Installation, Start-Up and Service Instructions

CONTENTS

Page
SAFETY CONSIDERATIONS 1
INSTALLATION 1-66
Step 1 — Provide Unit Support 1
• ROOF CURB
• ALTERNATE UNIT SUPPORT
Step 2 — Rig and Place Unit 1
• POSITIONING
• ROOF MOUNT
Step 3 — Field Fabricate Ductwork 32
Step 4 — Make Unit Duct Connections 32
Step 5 — Trap Condensate Drain 32
Step 6 — Controls Options 32
• THERMISTORS
• CONSTANT VOLUME APPLICATIONS
• VARIABLE AIR VOLUME (VAV) APPLICATIONS
Step 7 — Make Electrical Connections 37
• POWER WIRING
• FIELD POWER SUPPLY
• FIELD CONTROL WIRING
Step 8 — Make Outdoor-Air Inlet Adjustments 56
• ECONOMIZER
• ECONOMIZER SETTINGS
Step 9 — Position Power Exhaust/ Barometric Relief Damper Hood 60
Step 10 — Install Accessories 62
Step 11 — Field Modifications 64
START-UP 66-101
SERVICE 101-111
TROUBLESHOOTING 112-123
START-UP CHECKLIST CL-1,CL-2

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

INSTALLATION

Step 1 — Provide Unit Support

⚠ CAUTION

All panels must be in place when rigging. Unit is not designed for handling by fork truck.

ROOF CURB — Assemble and install accessory roof curb in accordance with instructions shipped with the curb. Accessory roof curb and information required to field fabricate a roof curb or horizontal adapter are shown in Fig. 1-6. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be secured to roof curb before unit is set in place.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a leak-proof seal. Install gasket supplied with the roof curb as shown in Fig. 1-4. Improperly applied gasket can result in air leaks and poor unit performance.

Curb should be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is shown in Fig 1-4. Refer to Accessory Roof Curb Installation Instructions for additional information as required. When accessory roof curb is used, unit may be installed on class A, B, or C roof covering material.

ALTERNATE UNIT SUPPORT — When the curb or adapter cannot be used, support unit with sleepers using unit curb or adapter support area. If sleepers cannot be used, support long sides of unit (refer to Fig. 7-18) with a minimum number of equally spaced 4-in. x 4-in. pads as follows: 50AJ, AK,AW,AY020-030 and 50EJ,EK,EW,EY024-034 units require 3 pads on each side; 50AJ,AK,AW,AY035-050 and 50EJ,EK,EW,EY038-048 require 4 pads on each side; 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 units require 6 pads on each side. Unit may sag if supported by corners only.

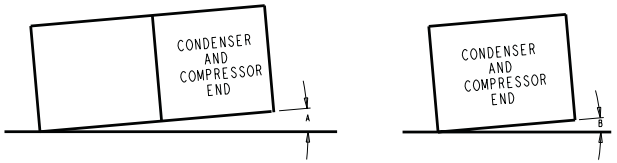
Step 2 — Rig and Place Unit — Inspect unit for transportation damage. See Tables 1A, 1B, and 1C for physical data. File any claim with transportation agency. Keep unit upright, and do not drop. Use spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit frame as a reference; leveling tolerance is shown in Fig. 1-4. See Fig. 19 for additional information. Unit operating weight is shown in Tables 2A and 2B.

Copy continued on page 20.

NOTE:

1. UNLESS OTHERWISE SPECIFIED ALL DIM ARE TO OUTSIDE OF PART.
2. ROOFCURB ACCESSORY CRRFCURB005A00 IS SHIPPED DISASSEMBLED.
3. ALL ROOFCURB PARTS ARE TO BE 14 GA GALVANIZED STL.
4. UNITS WITH ELECTRIC HEAT MUST BE INSTALLED WITH 90° ELBOW ON THE SUPPLY DUCT PRIOR TO ANY SUPPLY TAKE OFFS OR BRANCHES.
5. DIMENSIONS IN [ ] ARE MILLIMETERS.

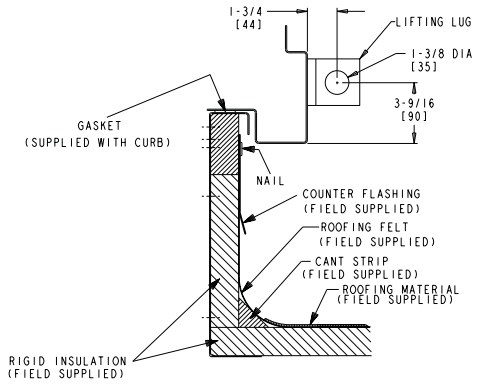
NOTE:
TO PREVENT STANDING WATER IN THE DRAIN PAN OF THE INDOOR SECTION, AND THE HEAT EXCHANGERS
UNIT CAN ONLY BE PITCHED AS SHOWN.

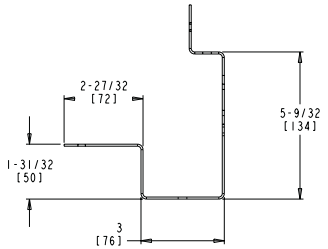


DIMENSIONS
(DEGREES AND INCHES)

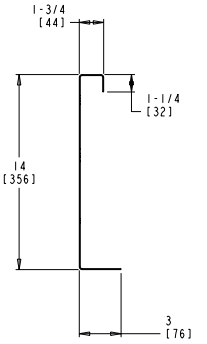
A			B		
DEG.	IN.	mm	DEG.	IN.	mm
1.0	2.9	73	.50	.75	19

UNIT LEVELING TOLERANCES
*FROM EDGE OF UNIT TO HORIZONTAL

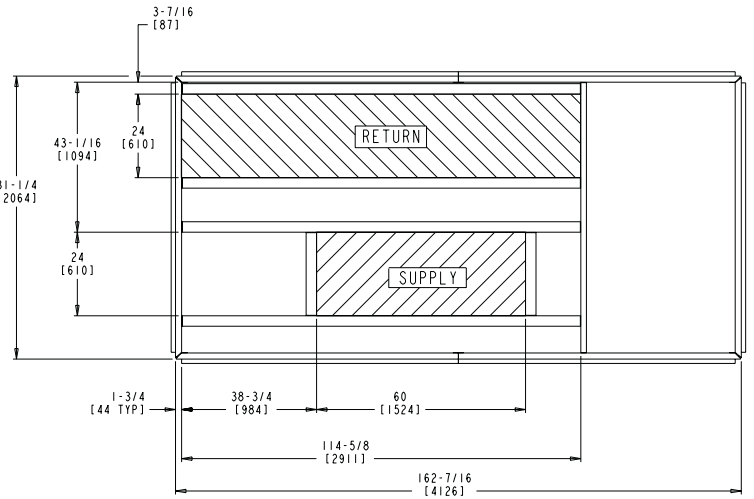


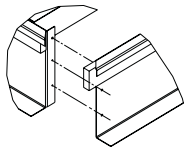


BASE RAIL CROSS SECTION
TYP 2 SIDES



ROOF CURB CROSS SECTION
TYP 4 SIDES





DETAIL Z
SCALE 1:8
TYP 4 CORNERS

ROOF CURB
SCALE 1:16

Fig. 1 — Roof Curb — 50AJ,AK020-030 and 50EJ,EK024-034 Units

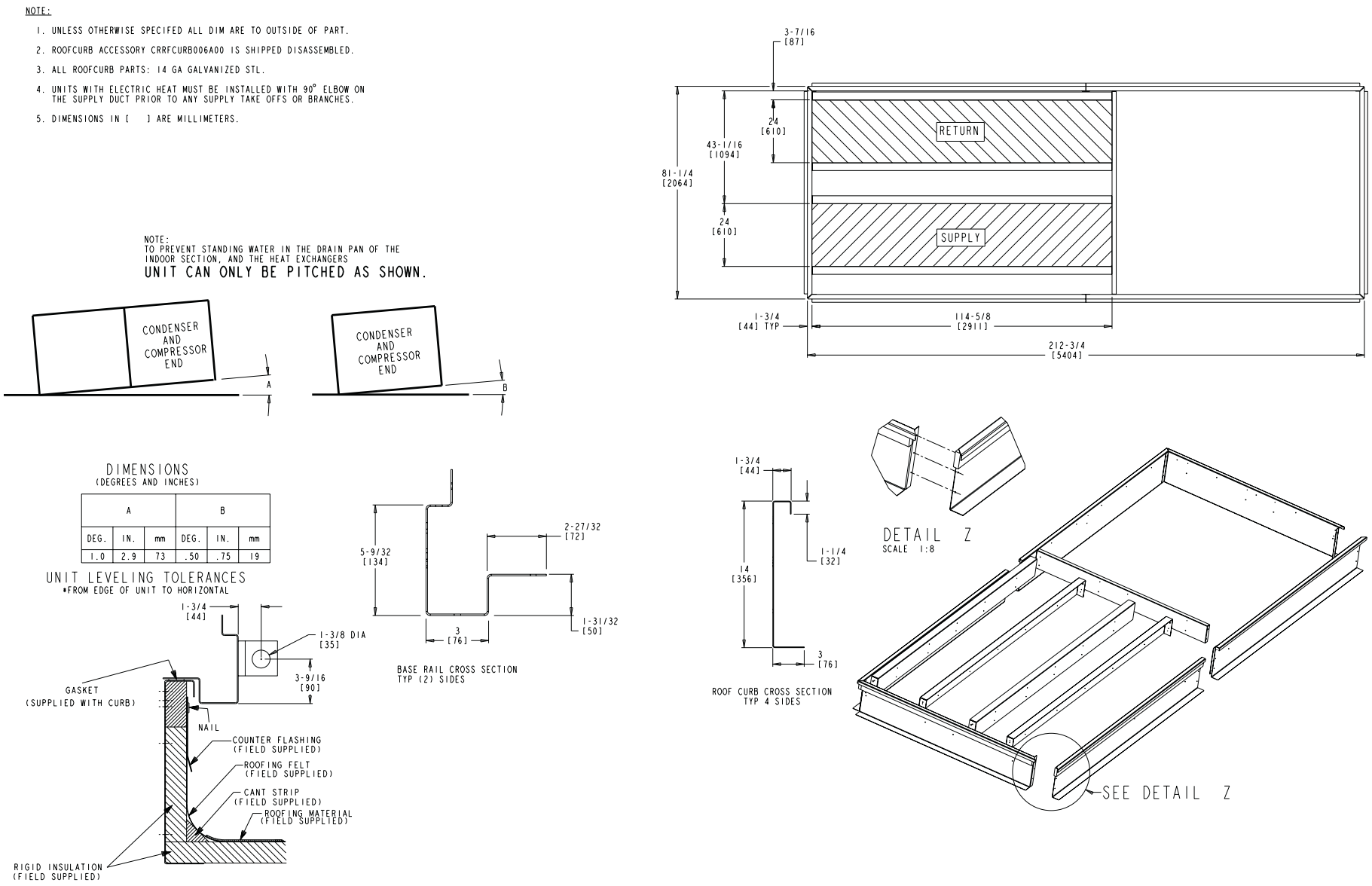


Fig. 2 — Roof Curb — 50AJ,AK035-050 and 50EJ,EK038-048 Units

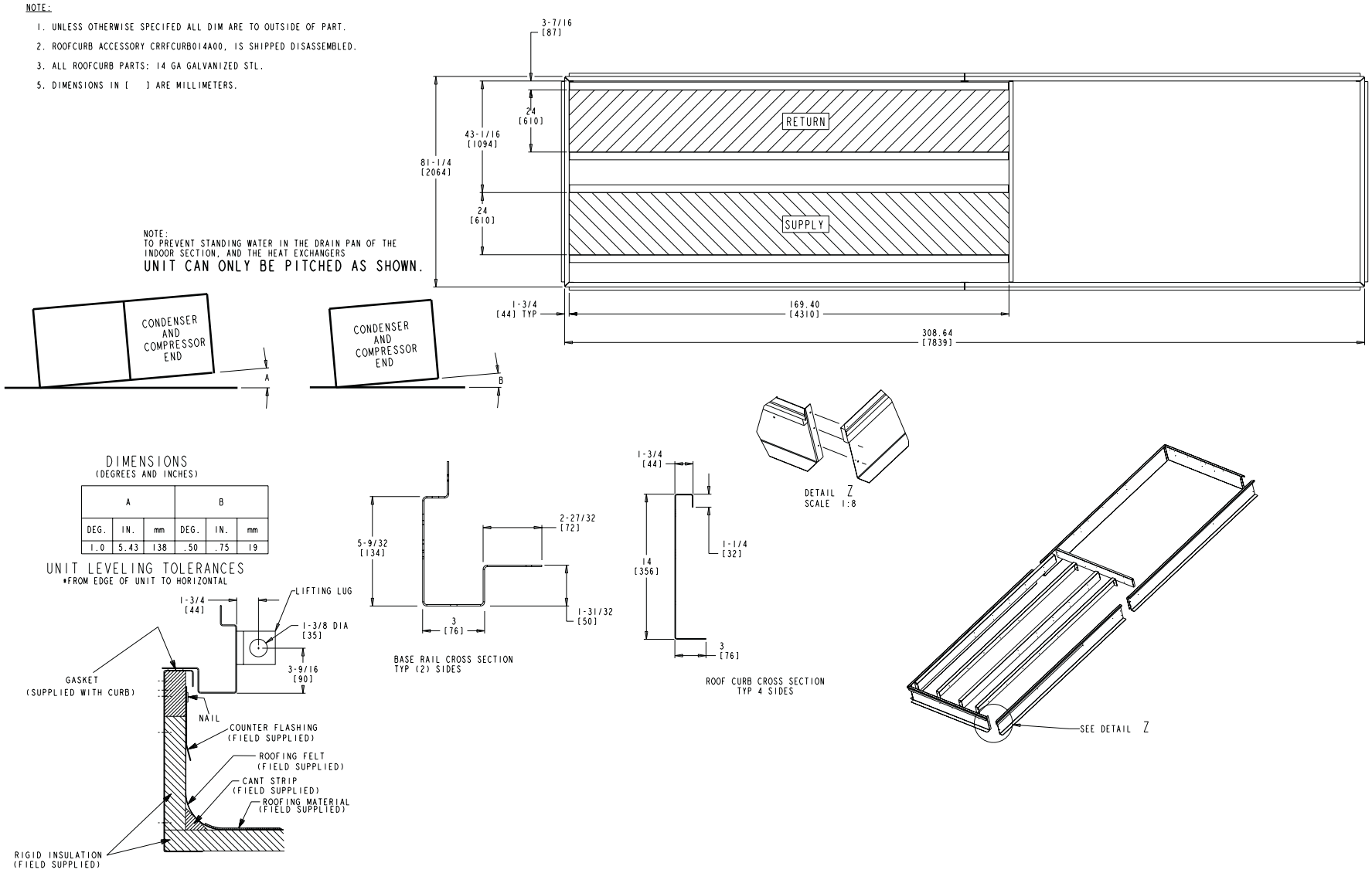


Fig. 3 — Roof Curb (50AJ,AK060 and 50EJ,EK054-068 Units) With Accessory Roof Curb Adapter CRRFCURB014A00

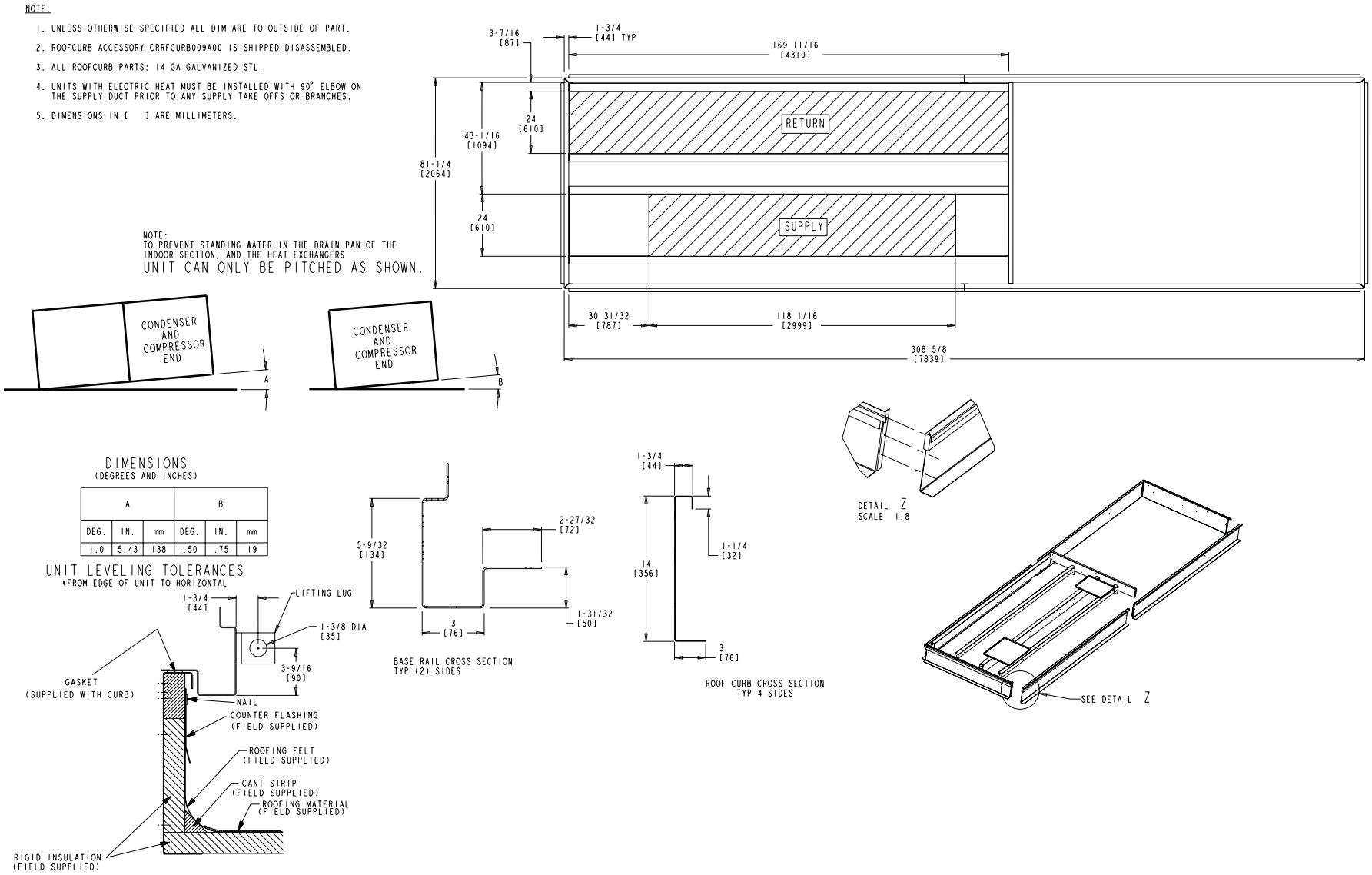


Fig. 4 — Roof Curb (50AJ,AK060 and 50EJ,EK054-068 Units) With Accessory Roof Curb Adapter CRRFCURB009A00

NOTES:
1. Unless otherwise specified, all dimensions are to outside of part.
2. Seal strip to be placed covering reference holes.
3. Phantom lines represent seal strip. Total length required is 75 linear ft.
4. If existing seal strip around roof curb seems damaged, replace it. Total length required is 62 linear ft.
5. Five crossrails are field located per dimensions shown and secured using self- tapping screws.
6. 50E series units will overhang existing “DD” roof curbs by 2.98″ at indoor motor end and 15.08″ at compressor end.
7. Ductwork (field supplied) must be notched to clear three crossrails.
8. Dimensions in [ ] are millimeters.

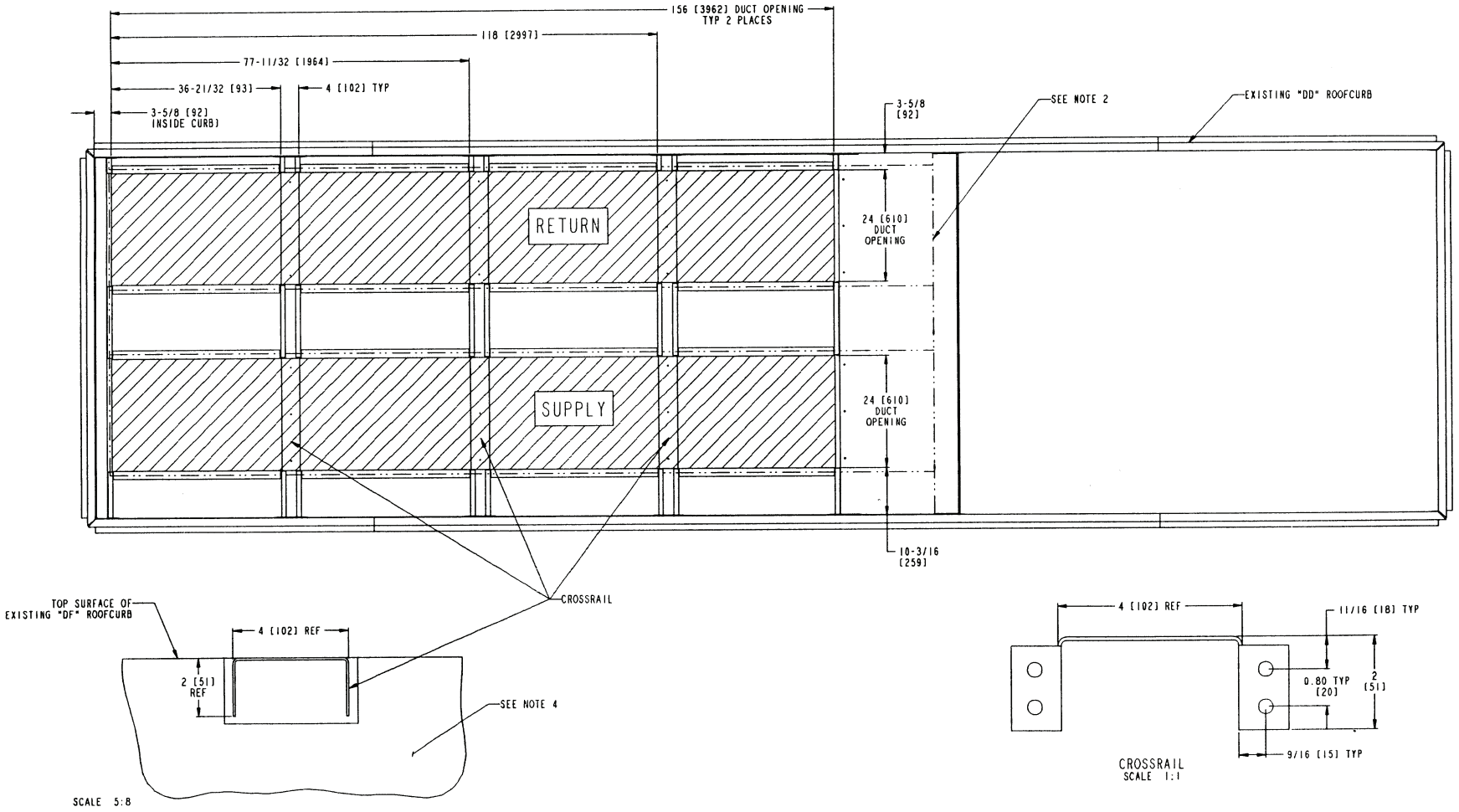


Fig. 5 — Roof Curb Adapter (50AJ,AK060 and 50EJ,EK054-068 Units on 50DD054-064 Retrofit Part No. CRRCADPT005A00)

NOTES:
1. Unless otherwise specified, all dimensions are to outside of part.
2. Seal strip to be placed covering reference holes.
3. Phantom lines represent seal strip. Total length required is 75 linear ft.
4. If existing seal strip around roof curb seems damaged, replace it. Total length required is 62 linear ft. At indoor motor end, remove existing seal strip on roof curb and place new seal strip as shown.
5. Five crossrails are field located per dimensions shown and secured using self-tapping screws.
6. 50E series units will overhang existing “DL” roof curbs by 9.97″ at indoor motor end and 8.09″ at compressor end.
7. Ductwork (field supplied) must be notched to clear three crossrails.
8. Dimensions are in inches.
9. Dimensions in [ ] are millimeters.

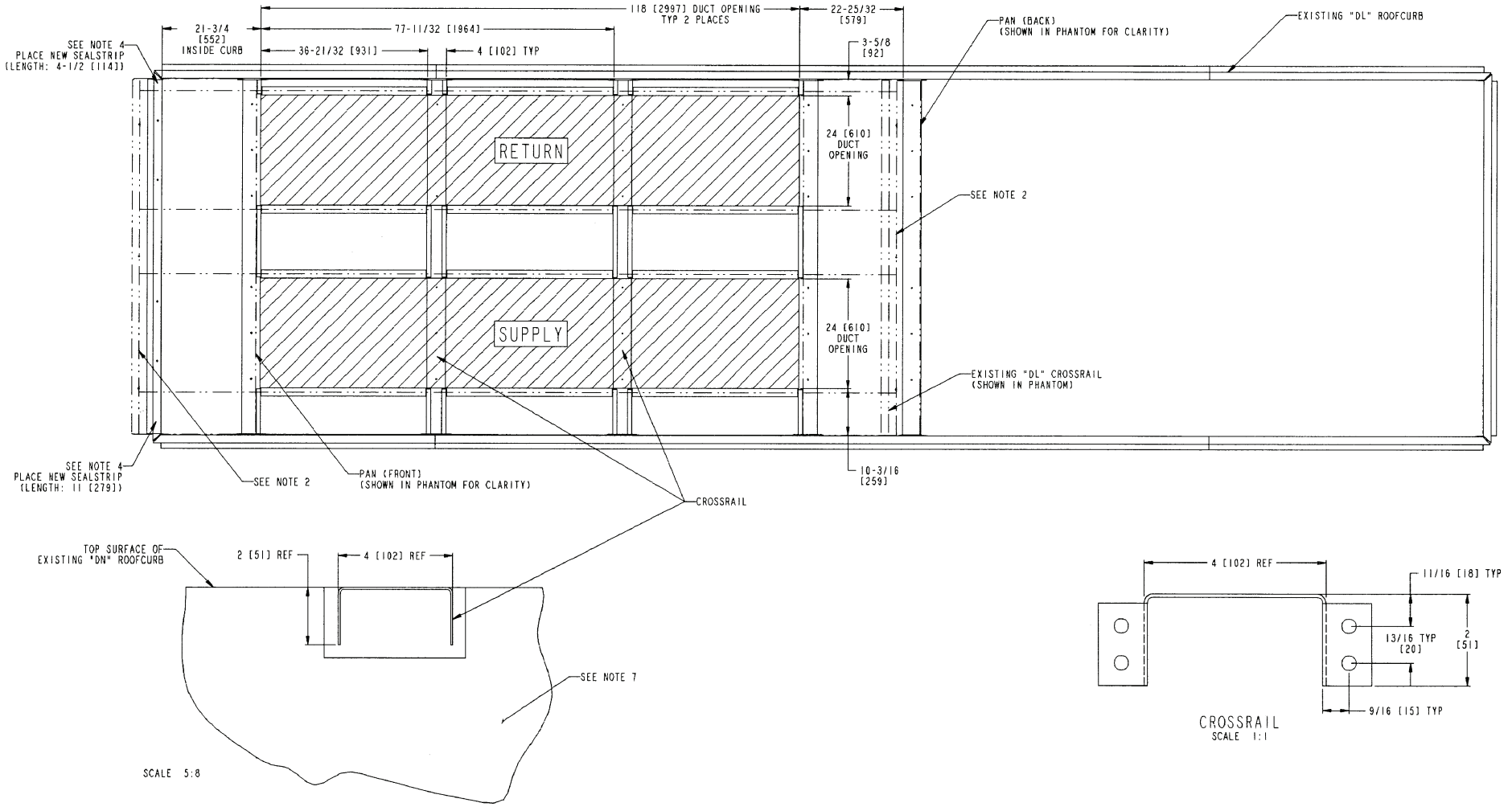


Fig. 6 — Roof Curb Adapter (50AJ,AK060 and 50EJ,EK054-068 on 50DL054-064 Retrofits Only Part No. CRRCADPT004A00)

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET.
   MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0"[4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0"[1219]
   ECONOMIZER SIDE: 6'-0"[1829]
   HEAT SIDE: 4'-0"[1219]
   FILTER ACCESS SIDE: 10'-0"[3048] (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. BOTTOM DUCTS DESIGNED TO BE ATTACHED TO ACCESSORY ROOF CURB IF UNIT IS MOUNTED ON DUNNAGE, IT IS RECOMENDED THE DUCTS MUST BE SUPPORTED BY CROSS BRACES AS DONE ON ACCESSORY ROOF CURB.
6. DIMENSIONS IN [ ] ARE IN MILLIMETERS.

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (LBS)			
	LBS	FT/IN	FT/IN	1	2	3	4
50AJ/AK020	5052	5'-11 3/8"	3'-5 11/16"	1036	1150	1508	1358
50AJ/AK025	5138	5'- 8 1/2"	3'- 7 5/8"	1057	1076	1516	1489
50AJ/AK027	5235	5'- 8 1/2"	3'- 7 5/8"	1077	1097	1545	1517
50AJ/AK030	5235	5'- 8 1/2"	3'- 7 5/8"	1077	1097	1545	1517

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (kg)			
	kg	MM	MM	1	2	3	4
50AJ/AK020	2292	[1814]	[1059]	470	522	684	616
50AJ/AK025	2331	[1740]	[1107]	479	488	688	675
50AJ/AK027	2375	[1740]	[1107]	488	497	701	688
50AJ/AK030	2375	[1740]	[1107]	488	497	701	688

* OPERATING WEIGHT INCLUDES LARGEST IFM, CU/ALUM COILS, MODULATING POWER EXHAUST (VAV), AND VFD (VAV).

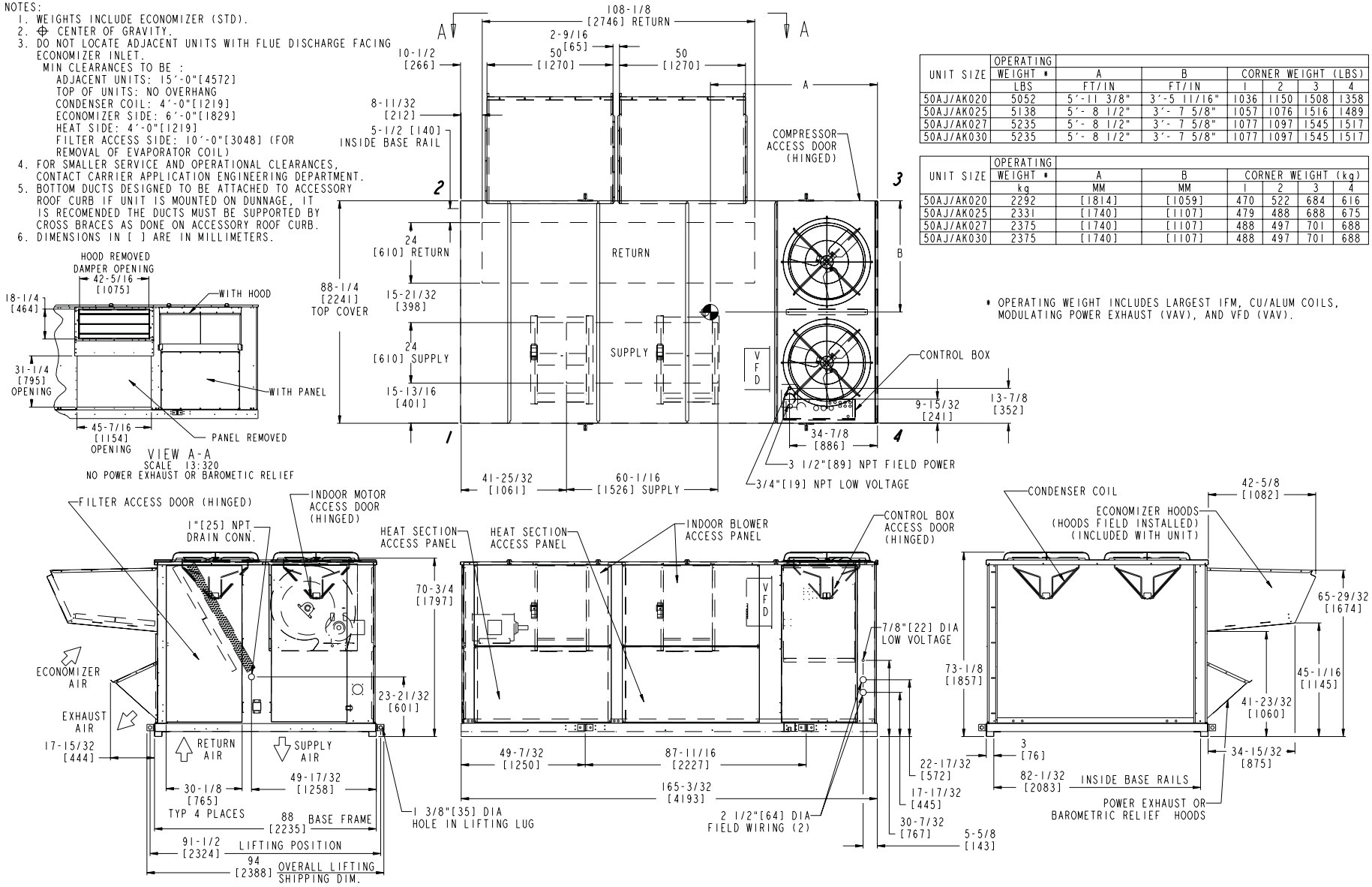
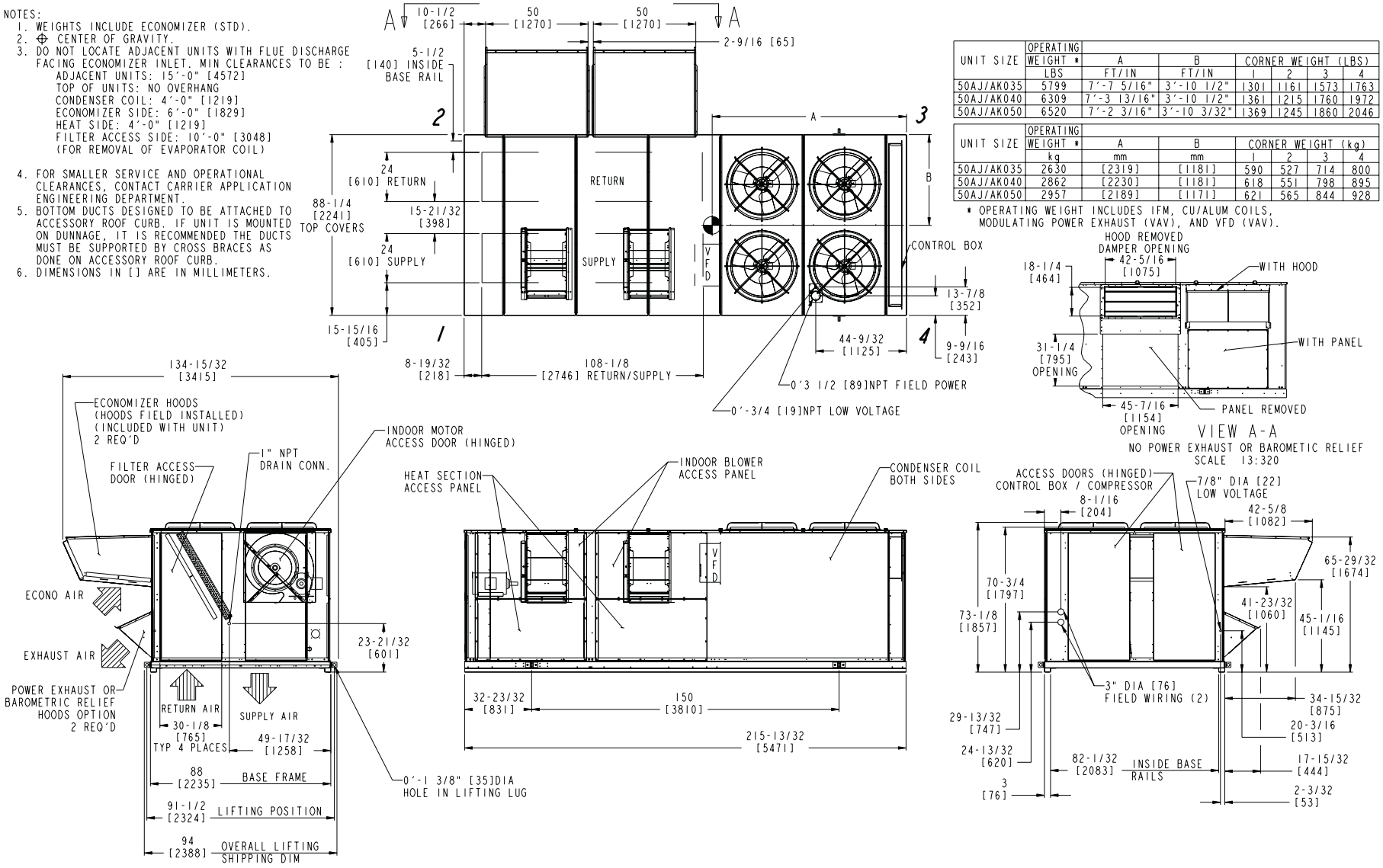


Fig. 7 — Base Unit Dimensions — 50AJ,AK020-030

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET. MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0" [4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0" [1219]
   ECONOMIZER SIDE: 6'-0" [1829]
   HEAT SIDE: 4'-0" [1219]
   FILTER ACCESS SIDE: 10'-0" [3048]
   (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. BOTTOM DUCTS DESIGNED TO BE ATTACHED TO ACCESSORY ROOF CURB. IF UNIT IS MOUNTED ON DUNNAGE, IT IS RECOMMENDED THE DUCTS MUST BE SUPPORTED BY CROSS BRACES AS DONE ON ACCESSORY ROOF CURB.
6. DIMENSIONS IN [] ARE IN MILLIMETERS.

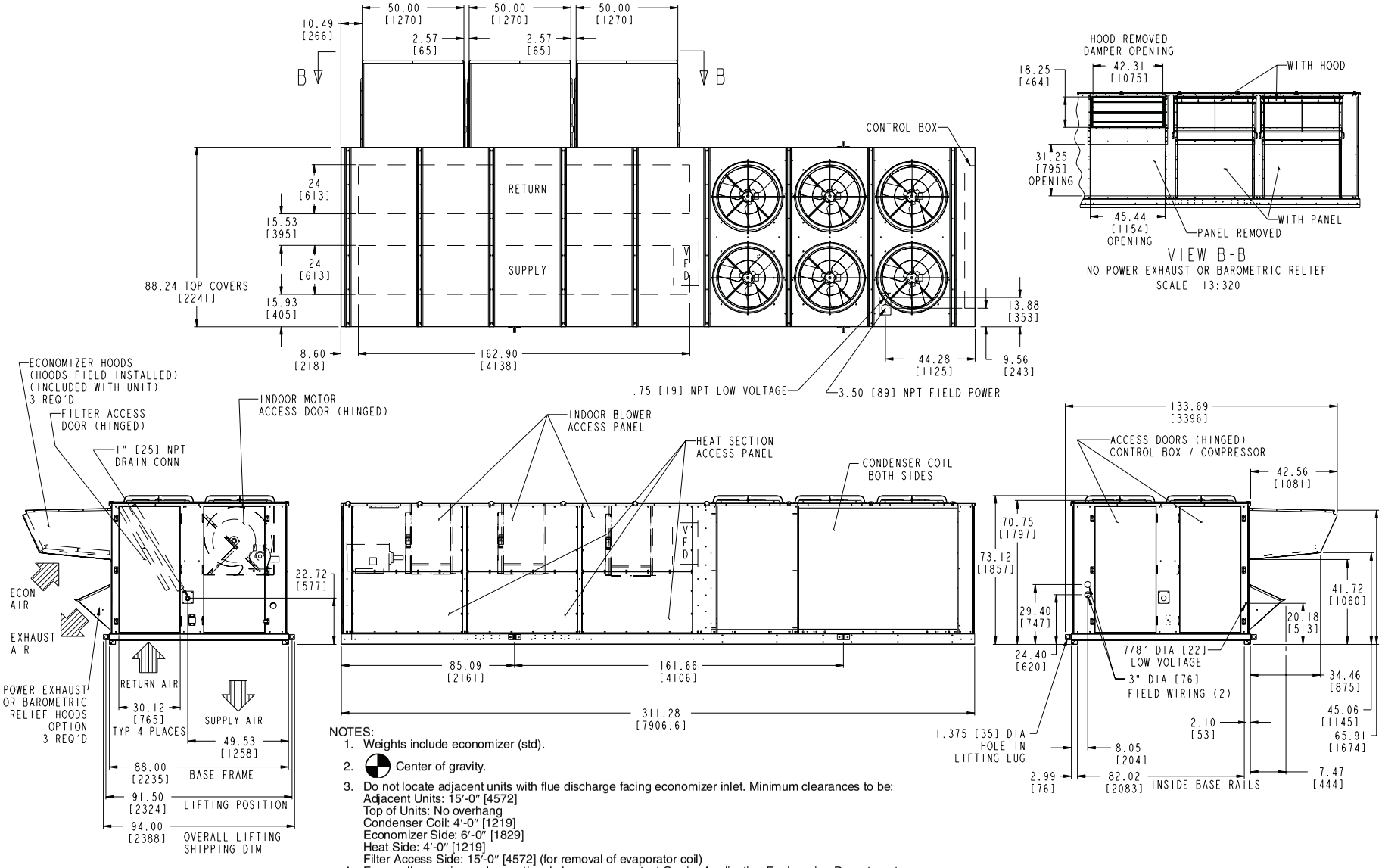


UNIT SIZE	OPERATING WEIGHT * LBS	A FT/IN	B FT/IN	CORNER WEIGHT (LBS) 1	2	3	4
50AJ/AK035	5799	7'-7 5/16"	3'-10 1/2"	1301	1161	1573	1763
50AJ/AK040	6309	7'-3 13/16"	3'-10 1/2"	1361	1215	1760	1972
50AJ/AK050	6520	7'-2 3/16"	3'-10 3/32"	1369	1245	1860	2046

UNIT SIZE	OPERATING WEIGHT * kg	A mm	B mm	CORNER WEIGHT (kg) 1	2	3	4
50AJ/AK035	2630	[2319]	[1181]	590	527	714	800
50AJ/AK040	2862	[2230]	[1181]	618	551	798	895
50AJ/AK050	2957	[2189]	[1171]	621	565	844	928

* OPERATING WEIGHT INCLUDES IFM, CU/ALUM COILS, MODULATING POWER EXHAUST (VAV), AND VFD (VAV).

Fig. 8 — Base Unit Dimensions — 50AJ,AK035-050



NOTES:

1. Weights include economizer (std).
2. Center of gravity.
3. Do not locate adjacent units with flue discharge facing economizer inlet. Minimum clearances to be:
   Adjacent Units: 15′-0″ [4572]
   Top of Units: No overhang
   Condenser Coil: 4′-0″ [1219]
   Economizer Side: 6′-0″ [1829]
   Heat Side: 4′-0″ [1219]
   Filter Access Side: 15′-0″ [4572] (for removal of evaporator coil)
4. For smaller service and operational clearances, contact Carrier Application Engineering Department.
5. Bottom ducts designed to be attached to accessory roof curb. If unit is mounted on dunnage, it is recommended the ducts must be supported by cross braces as done on accessory roof curb.
6. Base unit weights include outdoor air hoods and filters (indoor fan motor is not included). Add indoor motor, FIOPs and accessories for total operating weight.
7. VAV motor weights include indoor motor, VFD, compressor electric unloaders, VFD transducer and associated wiring.
8. Dimensions in [ ] are in millimeters, kilograms or kilowatts.
9. For side-supply/return applications, a single return and supply ductwork connection is recommended for covering all three return and all three supply openings. The entire area around the duct openings is available for a 1.5″ duct flange attachment.
10. See Fig. 19 for unit center of gravity. See Table 2 for unit weight.

Fig. 9 — Base Unit Dimensions — 50AJ,AK060

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET.)
   MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0"[4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0"[1219]
   ECONOMIZER SIDE: 6'-0"[1829]
   HEAT SIDE: 4'-0"[1219]
   FILTER ACCESS SIDE: 10'-0"[3048] (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. DIMENSIONS IN [ ] ARE IN MILLIMETERS.

UNIT SIZE	OPERATING WEIGHT * LBS	A IN	B IN	CORNER WEIGHT (LBS) 1	2	3	4
50AW/AY020	5130	5'-11 3/8"	3'-5 11/16"	1052	1168	1531	1379
50AW/AY025	5216	5'-8 1/2"	3'-7 5/8"	1073	1093	1539	1511
50AW/AY027	5313	5'-8 1/2"	3'-7 5/8"	1093	1113	1568	1540
50AW/AY030	5137	5'-8 1/2"	3'-7 5/8"	1093	1113	1568	1540

UNIT SIZE	OPERATING WEIGHT * kg	A FT/IN	B FT/IN	CORNER WEIGHT (kg) 1	2	3	4
50AW/AY020	2327	[1814]	[1059]	477	530	695	626
50AW/AY025	2366	[1740]	[1107]	487	496	698	686
50AW/AY027	2410	[1740]	[1107]	496	505	711	698
50AW/AY030	2410	[1740]	[1107]	496	505	711	698

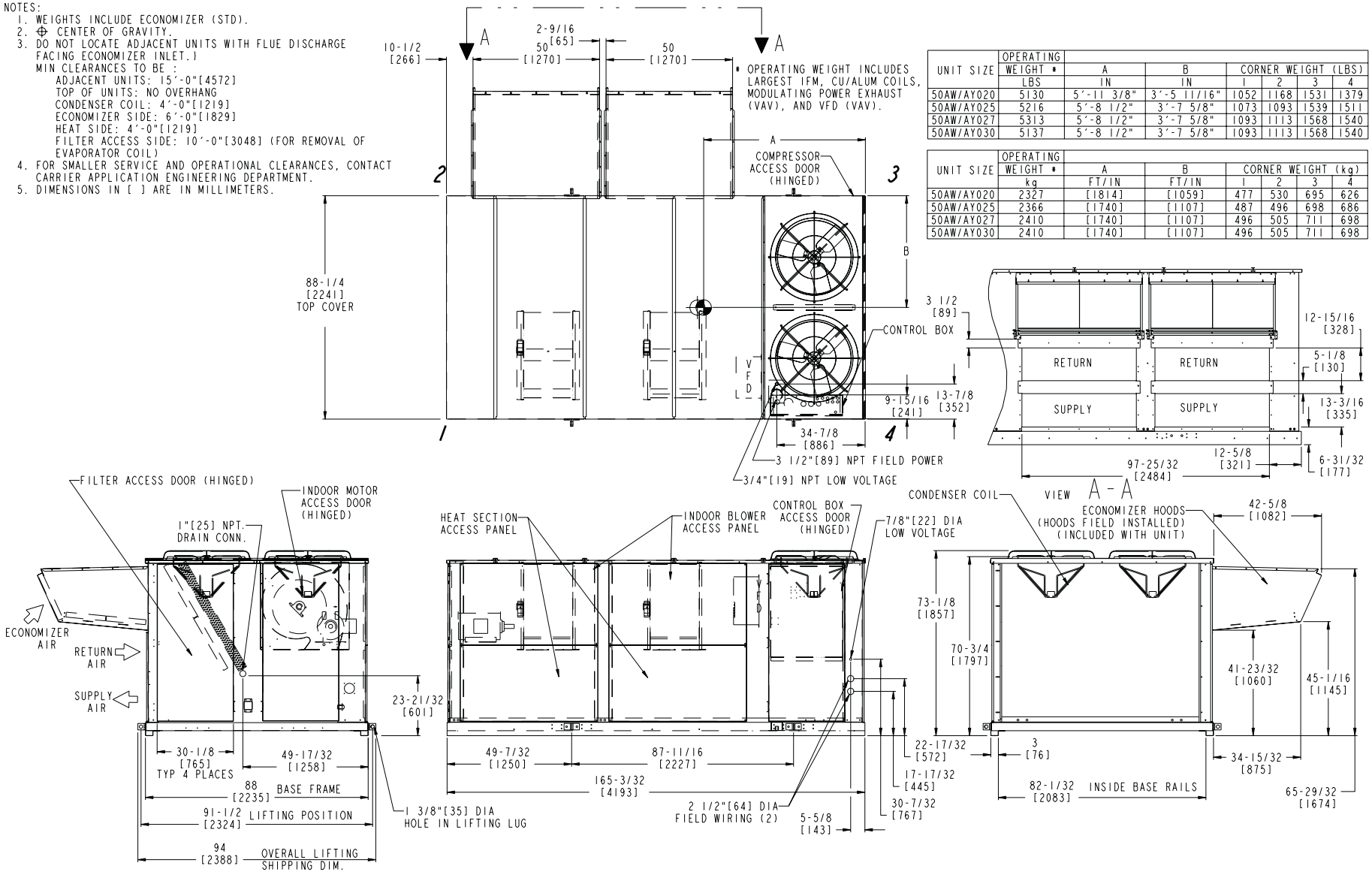


Fig. 10 — Base Unit Dimensions — 50AW,AY020-030

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET. MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0" [4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0" [1219]
   ECONOMIZER SIDE: 6'-0"[1829]
   HEAT SIDE: 4'-0" [1219]
   FILTER ACCESS SIDE: 10'-0" [3048]
   (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. DIMENSIONS IN [ ] ARE IN MILLIMETERS.

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (LBS)			
	LBS	FT/IN	FT/IN	1	2	3	4
50AW/AY035	5992	7'-7 5/16"	3'-10 1/2"	1344	1200	1626	1822
50AW/AY040	6502	7'-3 13/16"	3'-10 1/2"	1403	1252	1814	2033
50AW/AY050	6713	7'-2 3/16"	3'-10 3/32"	1410	1281	1915	2107

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (kg)			
	kg	MM	MM	1	2	3	4
50AW/AY035	2718	[2319]	[1181]	610	544	737	826
50AW/AY040	2949	[2230]	[1181]	636	568	823	922
50AW/AY050	3045	[2189]	[1171]	640	581	869	956

* OPERATING WEIGHT INCLUDES LARGEST IFM, CU/ALUM COILS, MODULATING POWER EXHAUST (VAV), AND VFD (VAV).

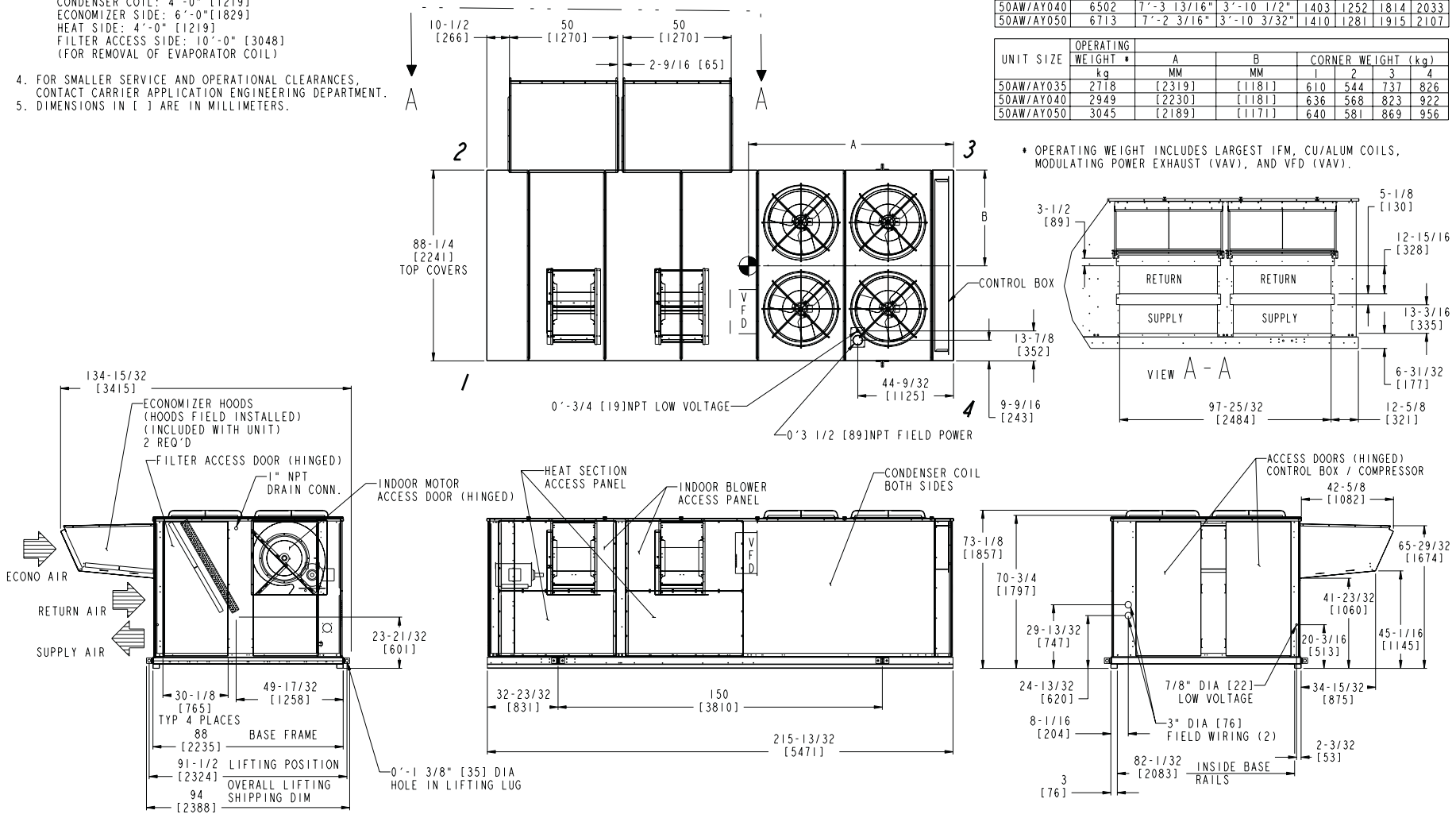
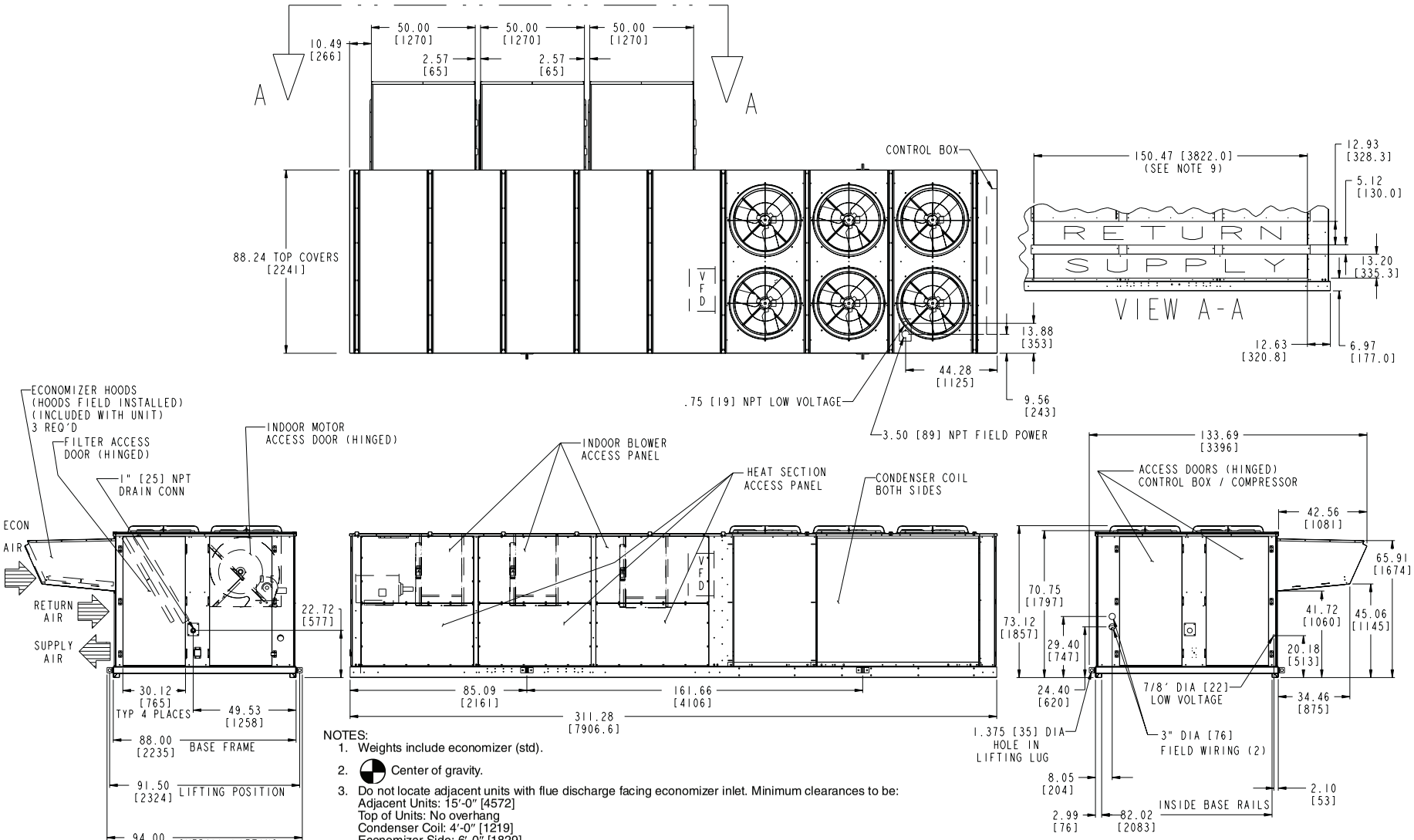


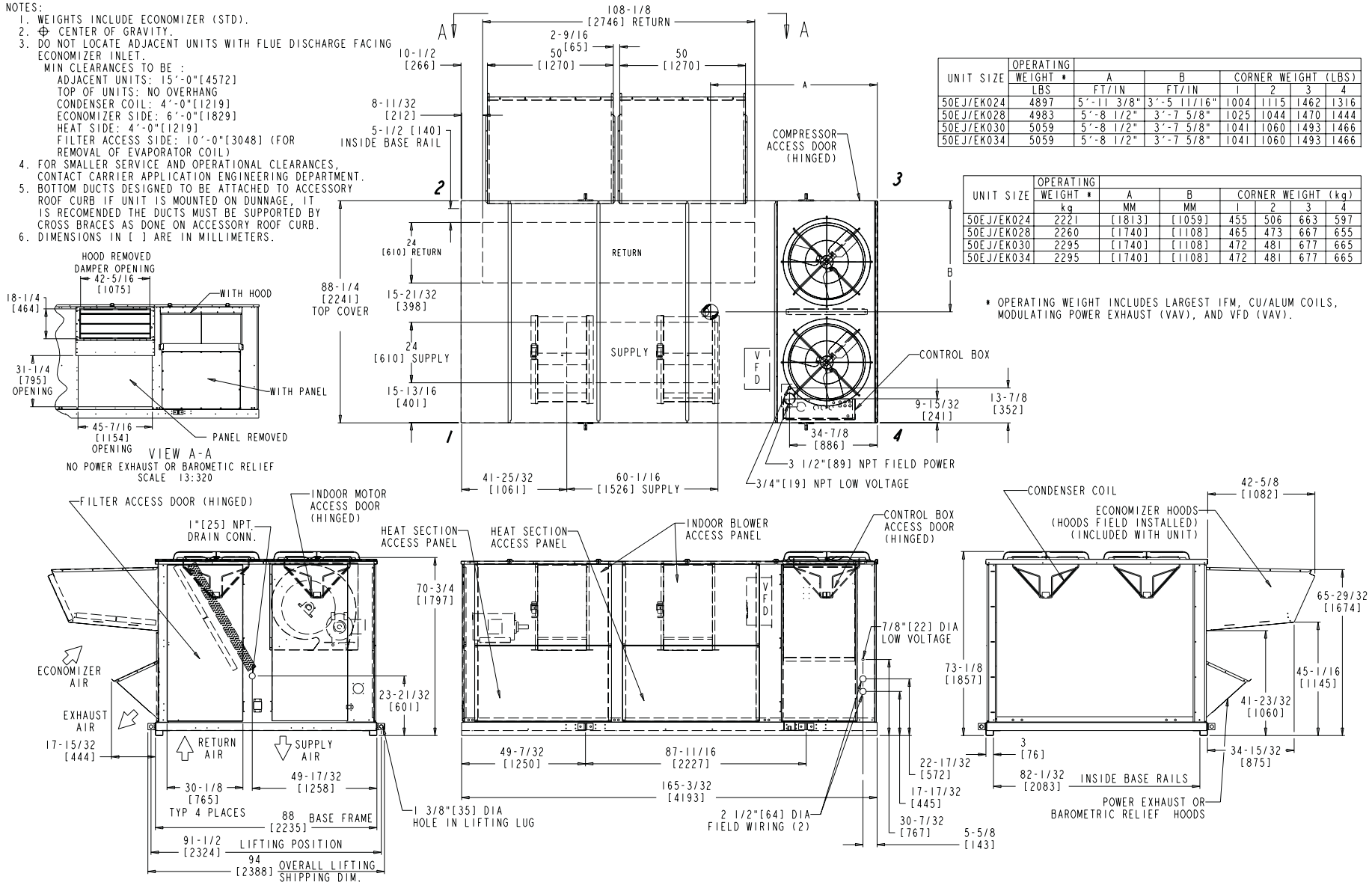
Fig. 11 — Base Unit Dimensions — 50AW,AY035-050



NOTES:

1. Weights include economizer (std).
2. Center of gravity.
3. Do not locate adjacent units with flue discharge facing economizer inlet. Minimum clearances to be:
   Adjacent Units: 15′-0″ [4572]
   Top of Units: No overhang
   Condenser Coil: 4′-0″ [1219]
   Economizer Side: 6′-0″ [1829]
   Heat Side: 4′-0″ [1219]
   Filter Access Side: 15′-0″ [4572] (for removal of evaporator coil)
4. For smaller service and operational clearances, contact Carrier Application Engineering Department.
5. Bottom ducts designed to be attached to accessory roof curb. If unit is mounted on dunnage, it is recommended the ducts must be supported by cross braces as done on accessory roof curb.
6. Base unit weights include outdoor air hoods and filters (indoor fan motor is not included). Add indoor motor, FIOPs and accessories for total operating weight.
7. VAV motor weights include indoor motor, VFD, compressor electric unloaders, VFD transducer and associated wiring.
8. Dimensions in [ ] are in millimeters, kilograms or kilowatts.
9. For side-supply/return applications, a single return and supply ductwork connection is recommended for covering all three return and all three supply openings. The entire area around the duct openings is available for a 1.5″ duct flange attachment.
10. See Fig. 19 for unit center of gravity. See Table 2 for unit weight.

Fig. 12 — Base Unit Dimensions — 50AW,AY060



UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (LBS)			
	LBS	FT/IN	FT/IN	1	2	3	4
50EJ/EK024	4897	5'-11 3/8"	3'-5 11/16"	1004	1115	1462	1316
50EJ/EK028	4983	5'-8 1/2"	3'-7 5/8"	1025	1044	1470	1444
50EJ/EK030	5059	5'-8 1/2"	3'-7 5/8"	1041	1060	1493	1466
50EJ/EK034	5059	5'-8 1/2"	3'-7 5/8"	1041	1060	1493	1466

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (kg)			
	kg	MM	MM	1	2	3	4
50EJ/EK024	2221	[1813]	[1059]	455	506	663	597
50EJ/EK028	2260	[1740]	[1108]	465	473	667	655
50EJ/EK030	2295	[1740]	[1108]	472	481	677	665
50EJ/EK034	2295	[1740]	[1108]	472	481	677	665

Fig. 13 — Base Unit Dimensions — 50EJ,EK024-034

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET. MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0" [4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0" [1219]
   ECONOMIZER SIDE: 6'-0" [1829]
   HEAT SIDE: 4'-0" [1219]
   FILTER ACCESS SIDE: 10'-0" [3048]
   (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. BOTTOM DUCTS DESIGNED TO BE ATTACHED TO ACCESSORY ROOF CURB. IF UNIT IS MOUNTED ON DUNNAGE, IT IS RECOMMENDED THE DUCTS MUST BE SUPPORTED BY CROSS BRACES AS DONE ON ACCESSORY ROOF CURB.
6. DIMENSIONS IN [] ARE IN MILLIMETERS.

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (LBS)			
	LBS	FT/IN	FT/IN	1	2	3	4
50EJ/EK038	5583	7'-7 5/16"	3'-10 1/2"	1253	1118	1515	1697
50EJ/EK044	5877	7'-3 13/16"	3'-11 1/2"	1268	1132	1640	1837
50EJ/EK048	6262	7'-2 3/16"	3'-10 3/32"	1315	1195	1786	1965

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (kg)			
	kg	mm	mm	1	2	3	4
50EJ/EK038	2532	[2319]	[1181]	568	507	687	770
50EJ/EK044	2666	[2230]	[1206]	575	513	744	833
50EJ/EK048	2840	[2189]	[1171]	547	542	810	891

* OPERATING WEIGHT INCLUDES IFM, CU/ALUM COILS, MODULATING POWER EXHAUST (VAV), AND VFD (VAV).

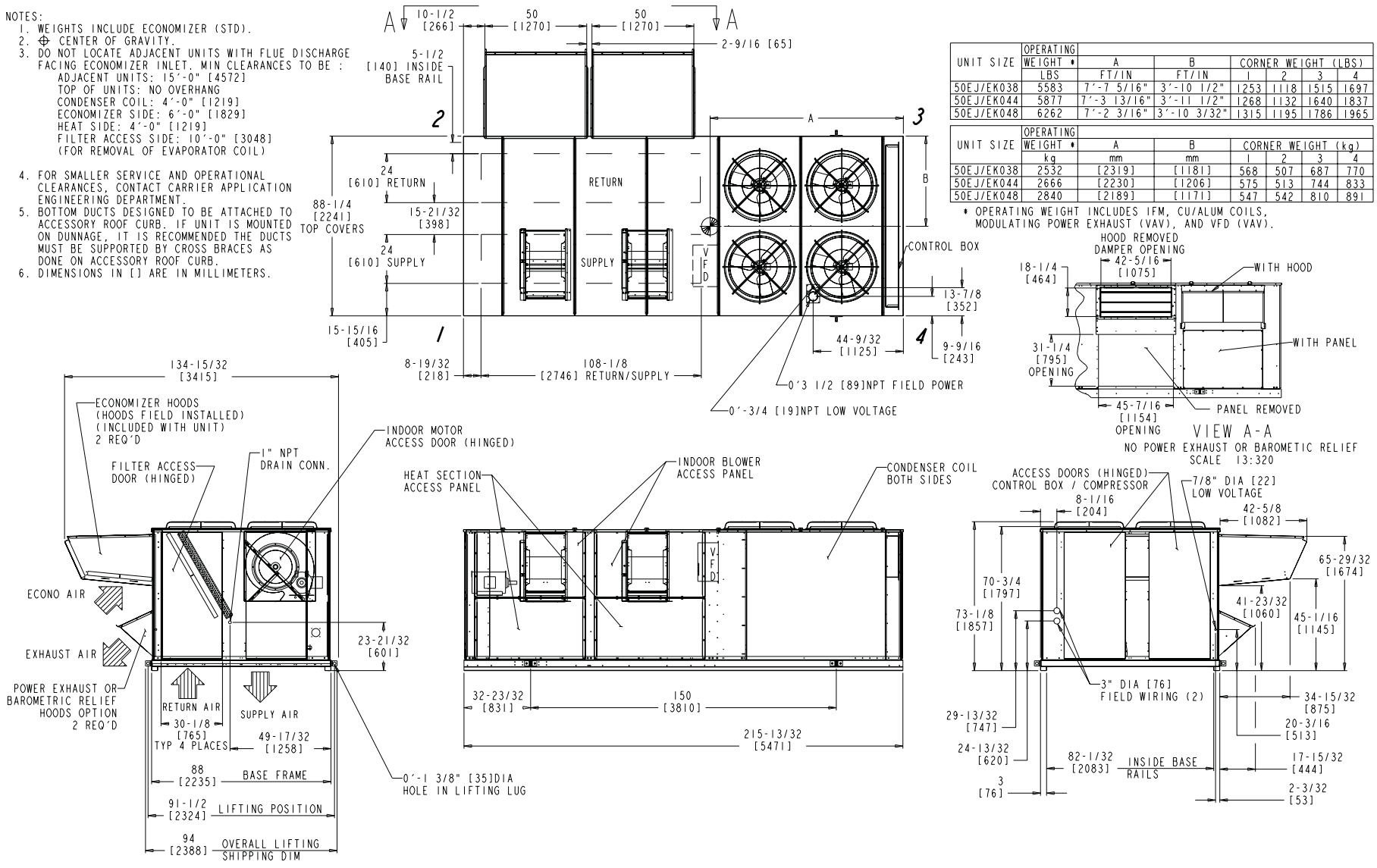
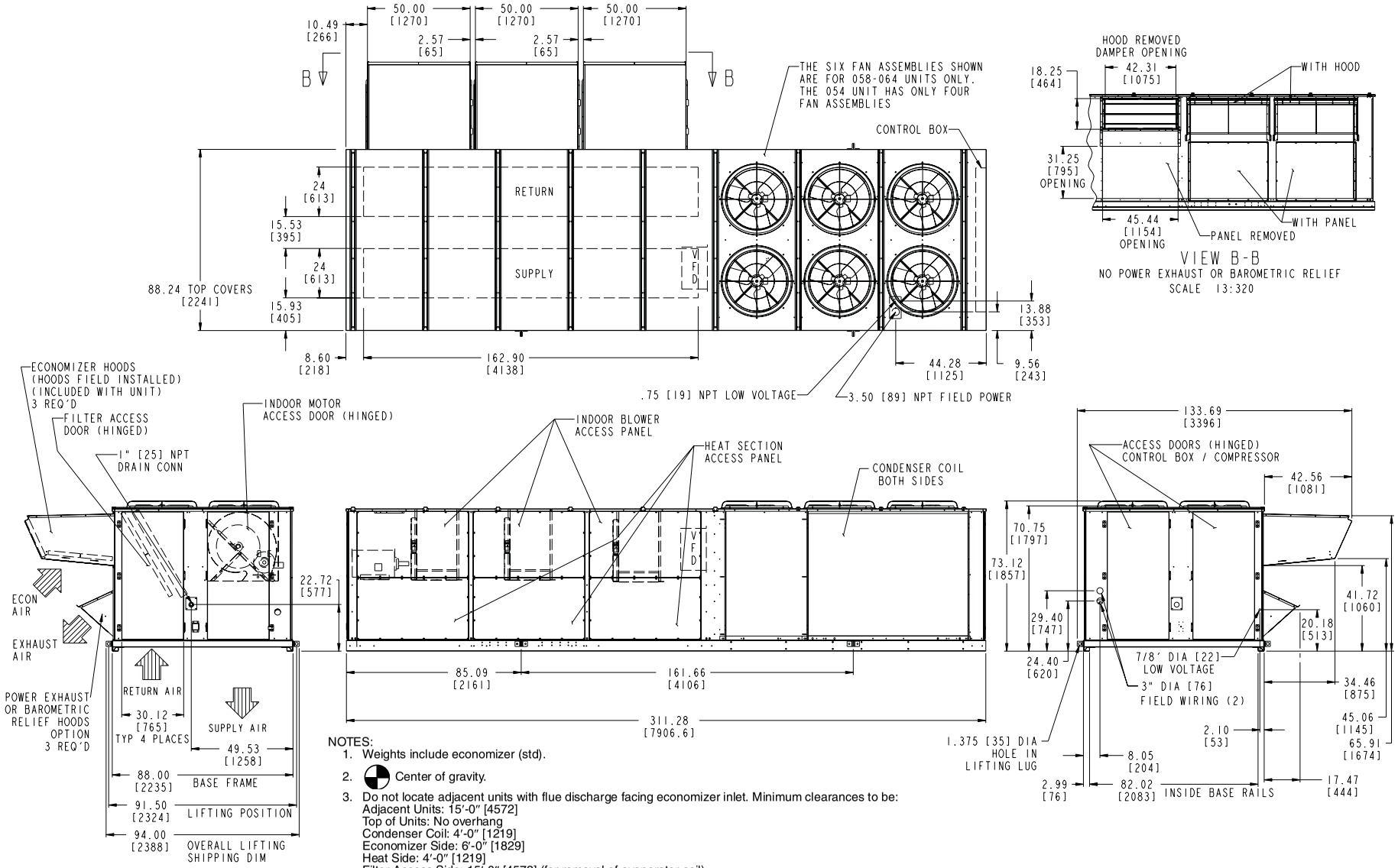


Fig. 14 — Base Unit Dimensions — 50EJ,EK038-048



NOTES:

1. Weights include economizer (std).
2. Center of gravity.
3. Do not locate adjacent units with flue discharge facing economizer inlet. Minimum clearances to be:
   Adjacent Units: 15'-0" [4572]
   Top of Units: No overhang
   Condenser Coil: 4'-0" [1219]
   Economizer Side: 6'-0" [1829]
   Heat Side: 4'-0" [1219]
   Filter Access Side: 15'-0" [4572] (for removal of evaporator coil)
4. For smaller service and operational clearances, contact Carrier Application Engineering Department.
5. Bottom ducts designed to be attached to accessory roof curb. If unit is mounted on dunnage, it is recommended the ducts must be supported by cross braces as done on accessory roof curb.
6. Base unit weights include outdoor air hoods and filters (indoor fan motor is not included). Add indoor motor, FIOPs and accessories for total operating weight.
7. VAV motor weights include indoor motor, VFD, compressor electric unloaders, VFD transducer and associated wiring.
8. Dimensions in [ ] are in millimeters, kilograms or kilowatts.
9. For side-supply/return applications, a single return and supply ductwork connection is recommended for covering all three return and all three supply openings. The entire area around the duct openings is available for a 1.5" duct flange attachment.
10. See Fig. 19 for center of gravity. See Table 2 for unit weight.

