed blower motor maintains specified air volumes up to a maximum of 0.8 in. w.g. total external static.

Variable speed operation is achieved by the use of an ECM (Electronically Commutated Motor) motor.

Allows cooling ramping profiles (field selectable) for enhanced dehumidification.

Motor accelerates and decelerates gradually, reducing start-up and shut-down sound.

Leadless blower motor features simple plug-in connections. Motor is controlled by BDC3 Electronic Blower Control that allows blower to operate at two of eight air volumes or speeds available.

Speeds may be field selected on BDC3 control depending on size of air handler and air volume desired.

See blower performance tables.



#### **Blower Assembly**

- 5 Lennox designed and built, direct drive blower. Each blower is statically and dynamically balanced as an assembly before installation in the unit. Blower motor is resiliently mounted to blower assembly. Blower slides out of cabinet for servicing.

### **CONTROLS**

- 6 **BDC3 Electronic Blower Control**

Blower control interfaces variable speed motor with thermostat and optional CCB1 humidity control.

Solid-state board controls evaporator humidity by controlling blower and compressor speed on two speed outdoor units.

Two speeds - HEAT and COOL (with four different air volume selections for each) are made by simple jumper pins on board.

ADJUST jumper pin allows approximately 10% higher, normal or 10% lower motor speed selection within HEAT and COOL speeds selected for fine tuning air volume.

DELAY jumper pin allows selection blower motor de-humidification profiles during cooling mode.

**Option 1** - Motor runs at 100% of capacity until demand met. Once demand is met, motor ramps down to stop.

**Option 2** - Motor runs at 82% of capacity for approximately 7-1/2 minutes, then 100% capacity (if needed) until demand is satisfied. Once demand is met, motor ramps down to stop.

**Option 3** - Motor runs at 50% capacity for 30 seconds, then 82% of capacity for approximately 7-1/2 minutes. If demand is not satisfied, motor runs at 100% capacity until demand is satisfied. Once demand is met, motor ramps down to stop.

**Option 4** - Motor runs at 50% capacity for 30 seconds, then 82% capacity for approximately 7-1/2 minutes. If demand is not satisfied, motor runs at 100% capacity until demand is met. Once demand is met, motor runs at 50% capacity for 30 seconds, then ramps down to stop.

**Option 5** - motor runs at 100% until demand is met. Once demand is satisfied, motor runs at 100% for 60 seconds then ramps down to stop.

BDC3 control has two diagnostic indicator lights, "CFM" and "RUN", to assist in servicing.

- 7 Accessory relay terminals provide connections for power humidifiers or electronic air cleaners.

Control is factory installed in the unit control box.

- 8 **Transformer and Blower Cooling Relay**

24 volt transformer with in-line fuse and blower cooling relay furnished as standard.

Factory installed in the unit control box.

Terminal strip furnished.

### **OPTIONS**

#### **SignatureStat™ Home Comfort Control**

Combination temperature and humidity control in cooling mode.

2 Heat/2 Cool

Auto-changeover

Controls humidity during cooling operation.

Easy-to-use, menu driven thermostat with a back-lit, dot-matrix LCD screen.

Remote outdoor sensor (furnished) allows the thermostat to display outdoor temperature and adjust indoor dewpoint temperature for precision humidity control in cooling mode.

See the SignatureStat Engineering Handbook bulletin in the Controls section for more information.

#### **Thermostat**

See Thermostat bulletins in Controls section and Lennox Price Book for a complete list of thermostats.



## FEATURES

### CABINET

Constructed of heavy gauge galvanized steel.

- 9 Completely insulated with thick fiberglass insulation. Pre-painted steel cabinets have mildly textured enamel finish with primer coat on unpainted side of all panels. Units are shipped in one piece but may be disassembled into two separate sections for ease of installation in tight applications. See dimension drawings. Thick rubber gasket between sections provides air tight seal. No external screw heads on sides of cabinet for tight installations without damage to walls or woodwork. Removable panels provide complete service access. Electrical inlets provided in sides and top of cabinet. See dimension drawings for locations.

#### Multi-Position Capability

Shipped for up-flow and horizontal right hand discharge. Quickly converted to down-flow or left-hand, horizontal air discharge.

#### 10 Dual Position Drain Pans

Drain pans designed for up-flow, down-flow or horizontal applications. Deep, corrosion resistant plastic drain pans have dual pipe drains. See dimension drawings.

#### Horizontal Support Frame Kit

Provides support of unit in horizontal applications. Consists of (2) 1 x 1-1/2 x 32-5/8 in. and (2) 1 x 3 x 53-7/8 in. painted heavy gauge cold rolled steel support channels with assembly and suspending holes. Bolts and nuts furnished for field assembly. Suspending rods must be field provided.

### OPTIONS

#### Down-Flow Additive Base

Additive base required for models with electric heat installed in down-flow position on combustible floors.

#### Side Return Unit Stand (Up-Flow Only)

Raises unit 16 in. above floor for side return air duct connection. Eliminates need for wooden platform construction. All aluminum construction. Two adjustable frames fit all sizes.

#### Wall Hanging Bracket Kit (Up-Flow Only)

Allows unit to be hung on wall at any height. Consists of heavy gauge steel support brackets (one for air handler unit, one for wall mount). Screws furnished for fastening one bracket to unit. Bolts for fastening one bracket to wall are field provided.

### FILTER

- 11 Tool-less access to filter area for quick and easy servicing. Disposable frame type filter furnished and factory installed in rails in cabinet. See Specifications tables for sizes.

### OPTIONAL ELECTRIC HEAT

#### 12 Electric Heat

Field install internal to unit cabinet. Available in several voltages and kW sizes. See Electric Heat tables. Helix wound nichrome heating elements exposed directly in air stream resulting in instant heat transfer, low element temperatures and long service life. Each element equipped with accurately located limit control with fixed temperature off setting and automatic reset. Supplemental thermal cutoff limit control, provides positive protection in case of excessive temperatures. Thermal sequencer relay brings elements on and off line, in sequence and equal increments, with time delay between each. Initiates and terminates blower operation. Heating control relay(s) furnished as standard. Control box and access cover constructed of heavy gauge galvanized steel. Factory assembled with controls installed and wired. Electric heat low voltage controls plug-in to air handler unit.

