

## Liebert® CW™

System Design Manual - 26-181kW, 50 & 60Hz





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## LIEBERT® CW™ MODEL NUMBER NOMENCLATURE

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<b>CW</b>	<b>114</b>	<b>D</b>	<b>C</b>	<b>S</b>	<b>A</b>	<b>2</b>	<b>1234</b>	<b>A</b>
↓	↓	↓	↓	↓	↓	↓	↓	↓
CW = Liebert CW Floor Mount Chilled Water Unit	Nominal Capacity, kW	D = Downflow U = Upflow	C = Chilled Water		A = 460/3/60 B = 575/3/60 C = 208/3/60 D = 230/3/60 2 = 380/3/60 F = 380/3/50 G = 415/3/50		Configuration	A-Z = Standard configuration S = SFA
			S = Forward-Curved Centrifugal Fan with Standard Motor V = Forward-Curved Centrifugal fan with Variable Speed Drive 1 = EC Motorized Impeller			2 = 2-Way Valve, Standard Pressure 3 = 3-Way Valve, Standard Pressure 1 = 2-Way Valve, High Pressure T = 3-Way Valve, High Pressure		

# 1.0 LIEBERT® CW™ PERFORMANCE DATA—50 & 60 Hz SYSTEMS

	026	038	041	051	060	076	084	106	114
Capacity Data BTU/H (kW) Based on 45°F (7.2°C) Entering Water, 10°F (5.5°C) Water Rise									
75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45% RH									
Total Capacity, kBTUH (kW)	78 (22.8)	108 (31.7)	144 (42.2)	169 (49.4)	229 (67.2)	233 (68.2)	292 (85.5)	352 (103.1)	437 (127.9)
Sensible Capacity, kBTUH (kW)	78 (22.8)	105 (30.8)	128 (37.5)	167 (48.9)	203 (59.6)	222 (65.1)	259 (75.8)	331 (96.8)	380 (111.2)
Flow Rate, GPM (l/s)	17.2 (1.1)	24.1 (1.5)	31.4 (2)	37.7 (2.4)	49.9 (3.1)	52 (3.3)	63.7 (4)	77.2 (4.9)	94.2 (5.9)
Pressure Drop, ft (kPa)	11.2 (33.4)	17.5 (52.3)	15.6 (46.6)	9.3 (27.8)	10.4 (31.1)	10.4 (31.1)	18.2 (54.3)	20.4 (60.9)	34.8 (103.9)
Hot-Aisle Return Capacity Data, 45°F (7.2°C) Entering Water, 12°F (6.7°C) Temperature Rise									
80°F DB, 62.8°F WB (26.7°C DB, 17.1°C WB) 38% RH									
Total Capacity, kBTUH (kW)	100 (29.2)	135 (39.4)	174 (50.9)	213 (62.3)	278 (81.3)	289 (84.7)	352 (103.1)	432 (126.5)	520 (152.2)
Sensible Capacity, kBTUH (kW)	100 (29.2)	132 (38.7)	157 (46)	211 (61.7)	250 (73.1)	278 (81.5)	318 (93.1)	409 (119.9)	463 (135.5)
Flow Rate, GPM (l/s)	21.5 (1.4)	29.4 (1.9)	37.4 (2.4)	46.4 (2.9)	59.5 (3.7)	63.2 (4)	75.7 (4.8)	93.1 (5.9)	110.7 (7)
Pressure Drop, ft (kPa)	17.1 (51.1)	25.4 (75.8)	21.4 (63.9)	13.7 (40.9)	14.3 (42.7)	14.9 (44.5)	25 (74.7)	28.8 (86)	47 (140.3)
85°F DB, 64.5°F WB (29.4°C DB, 18.1°C WB) 32.3% RH									
Total Capacity, kBTUH (kW)	121 (35.3)	164 (48)	206 (60.3)	261 (76.3)	330 (96.7)	347 (101.6)	417 (122.1)	514 (150.4)	616 (180.3)
Sensible Capacity, kBTUH (kW)	121 (35.3)	158 (46.2)	185 (54.2)	252 (73.8)	294 (86.1)	331 (97)	374 (109.6)	485 (141.9)	543 (159.1)
Flow Rate, GPM (l/s)	25.7 (1.6)	35.2 (2.2)	43.8 (2.8)	56 (3.5)	69.9 (4.4)	74.7 (4.7)	88.7 (5.6)	109.3 (6.9)	129.8 (8.2)
Pressure Drop, ft (kPa)	23.9 (71.4)	35.9 (107.2)	28.6 (85.4)	19.5 (58.2)	19.2 (57.3)	20.2 (60.3)	33.4 (99.7)	38.9 (116.2)	63 (188.1)
FAN SECTION - Variable Pitch, Two-Belt Drive Package* (*Some options or combinations of options may result in reduced air flow. Consult factory for recommendations.)									
Fan Data									
Air Volume, CFM (CMH)	5,050 (8,580)	5,850 (9,940)	5,750 (9,770)	9,150 (15,550)	8,900 (15,120)	12,100 (20,560)	11,650 (19,790)	17,100 (29,050)	16,500 (28,030)
Fan Motor, Maximum, hp (kW), ea	3.0 (2.2)	5.0 (3.7)		7.5 (5.6)		10.0 (7.5)		15.0 (11.2)	
Ext Static Pressure, in of water (PA)	0.2 (50)			0.2 (50)			0.2 (50)		
Number of Fans	1	1	1	2	2	2	2	3	3
Chilled Water Coil									
Face Area, ft <sup>2</sup> (m <sup>3</sup> )	11.7 (1.1)			18.5 (1.7)		25.0 (2.3)		36.3 (3.4)	
No. of Rows	3	4	6	4	6	4	6	4	6
Face Velocity, FPM (m/s)	433 (2.19)	501 (2.54)	493 (2.50)	501 (2.54)	487 (2.47)	484 (2.45)	466 (2.36)	471 (2.39)	455 (2.31)
Chilled Water Controls (Max. design water pressure 150 PSI (1034.3 kPa). Higher pressure available as an option. Consult factory).									
Valve Actuator	Modulating			Modulating			Modulating		
Sensors	Proportional			Proportional			Proportional		
Valve Body	3-Way			3-Way			3-Way		
Valve Cv	11.6	11.6	28.9	28.9	46.2	46.2	46.2	46.2	46.2
Valve Size	1	1-1/4	1-1/2	1-1/2	2	2	2	2	2
2-Way Valve (Opt.) Close-Off Press., PSI (kPa)	86 (593)		70 (483)		45 (310)			45 (310)	
REHEAT SECTION									
Electric Reheat - Three-Stage, Fin Tube									
Capacity, BTU/HR (kW)	34,130 (10)	51,195 (15)	68,260 (20)	85,325 (25)	102,390 (30)	102,390 (30)			
Steam Reheat: 218°F (103.3°C) Steam, 75°F (23.9°C) EAT, Std MTR - Modulating 2-way ****†									
Capacity, BTU/HR (kW)	84,100 (24.6)	85,800 (25.1)	85,800 (25.1)	93,400 (27.4)	144,500 (42.4)	163,200 (47.8)	163,200 (47.8)	171,700 (50.3)	171,700 (50.3)
Hot Water Reheat: Capacity @ 180°F (82.2°C) EWT, STD MTR 75°F (23.8°C) EAT - Modulating Control Valve 2-way****†									
Capacity, BTU/HR (kW)	47,000 (13.7)	49,500 (14.5)	49,500 (14.5)	89,900 (26.3)	89,900 (26.3)	125,200 (36.7)	125,200 (36.7)	133,700 (39.2)	133,700 (39.2)
Flow Rate, GPM (l/s)	5 (.31)	5 (.31)	5 (.31)	8 (.50)	8 (.50)	8 (.50)	8 (.50)	8 (.50)	8 (.50)
Pressure Drop, PSI (kPa)	3.5 (24.1)			1.6 (11.0)			1.6 (11.0)		
** Optional 3-way valve available; consult factory									
*** 25 PSI (172.4 kPa) maximum operating pressure; consult factory for higher pressures.									
† Unit CFM reduced by 300 with standard motor (142 l/s)									
**** 150 PSI (1034.3 kPa) maximum operating pressure; consult factory for higher pressures.									

	026	038	041	051	060	076	084	106	114
<b>HUMIDIFIER SECTION</b>									
<b>Infrared Humidifier Note (50 Hz Models are 22.1 lb/h (10.0 kg/h); 9.6 kW)</b>									
Capacity, lb/hr (kg/h)	11 (5.0)			17.4 (7.9)		22.1 (10)			
kW	4.8			6.4		9.6			
Pan	Stainless			Stainless			Stainless		
<b>Steam Generating Humidifier (Water conductivity between 200-500 micromhos is required for ideal operation)</b>									
Capacity, lb/hr (kg/h)	11 (5.0)			22 (10.0)			22 (10.0)		
kW	3.6			7.2					
<b>Steam Grid Humidifier - All Models (Standard Selection, 5 PSIG (34.5 kPa), Steam 14 lb/hr. [6.4 kg/h])</b>									
Supply Steam Pressure, PSIG (kPa)	—	2 (13.8)	4 (27.6)	5 (34.5)	6 (41.4)	8 (55.2)	10 (68.9)	—	—
Capacity, lb/hr (kg/h), w/ 5/32" orifice	—	8 (3.6)	12 (5.4)	14 (6.4)	16 (7.3)	19 (8.6)	21 (9.5)	—	—
<b>Filter Section - Disposable Type - Nominal Size and Quantities, MERV8 or MERV11 (option)</b>									
<b>Downflow Models</b>									
Nominal Size, in	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	24 x 31	24 x 31
Quantity	4	4	4	6	6	8	8	5	5
<b>Upflow Models (Front Return)</b>									
Nominal Size, in	24 x 24	24 x 24	24 x 24	24 x 24	24 x 24	24 x 24	24 x 24	18 x 24	18 x 24
Quantity	2	2	2	3	3	4	4	10	10
<b>Upflow Models (Bottom &amp; Rear Return) - Not available on CW106 or CW114</b>									
Nominal Size, in	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24	18 x 24
Quantity	4	4	4	6	6	8	8	10	5
<b>Connection Sizes, in.</b>									
Chilled Water, OD Copper	1-1/8	1-3/8	1-5/8	1-5/8	2-1/8	2-1/8	2-1/8	2-1/8	2-5/8
Infrared Humidifier, OD Copper	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Condensate Drain, FPT	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1-1/4	1-1/4
Steam Reheat, MPT	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4
Hot Water Reheat, OD Copper	5/8	5/8	5/8	7/8	7/8	7/8	7/8	7/8	7/8
Steam Humidifier, MPT	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
<b>Weight, Installed, lb. (kg)</b>	810 (367)	845 (383)	895 (405)	1140 (516)	1210 (548)	1390 (630)	1490 (675)	1950 (885)	2090 (949)