Fig. 15 — Base Unit Dimensions — 50EJ,EK054-068

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET.)
   MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0"[4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0"[1219]
   ECONOMIZER SIDE: 6'-0"[1829]
   HEAT SIDE: 4'-0"[1219]
   FILTER ACCESS SIDE: 10'-0"[3048] (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. DIMENSIONS IN [ ] ARE IN MILLIMETERS.

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (LBS)			
	LBS	FT/IN	FT/IN	1	2	3	4
50EW/EY024	4975	5'-11 3/8"	3'-5 11/16"	1020	1133	1485	1337
50EW/EY028	5061	5'-8 1/2"	3'-7 5/8"	1041	1060	1493	1467
50EW/EY030	5137	5'-8 1/2"	3'-7 5/8"	1057	1076	1516	1489
50EW/EY034	5137	5'-8 1/2"	3'-7 5/8"	1057	1076	1516	1489

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (kg)			
	kg	MM	MM	1	2	3	4
50EW/EY024	2257	[1813]	[1059]	463	514	674	607
50EW/EY028	2296	[1740]	[1108]	472	481	677	665
50EW/EY030	2330	[1740]	[1108]	479	488	688	675
50EW/EY034	2330	[1740]	[1108]	479	488	688	675

* OPERATING WEIGHT INCLUDES LARGEST IFM, CU/ALUM COILS, MODULATING POWER EXHAUST (VAV), AND VFD (VAV).

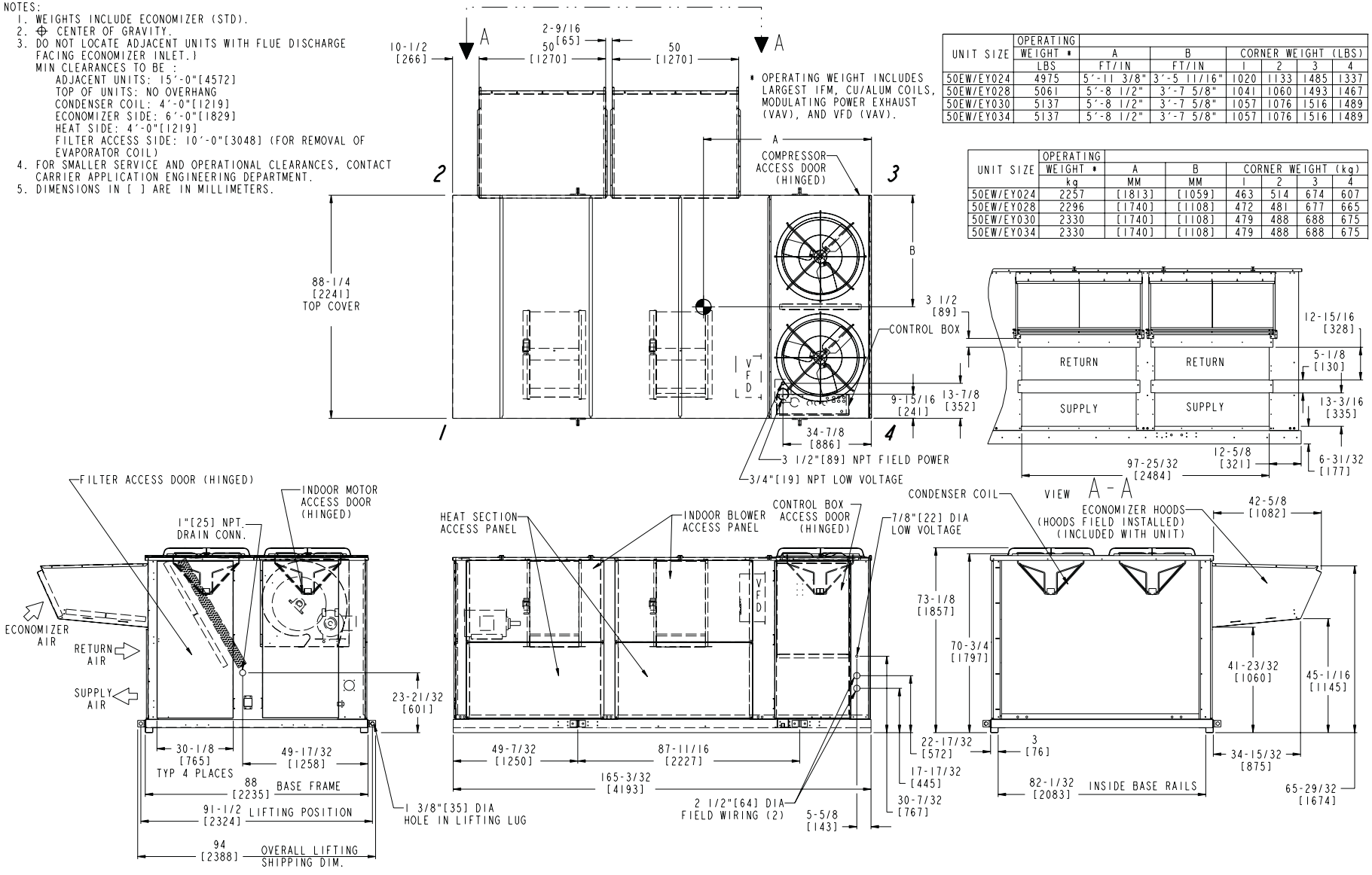


Fig. 16 — Base Unit Dimensions — 50EW,EY024-034

NOTES:
1. WEIGHTS INCLUDE ECONOMIZER (STD).
2. ⊕ CENTER OF GRAVITY.
3. DO NOT LOCATE ADJACENT UNITS WITH FLUE DISCHARGE FACING ECONOMIZER INLET. MIN CLEARANCES TO BE :
   ADJACENT UNITS: 15'-0" [4572]
   TOP OF UNITS: NO OVERHANG
   CONDENSER COIL: 4'-0" [1219]
   ECONOMIZER SIDE: 6'-0"[1829]
   HEAT SIDE: 4'-0" [1219]
   FILTER ACCESS SIDE: 10'-0" [3048]
   (FOR REMOVAL OF EVAPORATOR COIL)
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES, CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT.
5. DIMENSIONS IN [ ] ARE IN MILLIMETERS.

UNIT SIZE	OPERATING WEIGHT *	A	B	CORNER WEIGHT (LBS)			
	LBS	FT/IN	FT/IN	1	2	3	4
50EW/EY038	5776	7'-7 5/16"	3'-10 1/2"	1296	1157	1567	1756
50EW/EY044	5877	7'-3 13/16"	3'-11 1/2"	1268	1132	1640	1837
50EW/EY048	6455	7'-2 3/16"	3'-10 3/32"	1356	1232	1841	2026

* OPERATING WEIGHT INCLUDES LARGEST IFM, CU/ALUM COILS, MODULATING POWER EXHAUST (VAV), AND VFD (VAV).

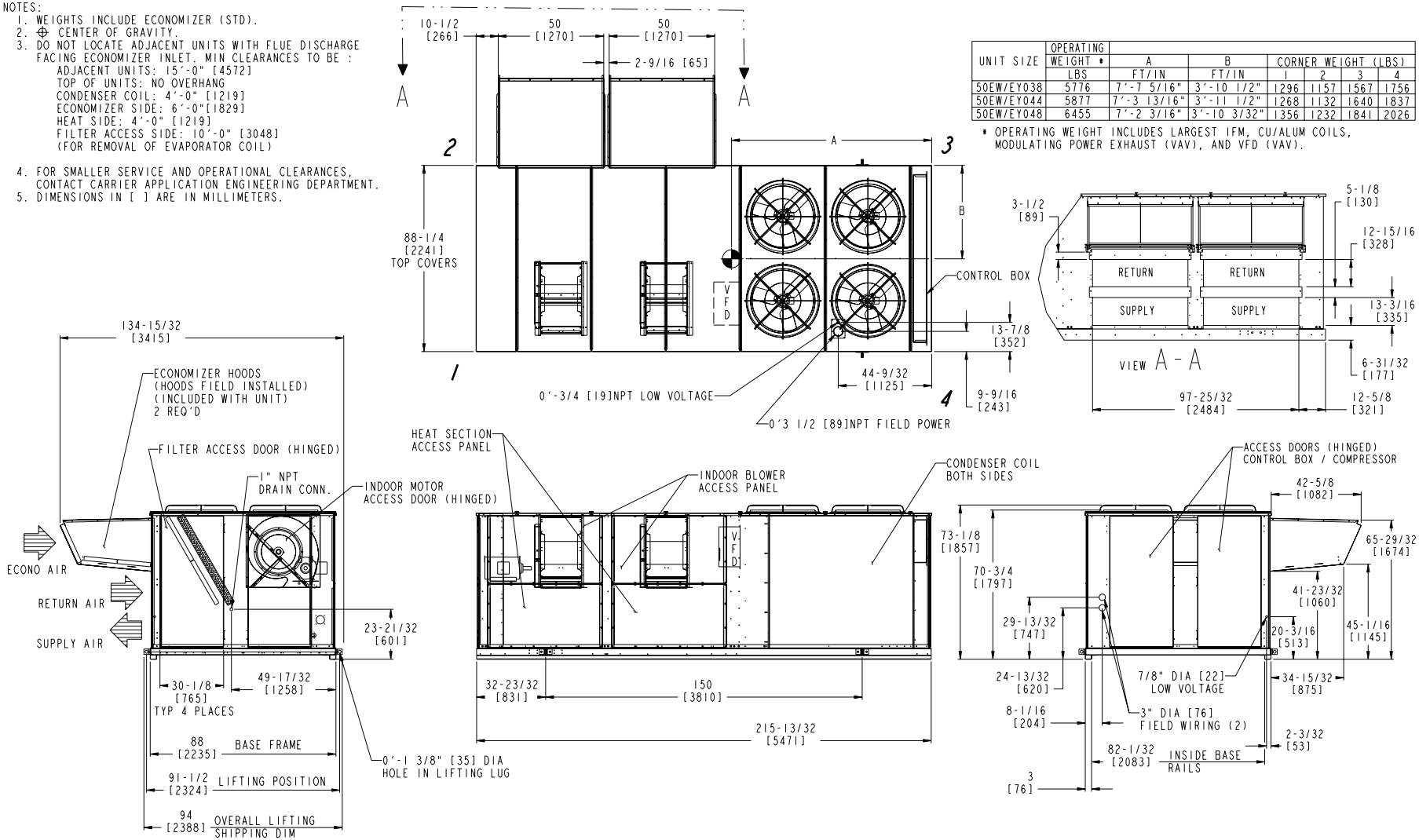
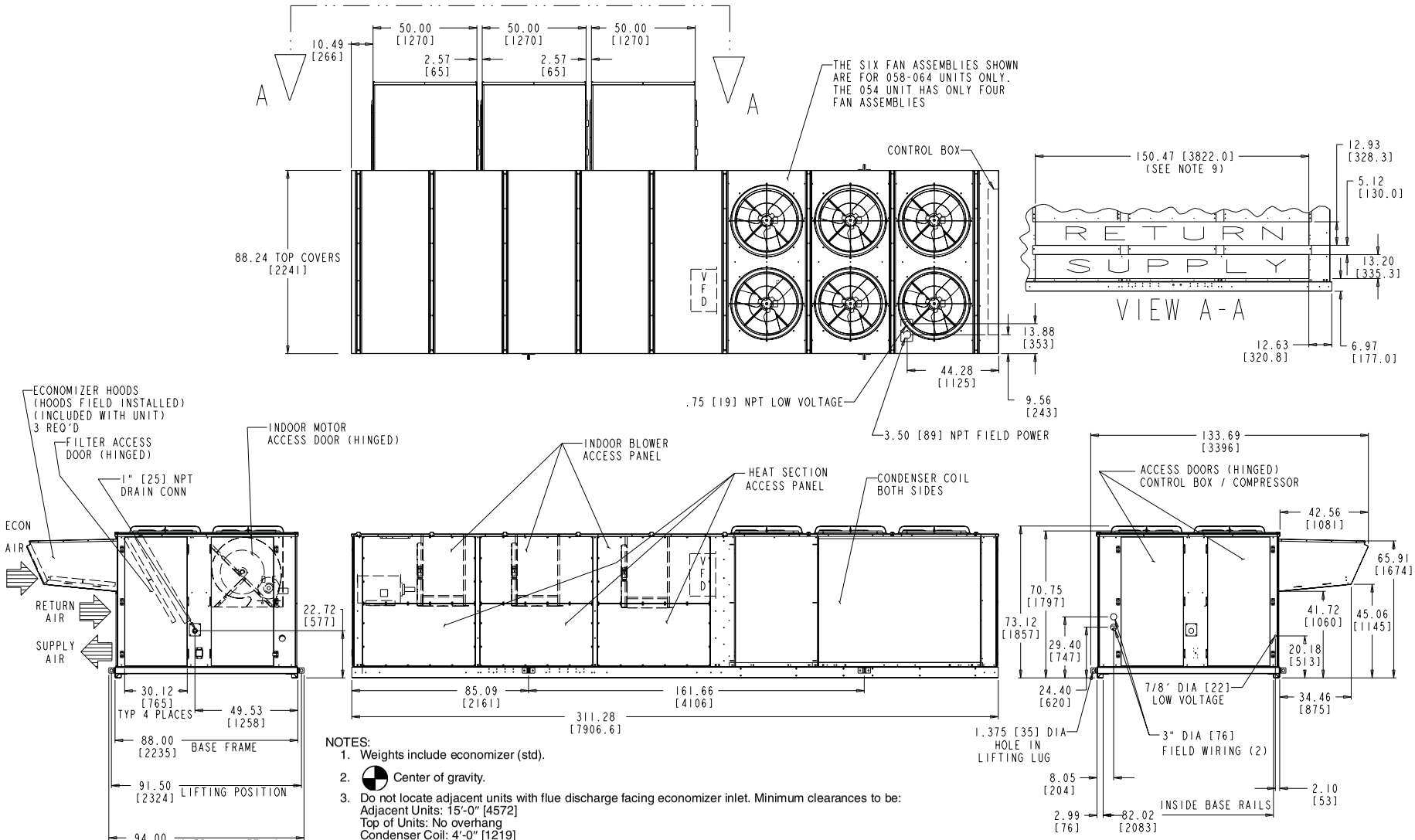


Fig. 17 — Base Unit Dimensions — 50EW,EY038-048



NOTES:
1. Weights include economizer (std).
2. Center of gravity.
3. Do not locate adjacent units with flue discharge facing economizer inlet. Minimum clearances to be:
   Adjacent Units: 15′-0″ [4572]
   Top of Units: No overhang
   Condenser Coil: 4′-0″ [1219]
   Economizer Side: 6′-0″ [1829]
   Heat Side: 4′-0″ [1219]
   Filter Access Side: 15′-0″ [4572] (for removal of evaporator coil)
4. For smaller service and operational clearances, contact Carrier Application Engineering Department.
5. Bottom ducts designed to be attached to accessory roof curb. If unit is mounted on dunnage, it is recommended the ducts must be supported by cross braces as done on accessory roof curb.
6. Base unit weights include outdoor air hoods and filters (indoor fan motor is not included). Add indoor motor, FIOPs and accessories for total operating weight.
7. VAV motor weights include indoor motor, VFD, compressor electric unloaders, VFD transducer and associated wiring.
8. Dimensions in [ ] are in millimeters, kilograms or kilowatts.
9. For side-supply/return applications, a single return and supply ductwork connection is recommended for covering all three return and all three supply openings. The entire area around the duct openings is available for a 1.5″ duct flange attachment.
10. See Fig. 19 for center of gravity. See Table 2 for unit weight.

Fig. 18 — Base Unit Dimensions — 50EW,EY054-068

NOTE: On retrofit jobs, ductwork may be attached to old unit instead of roof curb. Be careful not to damage ductwork when removing unit. Attach existing ductwork to roof curb instead of unit.

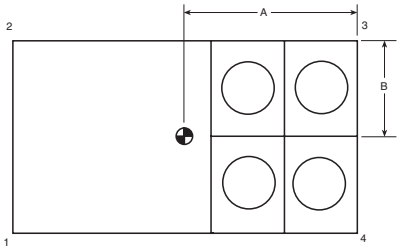
Four lifting lugs are provided on the unit base rails as shown in Fig. 7-18. Refer to rigging instructions on unit.

POSITIONING — Provide clearance around and above unit for airflow, safety, and service access (Fig. 7-18).

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air.

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

ROOF MOUNT — Check building codes for weight distribution requirements. See Fig. 19. Unit operating weight is shown in Tables 2A and 2B.



UNIT	CENTER OF GRAVITY				PERCENT OF TOTAL WEIGHT AT EACH CORNER (%)			
	Inches		Millimeters					
	A	B	A	B	1	2	3	4
50AJ,AK020	71.4	41.7	1814	1059	20.5	22.8	29.8	26.9
50AW,AY020	71.4	41.7	1814	1059	20.5	22.8	29.8	26.9
50AJ,AK025	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50AW,AY025	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50AJ,AK027	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50AW,AY027	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50AJ,AK030	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50AW,AY030	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50AJ,AK035	91.3	46.5	2319	1181	22.4	20.0	27.1	30.4
50AW,AY035	91.3	46.5	2319	1181	22.4	20.0	27.1	30.4
50AJ,AK040	87.8	46.5	2230	1181	21.6	19.3	27.9	31.3
50AW,AY040	87.8	46.5	2230	1181	21.6	19.3	27.9	31.3
50AJ,AK050	86.2	46.1	2189	1171	21.0	19.1	28.5	31.4
50AW,AY050	86.2	46.1	2189	1171	21.0	19.1	28.5	31.4
50AJ,AK060	122.2	44.7	3104	1135	19.6	19.1	30.2	31.1
50AW,AY060	120.6	44.6	3063	1133	19.6	19.1	30.2	31.1
50EJ,EK,EW,EY024	71.4	41.7	1814	1059	20.5	22.8	29.8	26.9
50EJ,EK,EW,EY028	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50EJ,EK,EW,EY030	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50EJ,EK,EW,EY034	68.5	43.6	1740	1107	20.6	20.9	29.5	29.0
50EJ,EK,EW,EY038	91.3	46.5	2319	1181	22.4	20.0	27.1	30.4
50EJ,EK,EW,EY044	87.8	46.5	2230	1181	21.6	19.3	27.9	31.3
50EJ,EK,EW,EY048	86.2	46.1	2189	1171	21.0	19.1	28.5	31.4
50EJ,EK,EW,EY054	128.1	46.1	3254	1171	21.6	19.6	28.0	30.8
50EJ,EK,EW,EY058	124.6	45.4	3164	1153	20.6	19.4	29.0	30.9
50EJ,EK,EW,EY064	122.2	44.7	3104	1135	19.9	19.3	29.9	30.8
50EJ,EK,EW,EY068	120.6	44.6	3063	1133	19.6	19.1	30.2	31.1

RIGGING WEIGHTS

UNIT	MAXIMUM UNIT WEIGHTS — Lb*							
	020	025	027	030	035	040	050	060
50AJ,AK	5052	5138	5235	5235	5799	6309	6520	8690
50AW,AY	5130	5216	5313	5313	5992	6502	6713	8895

UNIT	MAXIMUM UNIT WEIGHTS — Lb (Kg)*										
	024	028	030	034	038	044	048	054	058	064	068
50EJ,EK	5062 (2292)	5380 (2440)	5214 (2365)	5214 (2365)	5738 (2603)	6032 (2736)	6417 (2911)	7954 (3608)	8302 (3766)	8680 (3937)	8855 (4017)
50EW,EY	5130 (2327)	5586 (2534)	5292 (2400)	5292 (2400)	5931 (2690)	6032 (2736)	6610 (2998)	8159 (3701)	8507 (3859)	8885 (4030)	9060 (4110)

*Includes outdoor air hoods/filters, largest available indoor fan motor, modulating power exhaust, and the largest available Variable Frequency Drive (VFD).

NOTES:

1. Center of gravity.
2. Sizes 024-048 and 020-050 includes 500 lb (227 kg) and sizes 054-068 and 060 includes 725 lb (325 kg) for modulating power exhaust.
3. Sizes 024-048 and 020-050 includes 170 lb (77 kg) and sizes 054-068 and 060 includes 255 lb (116 kg) for economizer hoods.
4. Economizer hood packaging includes 45 lb (20.4 kg).
5. Sizes 024-048 and 020-050 includes 110 lb (50 kg) and sizes 054-068 and 060 includes 165 lb (75 kg) for electric heaters.
6. For sizes 024-034 and 020-030 add 220 lb (100 kg) for copper coil.
7. For sizes 038-044 and 035-040 add 284 lb (129 kg) for copper coil.
8. For 050 and 048 size add 380 lb (172 kg) for copper coil.
9. For 054 size add 271 lb (123 kg) for copper coil.
10. For 058 size add 407 lb (185 kg) for copper coil.
11. For 064 size add 489 lb (222 kg) for copper coil.
12. For 060 and 068 size add 651 lb (295 kg) for copper coil.

Fig. 19 — Rigging Information

Table 1A — Physical Data (50AJ,AK,AW,AY Units)

UNIT 50AJ,AK,AW,AY	020			025			027			030		
NOMINAL CAPACITY (tons)	20			25			27			30		
BASE UNIT OPERATING WEIGHT (lb)	See Operating Weights Table 2A											
COMPRESSOR												
Quantity...Type (Ckt 1 , Ckt 2)	1...06D328, 1...06D818			2...06D328			2...06D328			1...06D537, 1…06D328		
Number of Refrigerant Circuits	2			2			2			2		
Oil (oz) (Ckt 1, Ckt 2)	115, 88			115 ea.			115 ea.			115 ea.		
REFRIGERANT TYPE	R-22											
Operating Charge (lb-oz)												
Circuit 1*	25-0			25-0			29-0			27-0		
Circuit 2	31-0			25-0			28-0			29-0		
CONDENSER COIL	Cross-Hatched 3/8" Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins											
Quantity	1			1			1			1		
Rows...Fins/in.	4...15			4...15			4...15			4...15		
Total Face Area (sq ft)	33.3			33.3			33.3			33.3		
CONDENSER FAN	Propeller Type											
Nominal Cfm	13,420			13,420			13,420			13,420		
Quantity...Diameter (in.)	2...30			2...30			2...30			2...30		
Motor Hp	1			1			1			1		
EVAPORATOR COIL	Cross-Hatched Copper Tubes, Aluminum Plate Fins											
Tube Size (in.)	3.8			3/8			3/8			3/8		
Rows...Fins/in.	4...15			4...15			4...15			4...15		
Total Face Area (sq ft)	31.7			31.7			34.7			34.7		
EVAPORATOR FAN	Centrifugal Type											
Quantity...Size (in.)	2...20x15			2...20x15			2...20x15			2...20x15		
Type Drive	Belt			Belt			Belt			Belt		
Nominal Cfm	8,000			10,000			11,000			12,000		
Motor Hp	5	10†	15	7.5	10†	15	10	15†	20	10	15†	20
Motor Frame Size	184T	215T	254T	213T	215T	254T	215T	254T	256T	215T	254T	256T
Motor Bearing Type		Ball			Ball			Ball			Ball	
Maximum Allowable Rpm		1200			1200			1200			1200	
Motor Pulley Pitch Diameter	4.9	4.4	5.7	5.4	6.1	5.5	4.4	4.9	5.9	4.4	5.7	5.9
Nominal Motor Shaft Diameter (in.)	1 1/8	1 3/8	1 5/8	1 3/8	1 3/8	1 5/8	1 3/8	1 5/8	1 5/8	1 3/8	1 5/8	1 5/8
Fan Pulley Pitch Diameter (in.)	12.4	8.6	9.1	12.4	11.1	8.7	9.4	8.1	8.7	9.0	9.1	8.7
Nominal Fan Shaft Diameter (in.)		1 15/16			1 15/16			1 15/16			1 15/16	
Belt Quantity	1	2	2	1	1	2	2	2	2	2	2	2
Belt Type	BX56	BX50	5VX530	BX56	5VX590	5VX570	BX50	5VX500	5VX530	BX50	5VX530	5VX530
Belt Length (in.)	56	63	53	56	59	57	50	50	53	50	53	53
Pulley Center Line Distance (in.)	16.0-18.7	15.6-18.4	15.0-17.9	15.6-18.4	15.6-18.4	15.0-17.9	15.6-18.4	15.0-17.9	15.0-17.9	15.6-18.4	15.0-17.9	15.0-17.9
Factory Speed Setting (rpm)	717	924	1096	773	962	1106	848	1059	1187	884	1096	1187
HIGH-PRESSURE SWITCH (psig)												
Cutout	426			426			426			426		
Reset (Auto.)	320			320			320			320		
LOW-PRESSURE SWITCH (psig)												
Cutout	27			27			27			27		
Reset (Auto.)	67			67			67			67		
RETURN-AIR FILTERS												
Quantity...Size (in.)	10...20x24x2			10...20x24x2			10...20x24x2			10...20x24x2		
OUTDOOR AIR FILTERS												
Quantity...Size (in.)	8...16x25 4...20x25			8...16x25 4...20x25			8...16x25 4...20x25			8...16x25 4...20x25		

*Sizes 020-030: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.
Sizes 035-050: Circuit 1 uses the left condenser coil, Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 2.5 in. wg net external static. For more information, see Table 3A.

Table 1A — Physical Data (50AJ,AK,AW,AY Units) (cont)

UNIT 50AJ,AK,AW,AY	035			040			050			060		
NOMINAL CAPACITY (tons)	35			40			50			60		
BASE UNIT OPERATING WEIGHT (lb)	See Operating Weights Table 2A											
COMPRESSOR												
Quantity...Type (Ckt 1, Ckt 2)	2...06D537			1...06D537, 1...06EA250			2…06EA250			2...06EA265		
Number of Refrigerant Circuits	2			2			2			2		
Oil (oz) (Ckt 1, Ckt 2)	115 ea.			115, 224			224 ea.			304 ea.		
REFRIGERANT TYPE	R-22											
Operating Charge (lb-oz)												
Circuit 1*	34-8			51-8			50-0			79-8		
Circuit 2	34-8			49-8			50-0			79-8		
CONDENSER COIL	Cross-Hatched 3/8" Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins											
Quantity	2			2			2			2		
Rows...Fins/in.	3...15			4...15			4...15			4…15		
Total Face Area (sq ft)	58.3			66.7			66.7			100		
CONDENSER FAN	Propeller Type											
Nominal Cfm	27,064			27,064			27,064			43,900		
Quantity...Diameter (in.)	4...30			4...30			4...30			6...30		
Motor Hp	1			1			1			1		
EVAPORATOR COIL	Cross-Hatched Copper Tubes, Aluminum Plate Fins											
Tube Size (in.)	3/8			1/2			1/2			1/2		
Rows...Fins/in.	4...15			6...15			6...15			4...17		
Total Face Area (sq ft)	34.7			31.3			31.3			48.1		
EVAPORATOR FAN	Centrifugal Type											
Quantity...Size (in.)	2...20x15			2...20x15			2...20x15			3...20x15		
Type Drive	Belt			Belt			Belt			Belt		
Nominal Cfm	14,000			16,000			20,000			24,000		
Motor Hp	10	15†	20	15	20†	25	20	25†	30	25	30†	40
Motor Frame Size	215T	254T	256T	254T	256T	284T	256T	284T	286T	284T	286T	324T
Motor Bearing Type		Ball			Ball			Ball			Ball	
Maximum Allowable Rpm		1200			1200			1300			1200	
Motor Pulley Pitch Diameter	6.1	5.3	5.7	5.3	5.7	7.5	6.3	8.1	7.5	5.3	8.1	9.4
Nominal Motor Shaft Diameter (in.)	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 7/8	1 5/8	1 7/8	1 7/8	1 7/8	1 7/8	2 1/8
Fan Pulley Pitch Diameter (in.)	13.7	9.5	9.5	9.5	9.5	11.1	11.1	12.5	11.1	9.1	12.5	13.6
Nominal Fan Shaft Diameter (in.)		1 15/16			1 15/16			1 15/16			1 15/16	
Belt Quantity	1	2	2	2	2	2	2	2	2	3	3	2
Belt Type	5VX610	5VX530	5VX550	5VX530	5VX550	5VX590	5VX570	5VX630	5VX590	5VX530	5VX630	5VX650
Belt Length (in.)	61	53	55	53	55	59	57	63	59	53	63	65
Pulley Center Line Distance (in.)	15.6-18.4	15.0-17.9	15.0-17.9	15.0-17.9	15.0-17.9	14.6-17.6	15.0-17.9	14.6-17.6	14.6-17.6	15.2-17.5	14.7-17.2	14.2-17.0
Factory Speed Setting (rpm)	779	976	1050	976	1050	1182	993	1134	1182	1019	1134	1214
HIGH-PRESSURE SWITCH (psig)												
Cutout	426			426			426			426		
Reset (Auto.)	320			320			320			320		
LOW-PRESSURE SWITCH (psig)												
Cutout	27			27			27			27		
Reset (Auto.)	67			67			67			67		
RETURN-AIR FILTERS												
Quantity...Size (in.)	10...20x24x2			10...20x24x2			10...20x24x2			16...20x24x2		
OUTDOOR AIR FILTERS												
Quantity...Size (in.)	8...16x25 4...20x25			8...16x25 4...20x25			8...16x25 4...20x25			12...16x25 6...20x25		

*Sizes 020-030: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.
Sizes 035-050: Circuit 1 uses the left condenser coil, Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 2.5 in. wg net external static. For more information, see Table 3A.

Table 1B — Physical Data, English (50EJ,EK,EW,EY Units)

UNIT 50EJ,EK,EW,EY	024			028			030			034		
NOMINAL CAPACITY (tons)	20			25			27			30		
OPERATING WEIGHT (lb)	For Operating Weights see Table 2A.											
COMPRESSOR												
Type Ckt 1	06D328			06D328			06D537			06D537		
Ckt 2	06D818			06D328			06D328			06D537		
Number of Refrigerant Circuits	2			2			2			2		
Oil (oz) (Ckt 1, Ckt 2)	115, 88			115 ea.			115 ea.			115 ea.		
REFRIGERANT TYPE	R-22											
Operating Charge (lb-oz)												
Circuit 1*	25-0			25-0			25-0			25-0		
Circuit 2	31-0			25-0			25-0			25-0		
CONDENSER COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins											
Quantity	1			1			1			1		
Rows...Fins/in.	4...15			4...15			4...15			4...15		
Total Face Area (sq ft)	33.3			33.3			33.3			33.3		
CONDENSER FAN	Propeller Type											
Nominal Cfm	13,420			13,420			13,420			13,420		
Quantity...Diameter (in.)	2...30			2...30			2...30			2...30		
Motor Hp (1075 Rpm)	1			1			1			1		
EVAPORATOR COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Plate Fins, Intertwined Circuits											
Rows...Fins/in.	4...15			4...15			4...15			4...15		
Total Face Area (sq ft)	31.7			31.7			31.7			31.7		
EVAPORATOR FAN	Centrifugal Type											
Quantity...Size (in.)	2...20x15			2...20x15			2...20x15			2...20x15		
Type Drive	Belt			Belt			Belt			Belt		
Nominal Cfm	8,000			10,000			11,000			12,000		
Motor Hp	5	10†	15	7.5	10†	15	10	15†	20	10	15†	20
Motor Frame Size (Standard)	S184T	S215T	D254T	S213T	S215T	D254T	S215T	D254T	S256T	S215T	D254T	S256T
(High Efficiency)	S184T	S215T	S254T	S213T	S215T	S254T	S215T	S254T	S256T	S215T	S254T	S256T
Motor Bearing Type	Ball			Ball			Ball			Ball		
Maximum Allowable Rpm	1200			1200			1200			1200		
Motor Pulley Pitch Diameter	4.9	4.4	5.7	5.4	6.1	5.5	4.4	4.9	5.9	4.4	5.7	5.9
Nominal Motor Shaft Diameter (in.)	1 1/8	1 3/8	1 5/8	1 3/8	1 3/8	1 5/8	1 3/8	1 5/8	1 5/8	1 3/8	1 5/8	1 5/8
Fan Pulley Pitch Diameter (in.)	12.4	8.6	9.1	12.4	11.1	8.7	9.4	8.1	8.7	9.0	9.1	8.7
Nominal Fan Shaft Diameter (in.)		1 15/16			1 15/16			1 15/16			1 15/16	
Belt, Quantity...Type	1...BX56	2...BX50	2...5VX530	1...BX56	1...5VX570	2...5VX530	2...BX50	2...5VX500	2...5VX530	2...BX50	2...5VX530	2...5VX530
Belt, Length (in.)	56	50	53	56	59	57	50	50	53	50	53	53
Pulley Center Line Distance (in.)	16.0-18.7	15.6-18.4	15.0-17.9	15.6-18.4		15.0-17.9	15.6-18.4	15.0-17.9		15.6-18.4	15.0-17.9	
Factory Speed Setting (rpm)	717	924	1096	773	962	1106	848	1059	1187	884	1096	1187
HIGH-PRESSURE SWITCH (psig)												
Cutout	426			426			426			426		
Reset (Auto.)	320			320			320			320		
LOW-PRESSURE SWITCH (psig)												
Cutout	7			7			7			7		
Reset (Auto.)	22			22			22			22		
RETURN-AIR FILTERS (W x H x T)												
Quantity...Size (in.)	10...20x24x2			10...20x24x2			10...20x24x2			10...20x24x2		
OUTDOOR-AIR FILTERS	8...16x25			8...16x25			8...16x25			8...16x25		
Quantity...Size (in.)	4...20x25			4...20x25			4...20x25			4...20x25		
POWER EXHAUST	Direct Drive, 3-Speed, Single-Phase Motor (Factory-Wired for High Speed) and Forward Curved Fan											
Motor, Quantity...Hp	4...1											
Fan, Diameter...Width (in.)	11...10											

*Sizes 024-034: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.
Sizes 038-048: Circuit 1 uses the left condenser coil, Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 2.5 in. wg net external static. For more information, see Table 3A.

Table 1B — Physical Data, English (50EJ,EK,EW,EY Units) (cont)

UNIT 50EJ,EK,EW,EY	034			044			048		
NOMINAL CAPACITY (tons)	35			40			45		
OPERATING WEIGHT (lb)	For Operating Weights see Table 2.								
COMPRESSOR									
Type Ckt 1	06D537			06EA250			06EA265		
Ckt 2	06D537			06EA250			06EA250		
Number of Refrigerant Circuits	2			2			2		
Oil (oz) (Ckt 1, Ckt 2)	115 ea.			224 ea.			304, 224		
REFRIGERANT TYPE	R-22								
Operating Charge (lb-oz)									
Circuit 1*	34-0			35-0			41-0		
Circuit 2	34-0			35-0			41-0		
CONDENSER COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Fins								
Quantity	2			2			1	1	
Rows...Fins/in.	3...15			3...15			4...15	3...15	
Total Face Area (sq ft)	58.3			58.3			66.7		
CONDENSER FAN	Propeller Type								
Nominal Cfm	27,064			27,064			27,064		
Quantity...Diameter (in.)	4...30			4...30			4...30		
Motor Hp (1075 Rpm)	1			1			1		
EVAPORATOR COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Plate Fins, Intertwined Circuits								
Rows...Fins/in.	3...15			3...15			4...15		
Total Face Area (sq ft)	34.7			34.7			34.7		
EVAPORATOR FAN	Centrifugal Type								
Quantity...Size (in.)	2...20x15			2...20x15			2...20x15		
Type Drive	Belt			Belt			Belt		
Nominal Cfm	14,000			16,000			18,000		
Motor Hp	10	15†	20	15	20†	25	20	25†	30
Motor Frame Size (Standard)	S215T	D254T	S256T	D254T	S256T	S284T	S256T	S284T	S286T
(High Efficiency)	S215T	S254T	S256T	S254T	S256T	S284T	S256T	S284T	S286T
Motor Bearing Type	Ball			Ball			Ball		
Maximum Allowable Rpm	1200			1200			1200		
Motor Pulley Pitch Diameter	6.1	5.3	5.7	5.3	5.7	7.5	6.3	8.1	7.5
Nominal Motor Shaft Diameter (in.)	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 7/8	1 5/8	1 7/8	1 7/8
Fan Pulley Pitch Diameter (in.)	13.7	9.5	9.5	9.5	9.5	11.1	11.1	12.5	11.1
Nominal Fan Shaft Diameter (in.)		1 15/16			1 15/16			1 15/16	
Belt, Quantity...Type	1...5VX610	2...5VX530	2...5VX550	2...5VX530	2...5VX550	2...5VX590	2...5VX570	2...5VX630	2...5VX590
Belt, Length (in.)	61	53	55	53	55	59	57	63	59
Pulley Center Line Distance (in.)	15.6-18.4	15.0-17.9		15.0-17.9		14.6-17.6	15.0-17.9	14.6-17.6	
Factory Speed Setting (rpm)	779	976	1050	976	1050	1182	993	1134	1182
HIGH-PRESSURE SWITCH (psig)									
Cutout	426			426			426		
Reset (Auto.)	320			320			320		
LOW-PRESSURE SWITCH (psig)									
Cutout	7			7			7		
Reset (Auto.)	22			22			22		
RETURN-AIR FILTERS (W x H x T)									
Quantity...Size (in.)	10...20x24x2			10...20x24x2			10...20x24x2		
OUTDOOR-AIR FILTERS	8...16x25			8...16x25			8...16x25		
Quantity...Size (in.)	4...20x25			4...20x25			4...20x25		
POWER EXHAUST	Direct Drive, 3-Speed, Single-Phase Motor (Factory-Wired for High Speed) and Forward Curved Fan								
Motor, Quantity...Hp	4...1								
Fan, Diameter...Width (in.)	11...10								

*Sizes 024-034: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.
Sizes 038-048: Circuit 1 uses the left condenser coil, Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 2.5 in. wg net external static. For more information, see Table 3A.

Table 1B — Physical Data, English (50EJ,EK,EW,EY Units) (cont)

UNIT 50EJ,EK,EW,EY	054	058	064	068
NOMINAL CAPACITY (tons)	50	55	60	65
OPERATING WEIGHT (lb)	For Operating Weights see Table 2A.			
COMPRESSOR				
Quantity...Type (Ckt 1, Ckt 2)	1...06EA265, 1...06EA250	1...06EA275, 1...06EA250	1...06EA275, 1...06EA265	2...06EA275
Number of Refrigerant Circuits	2	2	2	2
Oil (oz) (Ckt 1, Ckt 2)	304, 224	304, 224	304, 304	304, 304
REFRIGERANT TYPE	R-22			
Operating Charge (lb-oz)				
Circuit 1*	50-11	57-0	68-0	81-0
Circuit 2	46-8	48-6	68-0	73-0
CONDENSER COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins			
Quantity	1 | 1	1 | 1	2	2
Rows...Fins/in.	3...15 | 2...15	3...15 | 2...15	3...15	4...15
Total Face Area (sq ft)	66.6	100.0	100	100
CONDENSER FAN	Propeller Type			
Nominal Cfm	30,000	43,900	43,900	43,900
Quantity...Diameter (in.)	4...30	6...30	6...30	6...30
Motor Hp (1075 Rpm)	1	1	1	1
EVAPORATOR COIL	Cross-Hatched 1/2″ Copper Tubes, Aluminum Plate Fins, Intertwined Circuits			
Rows...Fins/in.	4...17	4...17	4...17	4...17
Total Face Area (sq ft)	45.0	45.0	48.1	48.1
EVAPORATOR FAN	Centrifugal Type			
Quantity...Size (in.)	3...20x15	3...20x15	3...20x15	3...20x15
Type Drive	Belt	Belt	Belt	Belt
Nominal Cfm	20,000	22,000	24,000	26,000
Motor Hp	15 | 20† | 25	20 | 25† | 30	25 | 30† | 40	25 | 30† | 40
Motor Frame Size	S254T | S256T | S284T	S256T | S284T | S286T	S284T | S286T | S324T	S284T | S286T | S324T
Motor Bearing Type	Ball	Ball	Ball	Ball
Maximum Allowable Rpm	1200	1200	1200	1200
Motor Pulley Pitch Diameter	4.7 | 6.1 | 8.1	5.9 | 6.7 | 7.5	5.3 | 8.1 | 9.4	6.7 | 5.9 | 9.4
Nominal Motor Shaft Diameter (in.)	1 5/8 | 1 5/8 | 1 7/8	1 5/8 | 1 7/8 | 1 7/8	1 7/8 | 1 7/8 | 2 1/8	1 7/8 | 1 7/8 | 2 1/8
Fan Pulley Pitch Diameter (in.)	11.1 | 11.1 | 12.5	11.1 | 11.1 | 11.1	9.1 | 12.5 | 13.6	12.5 | 9.5 | 13.6
Nominal Fan Shaft Diameter (in.)	1 15/16	1 15/16	1 15/16	1 15/16
Belt, Quantity...Type	2...5VX550 | 2...5VX570 | 2...5VX630	2...5VX570 | 2...5VX590 | 2...5VX590	3...5VX530 | 2...5VX630 | 2...5VX650	2...5VX610 | 3...5VX550 | 2...5VX650
Length (in.)	55 | 57 | 63	57 | 59 | 59	53 | 63 | 65	61 | 55 | 65
Pulley Center Line Distance (in.)	15.2-17.5 | 15.2-17.5 | 14.7-17.2	15.2-17.5 | 14.7-17.2 | 14.7-17.2	15.2-17.5 | 14.7-17.2 | 14.2-17.0	14.7-17.2 | 14.7-17.2 | 14.3-17.0
Factory Speed Setting (rpm)	741 | 962 | 1134	930 | 1056 | 1182	930 | 1134 | 1214	1019 | 1087 | 1214
HIGH-PRESSURE SWITCH (psig)				
Cutout	426	426	426	426
Reset (Auto.)	320	320	320	320
LOW-PRESSURE SWITCH (psig)				
Cutout	7	7	7	7
Reset (Auto.)	22	22	22	22
RETURN-AIR FILTERS (W x H x T)				
Quantity...Size (in.)	16...24x20x2	16...20x24x2	16...24x20x2	16...24x20x2
OUTDOOR-AIR FILTERS	12...16x25	12...16x25	12...16x25	12...16x25
Quantity...Size (in.)	6...20x25	6...20x25	6...20x25	6...20x25
POWER EXHAUST	Direct Drive, 3-Speed, Single-Phase Motor (Factory-Wired for High Speed) and Forward Curved Fan			
Motor, Quantity...Hp	6...1			
Fan, Diameter...Width (in.)	11...10			

*Circuit 1 uses the left condenser coil. Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 2.5 in. wg net external static pressure. For more information see Table 3A.

Table 1C — Physical Data, SI (50EJ,EK,EW,EY Units)

UNIT 50EJ,EK,EW,EY	024			028			030			034		
NOMINAL CAPACITY (kW)	70			88			97			105		
OPERATING WEIGHT (kg)	For Operating Weights see Table 2B.											
COMPRESSOR												
Type Ckt 1	06D328			06D328			06D537			06D537		
Ckt 2	06D818			06D328			06D328			06D537		
Number of Refrigerant Circuits	2			2			2			2		
Oil (ml) (Ckt 1, Ckt 2)	3400, 2600			3400 ea.			3400 ea.			3400 ea.		
REFRIGERANT	R 22											
Operating Charge (kg)												
Circuit 1*	11.34			11.34			11.34			11.34		
Circuit 2	14.06			11.34			11.34			11.34		
CONDENSER COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins											
Quantity	1			1			1			1		
Rows...Fins/mm	4...590			4...590			4...590			4...590		
Total Face Area (sq m)	3.09			3.09			3.09			3.09		
CONDENSER FAN	Propeller Type											
Nominal L/s	6,330			6,330			6,330			6,330		
Quantity...Diameter (mm)	2...762			2...762			2...762			2...762		
Motor kW	0.75			0.75			0.75			0.75		
EVAPORATOR COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Plate Fins, Intertwined Circuits											
Rows...Fins/mm	4...590			4...590			4...590			4...590		
Total Face Area (sq m)	2.94			2.94			2.94			2.94		
EVAPORATOR FAN	Centrifugal Type											
Quantity...Size (mm)	2...508 x 381			2...508 x 381			2...508 x 381			2...508 x 381		
Type Drive	Belt			Belt			Belt			Belt		
Nominal L/s	3,775			4,720			5,190			5,600		
Motor kW	3.73	7.46†	11.19	5.6	7.46†	11.19	7.46	11.19†	14.92	7.46	11.19†	14.92
Motor Frame Size (Standard)	S184T	S215T	D254T	S213T	S215T	D254T	S215T	D254T	S256T	S215T	D254T	S256T
(High Efficiency)	S184T	S215T	S254T	S213T	S215T	S254T	S215T	S254T	S256T	S215T	S254T	S256T
Motor Bearing Type	Ball			Ball			Ball			Ball		
Maximum Allowable r/s	20			20			20			20		
Motor Pulley Pitch Diameter (mm)	124.46	111.76	144.78	137.16	154.94	139.70	111.76	124.46	149.86	111.76	144.78	149.86
Nominal Motor Shaft Diameter (mm)	28.58	34.93	41.28	34.93		41.28	34.93	41.28		34.93	41.28	
Fan Pulley Pitch Diameter (mm)	314.96	218.44	231.14	314.96	281.94	220.98	228.60	231.14	220.98	228.60	231.14	220.98
Nominal Shaft Diameter (mm)	49.21			49.21			49.21			49.21		
Belt, Quantity...Type	1...BX56	2...BX50	2...5VX530	1...BX56	1...5VX570	2...5VX530	2...BX50	2...5VX500	2...5VX530	2...BX50	2...5VX530	2...5VX530
Belt, Length (mm)	1422.4	1270.0	1346.2	1422.4	1498.6	1447.8	1270.0		1346.2	1270.0	1346.2	
Pulley Center Distance (mm)	406-475	396-467	381-455	396-467		381-455	396-487	381-455		396-467	381-455	
Factory Speed Setting (r/s)	12.0	15.4	18.3	12.9	16.0	18.4	14.1	17.7	19.8	14.7	18.3	19.8
HIGH-PRESSURE SWITCH (kPa)												
Cutout	2951			2951			2951			2951		
Reset (Auto.)	2206			2206			2206			2206		
LOW-PRESSURE SWITCH (kPa)												
Cutout	48			48			48			48		
Reset (Auto.)	152			152			152			152		
RETURN-AIR FILTERS (W x H x T)												
Quantity...Size (mm)	10...508x610x51			10...508 x 610 x 51			10...508 x 610 x 51			10...508x610x51		
OUTDOOR-AIR FILTERS	8...406x635			8...406x635			8...406x635			8...406x635		
Quantity...Size (mm)	4...508x635			4...508x635			4...508x635			4...508x635		
POWER EXHAUST	Direct Drive, 3-Speed, Single-Phase Motor (Factory-Wired for High Speed) and Forward Curved Fan											
Motor, Quantity...kW	4...0.75											
Fan, Diameter...Width (mm)	279...254											

*Sizes 024-034: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion. Sizes 038-048: Circuit 1 uses the left condenser coil, Circuit 2 the right. All units have intertwined evaporator coils.

†Motor and drive shown will deliver approximately 17.2 kPa net external static. For more information see Table 3B.

Table 1C — Physical Data, SI (50EJ,EK,EW,EY Units) (cont)

UNIT 50EJ,EK,EW,EY	038	044	048
NOMINAL CAPACITY (kW)	123	141	158
OPERATING WEIGHT (kg)	For Operating Weights see Table 2B.		
COMPRESSOR			
Type Ckt 1	06D537	06EA250	06EA265
Ckt 2	06D537	06EA250	06EA250
Number of Refrigerant Circuits	2	2	2
Oil (ml) (Ckt 1, Ckt 2)	3400 ea.	6625 ea.	9990, 6625
REFRIGERANT	R 22		
Operating Charge (kg)			
Circuit 1*	15.42	15.88	18.60
Circuit 2	15.42	15.88	18.60
CONDENSER COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins		
Quantity	2	2	1 | 1
Rows...Fins/m	3...590	3...590	4...590 | 3...590
Total Face Area (sq m)	5.42	5.42	6.19
CONDENSER FAN	Propeller Type		
Nominal L/s	12,770	12,770	12,770
Quantity...Diameter (mm)	4...762	4...762	4...762
Motor kW	0.75	0.75	0.75
EVAPORATOR COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Plate Fins, Intertwined Circuits		
Rows...Fins/m	3...590	3...590	4...590
Total Face Area (sq m)	3.22	3.22	3.22
EVAPORATOR FAN	Centrifugal Type		
Quantity...Size (mm)	2...508 x 381	2...508 x 381	2...508 x 381
Type Drive	Belt	Belt	Belt
Nominal L/s	5,660	6,600	8,498
Motor kW	7.46 | 11.19† | 14.92	11.19 | 14.92† | 18.65	14.92 | 18.65† | 22.38
Motor Frame Size (Standard)	S215T | D254T | S256T	D254T | S256T | S254T	S256T | S284T | S286T
(High Efficiency)	S215T | S254T | S256T	S254T | S256T | S284T	S256T | S284T | S286T
Motor Bearing Type	Ball	Ball	Ball
Maximum Allowable r/s	20	20	20
Motor Pulley Pitch Diameter (mm)	154.94 | 134.62 | 144.78	134.62 | 144.78 | 190.50	160.02 | 205.74 | 190.50
Nominal Motor Shaft Diameter (mm)	34.93 | 41.28	41.28 | 47.63	41.28 | 47.63
Fan Pulley Pitch Diameter (mm)	347.98 | 241.30 | 241.30	241.30 | 241.30 | 281.94	281.94 | 317.50 | 281.94
Nominal Shaft Diameter (mm)	49.21	49.21	49.21
Belt, Quantity...Type	1...5VX610 | 2...5VX530 | 2...5VX550	2...5VX530 | 2...5VX550 | 2...5VX590	2...5VX570 | 2...5VX630 | 2...5VX590
Belt, Length (mm)	1549.4 | 1346.2 | 3937.0	1346.2 | 3937.0 | 1498.6	1447.8 | 1600.2 | 1498.6
Pulley Center Distance (mm)	15.6-18.4 | 15.0-17.9	15.0-17.9 | 14.6-17.6	15.0-17.9 | 14.6-17.6
Factory Speed Setting (r/s)	13.0 | 16.3 | 17.5	16.3 | 17.5 | 19.7	16.6 | 18.9 | 19.7
HIGH-PRESSURE SWITCH (kPa)			
Cutout	2951	2951	2951
Reset (Auto.)	2206	2206	2206
LOW-PRESSURE SWITCH (kPa)			
Cutout	48	48	48
Reset (Auto.)	152	152	152
RETURN-AIR FILTERS (W x H x T)			
Quantity...Size (mm)	10...508x610x51	10...508x610x51	10...508x610x51
OUTDOOR-AIR FILTERS	8...406x635	8...406x635	8...406x635
Quantity...Size (mm)	4...508x635	4...508x635	4...508x635
POWER EXHAUST	Direct Drive, 3-Speed, Single-Phase Motor (Factory-Wired for High Speed) and Forward Curved Fan		
Motor, Quantity...kW	4...0.75		
Fan, Diameter...Width (mm)	279...254		

*Sizes 024-034: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion. Sizes 038-048: Circuit 1 uses the left condenser coil, Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 17.2 kPa net external static. For more information see Table 3B.

Table 1C — Physical Data, SI (50EJ,EK,EW,EY Units) (cont)

UNIT 50EJ,EK,EW,EY	054			058			064			068		
NOMINAL CAPACITY (kW)	171			188			205			222		
OPERATING WEIGHT (kg)	For Operating Weights see Table 2B.											
COMPRESSOR												
Quantity...Type (Ckt 1, Ckt 2)	1...06EA265, 1...06EA250			1...06EA275, 1...063A250			1...06EA275, 1...06EA265			2...06EA275		
Number of Refrigerant Circuits	2			2			2			2		
Oil (ml) (Ckt 1, Ckt 2)	9990, 6625			9990, 6625			9990, 9990			9990, 9990		
REFRIGERANT	R 22											
Operating Charge (kg)												
Circuit 1*	23.0			25.9			30.8			36.7		
Circuit 2	21.1			21.9			30.8			33.1		
CONDENSER COIL	Cross-Hatched 3/8″ Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins											
Quantity	1	1		1	1		2			2		
Rows...Fins/m	3...590	2...590		3...590	2...590		3...590			4...590		
Total Face Area (sq m)	6.19			9.29			9.29			9.29		
CONDENSER FAN	Propeller Type											
Nominal L/s	14 163			20 725			20 725			20 725		
Quantity... Diameter (mm)	4...762			6...762			6...762			6...762		
Motor kW	0.746			0.746			0.746			0.746		
EVAPORATOR COIL	Cross-Hatched 1/2″ Copper Tubes, Aluminum Plate Fins, Intertwined Circuits											
Rows...Fins/m	4...669			4...669			4...669			4...669		
Total Face Area (sq m)	4.18			4.18			4.47			4.47		
EVAPORATOR FAN	Centrifugal Type											
Quantity...Size (mm)	3...508 x 381			3...508 x 381			3...508 x 381			3...508 x 381		
Type Drive	Belt			Belt			Belt			Belt		
Nominal L/s	9,442			10,386			11,330			12,275		
Motor kW	11.1	14.8†	18.5	14.8	18.5†	22.2	18.5	22.2†	29.6	18.5	22.2†	29.6
Motor Frame Size	S254T	S256T	D284T	S256T	S284T	D286T	S284T	S286T	S324T	S284T	S286T	S324T
Motor Bearing Type	Ball			Ball			Ball			Ball		
Maximum Allowable r/s	20			20			20			20		
Motor Pulley Pitch Diameter (mm)	119.4	154.9	205.7	149.9	170.2	190.5	134.6	205.7	238.8	170.2	149.9	238.8
Nominal Motor Shaft Diameter (mm)	41.3	41.3	47.6	41.3	47.6	47.6	47.6	47.6	54.0	47.6	47.6	54.0
Fan Pulley Pitch Diameter (mm)	281.9	281.9	317.5	218.9	281.9	281.9	231.1	317.5	345.4	317.5	241.3	345.4
Nominal Shaft Diameter (mm)	49.21			49.21			49.21			49.21		
Belt, Quantity...Type	2...5VX550	2...5VX570	2...5VX630	2...5VX570	2...5VX590	2...5VX590	3...5VX530	2...5VX630	2...5VX650	2...5VX610	3...5VX550	2...5VX650
Belt, Length (mm)	1447.8	1447.8	1600.2	1346.2	1447.8	1498.6	1346.2	1600.2	1651.0	1549.4	1397.0	1651.0
Pulley Center Distance (mm)	386-444	386-444	373-437	386-444	373-437	373-437	386-444	373-437	361-432	333-437	373-437	363-432
Factory Speed Setting (r/s)	12.4	16.0	18.8	15.5	17.6	19.7	17.0	18.9	20.2	15.6	18.1	20.2
HIGH-PRESSURE SWITCH (kPa)												
Cutout	2937			2937			2937			2937		
Reset (Auto.)	2206			2206			2206			2206		
LOW-PRESSURE SWITCH (kPa)												
Cutout	48			48			48			48		
Reset (Auto.)	152			152			152			152		
RETURN-AIR FILTERS (W x H x T)												
Quantity...Size (mm)	16...508 x 610 x 51			16...508 x 610 x 51			16...508 x 610 x 51			16...508 x 610 x 51		
OUTDOOR-AIR FILTERS												
Quantity...Size (mm)	12...406x635 6...508x635			12...406x635 6...508x635			12...406x635 6...508x635			12...406x635 6...508x635		
POWER EXHAUST	Direct Drive, 3-Speed, Single-Phase Motor (Factory-Wired for High Speed) and Forward Curved Fan											
Motor, Quantity...kW	6...0.75											
Fan, Diameter...Width (mm)	279...254											

*Circuit 1 uses the left condenser coil. Circuit 2 the right. All units have intertwined evaporator coils.
†Motor and drive shown will deliver approximately 17.2 kPa net external static. For more information see Table 3B.

Table 2A — Operating Weights, English

50AJ,AK,AW,AY UNITS

UNIT	BASE UNIT WEIGHTS (Lb)*							
	020	025	027	030	035	040	050	060
50AJ,AK	4087	4173	4194	4194	4758	5200	5313	7240
50AW,AY	4165	4251	4272	4272	4951	5393	5506	7445

50EJ,EK,EW,EY UNITS

UNIT	BASE UNIT WEIGHTS (Lb)*										
	024	028	030	034	038	044	048	054	058	064	068
50EJ,EK	4087	4173	4173	4173	4697	4923	5210	6565	6815	7065	7240
50EW,EY	4165	4251	4251	4251	4890	4923	5403	6770	7020	7270	7445

50AJ,AK,AW,AY UNITS

OPTION/ ACCESSORY	OPTION/ACCESSORY WEIGHT ADDERS (Lb)							
	020	025	027	030	035	040	050	060
Barometric Relief	300	300	300	300	300	300	300	450
Power Exhaust	450	450	450	450	450	450	450	675
Mod. Power Exhaust	500	500	500	500	500	500	500	725
Electric Heat	110	110	110	110	110	110	110	165
Cu Tubing/Cu Fin Condenser Coil	220	220	220	220	285	285	380	651
Outdoor Air Hood Crate and Packaging (Less Hoods' Weight)	45	45	45	45	45	45	45	45
	(Packaging Only)				(Packaging Only)			
Outdoor Air Hoods/Filters	170	170	170	170	170	170	170	255
Roof Curb (14-in.)	365	365	365	365	410	410	410	585

50EJ,EK,EW,EY UNITS

OPTION/ ACCESSORY	OPTION/ACCESSORY WEIGHTS (Lb)										
	024	028	030	034	038	044	048	054	058	064	068
Barometric Relief	300	300	300	300	300	300	300	450	450	450	450
Power Exhaust	450	450	450	450	450	450	450	675	675	675	675
Modular Power Exhaust	500	500	500	500	500	500	500	725	725	725	725
Electric Heat	110	110	110	110	110	110	110	165	165	165	165
Cu Tubing/Cu Fin Condenser Coil	220	220	220	220	285	285	380	271	407	489	651
Roof Curb (14-in. curb)	365	365	365	365	410	410	410	585	585	585	585
Outdoor Air Hood Crate and Packaging	45	45	45	45	45	45	45	45	45	45	45

CV MOTOR WEIGHTS (Lb)

MOTOR HP	UNIT VOLTAGE	STANDARD EFFICIENCY IFM	HIGH EFFICIENCY IFM
5	230/380/460	78	94
	575	78	92
7.5	230/380/460	107	135
	575	107	136
10	230/380/460	118	164
	575	118	156
15	230/380/460	150	217
	575	150	220
20	230/380/460	212	250
	575	212	258
25	230/380/460	240	309
	575	240	319
30	230/380/460	283	355
	575	283	359
40	230/380/460	372	415
	575	372	410

LEGEND

Cu — Copper
CV — Constant Volume
FIOP — Factory-Installed Option
HP — Horsepower
IFM — Indoor Fan Motor
VAV — Variable Air Volume
VFD — Variable Frequency Drive

*Outdoor-air hoods and filters included in base unit weights; indoor-fan motors are NOT included.

VAV MOTOR WEIGHTS (Lb)

MOTOR HP	UNIT VOLTAGE	STANDARD EFFICIENCY IFM	HIGH EFFICIENCY IFM
5	230/380/460	125	141
	575	163	177
7.5	230/380/460	183	211
	575	193	222
10	230/380/460	204	250
	575	204	242
15	230/380/460	238	305
	575	240	310
20	230/380/460	348	386
	575	304	350
25	230/380/460	377	446
	575	375	454
30	230/380/460	480	552
	575	418	494
40	230/380/460	637	680
	575	587	625

NOTES:
1. Base unit weight includes outdoor-air hoods. Base unit weight does NOT include indoor-fan motor. ADD indoor-fan motor, FIOPs, and accessories for TOTAL operating weight.
2. The VAV motor weights include indoor fan motor and the VFD (variable frequency drive), compressor electric unloaders, VFD transducers, and associated wiring.

Table 2B — Operating Weights, SI (50EJ,EK,EW,EY Units)

UNIT	BASE UNIT WEIGHTS (Kg)*										
	024	028	030	034	038	044	048	054	058	064	068
50EJ,EK	1854	1893	1893	1893	2131	2233	2363	2978	3091	3205	3284
50EW,EY	1889	1928	1928	1928	2218	2233	2451	3071	3184	3298	3377

OPTION/ ACCESSORY	OPTION/ACCESSORY WEIGHTS (Kg)										
	024	028	030	034	038	044	048	054	058	064	068
Barometric Relief	136	136	136	136	136	136	136	204	204	204	204
Power Exhaust	204	204	204	204	204	204	204	306	306	306	306
Modular Power Exhaust	227	227	227	227	227	227	227	329	329	329	329
Electric Heat	50	50	50	50	50	50	50	75	75	75	75
Cu Tubing/Cu Fin Condenser Coil	100	100	100	100	129	129	172	123	185	222	295
Roof Curb (355.6 mm curb)	166	166	166	166	186	186	186	265	265	265	265
Outdoor Air Hood Crate and Packaging	20	20	20	20	20	20	20	20	20	20	20

CV MOTOR WEIGHTS (Kg)

MOTOR kW	UNIT VOLTAGE	STANDARD EFFICIENCY IFM	HIGH EFFICIENCY IFM
3.73	230/380/460	35	43
	575	35	42
5.6	230/380/460	49	61
	575	49	62
7.46	230/380/460	54	74
	575	54	71
11.19	230/380/460	68	98
	575	68	100
14.92	230/380/460	96	113
	575	96	117
18.65	230/380/460	109	140
	575	109	145
22.38	230/380/460	128	161
	575	128	163
29.84	230/380/460	169	188
	575	169	186

LEGEND

Cu — Copper
CV — Constant Volume
FIOP — Factory-Installed Option
HP — Horsepower
IFM — Indoor Fan Motor
VAV — Variable Air Volume
VFD — Variable Frequency Drive

*Outdoor-air hoods and filters included in base unit weights; indoor-fan motors are NOT included.

VAV MOTOR WEIGHTS (Kg)

MOTOR kW	UNIT VOLTAGE	STANDARD EFFICIENCY IFM	HIGH EFFICIENCY IFM
3.73	230/380/460	57	64
	575	74	80
5.6	230/380/460	83	96
	575	88	101
7.46	230/380/460	93	113
	575	93	110
11.19	230/380/460	108	138
	575	109	141
14.92	230/380/460	158	175
	575	138	159
18.65	230/380/460	171	202
	575	170	206
22.38	230/380/460	218	250
	575	190	224
29.84	230/380/460	289	308
	575	266	284

NOTES:
1. Base unit weight includes outdoor-air hoods. Base unit weight does NOT include indoor-fan motor. ADD indoor-fan motor, FIOPs, and accessories for TOTAL operating weight.
2. The VAV motor weights include indoor fan motor and the VFD (variable frequency drive), compressor electric unloaders, VFD transducers, and associated wiring.

Table 3A — Evaporator Fan Motor Data, English

UNIT SIZE 50A	UNIT SIZE 50E	MOTOR HP	MOTOR SHAFT DIA. (in.)	FAN SHAFT SPEED (rpm)	MOTOR SHEAVE	MOTOR SHEAVE PITCH DIAMETER (in.)	BUSHING DIAMETER (in.)	FAN SHEAVE	FAN SHEAVE PITCH DIAMETER (in.)	BUSHING DIAMETER (in.)	BELT (QUANTITY)	BELT TENSION (lb at .25 in.)
020	024	5	1.125	717	BK55	4.9	NONE - 1.125	1B5V124	12.4	B - 1.9375	BX56	8
		10	1.375	924	2BK50	4.4	NONE - 1.375	2B5V86	8.6	B - 1.9375	(2) BX50	8
		15	1.625	1096	2B5V56	5.7	B - 1.625	2B5V90	9.1	B - 1.9375	(2) 5VX530	9
025	028	7.5	1.375	773	BK60H	5.4	H - 1.375	1B5V124	12.4	B - 1.9375	BX56	10
		10	1.375	962	1B5V60	6.1	H - 1.375	1B5V110	11.1	B - 1.9375	5VX570	11
		15	1.625	1106	2B5V54	5.5	B - 1.625	2B5V86	8.7	B - 1.9375	(2) 5VX530	9
027	030	10	1.375	848	2BK50	4.4	NONE - 1.375	2B5V94	9.4	B - 1.9375	(2) BX50	8
		15	1.625	1059	2B5V48	4.9	B - 1.625	2B5V80	8.1	B - 1.9375	(2) 5VX500	10
		20	1.625	1187	2B5V58	5.9	B - 1.625	2B5V86	8.7	B - 1.9375	(2) 5VX530	11
030	034	10	1.375	884	2BK50	4.4	H - 1.375	2B5V90	9.0	B - 1.9375	(2) BX50	8
		15	1.625	1096	2B5V56	5.7	B - 1.625	2B5V90	9.1	B - 1.9375	(2) 5VX530	9
		20	1.625	1187	2B5V58	5.9	B - 1.625	2B5V86	8.7	B - 1.9375	(2) 5VX530	11
035	038	10	1.375	779	1B5V60	6.1	NONE - 1.375	1B5V136	13.7	B - 1.9375	5VX610	12
		15	1.625	976	2B5V52	5.3	B - 1.625	2B5V94	9.5	B - 1.9375	(2) 5VX530	10
		20	1.625	1050	2B5V56	5.7	B - 1.625	2B5V94	9.5	B - 1.9375	(2) 5VX550	11
040	044	15	1.625	976	2B5V52	5.3	B - 1.625	2B5V94	9.5	B - 1.9375	(2) 5VX530	10
		20	1.625	1050	2B5V56	5.7	B - 1.625	2B5V94	9.5	B - 1.9375	(2) 5VX550	11
		25	1.875	1182	2B5V74	7.5	B - 1.875	2B5V110	11.1	B - 1.9375	(2) 5VX590	11
050	048	20	1.625	993	2B5V62	6.3	B - 1.625	2B5V110	11.1	B - 1.9375	(2) 5VX570	11
		25	1.875	1134	2B5V80	8.1	B - 1.875	2B5V124	12.5	B - 1.9375	(2) 5VX630	11
		30	1.875	1182	2B5V74	7.5	B - 1.875	2B5V110	11.1	B - 1.9375	(2) 5VX590	13
—	054	15	1.625	741	2B5V46	4.7	B - 1.625	2B5V110	11.1	B - 1.9375	(2) 5VX550	11
		20	1.625	962	2B5V60	6.1	B - 1.625	2B5V110	11.1	B - 1.9375	(2) 5VX570	12
		25	1.875	1134	2B5V80	8.1	B - 1.875	2B5V124	12.5	B - 1.9375	(2) 5VX630	12
—	058	20	1.625	930	2B5V58	5.9	B - 1.625	2B5V110	11.1	B - 1.9375	(2) 5VX570	13
		25	1.875	1056	2B5V66	6.7	B - 1.875	2B5V110	11.1	B - 1.9375	(2) 5VX590	14
		30	1.875	1182	2B5V74	7.5	B - 1.875	2B5V110	11.1	B - 1.9375	(2) 5VX590	14
060	064	25	1.875	1019	3B5V52	5.3	B - 1.875	3B5V90	9.1	B - 1.9375	(3) 5VX530	12
		30	1.875	1134	2B5V80	8.1	B - 1.875	2B5V124	12.5	B - 1.9375	(2) 5VX630	14
		40	2.125	1214	2B5V94	9.4	B - 2.125	2B5V136	13.6	B - 1.9375	(2) 5VX650	15
—	068	25	1.875	938	2B5V66	6.7	B - 1.875	2B5V124	12.5	B - 1.9375	(2) 5VX610	14
		30	1.875	1087	3B5V58	5.9	B - 1.875	3B5V94	9.5	B - 1.9375	(3) 5VX550	13
		40	2.125	1214	2B5V94	9.4	B - 2.125	2B5V136	13.6	B - 1.9375	(2) 5VX650	15

NOTES:
1. Motor shaft speed is 1750 rpm. The fan shaft diameter is $1^{15}/_{16}$ inches.
2. All indoor fan motors meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT), effective October 24, 1997.