#### Circuit Breaker Models

ECB29-5CB, -6CB, -8CB, -9CB, -10CB, -12.5CB, -15CB, -20CB, -25CB and -30CB (208/240v-1ph) and ECB29-15CB, -20CB and -25CB (208/240v-3ph) heaters are equipped with circuit breakers for overload and short circuit protection.

Factory wired and mounted on electric heat unit.

Current sensitive and temperature actuated.

Manual reset.

Circuit breakers qualify as disconnect means at unit in many areas, eliminate the need for field provided disconnect.

Consult local electrical code in your area.

#### EvenHeater™ Models

Electric heat is staged to provide supplemental heat to meet desired comfort levels.

EHC control board stages the heat on and off based on the demand of the provided (field installed) supply plenum thermistor.

Temperature set point (85, 100, 115 or 130°F) is selected by use of a jumper pin on the EHC control board.

ECB29EH-9CB, -12.5CB, -15CB and -20CB heaters are equipped with circuit breakers for overload and short circuit protection.

Factory provided and field mounted in electric heat unit.

Current sensitive and temperature actuated.

Manual reset.

Circuit breakers qualify as disconnect means at unit in many areas, eliminate the need for field provided disconnect.

Consult local electrical code in your area.

#### Circuit Breaker Cover Kit

Flexible plastic cover protects circuit breaker. Recommended in areas with high humidity to prevent nuisance tripping.

#### Single-Point Power Source Control Box

Control Box may be used with optional electric heat when single power supply is connected to multi-circuit electric heat. Field installs external to the unit cabinet on either side or top. Constructed of heavy gauge steel, baked enamel finish, prepunched mounting holes, electrical inlet knockouts, and terminal strip.

Removeable cover provides easy access.

Dimensions (H x W x D) - 7 x 7 x 4 in.

## SPECIFICATIONS

General Data		Model Number	CB31MV-41	CB31MV-51	CB31MV-65
General Data	Nominal cooling capacity - tons		3	4	5
Connections	Suction (vapor) line - in. (sweat)		3/4	7/8	1-1/8
	Liquid line - in. (sweat)		3/8	3/8	3/8
	Condensate drain - in. (fpt)		(2) 3/4	(2) 3/4	(2) 3/4
Indoor Coil	Net face area - ft. <sup>2</sup>		5.0	7.22	7.22
	Tube outside diameter - in.		3/8	3/8	3/8
	Number of rows		3	3	3
	Fins per inch		12	12	12
Blower Data	Wheel nominal diameter x width - in.		10 x 8	12 x 9	12 x 9
	Motor output - hp		1/2	1	1
	Air Volume Range - cfm		900 - 1545	1205 - 2150	1205 - 2150
Filters	<sup>1</sup> Number and size - in.		(1) 20 x 20 x 1	(1) 20 x 24 x 1	(1) 20 x 24 x 1
Shipping Data - 1 Package - lbs.			183	212	212

## ELECTRICAL DATA

	Voltage - phase		208/230V-1ph	208/230V-1ph	208/230V-1ph
	<sup>2</sup> Maximum overcurrent protection (unit only)		15	20	20
	<sup>3</sup> Minimum circuit ampacity (unit only)		5	11	11

## OPTIONAL ACCESSORIES

Circuit Breaker Cover Kit			80M77	80M77	80M77
Down-Flow Combustible Base			34J73	34J73	34J73
Filter Base	3 in. base height 1 or 2 in. thick filters	Cat. Number	32X55	32X58	32X58
		Model Number	ACE2020-3	ACE2025-3N	ACE2025-3N
	6 in. base height 1, 2, or 4 in. thick filters	Cat. Number	62N01	32X57	32X57
		Model Number	ACE2020-6	ACE2025-6N	ACE2025-6N
	Cabinet Size D x W - in.		21-3/8 x 22	26-3/8 x 22	26-3/8 x 22
	Size of field provided filter - in.		20 x 20	25 x 20	25 x 20
Horizontal Support Frame Kit			56J18	56J18	56J18
Side Return Unit Stand			45K32	45K32	45K32
SignatureStat™ Home Comfort Controller Variable Speed Models Only	2 Heat / 2 Cool - Heat Pump		81M28	81M28	81M28
	2 Heat / 2 cool - Conventional		81M27	81M27	81M27
	1 Heat / 1 Cool - conventional or heat pump		81M26	81M26	81M26
Single Point Power Source Control Box (2 or 3 circuits)			21H39	21H39	21H39
Step-Down Transformer Kit - For 575V applications			66K90	66K90	66K90
Wall Hanging Bracket Kit (Up-Flow Only)			45K30	45K30	45K30

<sup>1</sup> Disposable frame type filter.

<sup>2</sup> HACR type circuit breaker or fuse.

<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

## INSTALLATION CLEARANCES

Cabinet	0 inch (0 mm)
Plenum and Outlet duct on air handler units	1 inch (25 mm)
Plenum and Warm air duct within 3 feet (914mm) of cabinet	1 inch (25 mm)
Floor	<sup>1</sup> Combustible

<sup>1</sup> When unit is installed in the down-flow position with electric heat on a combustible floor, an optional down flow base is required.

## BLOWER DATA

### CB31MV-41 BLOWER PERFORMANCE

0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Jumper Setting	BDC3 Jumper Speed Positions							
	"HEAT" Speed				"COOL" Speed			
	1 cfm	2 cfm	3 cfm	4 cfm	1 cfm	2 cfm	3 cfm	4 cfm
+	1230	1335	1445	1545	1090	1225	1380	1545
NORM	1120	1215	1315	1400	975	1125	1275	1400
-	1010	1185	1200	1265	900	1000	1135	1265

NOTES - The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.  
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 38% of COOL speed setting.  
 Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 442 cfm.