## 2.0 LIEBERT® CW™ PERFORMANCE DATA—MODELS WITH EC FANS, 50 & 60 Hz

	026	038	041	051	060	076	084	089	106	114	146	181
Capacity Data BTU/H (kW) Based on 45°F (7.2°C) Entering Water, 10°F (5.5°C) Water Rise												
75°F DB, 61°F WB (23.9°C DB, 16.1°C WB) 45% RH												
Total Capacity, kBTUH (kW)	83 (24.3)	115 (33.6)	152 (44.5)	174 (51.1)	240 (70.2)	246 (72)	305 (89.2)	353 (103.5)	364 (106.5)	457 (133.7)	515 (150.9)	725 (212.3)
Sensible Capacity, kBTUH (kW)	83 (24.3)	113 (33)	136 (39.8)	173 (50.6)	213 (62.5)	236 (69)	272 (79.6)	301 (88.2)	342 (100.1)	401 (117.3)	469 (137.3)	608 (178.2)
Flow Rate, GPM (l/s)	17.6 (1.1)	24.6 (1.5)	32.3 (2)	37.8 (2.4)	51.3 (3.2)	52.9 (3.3)	64.8 (4.1)	73.9 (4.7)	77.8 (4.9)	97.3 (6.1)	107.9 (6.8)	152.3 (9.6)
Press. Drop, ft (kPa)	11.8 (35.2)	18.1 (54)	16.4 (49)	9.3 (27.8)	10.9 (32.5)	10.7 (32)	18.8 (56.1)	22.3 (66.6)	20.7 (61.8)	37 (110.5)	10.6 (31.7)	25.6 (76.4)
80°F DB, 62.8°F WB (26.7°C DB, 15.6°C WB) 38% RH												
Total Capacity, kBTUH (kW)	105 (30.8)	142 (41.7)	183 (53.6)	219 (64.1)	289 (84.7)	304 (88.9)	366 (107.3)	418 (122.5)	444 (130)	55 (15.97)	617 (180.8)	854 (250)
Sensible Capacity, kBTUH (kW)	105 (30.8)	140 (41)	166 (48.7)	216 (63.4)	261 (76.4)	293 (85.7)	332 (97.2)	364 (106.6)	422 (123.5)	488 (142.8)	572 (167.5)	734 (214.9)
Flow Rate, GPM (l/s)	22.1 (1.4)	30.1 (1.9)	38.4 (2.4)	46.6 (2.9)	61.1 (3.8)	64.4 (4.1)	77 (4.9)	86.9 (5.5)	93.9 (5.9)	115 (7.2)	128.2 (8.1)	178 (11.2)
Press. Drop, ft (kPa)	18 (53.7)	26.6 (79.4)	22.5 (67.2)	13.8 (41.2)	15 (44.8)	15.4 (46)	25.8 (77)	30 (89.6)	29.3 (87.5)	50.3 (150.2)	14.6 (43.6)	34 (101.5)
85°FDB, 64.7°F WB (29.4°C DB, 18.2°C WB) 33% RH												
Total Capacity, kBTUH (kW)	127 (37.2)	172 (50.5)	215 (63.1)	267 (78.2)	343 (100.5)	362 (106.1)	432 (126.6)	488 (143)	526 (154.1)	645 (188.9)	731 (214.1)	993 (290.7)
Sensible Capacity, kBTUH (kW)	127 (37.2)	166 (48.7)	195 (57)	258 (75.6)	307 (89.8)	347 (101.5)	389 (114)	424 (124.1)	497 (145.7)	167 (159.1)	167 (196.4)	167 (249.7)
Flow Rate, GPM (l/s)	26.4 (1.7)	36.1 (2.3)	44.9 (2.8)	56.2 (3.5)	71.9 (4.5)	76 (4.8)	90.2 (5.7)	100.8 (6.4)	110 (6.9)	135 (8.5)	150.9 (9.5)	205.7 (13)
Press. Drop, ft (kPa)	25.2 (75.2)	37.7 (112.6)	29.9 (89.3)	19.7 (58.8)	20.2 (60.3)	20.9 (62.4)	34.4 (102.7)	39.5 (117.9)	39.5 (117.9)	67.6 (201.9)	19.7 (58.8)	44.3 (132.3)
Fan Data												
Air Volume, CFM (CMH)	5,250 (8,925)	6,050 (10,285)	5,950 (10,115)	9,200 (15,640)	9,200 (15,640)	12,400 (21,080)	11,900 (20,230)	12,100 (20,570)	17,300 (29,410)	17,300 (29,410)	21,000 (35,700)	24,000 (40,800)
Fan Motor, Maximum, hp (kW), ea	4.2 (3.4)			3.6 (2.7)		4.2 (3.4)		4.2 (3.4)		4.2 (3.4)		5.2 (4.3)
Ext. Static Pressure, in. of water (PA)	0.2 (50)			0.2 (50)		0.2 (50)		0.2 (50)		0.2 (50)		0.2 (50)
Chilled Water Coil												
Face Area, ft² (m³)	11.7 (1.1)			18.5 (1.7)		25.0 (2.3)		36.3 (3.4)			56.3 (5.3)	
No. of Rows	3	4	6	4	6	4	6	6	4	6	4	6
Face Velocity, FPM (m/s)	450 (2.28)	519 (2.63)	510 (2.59)	503 (2.55)	503 (2.55)	496 (2.51)	476 (2.41)	333 (1.69)	477 (2.42)	477 (2.42)	373 (1.89)	427 (2.16)
Valve Cv	11.6	11.6	28.9	28.9	46.2	46.2	46.2	46.2	46.2	46.2	4.62, qty 2	4.62, qty 2
Valve Size	1	1-1/4	1-1/2	1-1/2	2	2	2	2	2	2	2	2
Electric Reheat - Three-Stage, Fin Tube												
Capacity, BTU/h (kW)	34,130 (10)	51,195 (15)	51,195 (15)	68,260 (20)	85,325 (25)	102,390 (30)	102,390 (30)	102,390 (30)	102,390 (30)	102,390 (30)	102,390 (30)	102,390 (30)
Infrared Humidifier												
Capacity, lb/h (kg/h)	11 (5.0)	11 (5.0)	11 (5.0)	17.4 (7.9)	17.4 (7.9)	22.1 (10)	22.1 (10)	22.1 (10)	22.1 (10)	22.1 (10)	22.1 (10)	22.1 (10)
kW	4.8	4.8	4.8	6.4	6.4	9.6	9.6	9.6	9.6	9.6	9.6	9.6
Filter Section - Disposable Type - Nominal Size and Quantities, MERV8 or MERV11 (option)												
Nominal Size, in	18 x 24			18 x 24		18 x 24		24 x 31			21-1/2 x 24	
Quantity	4			6		8		5			10	
Connection Sizes, in												
Chilled Water, OD Copper	1-1/8	1-3/8	1-5/8	1-5/8	2-1/8	2-1/8	2-1/8	2-5/8	2-1/8	2-5/8	3-1/8	3-1/8
Infrared Humidifier, OD Copper	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Condensate Drain, FPT	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4
Weight, Installed, lb (kg)	810 (367)	845 (383)	895 (405)	1140 (516)	1210 (548)	1390 (630)	1490 (675)	2090 (949)	1950 (885)	2090 (949)	2500 (1135)	2800 (1271)