Table 3B — Evaporator Fan Motor Data, SI

UNIT SIZE 50E	MOTOR kW	MOTOR SHAFT DIA. (mm)	FAN SHAFT SPEED (r/s)	MOTOR SHEAVE	MOTOR SHEAVE PITCH DIAMETER (mm)	BUSHING DIAMETER (mm)	FAN SHEAVE	FAN SHEAVE PITCH DIAMETER (mm)	BUSHING DIAMETER (mm)	BELT (QUANTITY)	BELT TENSION (kg at 6.35 mm)
024	3.73	28.58	12.0	BK55	124.46	NONE - 29	1B5V124	314.96	B - 49	BX56	17.1
	7.46	34.93	15.4	2BK50	111.76	NONE - 35	2B5V86	218.44	B - 49	(2) BX50	17.3
	11.19	41.28	18.3	2B5V56	144.78	B - 41	2B5V90	231.14	B - 49	(2) 5VX530	19.8
028	5.60	34.93	12.9	BK60H	137.16	H - 35	1B5V124	314.96	B - 49	BX56	21.4
	7.46	34.93	16.0	1B5V60	154.94	H - 35	1B5V110	281.94	B - 49	5VX570	24.5
	11.19	41.28	18.4	2B5V54	139.70	B - 41	2B5V86	220.98	B - 49	(2) 5VX530	20.3
030	7.46	34.93	14.1	2BK50	111.76	NONE - 35	2B5V94	238.76	B - 49	(2) BX50	17.5
	11.19	41.28	17.7	2B5V48	124.46	B - 41	2B5V80	205.74	B - 49	(2) 5VX500	22.0
	14.92	41.28	19.8	2B5V58	149.86	B - 41	2B5V86	220.98	B - 49	(2) 5VX530	24.2
034	7.46	34.93	14.7	2BK50	111.76	H - 35	2B5V90	228.60	B - 49	(2) BX50	17.4
	11.19	41.28	18.3	2B5V56	144.78	B - 41	2B5V90	231.14	B - 49	(2) 5VX530	19.8
	14.92	41.28	19.8	2B5V58	149.86	B - 41	2B5V86	220.98	B - 49	(2) 5VX530	24.2
038	7.46	34.93	13.0	1B5V60	154.94	NONE - 35	1B5V136	347.98	B - 49	5VX610	25.5
	11.19	41.28	16.3	2B5V52	134.62	B - 41	2B5V94	241.30	B - 49	(2) 5VX530	21.1
	14.92	41.28	17.5	2B5V56	144.78	B - 41	2B5V94	241.30	B - 49	(2) 5VX550	25.2
044	11.19	41.28	16.3	2B5V52	134.62	B - 41	2B5V94	241.30	B - 49	(2) 5VX530	21.1
	14.92	41.28	17.5	2B5V56	144.78	B - 41	2B5V94	241.30	B - 49	(2) 5VX550	25.2
	18.65	47.63	19.7	2B5V74	190.50	B - 48	2B5V110	281.94	B - 49	(2) 5VX590	25.1
048	14.92	41.28	16.6	2B5V62	160.02	B - 41	2B5V110	281.94	B - 49	(2) 5VX570	23.9
	18.65	47.63	18.9	2B5V80	205.74	B - 48	2B5V124	317.50	B - 49	(2) 5VX630	24.3
	22.38	47.63	19.7	2B5V74	190.50	B - 48	2B5V110	281.94	B - 49	(2) 5VX590	29.1
054	11.19	41.28	12.4	2B5V46	119.38	B - 41	2B5V110	281.94	B - 49	(2) 5VX550	24.3
	14.92	41.28	16.0	2B5V60	154.94	B - 41	2B5V110	281.94	B - 49	(2) 5VX570	26.9
	18.65	47.63	18.8	2B5V80	205.74	B - 48	2B5V124	317.50	B - 49	(2) 5VX630	27.2
058	14.92	41.28	15.5	2B5V58	149.86	B - 41	2B5V110	281.94	B - 49	(2) 5VX570	27.7
	18.65	47.63	17.6	2B5V66	170.18	B - 48	2B5V110	281.94	B - 49	(2) 5VX590	30.9
	22.38	47.63	19.7	2B5V74	190.50	B - 48	2B5V110	281.94	B - 49	(2) 5VX590	31.6
064	18.65	47.63	17.0	3B5V52	134.62	B - 48	3B5V90	231.14	B - 49	(3) 5VX530	25.7
	22.38	47.63	18.9	2B5V80	205.74	B - 48	2B5V124	317.50	B - 49	(2) 5VX630	31.4
	29.84	53.98	20.2	2B5V94	238.76	B - 54	2B5V136	345.44	B - 49	(2) 5VX650	32.1
068	18.65	47.63	15.6	2B5V66	170.18	B - 48	2B5V124	317.50	B - 49	(2) 5VX610	31.5
	22.38	47.63	18.1	3B5V58	149.86	B - 48	3B5V94	241.30	B - 49	(3) 5VX550	27.7
	29.84	53.98	20.2	2B5V94	238.76	B - 54	2B5V136	345.44	B - 49	(2) 5VX650	32.1

NOTES:
1. Motor shaft speed is 29.2 r/s. The fan shaft diameter is 49.21 mm.
2. All indoor fan motors meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT), effective October 24, 1997.

Step 3 — Field Fabricate Ductwork — Secure all ducts to building structure. Use flexible duct connectors between unit and ducts as required. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

NOTE: Due to width of the horizontal supply/return ductwork, provisions should be made for servicing the outdoor air filters (i.e., catwalk over ductwork).

Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier.

To attach ductwork to roof curb, insert ductwork approximately 10 to 11 in. (254 to 279 mm) up into the curb. Connect ductwork to 14-gage roof curb material using sheet metal screw driven from inside the duct.

The units with electric heat require a 1-in. (25 mm) clearance for the first 24 in. (610 mm) of ductwork.

NOTE: A 90-degree elbow must be installed in the ductwork to comply with UL (Underwriters' Laboratories) codes for use with electric heat.

Outlet grilles must not lie directly below unit discharge.

⚠ WARNING

For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90 degree turn in the return ductwork between the unit and the conditioned space. If a 90 degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space. Due to electric heater, supply duct will require 90 degree elbow.

Step 4 — Make Unit Duct Connections

50AJ,AK AND 50EJ,EK UNITS — Unit is shipped for through-the-bottom duct connections. Ductwork openings are shown in Fig. 7-9 and 13-15. **Attach all ductwork to roof curb.** Air distribution is shown in Fig. 20. Refer to installation instructions shipped with accessory roof curb for more information.

50AW,AY AND 50EW,EY UNITS — Remove shipping covers from supply and return air openings. Attach field-supplied ductwork to unit. Use a single duct over **all** return openings and a single duct over **all** supply openings. Splitting of the airflow into branch ducts should not be done at the unit. Sufficient duct length should be used prior to branching to ensure air temperatures are well mixed within the ductwork. See Fig. 10-12 and 16-18 for duct opening dimensions. Secure all ducts to the building structure. Air distribution is shown in Fig. 21. Use flexible duct connectors between unit and ducts as required.

Install accessory barometric relief or power exhaust in the field-fabricated return ductwork. Refer to Step 9 — Position Power Exhaust/Barometric Relief Damper Hood Section on page 60 for more information.

Step 5 — Trap Condensate Drain — See Fig. 7-18 for drain location. Condensate drain is open to the atmosphere and must be trapped. Install a trapped drain at the drain location. One 1-in. FPT coupling is provided inside unit evaporator section for condensate drain connection. A trap at least 4-in. (102 mm) deep must be used. See Fig. 22. Trap must be installed to prevent freeze-up.

Condensate pans are sloped so that water will completely drain from the condensate pan to comply with indoor air quality (IAQ) guidelines. The condensate pans are not insulated.

Step 6 — Controls Options — The control options that the units can provide are based on the following parameters: CV (constant volume) or VAV (variable air volume) operation; stand-alone unit with field-supplied sensors installed

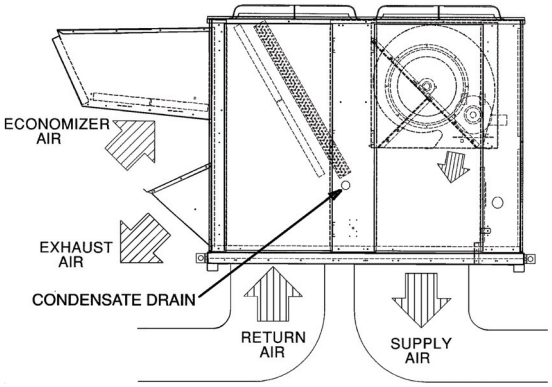


Fig. 20 — Air Distribution — Thru-the-Bottom

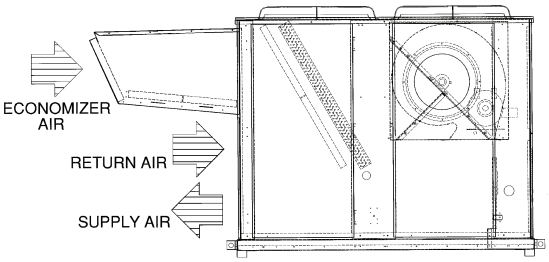


Fig. 21 — Air Distribution — Thru-the-Side

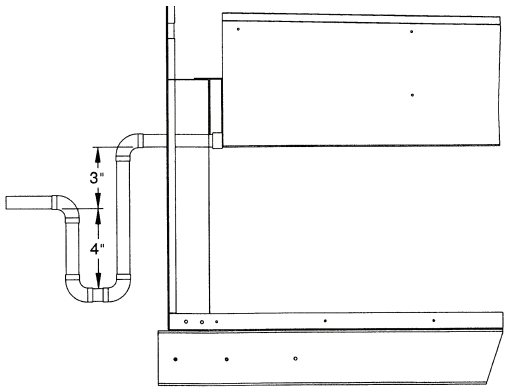


Fig. 22 — Condensate Drain Connections (Typical Roof Curb or Slab Mount Shown)

(CV or VAV); as a system via the Carrier Comfort System (TEMP or VVT® [Variable Volume and Temperature]); optional electronic expansion board installed (CV or VAV); linked to the Carrier Comfort Network (CCN); and availability of a computer and software (ComfortWORKS®, Building Supervisor, and Service Tool) or accessory Remote Enhanced Display to access the base control board. See Table 4.

NOTE: Access to the base control board allows unit occupancy schedules, unit timeclock, and various set points to be changed from their factory-defined default settings.

THERMISTORS — All units are equipped with a supply-air thermistor (SAT) located in the supply fan discharge and an outdoor-air thermistor (OAT) located in the outdoor-air hood. Variable air volume units are supplied with a return-air thermistor (RAT) located on the return-air damper support.

CONSTANT VOLUME APPLICATIONS — The units, as shipped, are operable as stand-alone units, using either a standard (mechanical or electronic) 2-stage heat, 2-stage cool thermostat, or with an electronic room sensor and a timeclock to establish unit start and stop times.

With a standard thermostat (programmable is optional), heating and cooling operation is set by space temperature.

With a space sensor and timeclock, the machine will operate at default values unless they are changed using appropriate input devices. The space sensor senses space temperature and may be equipped with a timed override feature, which allows unit operation during unoccupied periods.

The space sensor may be used in multiples of 4 or 9 to achieve space temperature averaging. The use of a space sensor also allows the unit to be turned on an off from a remote signal.

Features with Thermostat Control of Unit

- two-stage heating (if installed)
- two-stage cooling
- control of unit using Y1, Y2, W1, W2, and G thermostat inputs
- control of the indoor fan
- outdoor air temperature/supply air temperature monitoring
- control of an outdoor air condenser fan based on outdoor-air temperature
- control of modulating economizer damper to provide free cooling when outdoor conditions are suitable, using supply-air temperature as a control point
- control of the economizer damper and indoor fan to obtain unoccupied free cooling
- provide power exhaust output to an external power exhaust controller
- support a field test for field checkout
- control of 2 stages of CV power exhaust
- compressor Time Guard® (power up and minimum off and on times)
- compressor lockout during low supply-air temperature

Additional features are provided by accessing the standard unit control board via software with a computer. These features are:

- electronic expansion board features (if installed)
- control board diagnostics
- ability to change supply air set point (economizer control)
- ability to change high outdoor-air temperature lockout set point (economizer control)
- ability to change power exhaust set points

NOTE: A CV unit without a thermostat requires a field-supplied sensor for operation.

Features with Sensor Control of Unit (Stand-Alone Applications — Unit control is limited to CV unoccupied default set points, 90 F (32 C) for cooling, 55 F (13 C) for heating unless the user has changed the set points by computer. There are 2 sensor options available:

- T-55 sensor will monitor room temperature and provide unoccupied override capability (1 hour)
- T-56 sensor will monitor room temperature, provide unoccupied override capability (1 hour), and provide a temperature offset of 5° F (3° C).

Standard features are:

- support of remote occupied/unoccupied input to start and stop the unit
- cooling capacity control of 3 stages using economizer and 2 compressors to maintain space temperature to an occupied or unoccupied set point
- enable heating (if installed) or cooling during unoccupied periods as required to maintain space temperature within the unoccupied set points
- adjustment of space temperature set points of ± 5° F when using a T-56 sensor
- control of modulating economizer damper to maintain indoor air quality (IAQ) when outdoor conditions are suitable.

  NOTE: The IAQ sensor must be set for current output (4-20 mA), not voltage output. Ensure the jumper on the sensor is in the upper position. See Fig. 23.

Features with sensor control of unit (with computer access or accessory Remote Enhanced Display) are:

- 365-day timeclock with backup (supports minute, hour, day of week, date, month, and year)
- daylight savings time function
- occupancy control with 8 periods for unit operation
- holiday table containing up to 18 holiday schedules
- ability to initiate timed override from T-55 or T-56 sensors for a timed period of 1 to 4 hours
- ability to use multiple space temperature sensors to average the space temperature
- supply-air temperature reset for the supply-air temperature set point
- temperature compensated start to calculate early start times before occupancy
- access to the Display, Maintenance, Configuration, Service, and Set Point data tables through network software
- loadshed and demand limiting
- control of modulating economizer damper to maintain indoor air quality (IAQ) when outdoor conditions are suitable (units with serial number 0600F or later accept an external 4-20 mA signal)

  NOTE: The IAQ sensor must be set for current output (4-20 mA), not voltage output. Ensure the jumper on the sensor is in the upper position. See Fig. 23.
- provides CCN IAQ participation

Table 4 — Controls Options and Configurations (Non-Thermostat Applications)

UNIT CONFIGURATION	DEFAULT COOLING	DEFAULT HEATING
CV or VAV Unit with SPT Sensor	Unoccupied Cooling — 90 F (32 C) (SPT) Occupied Cooling — NA	Unoccupied Heating — 55 F (13 C) (SPT) Occupied Heating — NA
CV Unit with SPT Sensor and Remote Start/Stop Switch	Unoccupied Cooling — 90 F (32 C) (SPT) Occupied Cooling — 78 F (26 C) (SPT)	Unoccupied Heating — 55 F (13 C) (SPT) Occupied Heating — 68 F (20 C) (SPT)
VAV Unit Remote Start/Stop Switch Only	Unoccupied Cooling — 90 F (32 C) (RAT) Occupied Cooling — 55 F (13 C) (SAT)	Unoccupied Heating — 55 F (13 C) (RAT) Occupied Heating — 68 F (20 C) (RAT)*
VAV Unit with SPT Sensor and Remote Start/Stop Switch	Unoccupied Cooling — 90 F (32 C) (SPT) Occupied Cooling — 55 F (13 C) (SAT)	Unoccupied Heating — 55 F (13 C) (SPT) Occupied Heating — 68 F (20 C) (RAT)*

LEGEND

CV — Constant Volume
NA — Not Available
RAT — Return-Air Temperature
SAT — Supply-Air Temperature
SPT — Space Temperature
VAV — Variable Air Volume

*With DIP Switch No. 5 configured to OPEN (Occupied Heat Enabled).

NOTE: Space temperature sensor and remote stop/switch are field-

When the unit is equipped with a field-supplied space temperature sensor and a remote contact closure (remote start/stop) on the base control board, the occupied default set points will monitor unit operation. The occupied default set points are 78 F (26 C) cooling and 68 F (20 C) heating (if electric heat is installed). See Fig. 24 for remote start/stop wiring.

NOTE: For units (with a field-supplied space temperature sensor) which have not had the base unit control board accessed via software to set an occupancy schedule, the remote start/stop closure will allow the unit to operate in the pre-configured occupied default set points of 78 F (26 C) cooling and 68 F (20 C) heating. Without this feature, the unit will control to the unoccupied default set points of 90 F (32 C) cooling and 55 F (13 C) heating (if electric heat is installed).

An electronic expansion board may be field-installed to provide the following features:

- provide discrete inputs for fan status, filter status, field-applied status, and demand limit
- provide an output for the external alarm light indicator
- provide power exhaust fire outputs for direct control of modulated power exhaust stages during fire or smoke modes
- control of smoke control modes including evacuation, smoke purge, pressurization, and fire shutdown (modulating power exhaust required)

When the unit is connected to the CCN (Carrier Comfort Network), the following expansion board features can be utilized:

- perform Demand Limit functions based on CCN load-shed commands or the state of the discrete input
- alarm monitoring of all key parameters
- CCN protocol
- provides CCN IAQ participation

See Carrier TEMP or VVT® literature for complete TEMP (single zone) or VVT (multi-zone) application information.

Features with Sensor Control of Unit (Network Applications) — The base control board provides, as standard, a connection for use with a Carrier VVT (Variable Volume and Temperature) system and can also be integrated into a Carrier Comfort Network.

When the unit is accessed via a PC equipped with ComfortWORKS®, Building Supervisor, Service Tool software, or accessory Remote Enhanced Display, the following features can be accessed:

- on-board timeclock can be programmed
- occupancy schedules can be programmed
- unit set points can be changed
- alarms can be monitored

This access is available on the base control board via a RJ-11 phone jack or a 3-wire connection to the communication bus. See Fig. 25. The timeclock has a 10-hour minimum back-up time to provide for unit power off for servicing unit or during unexpected power outages. For complete Carrier Comfort System (CCS) or Carrier Comfort Network (CCN) features and benefits, refer to the product literature.

VARIABLE AIR VOLUME (VAV) APPLICATIONS

Features with Stand-Alone Applications — The units, as shipped, are operable as stand-alone units with the addition of a timeclock to establish unit start and stop times.

Heating and cooling in both on and off modes is controlled to default values by the base unit control. Set points may be changed with appropriate input devices.

The control has an on-board occupancy schedule which can be set using an input device and eliminates the need for an external timeclock.

During both the on and off periods, cooling operation is controlled to the supply air setting and heating is controlled to the return air setting (or to the optional space temperature sensor). During the on period, the supply fan runs continuously. During the off period, the supply fan will be activated if the return air sensor is outside of the set points and will run long enough to accurately sample the space temperature. The supply fan will then continue to run until any heating or cooling load is satisfied, at which point it will turn off.

The use of a space sensor will allow for supply air reset to conserve energy and maintain comfort. If equipped with an override feature, the sensor will allow operation during the off period for a fixed length of time.

Base unit control supports a Heat Interlock Relay (field supplied) to fully open the VAV terminal devices during heating operation.

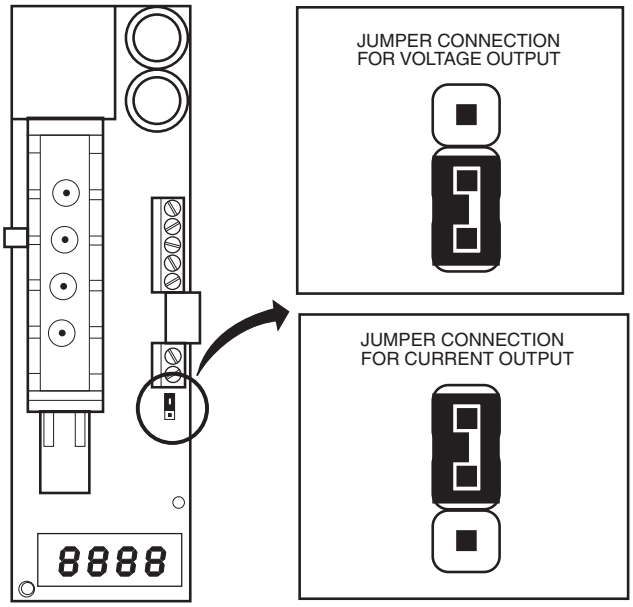


Fig. 23 — Indoor Air Quality Sensor Configuration

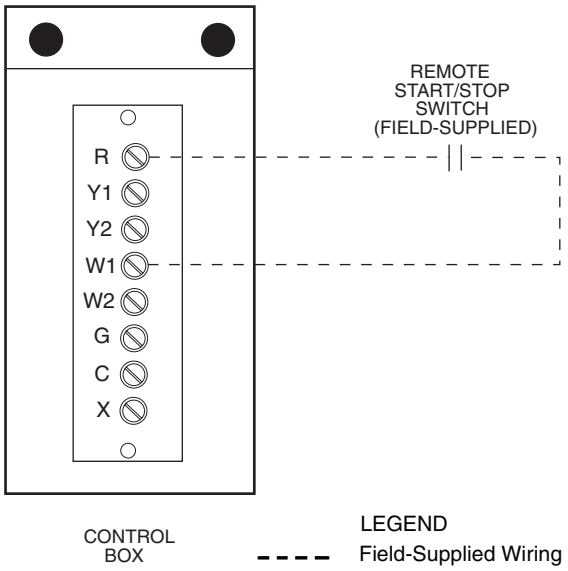


Fig. 24 — Field Control Remote Start/Stop

Standard features of a VAV unit with a remote start/stop switch are:

- control board diagnostics
- control of an outdoor condenser fan based upon outdoor-air temperature
- control of modulating economizer to provide free cooling when outdoor conditions are suitable, using supply-air temperature as a set point
- support of remote occupied/unoccupied input to start or stop the unit
- provide power exhaust output to an external power exhaust controller
- support supply-air temperature reset to offset supply-air set point
- support a field test for field check out
- support linkage to DAV (digital air volume) systems
- cooling capacity control of up to 6 stages plus economizer with compressors and unloaders to maintain supply-air temperature set point during occupied periods
- control of one stage of heat to maintain return-air temperature at heating set point during occupied periods
- provide a variable frequency drive high voltage relay output to enable VFD
- control of heat interlock relay
- DX compressor lockout occurs at 45 F outdoor air temperature (OAT) and is factory enabled on units with serial number 0600F and later. This feature may be disabled by using a computer
- compressor Time Guard® override (power up, minimum on and off times)
- IAQ (Indoor Air Quality) sensor
- OAQ (Outdoor Air Quality) sensor

With the addition of a remote start/stop switch heating or cooling is enabled during unoccupied periods as required to maintain space temperature to within unoccupied set points.

Occupied heating is enabled or disabled by the position of DIP (dual in-line package) switch no. 5.

Additional features may be provided with electronic access to Unit Control Board. These features are:

- additional control board diagnostics
- electronic expansion board features (if installed)
- control of the economizer damper and indoor fan to option unoccupied free cooling
- 365-day timeclock with backup (supports minute, hour, day, month, and year)
- holiday table containing up to 18 holiday schedules
- occupancy control with 8 periods for unit operation
- support a set of display, maintenance, configuration, service, and set point data tables for interface with Building Supervisor, ComfortWORKS®, or Service Tool software or accessory Remote Enhanced Display
- CCN IAQ participation
- CCN OAQ participation

When a VAV unit with a space temperature sensor is accessed via a computer, the following additional features are available:

- ability to initiate timed override from T-55 sensors
- temperature compensated start to calculate early start time before occupancy
- provide space temperature reset to reset the supply air set point upward when the temperature falls below the occupied cooling set point

An electronic expansion board may be field-installed to provide the following features:

- fan status
- filter status
- field-applied status
- demand limiting
- alarm light
- fire unit shutdown
- fire pressurization
- fire evacuation
- fire smoke purge

When the unit is connected to the CCN (Carrier Comfort Network), the following features can be utilized:

- CCN IAQ participation
- CCN OAQ participation
- CCN demand limit participation
- modulated power exhaust override
- ability to use multiple space temperature sensors (in multiples of 4 or 9) to average space temperature (CV and VAV only)

A field-supplied T-55 space temperature sensor can be added to monitor room temperature and provide unoccupied override capability (1 hour).

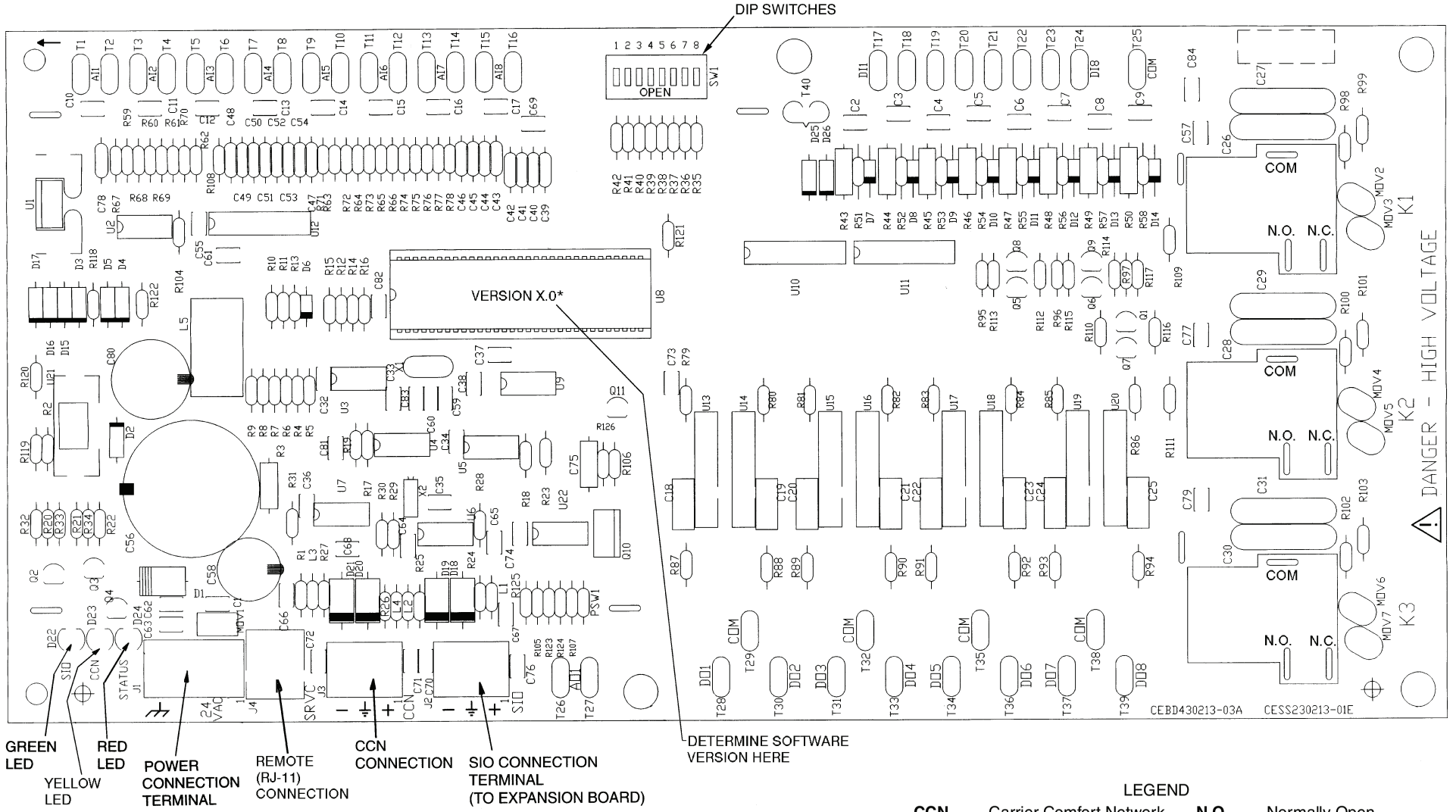
When the unit is equipped with a field-supplied space temperature sensor and a remote contact closure (remote start/stop), the occupied default set points will monitor unit operation. The occupied default set points are 55 F (13 C) (supply-air temperature) cooling and 68 F (20 C) (return-air temperature) heating (if electric heat is installed). See Fig. 24 for remote start/stop wiring.

NOTE: For units without a space temperature sensor and which have not had the base unit control board accessed via software to set an occupancy schedule, the remote start/stop closure will allow the unit to operate in the pre-configured occupied default set points of 55 F (13 C) (supply-air temperature) cooling and 68 F (20 C) (return-air temperature) heating. Without an occupancy schedule, the unit will control to the unoccupied default set points of 90 F (32 C) (return-air temperature) cooling and 55 F (13 C) (return-air temperature) heating (if electric heat is installed).

Features with Network Applications — The base control board provides, as standard, a connection for use with a Carrier Comfort System and can also be integrated into a Carrier Comfort Network (CCN). When the unit is accessed via a PC equipped with ComfortWORKS®, Building Supervisor, or Service Tool software, or accessory Remote Enhanced Display, the following features can be accessed:

- on-board timeclock can be programmed
- occupancy schedules can be programmed
- unit set points can be changed
- alarms can be monitored

This access is available on the base control board via a RJ-11 phone jack or a 3-wire connection to the communication bus. See Fig. 25. The timeclock has a 10-hour minimum backup time to provide for unit power off for servicing unit or during unexpected power outages. For complete Carrier Comfort



LEGEND

CCN	— Carrier Comfort Network	**N.O.**	— Normally Open
COM	— Common	**R**	— Relay
D	— Diode	**SIO**	— Serial Input/Output
LED	— Light-Emitting Diode	**SW**	— Switch
N.C.	— Normally Closed	**T**	— Terminal

*Where X is the unit control software version.

Fig. 25 — Control Board Diagram

Step 7 — Make Electrical Connections

POWER WIRING — Units are factory wired for the voltage shown on the unit nameplate. The main terminal block is suitable for use with aluminum or copper wires and is sized for single-point electric heat.

When installing units, provide a disconnect per NEC (National Electrical Code) of adequate size (MOCP [maximum overcurrent protection] of unit is on the informative plate). All field wiring must comply with NEC and all local codes. Size wire based on MCA (minimum circuit amps) on the unit informative plate. See Fig. 26 for power wiring connections to the unit power terminal block and equipment ground.

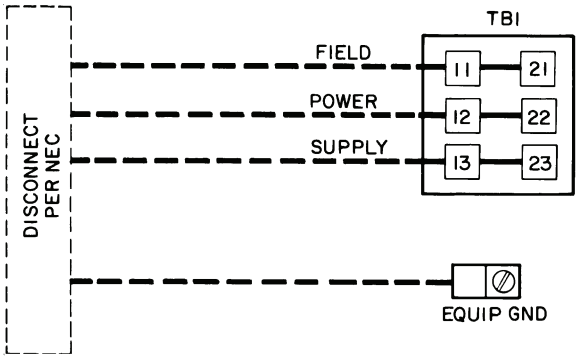
The main power terminal block is suitable for use with aluminum or copper wire. See Fig. 26. Units have circuit breakers for compressors, fan motors, and control circuit. If required by local codes, provide an additional disconnect, per NEC and local codes requirements, of adequate size (Tables 5A and 5B). Whenever external electrical sources are used, unit must be electrically grounded in accordance with local codes, or in absence of local codes, with NEC, ANSI (American National Standards Institute) C1-latest year.

All field wiring must comply with NEC and local code requirements.

FIELD POWER SUPPLY — Unit is factory wired for voltage shown on nameplate. See Tables 5A and 5B for electrical data.

Field wiring can be brought into the unit from bottom (through basepan and roof curb) or through side of unit (corner post next to control box).

A $3^1/_2$-in. NPT coupling for field power wiring and a $^3/_4$-in. NPT coupling for 24-v control wiring are provided in basepan. In the side post, there are two $2^1/_2$-in. (63.5 mm) (50AJ,AK,AW,AY020-030 and 50EJ,EK,EW,EY024-034) or 3-in. (76.2 mm) (50AJ,AK,AW,AY035-060 and 50EJ,EK, EW,EY038-068) knockouts for the field power wiring. See Fig. 7-18. If control wiring is to be brought in through the side of unit, a $^7/_8$-in. (22.2 mm) diameter hole is provided in the condenser side post next to the control box.



LEGEND

EQUIP — Equipment
GND — Ground
NEC — National Electrical Code
TB — Terminal Block

NOTE: Maximum wire size for TB1 is 500 MCM.

Fig. 26 — Field Power Wiring Connections

If disconnect box is mounted to corner post, be careful not to drill any screws into the condenser coil.

Routing Through Bottom of Unit — If wiring is brought in through bottom of unit, use field-supplied watertight conduit to run power wiring from basepan out through bottom $3^1/_2$-in. (89.9 mm) hole to the disconnect box and back into unit to the main control box.

Use strain relief going into control box through $2^1/_2$-in. (63.5 mm) diameter hole provided. After wires are in unit control box, connect to power terminal block (see Power Wiring section on this page).

Low-voltage wiring must be run in watertight conduit from the basepan to control box and through $^7/_8$-in. (22.2 mm) diameter hole provided in bottom of unit control box. Field-supplied strain relief must be used going into the box. After wiring is in control box, make connections to proper terminals on terminal blocks (see Field Control Wiring section on page 53).

Install conduit connector in unit basepan or side panel openings provided. Route power and ground lines through connector to connections in unit control box as shown on unit wiring diagram and Fig. 26.

Routing Through Side of Unit — Route power wiring in field-supplied watertight conduit into unit through $2^1/_2$- or 3-in. (63.5 or 76.2 mm) hole. Strain relief (field supplied) must be used in hole. See Fig. 26.

Use field-supplied strain relief going into control box through $2^1/_2$- or 3-in. (63.5 or 76.2) diameter hole provided. After wires are in unit control box, connect to power terminal block (see Power Wiring section on this page).

Bring low-voltage control wiring through factory-drilled $^7/_8$-in. (22.2 mm) diameter hole in condenser side post. Use strain relief going into $^7/_8$-in. (22.2 mm) diameter hole in bottom of unit control box.

After wiring is in control box, make connection to proper terminals on terminal blocks (see Field Control Wiring section on page 53).

IMPORTANT: The VAV (variable air volume) units incorporate VFD (variable frequency drives) which generate, use, and can radiate radio frequency energy. If units are not installed and used in accordance with these instructions, they may cause radio interference. They have been tested and found to comply with limits of a Class A computing device as defined by FCC (Federal Communications Commission) regulations, Subpart J of Part 15, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

⚠ WARNING

The unit must be electrically grounded in accordance with local codes and NEC ANSI/NFPA 70 (National Fire Protection Association).

Affix crankcase heater sticker (located in the installers packet) to unit disconnect switch.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2%.

Use the formula in Tables 5A and 5B to determine the percentage of voltage imbalance.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Table 5A — Electrical Data — 50AJ,AK,AW,AY Units

UNIT 50AJ,AK, AW,AY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM		IFM		POWER EXHAUST	ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2										
		Min	Max	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	kW	FLA	MCA	MOCP†
020	208/230	187	253	39.1	228	25.6	160	2	5.3 (ea)	5	16.7/15.2	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	101.8/100.3 114.8/127.3 171.0/192.2	125/125 125/150 200/225
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	125.4/123.9 144.3/156.8 200.5/221.7	150/150 150/175 225/250
										10	30.8/28.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	115.9/113.1 132.4/153.3 188.6/208.2	150/150 150/150 225/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	139.5/136.7 161.9/172.8 218.1/237.7	175/175 175/175 250/250
										15	46.2/42.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	133.1/127.8 151.6/160.8 207.9/225.7	175/150 175/175 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	156.7/151.4 181.1/190.3 237.4/255.2	200/175 200/200 250/300
	460	414	508	19.9	114	11.5	80	2	2.7 (ea)	5	7.6	—	— 36 72	— 43.3 86.6	49.4 63.6 96.1	60 70 110
												12.6	— 36 72	— 43.3 86.6	62.0 79.4 111.9	80 80 125
										10	14.0	—	— 36 72	— 43.3 86.6	55.8 71.6 104.1	70 80 125
												12.6	— 36 72	— 43.3 86.6	68.4 87.4 119.9	80 90 125
										15	21.0	—	— 36 72	— 43.3 86.6	63.1 80.4 112.9	80 90 125
												12.6	— 36 72	— 43.3 86.6	75.7 96.1 128.6	90 100 150
	575	518	632	16	91	9.6	64	2	2.4 (ea)	5	6.1	—	— 36 72	— 34.6 69.3	40.5 50.9 76.9	50 60 90
												12.6	— 36 72	— 34.6 69.3	53.1 66.6 92.7	60 70 100
										10	11.0	—	— 36 72	— 34.6 69.3	45.4 57.0 83.1	60 60 100
												12.6	— 36 72	— 34.6 69.3	58.0 72.8 98.8	70 80 110
										15	17.0	—	— 36 72	— 34.6 69.3	51.7 64.5 90.6	60 70 100
												12.6	— 36 72	— 34.6 69.3	64.3 80.3 106.3	80 90 110
025	208/230	187	253	39.1	228	39.1	256	2	5.3 (ea)	7.5	24.2/22.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	122.8/120.6 124.1/135.8 180.4/200.7	150/150 150/150 200/225
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	146.4/144.2 153.6/165.3 209.9/230/2	175/175 175/175 225/250
										10	30.8/28.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	129.4/126.6 132.4/143.3 188.6/208.2	150/150 150/150 225/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	153.0/150.2 161.9/172.8 218.1/237.7	175/175 175/175 250/250
										15	46.2/42.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	146.6/141.3 151.6/160.8 207.9/225.7	175/175 175/175 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	170.2/164.9 181.1/190.3 237.4/255.2	200/200 200/200 250/300
	460	414	508	19.9	114	19.9	114	2	2.7 (ea)	7.5	11.0	—	— 36 72	— 43.3 86.6	61.2 67.9 100.4	80 80 110
												12.6	— 36 72	— 43.3 86.6	73.8 83.6 116.1	90 90 125
										10	14.0	—	— 36 72	— 43.3 86.6	64.2 71.6 104.1	80 80 125
												12.6	— 36 72	— 43.3 86.6	76.8 87.4 119.9	90 90 125
										15	21.0	—	— 36 72	— 43.3 86.6	71.5 80.4 112.9	90 90 125
												12.6	— 36 72	— 43.3 86.6	84.1 96.1 128.6	100 100 150
	575	518	632	16	91	16	91	2	2.4 (ea)	7.5	9.0	—	— 36 72	— 34.6 69.3	49.8 54.5 80.6	60 60 90
												12.6	— 36 72	— 34.6 69.3	62.4 70.3 96.3	70 80 110
										10	11.0	—	— 36 72	— 34.6 69.3	51.8 57.0 83.1	60 60 100
												12.6	— 36 72	— 34.6 69.3	64.4 72.8 98.8	80 80 110
										15	17.0	—	— 36 72	— 34.6 69.3	58.1 64.5 90.6	70 70 100
												12.6	— 36 72	— 34.6 69.3	70.7 80.3 106.3	80 90 110

See Legend and Notes on page 52.

Table 5A — Electrical Data — 50AJ,AK,AW,AY Units (cont)

UNIT 50AJ,AK, AW,AY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM		IFM		POWER EXHAUST	ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2										
		Min	Max	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	kW	FLA	MCA	MOCP†
027	208/230	187	253	39.1	256	39.1	256	2	5.3 (ea)	10	30.8/28.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	129.4/126.6 132.4/143.3 188.6/208.2	150/150 150/150 225/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	153.0/150.2 161.9/172.8 218.1/237.7	175/175 175/175 250/250
										15	46.2/42.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	146.6/141.3 151.6/160.8 207.9/225.7	175/175 175/175 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	170.2/164.9 181.1/190.3 237.4/255.2	200/200 200/200 250/300
										20	59.4/54.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	163.1/156.3 168.1/175.8 224.4/240.7	200/200 200/200 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	186.7/179.9 197.6/250.3 253.9/270.2	225/225 225/225 300/300
	460	414	508	19.9	114	19.9	114	2	2.7 (ea)	10	14.0	—	— 36 72	— 43.3 86.6	64.2 71.6 104.1	80 80 125
												12.6	— 36 72	— 43.3 86.6	76.8 87.4 119.9	90 90 125
										15	21.0	—	— 36 72	— 43.3 86.6	71.5 80.4 112.9	90 90 125
												12.6	— 36 72	— 43.3 86.6	84.1 96.1 128.6	100 100 150
										20	27.0	—	— 36 72	— 43.3 86.6	79.0 87.9 120.4	100 100 125
												12.6	— 36 72	— 43.3 86.6	91.6 103.6 136.1	110 110 150
	575	518	632	16	91	16	91	2	2.4 (ea)	10	11.0	—	— 36 72	— 34.6 69.3	51.8 57.0 83.1	60 60 100
												12.6	— 36 72	— 34.6 69.3	64.4 72.8 98.8	80 80 110
										15	17.0	—	— 36 72	— 34.6 69.3	58.1 64.5 90.6	70 70 100
												12.6	— 36 72	— 34.6 69.3	70.7 80.3 106.3	80 90 110
										20	22.0	—	— 36 72	— 34.6 69.3	64.3 70.8 96.8	80 80 110
												12.6	— 36 72	— 34.6 69.3	76.9 86.5 112.6	90 90 125
030	208/230	187	253	57.1	266	39.1	228	2	5.3 (ea)	10	30.8/28.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	151.9/149.1 151.9/149.1 188.6/208.2	200/200 200/200 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	175.5/172.7 175.5/172.8 218.1/237.7	225/225 225/225 250/250
										15	46.2/42.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	167.3/163.1 167.3/163.1 207.9/225.7	200/200 200/200 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	190.9/186.7 190.9/190.3 237.4/255.2	225/225 225/225 250/300
										20	59.4/54.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	181.1/175.1 181.1/175.8 224.4/240.7	225/225 225/225 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	204.7/198.7 204.7/205.3 259.3/270.2	250/250 250/250 300/300
	460	414	508	25.6	120	19.9	114	2	2.7 (ea)	10	14.0	—	— 36 72	— 43.3 86.6	71.3 71.6 104.1	90 90 125
												12.6	— 36 72	— 43.3 86.6	83.9 87.4 119.9	100 100 125
										15	21.0	—	— 36 72	— 43.3 86.6	78.3 80.4 112.9	100 100 125
												12.6	— 36 72	— 43.3 86.6	90.9 96.1 128.6	110 110 150
										20	27.0	—	— 36 72	— 43.3 86.6	84.7 87.9 120.4	110 110 125
												12.6	— 36 72	— 43.3 86.6	97.3 103.6 136.1	110 110 150
	575	518	632	20.5	96	16.0	91	2	2.4 (ea)	10	11.0	—	— 36 72	— 34.6 69.3	57.4 57.4 83.1	70 70 100
												12.6	— 36 72	— 34.6 69.3	70.0 72.8 98.8	90 90 110
										15	17.0	—	— 36 72	— 34.6 69.3	63.4 64.5 90.6	80 80 110
												12.6	— 36 72	— 34.6 69.3	76.0 80.3 106.3	90 90 110
										20	22.0	—	— 36 72	— 34.6 69.3	68.8 70.8 96.8	90 90 110
												12.6	— 36 72	— 34.6 69.3	81.4 86.5 112.6	100 100 125

See Legend and Notes on page 52.

Table 5A — Electrical Data — 50AJ,AK,AW,AY Units (cont)

UNIT 50AJ,AK, AW,AY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM		IFM		POWER EXHAUST	ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2										
		Min	Max	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	kW	FLA	MCA	MOCP†
035	208/230	187	253	57.1	266	57.1	266	4	5.3 (ea)	10	30.8/28.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	180.5/177.7 180.5/177.7 186.6/208.2	225/225 225/225 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	204.1/201.3 204.1/201.3 218.1/237.7	250/250 250/250 250/250
										15	46.2/42.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	195.9/191.7 195.9/191.7 207.9/225.7	250/225 250/225 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	219.5/215.3 219.5/215.3 237.4/255.2	250/250 250/250 250/300
										20	59.4/54.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	209.7/203.7 209.7/203.7 224.4/240.7	250/250 250/250 250/250
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	233.3/227.3 233.3/227.3 253.9/270.2	250/250 250/250 300/300
	460	414	508	25.6	120	25.6	120	4	2.7 (ea)	10	14.0	—	— 36 72	— 43.3 86.6	82.4 82.4 104.1	100 100 125
												12.6	— 36 72	— 43.3 86.6	95.0 95.0 119.9	110 110 125
										15	21.0	—	— 36 72	— 43.3 86.6	89.4 89.4 112.9	110 110 125
												12.6	— 36 72	— 43.3 86.6	102.0 102.0 128.6	125 125 150
										20	27.0	—	— 36 72	— 43.3 86.6	95.8 95.8 120.4	110 110 125
												12.6	— 36 72	— 43.3 86.6	108.4 108.4 136.1	125 125 150
	575	518	632	20.5	96	20.5	96	4	2.4 (ea)	10	11.0	—	— 36 72	— 34.6 69.3	66.7 66.7 83.1	80 80 100
												12.6	— 36 72	— 34.6 69.3	79.3 79.3 98.8	90 90 110
										15	17.0	—	— 36 72	— 34.6 69.3	72.7 72.7 90.6	90 90 110
												12.6	— 36 72	— 34.6 69.3	85.3 85.3 106.3	100 100 110
										20	22.0	—	— 36 72	— 34.6 69.3	78.1 78.1 96.8	100 100 110
												12.6	— 36 72	— 34.6 69.3	90.7 90.7 112.6	110 110 125
040	208/230	187	253	57.1	266	69.2	345	4	5.3 (ea)	15	46.2/42.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	211.0/206.8 211.0/206.8 211.0/225.7	250/250 250/250 250/300
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	234.6/230.4 234.6/230.4 237.4/255.2	300/250 300/250 300/300
										20	59.4/54.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	224.2/218.8 224.2/218.8 224.4/240.7	250/250 250/250 250/300
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	247.8/242.4 247.8/242.4 253.9/270.2	300/300 300/300 300/300
										25	74.8/68.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	241.0/232.8 241.0/232.8 243.6/258.2	300/300 300/300 300/300
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	264.6/256.4 264.6/256.4 273.1/287.7	300/300 300/300 300/350
	460	414	508	25.6	120	28.8	173	4	2.7 (ea)	15	21.0	—	— 36 72	— 43.3 86.6	93.4 93.4 112.9	110 110 125
												12.6	— 36 72	— 43.3 86.6	106.0 106.0 128.6	125 125 150
										20	27.0	—	— 36 72	— 43.3 86.6	99.4 99.4 120.4	125 125 125
												12.6	— 36 72	— 43.3 86.6	112.0 112.0 136.1	125 125 150
										25	34.0	—	— 36 72	— 43.3 86.6	107.7 107.7 129.1	125 125 150
												12.6	— 36 72	— 43.3 86.6	120.3 120.3 144.9	150 150 175
	575	518	632	20.5	96	26.7	120	4	2.4 (ea)	15	17.0	—	— 36 72	— 34.6 69.3	80.5 80.5 90.6	100 100 110
												12.6	— 36 72	— 34.6 69.3	93.1 93.1 106.3	110 110 125
										20	22.0	—	— 36 72	— 34.6 69.3	85.5 85.5 96.8	110 110 110
												12.6	— 36 72	— 34.6 69.3	98.1 98.1 112.6	110 110 125
										25	27.0	—	— 36 72	— 34.6 69.3	90.6 90.6 103.1	110 110 125
												12.6	— 36 72	— 34.6 69.3	103.2 103.2 118.8	125 125 125

See Legend and Notes on page 52.

Table 5A — Electrical Data — 50AJ,AK,AW,AY Units (cont)

UNIT 50AJ,AK, AW,AY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM		IFM		POWER EXHAUST	ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2										
		Min	Max	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	kW	FLA	MCA	MOCP†
050	208/230	187	253	69.2	345	69.2	34.5	4	5.3 (ea)	20	59.4/54.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	236.3/230.9 236.3/230.9 236.3/240.7	300/300 300/300 300/300
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	259.9/254.5 259.9/254.5 259.9/270.2	300/300 300/300 300/300
										25	74.8/68.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	253.1/244.9 253.1/244.9 253.1/258.2	300/300 300/300 300/300
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	276.7/268.5 276.7/268.5 276.7/287.7	350/300 350/300 350/350
										30	88.0/80.0	—	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	269.6/259.6 269.6/259.6 269.6/273.2	350/300 350/300 350/350
												23.6/23.6	— 27/36 54/72	— 75.1/ 86.6 150.1/173.2	293.2/283.2 293.2/283.2 293.2/302.7	350/350 350/350 350/350
	460	414	508	28.8	173	28.8	173	4	2.7 (ea)	20	27.0	—	— 36 72	— 43.3 86.6	102.6 102.6 120.4	125 125 125
												12.6	— 36 72	— 43.3 86.6	115.2 115.2 136.1	125 125 150
										25	34.0	—	— 36 72	— 43.3 86.6	110.9 110.9 129.1	125 125 150
												12.6	— 36 72	— 43.3 86.6	123.5 123.5 144.9	150 150 175
										30	40.0	—	— 36 72	— 43.3 86.6	118.4 118.4 136.6	150 150 175
												12.6	— 36 72	— 43.3 86.6	131.0 131.0 152.4	150 150 175
	575	518	632	26.7	120	26.7	120	4	2.4 (ea)	20	22.0	—	— 36 72	— 34.6 69.3	91.7 91.7 96.8	110 110 110
												12.6	— 36 72	— 34.6 69.3	104.3 104.3 112.6	125 125 125
										25	27.0	—	— 36 72	— 34.6 69.3	96.8 96.8 103.1	110 110 125
												12.6	— 36 72	— 34.6 69.3	109.4 109.4 118.8	125 125 125
										30	32.0	—	— 36 72	— 34.6 69.3	103.0 103.0 109.3	125 125 125
												12.6	— 36 72	— 34.6 69.3	115.6 115.6 125.1	125 125 150
060	208/230	187	253	82.1	446	82.1	446	6	5.3 (ea)	25	74.8/68.0	—	— 41/ 54 81/108	— 112.6/129.9 225.2/259.8	291.3/284.5 291.3/284.5 318.7/344.8	350/350 350/350 400/400
												35.4/35.4	— 41/ 54 81/108	— 112.6/129.9 225.2/259.8	326.7/319.9 326.7/319.9 363.0/389.1	400/400 400/400 400/450
										30	88.0/80.0	—	— 41/ 54 81/108	— 112.6/129.9 225.2/259.8	306.0/296.5 306.0/296.5 335.2/359.8	350/350 350/350 400/400
												35.4/35.4	— 41/ 54 81/108	— 112.6/129.9 225.2/259.8	341.4/331.9 341.4/331.9 379.5/404.1	400/400 400/400 450/450
										40	114.0/104.0	—	— 41/ 54 81/108	— 112.6/129.9 225.2/259.8	338.5/326.0 338.5/326.0 367.7/389.8	450/400 450/400 450/450
												35.4/35.4	— 41/ 54 81/108	— 112.6/129.9 225.2/259.8	373.9/361.4 373.9/361.4 412.0/434.1	450/450 450/450 500/500
	460	414	508	43.6	223	43.6	223	6	2.7 (ea)	25	34.0	—	— 54 108	— 65.0 129.9	148.3 148.3 172.4	175 175 200
												18.9	— 54 108	— 65.0 129.9	167.2 167.2 196.0	200 200 225
										30	40.0	—	— 54 108	— 65.0 129.9	154.3 154.3 179.9	175 175 200
												18.9	— 54 108	— 65.0 129.9	173.2 173.2 203.5	200 200 225
										40	52.0	—	— 54 108	— 65.0 129.9	168.4 168.4 194.9	200 200 225
												18.9	— 54 108	— 65.0 129.9	187.3 187.3 218.5	225 225 250
	575	518	632	34.6	164	34.6	164	6	2.4 (ea)	25	27.0	—	— 54 108	— 52.0 103.9	119.3 119.3 137.7	150 150 150
												18.9	— 54 108	— 52.0 103.9	138.2 138.2 161.3	150 150 175
										30	32.0	—	— 54 108	— 52.0 103.9	124.3 124.3 143.9	150 150 175
												18.9	— 54 108	— 52.0 103.9	143.2 143.2 167.5	175 175 175
										40	41.0	—	— 54 108	— 52.0 103.9	134.9 134.9 155.2	175 175 175
												18.9	— 54 108	— 52.0 103.9	153.8 153.8 178.8	175 175 200

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
024	208/230	187	254	39.1	228	25.6	160	2	1	5.3	5	16.7/15.2	— 23.6	— 41.6	— —	— —	101.8/100.3 125/4123.9	125/125 150/150
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	114.7/127.3 144.2/156.8	125/150 150/175
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	171.0/192.2 200.5/221.7	200/225 225/225
											10	30.8/28.0	— 23.6	— 41.6	— —	— —	115.9/113.1 139.5/136.7	150/150 175/175
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	132.3/143.3 161.8/172.8	150/150 175/175
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	188.6/208.2 218.1/237.7	200/225 225/250
											15	46.2/42.0	— 23.6	— 41.6	— —	— —	131.3/127.1 154.9/150.7	150/150 175/175
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	151.6/160.8 181.1/190.3	175/175 200/200
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	207.9/225.7 237.4/255.2	250/250 275/275
	380	342	418	19.9	71	11.5	51	2	1	2.6	5	11.0	— 23.6	— 41.6	— —	— —	52.6 76.2	70 90
													— 23.6	— 41.6	23 23	34.2 34.2	56.5 86.0	70 90
													— 23.6	— 41.6	45 45	68.4 68.4	99.2 128.7	100 150
											10	20.7	— 23.6	— 41.6	— —	— —	62.3 85.9	80 100
													— 23.6	— 41.6	23 23	34.2 34.2	68.6 98.1	80 100
													— 23.6	— 41.6	45 45	68.4 68.4	111.3 140.8	125 150
											15	27.0	— 23.6	— 41.6	— —	— —	68.6 92.2	80 110
													— 23.6	— 41.6	23 23	34.2 34.2	76.5 106.0	90 110
													— 23.6	— 41.6	45 45	68.4 68.4	119.2 148.7	125 150
	460	414	508	19.9	114	11.5	80	2	1	2.7	5	7.6	— 12.6	— 23.6	— —	— —	49.4 62.0	60 80
													— 12.6	— 23.6	36 36	43.3 43.3	63.6 79.4	70 80
													— 12.6	— 23.6	72 72	86.6 86.6	96.1 111.9	110 125
											10	14.0	— 12.6	— 23.6	— —	— —	55.8 68.4	70 80
													— 12.6	— 23.6	36 36	43.3 43.3	71.6 87.4	80 90
													— 12.6	— 23.6	72 72	86.6 86.6	104.1 119.9	110 125
											15	21.0	— 12.6	— 23.6	— —	— —	62.8 75.4	80 90
													— 12.6	— 23.6	36 36	43.3 43.3	80.4 96.1	90 100
													— 12.6	— 23.6	72 72	86.6 86.6	112.9 128.6	125 150
	575	518	632	16.0	91	9.6	64	2	1	2.4	5	6.1	— 12.6	— 23.6	— —	— —	40.5 53.1	50 60
													— 12.6	— 23.6	36 36	34.6 34.6	50.9 66.7	60 70
													— 12.6	— 23.6	72 72	69.3 69.3	76.9 92.7	90 100
											10	11.0	— 12.6	— 23.6	— —	— —	45.4 58.0	60 70
													— 12.6	— 23.6	36 36	34.6 34.6	57.1 72.8	60 80
													— 12.6	— 23.6	72 72	69.3 69.3	83.0 98.8	90 100
											15	17.0	— 12.6	— 23.6	— —	— —	51.4 64.0	60 80
													— 12.6	— 23.6	36 36	34.6 34.6	64.6 80.3	70 90
													— 12.6	— 23.6	72 72	69.3 69.3	90.5 106.3	100 110

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
028	208/230	187	254	39.1	228	39.1	228	2	1	5.3	7.5	24.2/22.0	— 23.6	— 41.6	— —	— —	122.8/120.6 146.4/144.2	150/150 175/175
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	124.1/135.8 153.6/165.3	150/150 175/175
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	180.4/200.7 209.9/230.2	200/225 225/250
											10	30.8/28.0	— 23.6	— 41.6	— —	— —	129.4/126.6 153.0/150.2	150/150 175/175
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	132.3/143.3 161.8/172.8	150/150 175/175
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	188.6/208.2 218.1/237.7	200/225 225/250
											15	46.2/42.0	— 23.6	— 41.6	— —	— —	144.8/140.6 168.4/164.2	175/175 200/200
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	151.6/160.8 181.1/190.3	175/175 200/200
													— 3.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	207.9/225.7 237.4/255.2	250/250 275/275
	380	342	418	19.9	71	19.9	71	2	1	2.6	7.5	15.0	— 23.6	— 41.6	— —	— —	64.9 88.5	80 100
													— 23.6	— 41.6	23 23	34.2 34.2	64.9 91.0	80 100
													— 23.6	— 41.6	45 45	68.4 68.4	104.2 133.7	110 150
											10	20.7	— 23.6	— 41.6	— —	— —	70.6 94.2	90 110
													— 23.6	— 41.6	23 23	34.2 34.2	70.6 98.1	90 110
													— 23.6	— 41.6	45 45	68.4 68.4	111.3 140.8	125 150
											15	27.0	— 23.6	— 41.6	— —	— —	76.9 100.5	90 110
													— 23.6	— 41.6	23 23	34.2 34.2	76.9 106.0	90 110
													— 23.6	— 41.6	45 45	68.4 68.4	119.2 148.7	125 150
	460	414	508	19.9	114	19.9	114	2	1	2.7	7.5	11.0	— 12.6	— 23.6	— —	— —	61.2 73.8	80 90
													— 12.6	— 23.6	36 36	43.3 43.3	67.9 83.6	80 90
													— 12.6	— 23.6	72 72	86.6 86.6	100.4 116.1	110 125
											10	14.0	— 12.6	— 23.6	— —	— —	64.2 76.8	80 90
													— 12.6	— 23.6	36 36	43.3 43.3	71.6 87.4	80 90
													— 12.6	— 23.6	72 72	86.6 86.6	104.1 119.9	110 125
											15	21.0	— 12.6	— 23.6	— —	— —	71.2 83.8	90 100
													— 12.6	— 23.6	36 36	43.3 43.3	80.4 96.1	90 100
													— 12.6	— 23.6	72 72	86.6 86.6	112.9 128.6	125 150
	575	518	632	16.0	91	16.0	91	2	1	2.4	7.5	9.0	— 12.6	— 23.6	— —	— —	49.8 62.4	60 70
													— 12.6	— 23.6	36 36	34.6 34.6	54.6 70.3	60 80
													— 12.6	— 23.6	72 72	69.3 69.3	80.5 96.3	90 100
											10	11.0	— 12.6	— 23.6	— —	— —	51.8 64.4	60 80
													— 12.6	— 23.6	36 36	34.6 34.6	57.1 72.8	60 80
													— 12.6	— 23.6	72 72	69.3 69.3	83.0 98.8	90 100
											15	17.0	— 12.6	— 23.6	— —	— —	57.8 70.4	70 80
													— 12.6	— 23.6	36 36	34.6 34.6	64.6 80.3	70 90
													— 12.6	— 23.6	72 72	69.3 69.3	90.5 106.3	100 110

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
030	208/230	187	254	57.1	266	39.1	228	2	1	5.3	10	30.8/28.0	— 23.6	— 41.6	— —	— —	151.9/149.1 175.5/172.7	200/200 225/225
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	151.9/149.1 175.5/172.8	200/200 225/225
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	188.6/208.2 218.1/237.7	200/225 225/250
											15	46.2/42.0	— 23.6	— 41.6	— —	— —	167.3/163.1 190.9/186.7	200/200 225/225
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	167.3/163.1 190.9/190.3	200/200 225/225
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	207.9/225.7 237.4/255.2	250/250 275/275
											20	59.4/54.0	— 23.6	— 41.6	— —	— —	180.5/175.1 204.1/198.7	225/225 250/250
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	180.5/175.8 204.1/205.3	225/225 250/250
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	224.4/240.7 253.9/270.2	275/275 300/300
	380	342	418	25.6	99	19.9	71	2	1	2.6	10	20.7	— 23.6	— 41.6	— —	— —	77.8 101.4	100 125
													— 23.6	— 41.6	23 23	34.2 34.2	77.8 101.4	100 125
													— 23.6	— 41.6	45 45	68.4 68.4	111.3 140.8	125 150
											15	27.0	— 23.6	— 41.6	— —	— —	84.1 107.7	100 125
													— 23.6	— 41.6	23 23	34.2 34.2	84.1 107.7	100 125
													— 23.6	— 41.6	45 45	68.4 68.4	119.2 148.7	125 150
											20	37.4	— 23.6	— 41.6	— —	— —	94.5 118.1	110 125
													— 23.6	— 41.6	23 23	34.2 34.2	94.5 119.0	110 125
													— 23.6	— 41.6	45 45	68.4 68.4	132.2 161.7	150 175
	460	414	508	25.6	120	19.9	114	2	1	2.7	10	14.0	— 12.6	— 23.6	— —	— —	71.3 83.9	90 100
													— 12.6	— 23.6	36 36	43.3 43.3	71.6 87.4	90 100
													— 12.6	— 23.6	72 72	86.6 86.6	104.1 119.9	110 125
											15	21.0	— 12.6	— 23.6	— —	— —	78.3 90.9	100 110
													— 12.6	— 23.6	36 36	43.3 43.3	80.4 96.1	100 110
													— 12.6	— 23.6	72 72	86.6 86.6	112.9 128.6	125 150
											20	27.0	— 12.6	— 23.6	— —	— —	84.3 96.9	100 110
													— 12.6	— 23.6	36 36	43.3 43.3	87.9 103.6	100 110
													— 12.6	— 23.6	72 72	86.6 86.6	120.4 136.1	125 150
	575	518	632	20.5	96	16.0	91	2	1	2.4	10	11.0	— 12.6	— 23.6	— —	— —	57.4 70.0	70 90
													— 12.6	— 23.6	36 36	34.6 34.6	57.4 72.8	70 90
													— 12.6	— 23.6	72 72	69.3 69.3	83.0 98.8	90 100
											15	17.0	— 12.6	— 23.6	— —	— —	63.4 76.0	80 90
													— 12.6	— 23.6	36 36	34.6 34.6	64.6 80.3	80 90
													— 12.6	— 23.6	72 72	69.3 69.3	90.5 106.3	100 110
											20	22.0	— 12.6	— 23.6	— —	— —	68.4 81.0	80 100
													— 12.6	— 23.6	36 36	34.6 34.6	70.8 86.6	80 100
													— 12.6	— 23.6	72 72	69.3 69.3	96.8 112.5	110 125

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
034	208/230	187	254	57.1	266	57.1	266	2	1	5.3	10	30.8/28.0	— 23.6	— 41.6	— —	— —	169.9/167.1 193.5/190.7	225/200 250/225
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	169.9/167.1 193.5/190.7	225/200 250/225
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	188.6/208.2 218.1/237.7	225/225 250/250
											15	46.2/42.0	— 23.6	— 41.6	— —	— —	185.3/181.1 208.9/204.7	225/225 250/250
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	185.3/181.1 208.9/204.7	225/225 250/250
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	207.9/225.7 237.4/255.2	250/250 275/275
											20	59.4/54.0	— 23.6	— 41.6	— —	— —	198.5/193.1 222.1/216.7	250/250 275/250
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	198.5/193.1 222.1/216.7	250/250 275/250
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	224.4/240.7 253.9/270.2	275/275 300/300
	380	342	418	25.6	99	25.6	99	2	1	2.6	10	20.7	— 23.6	— 41.6	— —	— —	83.6 107.2	100 125
													— 23.6	— 41.6	23 23	34.2 34.2	83.6 107.2	100 125
													— 23.6	— 41.6	45 45	68.4 68.4	111.3 140.8	125 150
											15	27.0	— 23.6	— 41.6	— —	— —	89.9 133.5	110 125
													— 23.6	— 41.6	23 23	34.2 34.2	89.9 113.5	110 125
													— 23.6	— 41.6	45 45	68.4 68.4	119.2 148.7	125 150
											20	37.4	— 23.6	— 41.6	— —	— —	100.3 123.9	125 125
													— 23.6	— 41.6	23 23	34.2 34.2	100.3 123.9	125 125
													— 23.6	— 41.6	45 45	68.4 68.4	132.2 161.7	150 175
	460	414	508	25.6	120	25.6	120	2	1	2.7	10	14.0	— 12.6	— 23.6	— —	— —	77.0 89.6	100 110
													— 12.6	— 23.6	36 36	43.3 43.3	77.0 89.6	100 110
													— 12.6	— 23.6	72 72	86.6 86.6	104.1 119.9	110 125
											15	21.0	— 12.6	— 23.6	— —	— —	84.0 96.6	100 110
													— 12.6	— 23.6	36 36	43.3 43.3	84.0 96.6	100 110
													— 12.6	— 23.6	72 72	86.6 86.6	112.9 128.6	125 150
											20	27.0	— 12.6	— 23.6	— —	— —	90.0 102.6	110 125
													— 12.6	— 23.6	36 36	43.3 43.3	90.0 103.6	110 125
													— 12.6	— 23.6	72 72	86.6 86.6	120.4 136.1	125 150
	575	518	632	20.5	96	20.5	96	2	1	2.4	10	11.0	— 12.6	— 23.6	— —	— —	61.9 74.5	80 90
													— 12.6	— 23.6	36 36	34.6 34.6	61.9 74.5	80 90
													— 12.6	— 23.6	72 72	69.3 69.3	83.0 98.8	90 100
											15	17.0	— 12.6	— 23.6	— —	— —	67.9 80.5	80 100
													— 12.6	— 23.6	36 36	34.6 34.6	67.9 80.5	80 100
													— 12.6	— 23.6	72 72	69.3 69.3	90.5 106.3	100 110
											20	22.0	— 12.6	— 23.6	— —	— —	72.9 85.5	90 100
													— 12.6	— 23.6	36 36	34.6 34.6	72.9 86.6	90 100
													— 12.6	— 23.6	72 72	69.3 69.3	96.8 112.5	110 125

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
038	208/230	187	254	57.1	266	57.1	266	4	1	5.3	10	30.8/28.0	— 23.6	— 41.6	— —	— —	180.5/177.7 204.1/201.3	225/225 250/250
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	180.5/177.7 204.1/201.3	225/225 250/250
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	188.6/208.2 218.1/237.7	225/225 250/250
											15	46.2/42.0	— 23.6	— 41.6	— —	— —	195.9/191.7 219.5/215.3	250/225 275/250
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	195.9/191.7 219.5/215.3	250/225 275/250
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	207.9/225.7 237.4/255.2	250/250 275/275
											20	59.4/54.0	— 23.6	— 41.6	— —	— —	209.1/203.7 232.7/227.3	250/250 275/275
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	209.1/203.7 232.7/227.3	250/250 275/275
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	224.4/240.7 253.9/270.2	275/275 300/300
	380	342	418	25.6	99	25.6	99	2	1	2.6	10	20.7	— 23.6	— 41.6	— —	— —	88.8 112.4	100 125
													— 23.6	— 41.6	23 23	34.2 34.2	88.8 112.4	100 125
													— 23.6	— 41.6	45 45	68.4 68.4	111.3 140.8	125 150
											15	27.0	— 26.0	— 45.8	— —	— —	95.1 118.7	110 125
													— 26.0	— 45.8	23 23	34.2 34.2	95.1 118.7	110 125
													— 26.0	— 45.8	45 45	68.4 68.4	117.6 150.0	125 175
											20	37.4	— 26.0	— 45.8	— —	— —	105.5 129.1	125 150
													— 26.0	— 45.8	23 23	34.2 34.2	105.5 129.1	125 150
													— 26.0	— 45.8	45 45	68.4 68.4	132,2 161.7	150 175
	460	414	508	25.6	120	25.6	120	4	1	2.7	10	14.0	— 12.6	— 23.6	— —	— —	82.4 95.0	100 110
													— 12.6	— 23.6	36 36	43.3 43.3	82.4 95.0	100 110
													— 12.6	— 23.6	72 72	86.6 86.6	104.1 119.9	110 125
											15	21.0	— 12.6	— 23.6	— —	— —	89.4 102.0	110 125
													— 12.6	— 23.6	36 36	43.3 43.3	89.4 102.0	110 125
													— 12.6	— 23.6	72 72	86.6 86.6	112.9 128.6	125 150
											20	27.0	— 12.6	— 23.6	— —	— —	95.4 108.0	110 125
													— 12.6	— 23.6	36 36	43.3 43.3	95.4 108.0	110 125
													— 12.6	— 23.6	72 72	86.6 86.6	120.4 136.1	125 150
	575	518	632	20.5	96	20.5	96	4	1	2.4	10	11.0	— 12.6	— 23.6	— —	— —	66.7 79.3	80 90
													— 12.6	— 23.6	36 36	34.6 34.6	66.7 79.3	80 90
													— 12.6	— 23.6	72 72	69.3 69.3	83.0 98.8	90 100
											15	17.0	— 12.6	— 23.6	— —	— —	72.7 85.3	90 100
													— 12.6	— 23.6	36 36	34.6 34.6	72.7 85.3	90 100
													— 12.6	— 23.6	72 72	69.3 69.3	90.5 106.3	100 110
											20	22.0	— 12.6	— 23.6	— —	— —	77.7 90.3	90 110
													— 12.6	— 23.6	36 36	34.6 34.6	77.7 90.3	90 110
													— 12.6	— 23.6	72 72	69.3 69.3	96.8 112.5	110 125

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
044	208/230	187	254	69.2	345	69.2	345	4	1	5.3	15	46.2/42.0	— 23.6	— 41.6	— —	— —	223.1/218.9 246.7/242.5	275/275 300/300
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	223.1/218.9 246.7/242.5	275/275 300/300
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	223.1/225.7 246.7/255.2	275/275 300/300
											20	59.4/54.0	— 23.6	— 41.6	— —	— —	236.3/230.9 259.9/254.5	300/300 300/300
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	236.3/230.9 259.9/254.5	300/300 300/300
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	236.3/240.7 259.9/270.2	300/300 300/300
											25	74.8/68.0	— 23.6	— 41.6	— —	— —	251.7/244.9 275.3/268.5	300/300 300/300
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	251.7/244.9 275.3/268.5	300/300 300/300
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	251.7/258.2 275.3/287.7	300/300 300/300
	380	342	418	28.8	143	28.8	143	4	1	2.6	15	27.0	— 23.6	— 41.6	— —	— —	102.3 125.9	125 150
													— 23.6	— 41.6	23 23	34.2 34.2	102.3 125.9	125 150
													— 23.6	— 41.6	45 45	68.4 68.4	119.2 148.7	125 150
											20	37.4	— 23.6	— 41.6	— —	— —	112.7 136.3	125 150
													— 23.6	— 41.6	23 23	34.2 34.2	112.7 136.3	125 150
													— 23.6	— 41.6	45 45	68.4 68.4	132.2 161.7	150 175
											25	37.4	— 23.6	— 41.6	— —	— —	112.7 136.3	125 150
													— 23.6	— 41.6	23 23	34.2 34.2	112.7 136.3	125 150
													— 23.6	— 41.6	45 45	68.4 68.4	132.2 161.7	150 175
	460	414	508	28.8	173	28.8	173	4	1	2.7	15	21.0	— 12.6	— 23.6	— —	— —	96.6 109.2	125 125
													— 12.6	— 23.6	36 36	43.3 43.3	96.6 109.2	125 125
													— 12.6	— 23.6	72 72	86.6 86.6	112.9 128.6	125 150
											20	27.0	— 12.6	— 23.6	— —	— —	102.6 115.2	125 125
													— 12.6	— 23.6	36 36	43.3 43.3	102.6 115.2	125 125
													— 12.6	— 23.6	72 72	86.6 86.6	120.4 136.1	125 150
											25	34.0	— 12.6	— 23.6	— —	— —	109.6 122.2	125 150
													— 12.6	— 23.6	36 36	43.3 43.3	109.6 122.2	125 150
													— 12.6	— 23.6	72 72	86.6 86.6	129.1 144.9	150 175
	575	518	632	26.7	120	26.7	120	4	1	2.4	15	17.0	— 12.6	— 23.6	— —	— —	86.7 99.3	110 125
													— 12.6	— 23.6	36 36	34.6 34.6	86.7 99.3	110 125
													— 12.6	— 23.6	72 72	69.3 69.3	90.5 106.3	110 125
											20	22.0	— 12.6	— 23.6	— —	— —	91.7 104.3	110 125
													— 12.6	— 23.6	36 36	34.6 34.6	91.7 104.3	110 125
													— 12.6	— 23.6	72 72	69.3 69.3	96.8 112.5	110 125
											25	27.0	— 12.6	— 23.6	— —	— —	96.7 109.3	110 125
													— 12.6	— 23.6	36 36	34.6 34.6	96.7 109.3	110 125
													— 12.6	— 23.6	72 72	69.3 69.3	103.0 118.8	125 125