### CB31MV-41 BLOWER MOTOR WATTS AT "+" (Plus) BDC3 SETTING ("Adjust" Jumper at "+" Setting)

BDC3 Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"HEAT" Speed	Tap 1	220	235	265	290	310	335	360	385	465
	Tap 2	285	305	330	355	380	405	430	450	475
	Tap 3	345	365	405	430	455	485	515	545	570
	Tap 4	470	495	515	530	545	560	575	595	610
"COOL" Speed	Tap 1	145	165	200	225	250	275	300	325	350
	Tap 2	225	245	265	290	320	350	370	395	410
	Tap 3	305	325	350	390	420	445	475	505	535
	Tap 4	470	495	515	530	545	560	575	595	610

### CB31MV-41 BLOWER MOTOR WATTS AT "NORM" BDC3 SETTING ("Adjust" Jumper at NORM Setting)

BDC3 Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"HEAT" Speed	Tap 1	155	185	215	240	265	285	300	335	355
	Tap 2	225	245	270	295	325	345	370	390	415
	Tap 3	275	290	315	340	375	400	420	445	465
	Tap 4	320	345	375	405	435	460	485	515	540
"COOL" Speed	Tap 1	120	140	160	190	210	230	255	275	300
	Tap 2	160	190	220	240	265	290	320	340	365
	Tap 3	255	270	295	320	345	375	400	420	445
	Tap 4	320	345	375	405	435	460	485	515	540

### CB31MV-41 BLOWER MOTOR WATTS AT "-" (Minus) BDC3 SETTING ("Adjust" Jumper at "-" Setting)

BDC3 Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"HEAT" Speed	Tap 1	120	135	165	185	205	225	245	265	300
	Tap 2	140	165	195	215	245	270	300	315	335
	Tap 3	185	210	240	265	285	310	330	360	385
	Tap 4	245	255	290	310	335	355	380	405	430
"COOL" Speed	Tap 1	90	110	135	155	180	195	210	230	250
	Tap 2	120	140	160	185	215	235	255	275	295
	Tap 3	160	190	225	240	275	295	320	350	380
	Tap 4	245	255	290	310	335	355	380	405	430

## BLOWER DATA

### CB31MV-51 AND CB31MV-65 BLOWER PERFORMANCE

0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Jumper Setting	BDC3 Jumper Speed Positions							
	"HEAT" Speed				"COOL" Speed			
	1 cfm	2 cfm	3 cfm	4 cfm	1 cfm	2 cfm	3 cfm	4 cfm
+	1850	1960	2090	2150	1625	1820	2055	2145
NORM	1705	1800	1900	2005	1425	1625	1805	2005
-	1560	1625	1720	1770	1205	1375	1555	1725

NOTES - The effect of static pressure, filter and electric heater resistance is included in the air volumes listed.  
 First stage cooling air volume is 70% of COOL speed setting. Continuous blower speed is approximately 38% of COOL speed setting.  
 Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 442 cfm.

### CB31MV-51 AND CB31MV-65 BLOWER MOTOR WATTS AT "+" (Plus) BDC3 SETTING ("Adjust" Jumper at "+" Setting)

BDC3 Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"HEAT" Speed	Tap 1	455	505	540	585	630	665	710	745	780
	Tap 2	555	595	645	675	730	780	820	865	895
	Tap 3	680	720	770	820	865	900	945	985	1030
	Tap 4	730	780	825	870	920	970	1020	1055	1110
"COOL" Speed	Tap 1	300	335	370	360	435	465	500	535	575
	Tap 2	425	475	500	545	585	635	670	710	745
	Tap 3	625	660	705	755	810	850	885	940	970
	Tap 4	700	750	800	845	895	940	990	1030	1080

### CB31MV-51 AND CB31MV-65 BLOWER MOTOR WATTS AT "NORM" BDC3 SETTING ("Adjust" Jumper at NORM Setting)

BDC3 Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"HEAT" Speed	Tap 1	360	385	425	465	495	525	565	600	635
	Tap 2	400	440	485	520	555	595	640	670	705
	Tap 3	480	520	560	605	640	685	765	785	805
	Tap 4	580	625	665	710	760	800	835	875	925
"COOL" Speed	Tap 1	215	235	275	295	330	360	400	430	465
	Tap 2	310	335	375	405	440	465	500	530	565
	Tap 3	415	445	490	535	565	605	650	675	715
	Tap 4	580	610	655	695	740	785	830	870	910

### CB31MV-51 AND CB31MV-65 BLOWER MOTOR WATTS AT "-" (Minus) BDC3 SETTING ("Adjust" Jumper at "-" Setting)

BDC3 Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"HEAT" Speed	Tap 1	265	305	340	370	410	440	460	505	540
	Tap 2	320	350	395	420	450	475	515	545	580
	Tap 3	375	410	435	470	515	545	575	610	645
	Tap 4	400	435	480	525	555	595	640	670	700
"COOL" Speed	Tap 1	140	170	195	215	250	275	300	335	360
	Tap 2	200	230	260	285	315	355	385	415	450
	Tap 3	280	315	340	380	415	445	465	505	540
	Tap 4	375	420	440	475	515	550	575	610	645