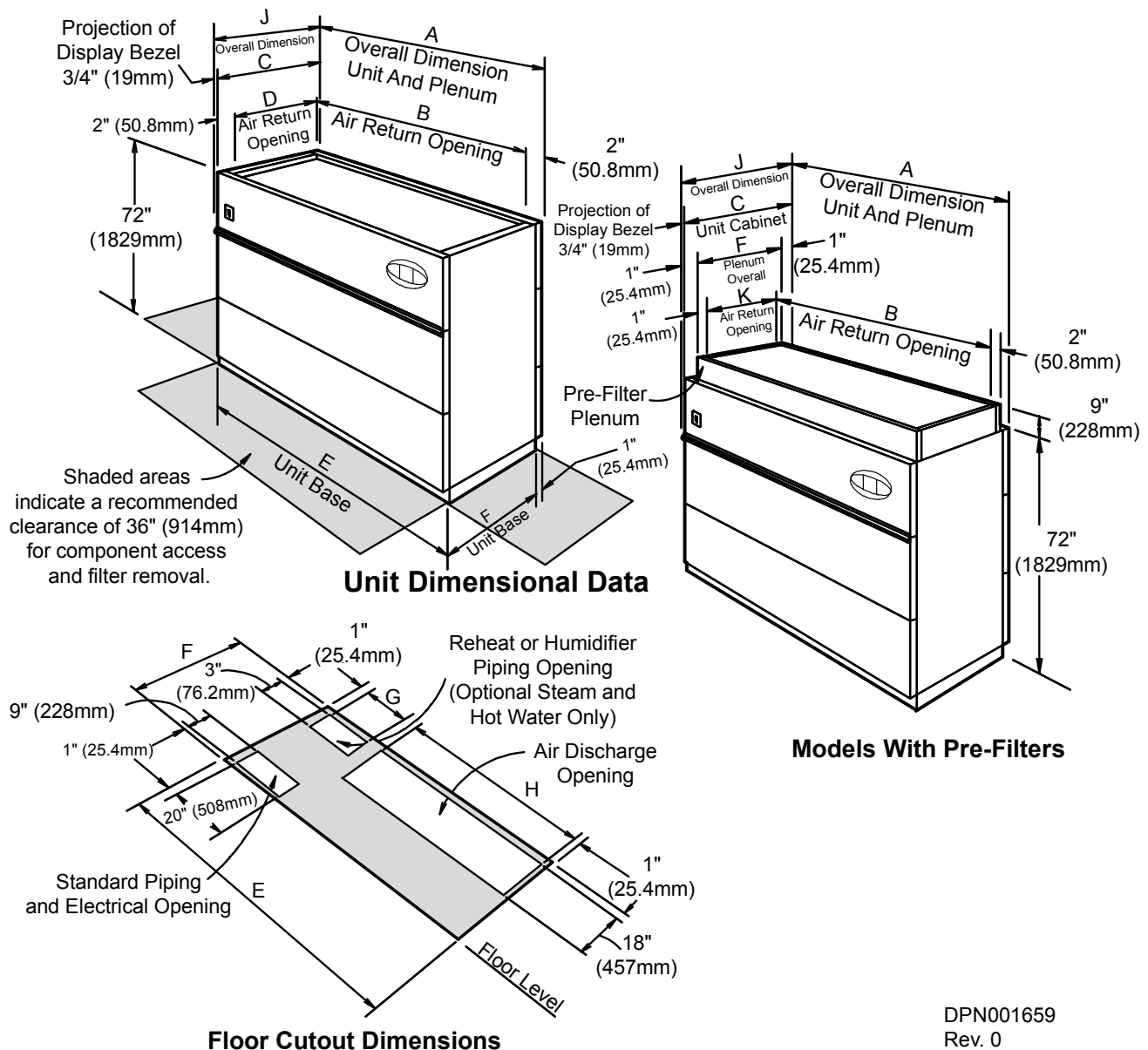
**Table 1     Motor size at rated airflow and ESP or maximum airflow at elevated ESP**

Model	Rated Airflow	Motor Size at Catalogued Airflow and Listed Static Pressure or Maximum Airflow with Maximum Motor Size at Listed Static Pressure						
		0.2"	0.4"	0.6"	0.8"	1.0"	1.2'	1.4"
026	5050	3	5	5	5	5	5	5
038	5850	5	5	5	5750	5600	5450	5350
041	5750	5	5700	5600	5450	5350	NA	NA
051	9150	7.5	7.5	9100	8900	8700	8550	8350
060	8900	7.5	7.5	8750	8550	8400	8200	8050
076	12100	10	15	15	15	15	11600	11000
084	11650	10	15	15	15	15	11400	NA
106	17100	15	15	15	15	15	16400	16100
114	16500	15	15	15	15	16100	NA	NA

1. Assumes MERV 8 filters, humidifier, reheat coil, 0 ft (0m) elevation entering air conditions of 80°F (26.6°C) DB, 52.3°F (11.36°C) DP and entering water conditions of 45°F (7°C) with 10°F (-12°C) ΔT.
2. NA = Not Available

### 3.0 DIMENSIONAL DATA

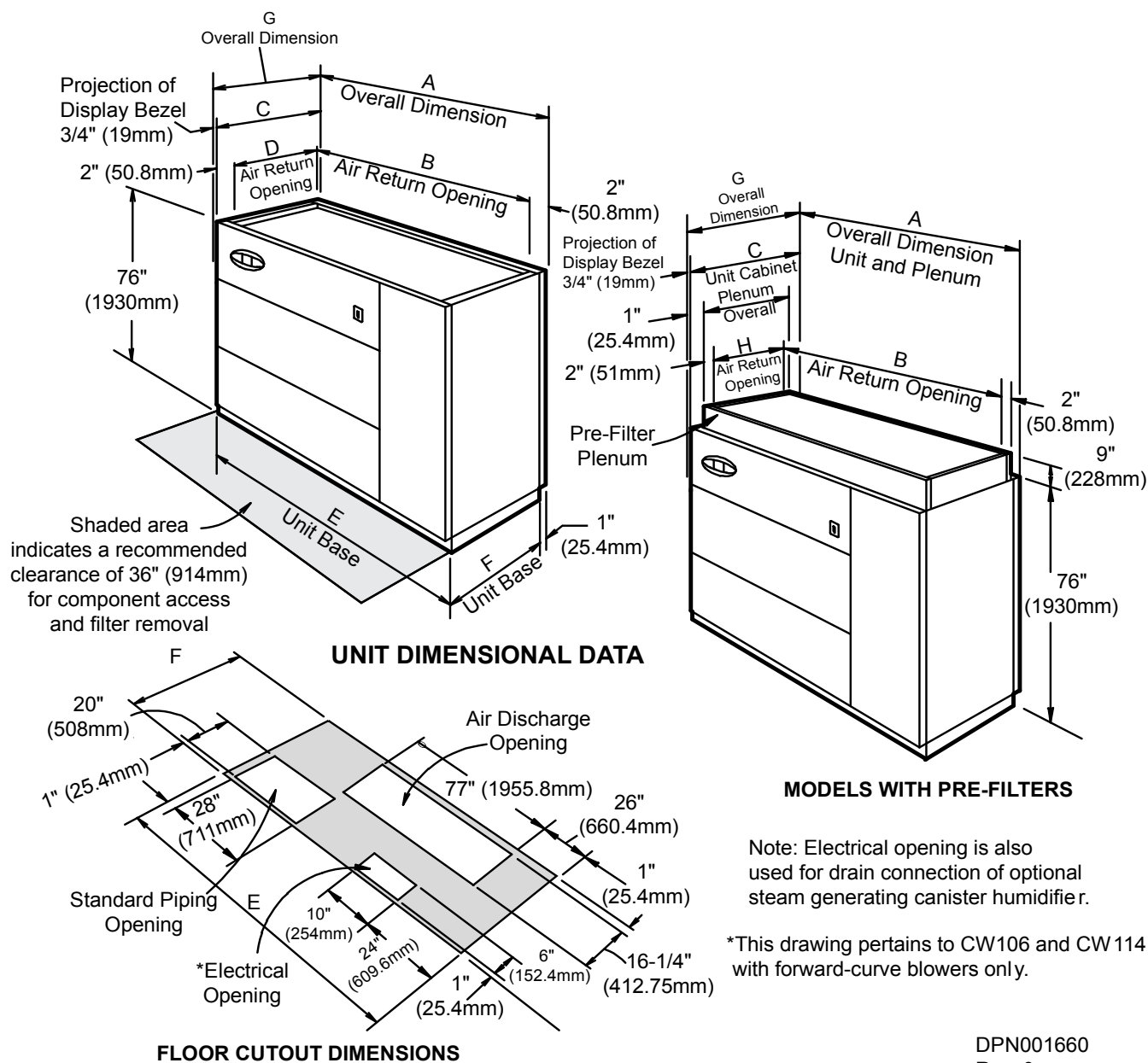
**Figure 1      Dimensions, CW026 - CW084**



DPN001659  
Rev. 0

Model	Dimensions, inches (mm)										Net Weight lb (kg)
	A	B	C	D	E	F	G	H	J	K	
CW026	50 (1270)	46 (1168)	35 (889)	32 (813)	48 (1219)	33 (883)	8 (203)	37 (940)	35-5/8 (905)	31 (787)	760 (345)
CW038	50 (1270)	46 (1168)	35 (889)	32 (813)	48 (1219)	33 (883)	8 (203)	37 (940)	35 5/8 (905)	31 (787)	795 (361)
CW041	50 (1270)	46 (1168)	35 (889)	32 (813)	48 (1219)	33 (883)	8 (203)	37 (940)	35 5/8 (905)	31 (787)	855 (388)
CW051	74 (1880)	70 (1778)	35 (889)	32 (813)	72 (1829)	33 (883)	8 (203)	61 (1549)	35 5/8 (905)	31 (787)	1090 (494)
CW060	74 (1880)	70 (1778)	35 (889)	32 (813)	72 (1829)	33 (883)	8 (203)	61 (1549)	35 5/8 (905)	31 (787)	1115 (524)
CW076	99 (2515)	95 (2413)	35 (889)	32 (813)	97 (2464)	33 (883)	15 1/4 (387)	78 3/4 (2000)	35 5/8 (905)	31 (787)	1320 (599)
CW084	99 (2515)	95 (2413)	35 (889)	32 (813)	97 (2464)	33 (883)	15 1/4 (387)	78 3/4 (2000)	35 5/8 (905)	31 (787)	1420 (644)