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
048	208/230	187	254	82.1	446	69.2	345	4	1	5.3	20	59.4/54.0	— 23.6	— 41.6	— —	— —	252.4/247.0 276.0/270.6	300/300 300/300
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	252.4/247.0 276.0.270.6	300/300 300/300
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	252.4/247.0 276.0/270.6	300/300 300/300
											25	74.8/68.0	— 23.6	— 41.6	— —	— —	267.8/261.0 291.4/284.6	300/300 300/300
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	267.8/261.0 291.4/284.6	300/300 300/300
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	267.8/261.0 291.4/287.7	300/300 300/300
											30	88.0/80.0	— 23.6	— 41.6	— —	— —	281.0/273.0 304.6/296.6	300/300 350/300
													— 23.6	— 41.6	27/36 27/36	75.1/ 86.6 75.1/ 86.6	281.0/273.0 304.6/296.6	300/300 350/300
													— 23.6	— 41.6	54/72 54/72	150.1/173.2 150.1/173.2	281.0/273.2 304.6/302.7	300/300 350/350
	460	414	508	42.3	223	28.8	173	4	1	2.7	20	27.0	— 12.6	— 23.6	— —	— —	119.5 132.1	150 150
													— 12.6	— 23.6	36 36	43.3 43.3	119.5 132.1	150 150
													— 12.6	— 23.6	72 72	86.6 86.6	120.4 136.1	150 150
											25	34.0	— 12.6	— 23.6	— —	— —	126.5 139.1	150 175
													— 12.6	— 23.6	36 36	43.3 43.3	126.5 139.1	150 175
													— 12.6	— 23.6	72 72	86.6 86.6	129.1 144.9	150 175
											30	40.0	— 12.6	— 23.6	— —	— —	132.5 145.1	150 175
													— 12.6	— 23.6	36 36	43.3 43.3	132.5 145.1	150 175
													— 12.6	— 23.6	72 72	86.6 86.6	136.6 152.4	175 175
	575	518	632	34.6	164	26.7	120	4	1	2.4	20	22.0	— 12.6	— 23.6	— —	— —	101.6 114.2	125 125
													— 12.6	— 23.6	36 36	34.6 34.6	101.6 114.2	125 125
													— 12.6	— 23.6	72 72	69.3 69.3	101.6 114.2	125 125
											25	27.0	— 12.6	— 23.6	— —	— —	106.6 119.2	125 150
													— 12.6	— 23.6	36 36	34.6 34.6	106.6 119.2	125 150
													— 12.6	— 23.6	72 72	69.3 69.3	106.6 119.2	125 150
											30	32.0	— 12.6	— 23.6	— —	— —	111.6 124.2	125 150
													— 12.6	— 23.6	36 36	34.6 34.6	111.6 124.2	125 150
													— 12.6	— 23.6	72 72	69.3 69.3	111.6 125.0	125 150

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
054	208/230	187	254	82.1	446	69.2	345	4	1	5.3	15	46.2/42.0	— 35.4	— 62.4	— —	— —	239.1/235.0 274.6/270.4	300/300 350/350
													— 35.4	— 62.4	41/ 54 41/ 54	112.6/129.9 112.6/129.9	239.2/235.0 274.6/270.4	300/300 350/350
													— 35.4	— 62.4	81/108 81/108	225.2/259.8 225.2/259.8	282.9/312.3 327.2/356.6	300/300 350/400
											20	59.4/54.0	— 35.4	— 62.4	— —	— —	252.4/247.0 287.8/282.4	300/300 350/350
													— 35.4	— 62.4	41/ 54 41/ 54	112.6/129.9 112.6/129.9	252.4/247.0 287.8/282.4	300/300 350/350
													— 35.4	— 62.4	81/108 81/108	225.2/259.8 225.2/259.8	299.4/327.3 343.7/371.6	350/350 350/400
											25	74.8/68.0	— 35.4	— 62.4	— —	— —	267.8/261.0 303.2/296.4	300/300 350/350
													— 35.4	— 62.4	41/ 54 41/ 54	112.6/129.9 112.6/129.9	267.8/261.0 303.2/296.0	300/300 350/350
													— 35.4	— 62.4	81/108 81/108	225.2/259.8 225.2/259.8	318.7/344.8 371.6/362.9	350/400 400/400
	380	342	418	46.8	247	35.9	191	4	1	2.6	15	28.7	— 35.4	— 62.4	— —	— —	133.5 168.9	175 200
													— 35.4	— 62.4	33.8 33.8	51.4 51.4	133.5 168.9	175 200
													— 35.4	— 62.4	67.7 67.7	102.8 102.8	138.7 183.0	175 200
											20	37.4	— 35.4	— 62.4	— —	— —	142.2 177.6	175 200
													— 35.4	— 62.4	33.8 33.8	51.4 51.4	142.2 177.6	175 200
													— 35.4	— 62.4	67.7 67.7	102.8 102.8	149.6 193.8	175 200
											25	37.4	— 35.4	— 62.4	— —	— —	142.2 177.6	175 200
													— 35.4	— 62.4	33.8 33.8	51.4 51.4	142.2 177.6	175 200
													— 35.4	— 62.4	67.7 67.7	102.8 102.8	149.6 193.8	175 200
	460	414	508	43.6	223	30.8	173	4	1	2.7	15	21.0	— 18.9	— 35.4	— —	— —	117.1 136.0	150 175
													— 18.9	— 35.4	54 54	65.0 65.0	117.1 136.0	150 175
													— 18.9	— 35.4	108 108	129.9 129.9	156.2 179.8	175 200
											20	27.0	— 18.9	— 35.4	— —	— —	123.1 142.0	150 175
													— 18.9	— 35.4	54 54	65.0 65.0	123.1 142.0	150 175
													— 18.9	— 35.4	108 108	129.9 129.9	163.7 187.3	175 200
											25	34.0	— 18.9	— 35.4	— —	— —	130.1 149.0	150 175
													— 18.9	— 35.4	54 54	65.0 65.0	130.1 149.0	150 175
													— 18.9	— 35.4	108 108	129.9 129.9	172.4 196.0	200 225
	575	518	632	34.6	164	26.9	120	4	1	2.4	15	17.0	— 18.9	— 35.4	— —	— —	96.8 115.7	125 150
													— 18.9	— 35.4	54 54	52.0 52.0	96.8 115.7	125 150
													— 18.9	— 35.4	108 108	103.9 103.9	125.2 148.8	150 150
											20	22.0	— 18.9	— 35.4	— —	— —	101.8 120.7	125 150
													— 18.9	— 35.4	54 54	52.0 52.0	101.8 120.7	125 150
													— 18.9	— 35.4	108 108	103.9 103.9	131.4 155.0	150 175
											25	27.0	— 18.9	— 35.4	— —	— —	106.8 125.7	125 150
													— 18.9	— 35.4	54 54	52.0 52.0	106.8 125.7	125 150
													— 18.9	— 35.4	108 108	103.9 103.9	137.7 161.3	150 175

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
058	208/230	187	254	106.4	506	69.2	345	6	1	5.3	20	59.4/54.0	— / 35.4	— / 62.4	— / —	— / —	293.4/288.0 / 328.8/323.4	350/350 / 400/400
													— / 35.4	— / 62.4	41/ 54 / 41/ 54	112.6/129.9 / 112.6/129.9	293.4/288.0 / 328.8/323.4	350/350 / 400/400
													— / 35.4	— / 62.4	81/108 / 81/108	225.2/259.8 / 225.2/259.8	299.4/327.3 / 343.7/371.6	350/350 / 400/400
											25	74.8/68.0	— / 35.4	— / 62.4	— / —	— / —	308.8/302.0 / 344.2/337.4	400/400 / 450/400
													— / 35.4	— / 62.4	41/ 54 / 41/ 54	112.6/129.9 / 112.6/129.9	308.8/302.0 / 344.2/337.4	400/400 / 450/400
													— / 35.4	— / 62.4	81/108 / 81/108	225.2/259.8 / 225.2/259.8	318.7/344.8 / 362.2/389.1	400/400 / 450/400
											30	88.0/80.0	— / 35.4	— / 62.4	— / —	— / —	322.0/314.0 / 357.4/349.4	400/400 / 450/450
													— / 35.4	— / 62.4	41/ 54 / 41/ 54	112.6/139.9 / 112.6/139.9	322.0/314.0 / 357.4/349.4	400/400 / 450/450
													— / 35.4	— / 62.4	81/108 / 81/108	225.2/259.8 / 225.2/259.8	335.2/359.8 / 379.4/404.1	400/400 / 450/450
	460	414	508	52.6	253	30.8	173	6	1	2.7	20	27.0	— / 18.9	— / 35.4	— / —	— / —	139.7 / 158.6	175 / 200
													— / 18.9	— / 35.4	54 / 54	65.0 / 65.0	139.7 / 158.6	175 / 200
													— / 18.9	— / 35.4	108 / 108	129.9 / 129.9	163.7 / 187.3	175 / 200
											25	34.0	— / 18.9	— / 35.4	— / —	— / —	146.7 / 165.6	175 / 200
													— / 18.9	— / 35.4	54 / 54	65.0 / 65.0	146.7 / 165.6	175 / 200
													— / 18.9	— / 35.4	108 / 108	129.9 / 129.9	172.4 / 196.0	200 / 225
											30	40.0	— / 18.9	— / 35.4	— / —	— / —	152.7 / 171.6	200 / 200
													— / 18.9	— / 35.4	54 / 54	65.0 / 65.0	152.7 / 171.6	200 / 200
													— / 18.9	— / 35.4	108 / 108	129.9 / 129.9	179.9 / 203.5	200 / 225
	575	518	632	40.4	176	26.9	120	6	1	2.4	20	22.0	— / 18.9	— / 35.4	— / —	— / —	113.8 / 132.7	150 / 150
													— / 18.9	— / 35.4	54 / 54	52.0 / 52.0	113.8 / 132.7	150 / 150
													— / 18.9	— / 35.4	108 / 108	103.9 / 103.9	131.4 / 155.0	150 / 175
											25	27.0	— / 18.9	— / 35.4	— / —	— / —	118.8 / 137.7	150 / 175
													— / 18.9	— / 35.4	54 / 54	52.0 / 52.0	118.8 / 137.7	150 / 175
													— / 18.9	— / 35.4	108 / 108	103.9 / 103.9	137.7 / 161.3	150 / 175
											30	32.0	— / 18.9	— / 35.4	— / —	— / —	123.8 / 142.7	150 / 175
													— / 18.9	— / 35.4	54 / 54	52.0 / 52.0	123.8 / 142.7	150 / 175
													— / 18.9	— / 35.4	108 / 108	103.9 / 103.9	143.9 / 167.5	175 / 175

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
064	208/230	187	254	106.4	506	82.1	446	6	1	5.3	25	74.8/ 68.0	— 35.4	— 62.4	— —	— —	321.7/314.9 357.1/350.3	400/400 450/450
													— 35.4	— 62.4	41/ 54 41/ 54	112.6/129.9 112.6/129.9	321.7/314.9 357.1/350.3	400/400 450/450
													— 35.4	— 62.4	81/108 81/108	225.2/259.8 225.2/259.8	321.7/344.8 362.9/389.1	400/400 450/450
											30	88.0/ 80.0	— 35.4	— 62.4	— —	— —	334.9/326.9 370.3/362.3	400/400 450/450
													— 35.4	— 62.4	41/ 54 41/ 54	112.6/129.9 112.6/129.9	334.4/226.9 370.3/362.3	400/400 450/450
													— 35.4	— 62.4	81/108 81/108	225.2/259.8 225.2/259.8	335.2/359.8 379.4/404.1	400/400 450/450
											40	114.0/104.0	— 35.4	— 62.4	— —	— —	360.9/350.9 396.3/386.3	450/450 500/450
													— 35.4	— 62.4	41/ 54 41/ 54	112.6/129.9 112.6/129.9	360.9/350.9 396.3/386.3	450/450 500/450
													— 35.4	— 62.4	81/108 81/108	225.2/259.8 225.2/259.8	367.7/389.8 411.9/434.1	450/450 500/500
	380	342	418	55.8	280	46.8	247	6	1	2.6	25	37.4	— 35.4	— 62.4	— —	— —	169.5 204.9	225 225
													— 35.4	— 62.4	33.8 33.8	51.4 51.4	169.5 204.9	225 300
													— 35.4	— 62.4	67.7 67.7	102.8 102.8	169.5 204.9	225 300
											30	43.8	— 35.4	— 62.4	— —	— —	175.9 211.3	225 225
													— 35.4	— 62.4	33.8 33.8	51.4 51.4	175.9 211.3	225 300
													— 35.4	— 62.4	67.7 67.7	102.8 102.8	175.9 211.3	225 300
											40	71.0	— 18.9	— 35.4	— —	— —	203.1 238.5	225 250
													— 18.9	— 35.4	33.8 33.8	51.4 51.4	203.1 238.5	300 300
													— 18.9	— 35.4	67.7 67.7	102.8 102.8	203.1 238.5	300 300
	460	414	508	52.6	253	43.6	253	6	1	2.7	25	34.0	— 18.9	— 35.4	— —	— —	159.5 178.4	200 225
													— 18.9	— 35.4	54 54	65.0 65.0	159.5 178.4	200 225
													— 18.9	— 35.4	108 108	129.9 129.9	172.4 196.0	200 225
											30	40.0	— 18.9	— 35.4	— —	— —	165.5 184.4	200 225
													— 18.9	— 35.4	54 54	65.0 65.0	165.5 184.4	200 225
													— 18.9	— 35.4	108 108	129.9 129.9	179.9 203.5	200 225
											40	52.0	— 18.9	— 35.4	— —	— —	177.5 196.4	225 225
													— 18.9	— 35.4	54 54	65.0 65.0	177.5 196.4	225 225
													— 18.9	— 35.4	108 108	129.9 129.9	194.9 218.5	225 250
	575	518	632	40.4	176	34.6	164	6	1	2.4	25	27.0	— 18.9	— 35.4	— —	— —	126.5 145.4	150 175
													— 18.9	— 35.4	54 54	52.0 52.0	126.5 145.4	150 175
													— 18.9	— 35.4	108 108	103.9 103.9	137.7 161.3	150 175
											30	32.0	— 18.9	— 35.4	— —	— —	131.5 150.4	150 175
													— 18.9	— 35.4	54 54	52.0 52.0	131.5 150.4	150 175
													— 18.9	— 35.4	108 108	103.9 103.9	143.9 167.5	175 175
											40	41.0	— 18.9	— 35.4	— —	— —	140.5 159.4	175 175
													— 18.9	— 35.4	54 54	52.0 52.0	140.5 159.4	175 175
													— 18.9	— 35.4	108 108	103.9 103.9	155.2 178.8	175 200

See Legend and Notes on page 52.

Table 5B — Electrical Data — 50EJ,EK,EW,EY Units (cont)

UNIT 50EJ,EK, EW,EY	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR				OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
068	208/230	187	254	106.4	506	106.4	506	6	1	5.3	25	74.8/ 68.0	—	—	—	—	346.0/339.2	450/450
													35.4	62.4	—	—	381.4/374.6	450/450
													—	—	41/ 54	112.6/129.9	346.0/339.2	450/450
													35.4	62.4	41/ 54	112.6/129.9	381.4/374.6	450/450
													—	—	81/108	225.2/259.8	346.0/344.8	450/400
													35.4	62.4	81/108	225.2/259.8	381.4/389.1	450/450
											30	88.0/ 80.0	—	—	—	—	359.2/351.2	450/450
													35.4	62.4	—	—	394.6/386.6	500/450
													—	—	41/ 54	112.6/129.9	359.2/351.2	450/450
													35.4	62.4	41/ 54	112.6/129.9	394.6/386.6	500/450
													—	—	81/108	225.2/259.8	359.2/359.8	450/450
													35.4	62.4	81/108	225.2/259.8	394.6/404.1	500/450
											40	114.0/104.0	—	—	—	—	385.2/375.2	450/450
													35.4	62.4	—	—	420.6/410.6	500/500
													—	—	41/ 54	112.6/139.9	385.2/375.2	450/450
													35.4	62.4	41/ 54	112.6/139.9	402.6/410.6	500/500
													—	—	81/108	225.2/259.8	385.2/389.8	450/450
													35.4	62.4	81/108	225.2/259.8	420.6/434.1	500/500
	460	414	508	52.6	253	52.6	253	6	1	2.7	25	34.0	—	—	—	—	168.5	200
													18.9	35.4	—	—	187.4	225
													—	—	54	65.0	168.5	200
													18.9	35.4	54	65.0	187.4	225
													—	—	108	129.9	172.4	200
													18.9	35.4	108	129.9	196.0	225
											30	40.0	—	—	—	—	174.5	225
													18.9	35.4	—	—	193.4	225
													—	—	54	65.0	174.5	225
													18.9	35.4	54	65.0	193.4	225
													—	—	108	129.9	179.9	225
													18.9	35.4	108	129.9	203.5	225
											40	52.0	—	—	—	—	186.5	225
													18.9	35.4	—	—	205.4	250
													—	—	54	65.0	186.5	225
													18.9	35.4	54	65.0	205.4	250
													—	—	108	129.9	194.9	225
													18.9	35.4	108	129.9	218.5	250
	575	518	632	40.4	176	40.4	176	6	1	2.4	25	27.0	—	—	—	—	132.3	150
													18.9	35.4	—	—	151.2	175
													—	—	54	52.0	132.3	150
													18.9	35.4	54	52.0	151.2	175
													—	—	108	103.9	137.7	150
													18.9	35.4	108	103.9	161.3	175
											30	32.0	—	—	—	—	137.3	175
													18.9	35.4	—	—	156.2	175
													—	—	54	52.0	137.3	175
													18.9	35.4	54	52.0	156.2	175
													—	—	108	103.9	143.9	175
													18.9	35.4	108	103.9	167.5	175
											40	41.0	—	—	—	—	146.3	175
													18.9	35.4	—	—	165.2	200
													—	—	54	52.0	132.3	150
													18.9	35.4	54	52.0	165.2	200
													—	—	108	103.9	155.2	175
													18.9	35.4	108	103.9	178.8	200

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

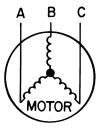
*Heater capacity (kW) is based on heater voltage of 240 v, 480 v, and 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. The Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

% Voltage Imbalance

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

3. MCA calculation for units with electric heaters over 50 kW = (1.25 x IFM amps) + (1.00 x heater FLA).
4. 72 kW (sizes 024-048) or 108 kW (sizes 054-068) heaters are for constant volume applications only.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.

On 208/230-v units, transformer no. 1 is wired for 230-v. If 208/230-v unit is to be run with 208-v power supply, the transformer must be rewired as follows:

1. Remove cap from red (208-v) wire.
2. Remove cap from spliced orange (230-v) wire. Disconnect orange wire from black unit power wire.
3. Cap orange wire.
4. Splice red wire and black unit power wire. Cap wires.

IMPORTANT: BE CERTAIN UNUSED WIRES ARE CAPPED. Failure to do so may damage the transformers.

FIELD CONTROL WIRING — Install either a Carrier-approved accessory thermostat or a CCN (Carrier Comfort Network) compatible temperature sensor. Thermostats are used on CV (constant volume) units only. Control box diagrams are shown in Fig. 27-29.

Thermostat Wiring (CV Only) — Install a Carrier-approved accessory thermostat assembly (per current price pages) according to the installation instructions included with the accessory or these instructions. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections as shown on unit label wiring diagram and in Fig. 30.

NOTE: For wire runs up to 50 ft (15 m), use no. 18 AWG (American Wire Gage, U.S.A. Standard) insulated wire (35 C minimum). For 50 to 75 ft (15 to 23 m), use no. 16 AWG insulated wire (35 C minimum). For over 75 ft (23 m), use no. 14 AWG insulated wire (35 C minimum). All wire larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

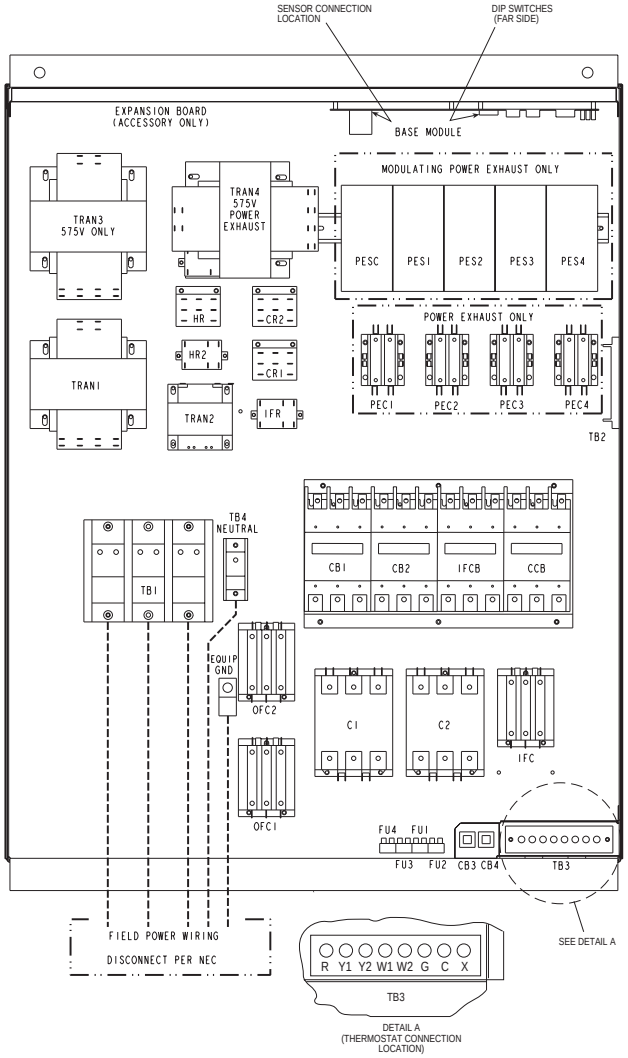
Set heat anticipators settings to 0.1 for all voltages. Settings may be changed slightly to provide a greater degree of comfort for a particular installation.

Sensor Wiring (CV or VAV) — The temperature sensor is wired into the unit control board. See Fig. 31.

The unit is controlled with a T-55 or T-56 (CV only) zone sensor. Terminal TH (T-56) or T1 (T-55) on the sensor is connected to T1 of the base module board. Terminal COM (T-56) or T2 (T-55) on the sensor is connected to T2 on the base module board. If a T-56 set point override sensor is used, the override connection SW on the sensor is connected to T3 on the base module board.

If more than one sensor is being used and averaged, the sensors must be wired in multiples of 4 or 9. See Fig. 32.

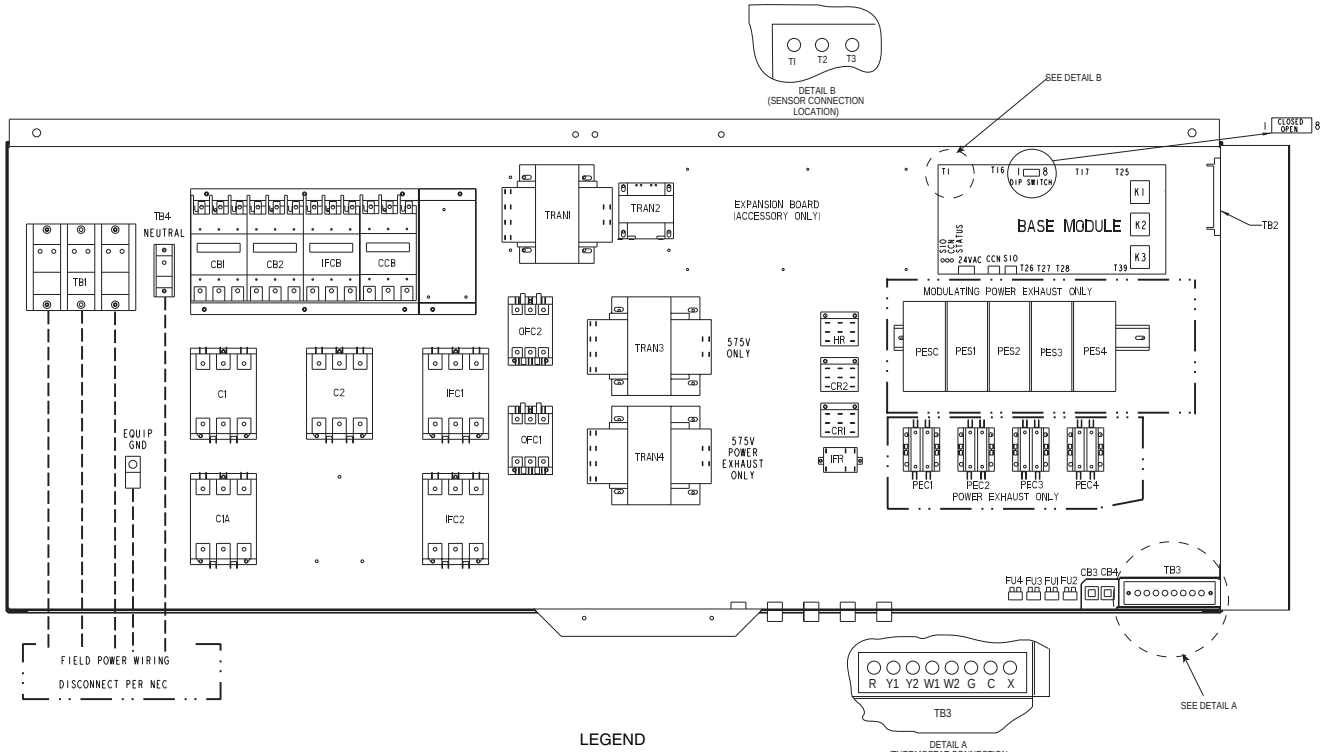
Heat Interlock Relay (VAV) — The VAV units require a field-supplied heat interlock relay (HIR) to drive the air terminal wide open when in heat mode. The HIR part number is HN61KK040.



LEGEND

C	—	Compressor/Contactor
CB	—	Circuit Breaker
CCB	—	Control Circuit Breaker
CR	—	Control Relay
DIP	—	Dual In-Line Package
Equip	—	Equipment
FU	—	Fuse
GND	—	Ground
HR	—	Heater Relay
IFC	—	Indoor Fan Contactor
IFCB	—	Indoor Fan Circuit Breaker
IFR	—	Indoor Fan Relay
NEC	—	National Electrical Code (U.S.A.)
OFC	—	Outdoor Fan Contactor
PEC	—	Power Exhaust Controller
PES	—	Power Exhaust Sequencer
PESC	—	Power Exhaust Sequencer Controller
TB	—	Terminal Block
TRAN	—	Transformer

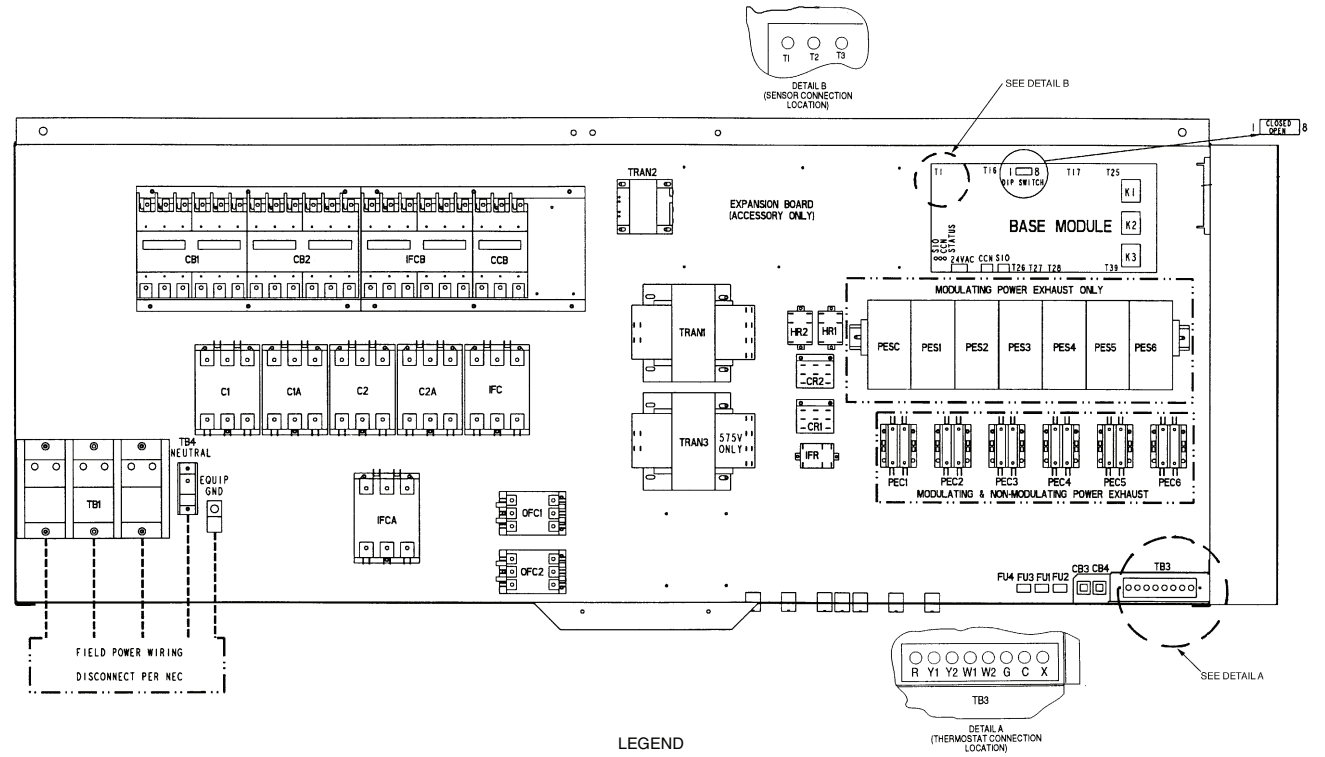
Fig. 27 — Control Box Diagram (50AJ,AK,AW,AY020-030 and 50EJ,EK,EW,EY024-034)



LEGEND

C	—	Compressor/Contactor	**Equip**	—	Equipment	**IFCB**	—	Indoor Fan Circuit Breaker	**PES**	—	Power Exhaust Sequencer
CB	—	Circuit Breaker	**FU**	—	Fuse	**IFR**	—	Indoor Fan Relay	**PESC**	—	Power Exhaust Sequencer Controller
CCB	—	Control Circuit Breaker	**GND**	—	Ground	**NEC**	—	National Electrical Code (U.S.A.)	**SIO**	—	Serial Input/Output
CCN	—	Carrier Comfort Network	**HR**	—	Heater Relay	**OFC**	—	Outdoor Fan Contactor	**TB**	—	Terminal Block
CR	—	Control Relay	**IFC**	—	Indoor Fan Contactor	**PEC**	—	Power Exhaust Controller	**TRAN**	—	Transformer
DIP	—	Dual-In-Line Package									

Fig. 28 — Control Box Diagram (50AJ,AK,AW,AY035-050 and 50EJ,EK,EW,EY038-048)



LEGEND

C	—	Compressor/Contactor	**Equip**	—	Equipment	**IFCB**	—	Indoor Fan Circuit Breaker	**PES**	—	Power Exhaust Sequencer
CB	—	Circuit Breaker	**FU**	—	Fuse	**IFR**	—	Indoor Fan Relay	**PESC**	—	Power Exhaust Sequencer Controller
CCB	—	Control Circuit Breaker	**GND**	—	Ground	**NEC**	—	National Electrical Code (U.S.A.)	**SIO**	—	Serial Input/Output
CCN	—	Carrier Comfort Network	**HR**	—	Heater Relay	**OFC**	—	Outdoor Fan Contactor	**TB**	—	Terminal Block
CR	—	Control Relay	**IFC**	—	Indoor Fan Contactor	**PEC**	—	Power Exhaust Controller	**TRAN**	—	Transformer
DIP	—	Dual-In-Line Package									

Fig. 29 — Control Box Diagram (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068)

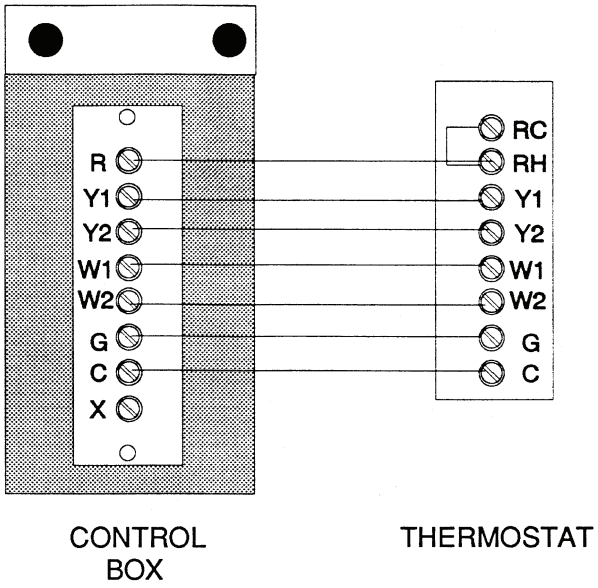
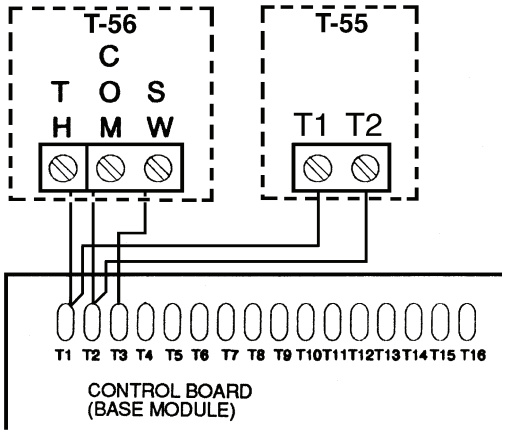


Fig. 30 — Field Control Thermostat Wiring



NOTE: Sensor part numbers are as follows:

T-55 — CEC0121448-01
T-56 — CEC0121503-01

Fig. 31 — Field Control Temperature Sensor Wiring

Remote Field Control — A switch closure across terminals R and W1 on TB-3 will initiate the Occupied mode. This can be done manually as well as through a field-supplied timeclock.

Service Tool, Building Supervisor, and ComfortWORKS® Software — Access to the control board can be achieved through the terminal marked CCN via a 3-wire bus.

IMPORTANT: Default bus address is 0. Default element number is 1. Refer to CCN literature for information on network addressing or changing CCN communication defaults.

Carrier Comfort Network Interface — The 50E units can be connected to the CCN. The communication bus wiring is supplied and installed in the field. Wiring consists of shielded, 3-conductor cable with drain wire.

The system elements are connected to the communication bus in a daisy chain arrangement. The positive pin of each system element communication connector must be wired to the positive pins of the system element on either side of it, the negative pins must be wired to the negative pins, and the signal pins must be wired to signal ground pins. Wiring connections for CCN should be made at the 3-pin plug (CCN located at the base board). Consult CCN literature for further information.

Conductors and drain wire must be 20 AWG minimum stranded, tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon, or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon, chrome vinyl, or Teflon with a minimum operating temperature range of –20 C to 60 C (–4 F to 140 F) is required. Table 6 lists cables that meet the requirements.

Table 6 — CCN Connection Approved Shielded Cables

MANUFACTURER	CABLE PART NO.
Alpha	2413 or 5463
American	A22503
Belden	8772
Columbia	02525

IMPORTANT: When connecting the CCN communication bus to a system element, use a color coding system for the entire network to simplify installation and checkout. See Table 7.

Table 7 — Color Code Recommendations

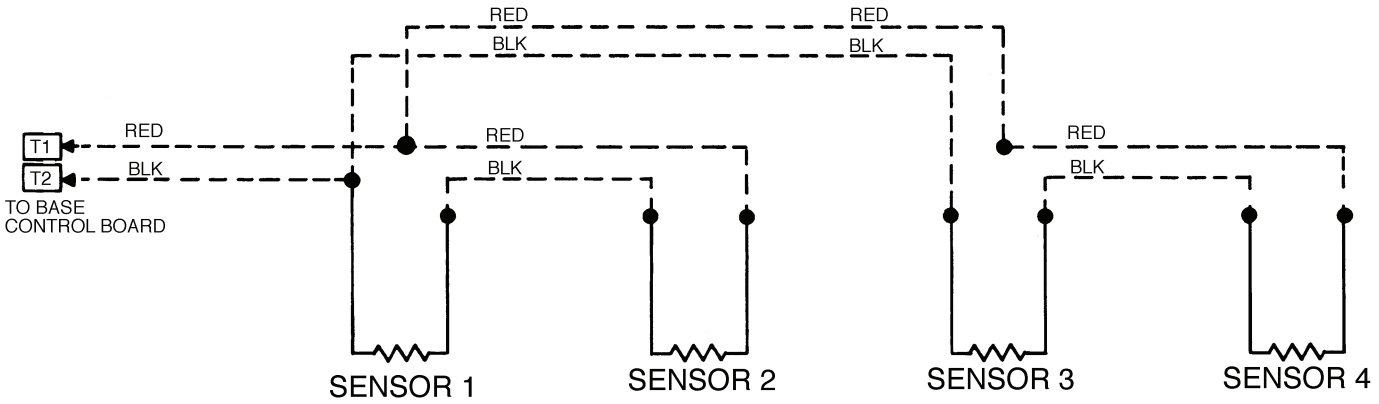
SIGNAL TYPE	CCN BUS CONDUCTOR INSULATION COLOR	CCN PLUG PIN NO.
Positive (+)	RED	1
Ground	WHITE	2
Negative (-)	BLACK	3

NOTE: If a cable with a different color scheme is selected, a similar color code should be adopted for the entire network.

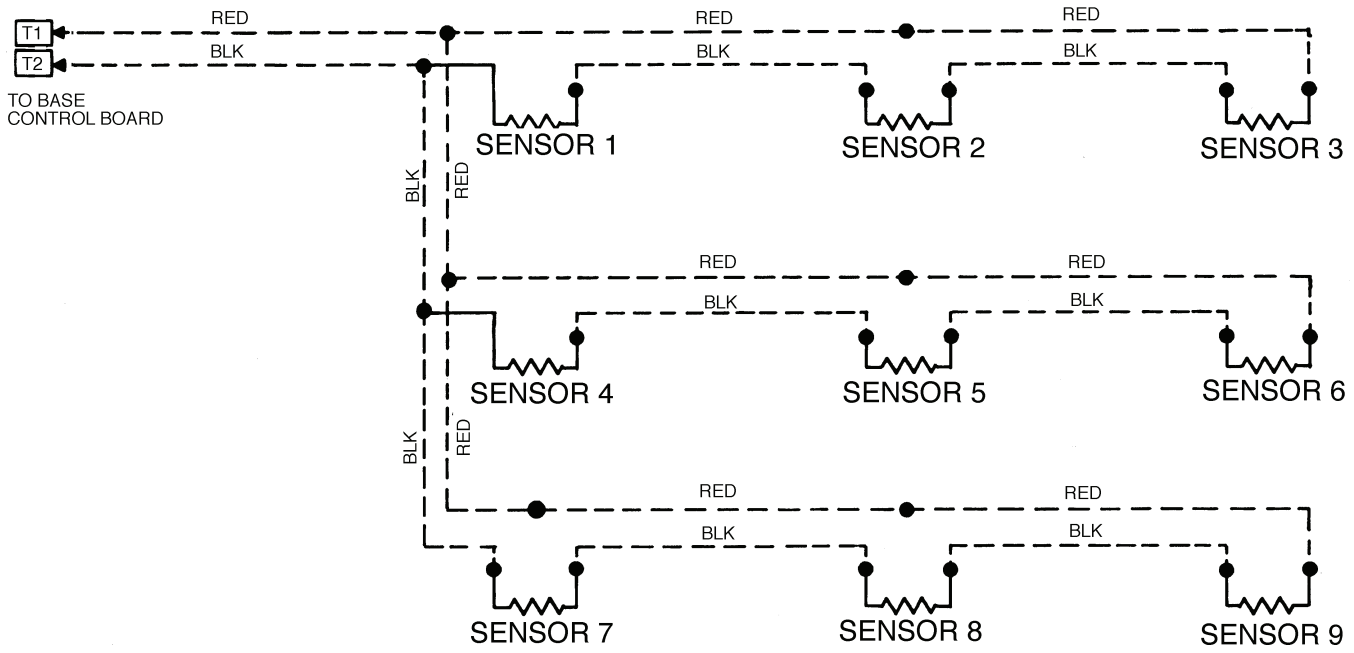
At each system element, the shields of the communication bus cables must be tied together. If the communication bus is entirely within one building, the resulting continuous shield must be connected to a ground **at one point only**. If the communication bus cable exits from one building and enters another, the shields must be connected to grounds at the lightning suppressor in each building where the cable enters or exits the building (one point per building only).

To connect the unit to the network:

1. Turn off power to the control box.
2. Cut the CCN wire and strip the ends of the red (+), white (ground), and black (-) conductors. (If a different network color scheme is used, substitute appropriate colors.)
3. Remove the 3-pin male plug from the base control board in the main control box, and connect the wires as follows:
   a. Insert and secure the red (+) wire to terminal 1 of the 3-pin plug.
   b. Insert and secure the white (ground) wire to terminal 2 of the 3-pin plug.
   c. Insert and secure the black (-) wire to terminal 3 of the 3-pin plug.



SPACE TEMPERATURE AVERAGING — 4 SENSOR APPLICATION



SPACE TEMPERATURE AVERAGING — 9 SENSOR APPLICATION

Fig. 32 — Space Temperature Averaging Wiring

Step 8 — Make Outdoor-Air Inlet Adjustments

ECONOMIZER

NOTE: If accessory power exhaust or barometric relief packages are being added to the unit, install power exhaust or barometric relief before installing economizer hoods.

Economizer Hood Assembly — The economizer hood is shipped in a package secured to the outside of the unit, behind the indoor access panel. The hood assemblies must be field-assembled. The 50AW,AY and 50EW,EY units are side supply and side return. The return duct limits access to economizer filters from below. Filter tracks (mounting angle without tabs) must be installed correctly to allow access to economizer filters from each side.

The 50AJ,AK,AW,AY024-050 and 50EJ,EK,EW,EY024-048 units have two hoods on every unit. Each hood has two lower filter tracks, one slotted side and one side without slots. Construct the assembly so that the slotted side is adjacent to the other hood when mounted on the unit.

The 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 units have 3 hoods on every unit. Each hood has two lower filter tracks, one slotted side and one side without slots. Construct the two outer hood assemblies so that the slotted side is adjacent to the center hood when mounted on the unit.

NOTE: Before assembly of the economizer hood, check along the outer edges of the economizer assembly for any seal strip protruding past the flanges. Trim the excess seal strip so that it is flush with the economizer assembly flanges.

Perform the following procedure to assemble the economizer hood.

1. Apply black seal strip (provided in package) to outside top-edge of hood sides. Wrap seal strip over edge to cover top flange (6 hood sides). Make sure seal strip covers screw holes. Allow strip to overhang $^1/_8$-in. (3 mm) past the end opposite the mounting flange. See Fig. 33.
2. Assemble hood sides, top, and cross member with gasketed screws provided. See Fig. 34.
3. Attach 15 green speed clips (provided) to hood top.
4. Apply black seal strip (provided) to mounting flanges of hood sides being sure to cover mounting holes. See Fig. 35.

NOTE: Each hood assembly has one hood side with slots and one hood side without slots. On the 50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048 units, the two outer hood assemblies must have the hood sides with the slots located adjacent to each other when mounted on the unit. On the 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 units, the two outer hood assemblies must have the hood sides with the slots located adjacent to the center hood. The center hood assembly should have hood side with slots located on the left side.

5. Apply black seal strip (provided) to hood top mounting flange. Seal strip of hood top mounting flange must press tightly against seal strip of hood side mounting flanges. See Fig. 36.
6. Add gray foam strip (provided in package) to cross members on bottom tray. See Fig. 37.
7. Place gray foam strip (provided) on inside of slotted hood side between filter and cross member opposite the mounting end. See Fig. 38.
8. Attach gray foam strip (provided) to block-off baffle on outer face of flange. See Fig. 39.
9. Remove the screws on each end and along top of damper assembly of unit. Remove top 4 screws on each side of filter panel under damper assembly. Set hood assembly in place and attach to unit using these screws.
10. Attach the outside-air thermostat (OAT) that is supplied from the factory or accessory field-supplied enthalpy sensor on to the hood side furthest from the control box. The OAT or enthalpy sensor is installed on the inside upper right-hand corner using the mounting bracket and mounting holes provided. Attach wiring to unit controls. If accessory enthalpy sensor is used, quick connects must be attached to enthalpy sensor wires.
11. Remove screws along bottom of damper assembly. Locate and mount blockoff baffle using these screws.
12. Assemble 2 filter tracks side-by-side with the assembled ends together.
13. Attach mounting angle (without tabs) to the assembled end of the filter track. See Fig. 40.
14. Attach 9 green speed clips (provided) to hood side panels without slots. Engagement section of clip faces up and towards the outside of the hood side panels.
15. Attach remaining mounting angle (with tabs) to other end of the filter track with no. 10 screws provided. See Fig. 41.
16. Place filter track assembly in bottom of hood by placing tabbed end into slotted side (with tab on bottom) and attaching opposite end to hood with speed clips and gasketed screws provided. Tabs can be hand bent after they have been inserted into the side.

    NOTE: The filter track assembly end with screws should face away from the other hood when mounted on the unit. Be sure the filters are installed with the airflow in the correct direction.

    NOTE: Tabs from both filter tracks will be in the same space. After one filter track has been inserted into the hood, bend the tabs so they will not interfere with installation of the second/center hood.
17. Attach black seal strip (provided) to filter cover. Seal strip should be applied centered over the holes of the one flange making sure to fully cover holes and centered over the other large flange. See Fig. 42.
18. Slide two 20 x 25-in. (508 x 635 mm) filters into cross members of hood assembly. Attach filter cover over filters with screws and speed clips provided.

Minimum Damper Position (MDP) Setting — Setting of the outdoor air damper position is performed in conjunction with a shortened version of the field-run test. This is performed by first opening DIP (Dual In-Line Package) switch no. 4 then no. 6. See Fig. 25 and Direct Digital Controls DIP Switch Configuration section on page 72.

The outdoor-air damper closes. The control allows 90 seconds for the damper to close in case it is in the full open position. Next, the indoor-fan contactor will energize. The outdoor-air damper will remain at 0% for 30 seconds. It will then move to the 10% damper motor travel position for another 30 seconds. This will be repeated at every 10% increment for 30 seconds until the damper reaches 100% open. Close DIP switch no. 4 during the 30 seconds immediately after the desired outdoor air minimum damper position. The 30-second time period is to allow time where DIP switch no. 4 can be closed. The default value of the minimum outdoor air damper position is 20%. If the desired minimum position is 30%, allow the damper position to go to 10% for 30 seconds, then 20% for 30 seconds, and when it reaches 30% close DIP switch no. 4 during the 30-second period following the 30% position.

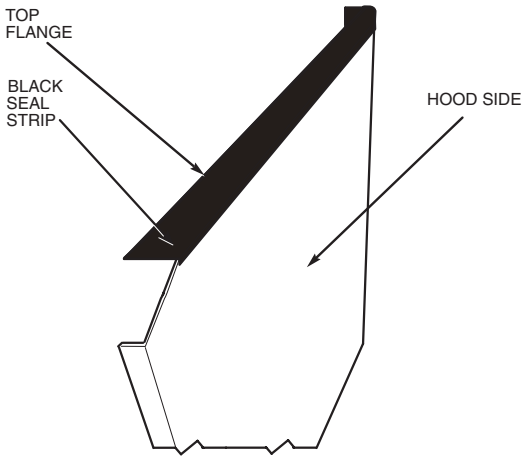
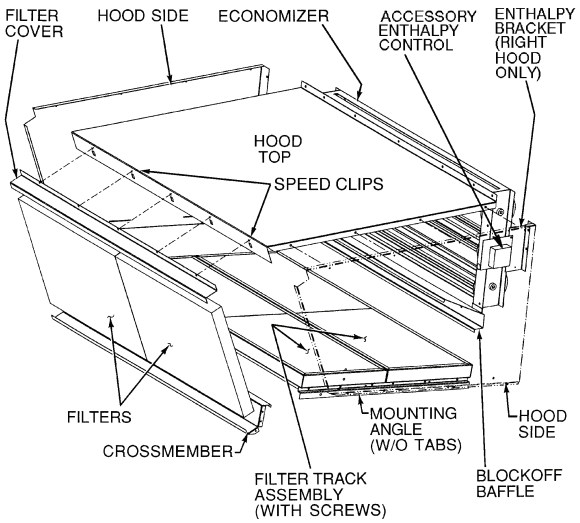


Fig. 33 — Adding Seal Strip to Top of Hood Sides



NOTE: Left side economizer hood has mounting angle without tabs and filter track assembled end on the opposite side.

Fig. 34 — Economizer Hood Assembly (Right-Side Economizer Hood Shown)

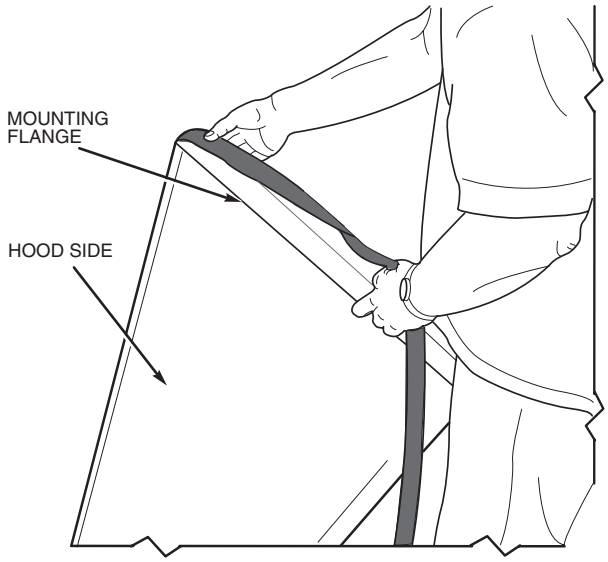


Fig. 35 — Adding Seal Strip to Mounting Flange of Hood Sides

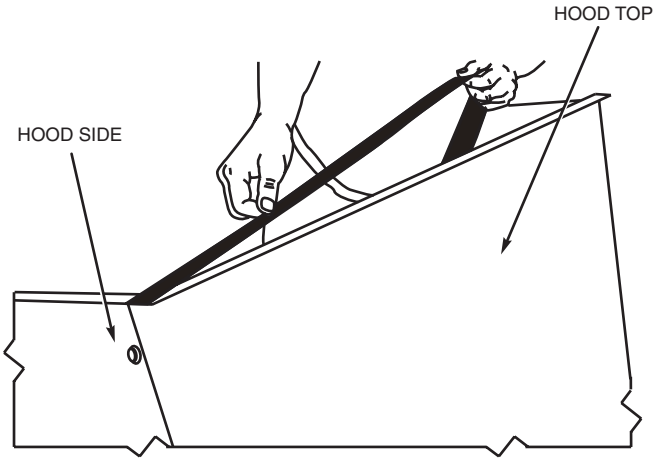


Fig. 36 — Adding Seal Strip to Hood Top Mounting Flange

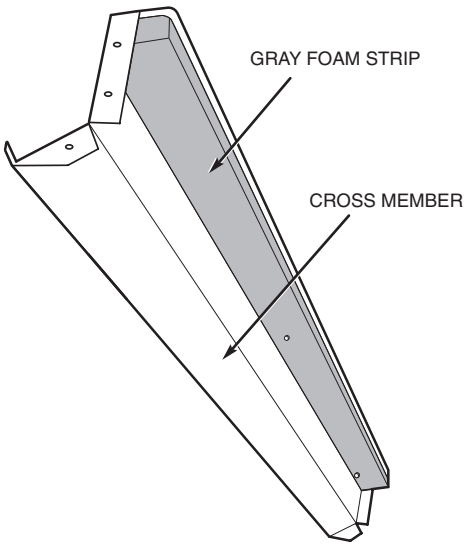


Fig. 37 — Adding Foam Strip to Cross Member

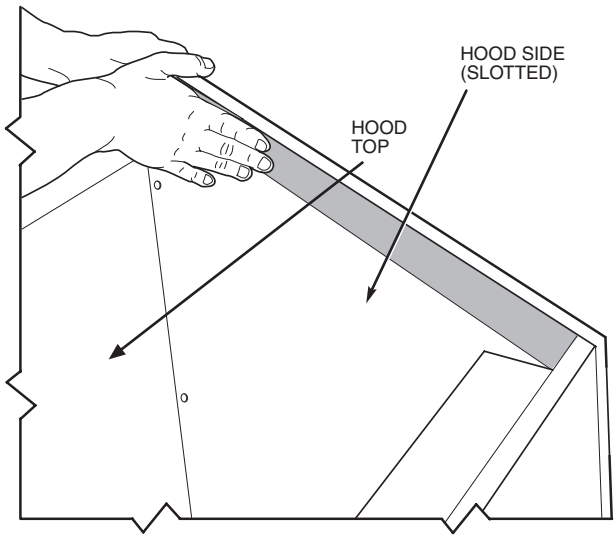


Fig. 38 — Adding Foam Strip to Hood Side

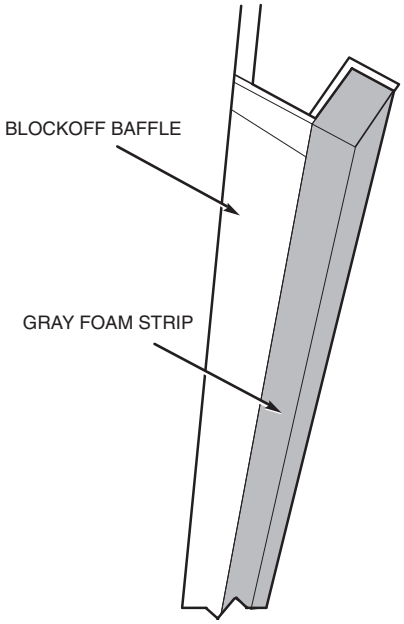


Fig. 39 — Adding Foam Strip to Blockoff Baffle

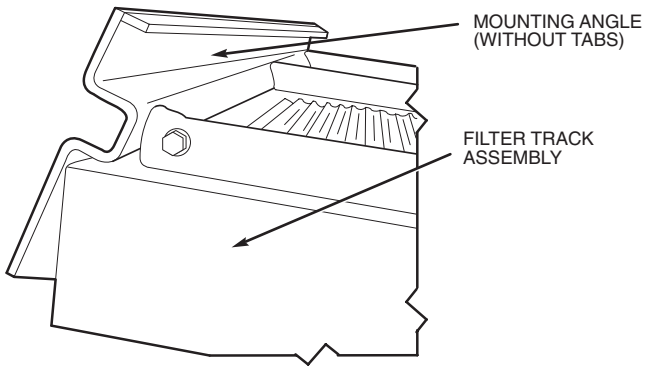


Fig. 40 — Mounting Angle (Without Tabs) Attached to Filter Track Assembly

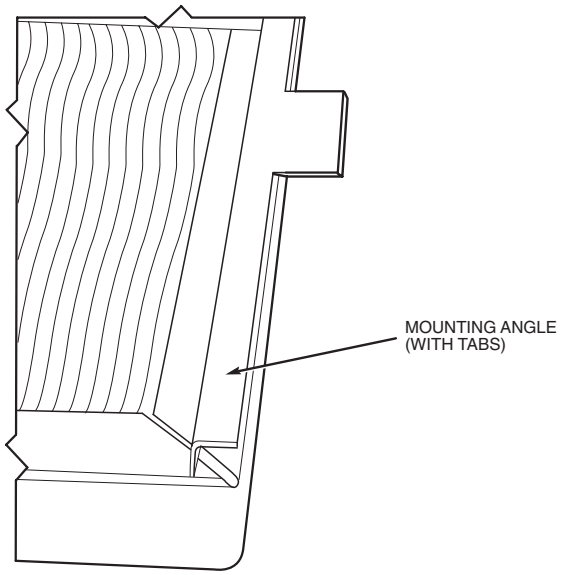


Fig. 41 — Mounting Angle (With Tabs) Attached to Filter Track Assembly

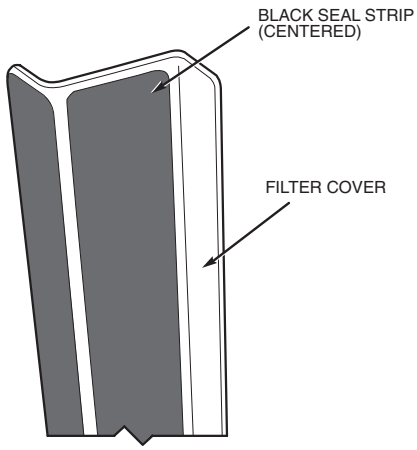


Fig. 42 — Attaching Seal Strip to Filter Cover

The minimum outdoor air damper position is now set. Close DIP switch no. 6.

ECONOMIZER SETTINGS

Accessory Enthalpy Control (Fig. 43) — The control (HH57AC077) is mounted in the economizer hood. See Fig. 34. The enthalpy setting adjustment is on the enthalpy control. For maximum benefit of outdoor air, set enthalpy control to A. See Fig. 44 and 45.

NOTE: The enthalpy control operates the economizer outdoor-air damper to provide free cooling on a signal from the cooling thermostat.

Enthalpy Control Installation — The outdoor air enthalpy control is installed on the inside panel of the outdoor air hood. The enthalpy control should be mounted when the outdoor air hoods are assembled. To install the control, perform the following procedure.

1. Turn off all power. Ensure disconnect is locked out.
2. Remove the economizer inlet filters from the bottom of the right hand economizer hood. See Fig. 34. See Fig. 46 for economizer details.
3. Mount the outdoor air enthalpy sensor inside the right economizer hood on the right side panel of the hood, adjacent to the outdoor-air thermistor.
4. Locate the red, violet, and brown wires near the outdoor air thermistor. Remove the splice from the red and violet wires. Remove the cap from the brown wire.
5. Install a 1/4-in. (6.35 mm) push on terminal (field-supplied) on the violet and brown wires.
6. Connect a 1/4-in. (6.35 mm) push on terminal (field-provided) to one end of a 18-gage, 6-in. (152.4 mm) jumper wire (field provided). Connect the other end to the red wire and attach a 1/4-in. (6.35 mm) push on connector (field-provided.)
7. Connect the red wire with the jumper to terminal TR1. Connect the jumper to terminal 2. Connect the brown wire to terminal TR. Connect the violet wire to terminal 3. All connections are on the enthalpy control.
8. Replace the economizer filters.
9. Return power to unit.

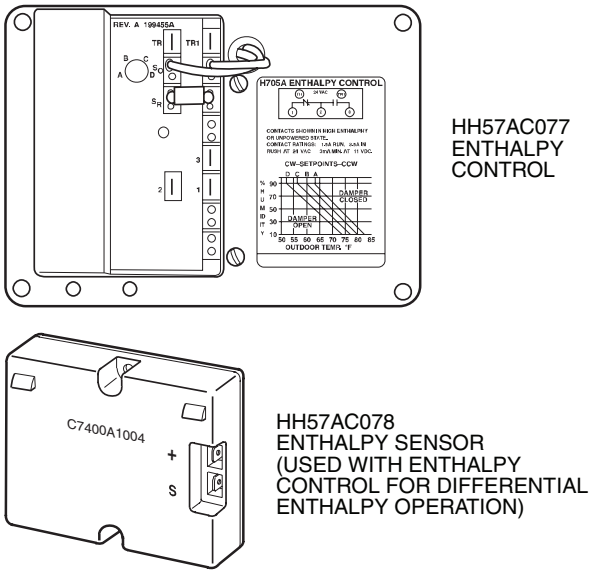
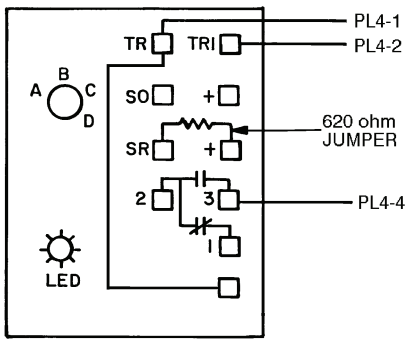


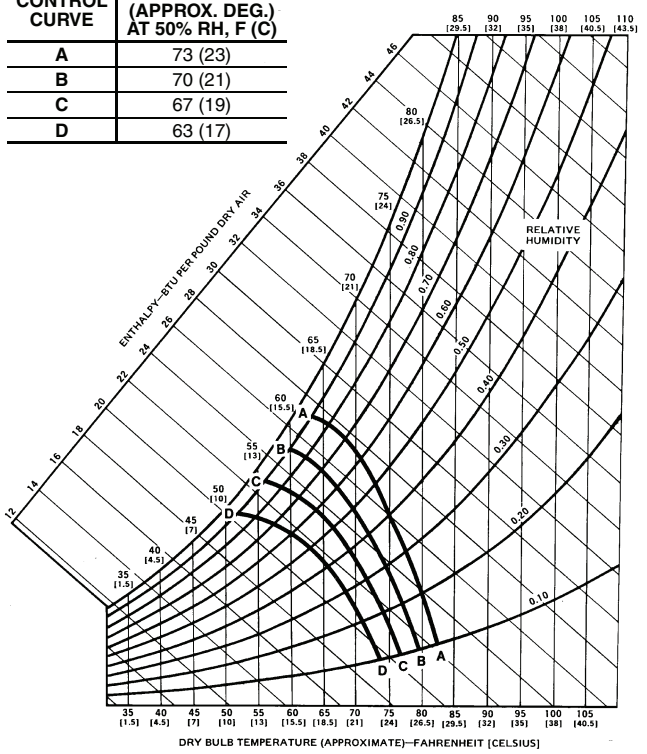
Fig. 43 — Differential Enthalpy Control and Sensor



NOTE: Switches shown in high enthalpy state. Terminals 2 and 3 close on enthalpy decrease.

Fig. 44 — Wire Connections for Solid-State Enthalpy Control (HH57AC077)

CONTROL CURVE	CONTROL POINT (APPROX. DEG.) AT 50% RH, F (C)
A	73 (23)
B	70 (21)
C	67 (19)
D	63 (17)



RH — Relative Humidity

Fig. 45 — Psychrometric Chart for Enthalpy Control

Accessory Differential Enthalpy Control (Fig. 43) — The control (HH57AC077), in conjunction with the accessory enthalpy sensor (HH57AC078), controls economizer operation according to the differential enthalpy. The control is mounted in the economizer hood. The sensor is mounted in the return duct (50AJ,AK and 50EJ,EK) or return-air plenum (50AW,AY and 50EW,EY).

Differential Enthalpy Sensor Installation — To install the control, perform the following procedure:

1. Turn off all power. Ensure disconnect is locked out.
2. Remove the economizer inlet filters from the bottom of the right hand economizer hood. See Fig. 34. See Fig. 46 for economizer details.
3. Remove the factory-installed, 620-ohm jumper between terminals SR and + on the enthalpy control located inside the outdoor air hood.
4. Connect the violet wire from the enthalpy sensor kit to the + terminal on the enthalpy control. Connect the blue wire from the enthalpy sensor kit to the SR terminal on the enthalpy control.
5. Turn the enthalpy control set point potentiometer clockwise past the "D" setting on the enthalpy control to configure the control to operate on differential enthalpy. See Fig. 44.
6. Remove the return-air enthalpy sensor from the accessory package. Using the screws provided, mount the sensor inside the return duct near the unit. Do not locate the control too far from the unit, or the wires will not reach from the sensor to the control. On 50AW,AY,EW,EY units, the enthalpy sensor can be installed in the return air section of the unit, under the return air dampers.
7. Route the wires from the enthalpy sensor to the return air enthalpy control through the holes on the inside of the hinged filter access panel. The holes are blocked by plug buttons which should be removed.
8. Use field-supplied wire ties to attach the violet wire to the + terminal and the blue wire to the SR terminal.
9. Replace economizer filters.
10. Return power to unit.

Disable Economizer — For applications where the economizer will not be used (areas of high humidity), the economizer should be disabled. To disable the economizer, perform the following:

1. Turn off power. Ensure disconnect is locked out.
2. Locate the OAT (outdoor-air thermostat) in the right hand outdoor air damper area.
3. Locate the splice connecting the violet wire coming from T24 on the base control board to the red wire coming from T29 on the base control board. Remove the wire nut and break the red to violet wire splice.
4. Cap off both wires. When the connection is broken the base control board is fooled into thinking that the enthalpy is not acceptable and economizer operation is disabled.
5. Restore power to unit.

NOTE: When the economizer is disabled the damper will function as a two-position damper.

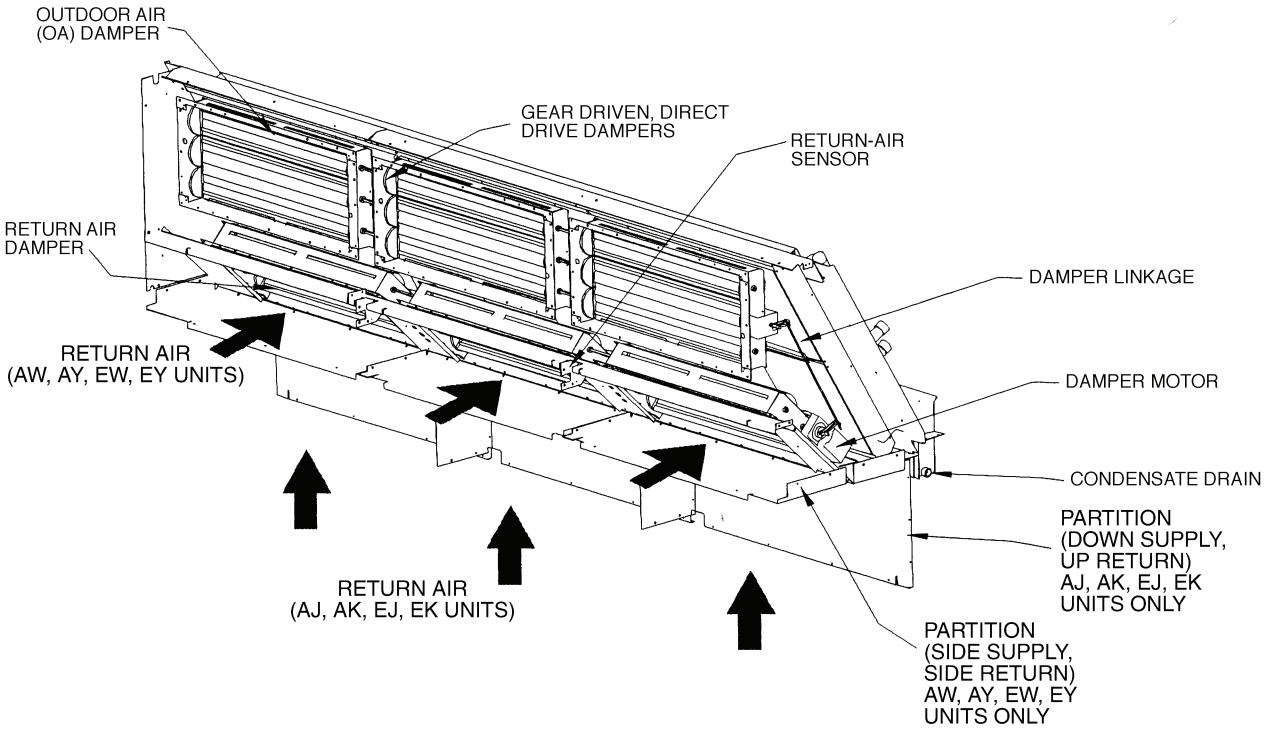
Step 9 — Position Power Exhaust/Barometric Relief Damper Hood — All electrical connections have been made and adjusted at the factory. The power exhaust blowers and barometric relief dampers are shipped assembled and tilted back into the unit for shipping. Brackets and extra screws are shipped in shrink wrap around the dampers. If ordered, each unit will have 4 (50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048) or 6 (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068) power exhaust blowers and motors or 4 (50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048) or 6 (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068) barometric relief dampers.

1. Remove 9 screws holding each damper assembly in place. See Fig. 47. Each damper assembly is secured with 3 screws on each side and 3 screws along the bottom. **Save screws.**

⚠ CAUTION

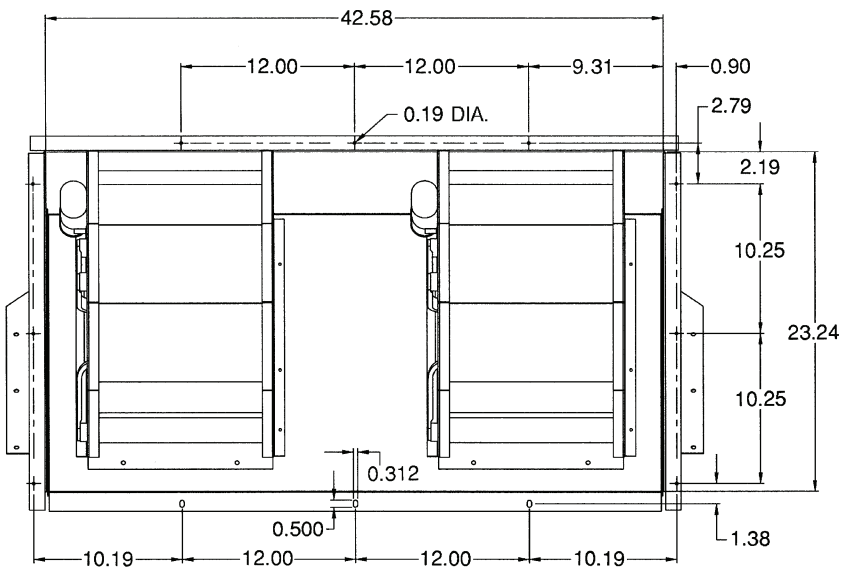
Be careful when tilting blower assembly. Hoods and blowers are heavy and can cause injury if dropped.

2. Pivot each damper assembly outward until edges of damper assembly rest against inside wall of unit.
3. Secure each damper assembly to unit with 6 screws across top (3 screws provided) and bottom (3 screws from Step 1) of damper.
4. With screws saved from Step 1, install brackets on each side of damper assembly.
5. Remove tape from damper blades.



