

TECHNICAL SUPPORT MANUAL

Fan Coils

FVM4X “B” Series

Safety Labeling and Signal Words

DANGER, WARNING, CAUTION, and NOTE

The signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING**, **CAUTION**, and **NOTE** will be used on product labels and throughout this manual and other manuals that may apply to the product.

DANGER – Immediate hazards which **will** result in severe personal injury or death.

WARNING – Hazards or unsafe practices which **could** result in severe personal injury or death.

CAUTION – Hazards or unsafe practices which **may** result in minor personal injury or product or property damage.

NOTE – Used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:



The signal word **CAUTION** is used throughout this manual in the following manner:



Signal Words on Product Labeling

Signal words are used in combination with colors and/or pictures on product labels.

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ELECTRICAL SHOCK HAZARD

Failure to turn off electric power could result in personal injury or death.

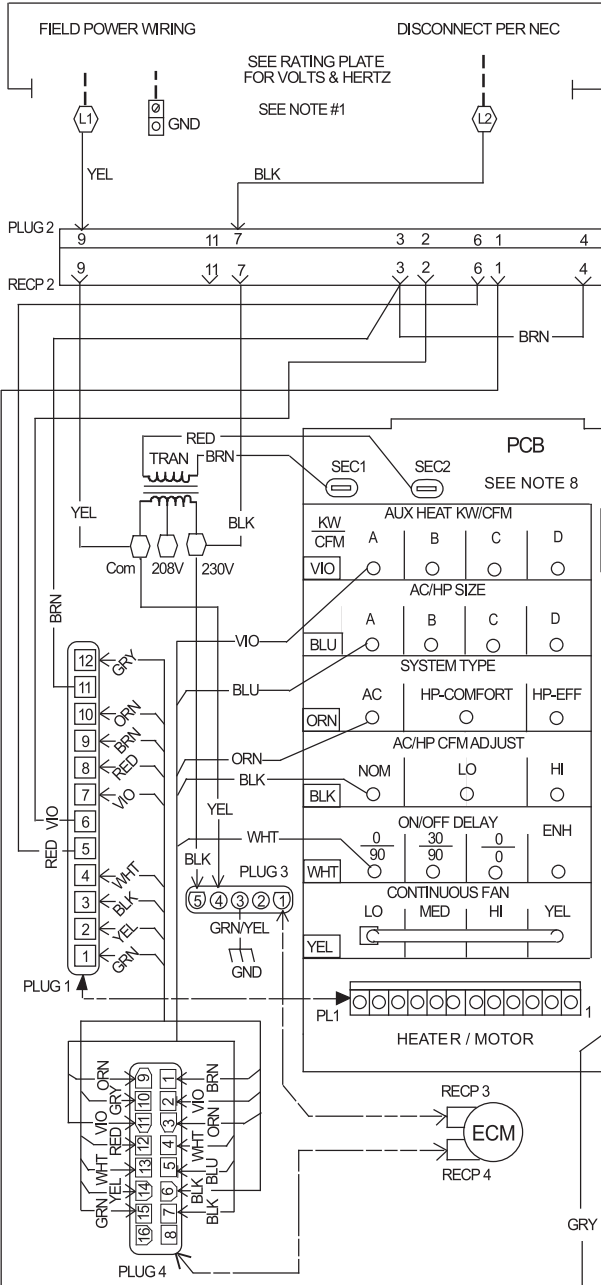
Before installing or servicing system, turn off main power to the system. There may be more than one disconnect switch, including accessory heater(s).

Wiring Diagram

THIS COMPARTMENT MUST BE CLOSED EXCEPT FOR SERVICING

BLOWER MOTOR ROTATION

COOLING ONLY SCHEMATIC DIAGRAM



AIRFLOW ADJUST TABLE

UNIT SIZE	AUX HEAT RANGE (KW/CFM)				
	VIO	A	B	C	D
2400	0-20 / 1100	0-15 / 875	0-10 / 675	0-5 / 625	0-5 / 625
3600	0-20 / 1225	0-15 / 1100	0-10 / 875	0-5 / 800	0-5 / 800
4800	0-30 / 1500	0-20 / 1250	0-15 / 1100	0-10 / 975	0-10 / 975
6000	0-30 / 1750	0-20 / 1525	0-15 / 1350	0-10 / 1100	0-10 / 1100

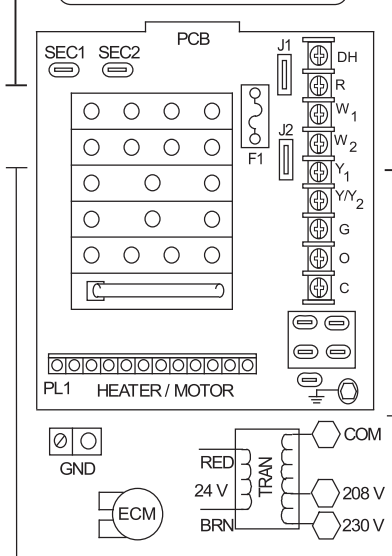
AC/HP SIZE

BLU	AC/HP SIZE			
	A	B	C	D
2400	36	30	24	18
3600	42	36	30	24
4800	48	42	36	30
6000	60	48	42	36

LEGEND

---	FIELD POWER WIRING	GND	EQUIPMENT GROUND
◯	MARKED TERMINAL	ECM	FAN MOTOR
⊞	PLUG AND RECEPTACLE	PCB	PRINTED CIRCUIT BOARD
COM	COMMON	RECP	RECEPTACLE
F1	LOW VOLTAGE FUSE	TRAN	TRANSFORMER