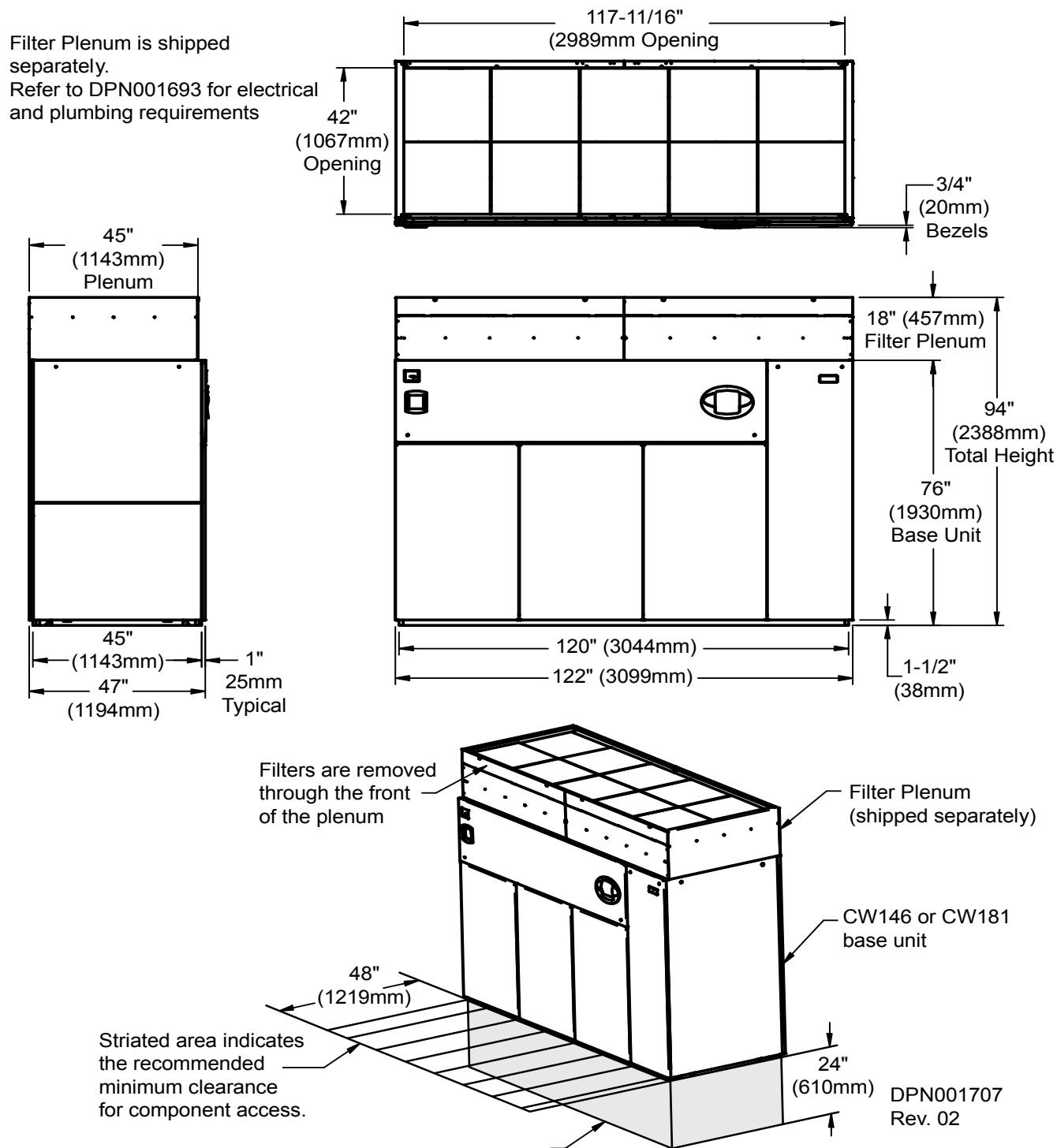
**Figure 2 Dimensions—50 & 60 Hz Systems CW089, CW106 and CW114, downflow models**



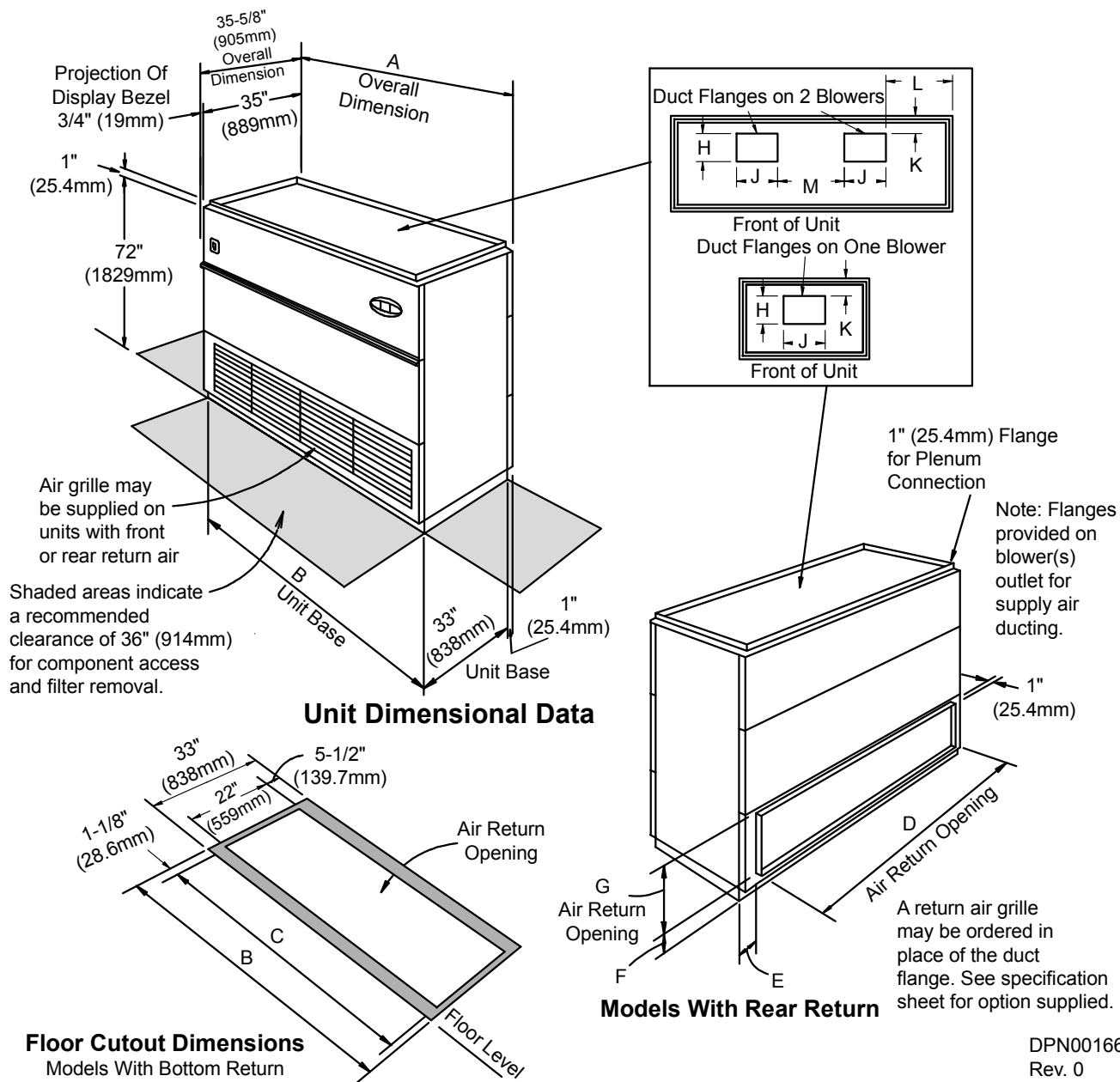
DPN001660  
Rev. 0

Model	Dimensions, inches (mm)									Net Weight lb (kg)
	A	B	C	D	E	F	G	H	I	
CW106	122 (3099)	118 (2997)	35 (889)	31 (787)	120 (3048)	33 (838)	35-5/8 (905)	30 (762)	34 (864)	1785 (810)
CW114										1925 (873)

**Figure 3 Cabinet and floor planning dimensions, downflow models CW146 and CW181 with EC fans**



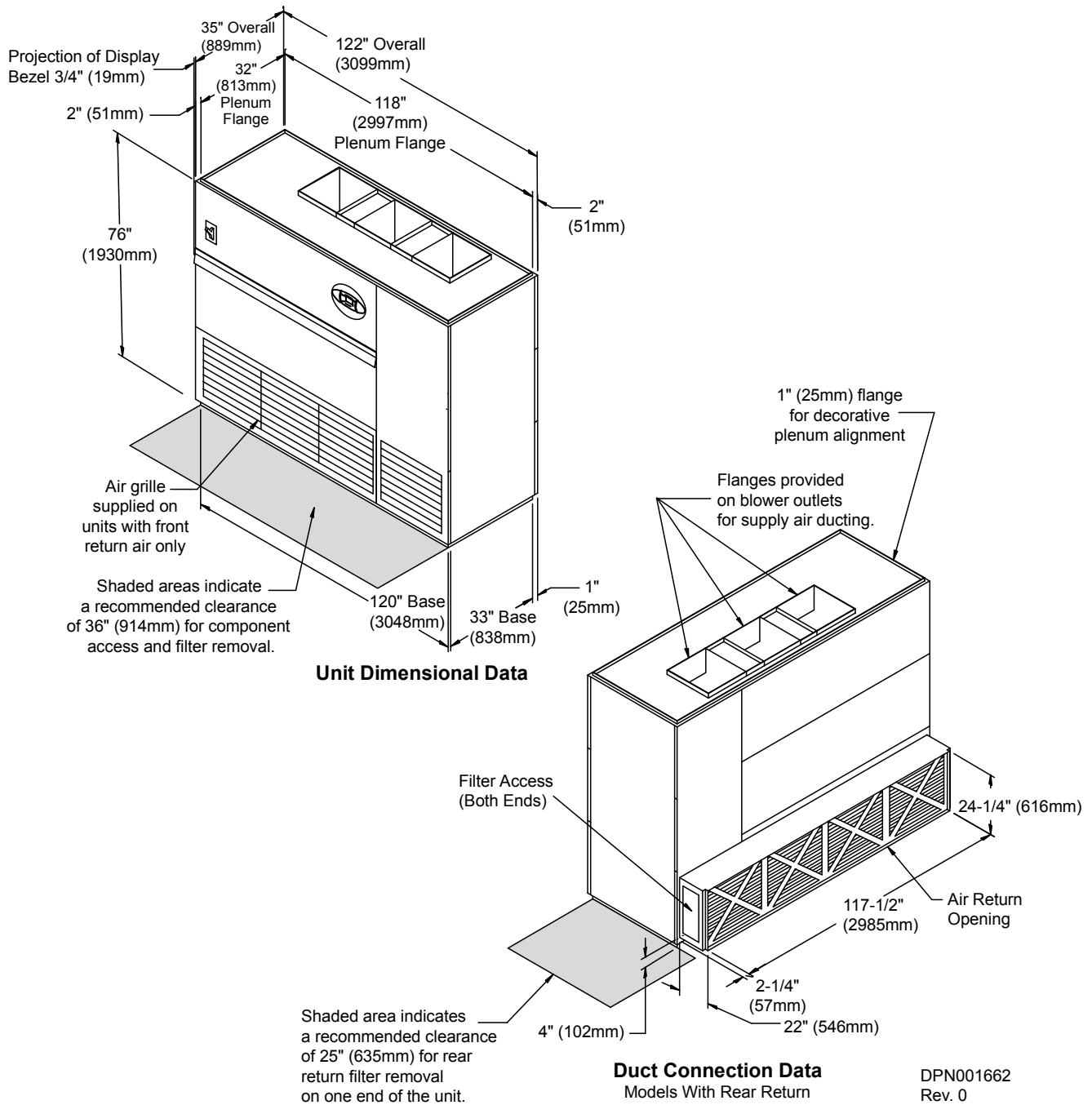
**Figure 4 Cabinet and floor planning dimensions, upflow models—CW026-CW084**