## CB31MV-41 - ELECTRIC HEAT DATA

### SINGLE PHASE ELECTRIC HEAT

SINGLE PHASE ELECTRIC HEAT						CB31MV-41								
						No. of Stages	Volts Input	kW Input	1 Btuh Input	2 Blower Motor Full Load Amps	3 Minimum Circuit Ampacity		5 Maximum Overcurrent Protection	
											1	2	1	2
<b>5 kW</b> 4 lbs.	ECB29-5 ( <b>28K31</b> ) Terminal Block	1	208	3.8	12,800	4.3	28	---	30	---				
	ECB29-5CB ( <b>28K32</b> ) 30A Circuit breaker		220	4.2	14,300	4.3	31	---	35	---				
			230	4.6	15,700	4.3	31	---	35	---				
			240	5.0	17,100	4.3	31	---	35	---				
<b>6 kW</b> 4 lbs.	ECB29-6 ( <b>47L22</b> ) Terminal Block	1	208	4.5	15,400	4.3	32	---	35	---				
	ECB29-6CB ( <b>47L23</b> ) 35A Circuit breaker		220	5.0	17,100	4.3	37	---	40	---				
			230	5.5	18,800	4.3	37	---	40	---				
			240	6.0	20,500	4.3	37	---	40	---				
<b>8 kW</b> 5 lbs.	ECB29-8 ( <b>28K33</b> ) Terminal Block	1	208	6.0	20,500	4.3	41	---	45	---				
	ECB29-8CB ( <b>28K34</b> ) 45A Circuit breaker		220	6.7	22,900	4.3	47	---	50	---				
			230	7.3	25,100	4.3	47	---	50	---				
			240	8.0	27,300	4.3	47	---	50	---				
<b>9 kW</b> 5 lbs.	ECB299CB ( <b>10L11</b> ) 50A Circuit breaker	2	208	6.8	23,100	4.3	46	---	50	---				
	ECB29EH-9CB ( <b>91K67</b> ) 50A Circuit breaker		220	7.6	25,800	4.3	52	---	60	---				
			230	8.3	28,200	4.3	52	---	60	---				
			240	9.0	30,700	4.3	52	---	60	---				
<b>12.5 kW</b> 10 lbs.	ECB29-12.5CB ( <b>28K37</b> ) (1) 25A & (1) 50A Circuit breaker	2	208	9.4	32,000	4.3	24	31	25	<b>4 45</b>				
	ECB29EH-12.5CB ( <b>91K68</b> ) (1) 25A & (1) 50A Circuit breaker		220	10.5	35,800	4.3	27	35	30	50				
			230	11.5	39,200	4.3	27	35	30	50				
			240	12.5	42,600	4.3	27	35	30	50				
<b>15 kW</b> 12 lbs.	ECB29-15CB ( <b>28K38</b> ) (1) 30A & (1) 60A Circuit breaker	2	208	11.3	38,400	4.3	28	37	30	<b>4 50</b>				
	ECB29EH-15CB ( <b>91K69</b> ) (1) 30A & (1) 60A Circuit breaker		220	12.6	43,000	4.3	31	42	35	60				
			230	13.8	47,000	4.3	31	42	35	60				
			240	15.0	51,200	4.3	31	42	35	60				
<b>20 kW</b> 19 lbs.	ECB29-20CB ( <b>11L31</b> ) (1) 50A & (1) 60A Circuit breaker	2	208	15.0	51,200	4.3	47	41	50	60				
	ECB29EH-20CB ( <b>91K70</b> ) (1) 50A & (1) 60A Circuit breaker		220	16.8	57,300	4.3	52	46	60	60				
			230	18.4	62,700	4.3	52	46	60	60				
			240	20.0	68,200	4.3	52	46	60	60				

### THREE PHASE ELECTRIC HEAT

<b>8 kW</b> 5 lbs.	ECB29-8 ( <b>28K42</b> ) Terminal Block	1	208	6.0	20,500	4.3	26	---	30	---
			220	6.7	22,900	4.3	29	---	30	---
			230	7.3	25,100	4.3	29	---	30	---
			240	8.0	27,300	4.3	29	---	30	---
<b>10 kW</b> 6 lbs.	ECB29-10 ( <b>28K43</b> ) Terminal Block	1	208	7.5	25,600	4.3	31	---	35	---
			220	8.4	28,700	4.3	35	---	35	---
			230	9.2	31,400	4.3	35	---	35	---
			240	10.0	34,100	4.3	35	---	35	---
<b>15 kW</b> 12 lbs.	ECB29-15CB ( <b>28K44</b> ) 50A Circuit breaker	1	208	11.3	38,400	4.3	44	---	<b>4 45</b>	---
			220	12.6	43,000	4.3	50	---	50	---
			230	13.5	47,000	4.3	50	---	50	---
			240	15.0	51,200	4.3	50	---	50	---
<b>20 kW</b> 19 lbs.	ECB29-20CB ( <b>28K45</b> ) (2) 35A Circuit breaker	2	208	15.0	51,200	4.3	31	21	35	<b>4 30</b>
			220	16.8	57,300	4.3	35	24	35	35
			230	18.4	62,700	4.3	35	24	35	35
			240	20.0	68,200	4.3	35	24	35	35

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

<sup>1</sup> Electric heater capacity only — does not include additional blower motor heat capacity.

<sup>2</sup> Amps shown are for blower motor only.

<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

<sup>4</sup> **Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted.**

<sup>5</sup> HACR type circuit breaker or fuse.