COMPONENT ARRANGEMENT



NOTES:

1. Use copper wire (75°C min) only between Disconnect Switch and unit.
2. To be wired in accordance with N.E.C. and local codes.
3. Transformer primary leads, blue 208v, red 230v.
4. If any of the original wire, as supplied, must be replaced, use the same or equivalent type wire.
5. Replace low voltage fuse with no greater than 5 amp fuse.
6. Use 60 amp class K fuses only, for replacement.
7. Connect R to R, G to G, etc., see outdoor instruction for details.
8. Use table to select proper airflow for aux heat size and AC/HP size.



339117-101 REV. A

FAN COIL MODEL NUMBER IDENTIFICATION GUIDE								
	F	V	M	2	X	2400	B	1
F = Fan Coil								
V = Variable speed ECM motor		MOTOR TYPE						
M = Multiposition		INSTALLATION TYPE						
2 = R-22								
4 = Environmentally Sound R-410A				REFRIGERANT				
X = TXV				METERING DEVICE				
2400 = 24,000 BTUH = 2 tons								
3600 = 36,000 BTUH = 3 tons								
4800 = 48,000 BTUH = 4 tons								
6000 = 60,000 BTUH = 5 tons						NOMINAL CAPACITY		
Sales Code								
Engineering Revision								

ACCESSORIES PART NUMBER IDENTIFICATION GUIDE					
	EB	AC	01	NCB	A
EB = Evaporator Blower					
AC = Accessory					
01 = Product Identifier Number					
NCB = Non-Combustible Base Kit					
DFK = Down Flow Kit					
PLG = Power Plug (no heat kit)					
SPK = Single Point Wiring Kit					
FKS = Filter Kit Small					
FKM = Filter Kit Medium					
FKL = Filter Kit Large					
FKX = Filter Kit Extra Large					
CTK = Condensate Trap Kit (PVC pipe)					
Sales Code					

FAN COIL AIRFLOW DELIVERY (CFM) IN COOLING MODE (A/C OR HP)										
Fan Coil Size	Outdoor Unit Size	Single Stage Cooling		Two-Stage Cooling				Fan Only		
		Nominal	Dehum	High		Low				
				Nominal	Dehum	Nominal	Dehum	Nominal	Dehum	Low
2400	18	525	420	Two-Stage outdoor unit not offered				350	420	525
	24	700	560	700	560	560	450	350	560	700
	30	875	700	Two-Stage outdoor unit not offered				440	700	875
	36	1050	840	1050	840	840	670	525	840	1050
3600	24	700	560	700	560	560	450	415	560	700
	30	875	700	Two-Stage outdoor unit not offered				440	700	875
	36	1050	840	1050	840	840	670	525	840	1050
	42	1225	980	Two-Stage outdoor unit not offered				615	980	1225
4800	30	875	700	Two-Stage outdoor unit not offered				440	700	875
	36	1050	840	1050	840	840	670	525	840	1050
	42	1225	980	Two-Stage outdoor unit not offered				615	980	1225
	48	1400	1120	1400	1120	1120	900	700	1120	1400
6000	36	1050	840	1050	840	840	670	540	840	1050
	42	1225	980	Two-Stage outdoor unit not offered				615	980	1225
	48	1400	1120	1400	1120	1120	900	700	1120	1400
	60	1750	1400	1750	1400	1400	1120	875	1400	1750

NOTES:

1. The above airflows result with the AC/HP CFM ADJUST select jumper set on NOM.
2. Airflow can be adjusted +15% or -10% by selecting Hi or Lo respectively for all modes except fan only.
3. Dry coil at 230 volts and with 10kW heater and filter installed.
4. Airflows shown are valid for systems with total static pressure between 0.1 and 0.7 inches water column.

Fan Coil Airflow Delivery (CFM) in Heat Pump Heating Mode Only										
Fan Coil Size	Outdoor Unit Size	Single Stage HP Heating		Two-Stage HP Heating				Fan Only		
		Comfort	Eff	High		Low				
				Comfort	Eff	Comfort	Eff	Comfort	Eff	Low
2400	18	475	525	Two-Stage outdoor unit not offered				350	380	475
	24	630	700	630	700	505	560	350	505	630
	30	785	875	Two-Stage outdoor unit not offered				440	630	785
	36	945	1050	945	1050	755	840	525	755	945
3600	24	630	700	630	700	505	560	415	505	630
	30	785	875	Two-Stage outdoor unit not offered				440	630	785
	36	945	1050	945	1050	755	840	525	755	945
	42	1100	1225	Two-Stage outdoor unit not offered				615	880	1100
4800	30	785	875	Two-Stage outdoor unit not offered				440	630	785
	36	945	1050	945	1050	755	840	525	755	945
	42	1100	1225	Two-Stage outdoor unit not offered				615	880	1100
	48	1260	1400	1260	1400	1010	1120	700	1010	1260
6000	36	945	1050	945	1050	755	840	540	755	945
	42	1100	1225	Two-Stage outdoor unit not offered				615	880	1100
	48	1260	1400	1260	1400	1010	1120	700	1010	1260
	60	1575	1750	1575	1750	1260	1400	875	1260	1575

NOTES:

1. The above airflows result with the AC/HP CFM ADJUST select jumper set on NOM.
2. Airflow can be adjusted +15% or -10% by selecting Hi or Lo respectively for all modes except fan only.
3. Dry coil at 230 volts and with 10kW heater and filter installed.
4. Airflows shown are valid for systems with total static pressure between 0.1 and 0.7 inches water column.