DPN001661  
Rev. 0

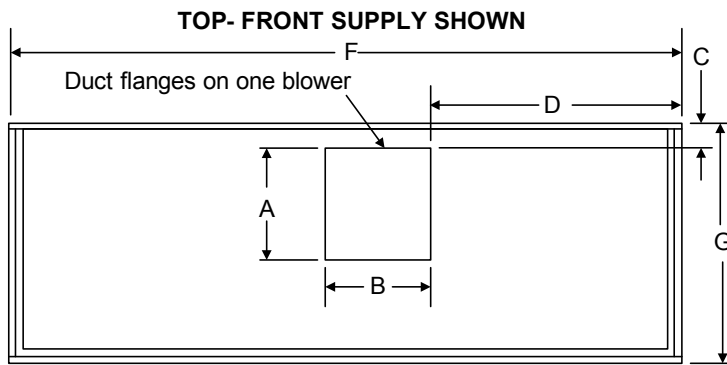
Model	No. of Blowers	Dimensions, inches (mm)												Net Weight, lb (kg)
		A	B	C	D	E	F	G	H	J	K	L	M	
CW026	1	50 (1270)	48 (1219)	46 (1168)	44 (1118)	3 (76)	5 (127)	18 (457)	15-7/8 (403)	18-5/8 (473)	2-3/16 (55)	17-3/8 (454)	—	760 (345)
CW038	1	50 (1270)	48 (1219)	46 (1168)	68 (1727)	3 (76)	5 (127)	18 (457)	15-7/8 (403)	18-5/8 (473)	2-3/16 (55)	17-3/8 (454)	—	795 (361)
CW041	1	50 (1270)	48 (1219)	46 (1168)	44 (1118)	3 (76)	5 (127)	18 (457)	15-7/8 (403)	18-5/8 (473)	2-3/16 (55)	17-3/8 (454)	—	855 (388)
CW051	2	74 (1880)	72 (1829)	70 (1778)	44 (1118)	3 (76)	4 (102)	20 (508)	15-7/8 (403)	14-5/8 (371)	2-3/16 (55)	20-3/8 (517)	11-1/4 (286)	1090 (494)
CW060	2	74 (1880)	72 (1829)	70 (1778)	68 (1727)	3 (76)	4 (102)	20 (508)	15-7/8 (403)	14-5/8 (371)	2-3/16 (55)	20-3/8 (517)	11-1/4 (286)	1155 (524)
CW076	2	99 (2515)	97 (2464)	95 (2413)	86 (2184)	6-1/2 (165)	5 (127)	18 (457)	15-7/8 (403)	18-5/8 (473)	3 1/4 (82)	20-5/8 (524)	12-5/8 (321)	1320 (599)
CW084	2	99 (2515)	97 (2464)	95 (2413)	86 (2184)	6-1/2 (165)	5 (127)	18 (457)	15-7/8 (403)	18-5/8 (473)	3 1/4 (82)	20-5/8 (524)	12-5/8 (321)	1420 (644)

**Figure 5 Cabinet and floor planning dimensions, CW 106 and CW114 upflow models**

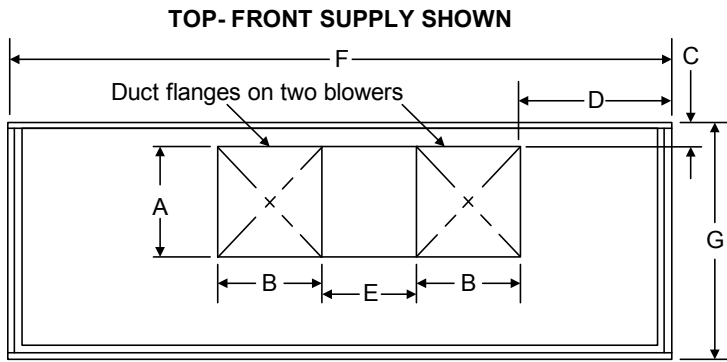


## 4.0 UPFLOW DUCT CONNECTION DATA CW026—CW084

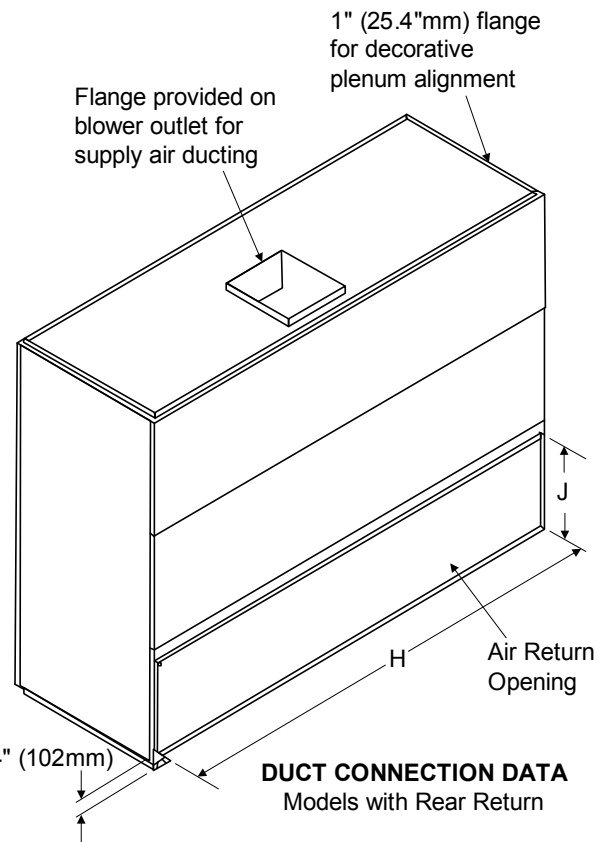
No. of Blowers	Model No. Chilled Water	Dimensions—in. (mm)								
		A	B	C	D	E	F	G	H	J
1	CW026	15-7/8 (403)	18-5/8 (473)	2-3/16 (55)	17-7/8 (454)	-	50 (1270)	35 (889)	44 (1118)	18 (457)
1	CW038	15-7/8 (403)	18-5/8 (473)	2-3/16 (55)	17-7/8 (454)	-	50 (1270)	35 (889)	44 (1118)	18 (457)
1	CW041	15-7/8 (403)	18-5/8 (473)	2-3/16 (55)	17-7/8 (454)	-	50 (1270)	35 (889)	44 (1118)	18 (457)
2	CW051	15-7/8 (403)	14-5/8 (371)	2-3/16 (55)	20-3/8 (517)	11-1/4 (288)	74 (1880)	35 (889)	68 (1727)	20 (508)
2	CW060	15-7/8 (403)	14-5/8 (371)	2-3/16 (55)	20-3/8 (517)	11-1/4 (288)	74 (1880)	35 (889)	68 (1727)	20 (508)
2	CW076	15-7/8 (403)	18-5/8 (473)	3-1/4 (82)	20-5/8 (524)	12-5/8 (321)	99 (2515)	35 (889)	86 (2184)	18 (457)
2	CW084	15-7/8 (403)	18-5/8 (473)	3-1/4 (82)	20-5/8 (524)	12-5/8 (321)	99 (2515)	35 (889)	86 (2184)	18 (457)