NOTE: Partitions shown indicate both side supply (AW,AY,EW,EY) and vertical supply (AJ,AK,EJ,EK) units.

Fig. 46 — Economizer Details



NOTES:
1. Unless otherwise specified, all dimensions are to outside of part.
2. Dimensions are in inches.

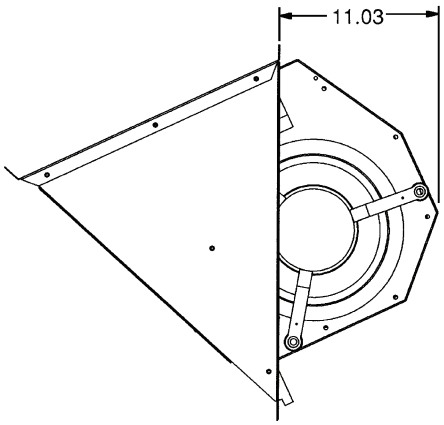
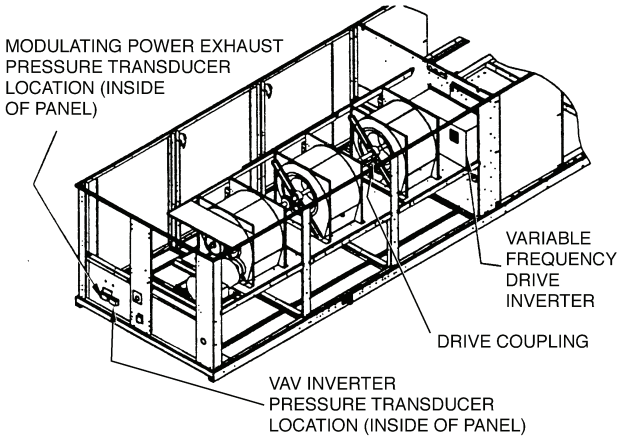


Fig. 47 — Barometric Relief Damper and Power Exhaust Mounting Details

VAV DUCT PRESSURE TRANSDUCER — The VAV duct pressure transducer (VAV inverter pressure transducer) is located behind the filter access door on the lower inner panel. See Fig. 48. A section of 1/4-in. (6.35 mm) plastic tubing must be run from the high-pressure tap on the differential pressure switch and connected to a tap in the supply-air duct. The tap is usually located 2/3 of the way out on the main supply duct. Remove plug button in panel to route tubing.

VAV BUILDING PRESSURE TRANSDUCER — The VAV building pressure transducer (modulating power exhaust pressure transducer) is located behind the filter access door on the inner panel. See Fig. 48. A section of 1/4-in. (6.35 mm) plastic tubing must be run from the high-pressure tap on the differential pressure switch to the conditioned space. The pressure tube must be terminated in the conditioned space where a constant pressure is required. This location is usually in an entrance lobby so that the building exterior doors will open and close properly. Remove plug button in panel to route tubing.

The low pressure tap is factory-routed to the atmosphere. For a positive-pressure building, route the high tap to the building air and low tap to the atmosphere. For a negative-pressure building, route the high tap to the atmosphere and the low to the building air.



LEGEND

VAV — Variable Air Volume

Fig. 48 — Pressure Transducer Locations (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 Units

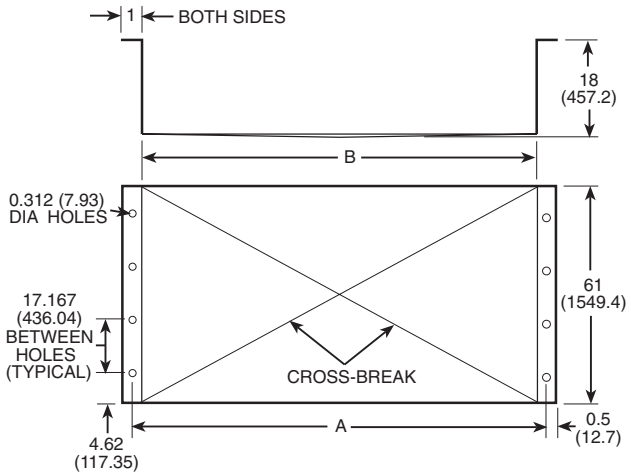
Step 10 — Install Accessories — After all the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory.

MOTORMASTER® III CONTROL INSTALLATION

Install Field-Fabricated Wind Baffles — Wind baffles must be field-fabricated for all units to ensure proper cooling cycle operation at low-ambient temperatures. See Fig. 49 for baffle details. Use 20-gage, galvanized sheet metal, or similar corrosion-resistant metal for baffles. Use field-supplied screws to attach baffles to unit. Screws should be 1/4-in. (6.35 mm) diameter and 5/8-in. (15.88 mm) long. Holes for wind baffles are pre-punched in the unit sheet metal.

⚠ CAUTION

To avoid damage to the refrigerant coils and electrical components, use recommended screw sizes only.



UNIT SIZE	A	B
50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-054	80.5 (2044.7)	79.5 (2019.3)
50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY058-068	120.5 (3060.7)	119.5 (3035.3)

NOTE: Dimensions are in inches. Dimensions in ( ) are in millimeters.

Material: 20 gage galvanized steel or other non-corrosive material.

Fig. 49 — Motormaster III Baffle Details

The wind baffles attach to flanges formed on the outer sheet metal of the unit corner post. The other end of the baffle is attached to the center panel between the condenser coil and the indoor section. Two baffles are required.

Install Motormaster III Controls — Only one Motormaster III control is required per unit.

Motor — One outdoor-fan motor (OFM) must be changed out in the field to accommodate the Motormaster III accessory. The replacement part number is HD52AK652.

For 50AJ,AK,AW,AY020-030 and 50EJ,EK,EW,EY024-034 units, the Motormaster controlled OFM is no. 2 OFM and is located at the left side of the unit looking from the compressor end. The other OFM no. 1 is controlled shut off at 55 F (13 C) and on at 65 F (18 C) outdoor-air temperature and does NOT need to be changed out.

For 50AJ,AK,AW,AY034-050 and 50EJ,EK,EW,EY038-054 units, the Motormaster controlled OFM is no. 1 OFM and is located at the left side of the unit looking from the compressor end and the second motor back. The no. 3 and 4 OFM are controlled to shut off at 55 F (13 C) and on at 65 F (18 C) outdoor-air temperature and do NOT need to be changed out. The no. 2 OFM is intended to run at all ambient temperatures.

For 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY058-068 units, the Motormaster controlled OFM is no. 3 OFM and is located at the left side of the unit looking from the compressor end and the second motor back. The no. 4, 5, and 6 OFM are controlled to shut off at 55 F (13 C) and on at 65 F (18 C) outdoor-air temperature and do NOT need to be changed out. The no. 1 and 2 OFM are intended to run at all ambient temperatures.

Sensor — Install the sensor for thermistor input control in the location shown in Fig. 50A-50E. Connect sensor leads to the violet and gray control signal leads on the Motormaster® III control.

Signal Selection Switch — Remove the cover of the Motormaster III control. Set the switch to accept the thermistor sensor input signal. Set the frequency to match the unit power supply (60 Hz).

Motormaster III Control — The recommended mounting location is in the indoor fan section, mounted on the panel that separates the indoor and outdoor sections. On VAV units, this location is next to the variable frequency drive (VFD).

Do not route the Motormaster III control wiring next to the VFD on VAV units. Use a separate connector through the partition when wiring to the OFM.

Electrical Connections

⚠ WARNING

To avoid possibility of electrical shock and personal injury, turn off all power to unit before making electrical connections.

When replacing the OFM, reconnect the black, yellow, and blue wires from the outdoor fan contactor to the black, yellow, and blue wires of the Motormaster III control. Run new wires from the red, orange, and brown wires to the leads of the new OFM. Connect the green wire from the control to ground.

NOTE: On all 575-v units, 2 transformers (part no. HT01AH851) must be used for each Motormaster III control to lower the supply voltage to the control to 460 v. Transformers can be mounted anywhere outside the control box, but are wired in a special auto-transformer configuration. Refer to the Controls Operation and Troubleshooting literature for more information.

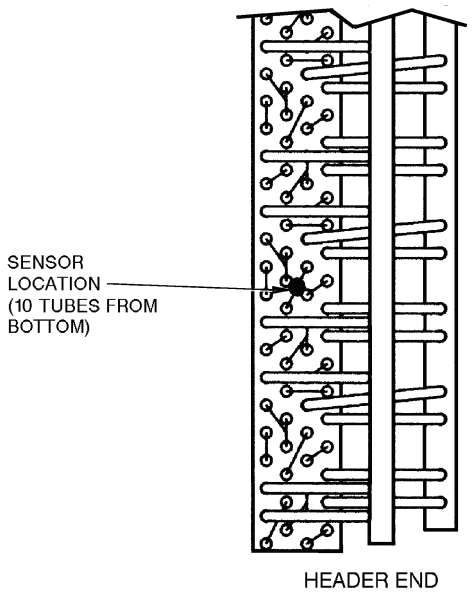


Fig. 50A — Motormaster III Sensor Location (50AJ,AK,AW,AY020-030 and 50EJ,EK,EW,EY024-034)

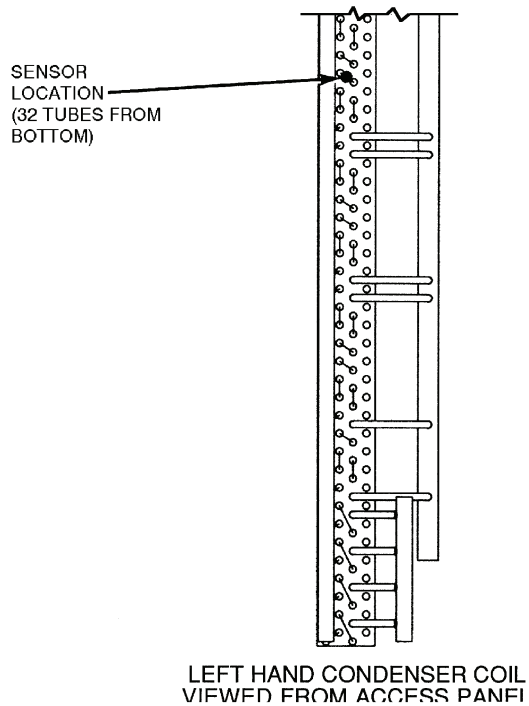


Fig. 50B — Motormaster III Sensor Location (50AJ,AK,AW,AY035 and 50EJ,EK,EW,EY038-044)

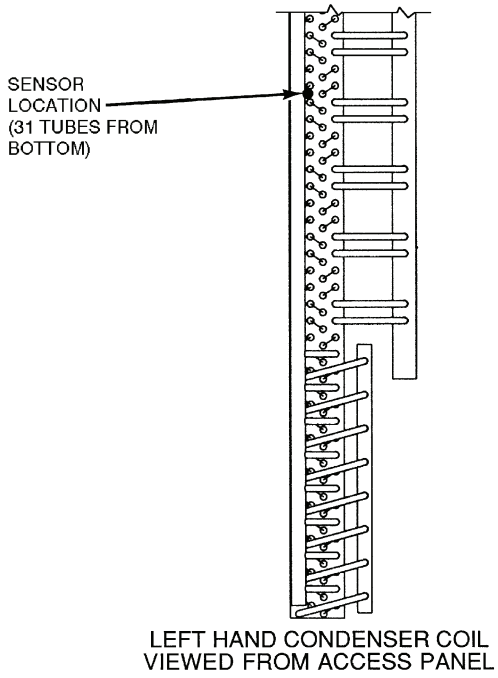


Fig. 50C — Motormaster III Sensor Location (50AJ,AK,AW,AY040, 050 and 50EJ,EK,EW,EY048)

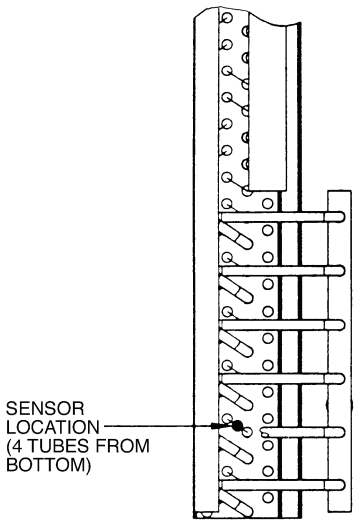


Fig. 50D — Motormaster® III Sensor Location (50EJ,EK,EW,EY054-064)

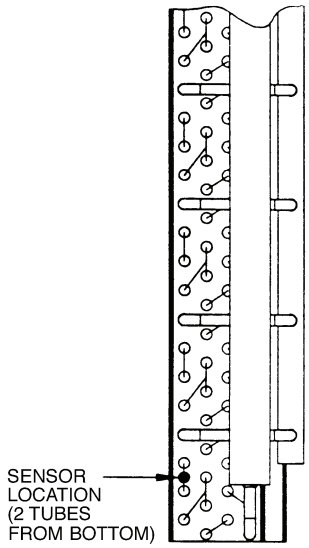


Fig. 50E — Motormaster III Sensor Location (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY068)

Step 11 — Field Modifications

BOTTOM RETURN UNITS (50AJ,AK,EJ,EK) FIELD-MODIFIED FOR SIDE RETURN — 50AJ,AK,EJ,EK units with bottom return air connections may be field-modified to accommodate side return air connections.

IMPORTANT: The following section is a guideline and not a comprehensive procedure to field modify the units. The installing contractor must provide some design initiative. Field-conversion is complex and is not recommended. Units with electric heat must not be converted because of potential heating mode operating problems.

Conversion to horizontal return requires that the bottom return openings of the unit must be sealed with airtight panels capable of supporting the weight of a person. The return ductwork connection locations on the side of the unit are higher than normal (31-in. high). Unit-mounted power exhaust or barometric relief cannot be used because of return air ductwork will cover the power exhaust or barometric relief installation locations. Power exhaust or barometric relief may be installed in the return air ductwork.

To convert the unit, perform the following:

1. Seal the bottom return openings of the unit with airtight panels capable of supporting the weight of a person.
2. Remove the panels located below the economizer outdoor air dampers. These openings will be used for the return air ductwork. There are 2 panels on size 024-048 and 020-050 units. There are 3 panels on size 054-068 and 060 units. These openings are normally used for power exhaust or barometric relief.
3. Run the return air ductwork up to the openings. One single duct is recommended to connect to the unit over the return air openings. See Fig. 51. The return duct must incorporate a minimum $^3/_4$-in. flange for connection to the unit cabinet. The unit does not have duct flanges for this conversion.

SIDE SUPPLY AND RETURN UNITS (50AW,AY,EW,EY) WITH FIELD-INSTALLED POWER EXHAUST IN RETURN DUCT — Space must be available in the return duct to mount the power exhaust fan (gravity relief) modules. Dimensions and suggested locations are shown in Fig. 52. These instructions are a guideline and not a comprehensive procedure. The design contractor must provide some design initiative.

The wiring harness that is provided with the power exhaust accessory is not long enough for the fan modules to be mounted in the return air duct. Field-supplied wiring must be spliced into the harness. Use a junction box at each splice. The wiring may be run in the return duct as shown in Fig. 52, or externally in conduit. A service access panel will be needed near each power exhaust fan.

ELECTRIC UNLOADERS (Constant Volume Units Only) — The rooftop units with version 4.0 control software and later are capable of controlling electronic unloaders when in the constant volume (CV) operating mode. The unloaders may be installed in the field and wired to the control box as shown in Fig. 53.

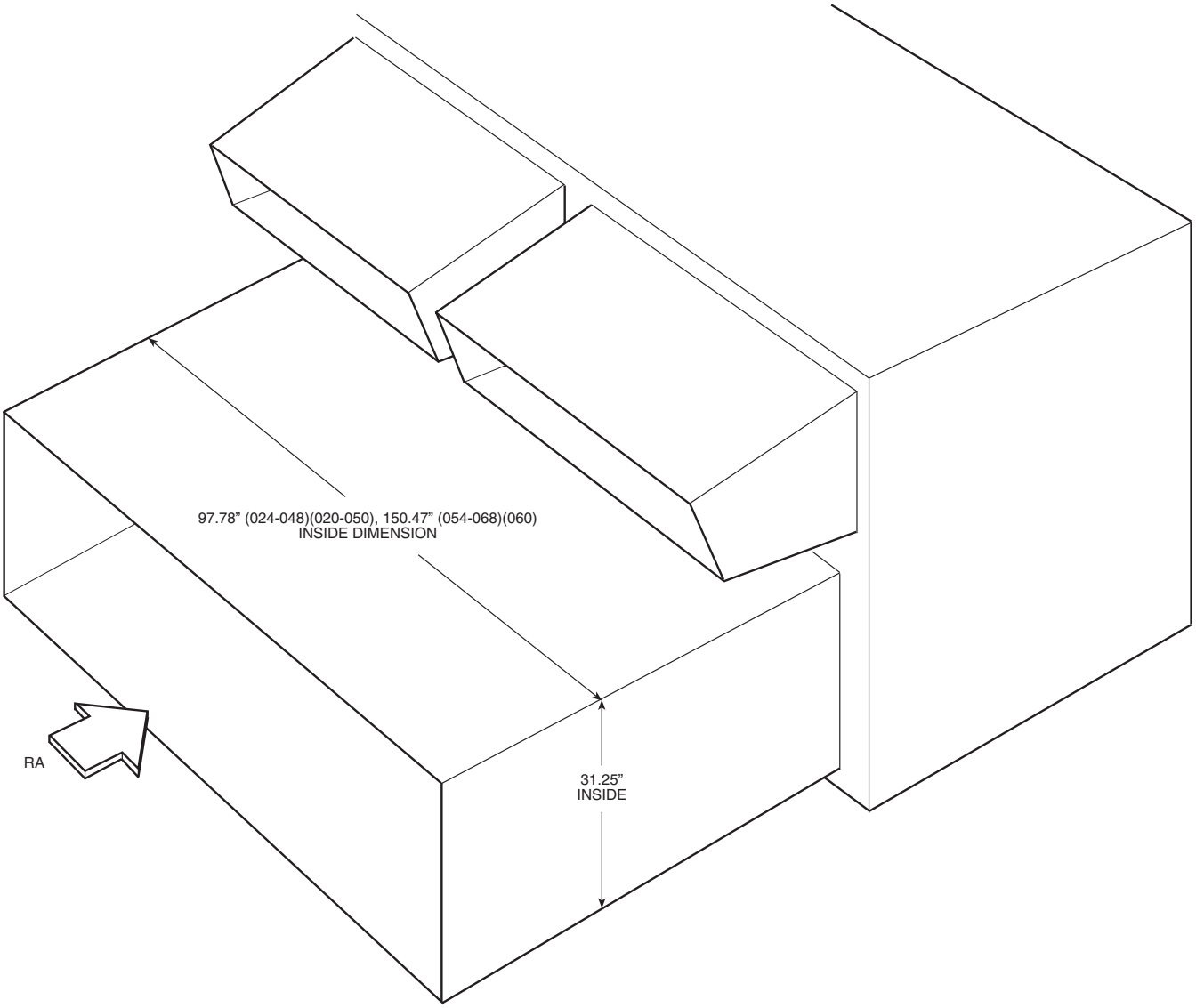


Fig. 51 — Side Return Air Conversion

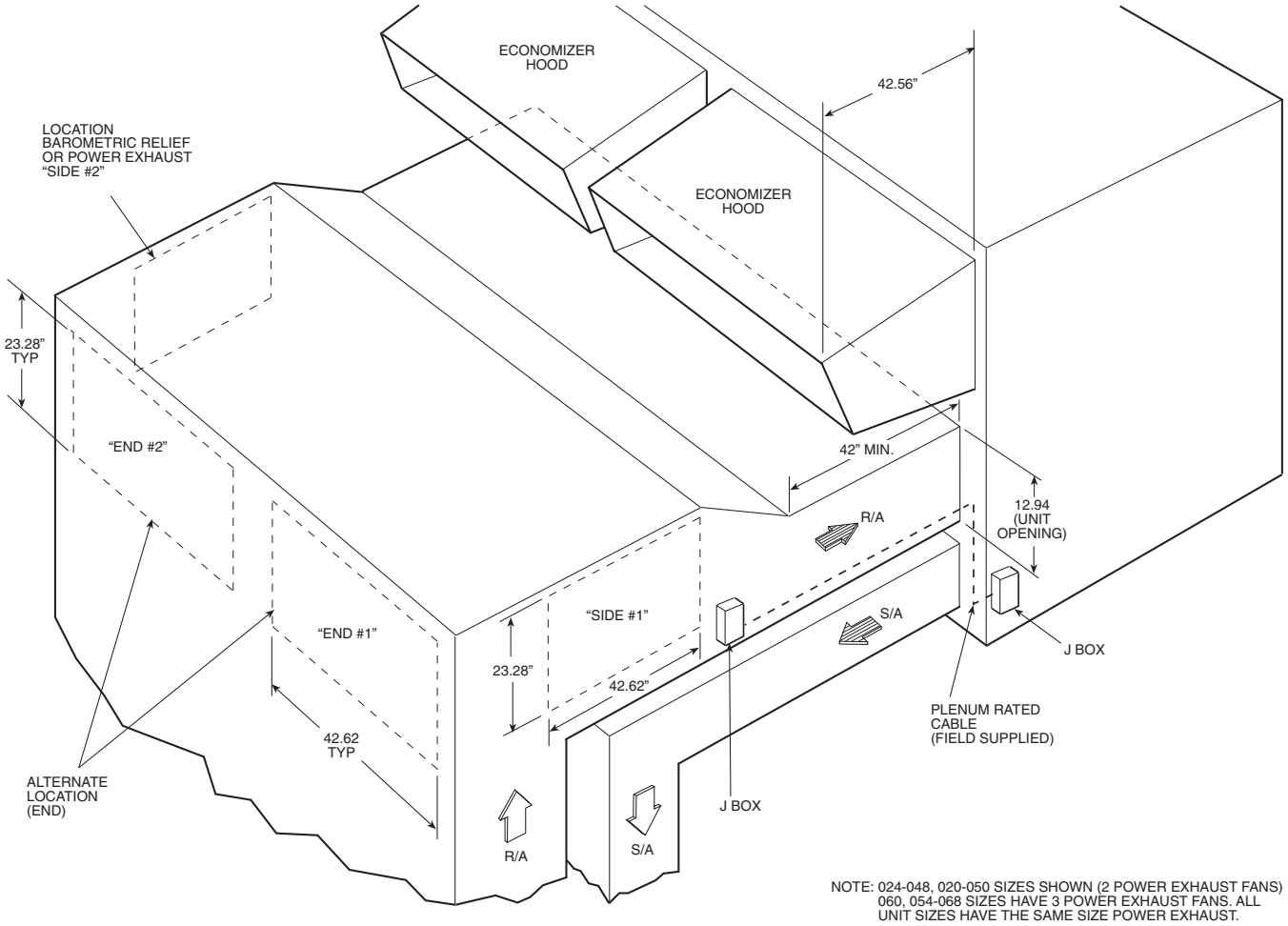


Fig. 52 — Power Exhaust Relocated to Side Return Duct

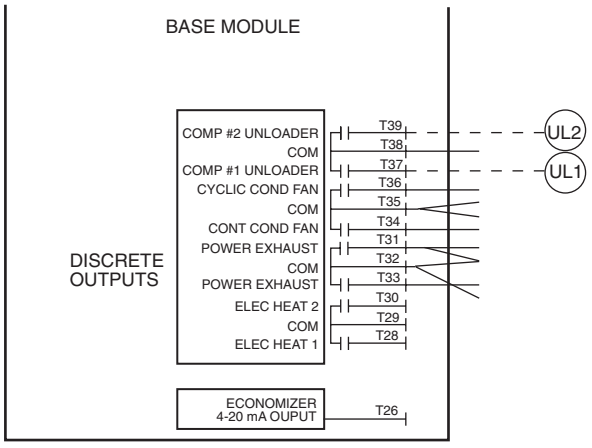


Fig. 53 — Wiring Field-Supplied Unloaders for Constant Volume Units

START-UP

Use the following information and Start-Up Checklist on pages CL-1 and CL-2 to check out unit PRIOR to start-up.

Unit Preparation — Check that unit has been installed in accordance with these installation instructions and applicable codes.

Compressor Mounting — Loosen the compressor hold-down bolts until sidewise movement of the washer under each holddown bolt head can be obtained. Do not loosen completely as bolts are self-locking and will maintain adjustment.

Service Valves — Ensure that the suction, discharge, and liquid line service valves are open. Damage to the compressor could result if they are left closed.

Internal Wiring — Check all electrical connections in unit control boxes; tighten as required.

Refrigerant Service Ports — Each refrigerant system has one suction port located in the top of the compressor motor casing. All units also have one service port on the liquid line valve and one on the compressor discharge valve. Be sure that caps on the ports are tight.

Variable Frequency Drive (VFD) — The VFD is factory set. These settings include factory-installed jumpers and software configurations. The only field configured set point is duct static pressure. A VFD Operational Manual is shipped with each VAV unit. This manual should be used if the drive needs to be customized for a particular application.

NOTE: The VFD will always provide the proper phase sequence to the indoor-fan motor. The indoor-fan motor operates in proper rotation regardless of the phase sequence to the unit. If, upon start-up, the outdoor fans operate backwards but the indoor fans operate in the correct direction, reverse any two leads to the main terminal block. All fans will then operate in the correct direction.

A factory-supplied 2-wire duct pressure transducer is supplied and wired complete with cable ground to reduce electrical noise. A $^1/_4$-in. air pressure tube must be routed to a location in the supply air ductwork where it can sense supply air duct pressure. The recommended location is about $^2/_3$ of the way out on the supply ductwork, so that a steady pressure will be provided for the transducer.

To set the duct static pressure, perform the following steps. The factory setting is zero. The duct transducer has a range from 0 to 5 in. wg (0.000 to 1.245 kPa). The transducer output is 4 to 20 mA, therefore, 0 to 5 in. wg (0.000 to 1.245 kPa) is proportional to the 4 to 20 mA and must be expressed to the VFD in terms of percentage of the frequency range. To do this, refer to Table 8. The set point value is a percentage of the maximum output frequency. Locate the duct static pressure closest to that desired and use the corresponding set point value. If necessary, interpolation between duct static pressures is permissible.

TOSHIBA TOSVERT130-E3 VFD — The VFD must be powered up, however, since it is located near the indoor fan, operation of the fan is not desirable. To disable the fan and set the duct static pressure, perform the following procedure:

1. Open the Indoor Fan Circuit Breaker (IFCB). This will shut off power to the VFD.
2. Wait for the VFD display to go blank and remove VFD cover without touching any interior components. Make sure that the charge indicator lamp is out, indicating that the VFD is discharged. The lamp is located on the upper right hand corner of the terminal block. It may take several minutes for the VFD to fully discharge.

⚠ WARNING

A high voltage potential can exist with the indoor fan circuit breaker open. The charge LED, located in the top right-hand corner of the Toshiba TOSVERT130-E3 VFD control board, will indicate charged capacitors. DO NOT TOUCH internal high voltage parts if LED is lit.

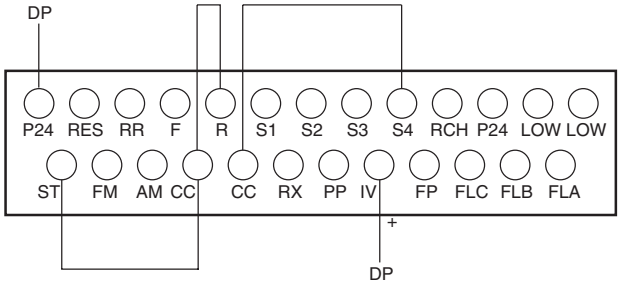
3. Remove jumper between ST and CC on the terminal block and replace the VFD cover. This will disable the running of the VFD. Refer to Fig. 54.
4. Close the IFCB and energize the Indoor Fan Contactor (IFC). The VFD is now powered but the fan will not operate.
5. On the front of the VFD is a keypad, which is used to change the VFD set point. At this point the drive should be disabled and the display read "OFF". If the current output frequency is displayed then verify that the ST and CC jumpers have been removed.
6. Press either the "DOWN ARROW" or "UP ARROW" key once, this will display the current frequency set point.
7. Press either the "DOWN ARROW" or "UP ARROW" key to change set point to the appropriate duct static set point desired. This number may be adjusted based on the amount of static pressure (in. wg) required. Refer to Table 8 to identify the VFD Set Point.
8. Press "READ/WRITE" key, to enter the new value. The desired set point value will alternately flash to indicate that the new value has been stored.

IMPORTANT: The Carrier factory default values for the VFD may be different than the default values of the manufacturer. Refer to the Carrier literature when checking default values. The following default values have been changed from the manufacturer settings to closely match the VFD operation with a Carrier VAV unit. Refer to Tables 9 and 10.

9. Fire-speed override mode is available by contact closure between terminals S1 and CC.
10. If the VFD is to be controlled by an external control system, other than the factory-supplied duct static pressure transducer, follow these steps:
    a. Install a jumper between S2 and CC. This jumper will disable the PID (Proportional Integral Derivative) control loop in the VFD. The VFD is set to follow an external speed reference signal from the control system.
    b. Connect the field-supplied speed reference (4-20 mA) signal across terminals IV and P24.
11. Once all the changes have been made, open the IFCB.
12. Wait for the VFD display to go blank and remove VFD cover without touching any interior components. Make sure that the charge indicator lamp is out. If still lit, wait until lamp goes completely out. This may take several minutes.
13. Replace jumper across terminals ST and CC.
14. Replace VFD cover.
15. Close the IFCB. The VFD is now powered and the fan will operate.

Table 8 — Toshiba TOSVERT VFD Set Point (Frequency Command) for Supply Duct Pressure

Pressure		Control Signal (mA)	VFD Set Point (Hz)
in. wg	kPa		
0.0	0.000	4.0	0
0.25	0.062	4.8	3
0.50	0.124	5.6	6
0.75	0.187	6.4	9
1.00	0.249	7.2	12
1.25	0.311	8.0	15
1.50	0.373	8.8	18
1.75	0.435	9.6	21
2.00	0.498	10.4	24
2.25	0.560	11.2	27
2.50	0.622	12.0	30
2.75	0.684	12.8	33
3.00	0.747	13.6	36
3.25	0.809	14.4	39
3.50	0.871	15.2	42



NOTES:
1. Drive enable (ST to CC made).
2. No emergency off command (S4 to CC made).
3. Direction command (F or R to CC made).
4. Frequency reference (4-20 mA signal at IV terminal).

Fig. 54 — Toshiba TOSVERT 130-E3 VFD Factory-Installed Jumpers

TOSHIBA TOSVERT VF-S9 VFD — The VFD must be powered up, however, since it is located near the indoor fan, operation of the fan is not desirable. To disable the fan and set the duct static pressure, perform the following procedure:

1. Open the Indoor Fan Circuit Breaker (IFCB). This will shut off power to the VFD.
2. Wait for the VFD display to go blank and the charge lamplight to go out. Remove the VFD cover without touching any interior components. It may take several minutes for the VFD to fully discharge.

⚠ WARNING

A high voltage potential can exist with the indoor fan circuit breaker open. The charge lamp LED, located on the upper left corner of the Toshiba TOSVERT VF-S9 VFD front cover, will indicate charged capacitors. DO NOT TOUCH internal high voltage parts if LED is lit.

Table 9 — Carrier VFD Default Program Parameter Values (Toshiba TOSVERT 130-E3)

PARAMETER GROUP	PARAMETER	DEFAULT VALUE
SetP (Setup)	ACC1	60.0 Sec
	DEC1	60.0 Sec
	UL	60.0 Hz
	LL	10.0 Hz*
	LuIn	1
	P3	20%
	F-P3	0.0 Hz
	P4	100%
	F-P4	60 Hz
	tHr1	See Table 10
	StC1	0
	StL1	110%
	OLN	1
	tYP	5*
Gr.F (Fundamental)	FH	60 Hz
	Pt	2
Gr.Fb (Feedback)	FbP1	1*
	FbIn	2
	GP	.30
	GI	2 sec
	GA	0
	GFS	80
	P1LL	10
	PuL	1
	PuUl	10
	PuLL	10
Gr.SF (Frequency Settings)	Fsor	60 Hz
Gr.Pn (Panel Control)	Fr	0*
Gr.St (Terminal Selection)	1t	1
	1t0	0
	1t1	56
	1t2	13
	1t3	3
	1t4	10
Gr.Pr (Protection)	UuC	1*
	UuCt	2
	ArSt	3
Gr.Ut (Utility)	Cnod	1*
	Fnod	2*
	bLPn	1*

* These settings differ from the Toshiba defaults and are required for Carrier applications.

Table 10 — Motor Electronic Thermal Protection (tHr) for Toshiba TOSVERT 130-E3 VFD

MOTOR		STANDARD EFFICIENCY					HIGH EFFICIENCY		
Hp	kW	IFM Letter*	230 V Setting	380 V Setting	460 V Setting	575 V Setting	IFM Letter*	230 V Setting	460 V Setting
5	3.73	A	66	100	72	89	L	72	72
7.5	5.60	B	100	100	80	76	M	100	80
10	7.46	C	96	94	97	91	N	96	100
15	11.19	D	78	94	100	100	P	78	100
20	14.92	E	87	94	100	95	Q	82	100
25	18.65	F	86	84	94	100	R	86	91
30	22.38	G	99	—	92	100	S	86	80
40	29.84	H	89	—	85	85	T	89	85

*IFM Letter refers to the 15th digit (Motor Option) of the unit model number.

3. Remove jumper between R and CC on the terminal block and replace the VFD cover. This will disable the running of the VFD. Refer to Fig. 55.
4. Close the IFCB and energize the Indoor Fan Contactor (IFC). The VFD is now powered but the fan will not operate.
5. On the front of the VFD is a keypad, which is used to change the VFD set point. At this point the drive should be disabled and the display read "OFF". If the current output frequency is displayed then verify that the R and CC jumpers have been removed.
6. Press either the "DOWN ARROW" or "UP ARROW" key once, this will display the current frequency set point.
7. Press either the "DOWN ARROW" or "UP ARROW" key to change set point to the appropriate duct static set point desired. This number may be adjusted based on the amount of static pressure (in. wg) required. Refer to Table 8 to identify the VFD Set Point.
8. Press "ENT" key, to enter the new value. The desired set point value will alternately flash to indicate that the new value has been stored.

IMPORTANT: The Carrier factory default values for the VFD may be different than the default values of the manufacturer. Refer to the Carrier literature when checking default values. The following default values have been changed from the manufacturer settings to closely match the VFD operation with a Carrier VAV unit. Refer to Tables 11 and 12.

9. Fire-speed override mode is available by contact closure between terminals S1 and CC.
10. If the VFD is to be controlled by an external control system, other than the factory-supplied duct static pressure transducer, follow these steps:
    a. Install a jumper between S2 and CC. This jumper will disable the PID (Proportional Integral Derivative) control loop in the VFD. The VFD is set to follow an external speed reference signal from the control system.
    b. Connect the field-supplied speed reference (4-20 mA) signal across terminals II and P24. See Fig. 55.
11. Once all the changes have been made, open the IFCB.
12. Wait for the VFD display to go blank and the charge lamplight to go out. Remove the VFD cover without touching any interior components. It may take several minutes for the VFD to fully discharge.
13. Replace jumper across terminals R and CC.
14. Replace VFD cover.
15. Close the IFCB. The VFD is now powered and the fan will operate.

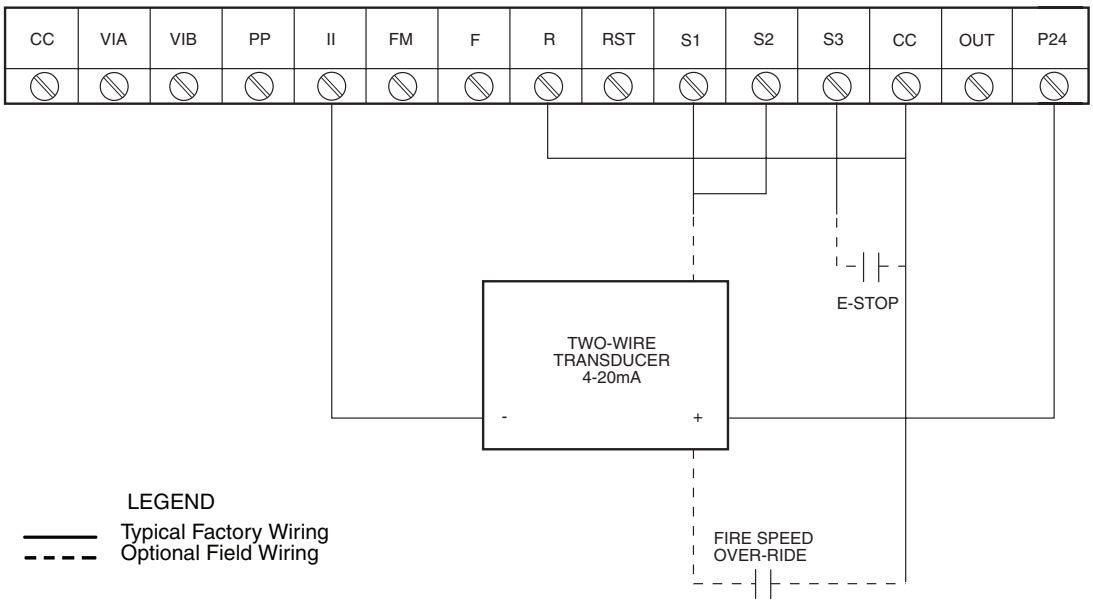


Fig. 55 — Toshiba TOSVERT VF-S9 VFD Factory-Installed Jumpers

Table 11 — Carrier VFD Default (Toshiba TOSVERT VF-S9) Program Parameter Values

PARAMETER GROUP	COMMUNICATION NO.	DESCRIPTION	CARRIER DEFAULT SETTINGS
Basic Parameters			
CNOd	0003	Command Mode Selection	0*
FNOd	0004	Frequency Setting Mode Selection	1*
Fr	0008	Forward/Reverse Run Selection	1*
ACC	0009	Acceleration Time 1	10.0 sec
dEC1	0010	Deceleration Time 1	10.0 sec
FH	0011	Maximum Frequency	60.0 Hz*
UL	0012	Upper Limit Frequency	60.0 Hz*
LL	0013	Lower Limit Frequency	10.0 Hz*
Pt	0015	V/f Control Mode Selection	1*
tHr	0041	Motor Electronic Thermal Protection Level 1	See Table 12*
Sr1	0018	Preset-Speed Operation Frequency 1	60.0 Hz*
Extended Parameters			
F115	0115	Input Terminal Selection 5 (S2)	14*
F116	0116	Input Terminal Selection 6 (S3)	11*
Frequency Parameters			
F201	0201	VIA/II Input Point 1 Setting	20%*
F202	0202	VIA/II Input Point 1 Frequency	0.0 Hz
F203	0203	VIA/II Input Point 2 Setting	100%
F204	0204	VIA/II Input Point 2 Frequency	60.0 Hz*
Operation Mode Parameters			
F300	0300	PWM Carrier Frequency	4 KHz*
F301	0301	Auto-Restart Control Selection	3*
F302	0302	Regenerative Power Ride-through Control	1*
F303	0303	Retry Selection (Number of Times)	2*
F360	0360	PI Control	1*
F362	0362	Proportional Gain	0.30
F363	0363	Integral Gain	0.20

*These settings differ from the Toshiba defaults and are required for Carrier applications.

Table 12 — Motor Electronic Thermal Protection (tHr) for Toshiba TOSVERT VF-S9 VFD

MOTOR		STD EFFICIENCY				HIGH EFFICIENCY		
HP	**kW**	**IFM Letter***	**230 V Setting**	**380 V Setting**	**460 V Setting**	**IFM Letter***	**230 V Setting**	**460 V Setting**
5	**3.73**	A	83	77	83	L	90	83
7.5	**5.60**	B	80	88	84	M	80	84
10	**7.46**	C	85	75	86	N	85	88
15	**11.19**	D	81	98	79	P	81	79
20	**14.92**	E	94	—	87	Q	88	87

*IFM Letter refers to the 15th digit (Motor Option) of the unit model number.

Power Exhaust — The optional non-modulating power exhaust (CV only) is a two-stage design where the operation of the exhaust fans is linked to economizer position. When the supply fan is running and the economizer is 25% open, the base module closes contacts, activating 2 (50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048) or 3 (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068) exhaust fans. When the economizer position reaches 75% open, the base module activates the other 2 (50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY 024-048) or 3 (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY 054-068) exhaust fans. The fans will turn off when the economizer closes below the same points. The economizer position set points that trigger the exhaust fans can be modified, but only through use of the Service Tool, ComfortWORKS®, or Building Supervisor Software. If single-stage operation is desired, adjust the economizer set points to identical values at the desired point to activate all exhaust fans.

The optional modulating power exhaust (VAV standard, CV optional) is controlled by a modular electronic sequencer system. This system consists of a model R353 signal input module and 4 model S353 staging modules (for 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068, 6 model S353 staging modules). The signal input module receives a 0 to 10 vdc signal from the building pressure transducer, which is mounted adjacent to the supply static transducer behind the filter access panel. The modules are mounted just below the unit control board. The left module is the R353, and the 4 or 6 modules on the right are S353 modules for stages 1 through 4 or 6. On the unit wiring label, the R353 is designated PESC, and the S353 modules are designated PES1 through PES4 (PES6 for 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068).

The building pressure transducer range is –0.5 to +0.5 in. wg (–0.124 to 0.124 kPa). It is powered by a 0 to 10 vdc signal. A factory-installed hose at the "Lo" connection leads to atmosphere, and a field-supplied hose must be connected to the "Hi" connection and led into the building to a point where building pressure is to be controlled. There is a plug button in the bulkhead just above the transducers, for use in leading the hoses into the building via the return air ductwork.

There are 3 adjustments at the R353 module, all of which have been factory set. In the center of the circuit board is a set of 4 pins with a jumper, labeled J2. This determines the mode of operation. The bottom 2 pins must be jumpered for direct operation. Direct operation means that the staging modules are activated in sequence as the input signal increases.

At the upper right corner of the board is a set of 5 pins and jumper, which determines the time constant for the control. The time constant is the delay in response built into the controls. The jumper should be on the middle or bottom 2 pins, for the maximum time constant. The delay can be decreased, if desired, by moving the jumper progressively upward, always jumpering adjacent pins.

At the lower left corner of the board below the terminal strip is a resistor marked R27. This must be removed in order to obtain the 0 to 10 vdc signal output. There will not be a resistor on a factory-supplied module, but a resistor may be present on a replacement module and must be removed.

The R353 module has a terminal block with 7 connections available for wiring. The 2 right-hand terminals are for the 24 vac and common connections. The next 2 terminals are for the 0 to 10 vdc signal. Consult the wiring label for wire identification if replacing the module. The 3 left-hand terminals are not used for this application.

The S353 module has an LED (light-emitting diode), a set of 4 jumper pins, and 2 potentiometers. The LED will light whenever the module is activated, providing a visual indication of the number of exhaust fans running. The jumper pins are arranged in a square format. Two jumpers are used to determine the mode of operation (direct or reverse). The 2 jumpers must be arranged horizontally for direct action (factory set).

At the top of the module are 2 potentiometers. The left potentiometer adjusts the **offset**. The right potentiometer adjusts **differential**. The potentiometers are factory set for a nominal 0 in. wg building pressure.

The **offset** set point is defined as the point at which a module turns off a fan, and is measured in terms of percent of the input signal. For control purposes, 0 offset is at an arbitrary "floor" which is established at 10% of the input signal, or 1 vdc. In this example, the first stage will turn off at 30% (3 vdc), and the offset potentiometer will be set at 20%. The second stage will turn off at 50% signal (5 vdc), and the offset potentiometer will be set at 40%. The fourth stage is at the maximum 75% offset, which equates to 85% signal or 8.5 vdc. The offset potentiometer is calibrated in 10% increments.

Table 13 relates building pressure to signal level.

Table 13 — Potentiometer Signal Levels

BUILDING PRESSURE		SIGNAL LEVEL (vdc)
in. wg	kPa	
–0.50	**–0.124**	2
–0.25	**–0.062**	4
0.00	**0.000**	6
0.25	**0.062**	8
0.50	**0.124**	10

If the building pressure is controlled at 0 in. wg, offset of the first stage should be set at 50%, which equates to 60% of the input signal, or 6 vdc. The other stages can then be set as desired between 50% and 75%.

The default offset set points for modulating power exhaust are shown in Tables 14A and 14B.

Table 14A — Power Exhaust Default Set Points (50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048)

STAGE	OFF-SET	DIFFERENTIAL	OFF VOLTAGE	ON VOLTAGE	OFF STATIC PRESSURE	
					in. wg	kPa
1	50%	3%	6.0	6.3	0.00	0.000
2	55%	3%	6.5	6.8	0.06	0.015
3	60%	3%	7.0	7.3	0.12	0.030
4	64%	3%	7.4	7.7	0.18	0.045

Table 14B — Power Exhaust Default Set Points (50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068)

STAGE	OFF-SET	DIFFERENTIAL	OFF VOLTAGE	ON VOLTAGE	OFF STATIC PRESSURE	
					in. wg	kPa
1	50%	3%	6.0	6.3	0.00	0.000
2	55%	3%	6.5	6.8	0.06	0.015
3	60%	3%	7.0	7.3	0.12	0.030
4	65%	3%	7.5	7.8	0.19	0.045
5	70%	3%	8.0	8.3	0.25	0.062
6	75%	3%	8.5	8.8	0.31	0.077

The **differential** set point is the difference between the turn off point and the turn on point for each module. It also is calibrated in terms of percent of input signal, and has a range of 1% to 7%. The differential potentiometer is calibrated in 1% increments, and is factory set at approximately 3%. It is recommended to leave the set point at 3%, to minimize cycling of the fans.

The offset and differential potentiometers have been factory set for atmospheric pressure. Do not change these settings until there is some experience with the building. In most cases the factory settings will be satisfactory. However, if the building pressure is not being maintained as desired, then some minor adjusting on a trial and error basis can be made.

Direct Digital Controls DIP Switch Configuration — The Direct Digital Control (DDC) board must be configured for each application. The DDC board is configured through the DIP (Dual In-Line Package) switches located on the board. There are 8 DIP switches which configure 8 different applications of the DDC. See Table 15. DIP switch 1 is on the left of the block. DIP switch 8 is on the right of the block. To open a DIP switch, push the switch up with suitable tool (small-blade screwdriver). To close a DIP switch, push the switch down. Factory settings are shown in Table 16.

The DIP switch configurations are as follows:

- DIP switch 1 configures the unit to operate as a VAV or CV unit
- DIP switch 2 configures the unit to use a space sensor (VAV units) or a thermostat (CV units)
- DIP switch 3 configures the DDC for use with an electronic expansion board
- DIP switch 4 is used to field test the unit
- DIP switch 5 is used to enable occupied heating (VAV units) or specify the type of power exhaust (CV units)
- DIP switch 6 configures the Time Guard® override and, when used with the field test function, sets the minimum damper position
- DIP switch 7 configures the unit for gas heat or electric heat
- DIP switch 8 configures the unit for heat pump or air conditioner operation

Crankcase Heater(s) — Unit is equipped with crankcase heaters. Crankcase heaters are energized as long as there is power to the unit, except when the compressors are operating.

IMPORTANT: Unit power must be on for 24 hours prior to start-up. Otherwise, damage to compressor may result.

Evaporator Fan — Fan belt and fixed pulleys are factory-installed. See Tables 17-31B for Fan Performance Data. Be sure that fans rotate in the proper direction. See Table 32 for Motor Limitation data. See Table 33 for Air Quantity Limits. Static pressure drop for power exhaust, barometric relief damper, and electric heat is negligible. To alter fan performance, see Evaporator Fan Performance Adjustment section on page 102.

Condenser Fans and Motors — Condenser fans and motors are factory set. Refer to Condenser-Fan Adjustment section on page 103 as required. Fan no. 2 (50AJ,AK,AW,AY 020-030 and 50EJ,EK,EW,EY024-034), fans no. 3 and 4 (50AJ,AK,AW,AY035-050 and 50EJ,EK,EW,EY038-054), and fans no. 4, 5, 6 (50AJ,AK,AW,AY060 and 50EJ,EK, EW,EY058-068) are cycled on the outdoor-air temperature.

Table 15 — DIP Switch Configuration

SETTING	1	2	3	4	5	6	7	8
OPEN	VAV	VAV — Space Sensor Installed	Expansion Board	Field Test ON	VAV — Occupied Heat Enabled	Time Guard® Override ON	Gas Heat	Heat Pump Operation
		CV — CCN or Sensors Used			CV — Modulated Power Exhaust	IN CONJUNCTION WITH FIELD TEST — Set Minimum Damper Position		
CLOSED	CV	VAV — No Space Sensor	Base Control Board Only	Field Test OFF	VAV — Occupied Heat Disabled	Time Guard Override OFF	Electric Heat	Air Conditioner Operation
		CV — Thermostat			CV — Constant Volume Power Exhaust			

LEGEND

CCN — Carrier Comfort Network
CV — Constant Volume
VAV — Variable Air Volume

NOTES:
1. The OPEN side of the DIP switch is marked “OPEN.” When the rocker switch is on the “OPEN” side of the switch, the switch is OPEN.
2. The configuration of DIP switches 2 and 5 are dependent on DIP switch 1. If DIP switch 1 is set to OPEN (VAV operation), then DIP switches 2 and 5 will configure VAV functions.
3. When the unit is field-tested (DIP switch 4 to OPEN), the function of DIP switch 6 changes and it is used to set the minimum damper position.
4. Recycle power to unit after modifying DIP switches. This will allow the unit to accept the new configuration and update its configuration tables.

Table 16 — DIP Switch Factory Settings

UNIT	1	2	3	4	5	6	7	8
50AJ,AW,EJ,EW	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
50AK,AY,EK,EY	Open	Closed	Closed	Closed	Closed	Closed	Closed	Closed

The VFD will always provide the proper phase sequence to the indoor fan motor to operate in the proper rotation regardless of the phase sequence to the unit. If on start-up, the outdoor fans operate backwards but the indoor fan operates in the correct direction, reverse any two leads to the unit main terminal block and all fans will operate in the correct direction.

Return-Air Filters — Check that correct filters are installed in filter tracks. See Tables 1A-1C. Do not operate unit without return-air filters.

Filter Replacement — To replace filters, open filter access door (marked with label). Remove inner access panel. Remove plastic filter retainer in between filter tracks by sliding and pulling outward. Remove first filter by sliding it out of the opening in filter track. Locate filter removal tool, which is shipped next to the return air dampers. Use the filter removal tool to remove the remaining filters.

Outdoor-Air Inlet Screens — Outdoor-air inlet screens must be in place before operating unit.

Economizer Adjustment — Remove filter access panel. Check that outdoor-air damper is closed and return-air damper is open.

Economizer operation and adjustment is described in Sequence of Operation and Step 8 — Make Outdoor Air Inlet Adjustments sections (this page and page 56), respectively.

Sequence of Operation

NOTE: Unit is shipped with default values that can be changed through Service Tool, Building Supervisor, ComfortWORKS® software, or using an accessory Remote Enhanced Display. See Table 34 for default values.

COOLING, CONSTANT VOLUME (CV) UNITS — On power up, the control module will activate the initialization software. The initialization software reads DIP switch no. 1 position to determine CV or VAV operation. Next, DIP switch no. 2 is read to determine if the control is thermostat or sensor type operation. If switch no. 2 is closed, then the thermostat is employed. The initialization sequence clears all alarms and alerts, re-maps the input/output database for CV operation, sets maximum heat stages to 2, and sets maximum cool stages to 3. The control module reads DIP switch no. 3 and determines if the unit will use expansion board operation.

The first time power is sent to the control board after a power outage, power up takes 5 minutes plus a random 1 to 63 seconds.

The TSTAT function performs a thermostat based control by monitoring Y1, Y2, W1, W2 and G inputs. These functions control stages: cool1, cool2, heat1, heat2, and the indoor fan respectively. If the TSTAT function is NOT selected, the control module determines the occupancy state based on the Time Schedules or with remote occupied/unoccupied input. If Temperature Compensated Start is active, the unit will be controlled as in the Occupied mode. User-defined set points are shown in Table 34.

Table 35 list the software link points addressable by Dataport and Datalink, Carrier devices that allow access to unit control by non-Carrier energy management systems (EMS).

The occupied or unoccupied comfort set points must be selected and the space temperature offset input will be used, if present. The Occupied Heat Set Point default value is 68 F (20 C). The Occupied Cool Set Point default value is 78 F (26 C). The Unoccupied Heat Set Point default value is 55 F (13 C). The Unoccupied Cool Set Point default value is 90 F (32 C). The control board will set appropriate operating mode and fan control. The control module will turn on the indoor fan, if in Occupied mode, or determine if the unit is in Unoccupied mode and the space temperature is outside of the unoccupied comfort set points (Unoccupied Heat or Unoccupied Cool).

The control module will then monitor space temperature against comfort set points and control heating or cooling stages as required. If the system is in the Occupied mode, the economizer will operate as required. If the system is in Unoccupied mode, the system will perform night time free cool and IAQ (indoor air quality) pre-occupancy purge as required (when functions are enabled via software). Whenever the DX (direct expansion) cooling is requested, the outdoor fan will operate.

If the unit is equipped with a field-supplied space sensor and a remote start/stop switch, constant volume (CV) cooling will operate as follows: Stage 1 cooling begins when there exists a 1.5° F demand and ends when the demand returns back to 0.5° F. Stage 2 cooling begins when there is a 2.0 F demand and will continue until the demand returns to 1.0° F. Stage 2 cannot be energized until a minimum of 8 minutes of stage 1 operation or as long as stage 1 is making a reduction in the space temperature trend. If the temperature trend stops improving but the demand still exceeds 2.0° F, then Stage 2 cooling will be energized.

When economizer operation is suitable, the control will use economizer as the first stage of cooling and will bring on the compressor 1 when Stage 2 demand is called for. If supply-air temperature (SAT) remains above supply-air set point (SASP) for 15 minutes after energizing compressor 1, then compressor 2 shall be started. When Stage 2 is satisfied, the last stage of compression shall be dropped. When Stage 1 is satisfied, the control will drop all DX cooling.

If the unit is equipped with a field-supplied space sensor and a remote start/stop switch, CV heating will operate as follows: Stage 1 heating begins when there exists a 1.5° F demand and ends when the demand returns back to 0.5° F. Stage 2 heating begins when there is a 2.0° F demand and will continue until the demand returns to 1.0° F. Stage 2 cannot be energized until a minimum of 8 minutes of stage 1 operation or as long as stage 1 is making an increase in the space temperature trend. If the temperature trend stops improving but the demand still exceeds 2.0° F, then Stage 2 heating will be energized.

The control module will operate economizer, run diagnostics to monitor alarms/alerts at all times, and respond to CCN communications to perform any configured network POC (product outboard control) functions such as time/ outdoor-air temperature broadcast and global occupancy broadcast. When the optional expansion I/O board is employed, it will: perform a periodic scan and maintain a database of expanded I/O points; perform Fire/Smoke control (power exhaust required); if in Occupied mode, perform IAQ control and monitor the fan, filter, demand limit, and field-applied status (with accessories).

If thermostats are used to energize the G input, the control module will turn on the indoor fan without delay and open the economizer dampers to minimum position. If thermostats are used to deenergize the G input, the control module will turn off the indoor fan without delay and close the economizer dampers.

When cooling, G must be energized before cooling can operate. The control module determines if outdoor conditions are suitable for economizer cooling using the standard outdoor air thermistor. For the economizer to function for outside air cooling: the enthalpy must be below the enthalpy set point; the outdoor-air temperature must be equal to or less than the High Outdoor Air Temperature Lockout (default is 65 F [18 C]); the SAT (supply-air temperature) thermistor must **not** be in alarm; and the outdoor air reading is available. When these conditions are satisfied, the control module will use economizer as the first stage of cooling.

Table 17 — Fan Performance — 50AJ,AK020-030 — Vertical Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	394	1.06	400	1.09	467	1.43	525	1.78	577	2.14	624	2.51	667	2.88	708	3.26
5,000	388	1.26	432	1.49	493	1.86	548	2.24	599	2.62	645	3.02	688	3.42	728	3.82
6,000	404	1.62	468	2.01	525	2.40	576	2.80	624	3.21	668	3.63	710	4.05	750	4.48
7,000	449	2.23	508	2.65	560	3.07	608	3.49	653	3.92	695	4.36	736	4.81	774	5.26
8,000	496	2.98	550	3.43	599	3.88	644	4.32	686	4.78	726	5.24	764	5.70	801	6.17
9,000	544	3.86	595	4.35	640	4.83	682	5.30	722	5.77	760	6.25	796	6.74	831	7.23
10,000	592	4.90	640	5.43	683	5.93	723	6.43	760	6.93	796	7.43	830	7.93	864	8.44
11,000	641	6.09	687	6.66	727	7.19	765	7.72	801	8.24	835	8.76	867	9.29	899	9.82
12,000	691	7.45	734	8.06	772	8.62	808	9.18	842	9.73	875	10.27	906	10.82	936	11.36
13,000	741	8.98	782	9.63	819	10.23	853	10.81	886	11.39	917	11.96	947	12.52	976	13.09
14,000	791	10.70	830	11.38	866	12.01	899	12.63	930	13.23	960	13.83	988	14.42	1016	15.01
15,000	842	12.60	879	13.32	913	13.99	945	14.63	975	15.26	1003	15.88	1031	16.50	1058	17.11

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	746	3.64	782	4.02	816	4.41	849	4.81	880	5.20	910	5.61	939	6.01	966	6.42
5,000	766	4.23	802	4.64	836	5.06	869	5.48	900	5.90	931	6.33	960	6.76	988	7.19
6,000	787	4.91	823	5.35	857	5.79	889	6.24	921	6.69	951	7.14	980	7.59	1008	8.05
7,000	810	5.72	845	6.18	878	6.64	910	7.11	941	7.58	971	8.05	1000	8.53	1028	9.01
8,000	836	6.65	869	7.13	902	7.61	933	8.10	964	8.59	993	9.09	1022	9.59	1049	10.09
9,000	864	7.72	897	8.22	928	8.72	959	9.23	988	9.74	1017	10.26	1045	10.78	1072	11.30
10,000	896	8.95	927	9.47	957	9.99	986	10.52	1015	11.04	1043	11.58	1070	12.11	1097	12.65
11,000	930	10.35	959	10.88	988	11.42	1017	11.96	1044	12.51	1071	13.06	1098	13.61	1123	14.17
12,000	966	11.91	994	12.47	1022	13.02	1049	13.58	1076	14.14	1102	14.71	1127	15.28	1152	15.85
13,000	1004	13.66	1031	14.23	1058	14.80	1084	15.38	1110	15.96	1135	16.54	1159	17.13	1184	17.71
14,000	1043	15.59	1070	16.18	1095	16.77	1120	17.37	1145	17.96	1169	18.56	1193	19.16	—	—
15,000	1084	17.72	1109	18.33	1134	18.94	1158	19.55	1182	20.16	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	993	6.83	1019	7.24	1045	7.66	1070	8.08
5,000	1015	7.63	1041	8.07	1067	8.51	1092	8.95
6,000	1035	8.51	1062	8.97	1088	9.44	1113	9.91
7,000	1055	9.50	1082	9.98	1108	10.47	1133	10.96
8,000	1076	10.59	1102	11.10	1128	11.61	1153	12.12
9,000	1098	11.82	1124	12.35	1150	12.88	1174	13.41
10,000	1122	13.19	1148	13.74	1173	14.29	1197	14.84
11,000	1149	14.73	1173	15.29	1198	15.85	—	—
12,000	1177	16.42	—	—	—	—	—	—
13,000	—	—	—	—	—	—	—	—
14,000	—	—	—	—	—	—	—	—
15,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 18 — Fan Performance — 50AJ,AK035 — Vertical Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	410	1.86	465	2.22	516	2.58	563	2.95	609	3.32	651	3.70	693	4.09	732	4.50
8,000	453	2.52	502	2.90	549	3.29	593	3.68	635	4.08	675	4.48	713	4.89	750	5.31
9,000	497	3.32	542	3.72	585	4.14	625	4.56	665	4.98	702	5.40	738	5.83	773	6.26
10,000	543	4.26	583	4.69	623	5.13	661	5.57	697	6.02	732	6.47	766	6.92	800	7.37
11,000	589	5.37	626	5.82	663	6.28	698	6.74	732	7.22	765	7.69	797	8.16	829	8.64
12,000	636	6.64	670	7.11	704	7.59	737	8.08	769	8.58	800	9.07	831	9.57	860	10.07
13,000	683	8.10	715	8.59	747	9.09	777	9.59	808	10.11	837	10.63	866	11.15	894	11.67
14,000	730	9.74	761	10.25	790	10.77	819	11.29	847	11.83	875	12.37	902	12.91	929	13.45
15,000	778	11.57	807	12.10	835	12.64	862	13.18	888	13.74	915	14.30	941	14.86	966	15.42
16,000	826	13.61	853	14.16	880	14.72	905	15.28	931	15.85	955	16.43	980	17.01	1004	17.59
17,000	874	15.86	900	16.43	925	17.01	949	17.59	973	18.18	997	18.77	1020	19.37	1043	19.97
18,000	923	18.33	947	18.92	971	19.51	994	20.11	1017	20.72	1039	21.33	1062	21.95	1084	22.57

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	770	4.91	806	5.33	841	5.77	875	6.21	907	6.66	939	7.11	969	7.57	998	8.04
8,000	786	5.73	821	6.16	855	6.61	888	7.06	919	7.52	950	7.99	980	8.46	1009	8.94
9,000	807	6.70	840	7.15	872	7.60	904	8.07	934	8.54	964	9.01	993	9.50	1022	9.99
10,000	832	7.83	863	8.29	894	8.76	923	9.24	953	9.72	981	10.21	1009	10.70	1037	11.20
11,000	859	9.12	889	9.60	918	10.09	946	10.58	974	11.07	1002	11.57	1029	12.08	1055	12.59
12,000	889	10.57	918	11.08	945	11.58	972	12.09	999	12.60	1025	13.12	1051	13.64	1076	14.16
13,000	921	12.20	948	12.72	975	13.25	1001	13.78	1026	14.31	1051	14.84	1076	15.38	1100	15.92
14,000	955	14.00	981	14.55	1006	15.10	1031	15.65	1056	16.20	1080	16.75	1103	17.31	1127	17.87
15,000	991	15.99	1016	16.56	1040	17.13	1064	17.70	1087	18.28	1110	18.85	1133	19.43	1155	20.00
16,000	1028	18.18	1051	18.77	1075	19.36	1097	19.96	1120	20.55	1142	21.15	1164	21.74	1186	22.33
17,000	1066	20.58	1089	21.19	1111	21.80	1133	22.41	1154	23.03	—	—	—	—	—	—
18,000	1105	23.19	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	1027	8.51	1054	8.99	1081	9.47	1107	9.96
8,000	1037	9.43	1065	9.92	1092	10.42	1118	10.92
9,000	1049	10.48	1076	10.99	1103	11.50	1129	12.01
10,000	1064	11.71	1090	12.22	1116	12.74	1141	13.27
11,000	1081	13.11	1106	13.63	1131	14.16	1156	14.69
12,000	1101	14.69	1126	15.23	1150	15.76	1174	16.31
13,000	1124	16.46	1148	17.01	1171	17.56	1194	18.12
14,000	1150	18.43	1172	18.99	1195	19.55	—	—
15,000	1177	20.58	1199	21.16	—	—	—	—
16,000	—	—	—	—	—	—	—	—
17,000	—	—	—	—	—	—	—	—
18,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 19 — Fan Performance — 50AJ,AK040,050 — Vertical Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	485	2.76	532	3.15	577	3.54	620	3.94	661	4.34	700	4.74	737	5.16	774	5.58
9,000	530	3.62	574	4.03	615	4.45	655	4.87	692	5.29	729	5.72	764	6.15	798	6.59
10,000	577	4.62	617	5.06	655	5.50	692	5.95	727	6.40	761	6.85	794	7.30	827	7.76
11,000	625	5.80	661	6.26	697	6.73	731	7.20	764	7.67	796	8.14	827	8.62	858	9.10
12,000	673	7.15	707	7.63	740	8.12	772	8.62	803	9.11	833	9.61	863	10.11	891	10.61
13,000	722	8.69	753	9.19	784	9.70	814	10.22	843	10.74	872	11.26	900	11.78	927	12.31
14,000	771	10.43	800	10.95	829	11.48	857	12.01	885	12.55	912	13.10	938	13.64	964	14.19
15,000	821	12.37	848	12.91	875	13.46	901	14.01	928	14.57	953	15.14	978	15.70	1003	16.27
16,000	870	14.52	896	15.08	922	15.65	947	16.22	971	16.80	996	17.39	1020	17.97	1043	18.56
17,000	920	16.89	945	17.48	969	18.06	993	18.65	1016	19.25	1039	19.86	1062	20.46	1084	21.07
18,000	971	19.50	994	20.10	1017	20.71	1039	21.32	1061	21.93	1083	22.55	1105	23.18	1126	23.80
19,000	1021	22.35	1043	22.96	1065	23.59	1086	24.21	1107	24.85	1128	25.49	1149	26.13	1170	26.78
20,000	1071	25.43	1092	26.07	1113	26.71	1133	27.36	1154	28.01	1174	28.66	1194	29.33	1213	29.99

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	809	6.01	843	6.45	876	6.90	908	7.35	939	7.82	970	8.29	999	8.77	1027	9.25
9,000	832	7.03	864	7.49	896	7.95	926	8.41	956	8.89	986	9.37	1014	9.86	1042	10.36
10,000	858	8.22	889	8.69	919	9.17	948	9.64	977	10.13	1005	10.62	1032	11.12	1059	11.63
11,000	888	9.58	917	10.07	945	10.56	973	11.05	1001	11.55	1027	12.06	1054	12.57	1080	13.09
12,000	920	11.12	947	11.62	975	12.13	1001	12.64	1027	13.16	1053	13.68	1078	14.21	1103	14.74
13,000	954	12.83	980	13.36	1006	13.89	1032	14.42	1057	14.96	1081	15.49	1105	16.03	1129	16.58
14,000	990	14.74	1015	15.29	1040	15.84	1064	16.39	1088	16.94	1112	17.50	1135	18.06	1158	18.62
15,000	1028	16.84	1052	17.41	1075	17.99	1098	18.56	1121	19.13	1144	19.71	1166	20.29	1188	20.86
16,000	1066	19.15	1089	19.75	1112	20.34	1134	20.93	1156	21.53	1178	22.12	1199	22.72	1221	23.32
17,000	1107	21.68	1129	22.30	1150	22.91	1172	23.52	1193	24.14	1214	24.76	1234	25.37	1255	25.99
18,000	1148	24.44	1169	25.07	1190	25.70	1210	26.34	1230	26.97	1250	27.61	1270	28.25	1290	28.89
19,000	1190	27.42	1210	28.08	1230	28.73	1250	29.38	1269	30.04	1289	30.70	—	—	—	—
20,000	1233	30.65	1252	31.33	1271	31.99	1290	32.67	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	1055	9.74	1082	10.24	1109	10.74	1134	11.25
9,000	1069	10.86	1096	11.37	1122	11.88	1148	12.40
10,000	1086	12.14	1112	12.66	1137	13.18	1162	13.71
11,000	1105	13.61	1130	14.14	1155	14.67	1179	15.21
12,000	1128	15.27	1152	15.81	1176	16.35	1199	16.90
13,000	1153	17.12	1176	17.68	1199	18.23	1221	18.80
14,000	1180	19.18	1203	19.75	1225	20.32	1246	20.90
15,000	1210	21.45	1231	22.03	1253	22.62	1274	23.21
16,000	1241	23.92	1262	24.52	1283	25.13	—	—
17,000	1275	26.61	1295	27.23	—	—	—	—
18,000	—	—	—	—	—	—	—	—
19,000	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 20 — Fan Performance — 50AJ,AK060 — Vertical Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	450	4.02	509	4.71	560	5.41	605	6.12	647	6.86	686	7.62	723	8.40	757	9.21
14,000	505	5.74	558	6.49	606	7.24	649	8.01	689	8.79	727	9.59	762	10.40	795	11.24
15,000	533	6.75	584	7.53	630	8.32	672	9.11	711	9.91	748	10.73	782	11.56	815	12.41
16,000	561	7.88	610	8.68	655	9.50	696	10.32	734	11.14	770	11.98	803	12.84	836	13.71
17,000	590	9.12	637	9.95	680	10.79	720	11.64	757	12.49	792	13.35	825	14.23	857	15.12
18,000	619	10.48	664	11.33	706	12.20	744	13.07	781	13.96	815	14.84	847	15.74	878	16.65
19,000	648	11.96	692	12.84	732	13.74	769	14.64	805	15.54	838	16.45	870	17.37	900	18.30
20,000	678	13.57	719	14.47	758	15.40	795	16.32	829	17.25	862	18.19	893	19.13	923	20.08
21,000	707	15.30	748	16.24	785	17.19	821	18.14	854	19.09	886	20.05	917	21.02	946	22.00
22,000	737	17.18	776	18.14	812	19.11	847	20.09	879	21.07	911	22.06	940	23.05	969	24.04
23,000	767	19.20	804	20.18	840	21.17	873	22.17	905	23.18	935	24.19	965	25.21	993	26.23
24,000	797	21.35	833	22.36	867	23.38	900	24.40	931	25.43	961	26.47	989	27.51	1017	28.55
25,000	827	23.66	862	24.68	895	25.72	927	26.78	957	27.83	986	28.89	1014	29.95	1041	31.02
26,000	857	26.11	891	27.16	923	28.23	954	29.30	984	30.38	1012	31.46	1040	32.55	1066	33.64
27,000	888	28.72	920	29.79	952	30.88	982	31.97	1011	33.08	1038	34.19	1065	35.29	1091	36.40