AIRFLOW DELIVERY (CFM)													
FVM Model Size	Outdoor Unit Capacity (BTUH)	Electric Heater kW Range											
		0 – 5			0 – 10			0 – 15			0 – 20		
		LO	NOM	HI	LO	NOM	HI	LO	NOM	HI	LO	NOM	HI
2400	18	625	625	625	675	675	675	*	*	*	*	*	*
	24	650	725	835	*	725	835	875	875	875	*	*	*
	30	815	905	1040	*	905	1040	900	900	1040	1100	1100	1100
	36	980	1085	1250	980	1085	1250	980	1085	1250	1100	1100	1250
3600	24	675	725	835	875	875	*	*	*	*	*	*	*
	30	815	905	1040	875	905	1040	1100	1100	1100	*	*	*
	36	980	1085	1250	980	1085	1250	1100	1100	1250	1225	1225	1250
	42	1140	1270	1460	1140	1270	1460	1140	1270	1460	1225	1270	1460
		0 – 10			0 – 15			0 – 20			0 – 30		
4800	30	975	975	1040	1100	1100	1100	*	*	*	*	*	*
	36	980	1085	1250	1100	1100	1250	1250	1250	1250	*	*	*
	42	1140	1270	1460	1140	1270	1460	1250	1270	1460	*	*	*
	48	1305	1450	1665	1305	1450	1665	1305	1450	1665	1500	1500	1665
6000	36	1100	1100	1250	1350	1350	1350	*	*	*	*	*	*
	42	1140	1270	1460	1350	1350	1460	1525	1525	1525	*	*	*
	48	1305	1450	1665	1350	1450	1665	1525	1525	1665	1750	1750	1750
	60	1630	1810	2085	1630	1810	2085	1630	1810	2085	1750	1810	2085

* Airflow not recommended for heater/system size

NOTE: LO, NOM, and HI refer to AC/HP CFM ADJUST selection on the Fan Control Board.

MINIMUM CFM FOR ELECTRIC HEATER APPLICATION						
FVM Model Size	Outdoor Unit Size	Heater Size kW				
		5	8, 9, 10	15	18, 20	24, 30
2400	18	625	625	--	--	--
	24	650	725	875	--	--
	30	800	875	875	1040	--
	36	970	970	970	1040	--
3600	24	675	875	--	--	--
	30	800	875	1100	1150	--
	36	975	975	1100	1225	--
	42	1125	1125	1125	1225	--
4800	30	800	875	875	1150	--
	36	975	975	1100	1225	--
	42	1125	1125	1125	1225	--
	48	1305	1305	1305	1305	1400
6000	36	1100	1100	1350	1350	--
	42	1125	1125	1350	1350	--
	48	1300	1300	1350	1465	1750
	60	1625	1625	1625	1750	1750

A/C Minimum CFM when using Electric Heat (CFM)						
FVM Model Size	Heater Only	Heater Size kW				
		5	8, 9, 10	15	18, 20	24, 30
2400	Heater Only	625	625	725	875	--
3600		675	700	850	1050	--
4800		675	700	850	1050	1400
6000		1050	1050	1050	1050	1750

NOTES:

1. Heater Only–Air conditioner with electric heater application.
2. These airflows are minimum acceptable airflows as UL listed. Actual airflow delivered will be per airflow delivery chart for Electric Heating Modes.

AIRFLOW PERFORMANCE – CFM RANGE		
Fan Coil Size	Use with Outdoor Unit Size	CFM Range
2400	18, 24, 30, 36	350 – 1200
3600	24, 30, 36, 42	415 – 1400
4800	30, 36, 42, 48	425 – 1600
6000	36, 42, 48, 60	540 – 2000

SEQUENCE OF OPERATION

FVM fan coils will supply airflow in a range which is more than twice the range of a standard fan coil. Each fan coil size is designed to provide nominal cooling capacities at 50 °F evaporator temperature and the required airflow in order to match with any of four (4) different air conditioner or heat pump outdoor unit sizes. Refer to Airflow Performance (above) for the CFM range for the different FVM fan coils.

The blower motor is a true variable speed motor designed to deliver constant CFM. Constant CFM is valid for systems with total external static pressure between 0.1 and 0.7 inches water column.

A. CONTINUOUS FAN

- Thermostat close circuit R to G.
- Blower runs at continuous fan airflow.

B. COOLING MODE – SINGLE STAGE

- If indoor temperature is above temperature set point and humidity is below humidity set point, thermostat closes circuits R to G, R to Y/Y2 and R to O.

NOTE: For single stage systems, do not use the Y1 terminal.

- Fan coil delivers single stage cooling airflow.