**FRONT OF UNIT**  
**BLOWER DUCT FLANGE LOCATION - One Fan**

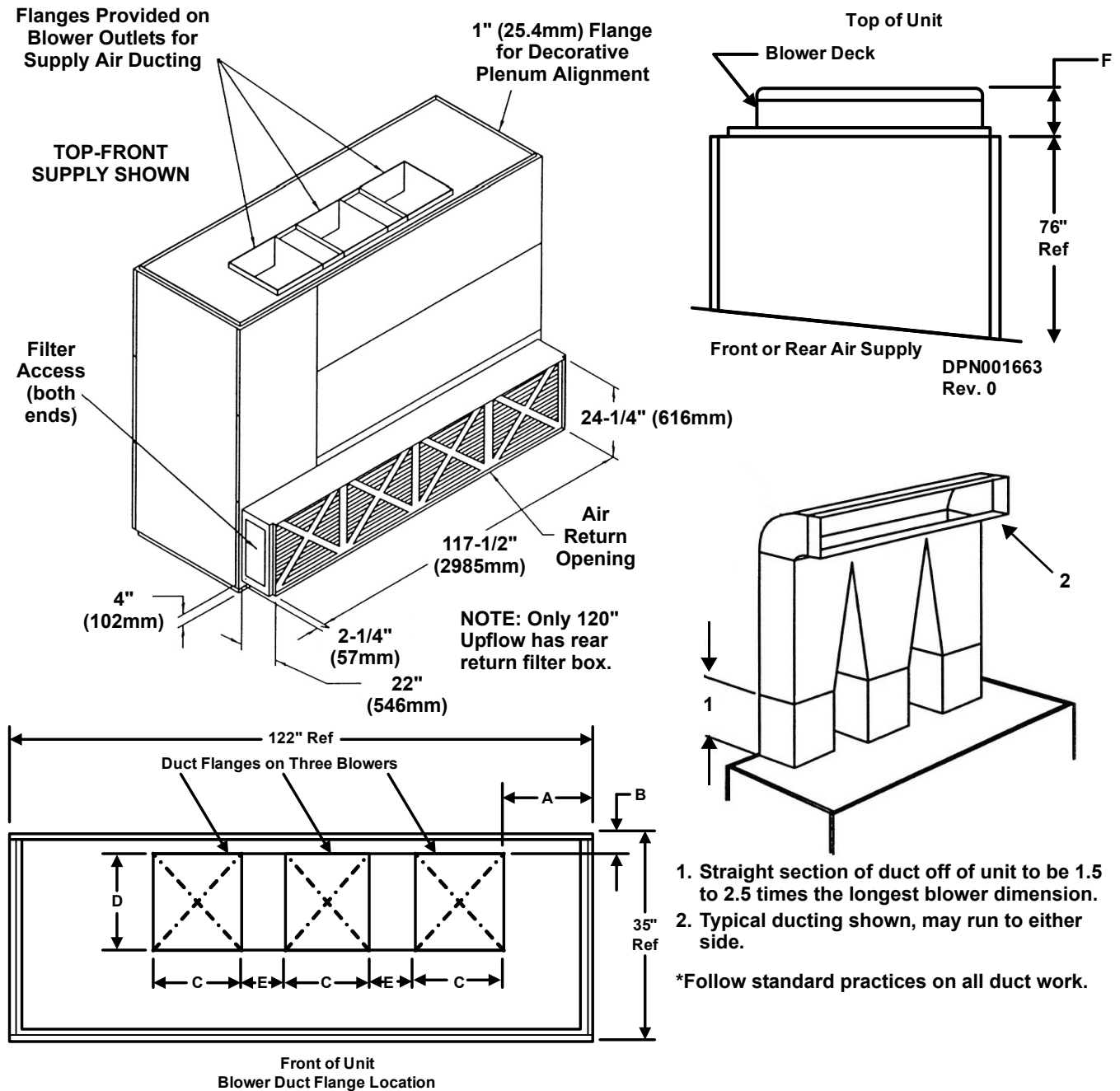


**FRONT OF UNIT**  
**BLOWER DUCT FLANGE LOCATION - Two Fans**



## 5.0 BLOWER DUCT & DECK DIMENSIONS, CW106 AND CW114, UPFLOW MODELS

Model	Blower	Supply	Motor, hp	Dimensions, inches (mm)						Net Weight lb. (Kg)
				A	B	C	D	E	F	
CW106	15 x 15	Top Front	10-15	27-1/2 (699)	3-1/2 (89)	18-11/16 (475)	16-3/16 (411)	10 (254)	4-1/2 (114)	1785 (810)
		Top Rear	10-15	27-1/2 (699)	12-5/16 (313)	18 11/16 (475)	16 3/16 (411)	10 (254)	4-1/2 (114)	
CW114	15 x 11	Top Front	10-15	30 (762)	3-1/2 (89)	14 3/4 (375)	16 3/16 (411)	10 (254)	4-1/2 (114)	1925 (873)
		Top Front	20	30 (762)	3-1/2 (89)	14 3/4 (375)	16 3/16 (411)	10 (254)	4-1/2 (114)	
		Top Rear	10-20	30 (762)	12-5/16 (313)	14 3/4 (375)	16 3/16 (411)	10 (254)	4-1/2 (114)	





## 6.0 ELECTRICAL SPECIFICATIONS

**Table 2 Electrical data—Forward-curved blowers, 50Hz systems**

Reheat Options			Electric			None			Electric			None		
Humidifier Options			IR/SGH			IR/SGH			Steam or None			Steam or None		
Models	Motor HP	Volts	200	230	380-415	200	230	380-415	200	230	380-415	200	230	380-415
CW026	2.0	FLA	46.7	43.4	24.3	19.8	17.2	9.9	33.9	32.3	17.9	7.0	6.1	3.5
	3.0	FLA	49.8	46.1	25.9	22.9	19.9	11.5	37.0	35.0	19.5	10.1	8.8	5.1
CW038	3.0	FLA	62.9	59.0	33.2	22.9	19.9	11.5	50.1	47.9	26.8	10.1	8.8	5.1
	5.0	FLA	68.6	63.9	36.0	28.6	24.8	14.3	55.8	52.8	29.6	15.8	13.7	7.9
CW041	3.0	FLA	62.9	59.0	33.2	22.9	19.9	11.5	50.1	47.9	26.8	10.1	8.8	5.1
	5.0	FLA	68.6	63.9	36.0	28.6	24.8	14.3	55.8	52.8	29.6	15.8	13.7	7.9
CW051	5.0	FLA	94.6	88.4	49.6	41.2	35.9	20.7	69.2	66.2	36.8	15.8	13.7	7.9
	7.5	FLA	103.9	96.5	54.2	50.5	44.0	25.3	78.5	74.3	41.4	25.1	21.8	12.5
CW060	5.0	FLA	107.9	101.4	56.8	41.2	35.9	20.7	82.5	79.2	44.0	15.8	13.7	7.9
	7.5	FLA	117.2	109.5	61.4	50.5	44.0	25.3	91.8	87.3	48.6	25.1	21.8	12.5
CW076	7.5	FLA	126.6	122.6	68.6	50.5	44.0	25.3	101.2	100.4	55.8	25.1	21.8	12.5
	10.0	FLA	131.7	128.4	71.2	55.6	49.8	27.9	106.3	106.2	58.4	30.2	27.6	15.1
CW084	7.5	FLA	126.6	122.6	68.6	50.5	44.0	25.3	101.2	100.4	55.8	25.1	21.8	12.5
	10.0	FLA	131.7	128.4	71.2	55.6	49.8	27.9	106.3	106.2	58.4	30.2	27.6	15.1
CW106	10.0	FLA	131.7	128.4	71.2	55.6	49.8	27.9	106.3	106.2	58.4	30.2	27.6	15.1
	15.0	FLA	147.1	142.4	78.9	71.0	63.8	35.6	121.7	120.2	66.1	45.6	41.6	22.8
	20.0	FLA	161.5	152.8	86.1	85.4	74.2	42.8	136.1	130.6	73.3	60.0	52.0	30.0
CW114	10.0	FLA	131.7	128.4	71.2	55.6	49.8	27.9	106.3	106.2	58.4	30.2	27.6	15.1
	15.0	FLA	147.1	142.4	78.9	71.0	63.8	35.6	121.7	120.2	66.1	45.6	41.6	22.8
	20.0	FLA	161.5	152.8	86.1	85.4	74.2	42.8	136.1	130.6	73.3	60.0	52.0	30.0

1. FLA = Full Load Amps (does not reflect typical operating amps)
2. Amperage requirements are based on the rated max FLA current of each component in the unit. The rated max FLA current of the unit is not the sum total of all components, but is the total of the components which operate during maximum electrical load conditions.
3. The values in the table are for power demand of the unit only.
4. Units are 3-phase, 50-cycle.
5. Consult factory engineering department for electrical requirements of units with variations not listed above.
6. SCCR—Short Circuit Current Rating 65,000 rms (less than 480V), 25,000 rms (575V)

**Table 3 Indoor evaporator fan motor electrical requirements—50Hz systems**

Hp	Volts	200	230	380-415
2.0	FLA	7.0	6.1	3.5
3.0	FLA	10.1	8.8	5.1
5.0	FLA	15.8	13.7	7.9
7.5	FLA	25.1	21.8	12.5
10.0	FLA	30.2	27.6	15.1
15.0	FLA	46.2	42.0	24.2
20.0	FLA	NA	NA	30.0