## CB31MV-51 AND CB31MV-65 - ELECTRIC HEAT DATA

### SINGLE PHASE ELECTRIC HEAT

Model Number		No. of Stages	Volts Input	kW Input	1 Btuh Input	2 Blower Motor Full Load Amps	CB31MV-51 and CB31MV-65					
							3 Minimum Circuit Ampacity			5 Maximum Overcurrent Protection		
							Circuit 1	Circuit 2	Circuit 3	Circuit 1	Circuit 2	Circuit 3
5 kW 4 lbs.	ECB29-5 (28K31) Terminal Block	1	208	3.8	12,800	9.1	34	---	---	40	---	---
	ECB29-5CB (28K32) 30A Circuit breaker		220	4.2	14,300	9.1	37	---	---	45	---	---
			230	4.6	15,700	9.1	37	---	---	45	---	---
			240	5.0	17,100	9.1	37	---	---	45	---	---
6 kW 4 lbs.	ECB29-6 (47L22) Terminal Block	1	208	4.5	15,400	9.1	36	---	---	45	---	---
	ECB29-6CB (47L23) 35A Circuit breaker		220	5.0	17,100	9.1	43	---	---	50	---	---
			230	5.5	18,800	9.1	43	---	---	50	---	---
			240	6.0	20,500	9.1	43	---	---	50	---	---
8 kW 5 lbs.	ECB29-8 (28K33) Terminal Block	1	208	6.0	20,500	9.1	47	---	---	50	---	---
	ECB29-8CB (28K34) 45A Circuit breaker		220	6.7	22,900	9.1	53	---	---	60	---	---
			230	7.3	25,100	9.1	53	---	---	60	---	---
			240	8.0	27,300	9.1	53	---	---	60	---	---
9 kW 5 lbs.	ECB29-9CB (10L11) 50A Circuit breaker	1	208	6.8	23,100	9.1	52	---	---	60	---	---
	ECB29EH-9CB (91K67) 50A Circuit breaker		220	7.6	25,800	9.1	58	---	---	60	---	---
			230	8.3	28,200	9.1	58	---	---	60	---	---
			240	9.0	30,700	9.1	58	---	---	60	---	---
12.5 kW 10 lbs.	ECB29-12.5CB (28K37) (1) 25A & (1) 50A Circuit breaker	2	208	9.4	32,000	9.1	30	31	---	<b>4 40</b>	<b>4 45</b>	---
	ECB29EH-12.5CB (91K68) (1) 25A & (1) 50A Circuit breaker		220	10.5	35,800	9.1	33	35	---	<b>4 45</b>	50	---
			230	11.5	39,200	9.1	33	35	---	<b>4 45</b>	50	---
			240	12.5	42,600	9.1	33	35	---	<b>4 45</b>	50	---
15 kW 12 lbs.	ECB29-15CB (28K38) (1) 30A & (1) 60A Circuit breaker	2	208	11.3	38,400	9.1	34	37	---	<b>4 40</b>	<b>4 50</b>	---
	ECB29EH-15CB (91K69) (1) 30A & (1) 60A Circuit breaker		220	12.6	43,000	9.1	37	42	---	<b>4 45</b>	60	---
			230	13.5	47,000	9.1	37	42	---	<b>4 45</b>	60	---
			240	15.0	51,200	9.1	37	42	---	<b>4 45</b>	60	---
20 kW 19 lbs.	ECB29-20CB (11L31) (1) 50A & (1) 60A Circuit breaker	2	208	15.0	51,200	9.1	53	41	---	60	60	---
	ECB29EH-20CB (91K70) (1) 50A & (1) 60A Circuit breaker		220	16.8	57,300	9.1	58	46	---	60	60	---
			230	18.4	62,700	9.1	58	46	---	60	60	---
			240	20.0	68,200	9.1	58	46	---	60	60	---
25 kW 19 lbs.	ECB29-25CB (28K40) (3) 50A Breakers	3	208	18.8	64,100	9.1	49	31	31	50	<b>4 45</b>	<b>4 45</b>
			220	21.0	71,700	9.1	54	35	35	60	50	50
			230	23.0	78,300	9.1	54	35	35	60	50	50
			240	25.0	85,300	9.1	54	35	35	60	50	50

### THREE PHASE ELECTRIC HEAT

8 kW 5 lbs.	ECB29-8 (28K42) Terminal block	1	208	6.0	20,500	9.1	32	---	---	40	---	---
			220	6.7	22,900	9.1	35	---	---	40	---	---
			230	7.3	25,100	9.1	35	---	---	40	---	---
			240	8.0	27,300	9.1	35	---	---	40	---	---
10 kW 6 lbs.	ECB29-10 (28K43) Terminal block	1	208	7.5	25,600	9.1	37	---	---	45	---	---
			220	8.4	28,700	9.1	41	---	---	50	---	---
			230	9.2	31,400	9.1	41	---	---	50	---	---
			240	10.0	34,100	9.1	41	---	---	50	---	---
15 kW 12 lbs.	ECB29-15CB (28K44) 50A Circuit breaker	1	208	11.3	38,400	9.1	50	---	---	60	---	---
			220	12.6	43,000	9.1	56	---	---	60	---	---
			230	13.5	47,000	9.1	56	---	---	60	---	---
			240	15.0	51,200	9.1	56	---	---	60	---	---
20 kW 19 lbs	ECB29-20CB (28K45) (2) 35A Circuit breakers	2	208	15.0	51,200	9.1	37	21	---	<b>4 45</b>	<b>4 30</b>	---
			220	16.8	57,300	9.1	41	24	---	<b>4 50</b>	35	---
			230	18.4	62,700	9.1	41	24	---	<b>4 50</b>	35	---
			240	20.0	68,200	9.1	41	24	---	<b>4 50</b>	35	---
25 kW 19 lbs	ECB29-25CB (28K46) (2) 45A Circuit breakers	2	208	18.8	64,100	9.1	44	27	---	50	<b>4 40</b>	---
			220	21.0	71,700	9.1	49	30	---	<b>4 60</b>	45	---
			230	23.0	78,300	9.1	49	30	---	<b>4 60</b>	45	---
			240	25.0	85,300	9.1	49	30	---	<b>4 60</b>	45	---

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

<sup>1</sup> Electric heater capacity only — does not include additional blower motor heat capacity.

<sup>2</sup> Amps shown are for blower motor only.