C. COOLING MODE – TWO STAGE

- First stage (low) cooling: Thermostat closes circuits to R to G, R to O, and R to Y1.
- Fan coil delivers low stage cooling airflow.
- Second stage (high) cooling: Thermostat closes circuits to R to G, R to O, R to Y1, and R to Y/Y2.
- Fan coil delivers high stage cooling airflow.

D. COOLING MODE – DEHUMIDIFICATION

NOTE: FVM4X**B* Dehumidification functionality has changed from previous fan coil series Enhanced Dehumidification - requires removing J1 jumper to activate the dehumidification mode, and install humidistat control between terminals R & Dh terminals (see page 6 Humidistat Wiring for De-Humidify Mode).

- If indoor temperature is above temperature set point and humidity is above humidity set point, thermostat closes circuits R to G, R to Y/Y2 and R to O and humidistat "opens R to DH".
- The fan coil delivers airflow which is approximately 80% of the nominal cooling airflow to increase the latent capacity of the system.

E. ELECTRIC HEAT HEATING MODE

- Thermostat closes circuit R to W/W1, or W2
- Fan coil delivers the selected electric heat airflow.

F. HEAT PUMP HEATING MODE – SINGLE STAGE

- Thermostat closes circuits R to G and R to Y/Y2.

NOTE: For single stage systems, do not use the Y1 terminal.

- Fan coil delivers single stage heat pump heating airflow.

G. HEAT PUMP HEATING MODE – TWO STAGE

- First stage (low) heating: Thermostat closes circuits R to G and R to Y1.
- Fan coil delivers low stage heating airflow.
- Second stage (high) heating: Thermostat closes R to G, R to Y1 and R to Y/Y2.
- Fan coil delivers high stage heating airflow.

H. HEAT PUMP HEATING WITH AUXILIARY ELECTRIC HEAT

- Thermostat closes circuits R to G, R to Y/Y2 and/or R to Y1 with R to W/W1 or W2 (and R to O in the case of defrost).

If the thermostat calls for electric heat when the heat pump is operating in heating or defrost, the motor will modify the airflow if necessary. The motor will provide an airflow which is safe for the operation of the electric heat. That airflow is the greater of the heat pump heating airflow and the electric heat only airflow.