1. Refer to General Data Section for standard fan motor size on units.
2. FLA = Full Load Amps

**Table 4 Electrical data—Forward-curved blowers, 60Hz systems**

Chilled Water Models - 60Hz																		
Reheat Options		Electric				None				Electric				None				
Humidifier Options		Infrared or Steam Generating				Infrared or Steam Generating				Steam or None				Steam or None				
Models / Motor HP	Volts	208	230	460	575	208	230	460	575	208	230	460	575	208	230	460	575	
CW026	2.0 HP	FLA	48.6	44.1	22.4	20.1	20.8	17.9	9.2	10.1	35.3	33.0	16.6	12.7	7.5	6.8	3.4	2.7
		WSA	60.8	55.1	28.0	25.1	26.0	22.4	11.5	12.6	44.1	41.3	20.8	15.9	9.4	8.5	4.3	3.4
		MFCB	60	50	25	30	30	25	15	15	40	40	20	15	15	15	15	15
CW026	3.0 HP	FLA	51.7	46.9	23.8	21.3	23.9	20.7	10.6	11.3	38.4	35.8	18.0	13.9	10.6	9.6	4.8	3.9
		WSA	64.6	58.6	29.8	26.6	29.9	25.9	13.3	14.1	48.0	44.8	22.5	17.4	13.3	12.0	6.0	4.9
		MFCB	60	50	25	30	35	30	15	15	50	45	20	15	20	20	15	15
CW038	3.0 HP	FLA	65.5	59.8	30.3	26.4	23.9	20.7	10.6	11.3	52.2	48.7	24.5	19.0	10.6	9.6	4.8	3.9
		WSA	81.9	74.8	37.9	33.0	29.9	25.9	13.3	14.1	65.3	60.9	30.6	23.8	13.3	12.0	6.0	4.9
		MFCB	90	80	40	35	35	30	15	15	60	70	35	20	20	20	15	15
CW038	5.0 HP	FLA	71.6	65.4	33.1	28.6	30.0	26.3	13.4	13.5	58.3	54.3	27.3	21.2	16.7	15.2	7.6	6.1
		WSA	89.5	81.8	41.4	35.8	37.5	32.9	16.8	16.9	72.9	67.9	34.1	26.5	20.9	19.0	9.5	7.6
		MFCB	90	80	40	35	50	45	20	20	70	70	35	25	35	30	15	15
CW041	3.0 HP	FLA	65.5	59.8	30.3	26.4	23.9	20.7	10.6	11.3	52.2	48.7	24.5	19.0	10.6	9.6	4.8	3.9
		WSA	81.9	74.8	37.9	33.0	29.9	25.9	13.3	14.1	65.3	60.9	30.6	23.8	13.3	12.0	6.0	4.9
		MFCB	90	80	40	35	35	30	15	15	60	70	35	20	20	20	15	15
CW041	5.0 HP	FLA	71.6	65.4	33.1	28.6	30.0	26.3	13.4	13.5	58.3	54.3	27.3	21.2	16.7	15.2	7.6	6.1
		WSA	89.5	81.8	41.4	35.8	37.5	32.9	16.8	16.9	72.9	67.9	34.1	26.5	20.9	19.0	9.5	7.6
		MFCB	90	80	40	35	50	45	20	20	70	70	35	25	35	30	15	15
CW051	5.0 HP	FLA	98.8	89.9	46.7	39.7	43.3	37.4	20.5	19.6	72.2	67.7	33.8	26.2	16.7	15.2	7.6	6.1
		WSA	123.5	112.4	58.4	49.6	54.1	46.8	25.6	24.5	90.3	84.6	42.3	32.8	20.9	19.0	9.5	7.6
		MFCB	125	110	60	50	60	50	30	25	90	80	40	30	35	30	15	15
	7.5 HP	FLA	106.3	96.7	50.1	42.6	50.8	44.2	23.9	22.5	79.7	74.5	37.2	29.1	24.2	22.0	11.0	9.0
		WSA	132.9	120.9	62.6	53.3	63.5	55.3	29.9	28.1	99.6	93.1	46.5	36.4	30.3	27.5	13.8	11.3
		MFCB	125	110	60	50	80	70	35	30	100	100	50	40	50	45	20	20
CW060	5.0 HP	FLA	112.7	102.9	53.2	44.7	43.3	37.4	20.5	19.6	86.1	80.7	40.3	31.2	16.7	15.2	7.6	6.1
		WSA	140.9	128.6	66.5	55.9	54.1	46.8	25.6	24.5	107.6	100.9	50.4	39.0	20.9	19.0	9.5	7.6
		MFCB	150	125	70	60	60	50	30	25	110	110	50	40	35	30	15	15
	7.5 HP	FLA	120.2	109.7	56.6	47.6	50.8	44.2	23.9	22.5	93.6	87.5	43.7	34.1	24.2	22.0	11.0	9.0
		WSA	150.3	137.1	70.8	59.5	63.5	55.3	29.9	28.1	117.0	109.4	54.6	42.6	30.3	27.5	13.8	11.3
		MFCB	150	125	80	60	80	70	35	30	110	110	50	45	50	45	20	20
CW076	7.5 HP	FLA	129.9	122.8	61.7	50.7	50.8	44.2	22.6	20.6	103.3	100.6	50.1	39.1	24.2	22.0	11.0	9.0
		WSA	162.4	153.5	77.1	63.4	63.5	55.3	28.3	25.8	129.1	125.8	62.6	48.9	30.3	27.5	13.8	11.3
		MFCB	175	150	80	60	80	70	35	30	125	125	60	50	50	45	20	20
CW076	10.0 HP	FLA	136.5	128.8	64.7	52.7	57.4	50.2	25.6	22.6	109.9	106.6	53.1	41.1	30.8	28.0	14.0	11.0
		WSA	170.6	161.0	80.9	65.9	71.8	62.8	32.0	28.3	137.4	133.3	66.4	51.4	38.5	35.0	17.5	13.8
		MFCB	175	150	80	60	90	80	40	35	125	125	70	50	60	60	30	20
CW084	7.5 HP	FLA	129.9	122.8	61.7	50.7	50.8	44.2	22.6	20.6	103.3	100.6	50.1	39.1	24.2	22.0	11.0	9.0
		WSA	162.4	153.5	77.1	63.4	63.5	55.3	28.3	25.8	129.1	125.8	62.6	48.9	30.3	27.5	13.8	11.3
		MFCB	175	150	80	60	80	70	35	30	125	125	60	50	50	45	20	20
CW084	10.0 HP	FLA	136.5	128.8	64.7	52.7	57.4	50.2	25.6	22.6	109.9	106.6	53.1	41.1	30.8	28.0	14.0	11.0
		WSA	170.6	161.0	80.9	65.9	71.8	62.8	32.0	28.3	137.4	133.3	66.4	51.4	38.5	35.0	17.5	13.8
		MFCB	175	150	80	60	90	80	40	35	125	125	70	50	60	60	30	20
CW106	10.0 HP	FLA	136.5	128.8	64.7	52.7	57.4	50.2	25.6	22.6	109.9	106.6	53.1	41.1	30.8	28.0	14.0	11.0
		WSA	170.6	161.0	80.9	65.9	71.8	62.8	32.0	28.3	137.4	133.3	66.4	51.4	38.5	35.0	17.5	13.8
		MFCB	175	150	80	60	90	80	40	35	125	125	70	50	60	60	30	20
CW106	15.0 HP	FLA	151.9	142.8	71.7	58.7	72.8	64.2	32.6	28.6	125.3	120.6	60.1	47.1	46.2	42.0	21.0	17.0
		WSA	189.9	178.5	89.6	73.4	91.0	80.3	40.8	35.8	156.6	150.8	75.1	58.9	57.8	52.5	26.3	21.3
		MFCB	200	175	90	70	125	110	50	45	175	150	80	60	100	90	45	35

**Table 4 Electrical data—Forward-curved blowers, 60Hz systems (continued)**

Chilled Water Models - 60Hz																	
Reheat Options		Electric				None				Electric				None			
Humidifier Options		Infrared or Steam Generating				Infrared or Steam Generating				Steam or None				Steam or None			
Models / Motor HP	Volts	208	230	460	575	208	230	460	575	208	230	460	575	208	230	460	575
<b>CW106</b> 20.0 HP (Upflow only)	FLA	165.1	154.8	77.7	63.7	86.0	76.2	38.6	33.6	138.5	132.6	66.1	52.1	59.4	54.0	27.0	22.0
	WSA	206.4	193.5	97.1	79.6	107.5	95.3	48.3	42.0	173.1	165.8	82.6	65.1	74.3	67.5	33.8	27.5
	MFCB	225	200	110	90	150	125	70	60	200	200	90	70	125	110	60	45
<b>CW114</b> 10.0 HP	FLA	136.5	128.8	64.7	52.7	57.4	50.2	25.6	22.6	109.9	106.6	53.1	41.1	30.8	28.0	14.0	11.0
	WSA	170.6	161.0	80.9	65.9	71.8	62.8	32.0	28.3	137.4	133.3	66.4	51.4	38.5	35.0	17.5	13.8
	MFCB	175	150	80	60	90	80	40	35	125	125	70	50	60	60	30	20
<b>CW114</b> 15.0 HP	FLA	151.9	142.8	71.7	58.7	72.8	64.2	32.6	28.6	125.3	120.6	60.1	47.1	46.2	42.0	21.0	17.0
	WSA	189.9	178.5	89.6	73.4	91.0	80.3	40.8	35.8	156.6	150.8	75.1	58.9	57.8	52.5	26.3	21.3
	MFCB	200	175	90	70	125	110	50	45	175	150	80	60	100	90	45	35
<b>CW114</b> 20.0 HP (Upflow only)	FLA	165.1	154.8	77.7	63.7	86.0	76.2	38.6	33.6	138.5	132.6	66.1	52.1	59.4	54.0	27.0	22.0
	WSA	206.4	193.5	97.1	79.6	107.5	95.3	48.3	42.0	173.1	165.8	82.6	65.1	74.3	67.5	33.8	27.5
	MFCB	225	200	110	90	150	125	70	60	200	200	90	70	125	110	60	45

**Table 5 Indoor evaporator fan motor electrical requirements—60Hz systems**

Hp	208		230		460		575	
	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA
<b>2.0 HP</b>	7.5	46.9	6.8	40.8	3.4	20.4	2.7	16.2
<b>3.0 HP</b>	10.6	66.0	9.6	58.0	4.8	26.8	3.9	23.4
<b>5.0 HP</b>	16.7	105.0	15.2	91.0	7.6	45.6	6.1	36.6
<b>7.5 HP</b>	24.2	152.0	22.0	132.0	11.0	66.0	9.0	54.0
<b>10.0 HP</b>	30.8	193.0	28.0	168.0	14.0	84.0	11.0	66.0
<b>15.0 HP</b>	46.2	290.0	42.0	252.0	21.0	126.0	17.0	102.0
<b>20.0 HP</b>	59.4	321.0	54.0	290.0	27.0	145.0	22.0	116.0

1. Refer to General Data Section for standard fan motor size on units.
2. FLA = Full Load Amps (does not reflect typical operating amps)  
WSA = Wire Sizing Amps (Minimum supply circuit ampacity)  
MFCB = Maximum Fuse or Circuit Breaker Size
3. Amperage requirements are based on the rated max FLA current of each component in the unit. The rated max FLA current of the unit is not the sum total of all components, but is the total of the components which operate during maximum electrical load conditions.
4. The values in the chart are for power of the unit only.
5. Units are 3 phase, 60 cycle.
6. For units with other variations not listed above, consult factory engineering department for electrical requirements.
7. SCCR - Short Circuit Current Rating 65,000 rms (less than 480V), 25,000 rms (575V).