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	790	10.04	821	10.89	851	11.75	880	12.63	907	13.53	934	14.45	960	15.38	985	16.32
14,000	827	12.09	857	12.96	886	13.85	915	14.76	942	15.68	968	16.62	993	17.57	1018	18.54
15,000	846	13.28	876	14.17	905	15.07	933	15.99	960	16.92	986	17.87	1011	18.83	1035	19.81
16,000	866	14.59	896	15.49	924	16.41	952	17.34	978	18.28	1004	19.25	1029	20.22	1053	21.21
17,000	887	16.02	916	16.94	944	17.86	971	18.81	997	19.77	1023	20.74	1047	21.73	1071	22.73
18,000	908	17.57	937	18.50	964	19.45	991	20.41	1017	21.38	1042	22.36	1066	23.36	1090	24.37
19,000	930	19.24	958	20.19	985	21.15	1011	22.13	1037	23.12	1061	24.11	1085	25.13	1109	26.15
20,000	952	21.04	979	22.01	1006	22.99	1032	23.98	1057	24.99	1081	26.00	1105	27.03	1128	28.06
21,000	974	22.98	1001	23.97	1028	24.97	1053	25.97	1078	26.99	1102	28.02	1126	29.06	1148	30.11
22,000	997	25.05	1024	26.06	1050	27.08	1075	28.10	1099	29.14	1123	30.18	1146	31.24	1169	32.30
23,000	1020	27.25	1046	28.28	1072	29.32	1097	30.37	1121	31.42	1144	32.48	1167	33.55	1190	34.64
24,000	1044	29.60	1070	30.65	1095	31.71	1119	32.78	1143	33.85	1166	34.93	1189	36.02	—	—
25,000	1068	32.09	1093	33.17	1118	34.25	1142	35.33	1165	36.42	1188	37.52	—	—	—	—
26,000	1092	34.73	1117	35.83	1141	36.93	1165	38.04	1188	39.15	—	—	—	—	—	—
27,000	1117	37.52	1141	38.64	1165	39.76	1188	40.89	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	1010	17.28	1033	18.24	1057	19.22	1079	20.22
14,000	1042	19.52	1066	20.51	1088	21.52	1111	22.53
15,000	1059	20.81	1082	21.81	1105	22.82	1127	23.85
16,000	1077	22.21	1100	23.22	1122	24.25	1144	25.29
17,000	1095	23.74	1117	24.76	1140	25.80	1161	26.85
18,000	1113	25.40	1136	26.43	1158	27.48	1179	28.54
19,000	1132	27.19	1154	28.24	1176	29.29	1197	30.36
20,000	1151	29.11	1173	30.17	1195	31.24	—	—
21,000	1171	31.17	1193	32.25	—	—	—	—
22,000	1191	33.38	—	—	—	—	—	—
23,000	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—
25,000	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—
27,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 21 — Fan Performance — 50AW,AY020-030 — Horizontal Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	394	1.06	409	1.13	473	1.47	530	1.82	581	2.18	629	2.55	673	2.93	714	3.31
5,000	388	1.26	445	1.57	505	1.93	557	2.30	606	2.68	651	3.07	694	3.47	734	3.88
6,000	422	1.72	485	2.12	541	2.52	590	2.92	636	3.32	679	3.73	719	4.15	758	4.57
7,000	471	2.38	528	2.81	580	3.24	627	3.67	671	4.10	711	4.53	750	4.97	786	5.41
8,000	522	3.19	574	3.64	622	4.10	666	4.56	708	5.02	747	5.48	783	5.94	818	6.41
9,000	575	4.16	622	4.63	666	5.11	708	5.60	747	6.09	784	6.58	820	7.07	853	7.56
10,000	629	5.30	671	5.79	712	6.30	751	6.81	789	7.32	824	7.84	858	8.35	891	8.87
11,000	683	6.61	723	7.13	760	7.66	797	8.19	832	8.72	866	9.26	898	9.81	930	10.35
12,000	738	8.11	775	8.66	810	9.20	844	9.75	877	10.31	909	10.87	940	11.44	970	12.00
13,000	793	9.80	828	10.38	861	10.95	892	11.51	924	12.09	954	12.67	984	13.26	1012	13.84
14,000	848	11.70	881	12.31	912	12.89	942	13.48	972	14.07	1000	14.67	1029	15.27	1056	15.88
15,000	904	13.80	936	14.44	965	15.05	993	15.66	1021	16.27	1048	16.88	1075	17.50	1101	18.13

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	752	3.70	789	4.10	823	4.50	856	4.90	887	5.30	917	5.71	946	6.12	974	6.53
5,000	772	4.30	808	4.72	843	5.14	876	5.57	908	6.01	938	6.44	968	6.88	996	7.33
6,000	794	5.01	830	5.44	864	5.89	896	6.34	928	6.79	958	7.25	988	7.72	1016	8.19
7,000	821	5.86	855	6.32	888	6.78	919	7.24	950	7.71	979	8.19	1008	8.67	1036	9.16
8,000	852	6.87	884	7.35	915	7.82	946	8.30	975	8.79	1004	9.28	1032	9.77	1059	10.27
9,000	886	8.05	917	8.54	947	9.03	976	9.53	1004	10.03	1032	10.54	1059	11.05	1085	11.56
10,000	922	9.38	952	9.90	981	10.42	1009	10.93	1036	11.45	1063	11.98	1089	12.50	1115	13.03
11,000	960	10.89	989	11.43	1017	11.97	1044	12.51	1071	13.05	1097	13.59	1122	14.14	1147	14.68
12,000	999	12.57	1028	13.13	1055	13.70	1081	14.26	1107	14.83	1132	15.39	1157	15.95	1181	16.52
13,000	1040	14.43	1068	15.02	1094	15.61	1120	16.20	1145	16.78	1170	17.37	1193	17.96	—	—
14,000	1083	16.49	1109	17.10	1135	17.71	1160	18.32	1184	18.93	—	—	—	—	—	—
15,000	1127	18.76	1152	19.38	1177	20.02	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	1001	6.95	1027	7.36	1052	7.78	1076	8.20
5,000	1024	7.77	1050	8.22	1076	8.67	1101	9.12
6,000	1044	8.66	1071	9.13	1097	9.61	1122	10.09
7,000	1064	9.65	1090	10.14	1116	10.64	1142	11.14
8,000	1086	10.78	1112	11.29	1137	11.80	1162	12.32
9,000	1111	12.08	1137	12.60	1161	13.13	1186	13.66
10,000	1140	13.56	1164	14.10	1188	14.64	—	—
11,000	1171	15.23	1195	15.78	—	—	—	—
12,000	—	—	—	—	—	—	—	—
13,000	—	—	—	—	—	—	—	—
14,000	—	—	—	—	—	—	—	—
15,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 22 — Fan Performance — 50AW,AY035 — Horizontal Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	431	2.00	484	2.36	534	2.72	581	3.09	625	3.46	667	3.85	707	4.24	746	4.65
8,000	477	2.71	525	3.09	571	3.48	614	3.88	655	4.28	694	4.68	732	5.09	768	5.51
9,000	525	3.57	569	3.98	610	4.40	650	4.82	688	5.24	725	5.67	760	6.10	795	6.54
10,000	574	4.59	614	5.03	652	5.47	689	5.92	724	6.37	759	6.82	792	7.27	824	7.73
11,000	624	5.79	660	6.25	696	6.71	730	7.18	763	7.66	795	8.13	827	8.61	857	9.09
12,000	674	7.17	708	7.65	741	8.13	772	8.63	804	9.13	834	9.63	864	10.13	892	10.63
13,000	725	8.74	756	9.24	787	9.75	817	10.26	846	10.78	874	11.31	902	11.83	930	12.36
14,000	776	10.51	805	11.04	834	11.56	862	12.10	889	12.64	916	13.18	943	13.73	969	14.28
15,000	827	12.50	855	13.04	881	13.59	908	14.15	934	14.71	959	15.27	984	15.84	1009	16.41
16,000	879	14.71	905	15.27	930	15.84	955	16.41	979	16.99	1003	17.57	1027	18.16	1051	18.75
17,000	931	17.15	955	17.72	979	18.31	1002	18.90	1026	19.50	1049	20.11	1071	20.71	1094	21.33
18,000	983	19.82	1006	20.42	1028	21.02	1051	21.63	1073	22.25	1095	22.87	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	783	5.06	819	5.49	854	5.92	887	6.37	919	6.82	950	7.28	980	7.74	1009	8.21
8,000	804	5.94	838	6.38	871	6.82	903	7.28	934	7.74	965	8.21	994	8.69	1023	9.17
9,000	828	6.98	860	7.43	892	7.89	923	8.35	953	8.83	982	9.31	1011	9.79	1039	10.29
10,000	856	8.19	887	8.66	917	9.13	946	9.61	975	10.09	1003	10.58	1030	11.08	1057	11.58
11,000	887	9.57	916	10.06	945	10.55	972	11.04	1000	11.54	1027	12.04	1053	12.55	1079	13.07
12,000	921	11.13	948	11.64	975	12.15	1002	12.66	1028	13.18	1054	13.70	1079	14.22	1104	14.75
13,000	957	12.88	983	13.41	1009	13.94	1034	14.47	1059	15.01	1083	15.55	1108	16.09	1131	16.63
14,000	994	14.83	1019	15.38	1044	15.93	1068	16.48	1092	17.04	1115	17.60	1139	18.15	1161	18.71
15,000	1033	16.98	1057	17.55	1081	18.13	1104	18.70	1127	19.27	1149	19.85	1172	20.43	1194	21.01
16,000	1074	19.35	1097	19.94	1119	20.53	1142	21.13	1163	21.73	1185	22.33	—	—	—	—
17,000	1116	21.94	1138	22.55	1159	23.17	—	—	—	—	—	—	—	—	—	—
18,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	1037	8.69	1065	9.17	1091	9.65	1117	10.14
8,000	1051	9.66	1078	10.16	1105	10.66	1131	11.16
9,000	1066	10.79	1093	11.30	1119	11.81	1145	12.33
10,000	1084	12.09	1110	12.61	1135	13.13	1160	13.66
11,000	1104	13.59	1130	14.12	1154	14.65	1178	15.19
12,000	1128	15.28	1152	15.82	1176	16.36	1199	16.91
13,000	1155	17.18	1178	17.73	—	—	—	—
14,000	1184	19.28	—	—	—	—	—	—
15,000	—	—	—	—	—	—	—	—
16,000	—	—	—	—	—	—	—	—
17,000	—	—	—	—	—	—	—	—
18,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 23 — Fan Performance — 50AW,AY040,050 — Horizontal Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	509	2.95	555	3.35	599	3.74	640	4.14	680	4.54	718	4.95	755	5.36	791	5.79
9,000	558	3.87	600	4.29	640	4.71	678	5.13	715	5.56	751	5.99	786	6.42	819	6.87
10,000	608	4.96	646	5.40	683	5.85	719	6.30	754	6.75	787	7.20	819	7.66	851	8.12
11,000	659	6.23	694	6.69	728	7.16	762	7.64	794	8.11	825	8.59	856	9.07	886	9.55
12,000	710	7.68	743	8.17	775	8.67	806	9.17	836	9.67	866	10.17	895	10.67	923	11.17
13,000	763	9.35	793	9.86	823	10.37	852	10.89	880	11.42	908	11.94	935	12.47	962	12.99
14,000	815	11.22	843	11.75	871	12.29	899	12.83	925	13.38	952	13.92	978	14.47	1003	15.02
15,000	868	13.31	895	13.86	921	14.42	946	14.98	972	15.55	997	16.12	1021	16.69	1045	17.26
16,000	921	15.64	946	16.21	971	16.78	995	17.37	1019	17.96	1043	18.54	1066	19.14	1089	19.73
17,000	974	18.20	998	18.79	1021	19.39	1044	19.99	1067	20.60	1089	21.21	1112	21.82	1134	22.43
18,000	1028	21.01	1050	21.62	1072	22.24	1094	22.86	1116	23.49	1137	24.12	1158	24.75	1179	25.38
19,000	1081	24.08	1103	24.71	1124	25.35	1145	25.99	1165	26.63	1185	27.28	1206	27.93	1226	28.58
20,000	1135	27.42	1155	28.06	1175	28.72	1195	29.38	1215	30.04	1234	30.71	1254	31.38	1273	32.05

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	826	6.22	859	6.66	892	7.12	923	7.57	954	8.04	984	8.52	1013	9.00	1041	9.49
9,000	852	7.31	884	7.77	915	8.23	945	8.70	975	9.18	1003	9.67	1032	10.16	1059	10.66
10,000	882	8.58	912	9.06	941	9.53	970	10.02	998	10.51	1026	11.00	1053	11.51	1080	12.01
11,000	915	10.04	943	10.53	971	11.02	999	11.52	1026	12.02	1052	12.53	1078	13.05	1103	13.57
12,000	950	11.68	978	12.19	1004	12.70	1030	13.22	1056	13.74	1081	14.26	1106	14.79	1130	15.33
13,000	988	13.52	1014	14.05	1039	14.59	1064	15.12	1088	15.66	1113	16.20	1136	16.74	1160	17.29
14,000	1028	15.57	1052	16.12	1076	16.68	1100	17.23	1123	17.79	1147	18.35	1169	18.91	1192	19.48
15,000	1069	17.83	1092	18.41	1115	18.98	1138	19.56	1160	20.14	1182	20.72	1204	21.30	1226	21.88
16,000	1111	20.32	1134	20.92	1156	21.52	1178	22.11	1199	22.71	1220	23.31	1241	23.91	1262	24.51
17,000	1155	23.05	1176	23.66	1198	24.28	1218	24.90	1239	25.52	1259	26.14	1279	26.76	1299	27.38
18,000	1200	26.02	1220	26.65	1240	27.29	1260	27.93	1280	28.57	1300	29.21	—	—	—	—
19,000	1245	29.24	1265	29.90	1284	30.55	—	—	—	—	—	—	—	—	—	—
20,000	1292	32.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	1069	9.98	1095	10.48	1121	10.98	1147	11.49
9,000	1086	11.16	1112	11.67	1138	12.19	1163	12.71
10,000	1106	12.53	1131	13.05	1156	13.58	1181	14.11
11,000	1128	14.09	1153	14.63	1177	15.16	1201	15.71
12,000	1154	15.86	1178	16.41	1201	16.96	1224	17.51
13,000	1183	17.85	1206	18.40	1228	18.96	1250	19.53
14,000	1214	20.04	1236	20.62	1257	21.19	1279	21.77
15,000	1247	22.47	1268	23.05	1289	23.65	—	—
16,000	1282	25.12	—	—	—	—	—	—
17,000	—	—	—	—	—	—	—	—
18,000	—	—	—	—	—	—	—	—
19,000	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 24 — Fan Performance — 50AW,AY060 — Horizontal Discharge Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	490	4.48	543	5.17	591	5.88	634	6.61	674	7.37	711	8.14	746	8.94	779	9.76
14,000	554	6.41	602	7.17	645	7.94	686	8.72	723	9.51	759	10.33	792	11.16	824	12.01
15,000	586	7.56	632	8.34	674	9.14	713	9.94	749	10.77	784	11.60	816	12.45	848	13.32
16,000	619	8.83	663	9.64	703	10.46	741	11.30	776	12.14	810	13.00	841	13.87	872	14.76
17,000	652	10.23	694	11.07	733	11.92	769	12.78	803	13.65	836	14.53	867	15.42	897	16.33
18,000	685	11.76	725	12.63	763	13.51	798	14.39	831	15.29	863	16.20	893	17.11	922	18.04
19,000	719	13.44	757	14.33	793	15.23	827	16.14	860	17.07	890	18.00	920	18.94	949	19.88
20,000	753	15.26	789	16.18	824	17.10	857	18.04	888	18.99	918	19.94	947	20.90	975	21.87
21,000	787	17.23	822	18.17	855	19.12	887	20.08	918	21.05	947	22.03	975	23.02	1002	24.01
22,000	821	19.35	855	20.32	887	21.29	918	22.28	947	23.28	976	24.28	1003	25.28	1030	26.30
23,000	855	21.63	888	22.62	919	23.62	949	24.63	977	25.65	1005	26.68	1032	27.71	1058	28.75
24,000	889	24.07	921	25.08	951	26.11	980	27.14	1008	28.19	1035	29.24	1061	30.29	1086	31.35
25,000	924	26.67	954	27.71	983	28.76	1011	29.82	1038	30.89	1065	31.96	1090	33.04	1115	34.12
26,000	958	29.45	987	30.51	1016	31.59	1043	32.67	1069	33.76	1095	34.85	1120	35.95	1144	37.06
27,000	993	32.40	1021	33.49	1048	34.58	1075	35.69	1101	36.80	1126	37.92	1150	39.04	1174	40.17

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	811	10.60	841	11.45	870	12.33	898	13.22	925	14.13	951	15.06	977	16.00	1002	16.96
14,000	855	12.88	884	13.76	912	14.67	939	15.59	965	16.52	991	17.47	1016	18.44	1040	19.42
15,000	878	14.21	906	15.11	934	16.02	961	16.96	987	17.90	1012	18.87	1036	19.84	1060	20.83
16,000	901	15.66	929	16.58	957	17.51	983	18.46	1008	19.42	1033	20.39	1057	21.38	1081	22.39
17,000	926	17.25	953	18.19	980	19.13	1006	20.10	1031	21.07	1055	22.06	1079	23.06	1102	24.07
18,000	950	18.98	978	19.93	1004	20.89	1029	21.87	1054	22.86	1078	23.86	1101	24.88	1124	25.91
19,000	976	20.84	1003	21.81	1028	22.80	1053	23.79	1078	24.80	1101	25.81	1124	26.84	1147	27.89
20,000	1002	22.85	1028	23.84	1053	24.85	1078	25.86	1102	26.88	1125	27.91	1148	28.96	1170	30.01
21,000	1029	25.01	1054	26.02	1079	27.04	1103	28.07	1126	29.11	1149	30.16	1172	31.22	1194	32.30
22,000	1056	27.32	1081	28.35	1105	29.39	1129	30.44	1152	31.50	1174	32.57	1196	33.65	—	—
23,000	1083	29.79	1108	30.85	1131	31.90	1155	32.97	1177	34.05	1199	35.13	—	—	—	—
24,000	1111	32.42	1135	33.49	1158	34.57	1181	35.66	—	—	—	—	—	—	—	—
25,000	1139	35.21	1163	36.31	1186	37.41	—	—	—	—	—	—	—	—	—	—
26,000	1168	38.17	1191	39.29	—	—	—	—	—	—	—	—	—	—	—	—
27,000	1197	41.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)							
	3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	1026	17.92	1049	18.90	1072	19.89	1094	20.89
14,000	1063	20.41	1086	21.41	1109	22.43	1131	23.46
15,000	1083	21.84	1106	22.85	1128	23.88	1150	24.92
16,000	1104	23.40	1126	24.43	1148	25.47	1170	26.52
17,000	1125	25.10	1147	26.14	1169	27.19	1190	28.26
18,000	1147	26.94	1169	28.00	1190	29.06	—	—
19,000	1169	28.94	1190	30.00	—	—	—	—
20,000	1192	31.08	—	—	—	—	—	—
21,000	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—
23,000	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—
25,000	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—
27,000	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 25A — Fan Performance, 50EJ,EK024-034 — Vertical Discharge Units (English)

FOR EW,EY UNITS, REDUCE NET AVAILABLE EXTERNAL STATIC PRESSURE BY 0.3 IN. WG

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	322	0.77	401	1.09	466	1.43	523	1.78	575	2.13	622	2.50	666	2.87	707	3.25
5,000	361	1.14	433	1.50	494	1.86	548	2.23	598	2.62	643	3.00	686	3.40	726	3.80
6,000	403	1.62	468	2.01	526	2.41	577	2.81	624	3.21	668	3.62	709	4.04	748	4.46
7,000	448	2.22	508	2.65	561	3.08	609	3.50	654	3.93	696	4.37	736	4.81	773	5.25
8,000	495	2.97	549	3.42	599	3.88	645	4.33	687	4.79	727	5.25	765	5.71	801	6.18
8,250	507	3.18	560	3.64	609	4.10	654	4.56	696	5.02	735	5.49	773	5.96	809	6.43
9,000	543	3.85	593	4.34	639	4.82	682	5.30	723	5.78	761	6.27	797	6.76	832	7.24
10,000	592	4.90	638	5.41	682	5.91	722	6.42	760	6.93	797	7.44	832	7.95	865	8.46
11,000	642	6.10	685	6.64	725	7.17	764	7.70	800	8.24	835	8.77	868	9.30	900	9.84
12,000	693	7.48	733	8.04	771	8.60	807	9.15	841	9.71	874	10.26	906	10.82	937	11.38
12,500	718	8.23	757	8.80	794	9.37	829	9.94	862	10.51	895	11.08	926	11.64	956	12.21
13,000	744	9.03	781	9.62	817	10.20	851	10.78	884	11.36	915	11.93	946	12.51	975	13.09
13,750	783	10.32	818	10.92	852	11.52	885	12.12	917	12.71	947	13.31	977	13.90	1005	14.50
14,000	795	10.77	831	11.38	864	11.98	896	12.59	928	13.19	958	13.79	987	14.39	1015	14.99
15,000	847	12.71	880	13.34	912	13.96	943	14.59	972	15.21	1001	15.83	1029	16.45	1056	17.08

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	746	3.64	783	4.03	818	4.44	852	4.85	884	5.26	916	5.68	946	6.11	975	6.54
5,000	764	4.21	800	4.62	834	5.04	868	5.46	900	5.89	930	6.33	960	6.77	989	7.22
6,000	785	4.89	820	5.32	854	5.76	886	6.21	918	6.65	948	7.11	977	7.56	1006	8.02
7,000	809	5.70	843	6.16	876	6.61	908	7.08	939	7.54	968	8.01	997	8.49	1025	8.96
8,000	836	6.65	869	7.12	901	7.60	932	8.08	962	8.57	991	9.05	1019	9.55	1046	10.04
8,250	843	6.91	876	7.39	908	7.87	938	8.36	968	8.84	997	9.34	1025	9.83	1052	10.33
9,000	865	7.74	898	8.23	929	8.73	959	9.23	988	9.74	1016	10.24	1043	10.75	1070	11.27
10,000	897	8.98	928	9.49	958	10.01	987	10.53	1016	11.06	1043	11.58	1070	12.11	1096	12.64
11,000	931	10.37	961	10.91	990	11.45	1018	11.99	1046	12.54	1073	13.08	1099	13.63	1124	14.18
12,000	967	11.94	996	12.49	1024	13.06	1051	13.62	1078	14.18	1104	14.75	1129	15.31	1154	15.88
12,500	985	12.78	1014	13.35	1041	13.92	1068	14.49	1094	15.07	1120	15.64	1145	16.22	1169	16.80
13,000	1004	13.67	1032	14.25	1059	14.83	1086	15.42	1111	16.00	1137	16.59	1161	17.17	1185	17.76
13,750	1033	15.09	1060	15.69	1087	16.29	1112	16.88	1138	17.48	1162	18.08	1186	18.68	—	—
14,000	1043	15.59	1070	16.19	1096	16.79	1122	17.40	1147	18.00	1171	18.60	1195	19.21	—	—
15,000	1083	17.70	1109	18.32	1134	18.94	1159	19.56	1183	20.19	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)					
	3.4		3.6		3.8	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	1004	6.97	1032	7.41	1059	7.86
5,000	1017	7.67	1045	8.12	1072	8.58
6,000	1034	8.49	1061	8.96	1087	9.43
7,000	1052	9.44	1079	9.93	1105	10.42
8,000	1073	10.54	1099	11.04	1125	11.55
8,250	1079	10.84	1105	11.34	1130	11.85
9,000	1096	11.78	1122	12.30	1147	12.82
10,000	1122	13.18	1147	13.71	1171	14.25
11,000	1149	14.73	1173	15.29	1197	15.84
12,000	1178	16.45	1202	17.03	—	—
12,500	1193	17.38	—	—	—	—
13,000	—	—	—	—	—	—
13,750	—	—	—	—	—	—
14,000	—	—	—	—	—	—
15,000	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 25B — Fan Performance, 50EJ,EK024-034 — Vertical Discharge Units (SI)

FOR EW,EY UNITS, REDUCE NET AVAILABLE EXTERNAL STATIC PRESSURE BY 75 PA

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)															
	50		100		150		200		250		300		350		400	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
1900	5.4	0.60	6.7	0.80	7.8	1.10	8.7	1.30	9.6	1.60	10.4	1.90	11.1	2.10	11.8	2.40
2400	6.0	0.80	7.2	1.10	8.2	1.40	9.1	1.70	10.0	2.00	10.7	2.20	11.4	2.50	12.1	2.80
2800	6.7	1.20	7.8	1.50	8.8	1.80	9.6	2.10	10.4	2.40	11.1	2.70	11.8	3.00	12.5	3.30
3300	7.5	1.70	8.5	2.00	9.3	2.30	10.2	2.60	10.9	2.90	11.6	3.30	12.3	3.60	12.9	3.90
3800	8.2	2.20	9.2	2.60	10.0	2.90	10.7	3.20	11.5	3.60	12.1	3.90	12.8	4.30	13.4	4.60
3900	8.4	2.40	9.3	2.70	10.1	3.10	10.9	3.40	11.6	3.70	12.3	4.10	12.9	4.40	13.5	4.80
4200	9.1	2.90	9.9	3.20	10.7	3.60	11.4	4.00	12.0	4.30	12.7	4.70	13.3	5.00	13.9	5.40
4700	9.9	3.70	10.6	4.00	11.4	4.40	12.0	4.80	12.7	5.20	13.3	5.50	13.9	5.90	14.4	6.30
5200	10.7	4.60	11.4	5.00	12.1	5.30	12.7	5.70	13.3	6.10	13.9	6.50	14.5	6.90	15.0	7.30
5700	11.5	5.60	12.2	6.00	12.8	6.40	13.4	6.80	14.0	7.20	14.6	7.70	15.1	8.10	15.6	8.50
5900	12.0	6.10	12.6	6.60	13.2	7.00	13.8	7.40	14.4	7.80	14.9	8.30	15.4	8.70	15.9	9.10
6100	12.4	6.70	13.0	7.20	13.6	7.60	14.2	8.00	14.7	8.50	15.3	8.90	15.8	9.30	16.3	9.80
6500	13.0	7.70	13.6	8.10	14.2	8.60	14.7	9.00	15.3	9.50	15.8	9.90	16.3	10.40	16.8	10.80
6600	13.3	8.00	13.8	8.50	14.4	8.90	14.9	9.40	15.5	9.80	16.0	10.30	16.4	10.70	16.9	11.20
7100	14.1	9.50	14.7	9.90	15.2	10.40	15.7	10.90	16.2	11.30	16.7	11.80	17.2	12.30	17.6	12.70

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)															
	450		500		550		600		650		700		750		800	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
1900	12.4	2.70	13.0	3.00	13.6	3.30	14.2	3.60	14.7	3.90	15.3	4.20	15.8	4.60	16.3	4.90
2400	12.7	3.10	13.3	3.40	13.9	3.80	14.5	4.10	15.0	4.40	15.5	4.70	16.0	5.10	16.5	5.40
2800	13.1	3.60	13.7	4.00	14.2	4.30	14.8	4.60	15.3	5.00	15.8	5.30	16.3	5.60	16.8	6.00
3300	13.5	4.30	14.1	4.60	14.6	4.90	15.1	5.30	15.6	5.60	16.1	6.00	16.6	6.30	17.1	6.70
3800	13.9	5.00	14.5	5.30	15.0	5.70	15.5	6.00	16.0	6.40	16.5	6.80	17.0	7.10	17.4	7.50
3900	14.1	5.20	14.6	5.50	15.1	5.90	15.6	6.20	16.1	6.60	16.6	7.00	17.1	7.30	17.5	7.70
4200	14.4	5.80	15.0	6.10	15.5	6.50	16.0	6.90	16.5	7.30	16.9	7.60	17.4	8.00	17.8	8.40
4700	15.0	6.70	15.5	7.10	16.0	7.50	16.5	7.90	16.9	8.20	17.4	8.60	17.8	9.00	18.3	9.40
5200	15.5	7.70	16.0	8.10	16.5	8.50	17.0	8.90	17.4	9.40	17.9	9.80	18.3	10.20	18.7	10.60
5700	16.1	8.90	16.6	9.30	17.1	9.70	17.5	10.20	18.0	10.60	18.4	11.00	18.8	11.40	19.2	11.80
5900	16.4	9.50	16.9	10.00	17.4	10.40	17.8	10.80	18.2	11.20	18.7	11.70	19.1	12.10	19.5	12.50
6100	16.7	10.20	17.2	10.60	17.7	11.10	18.1	11.50	18.5	11.90	18.9	12.40	19.4	12.80	19.8	13.20
6500	17.2	11.30	17.7	11.70	18.1	12.10	18.5	12.60	19.0	13.00	19.4	13.50	19.8	13.90	—	—
6600	17.4	11.60	17.8	12.10	18.3	12.50	18.7	13.00	19.1	13.40	19.5	13.90	19.9	14.30	—	—
7100	18.1	13.20	18.5	13.70	18.9	14.10	19.3	14.60	19.7	15.10	—	—	—	—	—	—

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)					
	850		900		950	
	r/s	BkW	r/s	BkW	r/s	BkW
1900	16.7	5.20	17.2	5.50	17.6	5.90
2400	17.0	5.70	17.4	6.10	17.9	6.40
2800	17.2	6.30	17.7	6.70	18.1	7.00
3300	17.5	7.00	18.0	7.40	18.4	7.80
3800	17.9	7.90	18.3	8.20	18.7	8.60
3900	18.0	8.10	18.4	8.50	18.8	8.80
4200	18.3	8.80	18.7	9.20	19.1	9.60
4700	18.7	9.80	19.1	10.20	19.5	10.60
5200	19.2	11.00	19.6	11.40	20.0	11.80
5700	19.6	12.30	20.0	12.70	—	—
5900	19.9	13.00	—	—	—	—
6100	—	—	—	—	—	—
6500	—	—	—	—	—	—
6600	—	—	—	—	—	—
7100	—	—	—	—	—	—

LEGEND

BkW — Motor Brake (Output) Power (kW)
r/s — Fan Wheel Speed, Revolutions per Second

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 51 mm filters.
2. Variable air volume (VAV) units will operate down to 9.39 l/s per kW.

Table 26A — Fan Performance, 50EJ,EK038,044 — Vertical Discharge Units (English)

FOR EW,EY UNITS, REDUCE NET AVAILABLE EXTERNAL STATIC PRESSURE BY 0.5 IN. WG

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	406	1.60	461	2.20	512	2.60	560	2.90	605	3.30	648	3.70	690	4.10	729	4.50
8,000	448	2.18	498	2.87	544	3.25	589	3.64	631	4.04	671	4.44	710	4.86	747	5.27
9,000	492	2.87	537	3.68	580	4.09	621	4.50	660	4.92	698	5.35	734	5.78	769	6.22
10,000	537	3.69	578	4.63	617	5.07	655	5.50	692	5.95	727	6.39	761	6.85	795	7.30
11,000	582	4.65	620	5.75	657	6.20	692	6.66	726	7.13	759	7.60	792	8.07	823	8.55
12,000	629	5.75	664	7.02	698	7.50	730	7.98	763	8.47	794	8.96	824	9.45	854	9.95
13,000	675	7.00	708	8.48	739	8.98	770	9.48	800	9.99	830	10.50	859	11.01	887	11.53
14,000	722	8.42	753	10.11	782	10.63	811	11.16	840	11.69	868	12.22	895	12.75	922	13.29
15,000	770	10.00	798	11.94	826	12.48	853	13.03	880	13.57	907	14.13	932	14.68	958	15.24
16,000	817	11.76	844	13.96	870	14.53	896	15.09	922	15.66	947	16.23	971	16.81	995	17.38
17,000	865	13.70	890	16.19	915	16.78	940	17.37	964	17.95	988	18.54	1011	19.14	1034	19.73
18,000	913	15.83	937	18.64	961	19.25	984	19.85	1007	20.46	1030	21.07	1052	21.68	1074	22.30
19,000	961	18.16	984	21.32	1006	21.94	1029	22.56	1050	23.19	1072	23.82	1093	24.45	1115	25.08
20,000	1009	20.69	1031	24.22	1052	24.86	1074	25.50	1095	26.15	1115	26.80	1136	27.45	1156	28.10

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	767	4.90	803	5.28	839	5.70	873	6.13	906	6.56	939	6.99	970	7.43	1001	7.88
8,000	783	5.70	818	6.13	852	6.56	884	7.00	916	7.45	947	7.90	978	8.36	1007	8.82
9,000	803	6.66	836	7.11	869	7.56	900	8.02	930	8.48	960	8.95	989	9.42	1018	9.90
10,000	827	7.77	858	8.23	889	8.70	919	9.18	948	9.66	977	10.15	1005	10.64	1032	11.13
11,000	854	9.03	884	9.51	913	10.00	941	10.50	969	11.00	997	11.50	1024	12.01	1050	12.52
12,000	883	10.45	911	10.96	939	11.47	967	11.98	993	12.50	1020	13.02	1046	13.54	1071	14.07
13,000	914	12.05	942	12.57	968	13.10	994	13.63	1020	14.17	1045	14.71	1070	15.25	1094	15.79
14,000	948	13.83	974	14.37	999	14.92	1024	15.47	1049	16.02	1073	16.58	1096	17.14	1120	17.70
15,000	983	15.80	1007	16.36	1032	16.92	1056	17.49	1079	18.06	1102	18.64	1125	19.21	1148	19.79
16,000	1019	17.96	1043	18.54	1066	19.13	1089	19.71	1111	20.30	1134	20.89	1156	21.49	1177	22.08
17,000	1057	20.33	1079	20.93	1102	21.53	1124	22.14	1145	22.75	1167	23.35	1188	23.97	—	—
18,000	1096	22.91	1117	23.53	1138	24.15	1160	24.78	1180	25.40	—	—	—	—	—	—
19,000	1135	25.72	1156	26.36	1176	26.99	1197	27.63	—	—	—	—	—	—	—	—
20,000	1176	28.75	1196	29.41	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)					
	3.4		3.6		3.8	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	1031	8.34	1060	8.79	1089	9.26
8,000	1036	9.29	1065	9.76	1092	10.24
9,000	1046	10.38	1073	10.87	1100	11.36
10,000	1059	11.63	1086	12.13	1112	12.64
11,000	1076	13.03	1102	13.55	1127	14.07
12,000	1096	14.60	1121	15.13	1145	15.67
13,000	1118	16.34	1142	16.89	1165	17.45
14,000	1143	18.26	1166	18.83	1188	19.40
15,000	1170	20.37	1192	20.96	—	—
16,000	1199	22.68	—	—	—	—
17,000	—	—	—	—	—	—
18,000	—	—	—	—	—	—
19,000	—	—	—	—	—	—
20,000	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 26B — Fan Performance, 50EJ,EK038,044 — Vertical Discharge Units (SI)

FOR EW,EY UNITS, REDUCE NET AVAILABLE EXTERNAL STATIC PRESSURE BY 125 PA

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)															
	50		100		150		200		250		300		350		400	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
3800	7.5	1.60	8.3	2.10	9.1	2.40	9.8	2.70	10.5	3.00	11.2	3.30	11.8	3.60	12.5	3.90
4200	8.2	2.10	8.9	2.70	9.7	3.00	10.3	3.40	11.0	3.70	11.6	4.00	12.2	4.30	12.8	4.60
4700	8.9	2.80	9.6	3.50	10.3	3.80	10.9	4.10	11.5	4.40	12.1	4.80	12.7	5.10	13.2	5.40
5200	9.7	3.50	10.3	4.30	10.9	4.60	11.5	5.00	12.1	5.30	12.7	5.70	13.2	6.00	13.7	6.40
5600	10.5	4.30	11.1	5.20	11.6	5.60	12.2	6.00	12.7	6.30	13.2	6.70	13.7	7.10	14.2	7.40
6100	11.3	5.20	11.8	6.30	12.3	6.70	12.8	7.10	13.3	7.50	13.8	7.80	14.3	8.20	14.8	8.60
6600	12.0	6.30	12.5	7.50	13.0	7.90	13.5	8.30	14.0	8.70	14.5	9.10	14.9	9.50	15.4	9.90
7100	12.8	7.50	13.3	8.90	13.8	9.30	14.2	9.70	14.7	10.10	15.1	10.50	15.5	11.00	16.0	11.40
7600	13.6	8.80	14.1	10.40	14.5	10.80	14.9	11.30	15.4	11.70	15.8	12.10	16.2	12.50	16.6	13.00
8000	14.4	10.20	14.8	12.10	15.3	12.50	15.7	13.00	16.1	13.40	16.5	13.80	16.9	14.30	17.2	14.70
8500	15.2	11.80	15.6	13.90	16.0	14.40	16.4	14.80	16.8	15.30	17.2	15.70	17.5	16.20	17.9	16.60
9000	16.0	13.50	16.4	15.90	16.8	16.40	17.1	16.80	17.5	17.30	17.9	17.80	18.2	18.20	18.6	18.70
9400	16.8	15.40	17.2	18.10	17.5	18.50	17.9	19.00	18.2	19.50	18.6	20.00	18.9	20.50	19.3	21.00

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)															
	450		500		550		600		650		700		750		800	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
3800	13.0	4.20	13.6	4.60	14.2	4.90	14.7	5.20	15.3	5.60	15.8	5.90	16.3	6.20	16.8	6.60
4200	13.4	5.00	13.9	5.30	14.5	5.60	15.0	6.00	15.5	6.30	16.0	6.70	16.5	7.00	17.0	7.40
4700	13.8	5.80	14.3	6.10	14.8	6.50	15.3	6.80	15.8	7.20	16.3	7.60	16.8	7.90	17.2	8.30
5200	14.2	6.70	14.7	7.10	15.2	7.50	15.7	7.80	16.2	8.20	16.6	8.60	17.1	9.00	17.5	9.30
5600	14.7	7.80	15.2	8.20	15.7	8.60	16.1	8.90	16.6	9.30	17.0	9.70	17.4	10.10	17.8	10.50
6100	15.2	9.00	15.7	9.40	16.1	9.80	16.6	10.20	17.0	10.60	17.4	11.00	17.8	11.40	18.2	11.80
6600	15.8	10.30	16.2	10.70	16.7	11.10	17.1	11.50	17.5	12.00	17.9	12.40	18.3	12.80	18.7	13.20
7100	16.4	11.80	16.8	12.20	17.2	12.60	17.6	13.00	18.0	13.50	18.4	13.90	18.8	14.30	19.1	14.80
7600	17.0	13.40	17.4	13.80	17.8	14.30	18.1	14.70	18.5	15.10	18.9	15.60	19.3	16.00	19.6	16.50
8000	17.6	15.20	18.0	15.60	18.4	16.10	18.7	16.50	19.1	17.00	19.4	17.40	19.8	17.90	—	—
8500	18.3	17.10	18.6	17.60	19.0	18.00	19.3	18.50	19.7	18.90	—	—	—	—	—	—
9000	18.9	19.20	19.3	19.70	19.6	20.10	19.9	20.60	—	—	—	—	—	—	—	—
9400	19.6	21.40	19.9	21.90	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)					
	850		900		950	
	r/s	BkW	r/s	BkW	r/s	BkW
3800	17.3	6.90	17.7	7.30	18.2	7.60
4200	17.4	7.70	17.9	8.10	18.3	8.50
4700	17.7	8.70	18.1	9.00	18.5	9.40
5200	17.9	9.70	18.4	10.10	18.8	10.50
5600	18.3	10.90	18.7	11.30	19.1	11.70
6100	18.6	12.20	19.0	12.60	19.4	13.00
6600	19.1	13.60	19.4	14.00	19.8	14.50
7100	19.5	15.20	19.9	15.60	—	—
7600	20.0	16.90	—	—	—	—
8000	—	—	—	—	—	—
8500	—	—	—	—	—	—
9000	—	—	—	—	—	—
9400	—	—	—	—	—	—

LEGEND

BkW — Motor Brake (Output) Power (kW)
r/s — Fan Wheel Speed, Revolutions per Second

NOTES:
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 51 mm filters.
2. Variable air volume (VAV) units will operate down to 9.39 l/s per kW.

Table 27A — Fan Performance, 50EJ,EK048 — Vertical Discharge Units (English)

FOR EW,EY UNITS, REDUCE NET AVAILABLE EXTERNAL STATIC PRESSURE BY 0.5 IN. WG

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
9,000	497	2.90	542	3.70	585	4.10	625	4.60	664	5.00	702	5.40	738	5.80	773	6.30
10,000	542	3.70	583	4.70	623	5.10	661	5.60	697	6.00	732	6.50	766	6.90	800	7.40
11,000	589	4.70	626	5.80	663	6.30	698	6.70	732	7.20	765	7.70	797	8.20	829	8.60
12,000	635	5.80	670	7.10	704	7.60	737	8.10	769	8.60	800	9.10	830	9.60	860	10.10
13,000	683	7.10	715	8.59	747	9.09	777	9.60	808	10.11	837	10.62	866	11.14	894	11.66
14,000	730	8.53	761	10.25	790	10.77	819	11.30	847	11.83	875	12.36	902	12.90	929	13.44
15,000	778	10.14	807	12.10	834	12.65	862	13.19	888	13.75	915	14.30	941	14.86	966	15.42
16,000	826	11.93	853	14.15	879	14.72	905	15.29	931	15.86	955	16.44	980	17.01	1004	17.59
17,000	875	13.90	900	16.42	925	17.01	949	17.60	973	18.19	997	18.78	1020	19.38	1043	19.98
18,000	923	16.06	947	18.90	971	19.51	994	20.12	1017	20.73	1039	21.34	1062	21.96	1084	22.58
19,000	972	18.42	995	21.61	1017	22.24	1039	22.87	1061	23.50	1083	24.13	1104	24.76	1125	25.40
20,000	1021	20.98	1042	24.55	1064	25.20	1085	25.85	1106	26.50	1126	27.15	1147	27.80	1167	28.46

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
9,000	807	6.70	840	7.16	872	7.61	904	8.07	934	8.54	964	9.00	993	9.48	1021	9.95
10,000	832	7.80	863	8.30	894	8.78	923	9.25	953	9.73	981	10.22	1009	10.71	1036	11.20
11,000	859	9.10	889	9.60	918	10.09	947	10.59	974	11.09	1002	11.59	1029	12.10	1055	12.61
12,000	889	10.60	917	11.07	945	11.58	972	12.09	999	12.61	10.25	13.13	1051	13.65	1076	14.18
13,000	921	12.18	948	12.71	975	13.24	1001	13.77	1026	14.30	1051	14.84	1076	15.39	1100	15.93
14,000	955	13.98	981	14.53	1006	15.08	1031	15.63	1056	16.18	1080	16.74	1103	17.30	1127	17.86
15,000	991	15.98	1015	16.54	1040	17.11	1063	17.68	1087	18.25	1110	18.83	1133	19.41	1155	19.99
16,000	1028	18.17	1051	18.76	1074	19.34	1097	19.93	1120	20.52	1142	21.12	1164	21.71	1185	22.31
17,000	1066	20.58	1089	21.18	1111	21.78	1133	22.39	1154	23.00	1175	23.61	1197	24.23	—	—
18,000	1106	23.19	1127	23.82	1148	24.44	1169	25.07	1190	25.69	—	—	—	—	—	—
19,000	1146	26.04	1166	26.68	1187	27.32	—	—	—	—	—	—	—	—	—	—
20,000	1187	29.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)					
	3.4		3.6		3.8	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
9,000	1049	10.44	1076	10.92	1103	11.41
10,000	1063	11.70	1090	12.20	1116	12.71
11,000	1081	13.12	1106	13.64	1131	14.16
12,000	1101	14.71	1126	15.25	1150	15.79
13,000	1124	16.48	1148	17.03	1171	17.59
14,000	1150	18.43	1173	19.00	1195	19.57
15,000	1177	20.57	1199	21.16	—	—
16,000	—	—	—	—	—	—
17,000	—	—	—	—	—	—
18,000	—	—	—	—	—	—
19,000	—	—	—	—	—	—
20,000	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 27B — Fan Performance, 50EJ,EK048 — Vertical Discharge Units (SI)

FOR EW,EY UNITS, REDUCE NET AVAILABLE EXTERNAL STATIC PRESSURE BY 75 PA

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)															
	50		100		150		200		250		300		350		400	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4250	8.3	2.2	9.0	2.8	9.7	3.1	10.4	3.4	11.1	3.7	11.7	4.0	12.3	4.4	12.9	4.7
4720	9.0	2.8	9.7	3.5	10.4	3.8	11.0	4.2	11.6	4.5	12.2	4.8	12.8	5.2	13.3	5.5
5190	9.8	3.5	10.4	4.3	11.0	4.7	11.6	5.0	12.2	5.4	12.8	5.7	13.3	6.1	13.8	6.4
5660	10.6	4.3	11.2	5.3	11.7	5.7	12.3	6.0	12.8	6.4	13.3	6.8	13.8	7.1	14.3	7.5
6140	11.4	5.3	11.9	6.4	12.4	6.8	13.0	7.2	13.5	7.5	13.9	7.9	14.4	8.3	14.9	8.7
6610	12.2	6.4	12.7	7.6	13.2	8.0	13.7	8.4	14.1	8.8	14.6	9.2	15.0	9.6	15.5	10.0
7080	13.0	7.6	13.4	9.0	13.9	9.4	14.4	9.8	14.8	10.3	15.2	10.7	15.7	11.1	16.1	11.5
7550	13.8	8.9	14.2	10.6	14.7	11.0	15.1	11.4	15.5	11.8	15.9	12.3	16.3	12.7	16.7	13.1
8020	14.6	10.4	15.0	12.2	15.4	12.7	15.8	13.1	16.2	13.6	16.6	14.0	17.0	14.5	17.4	14.9
8500	15.4	12.0	15.8	14.1	16.2	14.6	16.6	15.0	16.9	15.5	17.3	15.9	17.7	16.4	18.1	16.8
8970	16.2	13.7	16.6	16.1	17.0	16.6	17.3	17.1	17.7	17.5	18.0	18.0	18.4	18.5	18.7	18.9
9440	17.0	15.7	17.4	18.3	17.7	18.8	18.1	19.3	18.4	19.8	18.8	20.3	19.1	20.7	19.4	21.2

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)															
	450		500		550		600		650		700		750		800	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4250	13.5	5.0	14.0	5.3	14.5	5.7	15.1	6.0	15.6	6.4	16.1	6.7	16.5	7.1	17.0	7.4
4720	13.9	5.8	14.4	6.2	14.9	6.5	15.4	6.9	15.9	7.3	16.4	7.6	16.8	8.0	17.3	8.4
5190	14.3	6.8	14.8	7.2	15.3	7.5	15.8	7.9	16.2	8.3	16.7	8.6	17.1	9.0	17.6	9.4
5660	14.8	7.9	15.3	8.3	15.8	8.6	16.2	9.0	16.7	9.4	17.1	9.8	17.5	10.2	17.9	10.6
6140	15.4	9.1	15.8	9.5	16.2	9.9	16.7	10.3	17.1	10.7	17.5	11.1	17.9	11.5	18.3	11.9
6610	15.9	10.4	16.3	10.8	16.8	11.2	17.2	11.7	17.6	12.1	18.0	12.5	18.4	12.9	18.8	13.3
7080	16.5	11.9	16.9	12.3	17.3	12.8	17.7	13.2	18.1	13.6	18.5	14.0	18.9	14.5	19.3	14.9
7550	17.1	13.6	17.5	14.0	17.9	14.4	18.3	14.9	18.7	15.3	19.0	15.8	19.4	16.2	19.8	16.6
8020	17.8	15.3	18.1	15.8	18.5	16.3	18.9	16.7	19.2	17.2	19.6	17.6	19.9	18.1	20.3	18.5
8500	18.4	17.3	18.8	17.8	19.1	18.2	19.5	18.7	19.8	19.2	20.2	19.6	20.5	20.1	20.8	20.6
8970	19.1	19.4	19.4	19.9	19.8	20.4	20.1	20.9	20.4	21.3	20.8	21.8	21.1	22.3	21.4	22.8
9440	19.8	21.7	20.1	22.2	20.4	22.7	20.8	23.2	21.1	23.7	21.4	24.2	21.7	24.7	22.0	25.2

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)					
	850		900		950	
	r/s	BkW	r/s	BkW	r/s	BkW
4250	17.5	7.8	17.9	8.1	18.4	8.5
4720	17.7	8.7	18.2	9.1	18.6	9.5
5190	18.0	9.8	18.4	10.2	18.9	10.6
5660	18.4	11.0	18.8	11.4	19.2	11.8
6140	18.7	12.3	19.1	12.7	19.5	13.1
6610	19.2	13.7	19.5	14.2	19.9	14.6
7080	19.6	15.3	20.0	15.8	20.3	16.2
7550	20.1	17.1	20.5	17.5	20.8	18.0
8020	20.6	19.0	21.0	19.5	21.3	19.9
8500	21.2	21.1	21.5	21.5	21.8	22.0
8970	21.7	23.3	22.1	23.8	22.4	24.3
9440	22.3	25.7	22.6	26.2	22.9	26.7

LEGEND

BkW — Brake Kilowatts

NOTES:

1. Fan performance is based on dry coils, economizer, roof curb, cabinet losses, and clean 51 mm filters.
2. Conversion — BkW to input watts:
   Watts = BkW/Motor Efficiency
3. VAV units will operate down to 1.02 L/s/1000 kW is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 28A — Fan Performance, 50EJ,EK054-068 — Vertical Discharge Units (English)

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	397	2.68	463	3.34	516	3.97	560	4.58	600	5.18	635	5.79	668	6.40	699	7.02
12,000	446	3.96	510	4.73	562	5.46	606	6.15	645	6.84	680	7.52	713	8.19	744	8.87
15,000	520	6.51	582	7.47	632	8.35	675	9.19	714	10.00	749	10.79	781	11.58	812	12.36
16,000	545	7.55	606	8.58	656	9.51	699	10.39	737	11.25	772	12.08	804	12.91	834	13.72
17,000	571	8.69	631	9.78	680	10.77	722	11.70	760	12.60	795	13.48	827	14.34	857	15.19
18,000	596	9.94	655	11.09	704	12.13	746	13.11	784	14.06	818	14.98	850	15.88	880	16.77
19,000	622	11.29	680	12.50	728	13.60	770	14.63	808	15.62	842	16.59	874	17.53	904	18.46
20,000	648	12.75	705	14.03	752	15.18	794	16.27	831	17.31	865	18.31	897	19.30	927	20.27
21,000	674	14.33	730	15.67	777	16.88	818	18.02	855	19.10	889	20.16	921	21.18	950	22.19
22,000	700	16.03	755	17.43	802	18.70	842	19.89	879	21.02	913	22.12	944	23.19	974	24.24
23,000	726	17.85	780	19.31	826	20.64	867	21.88	903	23.06	937	24.20	968	25.32	997	26.41
24,000	752	19.79	806	21.32	851	22.70	891	23.99	927	25.22	961	26.41	992	27.57	1021	28.71
25,000	779	21.87	831	23.45	876	24.89	916	26.24	952	27.52	985	28.75	1015	29.96	1044	31.13
26,000	805	24.07	857	25.72	901	27.21	940	28.61	976	29.94	1009	31.23	1039	32.47	1068	33.69
27,000	832	26.41	883	28.12	926	29.67	965	31.12	1000	32.50	1033	33.83	1063	35.13	1092	36.39

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	728	7.64	755	8.26	781	8.89	806	9.53	830	10.17	853	10.82	876	11.47	897	12.13
12,000	773	9.55	800	10.23	826	10.92	851	11.61	875	12.30	898	12.99	920	13.70	941	14.40
15,000	840	13.14	867	13.91	893	14.69	918	15.46	941	16.24	964	17.01	986	17.79	1008	18.57
16,000	863	14.53	890	15.34	916	16.15	940	16.95	964	17.76	987	18.56	1009	19.37	1030	20.18
17,000	886	16.04	913	16.88	938	17.72	963	18.56	987	19.39	1009	20.23	1031	21.06	1053	21.90
18,000	909	17.65	936	18.53	961	19.40	986	20.27	1009	21.14	1032	22.00	1054	22.87	1075	23.73
19,000	932	19.38	958	20.29	984	21.20	1008	22.10	1032	23.00	1055	23.89	1076	24.79	1098	25.68
20,000	955	21.23	982	22.17	1007	23.11	1031	24.05	1055	24.98	1077	25.90	1099	26.83	1120	27.75
21,000	978	23.19	1005	24.17	1030	25.15	1054	26.12	1078	27.08	1100	28.04	1122	28.99	1143	29.95
22,000	1001	25.27	1028	26.29	1053	27.31	1077	28.31	1101	29.31	1123	30.30	1145	31.28	1166	32.27
23,000	1025	27.48	1051	28.54	1076	29.59	1100	30.63	1124	31.66	1146	32.68	1168	33.70	1189	34.72
24,000	1048	29.82	1074	30.92	1100	32.00	1124	33.08	1147	34.14	1169	35.20	1191	36.25	—	—
25,000	1072	32.29	1098	33.42	1123	34.55	1147	35.66	1170	36.76	1192	37.85	—	—	—	—
26,000	1095	34.89	1121	36.06	1146	37.22	1170	38.37	1193	39.51	—	—	—	—	—	—
27,000	1119	37.62	1145	38.84	1170	40.04	1194	41.22	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)					
	3.4		3.6		3.8	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	918	12.79	938	13.46	958	14.13
12,000	962	15.11	982	15.82	1002	16.54
15,000	1028	19.36	1049	20.14	1068	20.93
16,000	1051	20.99	1071	21.80	1090	22.61
17,000	1073	22.73	1093	23.57	1113	24.41
18,000	1096	24.59	1116	25.46	1135	26.32
19,000	1118	26.57	1138	27.47	1158	28.36
20,000	1141	28.67	1161	29.59	1180	30.51
21,000	1163	30.90	1183	31.85	—	—
22,000	1186	33.25	—	—	—	—
23,000	—	—	—	—	—	—
24,000	—	—	—	—	—	—
25,000	—	—	—	—	—	—
26,000	—	—	—	—	—	—
27,000	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp x 746}}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton in the cooling mode. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 28B — Fan Performance, 50EJ,EK054-068 — Vertical Discharge Units (SI)

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)													
	50		100		149		199		249		299		349	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4,721	6.6	2.00	7.7	2.49	8.6	2.96	9.3	3.41	10.0	3.87	10.6	4.32	11.1	4.78
5,665	7.4	2.95	8.5	3.53	9.4	4.07	10.1	4.59	10.7	5.10	11.3	5.61	11.9	6.11
7,082	8.7	4.86	9.7	5.58	10.5	6.23	11.3	6.85	11.9	7.46	12.5	8.05	13.0	8.64
7,554	9.1	5.63	10.1	6.40	10.9	7.09	11.6	7.75	12.3	8.39	12.9	9.01	13.4	9.63
8,026	9.5	6.48	10.5	7.30	11.3	8.03	12.0	8.73	12.7	9.40	13.3	10.05	13.8	10.70
8,498	9.9	7.41	10.9	8.27	11.7	9.05	12.4	9.78	13.1	10.49	13.6	11.17	14.2	11.85
8,970	10.4	8.42	11.3	9.33	12.1	10.15	12.8	10.92	13.5	11.66	14.0	12.37	14.6	13.08
9,442	10.8	9.51	11.7	10.47	12.5	11.33	13.2	12.14	13.9	12.91	14.4	13.66	15.0	14.40
9,914	11.2	10.69	12.2	11.69	12.9	12.59	13.6	13.44	14.3	14.25	14.8	15.04	15.3	15.80
10,386	11.7	11.96	12.6	13.00	13.4	13.95	14.0	14.83	14.7	15.68	15.2	16.50	15.7	17.30
10,858	12.1	13.32	13.0	14.41	13.8	15.39	14.4	16.32	15.1	17.20	15.6	18.06	16.1	18.89
11,330	12.5	14.77	13.4	15.90	14.2	16.93	14.9	17.90	15.5	18.82	16.0	19.71	16.5	20.57
11,803	13.0	16.31	13.9	17.50	14.6	18.57	15.3	19.57	15.9	20.53	16.4	21.45	16.9	22.35
12,275	13.4	17.96	14.3	19.19	15.0	20.30	15.7	21.34	16.3	22.34	16.8	23.30	17.3	24.23
12,747	13.9	19.70	14.7	20.98	15.4	22.13	16.1	23.22	16.7	24.25	17.2	25.24	17.7	26.20

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)													
	399		448		498		548		598		648		697	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4,721	11.7	5.24	12.1	5.70	12.6	6.16	13.0	6.63	13.4	7.11	13.8	7.59	14.2	8.07
5,665	12.4	6.62	12.9	7.12	13.3	7.63	13.8	8.14	14.2	8.66	14.6	9.17	15.0	9.69
7,082	13.5	9.22	14.0	9.80	14.5	10.38	14.9	10.96	15.3	11.53	15.7	12.11	16.1	12.69
7,554	13.9	10.24	14.4	10.84	14.8	11.44	15.3	12.05	15.7	12.65	16.1	13.25	16.4	13.85
8,026	14.3	11.33	14.8	11.97	15.2	12.59	15.6	13.22	16.0	13.84	16.4	14.47	16.8	15.09
8,498	14.7	12.51	15.1	13.17	15.6	13.82	16.0	14.47	16.4	15.12	16.8	15.77	17.2	16.41
8,970	15.1	13.77	15.5	14.46	16.0	15.14	16.4	15.81	16.8	16.49	17.2	17.16	17.6	17.82
9,442	15.4	15.12	15.9	15.83	16.4	16.54	16.8	17.24	17.2	17.94	17.6	18.63	18.0	19.32
9,914	15.8	16.56	16.3	17.30	16.7	18.03	17.2	18.76	17.6	19.48	18.0	20.20	18.3	20.92
10,386	16.2	18.08	16.7	18.85	17.1	19.62	17.6	20.37	18.0	21.12	18.3	21.86	18.7	22.60
10,858	16.6	19.70	17.1	20.50	17.5	21.29	17.9	22.07	18.3	22.85	18.7	23.62	19.1	24.38
11,330	17.0	21.41	17.5	22.25	17.9	23.06	18.3	23.87	18.7	24.67	19.1	25.47	19.5	26.26
11,803	17.4	23.22	17.9	24.09	18.3	24.93	18.7	25.77	19.1	26.60	19.5	27.42	19.9	28.24
12,275	17.8	25.13	18.3	26.03	18.7	26.90	19.1	27.77	19.5	28.62	19.9	29.47	—	—
12,747	18.2	27.15	18.7	28.07	19.1	28.97	19.5	29.87	19.9	30.75	—	—	—	—

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)									
	747		797		847		897		947	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4,721	14.6	8.56	15.0	9.05	15.3	9.54	15.6	10.04	16.0	10.54
5,665	15.3	10.22	15.7	10.74	16.0	11.27	16.4	11.80	16.7	12.34
7,082	16.4	13.27	16.8	13.86	17.1	14.44	17.5	15.03	17.8	15.61
7,554	16.8	14.45	17.2	15.05	17.5	15.66	17.8	16.26	18.2	16.87
8,026	17.2	15.71	17.5	16.33	17.9	16.96	18.2	17.58	18.5	18.21
8,498	17.6	17.06	17.9	17.70	18.3	18.35	18.6	18.99	18.9	19.64
8,970	17.9	18.49	18.3	19.16	18.6	19.82	19.0	20.49	19.3	21.16
9,442	18.3	20.01	18.7	20.70	19.0	21.39	19.3	22.08	19.7	22.76
9,914	18.7	21.63	19.1	22.34	19.4	23.05	19.7	23.76	—	—
10,386	19.1	23.34	19.4	24.07	—	—	—	—	—	—
10,858	19.5	25.14	19.8	25.90	—	—	—	—	—	—
11,330	19.8	27.04	—	—	—	—	—	—	—	—
11,803	—	—	—	—	—	—	—	—	—	—
12,275	—	—	—	—	—	—	—	—	—	—
12,747	—	—	—	—	—	—	—	—	—	—

LEGEND

BkW — Brake Kilowatts

NOTES:
1. Fan performance is based on dry coils, economizer, roof curb, cabinet losses, and clean 51 mm filters.
2. Conversion — BkW to input watts:
   Watts = BkW/Motor Efficiency
3. VAV units will operate down to 1.02 L/s/1000 kW in the cooling mode. Performance at 1.02 L/s/1000 kW is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 29A — Fan Performance, 50EW,EY054-068 — Horizontal Discharge Units (English)

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	424	2.7	485	3.3	535	3.9	577	4.5	615	5.0	650	5.6	682	6.2	712	6.7
12,000	481	4.0	540	4.7	588	5.4	629	6.1	666	6.7	700	7.3	732	8.0	762	8.6
15,000	570	6.7	624	7.6	669	8.4	709	9.1	745	9.9	779	10.6	809	11.4	838	12.1
16,000	600	7.8	653	8.7	697	9.6	737	10.4	772	11.2	805	11.9	836	12.7	864	13.5
17,000	631	9.0	682	10.0	725	10.9	764	11.7	799	12.6	832	13.4	862	14.2	891	15.0
18,000	661	10.4	711	11.4	754	12.3	792	13.2	827	14.0	859	14.9	889	15.7	917	16.6
19,000	692	11.8	740	12.8	782	13.8	820	14.8	854	15.7	886	16.5	916	17.4	944	18.3
20,000	723	13.4	770	14.4	811	15.5	848	16.4	882	17.4	913	18.3	943	19.2	970	20.1
21,000	754	15.0	800	16.2	840	17.2	877	18.3	910	19.2	941	20.2	970	21.2	997	22.1
22,000	785	16.9	830	18.0	869	19.1	905	20.2	938	21.2	969	22.2	997	23.2	1025	24.2
23,000	817	18.8	860	20.0	899	21.2	934	22.3	966	23.3	997	24.4	1025	25.4	1052	26.4
24,000	848	20.9	891	22.2	928	23.3	963	24.5	995	25.6	1025	26.7	1053	27.7	1080	28.8
25,000	880	23.1	921	24.4	958	25.7	992	26.8	1024	28.0	1053	29.1	1081	30.2	1107	31.3
26,000	912	25.5	952	26.8	988	28.1	1021	29.3	1052	30.5	1082	31.7	1109	32.8	1135	33.9
27,000	943	28.0	983	29.4	1018	30.7	1051	32.0	1082	33.2	1110	34.4	1137	35.5	1163	36.7

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)															
	1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	740	7.3	766	7.88	792	8.46	816	9.04	840	9.63	862	10.23	884	10.83	905	11.43
12,000	789	9.2	816	9.84	841	10.47	865	11.11	889	11.75	911	12.39	933	13.04	953	13.69
15,000	866	12.8	892	13.53	917	14.25	940	14.97	963	15.68	985	16.41	1007	17.13	1028	17.85
16,000	891	14.2	917	14.97	942	15.72	966	16.46	989	17.21	1011	17.96	1032	18.71	1053	19.46
17,000	918	15.7	943	16.52	968	17.30	991	18.08	1014	18.85	1036	19.63	1057	20.40	1078	21.18
18,000	944	17.4	969	18.19	994	19.00	1017	19.80	1040	20.61	1061	21.41	1083	22.21	1103	23.02
19,000	970	19.1	995	19.97	1020	20.81	1043	21.65	1065	22.48	1087	23.32	1108	24.15	1129	24.98
20,000	997	21.0	1022	21.88	1046	22.75	1069	23.62	1091	24.48	1113	25.35	1134	26.20	1154	27.06
21,000	1024	23.0	1049	23.91	1072	24.82	1095	25.72	1118	26.61	1139	27.50	1160	28.39	1180	29.27
22,000	1051	25.1	1075	26.08	1099	27.01	1122	27.94	1144	28.87	1165	29.79	1186	30.70	—	—
23,000	1078	27.4	1102	28.37	1126	29.34	1148	30.30	1170	31.26	1192	32.21	—	—	—	—
24,000	1105	29.8	1129	30.80	1153	31.80	1175	32.79	1197	33.78	—	—	—	—	—	—
25,000	1132	32.3	1157	33.37	1180	34.40	—	—	—	—	—	—	—	—	—	—
26,000	1160	35.0	1184	36.08	—	—	—	—	—	—	—	—	—	—	—	—
27,000	1188	37.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)					
	3.4		3.6		3.8	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	925	12.04	945	12.65	965	13.27
12,000	974	14.34	994	15.00	1013	15.66
15,000	1048	18.57	1067	19.30	1086	20.03
16,000	1073	20.21	1092	20.96	1111	21.71
17,000	1098	21.95	1117	22.73	1136	23.51
18,000	1123	23.82	1142	24.62	1161	25.42
19,000	1148	25.80	1168	26.63	1186	27.46
20,000	1174	27.92	1193	28.77	—	—
21,000	1200	30.16	—	—	—	—
22,000	—	—	—	—	—	—
23,000	—	—	—	—	—	—
24,000	—	—	—	—	—	—
25,000	—	—	—	—	—	—
26,000	—	—	—	—	—	—
27,000	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable Air Volume units will operate down to 70 cfm/ton in the cooling mode. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 29B — Fan Performance, 50EW,EY054-068 — Horizontal Discharge Units (SI)

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)													
	50		100		149		199		249		299		349	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4,721	7.1	2.02	8.1	2.48	8.9	2.91	9.6	3.33	10.3	3.75	10.8	4.17	11.4	4.59
5,665	8.0	3.01	9.0	3.54	9.8	4.04	10.5	4.52	11.1	4.99	11.7	5.46	12.2	5.93
7,082	9.5	5.02	10.4	5.65	11.2	6.25	11.8	6.82	12.4	7.38	13.0	7.93	13.5	8.48
7,554	10.0	5.84	10.9	6.51	11.6	7.14	12.3	7.74	12.9	8.33	13.4	8.91	13.9	9.48
8,026	10.5	6.74	11.4	7.45	12.1	8.11	12.7	8.75	13.3	9.36	13.9	9.97	14.4	10.56
8,498	11.0	7.72	11.8	8.47	12.6	9.16	13.2	9.83	13.8	10.48	14.3	11.11	14.8	11.73
8,970	11.5	8.80	12.3	9.58	13.0	10.31	13.7	11.00	14.2	11.68	14.8	12.34	15.3	12.99
9,442	12.0	9.96	12.8	10.78	13.5	11.54	14.1	12.27	14.7	12.97	15.2	13.66	15.7	14.34
9,914	12.6	11.22	13.3	12.07	14.0	12.86	14.6	13.62	15.2	14.36	15.7	15.08	16.2	15.78
10,386	13.1	12.57	13.8	13.45	14.5	14.28	15.1	15.07	15.6	15.84	16.1	16.58	16.6	17.32
10,858	13.6	14.03	14.3	14.94	15.0	15.80	15.6	16.62	16.1	17.41	16.6	18.19	17.1	18.95
11,330	14.1	15.58	14.8	16.52	15.5	17.41	16.0	18.27	16.6	19.09	17.1	19.90	17.5	20.68
11,803	14.7	17.24	15.4	18.22	16.0	19.14	16.5	20.02	17.1	20.87	17.6	21.71	18.0	22.52
12,275	15.2	19.01	15.9	20.01	16.5	20.96	17.0	21.88	17.5	22.76	18.0	23.62	18.5	24.47
12,747	15.7	20.88	16.4	21.92	17.0	22.90	17.5	23.84	18.0	24.76	18.5	25.65	19.0	26.52

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)													
	399		448		498		548		598		648		697	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4,721	11.9	5.02	12.3	5.44	12.8	5.88	13.2	6.31	13.6	6.75	14.0	7.19	14.4	7.63
5,665	12.7	6.40	13.2	6.87	13.6	7.34	14.0	7.81	14.4	8.29	14.8	8.77	15.2	9.25
7,082	14.0	9.02	14.4	9.56	14.9	10.09	15.3	10.63	15.7	11.16	16.1	11.70	16.4	12.24
7,554	14.4	10.04	14.9	10.61	15.3	11.17	15.7	11.72	16.1	12.28	16.5	12.84	16.8	13.40
8,026	14.8	11.16	15.3	11.74	15.7	12.32	16.1	12.91	16.5	13.48	16.9	14.06	17.3	14.64
8,498	15.3	12.35	15.7	12.96	16.2	13.57	16.6	14.17	17.0	14.77	17.3	15.37	17.7	15.97
8,970	15.7	13.63	16.2	14.27	16.6	14.90	17.0	15.53	17.4	16.15	17.8	16.77	18.1	17.39
9,442	16.2	15.01	16.6	15.67	17.0	16.32	17.4	16.97	17.8	17.62	18.2	18.27	18.6	18.91
9,914	16.6	16.47	17.1	17.16	17.5	17.84	17.9	18.51	18.3	19.19	18.6	19.85	19.0	20.52
10,386	17.1	18.04	17.5	18.75	17.9	19.45	18.3	20.15	18.7	20.85	19.1	21.53	—	—
10,858	17.5	19.70	18.0	20.44	18.4	21.16	18.8	21.89	—	—	—	—	—	—
11,330	18.0	21.46	18.4	22.22	18.8	22.98	—	—	—	—	—	—	—	—
11,803	18.5	23.32	18.9	24.11	—	—	—	—	—	—	—	—	—	—
12,275	18.9	25.29	—	—	—	—	—	—	—	—	—	—	—	—
12,747	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)									
	747		797		847		897		947	
	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW	r/s	BkW
4,721	14.7	8.08	15.1	8.53	15.4	8.98	15.8	9.44	16.1	9.90
5,665	15.5	9.73	15.9	10.21	16.2	10.70	16.6	11.19	16.9	11.68
7,082	16.8	12.78	17.1	13.32	17.5	13.86	17.8	14.40	18.1	14.94
7,554	17.2	13.96	17.5	14.51	17.9	15.07	18.2	15.63	18.5	16.20
8,026	17.6	15.22	18.0	15.80	18.3	16.38	18.6	16.96	18.9	17.54
8,498	18.0	16.57	18.4	17.17	18.7	17.77	19.0	18.37	19.4	18.96
8,970	18.5	18.01	18.8	18.63	19.1	19.25	19.5	19.87	19.8	20.49
9,442	18.9	19.55	—	—	19.6	20.83	19.9	21.46	—	—
9,914	—	—	—	—	20.0	22.50	—	—	—	—
10,386	—	—	—	—	—	—	—	—	—	—
10,858	—	—	—	—	—	—	—	—	—	—
11,330	—	—	—	—	—	—	—	—	—	—
11,803	—	—	—	—	—	—	—	—	—	—
12,275	—	—	—	—	—	—	—	—	—	—
12,747	—	—	—	—	—	—	—	—	—	—

LEGEND

BkW — Brake Kilowatts

NOTES:
1. Fan performance is based on dry coils, economizer, roof curb, cabinet losses, and clean 51 mm filters.
2. Conversion — BkW to input watts:
   Watts = BkW/Motor Efficiency
3. VAV units will operate down to 1.02 L/s/1000 kW in the cooling mode. Performance at 1.02 L/s/1000 kW is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

Table 30A — Fan Performance — Power Exhaust, 50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048 (English)

AIRFLOW (Cfm)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
6,500	0.32	2.82	3160	0.70	2.98	3340	—	—	—	—	—	—	—	—	—	—	—	—
6,700	0.23	2.87	3220	0.63	3.03	3400	0.60	3.01	3380	0.82	3.23	3620	—	—	—	—	—	—
6,900	0.17	2.92	3270	0.59	3.09	3460	0.55	3.07	3440	0.78	3.28	3680	—	—	—	—	—	—
7,100	0.13	2.93	3290	0.56	3.11	3490	0.49	3.12	3500	0.73	3.34	3740	—	—	—	—	—	—
7,300	0.09	2.97	3330	0.53	3.15	3530	0.43	3.18	3560	0.68	3.39	3800	—	—	—	—	—	—
7,500	—	—	—	0.51	3.19	3580	0.39	3.24	3630	0.64	3.44	3860	—	—	—	—	—	—
7,700	—	—	—	0.48	3.23	3620	0.33	3.27	3670	0.59	3.48	3900	0.60	3.69	4140	0.73	3.98	4460
7,900	—	—	—	0.45	3.27	3670	0.27	3.32	3720	0.54	3.52	3950	0.56	3.74	4190	0.69	4.02	4510
8,100	—	—	—	0.40	3.33	3730	0.22	3.36	3770	0.49	3.57	4000	0.51	3.78	4240	0.65	4.07	4560
8,500	—	—	—	—	—	—	0.17	3.47	3890	0.40	3.67	4120	0.41	3.83	4290	0.56	4.12	4620
8,900	—	—	—	—	—	—	0.00	3.58	4010	0.30	3.77	4230	0.31	3.93	4410	0.47	4.23	4740
9,300	—	—	—	—	—	—	—	—	—	0.22	3.87	4340	0.20	4.07	4560	0.37	4.37	4900
9,700	—	—	—	—	—	—	—	—	—	0.16	3.95	4430	0.11	4.17	4670	0.30	4.47	5010
10,100	—	—	—	—	—	—	—	—	—	0.12	4.03	4520	0.04	4.25	4770	0.23	4.56	5110
10,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	4.66	5220
10,900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	4.75	5330
11,300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	4.80	5380
11,700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	4.83	5420

LEGEND

Bhp — Brake Horsepower
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

Table 30B — Fan Performance — Power Exhaust, 50AJ,AK,AW,AY020-050 and 50EJ,EK,EW,EY024-048 (SI)

AIRFLOW (L/s)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v		
	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)
3069	80	1.57	3160	174	1.66	3340	—	—	—	—	—	—	—	—	—	—	—	—
3163	57	1.60	3220	157	1.69	3400	149	1.68	3380	204	1.80	3620	—	—	—	—	—	—
3257	42	1.62	3270	147	1.72	3460	137	1.71	3440	194	1.83	3680	—	—	—	—	—	—
3352	32	1.63	3290	139	1.73	3490	122	1.74	3500	182	1.86	3740	—	—	—	—	—	—
3446	22	1.65	3330	132	1.75	3530	107	1.77	3560	169	1.89	3800	—	—	—	—	—	—
3541	—	—	—	127	1.78	3580	97	1.80	3630	159	1.92	3860	—	—	—	—	—	—
3635	—	—	—	120	1.80	3620	82	1.82	3670	147	1.94	3900	149	2.05	4140	182	2.21	4460
3730	—	—	—	112	1.82	3670	67	1.85	3720	135	1.96	3950	139	2.08	4190	172	2.24	4510
3824	—	—	—	100	1.85	3730	55	1.87	3770	122	1.99	4000	127	2.10	4240	162	2.26	4560
4013	—	—	—	—	—	—	42	1.93	3890	100	2.04	4120	102	2.13	4290	139	2.29	4620
4202	—	—	—	—	—	—	0	1.99	4010	75	2.10	4230	77	2.19	4410	117	2.35	4740
4391	—	—	—	—	—	—	—	—	—	55	2.15	4340	50	2.26	4560	92	2.43	4900
4579	—	—	—	—	—	—	—	—	—	40	2.20	4430	27	2.32	4670	75	2.49	5010
4768	—	—	—	—	—	—	—	—	—	30	2.24	4520	10	2.37	4770	57	2.54	5110
4957	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42	2.59	5220
5146	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	2.65	5330
5335	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	2.67	5380
5524	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	2.69	5420

LEGEND

ESP — External Static Pressure (Pa)
kW — Kilowatts
W — Input Watts to Motor

Table 31A — Fan Performance — Power Exhaust, 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 (English)

AIRFLOW (Cfm)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
9,750	0.32	4.23	4740	0.70	4.47	5010	—	—	—	—	—	—	—	—	—	—	—	—
10,050	0.23	4.31	4830	0.63	4.55	5100	0.60	4.52	5070	0.82	4.84	5430	—	—	—	—	—	—
10,350	0.17	4.37	4905	0.59	4.63	5190	0.55	4.60	5160	0.78	4.92	5520	—	—	—	—	—	—
10,650	0.13	4.40	4935	0.56	4.67	5235	0.49	4.68	5250	0.73	5.00	5610	—	—	—	—	—	—
10,950	0.09	4.46	4995	0.53	4.72	5295	0.43	4.76	5340	0.68	5.08	5700	—	—	—	—	—	—
11,250	—	—	—	0.51	4.79	5370	0.39	4.86	5445	0.64	5.16	5790	—	—	—	—	—	—
11,550	—	—	—	0.48	4.84	5430	0.33	4.91	5505	0.59	5.22	5850	0.60	5.54	6210	0.73	5.97	6690
11,850	—	—	—	0.45	4.91	5505	0.27	4.98	5580	0.54	5.28	5925	0.56	5.61	6285	0.69	6.03	6765
12,150	—	—	—	0.40	4.99	5595	0.22	5.04	5655	0.49	5.35	6000	0.51	5.67	6360	0.65	6.10	6840
12,750	—	—	—	—	—	—	0.17	5.20	5835	0.40	5.51	6180	0.41	5.74	6435	0.56	6.18	6930
13,350	—	—	—	—	—	—	0.00	5.36	6015	0.30	5.66	6345	0.31	5.90	6615	0.47	6.34	7110
13,950	—	—	—	—	—	—	—	—	—	0.22	5.81	6510	0.20	6.10	6840	0.37	6.56	7350
14,550	—	—	—	—	—	—	—	—	—	0.16	5.93	6645	0.11	6.25	7005	0.30	6.70	7515
15,150	—	—	—	—	—	—	—	—	—	0.12	6.05	6780	0.04	6.38	7155	0.23	6.84	7665
15,750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	6.98	7830
16,350	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	7.13	7995
16,950	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	7.20	8070
17,550	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	7.25	8130

LEGEND

Bhp — Brake Horsepower
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

Table 31B — Fan Performance — Power Exhaust, 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 (SI)

AIRFLOW (L/s)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v			208 v			230, 380, 460, 575 v		
	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)	ESP	kW	Power (W)
4603	80	2.35	4740	174	2.49	5010	—	—	—	—	—	—	—	—	—	—	—	—
4745	57	2.40	4830	157	2.53	5100	149	2.52	5070	204	2.70	5430	—	—	—	—	—	—
4886	42	2.43	4905	147	2.58	5190	137	2.56	5160	194	2.74	5520	—	—	—	—	—	—
5028	32	2.45	4935	139	2.60	5235	122	2.61	5250	182	2.78	5610	—	—	—	—	—	—
5169	22	2.48	4995	132	2.63	5295	107	2.65	5340	169	2.83	5700	—	—	—	—	—	—
5311	—	—	—	127	2.67	5370	97	2.70	5445	159	2.87	5790	—	—	—	—	—	—
5453	—	—	—	120	2.70	5430	82	2.73	5505	147	2.90	5850	149	3.08	6210	182	3.32	6690
5594	—	—	—	112	2.73	5505	67	2.77	5580	135	2.94	5925	139	3.12	6285	172	3.36	6765
5736	—	—	—	100	2.78	5595	55	2.81	5655	122	2.98	6000	127	3.16	6360	162	3.40	6840
6019	—	—	—	—	—	—	42	2.90	5835	100	3.07	6180	102	3.19	6435	139	3.44	6930
6303	—	—	—	—	—	—	0	2.99	6015	75	3.15	6345	77	3.28	6615	117	3.53	7110
6586	—	—	—	—	—	—	—	—	—	55	3.23	6510	50	3.40	6840	92	3.65	7350
6869	—	—	—	—	—	—	—	—	—	40	3.30	6645	27	3.48	7005	75	3.73	7515
7152	—	—	—	—	—	—	—	—	—	30	3.37	6780	10	3.55	7155	57	3.80	7665
7436	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42	3.89	7830
7719	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	3.97	7995
8002	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	4.01	8070
8285	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	4.04	8130

LEGEND

ESP — External Static Pressure (Pa)
kW — Kilowatts
W — Input Watts to Motor

Table 32 — Motor Limitations

STANDARD EFFICIENCY MOTORS									
Nominal		Maximum		Maximum Amps				Maximum Watts	Maximum Efficiency
Bhp	BkW	Bhp	BkW	230 v	380 v	460 v	575 v		
5	3.73	5.9	4.40	14.6	11.0	7.9	6.0	5,030	87.5
7.5	5.60	8.7	6.49	22.0	—	—	—	7,717	84.1
		9.5	7.09	—	15.0	12.0	10.0	8,008	88.5
10	7.46	10.2	7.61	28.0	—	—	—	8,502	89.5
		11.8	8.80	—	20.7	14.6	12.0	9,836	89.5
15	11.19	15.3	11.41	43.8	—	—	—	12,543	91.0
		18.0	13.43	—	27.0	21.9	19.0	14,756	91.0
20	14.92	22.4	16.71	62.0	—	—	—	18,363	91.0
		23.4	17.46	—	37.4	28.7	23.0	19,183	91.0
25	18.65	28.9	21.56	72.0	—	—	—	23,511	91.7
		29.4	21.93	—	43.8	37.4	31.0	23,918	91.7
30	22.38	35.6	26.56	95.0	—	—	—	28,742	92.4
		34.7	25.89	—	N/A	48.0	47.0	28,015	92.4
40	29.84	42.0	31.33	110.0	N/A	55.0	48.8	33,690	93.0

HIGH EFFICIENCY MOTORS							
Nominal		Maximum		Maximum Amps		Maximum Watts	Maximum Efficiency
Bhp	BkW	Bhp	BkW	230 v	460 v		
5	3.73	5.9	4.40	15.8	7.9	4,918	89.5
7.5	5.60	8.7	6.49	22.0	—	7,078	91.7
		9.5	7.09	—	12.0	7,728	91.7
10	7.46	10.2	7.61	28.0	—	8,298	91.7
		11.8	8.80	—	15.0	9,600	91.7
15	11.19	15.3	11.41	43.8	—	12,273	93.0
		18.0	13.43		21.9	14,439	93.0
20	14.92	22.4	16.71	58.2	—	17,853	93.6
		23.4	17.46	—	28.7	18,650	93.6
25	18.65	28.9	21.56	73.0	—	23,034	93.6
		29.4	21.93	—	36.3	23,432	93.6
30	22.38	35.6	26.56	82.6	—	28,374	93.6
		34.7	25.89	—	41.7	27,656	93.6
40	29.84	42.0	31.33	110.0	55.0	33,156	94.5

LEGEND

Bhp — Brake Horsepower
BkW — Brake Kilowatts

NOTES:
1. Extensive motor and electrical testing on the Carrier units has ensured that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horsepower ratings shown in the Motor Limitations table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
2. All motors comply with Energy Policy Act (EPACT) Standards effective October 24, 1997.