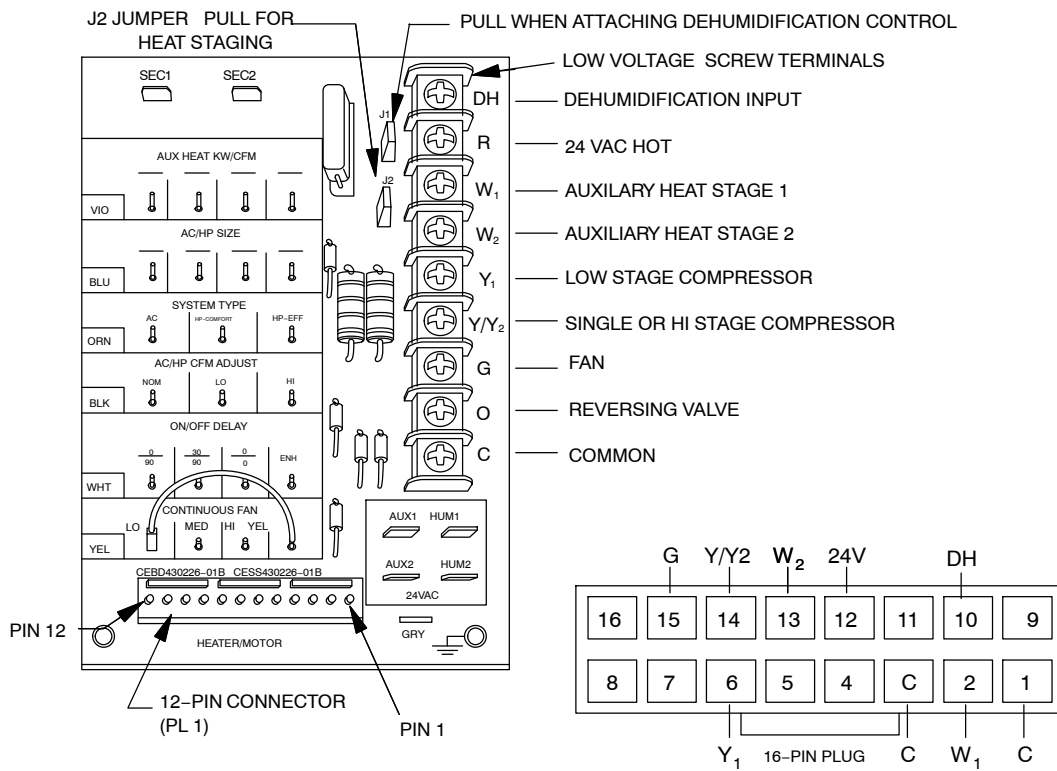
CAUTION

ELECTRICAL SHOCK or UNIT DAMAGE HAZARD

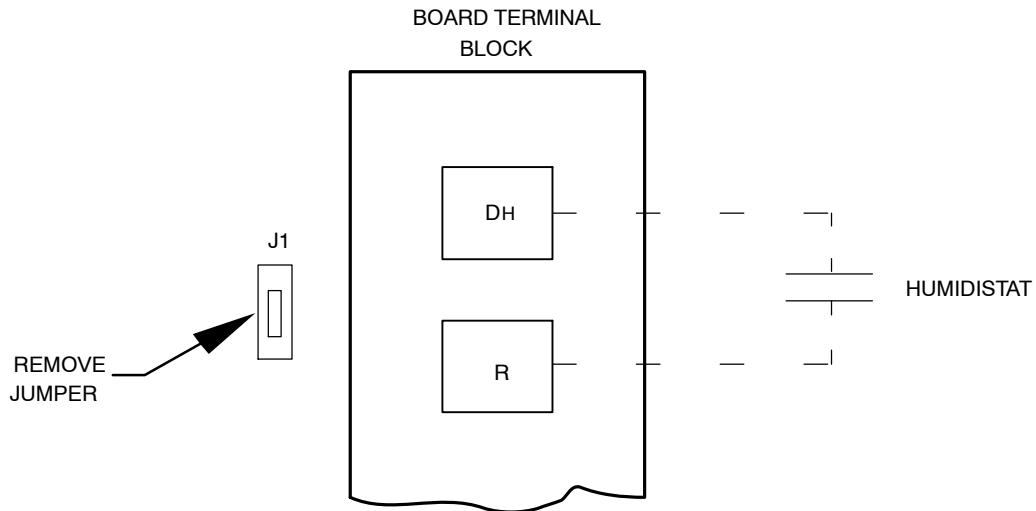
Failure to carefully read and follow this CAUTION may result in equipment malfunction, property damage, personal injury and/or death.

Disconnect power to unit before removing or replacing connectors or servicing motor. Wait at least five (5) minutes after disconnecting power before opening motor.

FAN CONTROL BOARD



Humidistat Wiring for De-Humidify Mode



TROUBLESHOOTING ECM MOTOR AND CONTROLS

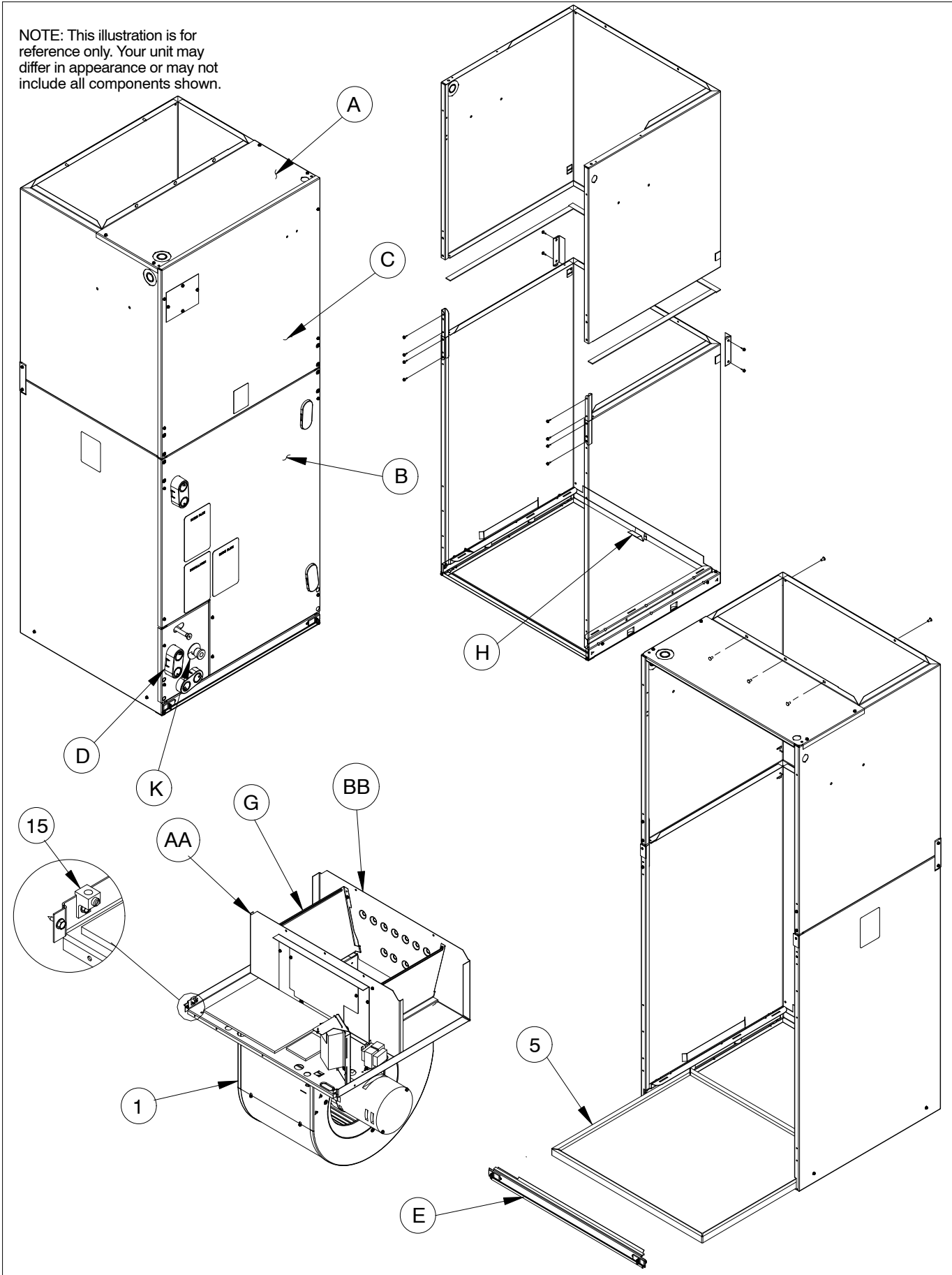
SEE INSTALLATION INSTRUCTIONS FOR TROUBLESHOOTING INFORMATION.