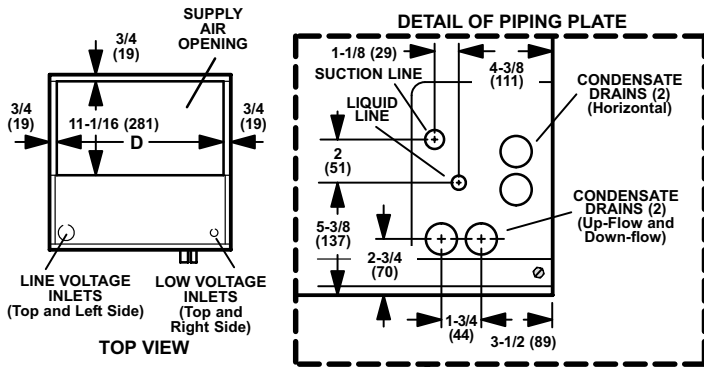
<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

<sup>4</sup> **Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted.**

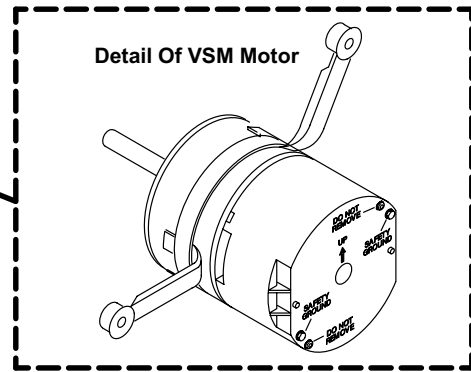
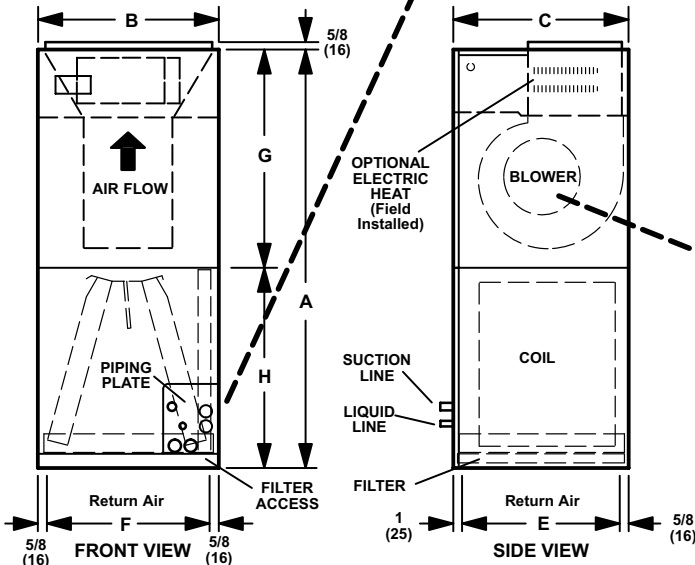
<sup>5</sup> HACR type circuit breaker or fuse.

**DIMENSIONS - INCHES (MM)**

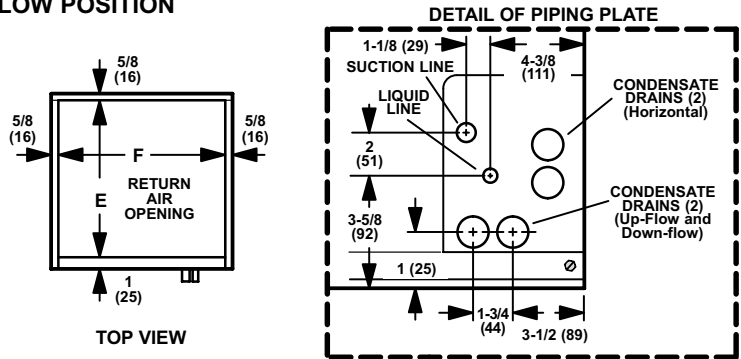
**UP-FLOW POSITION**



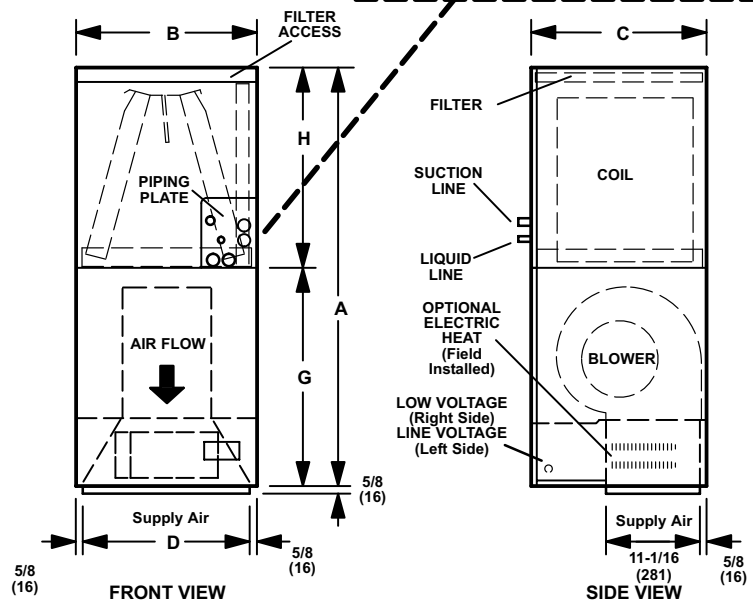
Model No.	CB31MV-41		CB31MV-51 CB31MV-65	
	inch	mm	inch	mm
A	51	1295	58-1/2	1486
B	21-1/4	540	21-1/4	540
C	22-5/8	575	24-5/8	625
D	19-3/4	502	19-3/4	502
E	21	533	23	584
F	20	508	20	508
G	26-3/8	670	27-7/8	708
H	24-5/8	625	30-5/8	778