Table 33 — Air Quantity Limits

UNIT 50AJ,AK,AW,AY	UNIT 50EJ,EK,EW,EY	MINIMUM HEATING AIRFLOW (VAV)		MINIMUM HEATING AIRFLOW (CV)		MINIMUM COOLING AIRFLOW (VAV) AT FULL LOAD OPERATION		MINIMUM COOLING AIRFLOW (CV)		MAXIMUM AIRFLOW	
		Cfm	L/s	Cfm	L/s	Cfm	L/s	Cfm	L/s	Cfm	L/s
020	024	6,000	2,830	6,000	2,830	4,000	1,890	6,000	2,830	10,000	4,720
025	028	6,000	2,830	7,500	3,540	5,000	2,360	7,500	3,540	12,500	5,900
027	030	6,000	2,830	8,100	3,820	5,400	2,550	8,100	3,820	13,500	6,370
030	034	6,000	2,830	9,000	4,250	6,000	2,830	9,000	4,250	15,000	7,080
035	038	10,500	4,960	10,500	4,960	7,000	3,300	10,500	5,960	17,500	8,260
040	044	10,500	4,960	12,000	5,670	8,000	3,780	12,000	5,670	20,000	9,440
—	048	10,500	4,960	13,500	6,370	9,000	4,250	13,500	6,370	22,500	10,620
050	—	10,500	4,960	15,000	7,080	10,000	4,720	15,000	7,080	22,500	10,620
—	054	15,000	7,080	15,000	7,080	10,000	4,720	15,000	7,080	25,000	11,800
—	058	15,000	7,080	16,500	7,790	11,000	5,190	16,500	7,790	27,000	12,750
060	064	15,000	7,080	18,000	8,500	12,000	5,670	18,000	8,500	27,000	12,750
—	068	15,000	7,080	19,500	9,210	13,000	6,140	19,500	9,210	27,000	12,750

LEGEND

CV — Constant Volume
VAV — Variable Air Volume

NOTE: Variable Air Volume units will operate down to 70 cfm/ton (9.39 L/s per kW) in Cooling mode. Performance at 70 cfm/ton (9.39 L/s per kW) is limited to unloaded operation and may be additionally limited to edb and ewb conditions.

Table 34 — User Defined Set Points

SET POINT	FORMAT	DESCRIPTION	LIMITS	DEFAULT
OHSP	xx.xF	Occupied Heat Set Point	55 to 80 F (13 to 27 C)	68 F (20 C)
OCSP	xx.xF	Occupied Cool Set Point	55 to 80 F (13 to 27 C)	78 F (26 C)
UHSP	xx.xF	Unoccupied Heat Set Point	35 to 80 F (4 to 27 C)	55 F (13 C)
UCSP	xx.xF	Unoccupied Cool Set Point	75 to 110 F (24 to 35 C)	90 F (32 C)
SASP	xx.xF	Supply Air Set Point	45 to 70 F (7 to 21 C)	55 F (13 C)
OATL	xx.xF	Hi OAT Lockout Temperature	55 to 75 F (13 to 25 C)	65 F (18 C)
NTLO	xx.xF	Unoccupied OAT Lockout Temperature	40 to 70 F (4 to 21 C)	50 F (10 C)
RTIO	xx.x	Reset Ratio	0 to 10	3
LIMT	xx.x^F	Reset Limit	0 to 20° F (0 to 11° C)	10° F (5.6° C)
MDP	xxx%	Minimum Damper Position	0 to 100%	20%
LOWMDP	xxx%	Low Temperature Minimum Damper Position Override	0 to 100%	100%
IAQS	xxxx	IAQ Set Point	1 to 5000 PPM	650 PPM
UHDB	xx.x^F	Unoccupied Heating Deadband	0 to 10° F (0 to 6° C)	1° F (0.56° C)
UCDB	xx.x^F	Unoccupied Cooling Deadband	0 to 10° F (0 to 6° C)	1° F (0.56° C)
LTMP	xxx%	Low Temp. Min. Position	0 to 100%	10%
HTMP	xxx%	High Temp. Min. Position	0 to 100%	35%
PES1	xxx%	CV Power Exhaust Stage 1 Point	0 to 100%	25%
PES2	xxx%	CV Power Exhaust Stage 2 Point	0 to 100%	75%

LEGEND

CV — Constant Volume
IAQ — Indoor Air Quality
OAT — Outdoor Air Temperature

Table 35 — Software Control Link Points

SET POINT	DESCRIPTION	SET POINT	DESCRIPTION
		CV Data	
SPT	Space Temperature	**HS2**	Heat Stage 2
SAT	Supply-Air Temperature	**STO**	Space Temp. Offset
RAT	Return-Air Temperature	**CVPE1**	CV Power Exhaust Stg 1
OAT	Outside-Air Temperature	**CVPE2**	CV Power Exhaust Stg 2
CLSP	Control Set point	**VAV Data**	
CCAP	Cooling % Total Capacity	**HIR**	Heat Interlock Relay
HCAP	Heating % Total Capacity	**SPTRESET**	Space Temp. Reset
ECOS	Economizer Active	**CMP1**	Compressor 1
SFSTAT	Supply Fan Status	**CMP1SAFE**	Compressor 1 Safety
SF	Fan Relay	**CMP2**	Compressor 2
ECONPOS	Economizer Position	**CMP2SAFE**	Compressor 2 Safety
IQMP	Min. Damper Position	**ULD1**	Unloader 1
PEXE	Pwr. Exhaust Enable	**ULD2**	Unloader 2
FLTS	Filter Status	**OFC1**	Outdoor Fan 1
FAS	Field Applied Status	**OFC2**	Outdoor Fan 2
RMTOCC	Remote Occupied Mode	**Y1**	Y1 - Call for Cool 1
General Data		**Y2**	Y2 - Call for Cool 2
HS1	Heat Stage 1	**W1**	W1 - Call for Heat 1
ENTH	Enthalpy	**W2**	W2 - Call for Heat 2
IAQI	Indoor Air Quality	**G**	G - Call for Fan
IAQO	Outdoor Air Quality	**CDEVCODE**	CONQUEST DEVICE CODE
SATRES	SAT Reset	**CDEVURST**	CONQUEST UNIT RESET
ALMLIGHT	Alarm Warning Light	**CDEVBCAK**	CONQUEST BROADCAST ACK
DL	Demand Limit Switch	**PE1**	Mod. Power Exhaust Stg 1
EVAC	Evacuation	**PE2**	Mod. Power Exhaust Stg 2
PRES	Pressurization	**PE3**	Mod. Power Exhaust Stg 3
PURG	Smoke Purge	**PE4**	Mod. Power Exhaust Stg 4
FSD	Fire Shutdown	**PE5**	Mod Power Exhaust Stg 5
		PE6	Mod Power Exhaust Stg 6

When Y1 input is energized, the economizer will be modulated to maintain SAT at the defined set point. The default is 55 F (13 C). When SAT is above the set point, the economizer will be 100% open. When SAT is below the set point, the economizer will modulate between minimum and 100% open position. When Y2 is energized, the control module will turn on compressor 1 and continue to modulate the economizer as described above. If the Y2 remains energized and the SAT reading remains above the set point for 15 minutes, compressor 2 will turn on. If Y2 is deenergized at any time, only the last stage of compression that was energized will be turned off. If outdoor conditions are not suitable for economizer cooling, the economizer will go to minimum position and cycle compressors 1 and 2 based on demand from Y1 and Y2 respectively. The compressors will be locked out when the SAT temperature is too low (less than 40 F [4 C] for compressor 1 and less than 45 F [7 C] for compressor 2). After a compressor is locked out, it can restart after normal time-guard period.

The Time Guard® function maintains a minimum off time of 5 minutes, a minimum on time of 10 seconds, and a minimum delay before starting the second compressor of 10 seconds.

If the compressors have been off for more than 15 minutes and the outdoor air temperature is less than 45 F (7 C), then the safeties will be ignored for 5 minutes. At all other times, safeties will be used.

When heating, the heat stages respond to the demand from W1 and W2 of the thermostat input. Heating and cooling will be mutually locked out on demand on a first call basis. The heating and the cooling functions cannot operate simultaneously.

COOLING, VARIABLE AIR VOLUME (VAV) UNITS — On power up, the control module will activate the initialization software. The initialization software reads DIP switch no. 1 position to determine CV or VAV operation. The initialization sequence clears all alarms and alerts, re-maps the input/output database for VAV operation, sets maximum heat stages to 1, and sets maximum cool stages to 6. The control module reads DIP switch no. 3 and determines if the unit will use expansion board operation. Power up takes a random time of 1 to 63 seconds plus 5 minutes the first time power is sent to the control board after a power outage.

The control module will determine if an interface (linkage) is active and if the unit will operate in a Digital Air Volume (DAV) mode. In a DAV system, the room terminals are equipped with microprocessor controls that give commands to the base unit module. If a linkage is active, the control module will replace local comfort set points, space and return air temperatures, and occupancy status with the linkage data supplied.

The control module will determine occupancy status from Time Schedules (if programmed), Remote Occupied/ Unoccupied input, global occupancy schedules, or DAV. If Temperature Compensated Start is active, the unit will be controlled as in the Occupied mode.

NOTE: The temperature compensated start is a period of time calculated to bring the unit on while in Unoccupied mode to reach the occupied set point when occupancy occurs.

The control module will set the appropriate operating mode and fan control. The control module will turn on the VFD if Occupied mode is evident.

For units equipped with a start/stop switch only (no space temperature sensor), if in Unoccupied mode and a valid return air temperature reading is available (either from a sensor or DAV), the control module will monitor return air temperature against Unoccupied Heat and Cool set points.

For units with a start/stop switch and a space temperature (SPT) sensor, the control module will start the VFD whenever SPT is outside of the set points (Unoccupied Heat or Unoccupied Cool). The VFD may also be started by nighttime thermostat via remote Occupied/Unoccupied input or by a Temperature Compensated Start algorithm. When the VFD is running in a normal mode, the control module will start heating or cooling as required to maintain supply-air temperature (SAT) at the supply air set point (SASP) plus the reset (when enabled). The reset value is determined by SAT reset and/or space temperature reset algorithms. The reset is only available when enabled through software.

When cooling, the control module will energize the power exhaust enable output to the external power exhaust controller (when power exhaust is used).

If Occupied, the control module will perform economizer control (economizer control same as described above for CV units). If Unoccupied, the control module will perform nighttime free cool and IAQ pre-occupancy purge as required (when enabled through software). When DX (direct expansion) cooling is called, the outdoor fans will always operate.

The control module will run continuous diagnostics for alarms/alerts; respond to CCN (Carrier Comfort Network) communications; perform any configured network POC (product outboard control) functions such as time and outdoor air temperature broadcast and global broadcast; and perform Fire/ Smoke control if equipped with power exhaust.

ELECTRIC HEATING, CONSTANT VOLUME (CV) UNITS — The control module is powered by 24 vac. If the unit is controlled with a room sensor, the fan will run continuously in the Occupied mode, with the outside-air damper in the minimum position. If the unit is controlled through a room thermostat (with FAN set to AUTO), upon a call for heat the first stage of heat is energized, the indoor-fan motor will turn on, and the outdoor-air damper will move to the minimum position. Upon a call for additional heat (if the unit is equipped with a two-stage heater), the second stage of heat is energized. When the call for heat is satisfied, the heaters will deenergize. The indoor-fan motor will also deenergize (unless controlled by a room sensor) and the outdoor-air damper will move to the closed position.

If the unit is controlled with a room sensor the fan will not run in the Unoccupied mode. Upon a call for heat, the first stage of heat is energized, the indoor-fan motor will turn on, and the outdoor air damper will move to the Unoccupied IAQ position (generally set to zero in the Unoccupied mode). The IAQ feature is enabled through system software. Upon a call for additional heat (if the unit is equipped with a two-stage heater), the second stage of heat is energized. When the call for heat is satisfied, the heaters and indoor-fan motor will deenergize and the outdoor-air damper will move to the closed position (if open).

ELECTRIC HEATING, VARIABLE AIR VOLUME (VAV) UNITS — Variable Air Volume (VAV) occupied heat is controlled by return-air temperature (RAT) using a 5k thermistor located just below the outdoor-air dampers. The RAT also controls a VAV unit without a space temperature sensor. A VAV unit with a space temperature sensor has Unoccupied Heat controlled by space temperature (SPT).

The control module board is powered by 24 vac. When there is a call for heating (from Morning Warm-up, Unoccupied, or Occupied modes), power is sent from the control module board to energize the first stage of electric heat. A field-supplied heat interlock relay (HIR) signals for the air terminals to fully open. The HIR is not required on a DAV system. In the Occupied mode, the indoor-fan motor will operate continuously and the outdoor-air dampers will be in the minimum position. In the Unoccupied mode, the indoor-fan motor will be off, but will energize upon the call for heat. The outdoor-air dampers will move to the IAQ unoccupied position (generally set to zero in the Unoccupied mode). The duct pressure sensor will signal to the variable frequency drive to operate at full speed. When the call for heat is satisfied the heaters will deenergize.

If the unit is in the Unoccupied mode, the indoor-fan motor will deenergize and the outdoor-air damper will move to the closed position (if open).

MORNING WARM-UP (VAV Only with PC Accessed/ CCN Operation) — Morning warm-up occurs when the control module has been programmed to turn on heat, prior to the Occupied mode, to be ready for the occupancy. Morning warm-up is a condition in VAV systems that occurs when the Temperature Compensated Start algorithm calculates a biased occupied start time and the unit has a demand for heating. The warm-up will continue into the occupied period as long as there is a need for heat. During warm-up, the unit can continue heating into the occupied period, even if occupied heating is disabled. When the heating demand is satisfied, the warm-up condition will terminate. To increase or decrease the heating demand, use the network access software to change the Occupied Heating Set Point.

NOTE: To utilize morning warm-up mode, the unit occupancy schedule must be accessed via Service Tool, ComfortWORKS®, or accessory Remote Enhanced Display. The PC can access the base control board via the 3-wire communication bus or via an RJ-11 connection to the CCN terminal on the base control board. See Fig. 25.

For software (version 3.0 or later), the Low Temperature Minimum Damper Position Override (LOWMDP) has a 0 to 100% limit, with a default of 100%. Think of the LOWMDP as a second minimum damper position. This LOW-MDP limit change requires access to the unit software with a computer equipped with Building Supervisor, Service Tool, or ComfortWORKS Software.

When the LOWMDP is in effect the outdoor air dampers will remain at the LOWMDP position (typically set to 0% closed) during heating, even in the Occupied Mode. For the LOWMDP to be in effect, the LOWMDP must be less than the minimum damper position (MDP) and the return-air temperature (RAT) must be less than the Occupied Heat Set Point (OHSP) minus 2.5 F. Table 36 summarizes the operational requirements and controlling factors for Occupied Heat and Morning Warm-up.

Table 36 — Occupied Heat and Morning Warm-Up Operation and Controlling Factors

SOFTWARE VERSION	OCCUPIED HEAT ENABLED VIA	MORNING WARM-UP MAY START DURING	TEMPERATURE CONDITION FOR HEAT TO START
3.0 and later	DIP switch no. 5	Smart start or within 10 minutes	RAT < OHSP

LEGEND

OSHP — Occupied Heat Set Point
RAT — Return-Air Temperature
SAT — Supply-Air Temperature

MORNING WARM-UP (VAV Only with Stand-Alone Operation) — When a unit operates in stand-alone mode, morning warm-up occurs when the unit is energized in Occupied mode and return-air temperature (RAT) is below 68 F (20 C). Warm-up will not terminate until the RAT reaches 68 F (20 C). The heat interlock relay output is energized during morning warm-up. (A field-installed 24-vac heat interlock relay is required.) The output will be energized until the morning warm-up cycle is complete. Refer to Fig. 56 for heat interlock relay wiring.

SPACE TEMPERATURE RESET SENSOR (VAV Only) — An accessory space temperature sensor (T-55 or T-56 without offset) is required. Space temperature reset is used to reset the supply-air temperature set point of a VAV system higher, as the space temperature falls below the Occupied Cool set point. As the space temperature falls below the cool set point, the supply-air temperature will be reset upward as a function of the reset ratio. (Default is 3.) Reset ratio is expressed in degrees change in supply-air temperature per degree of space temperature change. A reset limit will exist which will limit the maximum number of degrees the supply-air temperature may be raised. (Default is 10° F [5.6° C].) Both the reset ratio and the reset limit are user definable. The sequence of operation is as follows:

1. The on/off status of the unit supply fan is determined.
2. If the fan is on, the sequence will check if the system is in Occupied mode.
3. If the system is in Occupied mode, the sequence will determine if the reset option is enabled.
4. If the reset option is enabled, the sequence will read the space temperature and compare it to the Occupied Cool set point. If the temperature is below the Occupied Cool set point, the algorithm will compute the reset value and compare this value against the reset limit. If it is greater than the reset limit, the sequence will use the reset limit as the reset value. See Fig. 57.

NOTE: A computer equipped with Carrier network access software (ComfortWORKS, Building Supervisor, or Service Tool) or an accessory Remote Enhanced Display is required to enable this function.

Space Temperature Reset Example — The Occupied Cooling Set Point (OCSP) is set to 73 F (22.8 C). The Reset Ratio is set to 5. The Reset Limit is set to 20° F. The Reset Ratio determines how many degrees F the temperature is reset. At 72 F (22.2 C), the supply temperature will be reset 5° F (2.8° C) higher. At 71 F (21.7 C), the supply temperature will be reset 10° F (5.6° C) higher. At 70 F (21.1 C), the supply temperature will be reset 15° F (8.4° C) higher. At 69 F (20.6 C), the supply temperature will be reset 20° F (11.2° C) higher and the Reset Limit will have been reached.

POWER EXHAUST OPERATION — Power exhaust has two options (constant volume and modulating) that have the following sequence of operation:

The constant volume power exhaust stage 1 (CVPE1) is enabled when the indoor fan has been energized and the desired outdoor-air damper position for the economizer increases above the first constant volume (CV) power exhaust stage 1 point (PES1). The PES1 factory default value is set at 25%. The constant volume power exhaust stage 2 (CVPE2) is enabled when the desired outdoor-air damper position for the economizer increases above the second CV power exhaust stage 2 point (PES2). The PES2 factory default value is set at 75%. Each stage is disabled when the desired damper position decreases below the respective set points.

The modulating power exhaust is enabled when the indoor fan is energized and the building pressure has exceeded the individual sequencer set points. The default set points are 0.04 in. wg (9.9 Pa) (6.3 Vdc) for stage 1, 0.10 in. wg (24.9 Pa) (6.8 Vdc) for stage 2, 0.16 in. wg (39.8 Pa) (7.3 Vdc) for stage 3, 0.23 in. wg (57.1 Pa) (7.8 Vdc) for stage 4, 0.29 in. wg (72.0 Pa) (8.3 Vdc) for stage 5, and 0.35 in. wg (86.9 Pa) (8.8 Vdc) for stage 6 power exhaust sequencer. Each stage also requires that the building pressure be reduced until it drops below the disable set point. The default set points are 0 in. wg (0.0 Pa) (6.0 Vdc) for stage 1, 0.60 in. wg (14.9 Pa) (6.5 Vdc) for stage 2, 0.13 in. wg (32.3 Pa) (7.0 Vdc) for stage 3, 0.19 in. wg (47.2 Pa) (7.4 Vdc) for stage 4, 0.25 in. wg (47.5 Pa) (8.0 Vdc) for stage 5, and 0.31 in. wg (62.4 Pa) (8.5 Vdc) for stage 6 power exhaust sequencer. Both of these set points are changed at the specific controlling sequencer. It is not forcible from CCN.

If the indoor fan is on, then PEXE = ON. If the indoor fan is off, then PEXE = OFF. In addition, on units equipped with the Expansion I/O module, the control module board may have direct access 4 to 6 Modulated Power Exhausted stages bypassing an external sequencer device. These stages will be controlled directly in fire/smoke modes.

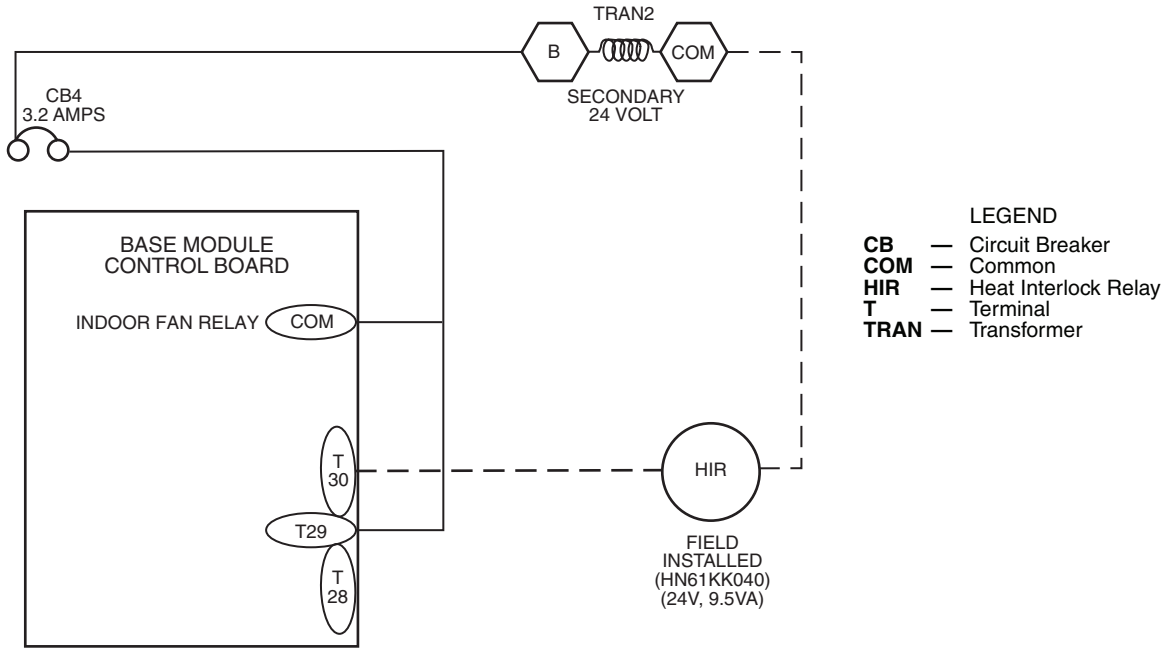
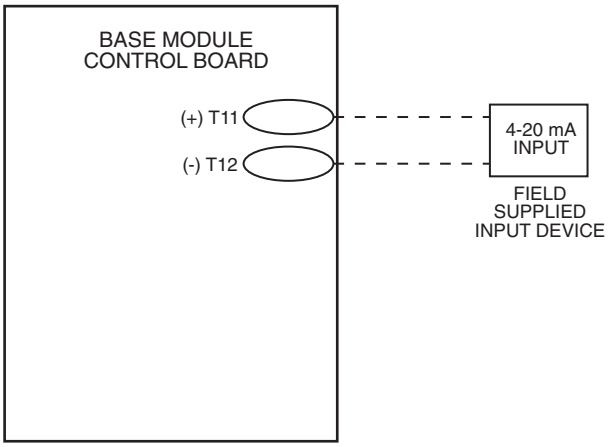


Fig. 56 — Heat Interlock Relay Wiring



LEGEND

T — Terminal

NOTE: The 4 to 20 mA input is a field-supplied non-Carrier EMS (Energy Management System) device.

mA INPUT	RESET	
	DEG. F	DEG. C
4	0.00	0.00
5	1.25	0.70
6	2.50	1.40
7	3.75	2.10
8	5.00	2.80
9	6.25	3.50
10	7.50	4.20
11	8.75	4.90
12	10.00	5.60
13	11.25	6.30
14	12.50	7.00
15	13.75	7.70
16	15.00	8.40
17	16.25	9.10
18	17.50	9.80
19	18.75	10.50
20	20.00	11.20

Fig. 57 — Supply Temperature Reset Wiring

SMOKE CONTROL MODES — The 50AJ,AK,AW,AY and 50EJ,EK,EW,EY units with an optional expansion board perform fire and smoke control modes. The expansion board provides 4 modes which can be used to control smoke within the conditioned area. The modes of operation are fire shutdown, pressurization, evacuation, and smoke purge. See Table 37.

SMOKE DETECTOR — A smoke detector can be used to initiate fire shutdown. This can be accomplished by a set of normally closed pilot relay contacts which will interrupt power from the 24-v transformer, secondary "B" terminal to the control circuit breaker (CB4). See Fig. 58. The wire that connects these two points is white and labeled "W78."

The smoke detector may be mounted in the return air duct or the supply duct. Carrier does not make recommendations as to specific smoke detector location due to liability considerations.

INDOOR AIR QUALITY (IAQ) CONTROL — The accessory IAQ sensor is required for IAQ control on the base control board. The Carrier sensors operate with a 4 to 20 mA signal. The 4 to 20 mA signal is connect to T13 (+) and T14 (-) on the base control board for the IAQ sensor, and T15 (+) and T16 (-) on the base control board for the OAQ (Outdoor Air Quality) sensor. The sensor is field-mounted and wired to the base control board installed in the unit main control box. The IAQ sensor must be powered by a field-supplied 24-V power supply (ungrounded). Do not use the unit 24-V power supply to power sensor.

NOTE: The Carrier IAQ/OAQ sensors are shipped configured for a 0 to 10 vdc signal for use on previously designed PIC (Product Integrated Control) products. This signal must be changed to the 4 to 20 mA signal to be used on these products, which is accomplished through a jumper change. The IAQ/OAQ input signals are also polarized, with (+) connecting to the odd numbered terminals and (-) connected to the even numbered terminals. Refer to Indoor-Air Quality Section in the Controls, Operation, and Troubleshooting Manual for further sequence of operation.

NOTE: The IAQ Control function was incorporated onto the base control board on these units with serial number of 0600F and later.

Once installed, the sensor must be enabled. The sensor is configured with default values which may be changed through network access software. To work properly, the IAQ sensor high and low reference points for the sensor that is used must match the configured values. The base control board reacts to a 4 to 20 mA signal from the IAQ sensor. The low reference (4 mA output) must be configured to the minimum IAQ sensor reading. The high reference (20 mA output) must be configured to the maximum IAQ sensor reading.

The IAQ sensor can be configured to either low or high priority. The priority value can be changed by the user. The default is low.

Low Priority — When the priority is set to low, the initial control is to the IAQ set point, but the outside air damper position will change to its minimum position when the following conditions occur:

- CV units with sensor — when the space temperature is greater than the occupied cooling set point plus 2.5º F (1.4 C) or when the space temperature is less than the occupied heating set point minus 2.5º F (1.4 C).
- VAV and CV units with thermostat — when the supply-air temperature (SAT) is less than the supply-air temperature set point (SASP) minus 8º F (4.4 C) (valid only when unit is at full heating capacity) or when SAT is greater than the SASP plus 5º F (2.8 C) (valid only when unit is at full cooling capacity) for 4 minutes.
- When the outdoor air quality is greater than the outdoor air quality set point (ppm)

High Priority — When the priority is set to high, the IAQ set point controls the outside air damper exclusively, with no regard to comfort conditioning.

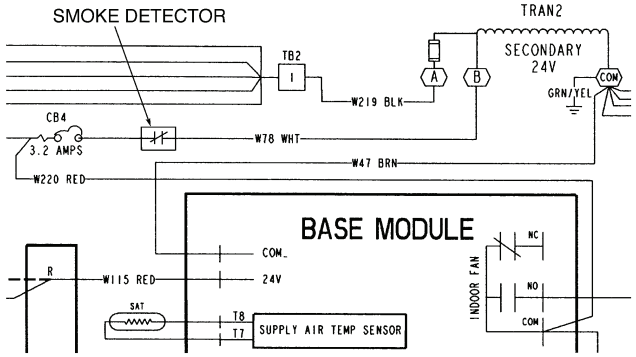


Fig. 58 — Smoke Detector Wiring

Table 37 — Smoke Control Modes

DEVICE	PRESSURIZATION	SMOKE PURGE	EVACUATION	FIRE SHUTDOWN
Economizer	100%	100%	100%	0%
Indoor Fan/VFD	ON	ON	OFF	OFF
Power Exhaust (all outputs)	OFF	ON	ON	OFF
Cool Stages	OFF	OFF	OFF	OFF
Heat Stages	OFF	OFF	OFF	OFF
HIR	ON	ON	OFF	OFF

LEGEND

HIR — Heat Interlock Relay
VFD — Variable Frequency Drive

MOTORMASTER® III DEVICE — The Motormaster III Solid-State Head Pressure Control is a field-installed accessory, fan speed control device actuated by a temperature sensor. The Motormaster III device is specifically designed for use on Carrier equipment and controls the outdoor-fan motor speed in response to the saturated condensing temperature. For outdoor temperatures down to –20 F (–29 C), the Motormaster III device maintains condensing temperature at 100 F (38 C). Refer to accessory Motormaster installation instructions for more information.

TIME GUARD® CIRCUIT — The Time Guard function (built into the rooftop's control module board) maintains a minimum off time of 5 minutes, a minimum on time of 10 seconds, and a 10-second delay between compressor starts.

CRANKCASE HEATER — The unit main power supply must remain on to provide crankcase heater operation. The crankcase heater in each compressor keeps oil free of refrigerant while compressor is off.

HEAD PRESSURE CONTROL — Each unit has a fan cycling, outdoor thermostat to shut off outdoor-fan motor(s) at 55 F (13 C) (one outdoor-fan motor on 50AJ,AK,AW,AY020-030 and 50EJ,EK,EW,EY024-034 units, 2 outdoor-fan motors on 50AJ,AK,AW,AY035-050 and 50EJ,EK,EW,EY038-048 units and 3 outdoor-fan motors on 50AJ,AK,AW,AY060 and 50EJ,EK,EW,EY054-068 units). The head pressure control permits the unit to operate with correct condensing temperatures down to 35 F (2 C) outdoor-air temperature.

CAPACITY CONTROL, COOLING — The cooling capacity staging tables are shown in Tables 38 and 39.

Table 38 — Cooling Capacity Staging Table CV Units with 2 Compressors

STAGES	0	1 ECONOMIZER	2	3
Compressor 1	Off	Off	On	On
Compressor 2	Off	Off	Off	On

NOTE: On CV units that require additional unloading, add suction pressure unloaders on Compressor 1 only.

Table 39 — Cooling Capacity Staging Table VAV Units with 2 Compressors and 2 Unloaders*

STAGES	0	1	2	3	4	5	6
Compressor 1	Off	On	On	On	On	On	On
Unloader 1	Off	On	On	Off	On	On	Off
Unloader 2	Off	On	Off	Off	On	Off	Off
Compressor 2	Off	Off	Off	Off	On	On	On

*40 ton units have only 1 unloader.

It is often desirable to use a variable air volume (VAV) unit in a variable volume and temperature (VVT®) control system because of the greater unloading capability. A VAV unit (with software version 4.0 and later) can easily be configured in the field to run off of either space thermostat (VVT relay pack) input or a space sensor. When configured in this manner, the unit control will turn on compressors based upon load in the space. If the supply-air falls below predefined limits, the control will unload the compressor in order to maintain the minimum supply-air limit. If unloading is not successful in maintaining the minimum supply-air temperature (SAT), then the compressors will be turned off. An alarm will be issued when the compressors are turned off.

A VAV unit configured to run off thermostat input or a space sensor will have the capability for two stages of heating, however, modification to the control wiring will be required to make this available. The Variable Frequency Drive (VFD) for the supply fan will still be active, varying the supply air fan speed to maintain supply duct pressure.

Upon a call for Y1 (or Y2_SPT) cooling, the compressor 1 will start after appropriate time guard functions have expired. Thirty seconds after the SAT drops below the "SAT1TRIP" the compressor will be unloaded. The unloading sequence will be as follows:

Compressor no. 1 On, Full Load	Unloader no. 1 and no. 2 Off
Compressor no. 1 On, 2/3 Load	Unloader no. 1 Off, Unloader no. 2 On
Compressor no. 1 On, 1/3 Load	Unloader no. 1 and no. 2 On
Compressor no. 1 Off	Unloader no. 1 and no. 2 Off

The "Y1 Low SAT Limit" has an adjustable range from 50 F to 65 F (10.0 to 18.3 C), with a factory setting of 53 F (11.7 C). If the temperature of the SAT rise above the "Y1 Low SAT Limit" plus 2° F, the compressor will be loaded in the reverse order in which it was unloaded following the predescribed time guard functions. There will be a 90-second time guard function between any change in unloaded state, and the normal 5-minute time guard function for change in compressor On/Off state.

If compressor no. 1 is forced off due to "Y1 LOW SAT Limit" an alert will be issued. If economizer is suitable, the economizer mode will remain active. The alert will be cleared after the 5-minute time guard function has expired and the compressor is restarted. With Y1 (or Y1_SPT) input, only compressor no. 1 can be running.

Upon a call for Y1 (or Y1_SPT) and Y2 (or Y2_SPT) cooling both compressor no. 1 and 2 will start after appropriate time guard functions have expired. Thirty seconds after SAT drops below the "Y2 Low SAT Limit" the compressor will be unloaded. The unloading sequence will be as follows:

Compressor no. 1 On, Full Load	Unloader no. 1 and no. 2 Off	Compressor no. 2 On
Compressor no. 1 On, 2/3 Load	Unloader no. 1 Off, Unloader no. 2 On	Compressor no. 2 On
Compressor no. 1 On, 1/3 Load	Unloader no. 1 and no. 2 On	Compressor no. 2 On
Compressor no. 1 On, Full Load	Unloader no. 1 and no. 2 Off	Compressor no. 2 Off
Compressor no. 1 On, 2/3 Load	Unloader no. 1 Off, Unloader no. 2 On	Compressor no. 2 Off
Compressor no. 1 On, 1/3 Load	Unloader no. 1 and no. 2 On	Compressor no. 2 Off
Compressor no. 1 Off	Unloader no. 1 and no. 2 Off	Compressor no. 2 Off

The "Y2 Low SAT Limit" has an adjustable range from 45 F to 55 F (7.2 to 12.8 C), with a factory setting of 48 F (8.9 C). If the temperature of the SAT rises above the "Y2 Low SAT Limit" plus 2° F (1.1° C), the compressor will be loaded in the reverse order in which it was unloaded following the predescribed time guard functions. There will be a 90-second time guard function between any change in unloaded state, and the normal 5-minute time guard function for change in compressor On/Off state.

If a Y2 (or Y2_SPT) call begins while the unit was under "Y1 cooling" control, compressor no. 2 will not be started until "Y1 cooling" control has ended.

If the Y2 (or Y2_SPT) call ends, with compressor no. 1 in an unloaded state and compressor no. 2 ON, then compressor no. 1 will be immediately brought up to the fully loaded state. If however, the Y2 (or Y2_SPT) call ends, with compressor no. 1 in an unloaded state and compressor no. 2 OFF, then compressor no. 1 will be left in its unloaded state. In either case the compressor no. 1 will be loaded/unloaded as appropriate to the "Y1 Low Limit".

The control shall lockout compressors if SAT becomes too low and an alarm shall be issued.

Compressor no. 1 lockout at SAT < 53 F (11.7 C).

Compressor no. 2 lockout at SAT < 48 F (8.9 C).

If SAT sensor fails the control will energize compressor no. 1 fully loaded (unloaders off), whenever there is a Y1 (or Y1_SPT) call. Compressor no. 2 will be energized whenever there is a call for Y2 (or Y2_SPT).

NOTE: When a VAV unit with software version 4.0 and later is configured to operate from a space thermostat (VVT relay pack) or a space sensor, compressors start loaded and then unload as needed. Which is the opposite of the normal VAV unloading sequence when operating from supply-air temperature (SAT) sensor, VAV units will unload in the reverse sequence.

FIELD TEST — The field test program is initiated by moving up DIP switch no. 4 to the OPEN position. The outdoor-air damper will close. The control allows 90 seconds for the damper to close in case it was in the full open position. Next, the indoor-fan contactor will be energized, and the outside-air damper will begin to open to its default value of 20% and stay at that position for a short period of time. The outdoor-air damper will then open to its full open position and stay at that position for a short period of time. The outdoor-air damper will then close.

If the unit is equipped with power exhaust, stage 1 will be energized for 5 seconds. If the unit is configured for stage 2 of power exhaust, stage 2 will be energized for 5 seconds after the first stage is deenergized.

The first stage of heat will be energized for 30 seconds, after which the second stage heat will be energized for an additional 30 seconds. Heat is then deenergized.

The last step is the Cooling mode. Outdoor-fan contactor no. 1 is energized. This is followed by each stage of cooling energized with a 10-second delay between stages. After this is complete, outdoor-fan contactor no. 2 is energized for 10 seconds.

The compressors will now deenergize, followed by the outdoor-fan contactors and indoor-fan contactors.

The field test is then complete.

SERVICE

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Turn off accessory heater power switch if applicable. Electrical shock could cause personal injury.

Service Access — All unit components can be reached through clearly labelled hinged access doors. These doors are not equipped with tiebacks, so if heavy duty servicing is needed, either remove them or prop them open to prevent accidental closure.

Each door is held closed with 3 latches. The latches are secured to the unit with a single $^1/_4$-in. — 20 x $^1/_2$-in. long bolt. See Fig. 59.

To open, loosen the latch bolt using a $^7/_{16}$-in. wrench. Pivot the latch so it is not in contact with the door. Open the door. To shut, reverse the above procedure.

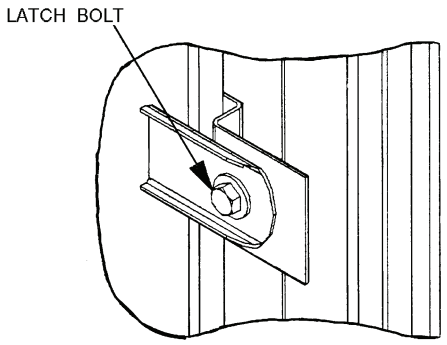


Fig. 59 — Door Latch

NOTE: Disassembly of the top cover may be required under special service circumstances. It is very important that the orientation and position of the top cover be marked on the unit prior to disassembly. This will allow proper replacement of the top cover onto the unit and prevent rainwater from leaking into the unit.

IMPORTANT: After servicing is completed, make sure door is closed and relatched properly, and that the latches are tight. Failure to do so can result in water leakage into the evaporator section of the unit.

Cleaning — Inspect unit interior at beginning of each heating and cooling season and as operating conditions require. Remove unit top panel and/or side panels for access to unit interior.

EVAPORATOR COIL — Remove access panels and clean as required with a commercial coil cleaner.

CONDENSER COIL — Remove access panels and clean condenser coil annually and as required by location and outdoor-air conditions. Inspect coil monthly — clean as required.

CONDENSATE DRAIN — Check and clean each year at start of cooling season. In winter, keep drains and traps dry.

FILTERS — Clean or replace at start of each heating and cooling season, or more often if operating conditions require. Refer to Table 1A-1C for type and size.

NOTE: The unit requires industrial grade throwaway filters capable of withstanding face velocities up to 625 fpm (3.175 m/s).

OUTDOOR-AIR INLET SCREENS — Clean screens with steam or hot water and a mild detergent. Do not use throwaway filters in place of screens. See Fig. 34 for location of screens (filter track assembly).

Lubrication

COMPRESSORS — Each compressor is charged with the correct amount of oil at the factory. The correct oil charge is

FAN SHAFT BEARINGS — Lubricate the bearings at least twice annually with suitable bearing grease. Do not over grease. Typical lubricants are show below:

MANUFACTURER	LUBRICANT
Texaco	Regal AFB-2*
Mobil	Mobilplex EP No. 1
Sunoco	Prestige 42
Texaco	Multifak 2

*Preferred lubricant because it contains rust and oxidation inhibitors.

CONDENSER AND EVAPORATOR-FAN MOTOR BEARINGS — The condenser and evaporator-fan motors have permanently sealed bearings, so no field lubrication is necessary.

Evaporator Fan Performance Adjustment (Fig. 60) — Fan motor pulleys are factory set for speed shown in Tables 1A-1C (factory speed setting).

IMPORTANT: Check to ensure that the unit drive matches the duct static pressure in Tables 17-31B.

To change fan speeds, change pulleys.

To align fan and motor pulleys:

1. Shut off unit power supply.
2. Loosen fan shaft pulley bushing.
3. Slide fan pulley along fan shaft.
4. Make angular alignment by loosening motor from mounting plate.
5. Retighten pulley.

Evaporator Fan Coupling Assembly — If the coupling has been removed for other blower assembly component repair or replacement, it is critical that the coupling be reassembled and aligned correctly to prevent premature failures.

REASSEMBLING THE COUPLING INTO THE UNIT (Fig. 61)

1. Prior to reassembling the coupling, loosen the 4 bearing mounting bolts, which secure the 2 bearings on either side of the coupling. Remove the drive belts.
2. Reassemble the coupling with the bearings loose. This allows the coupling to find its own self-alignment position.
3. Check the hub-to-shaft fit for close fitting clearances. Replace hubs if high clearances are determined.
4. Check the key for close-fitted clearances on the sides and 0.015 in. (0.39 mm) clearance over the top of the key. Replace key if necessary.
5. Be sure that hub flanges, flex members, spacer, and hardware are clean and free of oil.
6. Place the flanges onto the shafts with the hub facing outward. Do not tighten the set screws at this time.
7. Outside of the unit, assemble the flex members to the center drive shaft with 4 bolts and nuts. The flex members have collars that need to be inserted into the smaller hole of the drive shaft flange.
8. Assemble the flex member/drive shaft assembly to one of the shaft flanges, using 2 bolts and nuts. Slide the other shaft flange towards the assembly and assemble using 2 bolts and nuts. If the shafts are not misaligned, the collar in the flex member should line up with the shaft flange holes.
9. Torque nuts properly to 95 to 100 ft-lb (28.8 to 135.6 N-m). Do not turn a coupling bolt. Always turn the nut. Always use thread lubricant or anti-seize compound to prevent thread galling.
10. The ends of the shafts should be flush with the inside of the shaft flange. Torque the set screws to 25 ft-lb (33.8 N-m).
11. After assembly is complete, slowly rotate the shafts by hand for 30 to 60 seconds.
12. Tighten the bearing mounting bolts, using care not to place any loads on the shaft which would cause flexure to the shafts.
13. Reinstall drive belts. (Refer to Belt Tension Adjustment section on page 103.)
14. Visually inspect the assembly. If the shafts are overly misaligned, the drive shaft flange will not be parallel with the shaft flanges.
15. Recheck nut torque after 1 to 2 hours of operation. Bolts tend to relax after being initially torqued.

Evaporator Fan Service and Replacement

1. Turn off unit power supply.
2. Remove supply-air section panels.
3. Remove belt and blower pulley.
4. Loosen setscrews in blower wheels.
5. Remove locking collars from bearings.
6. Remove shaft.
7. Remove venturi on opposite side of bearing.
8. Lift out wheel.
9. Reverse above procedure to reinstall fan.
10. Check and adjust belt tension as necessary.

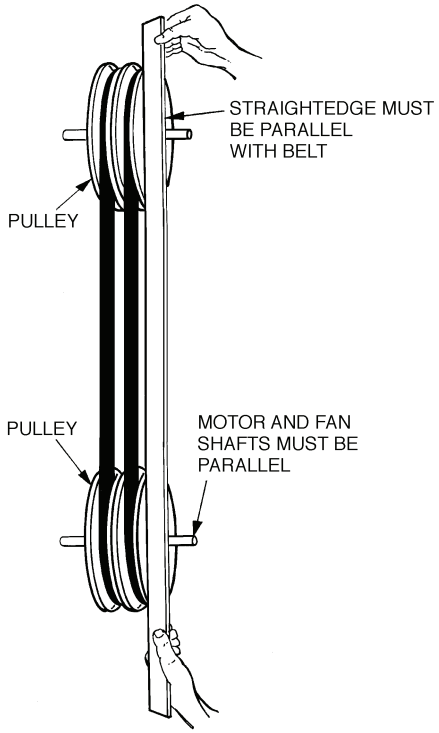


Fig. 60 — Evaporator-Fan Pulley Alignment and Adjustment

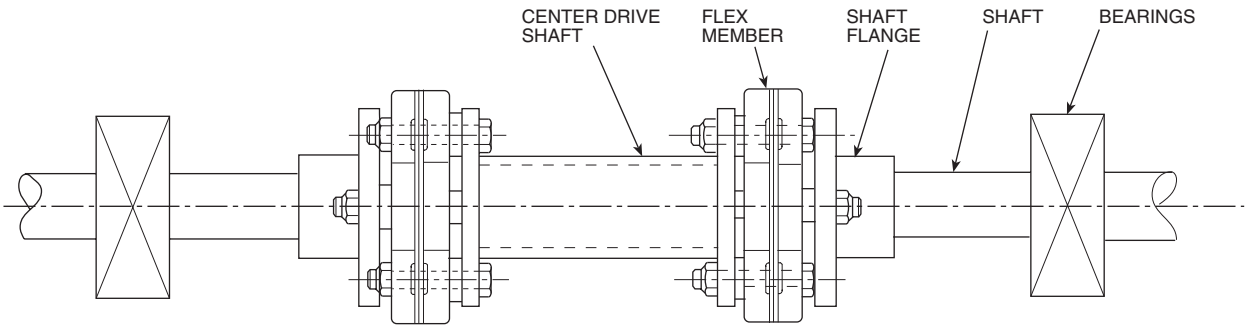


Fig. 61 — Evaporator Fan Coupling

Belt Tension Adjustment — To adjust belt tension:

1. Turn off unit power supply.
2. Loosen motor mount nuts and bolts.
3. Loosen fan motor nuts. See Fig. 62.
4. Turn motor jacking bolts to move motor mounting plate left or right for proper belt tension. A slight bow should be present in the belt on the slack side of the drive while running under full load.
5. Tighten nuts.
6. Adjust bolts and nut on mounting plate to secure motor in fixed position. Recheck belt tension after 24 hours of operation. Adjust as necessary. See Tables 3A and 3B for proper tension values.

Evaporator-Fan Motor Replacement

1. Turn off unit power supply.
2. Remove upper outside panel and open hinged door to gain access to motor.
3. Fully retract motor plate adjusting bolts.
4. Loosen the 2 rear (nearest the evaporator coil) motor plate nuts.
5. Remove the 2 front motor plate nuts and carriage bolts.
6. Slide motor plate to the rear (toward the coil) and remove fan belt(s).
7. Slide motor plate to the front and hand tighten one of the rear motor plate nuts (tight enough to prevent the motor plate from sliding back but loose enough to allow the plate to pivot upward).
8. Pivot the front of the motor plate upward enough to allow access to the motor mounting hex bolts and secure in place by inserting a prop.
9. Remove the nuts from the motor mounting hex bolts and remove motor.
10. Reverse above steps to install new motor.

Condenser-Fan Adjustment

1. Shut off unit power supply.
2. Remove fan guard.
3. Loosen fan hub setscrews.
4. Adjust fan height on shaft using a straightedge placed across venturi and measure per Fig. 63.
5. Fill hub recess with Permagum if rubber cap is missing.
6. Tighten setscrews and replace fan guard.
7. Turn on unit power.

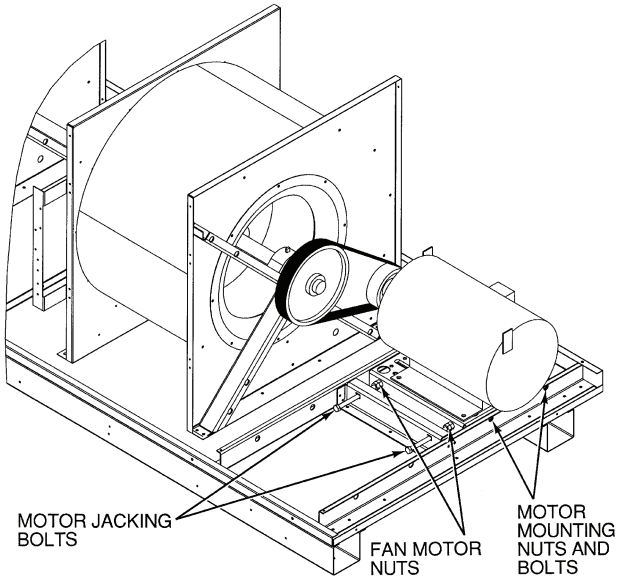


Fig. 62 — Belt Tension Adjustment

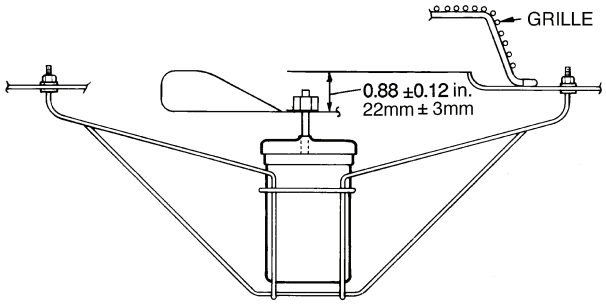


Fig. 63 — Condenser-Fan Adjustment

Power Failure — The economizer damper motors are spring return design. In event of power failure, dampers will return to fully closed position until power is restored.

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate and in Tables 1A-1C. Refer to Carrier GTAC II; Module 5; Charging, Recovery, Recycling, and Reclamation section for charging methods and procedures.

Unit panels must be in place when unit is operating during charging procedure.

NO CHARGE — Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant (refer to Table 1A-1C).

LOW CHARGE COOLING — Using appropriate cooling charging chart (see Fig. 64-67), add or remove refrigerant until conditions of the appropriate chart are met. Note that charging chart is different from those normally used. An accurate pressure gage and temperature sensing device are required. Measure liquid line pressure at the liquid line service valve using pressure gage. Connect temperature sensing device to liquid line near the liquid line service valve and insulate it so that outdoor ambient temperature does not affect reading.

Using the above pressure and temperature readings, find the intersect point on the appropriate cooling chart. If intersection point on chart is above the line, add refrigerant. If intersection point is below the line, carefully recover some of the charge. Recheck suction pressure as charge is adjusted.

NOTE: Indoor air cfm must be within normal operating range of the unit. All outdoor fans must be operating.

Thermostatic Expansion Valve (TXV) — Each circuit has a TXV. The TXV is nonadjustable and is factory set to maintain 10 to 13° F (5 to 7° C) superheat leaving the evaporator coil. The TXV controls flow of liquid refrigerant to the evaporator coils.

Filter Drier — Replace whenever refrigerant system is exposed to atmosphere.

Protective Devices

COMPRESSOR PROTECTION

Overcurrent — Each compressor has one manual reset, calibrated trip, magnetic circuit breaker. Do not bypass connections or increase the size of the circuit breaker to correct trouble. Determine the cause and correct it before resetting the breaker.

Overtemperature — Each 06D type compressor (50AJ,AK, AW,AY020-035 and 50EJ,EK,EW,EY024-038 units only) has an internal protector to protect it against excessively high discharge gas temperatures.

Crankcase Heater — Each compressor has a crankcase heater to prevent absorption of liquid refrigerant by oil in the crankcase when the compressor is idle. Since power for the crankcase heaters is drawn from the unit incoming power, main unit power must be on for the heaters to be energized.

IMPORTANT: After a prolonged shutdown or service job, energize the crankcase heaters for 24 hours before starting the compressors.

EVAPORATOR-FAN MOTOR PROTECTION — A manual reset, calibrated trip, magnetic circuit breaker protects against overcurrent. Do not bypass connections or increase the size of the breaker to correct trouble. Determine the cause and correct it before resetting the breaker. If the evaporator-fan motor is replaced with a different horsepower motor, resizing of the circuit breaker is required. Contact Carrier Application Engineering.

CONDENSER-FAN MOTOR PROTECTION — Each condenser-fan motor is internally protected against overtemperature.

HIGH- AND LOW-PRESSURE SWITCHES — If either switch trips, or if the compressor overtemperature switch activates, that refrigerant circuit will be automatically locked out. See Compressor Lockout Logic on this page.

FREEZE PROTECTION THERMOSTAT (FPT) — Freeze protection thermostats are located on the evaporator coil for each circuit. One is located at the top and bottom of each coil. It detects frost build-up and turns off the compressor, allowing the coil to clear. Once the frost has melted, the compressor can be reenergized.

Relief Devices — All units have relief devices to protect against damage from excessive pressures (i.e., fire). These devices are installed on the suction line, liquid line, and on the compressor.

Power Circuit — A typical wiring schematic is shown in Fig. 68.

Control Circuit, 24-V — This control circuit is protected against overcurrent by a 3.2-amp circuit breaker (CB4). Breaker can be reset. If it trips, determine cause of trouble before resetting. A typical 24-v control wiring schematic is shown in Fig. 69 and 70.

Control Circuit, 115-V — This control circuit is protected against overcurrent by a 5.2-amp circuit breaker (CB3). Breaker can be reset. If it trips, determine cause of trouble before resetting. A typical 115-v control wiring schematic is shown in Fig. 71 and 72.

Compressor Lockout Logic — If any of the safeties trip, the circuit will automatically reset (providing the safety has reset) and restart the compressor in 15 minutes. If any of the safeties trip 3 times within a 90-minute period, then the circuit will be locked out and will require manual resetting by turning off either the unit disconnect or the control circuit breaker, or opening the thermostat.

If the compressors have been off for more than 15 minutes and the outdoor-air temperature (OAT) is less than 45 F then safeties will be ignored for 5-minutes.

Replacement Parts — A complete list of replacement parts may be obtained from any Carrier distributor upon request.