FCM4X PARTS LIST						
KEY NO.	DESCRIPTION	PART NO.	FVM4X2400BT1	FVM4X3600BT1	FVM4X4800BT1	FVM4X6000BT1
01	BLOWER ASY	1183569	1	-	-	-
01	BLOWER ASY	1183570	-	1	-	-
01	BLOWER ASY	1183571	-	-	1	-
01	BLOWER ASY	1183572	-	-	-	1
02	TRANS 208/230>24 40VA	1170676	1	1	1	1
03	BOARD CIRCUIT CONTROL	1185358	1	1	1	1
04	HARNES ASSY BLOWER	1171676	1	1	1	1
05	FILTER HH 21.5X16.375X1	1171652	1	-	-	-
05	FILTER HH 21.5X19.875X1	1171653	-	1	1	-
05	FILTER HH 21.5X23.3125X1	1171654	-	-	-	1
06	VALVE EXPANSION	1172348	1	-	-	-
06	VALVE EXPANSION	1172349	-	1	-	-
06	VALVE EXPANSION	1172350	-	-	1	1
07	COIL AND HDR ASY	1183574	1	-	-	-
07	COIL AND HDR ASY	1179023	-	1	-	-
07	COIL AND HDR ASY	1179025	-	-	1	-
07	COIL AND HDR ASY	1179026	-	-	-	1
08	STRAINER	1171740	1	1	1	1
09	PAN DRAIN	1179727	1	-	-	-
09	PAN DRAIN	1179674	-	-	1	-
09	PAN DRAIN	1179728	-	-	-	1
10	CNDS PAN ASY	1179675	1	-	-	-
10	CNDS PAN ASY	1179731	-	1	-	-
10	CNDS PAN ASY	1179676	-	-	1	-
10	CNDS PAN ASY	1179677	-	-	-	1
11	WHEEL DD9X7X1/2 CW CV	1171744	1	-	-	-
11	WHEEL DD10X9X1/2 CW CV	1171741	-	1	1	1
12	MOTOR 1/2 HP	1185246	1	-	-	-
12	MOTOR 1/2 HP	1185247	-	1	-	-
12	MOTOR 1/2 HP	1185248	-	-	1	-
12	MOTOR 3/4 HP	1185249	-	-	-	1
12A	MODULE CONTROL	1176245	1	-	-	-
12A	MODULE CONTROL	1176246	-	1	-	-
12A	MODULE CONTROL	1176247	-	-	1	-
12A	MODULE CONTROL	1176248	-	-	-	1
12B	MTR BLR 1/115 1/2 1240 GE VARI	1172828	1	1	1	-
12B	MTR BLR 1/115 .75/1 1240 GEVAR	1172829	-	-	-	1
13	HARNES ASSY UNIT	1174913	1	1	1	1
14	PANEL CUTOFF BLWR	1171571	1	-	-	-
14	PANEL CUTOFF BLWR	1171568	-	1	1	1
15	LUG GROUND	1170677	1	1	1	1