**DOWN-FLOW POSITION**

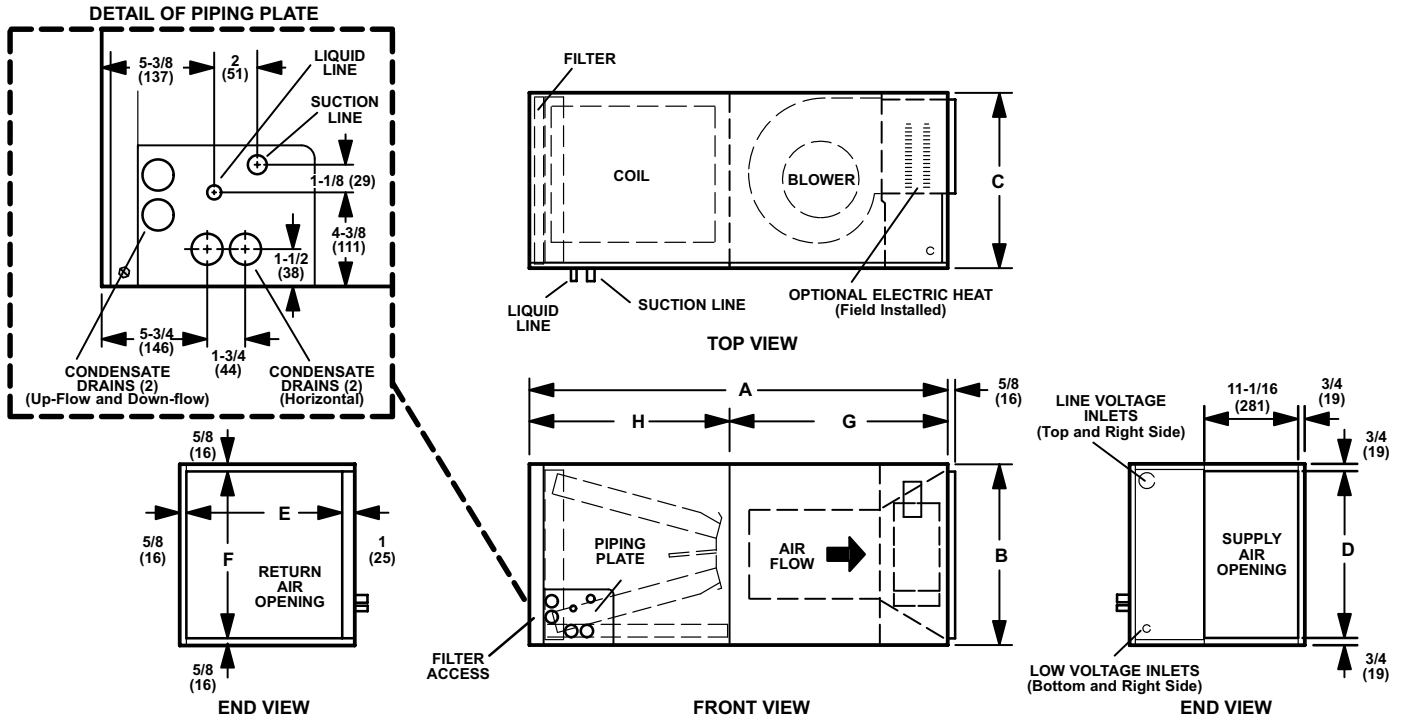


Model No.	CB31MV-41		CB31MV-51 CB31MV-65	
	inch	mm	inch	mm
A	51	1295	58-1/2	1486
B	21-1/4	540	21-1/4	540
C	22-5/8	575	24-5/8	625
D	19-3/4	502	19-3/4	502
E	21	533	23	584
F	20	508	20	508
G	26-3/8	670	27-7/8	708
H	24-5/8	625	30-5/8	778