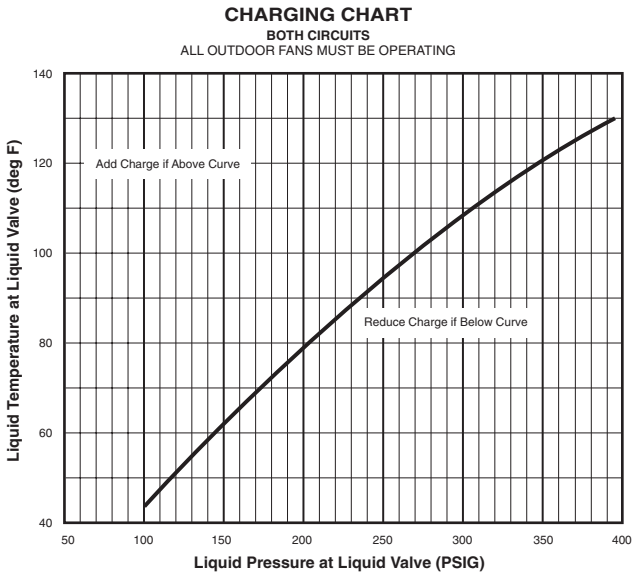


Fig. 64 — Cooling Charging Chart, 50AJ,AK,AW,AY020-060 Units

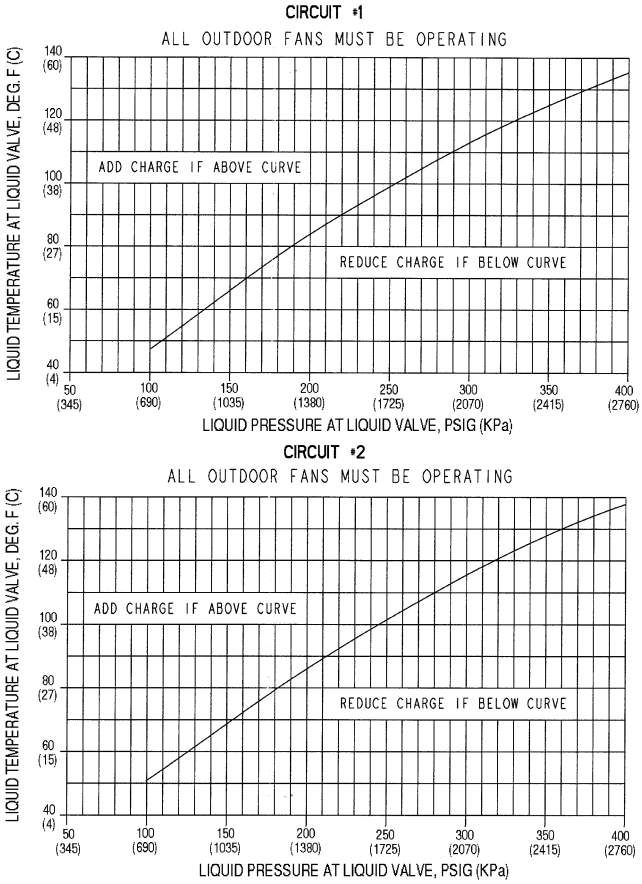


Fig. 65 — Cooling Charging Chart, Sizes 50EJ,EK,EW,EY024-034

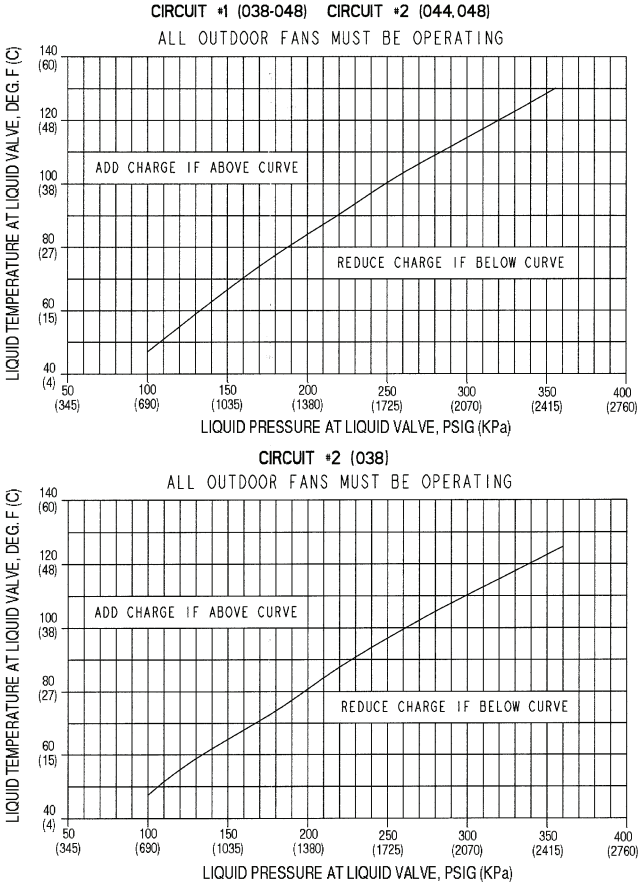


Fig. 66 — Cooling Charging Chart, Sizes 50EJ,EK,EW,EY038-048

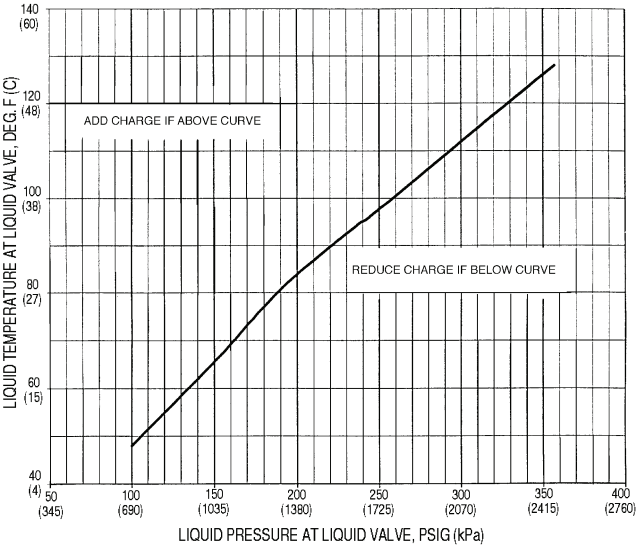


Fig. 67 — Cooling Charging Chart, Sizes 50EJ,EK,EW,EY054-068

LEGEND for Fig. 68-72 — Typical Wiring Schematics

AHA — Adjustable Heat Anticipator
BP — Building Pressure
C — Contactor, Compressor
CAP — Capacitor
CB — Circuit Breaker
CC — Cooling Compensator
CCB — Controller Circuit Breaker
CCH — Crankcase Heater
COM — Communication
COMP — Compressor Motor
CR — Control Relay
CV — Constant Volume
DM — Damper Motor
DP — Duct Pressure
EC — Enthalpy Control
EQUIP — Equipment
FLA — Full Load Amps
FPT — Freeze Protection Thermostat
FU — Fuse
GRD — Ground
HC — Heater Contactor
HPS — High-Pressure Switch
HR — Heater Relay
IFC — Indoor-Fan Contactor
IFCB — Indoor Fan Circuit Breaker
IFM — Indoor-Fan Motor
IFR — Indoor-Fan Relay
IP — Internal Protector
L — Light
LPS — Low-Pressure Switch
LS — Limit Switch
NC — Normally Closed
NO — Normally Open
OAT — Outdoor-Air Thermistor
OD — Outdoor
OFC — Outdoor-Fan Contactor
OFM — Outdoor-Fan Motor
PEC — Power Exhaust Contactor
PEM — Power Exhaust Motor
PES — Power Exhaust Sequencer
PESC — Power Exhaust Sequencer Controller
PL — Plug Assembly
R — Relay
RAT — Return-Air Thermistor
SAT — Supply-Air Thermistor
SEN — Sensor
SW — Switch
TB — Terminal Block
TC — Thermostat Cooling
TH — Thermostat Heating
TRAN — Transformer
UL — Compressor Unloader
VFD — Variable Frequency Drive


Terminal (Marked)


Terminal (Unmarked)


Terminal Block


Splice

Factory Wiring

Field Wiring

To Indicate Common Potential Only, Not To Represent Wiring

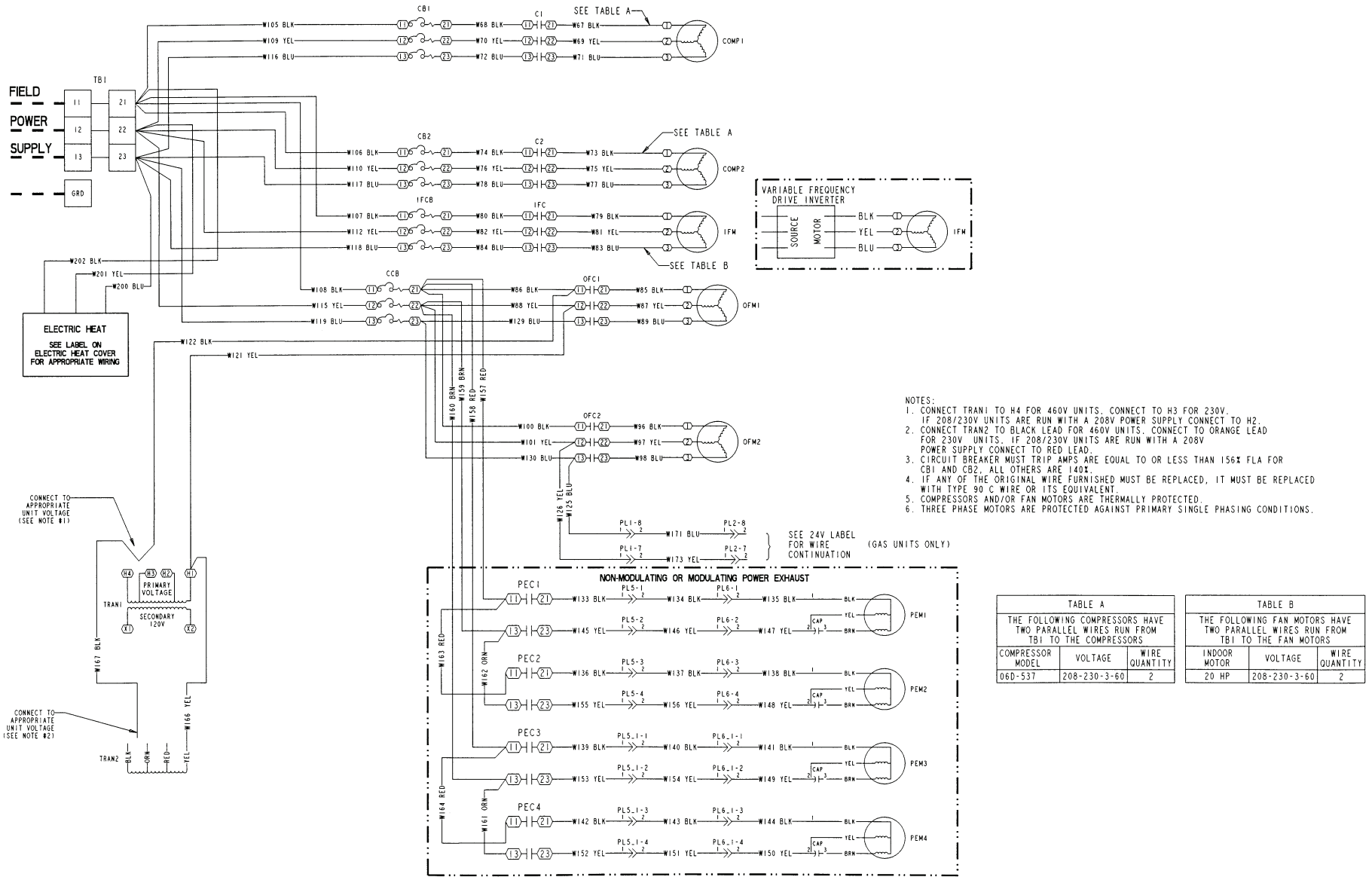


TABLE A		
THE FOLLOWING COMPRESSORS HAVE TWO PARALLEL WIRES RUN FROM TB1 TO THE COMPRESSORS		
COMPRESSOR MODEL	VOLTAGE	WIRE QUANTITY
06D-537	208-230-3-60	2

TABLE B		
THE FOLLOWING FAN MOTORS HAVE TWO PARALLEL WIRES RUN FROM TB1 TO THE FAN MOTORS		
INDOOR MOTOR	VOLTAGE	WIRE QUANTITY
20 HP	208-230-3-60	2

Fig. 68 — Typical Power Schematic, 50EJ,EK,EW,EY024-034; 208/230-3-60 and 460-3-60

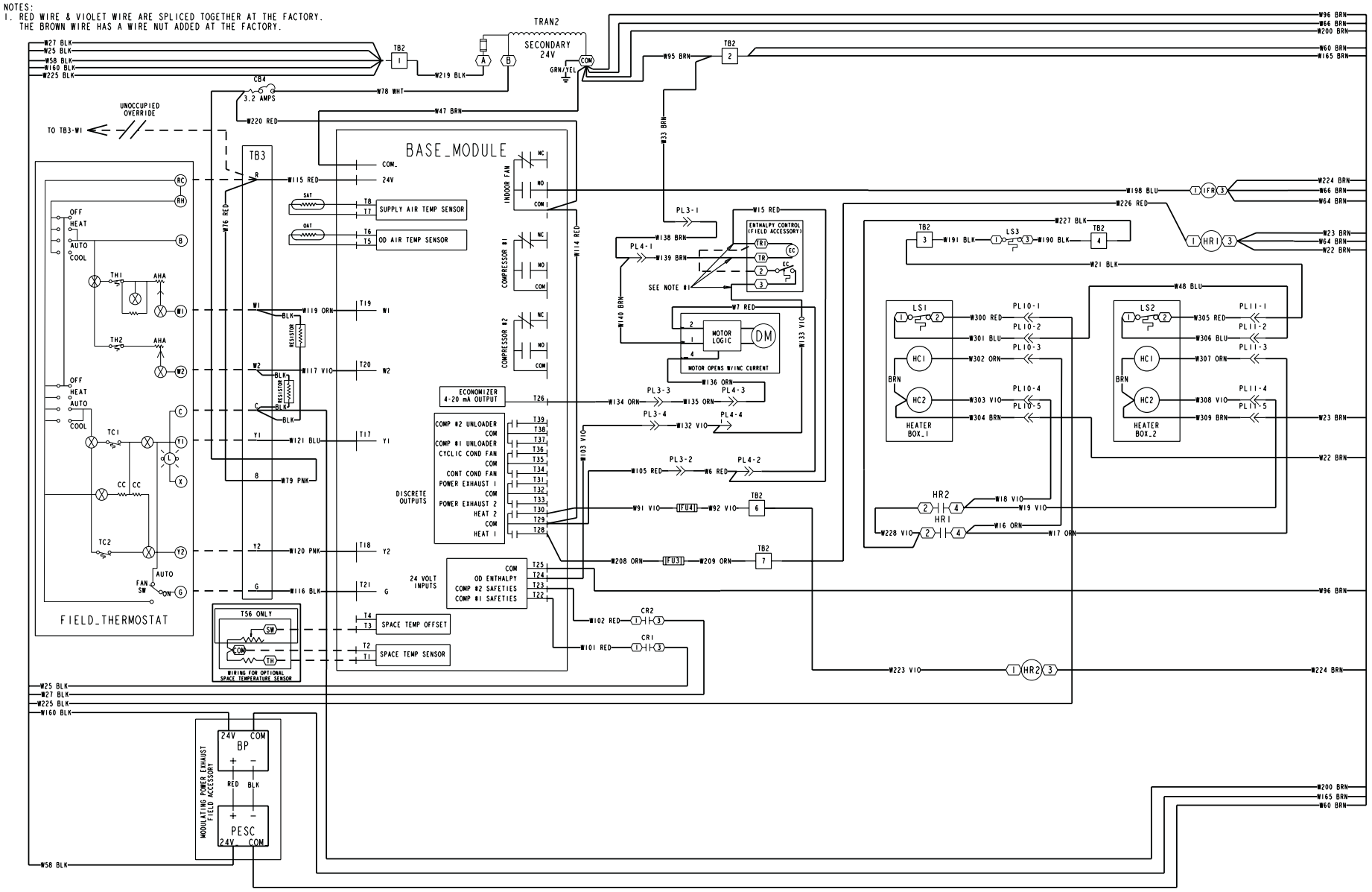


Fig. 69 — Typical CV 24-V Control Circuit

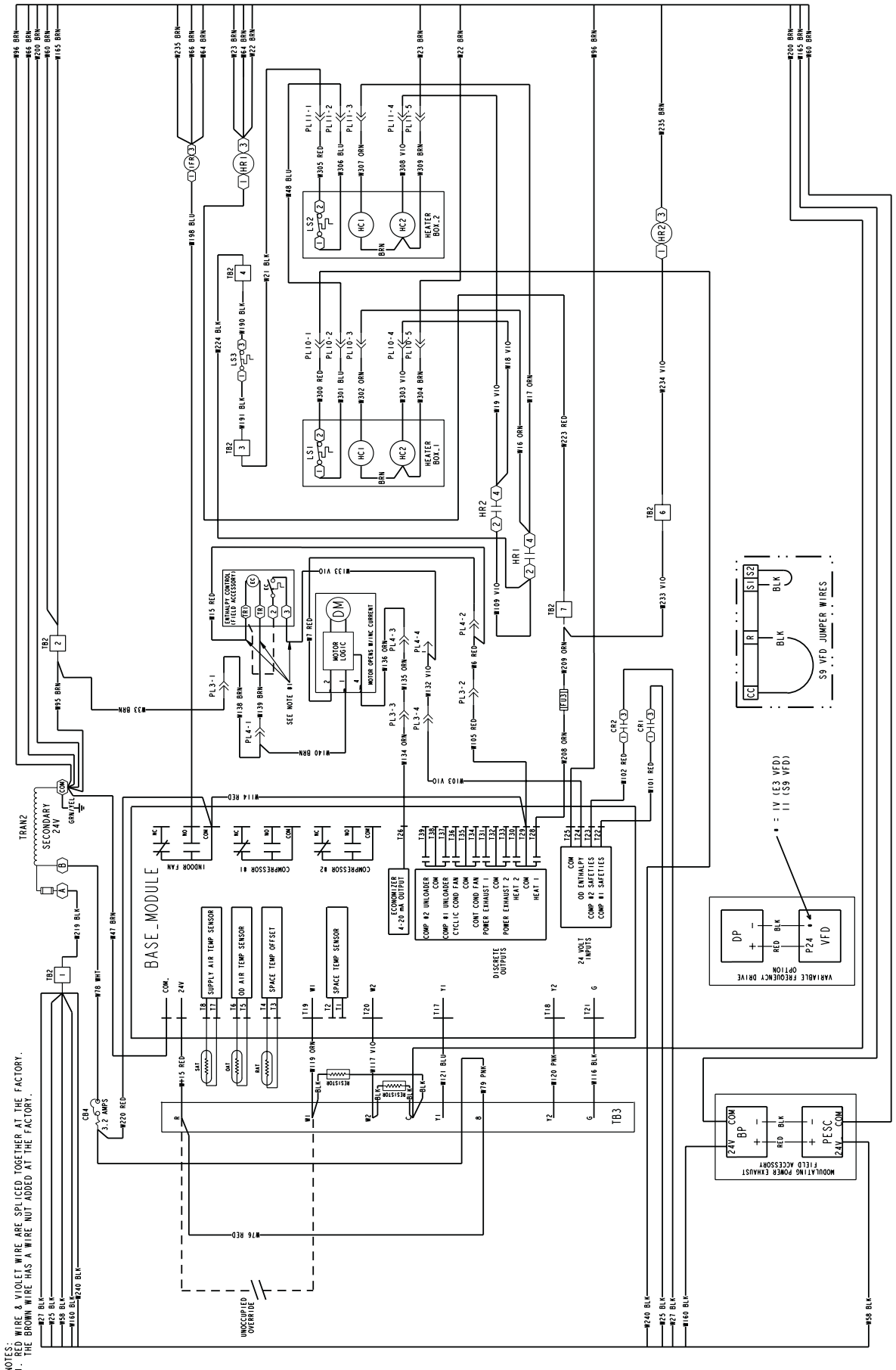


Fig. 70 — Typical VAV 24-V Control Circuit

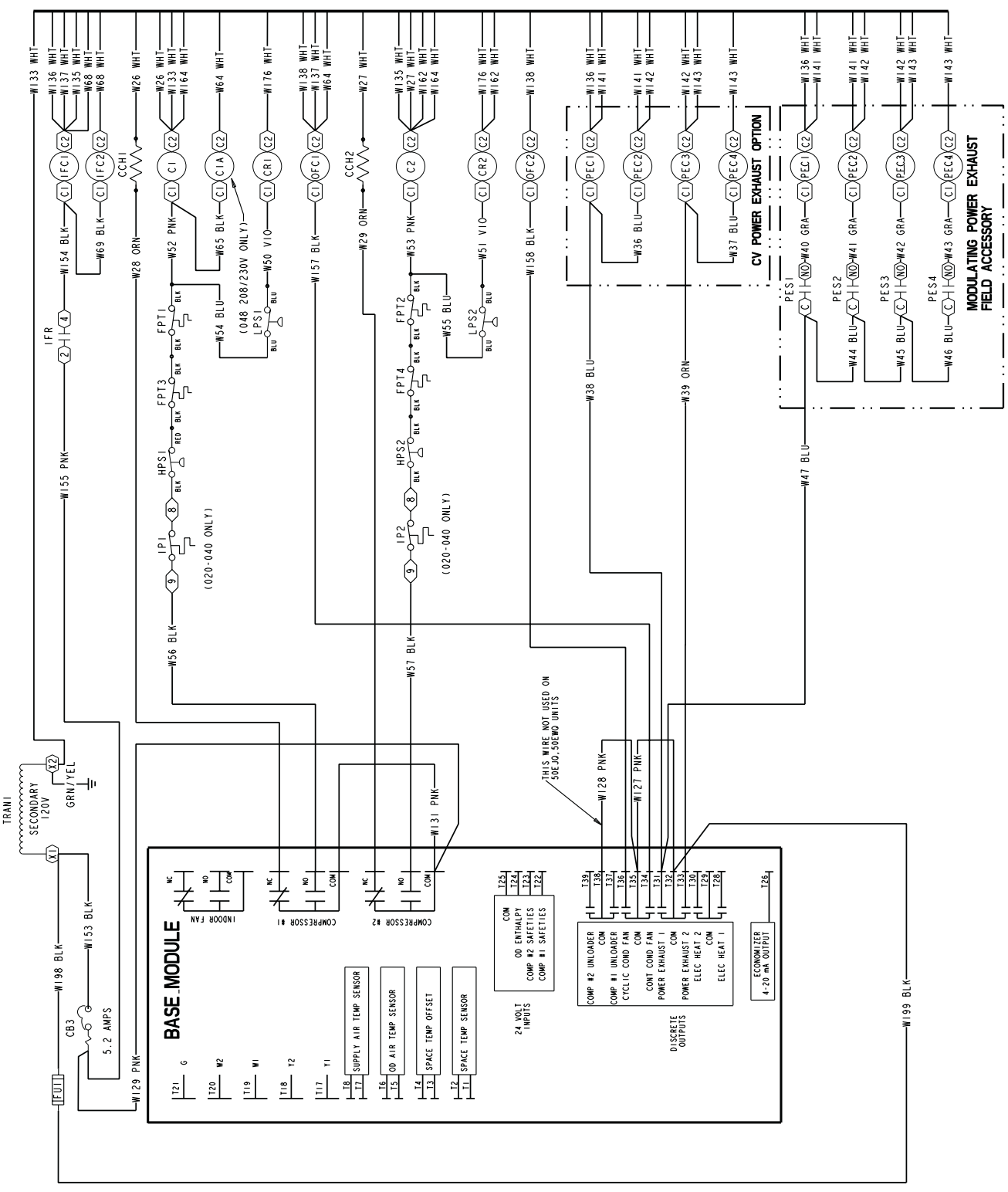


Fig. 71 — Typical CV 115-V Control Circuit (Sizes 020-050 and 024-048 Shown)

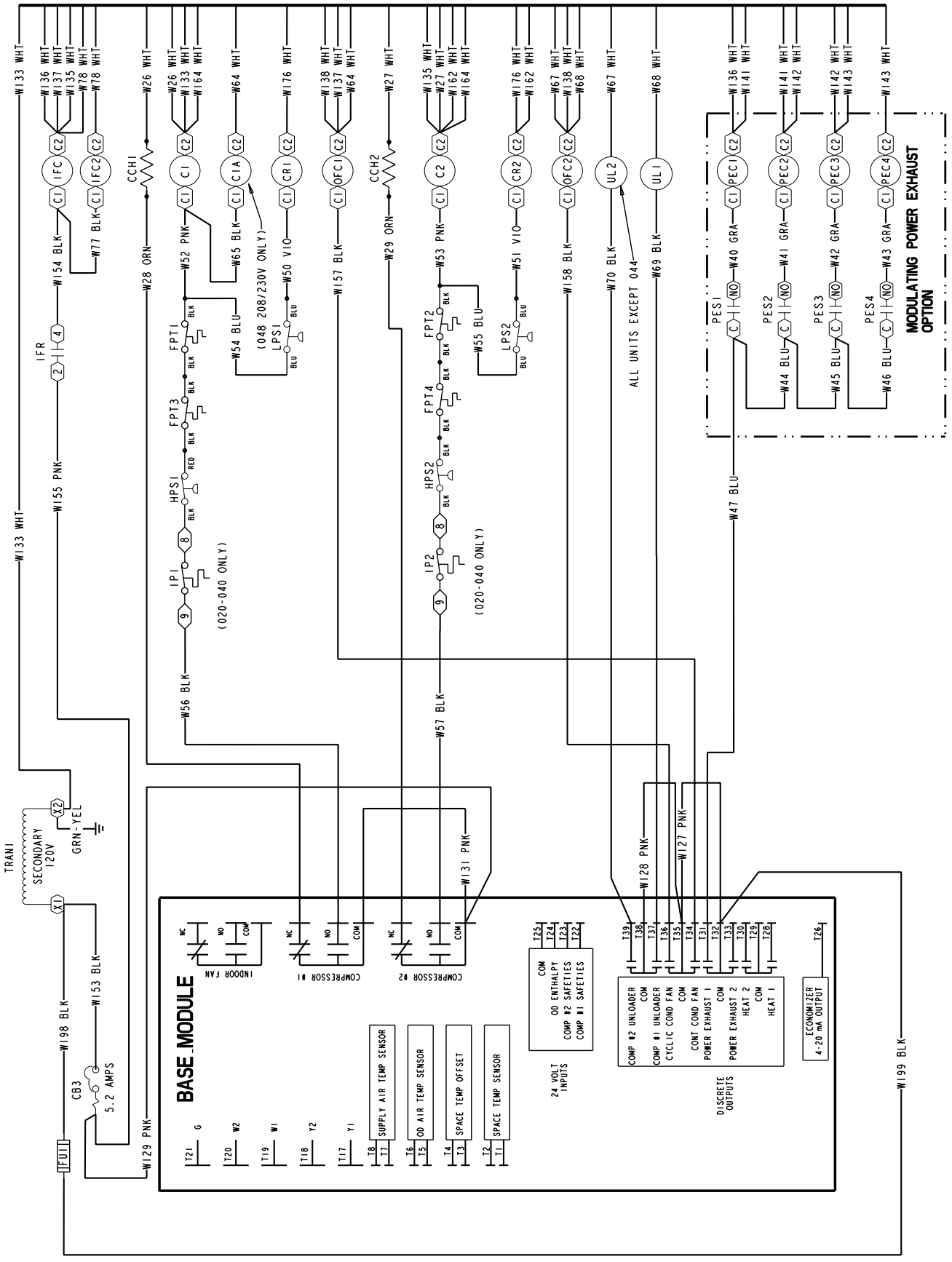
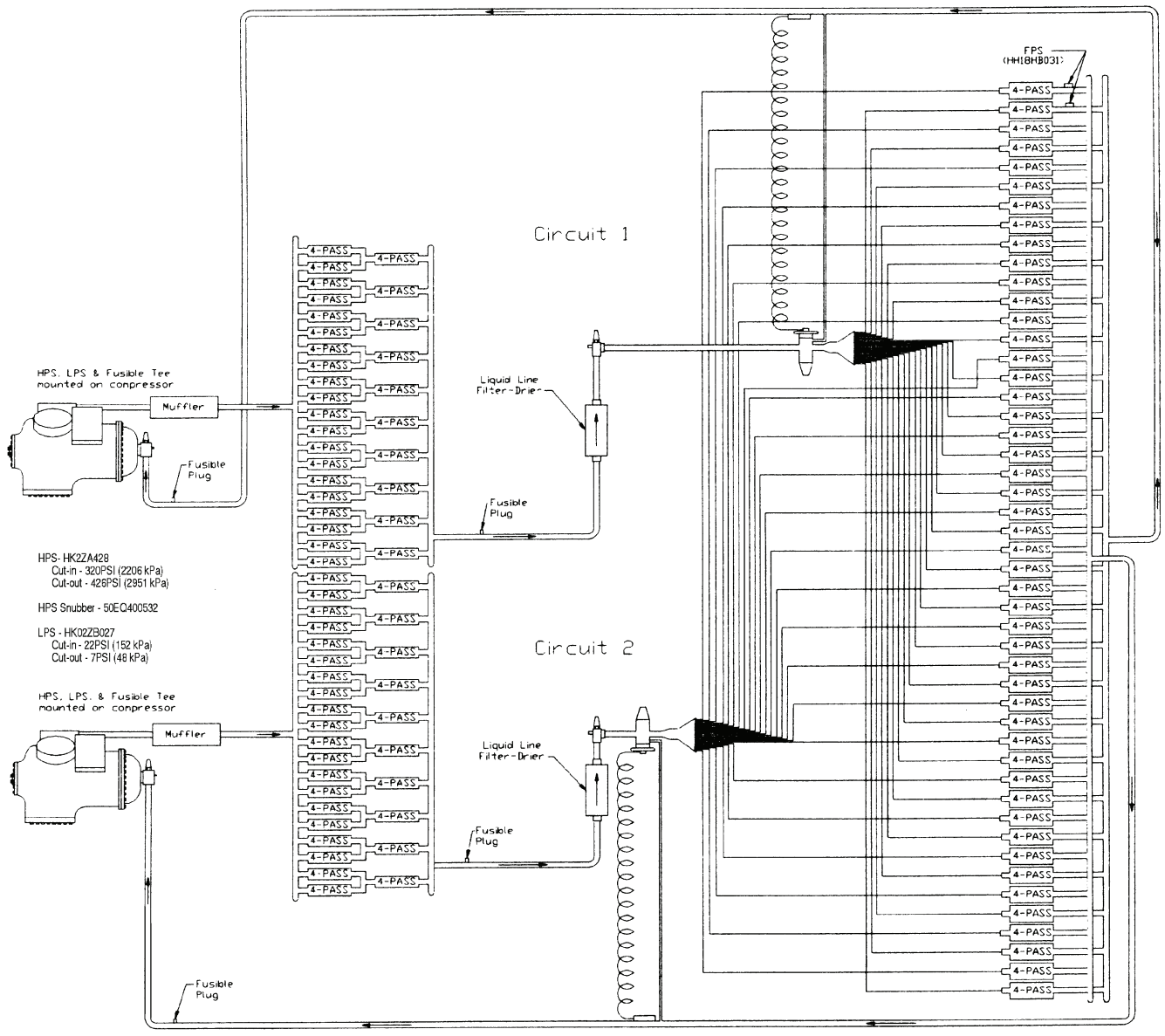


Fig. 72 — Typical VAV 115-V Control Circuit (Sizes 020-050 and 024-048 Shown)

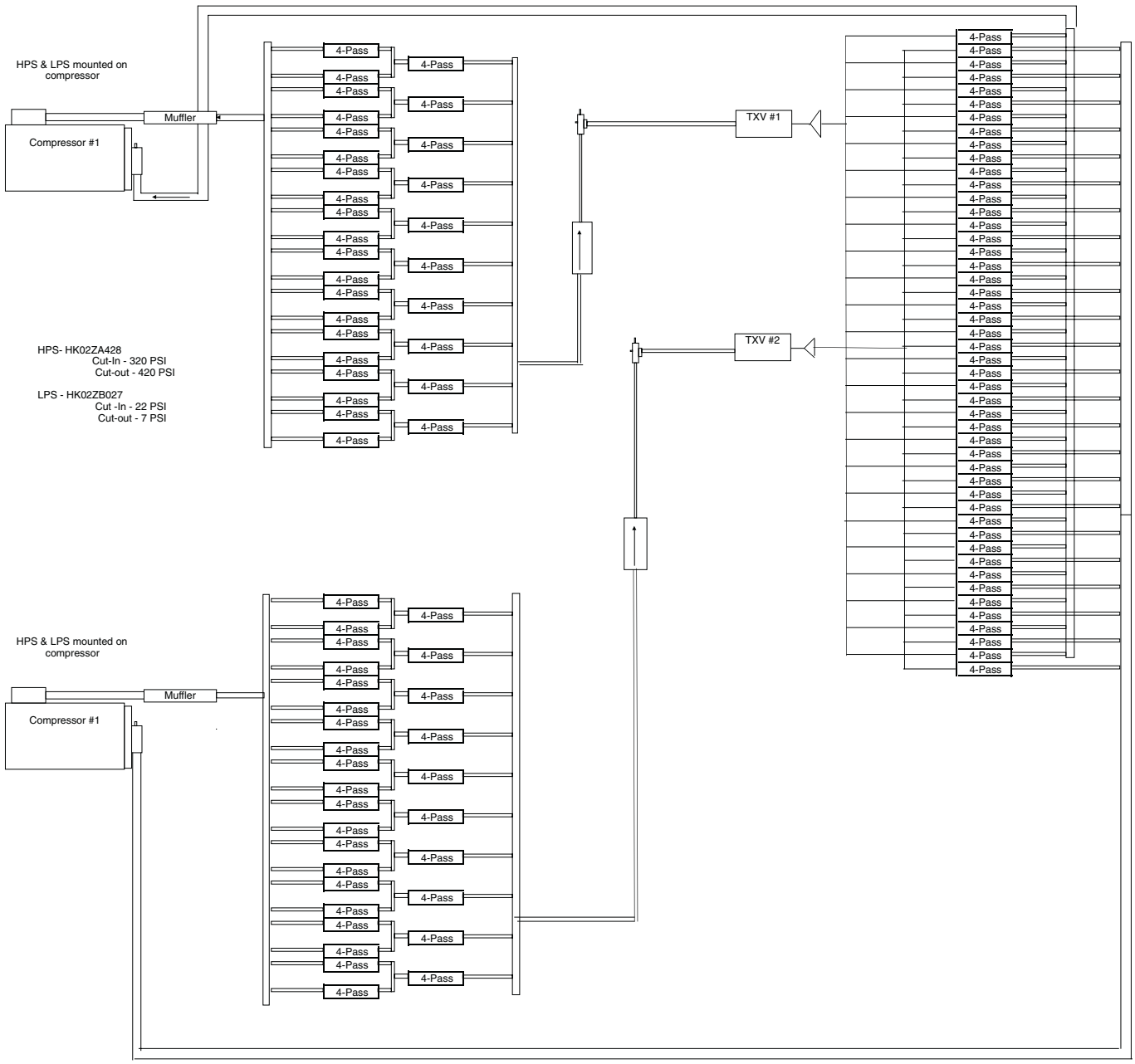
Typical refrigerant circuiting diagrams are shown in Fig. 73-82.



LEGEND

FPS — Freeze Protection Switch
HPS — High-Pressure Switch
LPS — Low-Pressure Switch

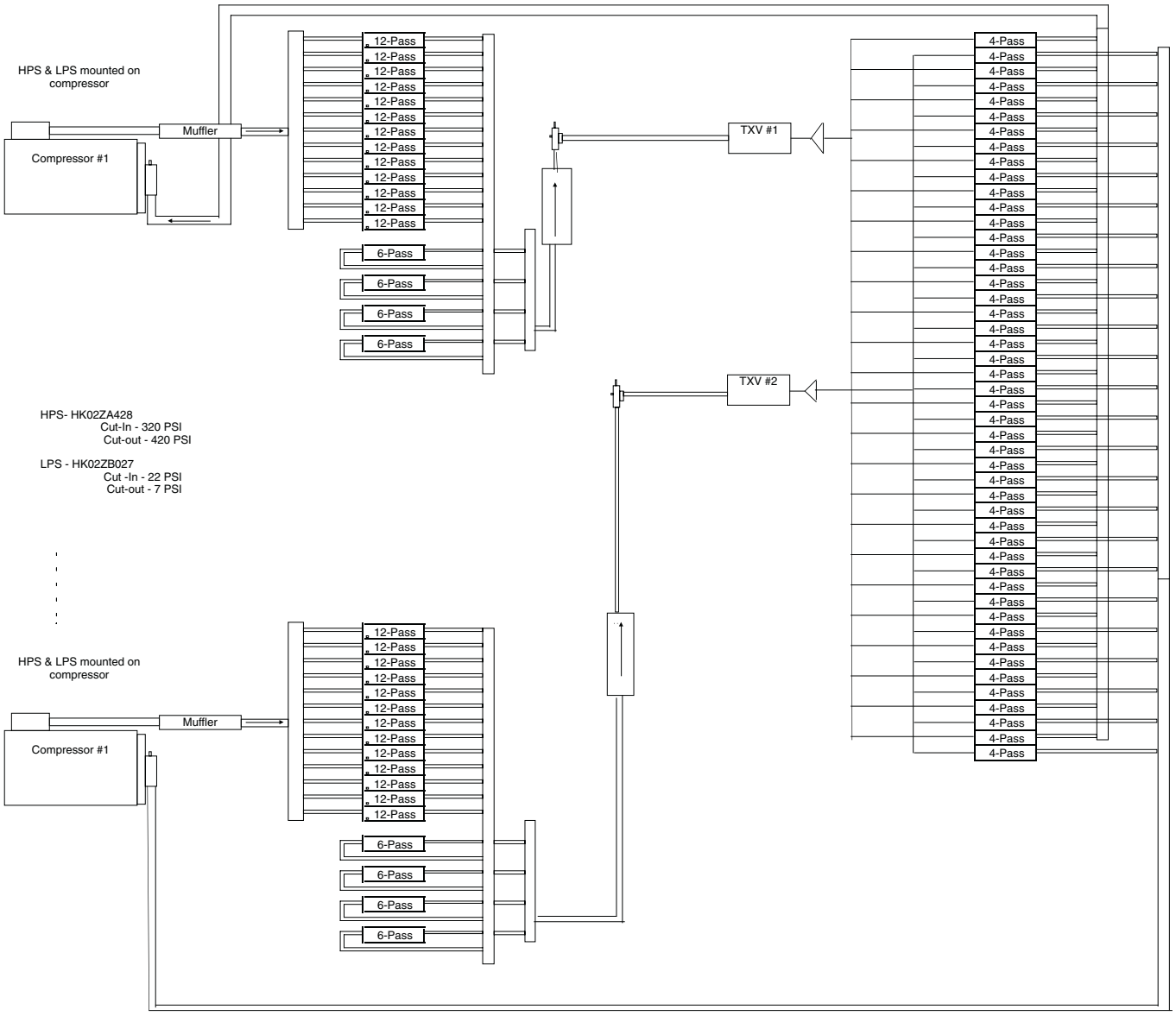
Fig. 73 — Typical Refrigerant Circuiting (50AJ,AK,AW,AY020,025 and 50EJ,EK,EW,EY024-034)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

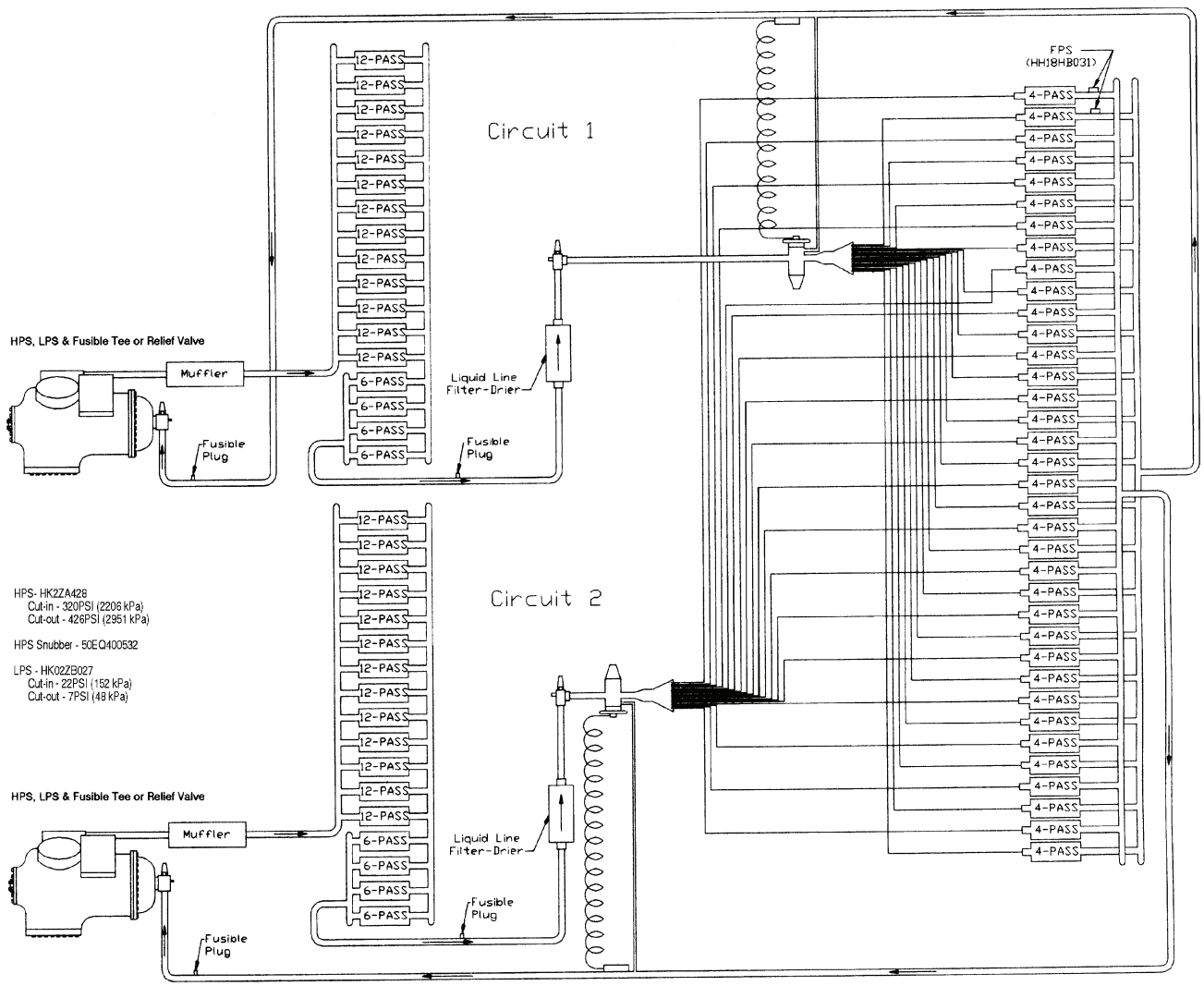
Fig. 74 — Typical Refrigerant Circuiting (50AJ,AK,AW,AY027,030)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

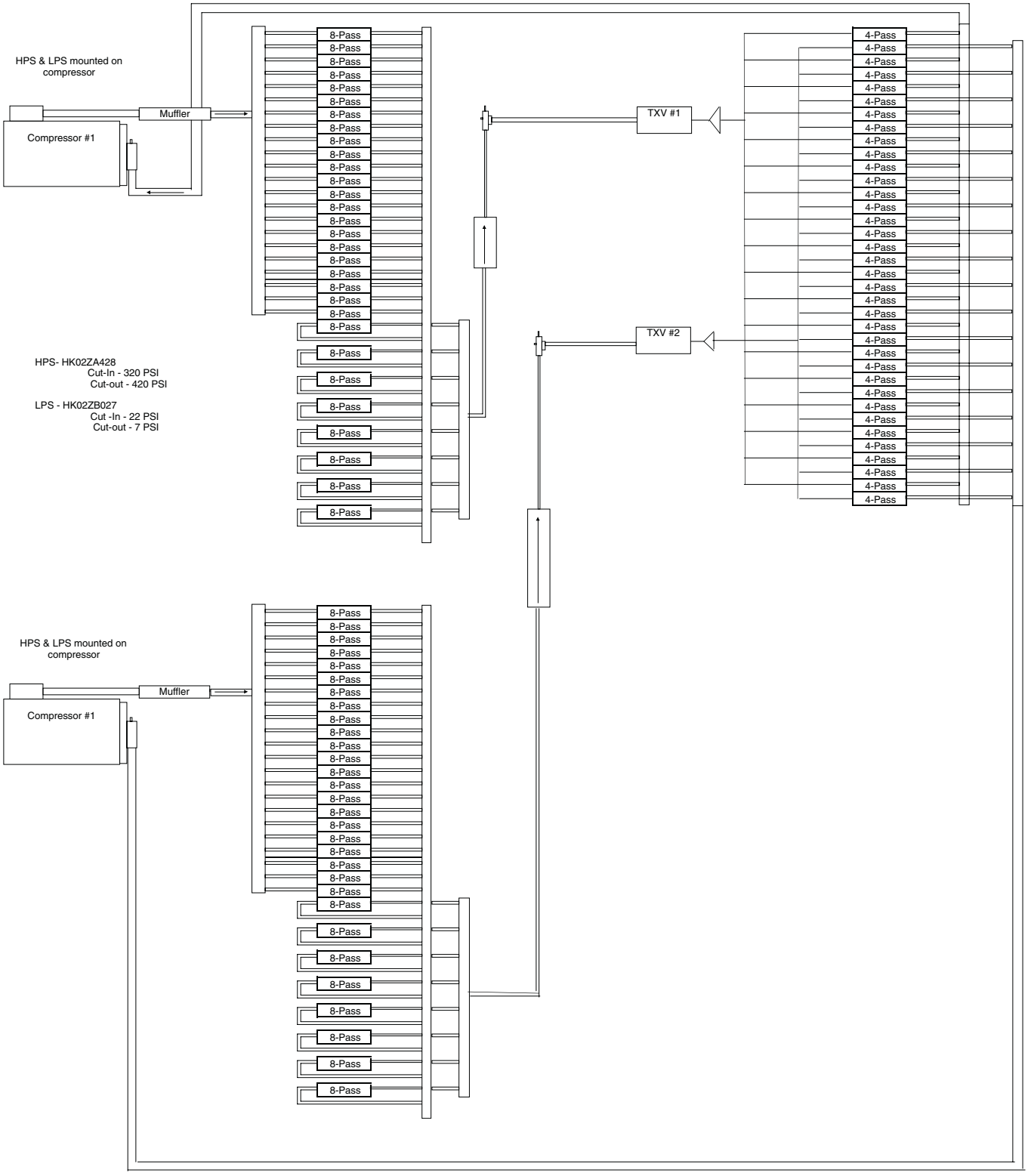
Fig. 75 — Typical Refrigerant Circuiting (50AJ,AK,AW,AY035)



LEGEND

FPS — Freeze-Protection Switch
HPS — High-Pressure Switch
LPS — Low-Pressure Switch

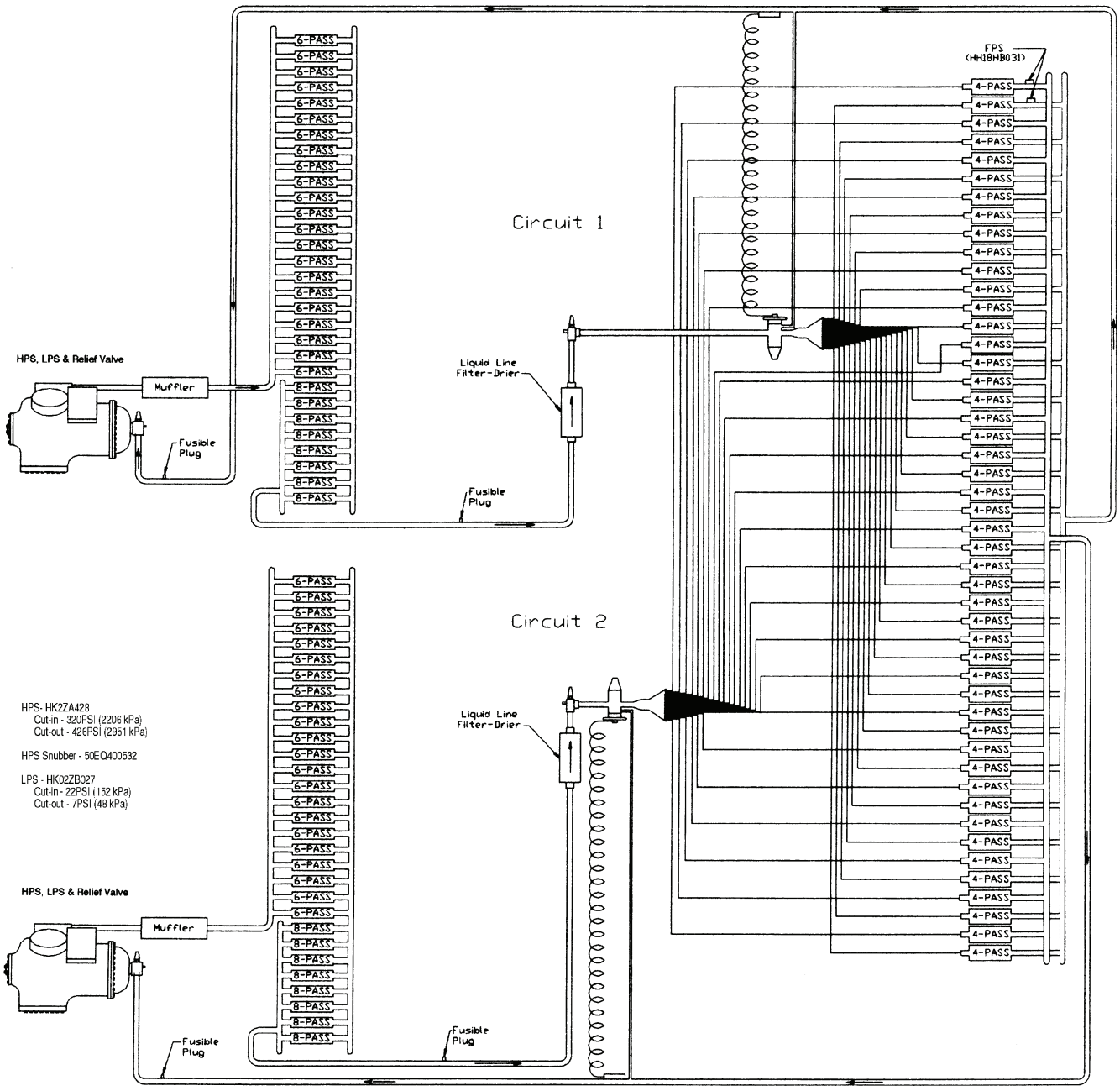
Fig. 76 — Typical Refrigerant Circuiting (50EJ,EK,EW,EY038 and 044)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

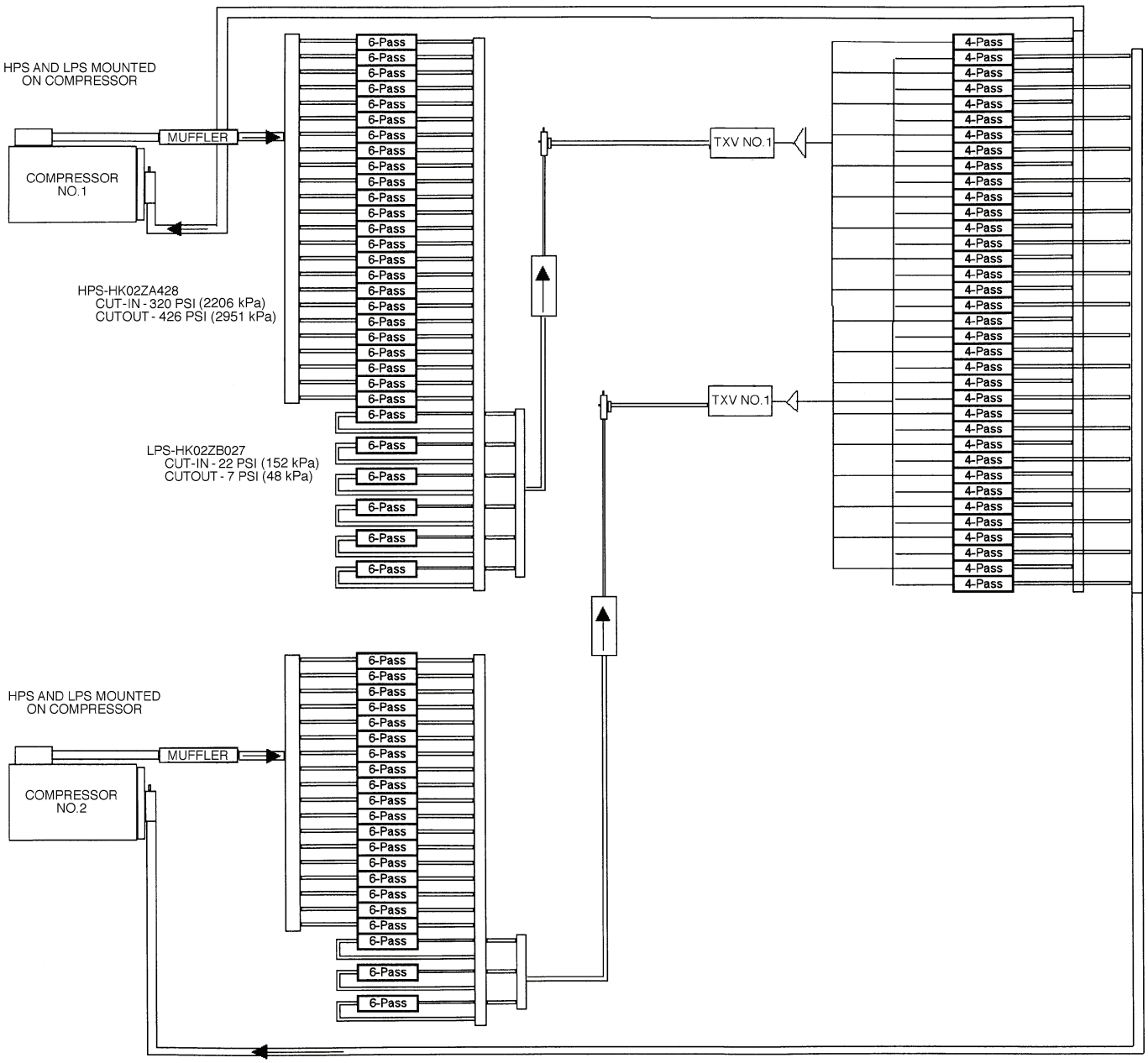
Fig. 77 — Typical Refrigerant Circuiting (50AJ,AK,AW,AY040,050)



LEGEND

FPS — Freeze-Protection Switch
HPS — High-Pressure Switch
LPS — Low-Pressure Switch

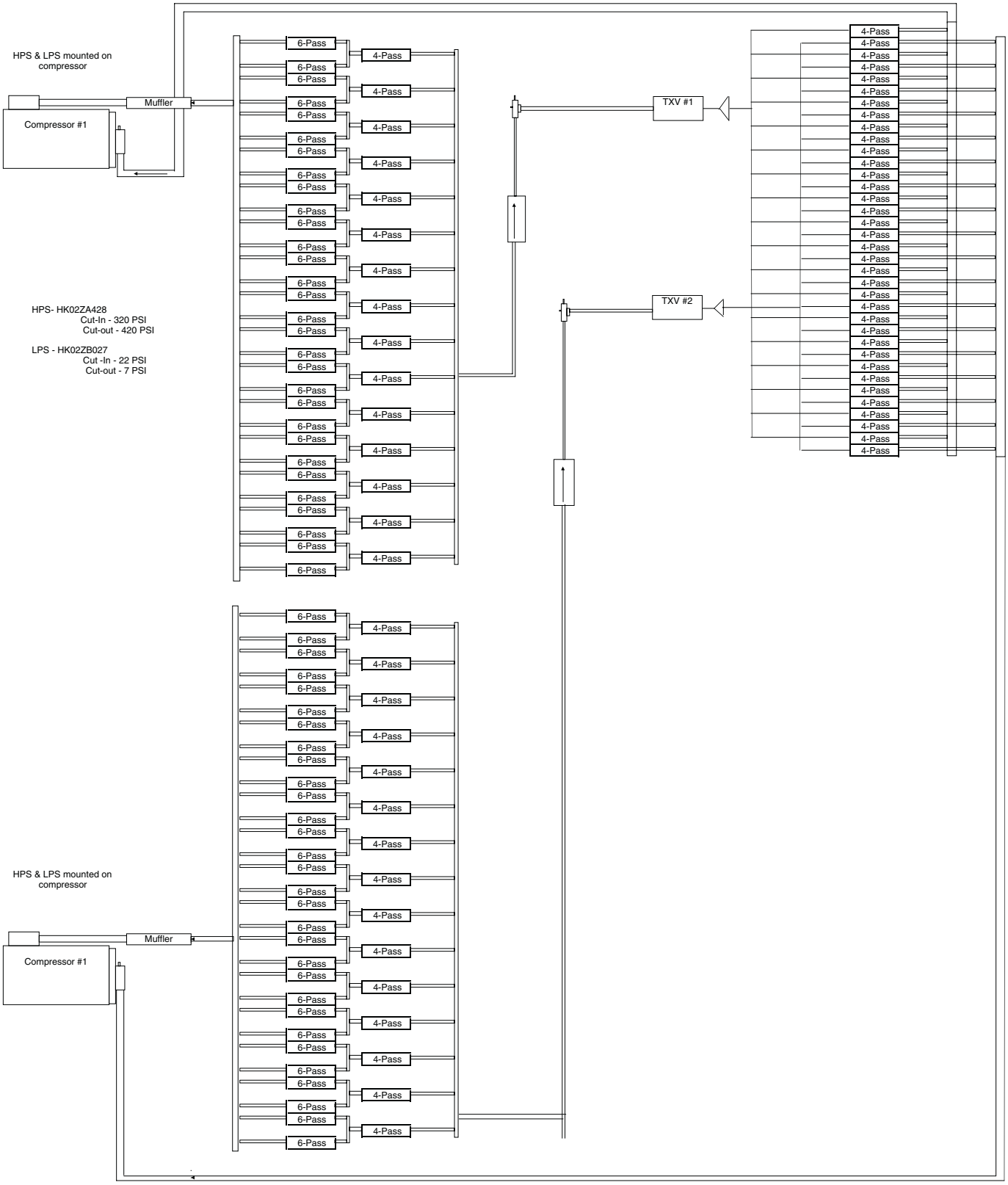
Fig. 78 — Typical Refrigerant Circuiting (50EJ,EK,EW,EY048)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

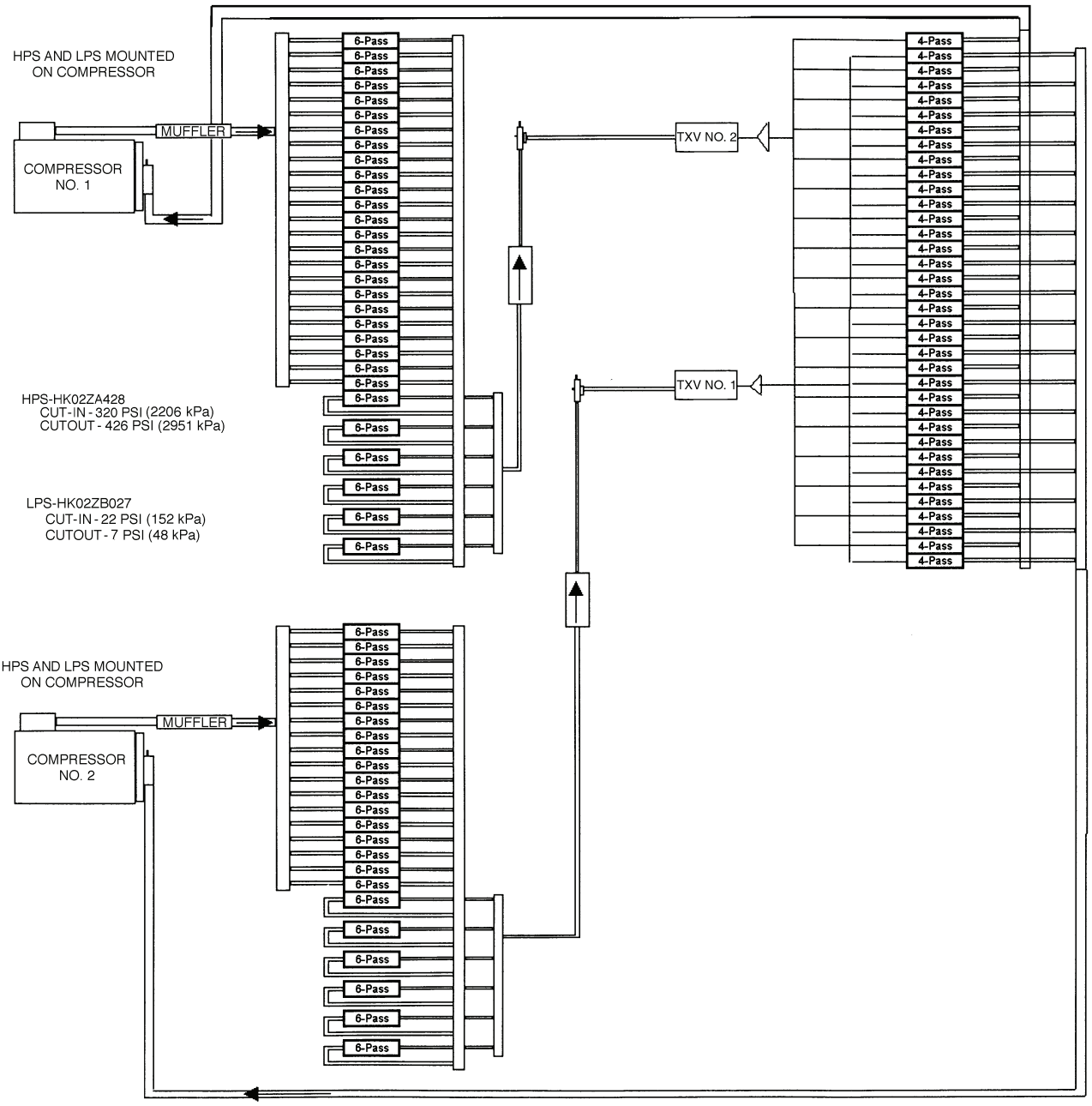
Fig. 79 — Typical Refrigerant Circuiting (50EJ,EK,EW,EY054 and 058)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

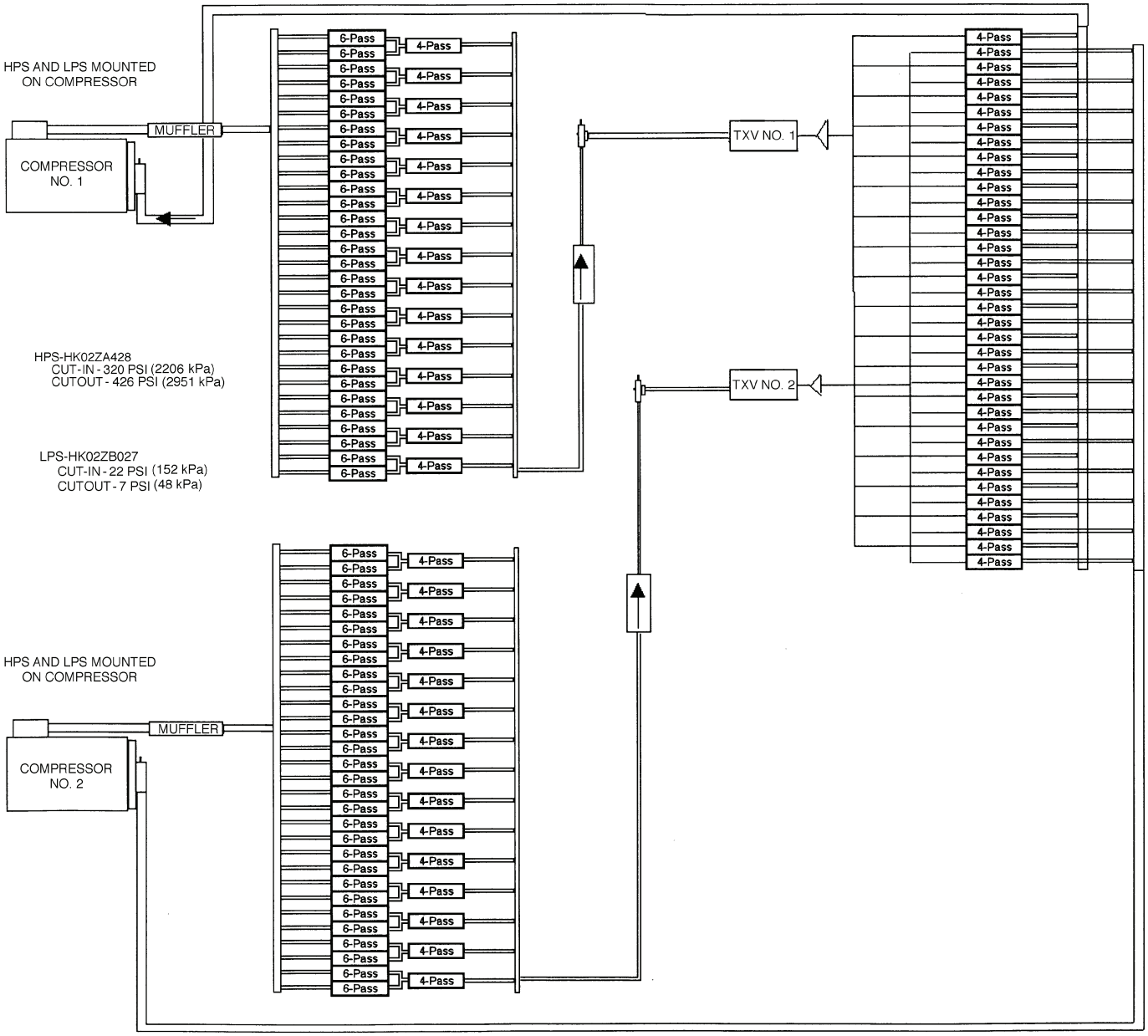
Fig. 80 — Typical Refrigerant Circuiting (50AJ,AK,AW,AY060)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

Fig. 81 — Typical Refrigerant Circuiting (50EJ,EK,EW,EY064)



LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch
TXV — Thermostatic Expansion Valve

Fig. 82 — Typical Refrigerant Circuiting (50EJ,EK,EW,EY068)

Diagnostic LEDs (Light-Emitting Diodes) — There are 3 LEDs (red, yellow, and green) on the lower right hand side of the control board. The red light is used to check unit operation and alarms. A constant pulse is normal unit operation. A series of quick blinks indicates an alarm. Refer to Table 40 below for a description of alarms. The yellow LED blinks during transmission with the CCN (Carrier Comfort Network). The green LED blinks during transmission with the expansion board.

Table 40 — Control Board LED Alarms

LED BLINKS	ERROR CODE	DESCRIPTION	RESET METHOD	ACTION TAKEN BY CONTROL	PROBABLE CAUSE
1	—	Normal Operation	—	None	The expansion board and control board flash the red LED in one-second intervals when the board is operating properly.
2	HF_13	Compressor No. 1 Safety	Automatic and Manual	Cooling disabled. Automatic reset after 15 minutes. Manual if repeated 3 times in 90 minutes.	High or low pressure switch open. Wiring error. Internal protector open. LPS ignored during first 5 minutes of operation.
3	HF_14	Compressor No. 2 Safety	Automatic and Manual	Cooling disabled. Automatic reset after 15 minutes. Manual if repeated 3 times in 90 minutes.	High or low pressure switch open. Wiring error. Internal protector open. LPS ignored during first 5 minutes of operation.
4	HF_15	Thermostat Failure	Automatic	Alarm generated.	Simultaneous call for heat and cool. Call for 2nd stage heat/cool before 1st stage heat/cool.
5	HF_05	SAT Thermistor Failure	Automatic	Heating, cooling, and economizer disabled.	Bad, shorted, or open thermistor caused by a wiring error or loose connection.
6	HF_10	OAT Thermistor Failure	Automatic	NTFC, IAQ purge, economizer, and low ambient DX cooling locked out disabled.	Bad, shorted, or open thermistor caused by a wiring error or loose connection.
7	HF_03	SPT Thermistor Failure	Automatic	Disables unoccupied cooling/ heating, CV economizer, and CV cooling/heating.	Bad thermistor, wiring error, or loose connection. Not used with thermostat.
8	HF_12	RAT Thermistor Failure	Automatic	VAV heating disabled.	Bad, shorted, or open thermistor caused by a wiring error or loose connection.
9	SE_05	Communications Loss w/ Expansion Board	Automatic	Algorithms in expansion board are bypassed.	Faulty or improperly connected plug faulty expansion module, or wiring error.
10	HF_16	Control Board Failure: Non-volatile RAM	None	Control uses default values. (May seem as normal operation)	Point(s) in RAM not readable.
		Analog to Digital Conversion	None	All outputs turned off.	Faulty module.
11	HF_17	Expansion I/O Board Failure: Non-volatile RAM	None	All outputs turned off.	Faulty module.
12	SE_23	Cooling SAT Low Limit Shutdown	Automatic	Alarm generated.	CV operation. When SAT low limits are below range and compressor shut off.

LEGEND

CV — Constant Volume
DIP — Dual In-Line Package
DX — Direct Expansion
IAQ — Indoor-Air Quality
LED — Light-Emitting Diode
NTFC — Nighttime Free Cooling
VAV — Variable Air Volume

Tables 41-43 show the input and output channel designations.

Table 41 — I/O Channel Designations Base Module — CV

TERMINAL NO.	ASSIGNMENT	TERMINAL NO.	ASSIGNMENT
T1-2	SPT (CCN) — 10KΩThermistor	**T23-25**	Compressor 2 Safety — DI (24 vac)
T3-4	STO (CCN) — 10KΩ Thermistor	**T24-25**	Outside Air Enthalpy — DI (24 vac)
T5-6	OAT — 5KΩ Thermistor	**T26-27**	Economizer Pos. — AO (4-20 mA)
T7-8	SAT — 5KΩ Thermistor	**T28-29**	Heat 1 Relay — DO (24 vac)
T9-10	—	**T30-29**	Heat 2 Relay — DO (24 vac)
T11-12	SAT Reset — AI (4 to 20 mA)	**T31-32**	CV Power Exhaust 1/Modulating Power Exhaust — DO (115 vac)
T13-14	IAQ Indoor — AI (4 to 20 mA)	**T33-32**	CV Power Exhaust 2 — DO (115 vac)
T15-16	IAQ Outdoor — AI (4 to 20 mA)	**T34-35**	Condenser Fan — DO (115 vac)
T17-25	Y1 or Remote Start/Stop — DI (24 vac)	**T36-35**	OFC2 — DO (115 vac)
T18-25	Y2 — DI (24 vac)	**T37-38**	—
T19-25	W1 — DI (24 vac)	**T39-38**	—
T20-25	W2 — DI (24 vac)	**K1**	Indoor Fan Relay — DO (LV)
T21-25	G — DI (24 vac)	**K2**	Compr. 1 — DO (HV)
T22-25	Compressor 1 Safety — DI (24 vac)	**K3**	Compr. 2 — DO (HV)

Table 42 — I/O Channel Designations Base Module — VAV

TERMINAL NO.	ASSIGNMENT	TERMINAL NO.	ASSIGNMENT
T1-2	SPT (CCN) — 10KΩ Thermistor	**T23-25**	Compressor 2 Safety — DI (24 vac)
T3-4	RAT — 5KΩ Thermistor	**T24-25**	Outside Air Enthalpy — DI (24 vac)
T5-6	OAT — 5KΩ Thermistor	**T26-27**	Economizer Pos. — AO (4-20 mA)
T7-8	SAT — 5KΩ Thermistor	**T28-29**	Heat 1 Relay — DO (24 v)
T9-10	—	**T30-29**	Heat Interlock Relay — DO (24 v)
T11-12	SAT Reset — AI (4 to 20 mA)	**T31-32**	Modulated Power Exhaust — DO (24 vac)
T13-14	IAQ Indoor — AI (4 to 20 mA)	**T33-32**	—
T15-16	IAQ Outdoor — AI (4 to 20 mA)	**T34-35**	Condenser Fan — DO (115 vac)
T17-25	Remote Start/Stop — DI (24 vac)	**T36-35**	OFC2 — DO (115 vac)
T18-25	—	**T37-38**	Unloader 1 — DO (115 vac)
T19-25	—	**T39-38**	Unloader 2 — DO (115 vac)
T20-25	—	**K1**	Indoor Fan Relay — DO (LV)
T21-25	—	**K2**	Compr. 1 — DO (HV)
T22-25	Compressor 1 Safety — DI (24 vac)	**K3**	Compr. 2 — DO (HV)

Table 43 — I/O Channel Designations Base Module (field-Installed) — CV and VAV

TERMINAL NO.	ASSIGNMENT	TERMINAL NO.	ASSIGNMENT
T1-2	—	**T23 and TB2-1**	Fire — Evacuation — DI (24 vac)
T3-4	—	**T24 and TB2-1**	Fire — Smoke Purge — DI (24 vac)
T5-6	—	**T26-27**	—
T7-8	—	**T28-29**	—
T9-10	—	**T30 and TB2-2**	Alarm Light Indicator — DO (24 vac)
T11-12	—	**T31**	Power Exhaust Fire No. 1 — DO (115 vac)
T13-14	—	**T33**	Power Exhaust Fire No. 2 — DO (115 vac)
T15-16	—	**T34**	Power Exhaust Fire No. 3 — DO (115 vac)
T17 and TB2-1	Fan Status — DI (24 vac)	**T36**	Power Exhaust Fire No. 4 — DO (115 vac)
T18 and TB2-1	Filter Status - DI (24 vac)	**T37**	Modulating Power Exhaust No. 5
T19 and TB2-1	Field Applied Status — DI (24 vac)	**T39**	Modulating Power Exhaust No. 6
T20 and TB2-1	Demand Limit — DI (24 vac)	**K1**	—
T21 and TB2-1	Fire — Unit Shutdown — DI (24 vac)	**K2**	—
T22 and TB2-1	Fire — Pressurization — DI (24 vac)	**K3**	—

LEGEND (Tables 41-43)

AI — Analog Input
AO — Analog Output
CCN — Carrier Comfort Network
CV — Constant Volume
DI — Direct Input
DO — Direct Output
HV — High Voltage
IAQ — Indoor Air Quality
KΩ — Kilo-Ohms
LV — Low Voltage
OAT — Outdoor-Air Temperature
OFC — Outdoor Fan Contactor
RAT — Return-Air Temperature
SAT — Supply-Air Temperature
SPT — Space Temperature
STO — Space Temperature Offset
T — Terminal
TB — Terminal Block
VAV — Variable Air Volume

NOTE: All even numbered terminals are negative (-) polarity and all odd numbered terminals are positive (+) polarity.

SERVICE TRAINING

Packaged Service Training programs are an excellent way to increase your knowledge of the equipment discussed in this manual, including:

- Unit Familiarization
- Installation Overview
- Maintenance
- Operating Sequence

A large selection of product, theory, and skills programs are available, using popular video-based formats and materials. All include video and/or slides, plus companion book.

Classroom Service Training which includes "hands-on" experience with the products in our labs can mean increased confidence that really pays dividends in faster troubleshooting and fewer callbacks. Course descriptions and schedules are in our catalog.

CALL FOR FREE CATALOG 1-800-962-9212

[ ] Packaged Service Training [ ] Classroom Service Training

Copyright 2001 Carrier Corporation

START-UP CHECKLIST

MODEL NO.: _____ SERIAL NO.: _____

SOFTWARE VERSION (SEE FIG. 25): _____ TECHNICIAN: _____

DATE: _____

PRE-START-UP:

☐ VERIFY THAT DIP SWITCH SETTINGS ARE CORRECT

☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT

☐ REMOVE ALL COMPRESSOR SHIPPING HOLDDOWN BOLTS AND BRACKETS PER INSTRUCTIONS

☐ VERIFY INSTALLATION OF ECONOMIZER HOOD

☐ VERIFY INSTALLATION OF ALL OPTIONS AND ACCESSORIES

☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS

☐ VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT

☐ CHECK THAT RETURN-AIR FILTERS AND OUTDOOR-AIR INLET SCREENS ARE CLEAN AND IN PLACE

☐ VERIFY THAT UNIT IS LEVEL WITHIN TOLERANCES FOR PROPER CONDENSATE DRAIN

☐ CHECK FAN WHEELS AND PROPELLERS FOR LOCATION IN HOUSING/ORIFICE, AND VERIFY SETSCREW IS TIGHT

☐ VERIFY THAT FAN SHEAVES ARE ALIGNED AND BELTS ARE PROPERLY TENSIONED

☐ VERIFY THAT SUCTION, DISCHARGE, AND LIQUID LINE SERVICE VALVES ON EACH CIRCUIT ARE OPEN

☐ VERIFY THAT CRANKCASE HEATERS HAVE BEEN ENERGIZED FOR 24 HOURS BEFORE START-UP

START-UP:

ELECTRICAL

SUPPLY VOLTAGE L1-L2 _____ L2-L3 _____ L3-L1 _____

COMPRESSOR AMPS — COMPRESSOR NO. 1 L1 _____ L2 _____ L3 _____

COMPRESSOR AMPS — COMPRESSOR NO. 2 L1 _____ L2 _____ L3 _____

SUPPLY FANS AMPS (CV) _____ EXHAUST FAN AMPS _____

(VAV) _____ *

*VAV fan supply amps reading must be taken with a true RMS meter for accurate readings.

☐ ADJUST VARIABLE FREQUENCY DRIVE (VFD) TO APPLICATION REQUIREMENTS

ELECTRIC HEAT AMPS (IF SO EQUIPPED) L1 _____ L2 _____ L3 _____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE _____ F (C) db (Dry Bulb)

RETURN-AIR TEMPERATURE _____ F (C) db _____ F (C) wb (Wet Bulb)

COOLING SUPPLY AIR _____ F (C)

ELECTRIC HEAT SUPPLY AIR (IF SO EQUIPPED) _____ F (C)

PRESSURES

REFRIGERANT SUCTION CIRCUIT NO. 1 _____ PSIG (kPa) CIRCUIT NO. 2 _____ PSIG (kPa)

REFRIGERANT DISCHARGE CIRCUIT NO. 2 _____ PSIG (kPa) CIRCUIT NO. 2 _____ PSIG (kPa)

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGE 105.

START-UP CHECKLIST (cont)

GENERAL

☐ ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS

☐ ENSURE DRIVES OPERATE WITHIN LIMITS OF FAN PERFORMANCE TABLES

HIGH PRESSURE SWITCH SETTING _____ PSIG (kPa)

LOW PRESSURE SWITCH SETTING _____ PSIG (kPa)

MOTOR PULLEY PART NUMBER _____

FAN PULLEY PART NUMBER _____

BELT PART NUMBER _____

BELT SIZE _____ in. (mm)

FILTER QUANTITY _____

FILTER SIZES _____ in. (mm)

ADDITIONAL NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Copyright 2001 Carrier Corporation