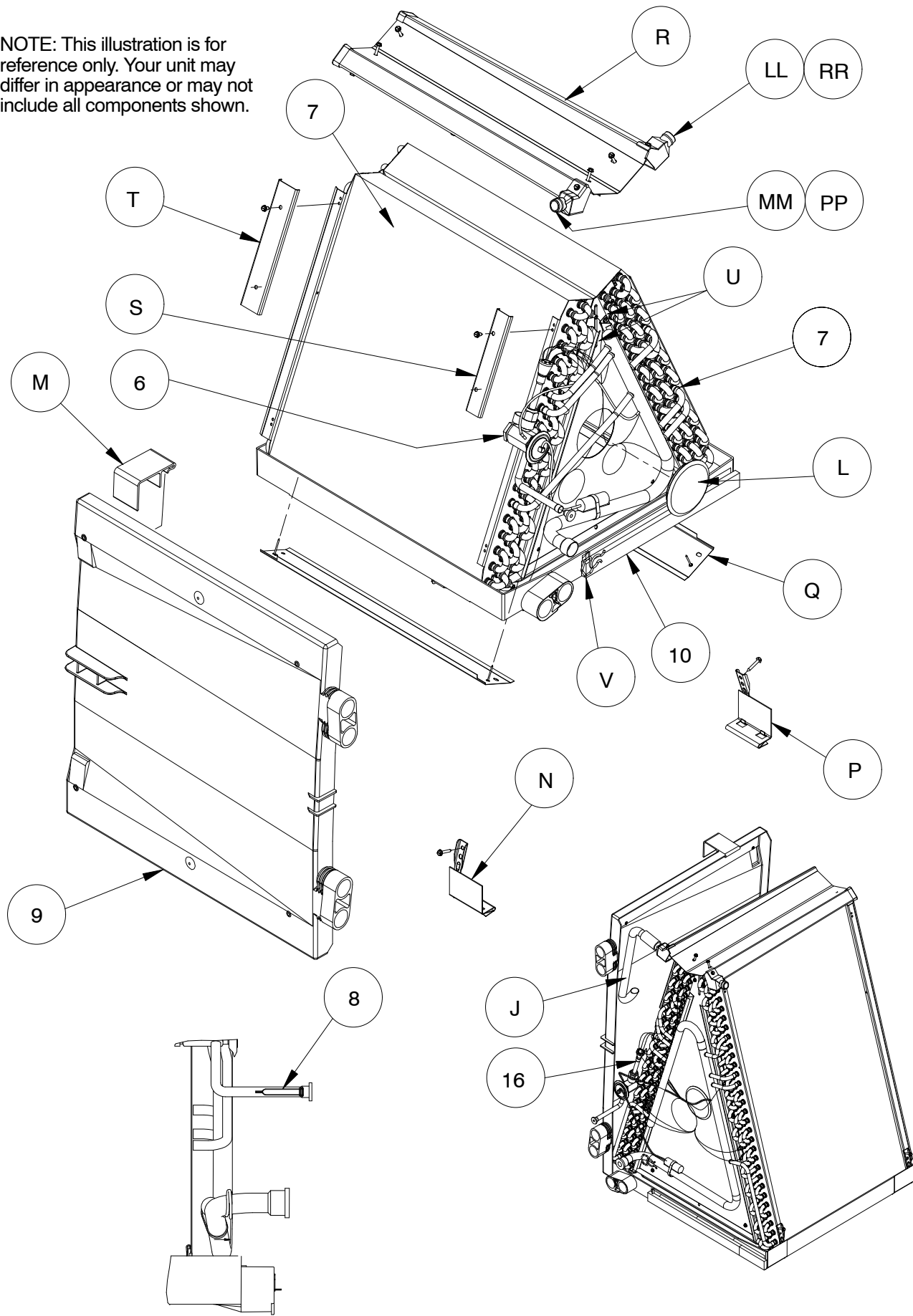
FCM4X PARTS LIST (continued)						
KEY NO.	DESCRIPTION	PART NO.	FVM4X2400BT1	FVM4X3600BT1	FVM4X4800BT1	FVM4X6000BT1
16	DISTRIBUTOR ASY	1171924	1	-	-	-
16	DISTRIBUTOR ASY	1172888	-	1	-	-
16	DISTRIBUTOR ASY	1171606	-	-	1	-
16	DISTRIBUTOR ASY	1171605	-	-	-	1
A	PANEL TOP	1172364	1	-	-	-
A	PANEL TOP	1172335	-	1	1	-
A	PANEL TOP	1172336	-	-	-	1
AA	PLATE HEATER	1171584	1	-	-	-
AA	PLATE HEATER	1171581	-	1	1	-
AA	PLATE HEATER	1171582	-	-	-	1
B	DOOR LOWER	1172369	1	-	-	-
B	DOOR LOWER	1172340	-	1	-	-
B	DOOR ASSY LOWER	1173795	-	-	1	-
B	DOOR LOWER	1172342	-	-	-	1
BB	DECK BLOWER	1171586	1	-	-	-
BB	DECK BLOWER	1171588	-	1	1	-
BB	DECK BLOWER	1171589	-	-	-	1
C	DOOR UPPER	1172380	1	-	-	-
C	DOOR UPPER	1172346	-	1	-	-
C	DOOR ASSY UPPER	1173796	-	-	1	-
C	DOOR UPPER	1172347	-	-	-	1
CC	BRACKET COIL	1171650	-	1	-	-
D	DOOR FITTING	1172344	1	-	1	1
D	DOOR FITTING	1172339	-	1	-	-
E	DOOR FILTER	1171934	1	-	-	-
E	DOOR FILTER	1171935	-	1	1	-
E	DOOR FILTER	1171936	-	-	-	1
EE	EXTENSION COIL	1171580	-	1	-	-
F	BRACKET PCB	1171922	1	1	1	1
FF	SUPPORT COIL	1171667	-	1	-	-
G	BAFFLE DIFFUSER	1171569	2	2	2	2
GG	BAFFLE COIL	1171644	-	1	-	-
H	SPRING FILTER	1172554	1	1	1	1
HH	SUPPORT COND PAN	1171664	-	1	-	-
J	TUBE DRAIN	1172337	1	-	1	1
JJ	CHANNEL COND	1171645	-	1	-	-
K	GROMMET SUCTION	1171622	1	1	1	-
K	GROMMET SUCTION	1173772	-	-	-	1
L	PLUG BUTTON	1173764	1	-	1	1
LL	FITTING DRAIN	1171636	1	-	1	1
M	SUPPORT BRACKET	1172636	-	-	1	1