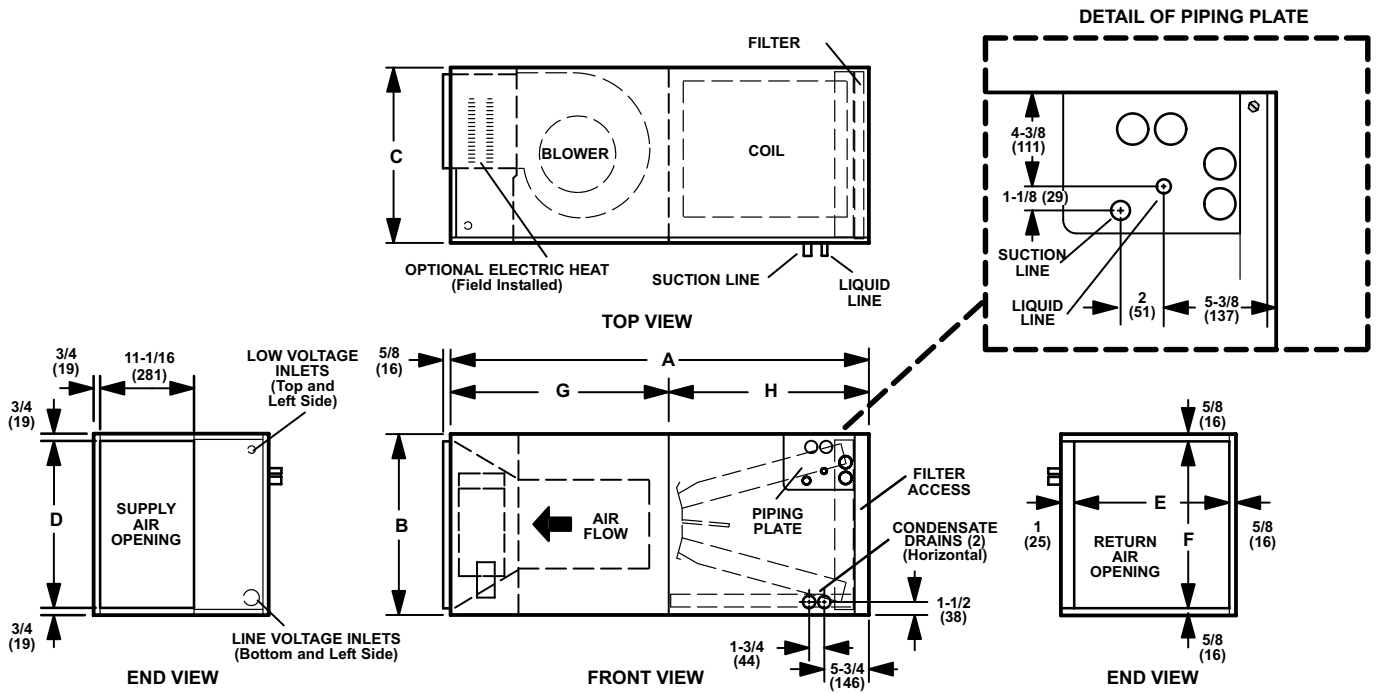


# DIMENSIONS - INCHES (MM)

## HORIZONTAL POSITION (RIGHT-HAND AIR DISCHARGE)



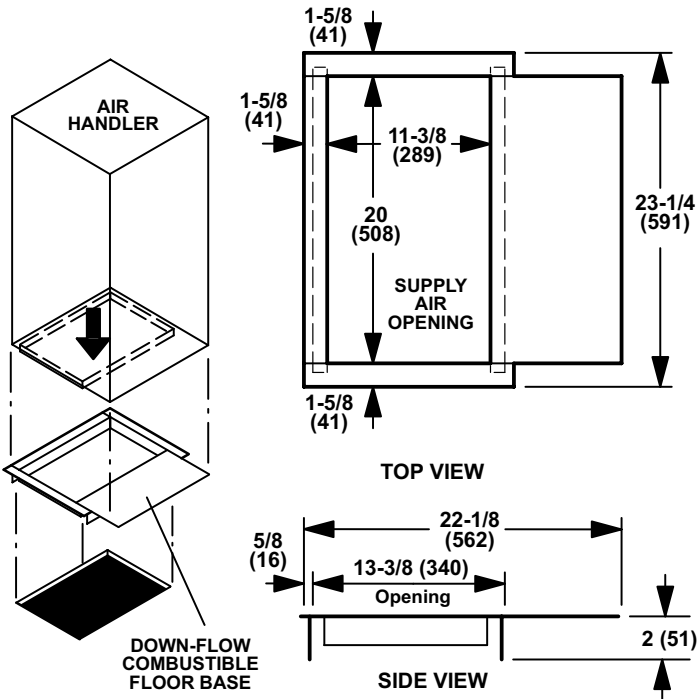
## HORIZONTAL POSITION (LEFT-HAND AIR DISCHARGE)



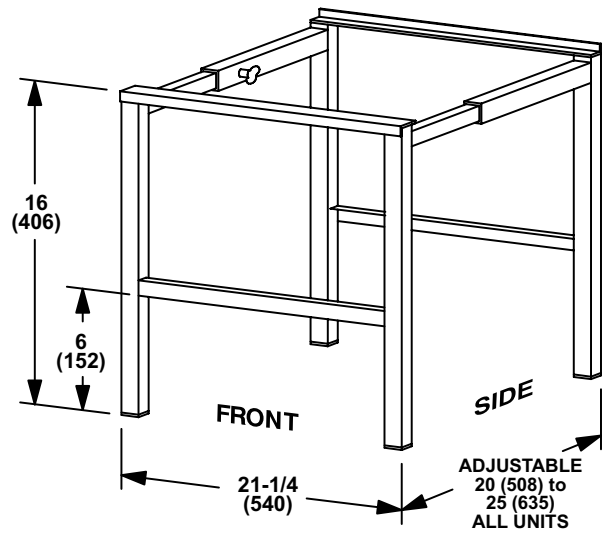
Model No.	A		B		C		D		E		F		G		H	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CB31MV-41	51	1295	21-1/4	540	22-5/8	575	19-3/4	502	21	533	20	508	26-3/8	670	24-5/8	625
CB31MV-51 CB31MV-65	58-1/2	1486	21-1/4	540	24-5/8	625	19-3/4	502	23	584	20	508	27-7/8	708	30-5/8	778

**DIMENSIONS - INCHES (MM)**

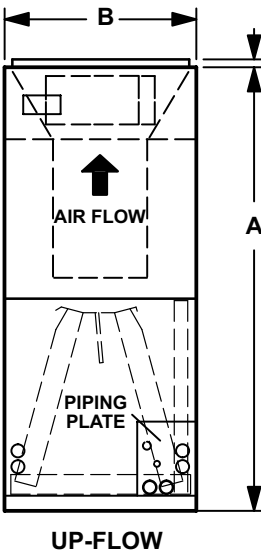
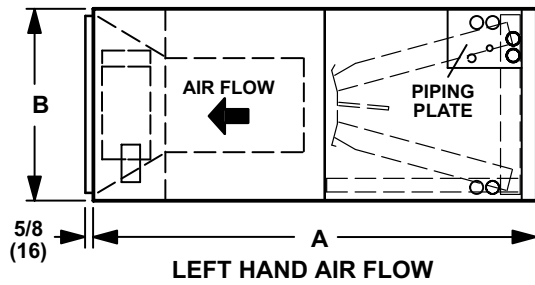
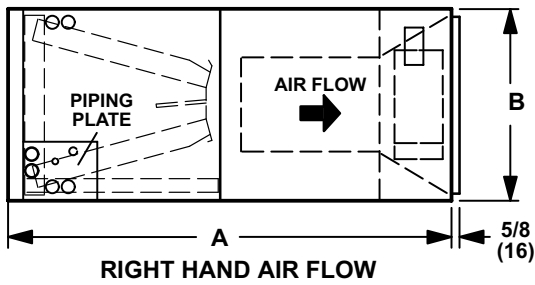
**DOWN-FLOW COMBUSTIBLE FLOOR BASE**



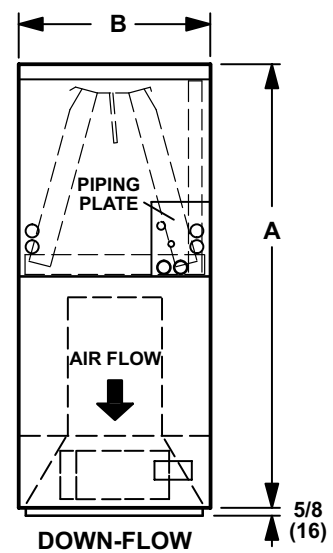
**SIDE RETURN UNIT STAND (Up-Flow Only)**



**AIR FLOW**



Model No.	A		B	
	in.	mm	in.	mm
CB31MV-41	51	1295	21-1/4	540
CB31MV-51 CB31MV-65	58-1/2	1486	21-1/4	540



**REVISIONS**

Section	Description of Change
Electric Heat Data	Revised staging information.







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