FCM4X PARTS LIST (continued)						
KEY NO.	DESCRIPTION	PART NO.	FVM4X2400BT1	FVM4X3600BT1	FVM4X4800BT1	FVM4X6000BT1
MM	FITTING DRAIN	1171635	1	-	1	1
PP	CAP END	1174949	1	-	1	1
N	BRACKET COIL	1171574	1	-	2	2
RR	CAP END	1174950	1	-	1	1
P	BRACKET COIL	1171575	1	-	2	2
Q	SHIELD COND PAN	1172328	1	1	2	2
R	AIR SEAL ASY	1171640	1	-	-	-
R	AIR SEAL ASY	1171641	-	-	1	1
S	TROUGH CNDS	1171920	1	-	-	-
S	TROUGH CNDS	1171638	-	-	1	1
T	TROUGH CNDS	1171637	1	-	1	1
U	BAFFLE DRIP	1171921	1	-	-	-
U	BAFFLE DRIP	1171647	-	-	2	-
U	BAFFLE DRIP	1171648	-	-	-	2
V	RING DRIP	1171649	1	-	1	-
V	RING DRIP	1172329	-	-	-	1
W	BAND MOTOR MOUNT	1171733	1	1	1	1
X	KIT HSG/WHEEL 9 X 7	1174921	1	-	-	-
X	KIT HSG/WHEEL 10 X 9	1174922	-	1	1	1
Y	ARM & GROM ASSY	1173746	3	3	3	3
Z	SCREW	1170636	3	3	3	3
Parts Not Shown						
)	GROMMET	1171737	1	1	1	1
)	GROMMET LIQUID	1171620	1	1	1	1
)	PAINT DARK GREY 16OZ AEROSOL S	1171357	1	1	1	1
)	FUSE	1171735	1	1	1	1

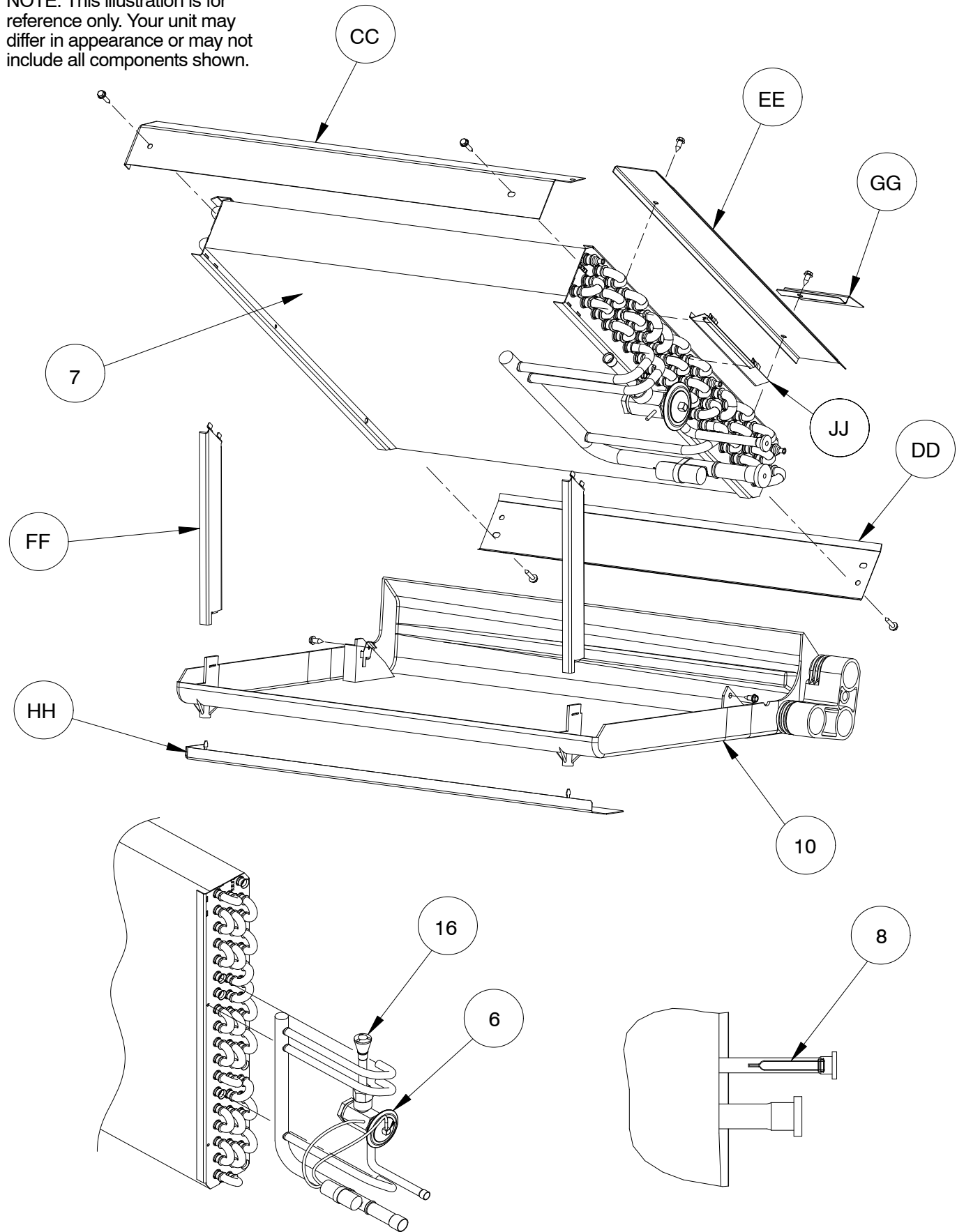
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