**Table 6 Electrical data—EC fan models, 60Hz**

Reheat Options		Reheat					No Reheat					Reheat					No Reheat				
Humidifier Options		Humidifier					Humidifier					No Humidifier					No Humidifier				
Models	Volts	208	230	380	460	575	208	230	380	460	575	208	230	380	460	575	208	230	380	460	575
CW026	FLA	50.3	46.5	24.7	23.0	—	22.5	20.3	11.0	9.8	—	37.0	35.4	18.6	17.2	—	9.2	9.2	4.9	4.0	—
	WSA	62.9	58.1	30.9	28.8	—	28.2	25.4	13.8	12.3	—	46.2	44.3	23.3	21.5	—	11.5	11.5	6.1	5.0	—
	OPD	70	60	35	30	—	30	30	15	15	—	45	45	20	20	—	20	20	15	15	—
CW038	FLA	64.2	59.4	31.6	29.5	—	22.5	20.3	11.0	9.8	—	50.8	48.3	25.5	23.7	—	9.2	9.2	4.9	4.0	—
	WSA	80.2	74.3	39.5	36.9	—	28.2	25.4	13.8	12.3	—	63.5	60.4	31.9	29.6	—	11.5	11.5	6.1	5.0	—
	OPD	90	80	40	40	—	30	30	15	15	—	70	70	35	30	—	20	20	15	15	—
CW041	FLA	64.2	59.4	31.6	29.5	—	22.5	20.3	11.0	9.8	—	50.8	48.3	25.5	23.7	—	9.2	9.2	4.9	4.0	—
	WSA	80.2	74.3	39.5	36.9	—	28.2	25.4	13.8	12.3	—	63.5	60.4	31.9	29.6	—	11.5	11.5	6.1	5.0	—
	OPD	90	80	40	40	—	30	30	15	15	—	70	50	35	30	—	20	20	15	15	—
CW051	FLA	85.4	80.2	41.3	38.2	—	29.9	27.7	13.9	12.0	—	72.1	69.1	35.2	32.4	—	16.6	16.6	7.8	6.2	—
	WSA	106.8	100.3	51.6	47.8	—	37.4	34.6	17.4	15.0	—	90.1	86.4	44.0	40.5	—	18.7	18.7	8.8	7.0	—
	OPD	110	110	60	50	—	40	35	15	15	—	100	90	45	45	—	25	25	15	15	—
CW060	FLA	99.3	93.2	48.2	44.7	—	29.9	27.7	13.9	12.0	—	86.0	82.1	42.1	38.9	—	16.6	16.6	7.8	6.2	—
	WSA	124.1	116.5	60.3	55.9	—	37.4	34.6	17.4	15.0	—	107.5	102.6	52.6	48.6	—	18.7	18.7	8.8	7.0	—
	OPD	125	125	70	60	—	40	35	15	15	—	110	110	60	50	—	25	25	15	15	—
CW076	FLA	124.1	119.2	63.1	58.7	—	45.0	40.6	22.0	19.6	—	97.5	97.0	50.9	47.1	—	18.4	18.4	9.8	8.0	—
	WSA	155.1	149.0	78.9	73.4	—	56.3	50.8	27.5	24.5	—	121.9	121.3	63.6	58.9	—	20.7	20.7	11.0	9.0	—
	OPD	175	150	80	80	—	50	50	25	20	—	125	125	70	60	—	25	25	15	15	—
CW084	FLA	124.1	119.2	63.1	58.7	—	45.0	40.6	22.0	19.6	—	97.5	97.0	50.9	47.1	—	18.4	18.4	9.8	8.0	—
	WSA	155.1	149.0	78.9	73.4	—	56.3	50.8	27.5	24.5	—	121.9	121.3	63.6	58.9	—	20.7	20.7	11.0	9.0	—
CW089	FLA	—	—	—	58.2	48.1	—	—	—	19.1	18.0	—	—	—	47.1	36.5	—	—	—	8.0	6.4
	WSA	—	—	—	72.8	60.1	—	—	—	23.9	22.5	—	—	—	58.9	45.6	—	—	—	9.0	7.2
	OPD	—	—	—	80	70	—	—	—	20	25	—	—	—	60	50	—	—	—	15	15
CW106	FLA	—	—	—	62.7	51.3	—	—	—	23.6	21.2	—	—	—	51.1	39.7	—	—	—	12.0	9.6
	WSA	—	—	—	78.4	64.1	—	—	—	29.5	26.5	—	—	—	63.9	49.6	—	—	—	13.0	10.4
	OPD	—	—	—	80	70	—	—	—	30	30	—	—	—	70	50	—	—	—	15	15
CW114	FLA	—	—	—	62.7	51.3	—	—	—	23.6	21.2	—	—	—	51.1	39.7	—	—	—	12.0	9.6
	WSA	—	—	—	78.4	64.1	—	—	—	29.5	26.5	—	—	—	63.9	49.6	—	—	—	13.0	10.4
	OPD	—	—	—	80	70	—	—	—	30	30	—	—	—	70	50	—	—	—	15	15
CW146	FLA	—	—	—	61.8	50.7	—	—	—	22.7	20.6	—	—	—	50.2	39.1	—	—	—	11.1	9.6
	WSA	—	—	—	77.3	63.4	—	—	—	28.4	25.8	—	—	—	62.8	48.9	—	—	—	12.0	9.8
	OPD	—	—	—	80	70	—	—	—	30	30	—	—	—	70	50	—	—	—	15	15
CW181	FLA	—	—	—	66.3	54.3	—	—	—	27.2	24.2	—	—	—	54.7	42.7	—	—	—	15.6	12.6
	WSA	—	—	—	82.9	67.9	—	—	—	34.0	30.3	—	—	—	68.4	53.4	—	—	—	16.9	13.7
	OPD	—	—	—	90	70	—	—	—	35	35	—	—	—	70	60	—	—	—	20	15

**Acceptable Power Supplies for Liebert CW181**

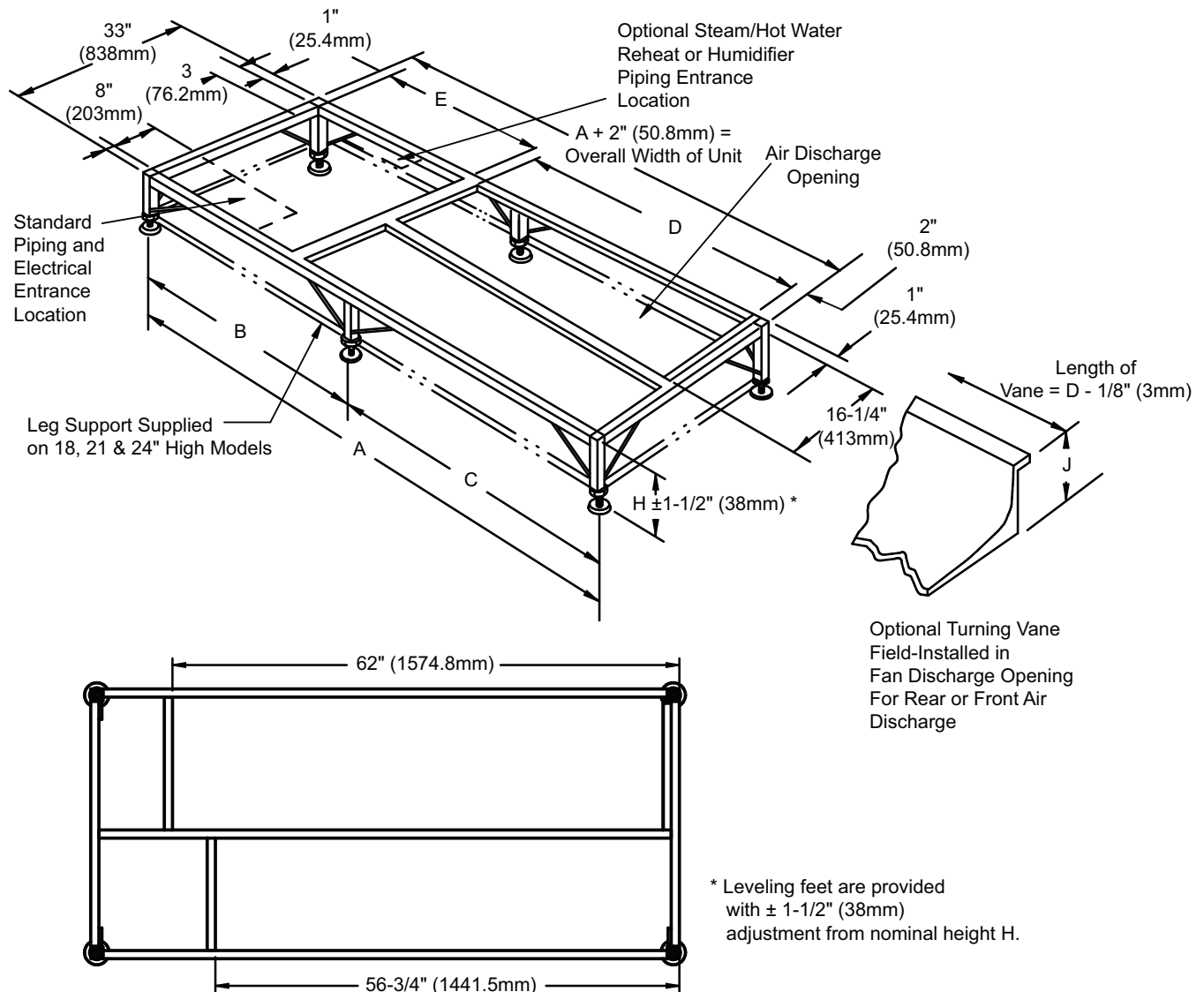
- 208V and 230V—any Wye or Delta power supply type
- 380V—Wye with solidly grounded neutral and 220V line to ground
- 460V—Wye with solidly grounded neutral and 266V line to ground
- 480V—Wye with solidly grounded neutral and 277V line to ground

**Table 7     Electrical data—EC fan models, 50Hz**

Reheat Options		Reheat	No Reheat	Reheat	No Reheat
Humidifier Options		Humidifier		No Humidifier	
Models	Volts	400V	400V	400V	400V
CW026	FLA	25.7	11.3	19.3	4.9
	WSA	32.1	14.1	24.1	6.1
	OPD	35	15	25	15
CW038	FLA	33.0	11.3	26.6	4.9
	WSA	41.3	14.1	33.3	6.1
	OPD	45	15	35	15
CW041	FLA	33.0	11.3	26.6	4.9
	WSA	41.3	14.1	33.3	6.1
	OPD	45	15	35	15
CW051	FLA	43.1	14.2	36.7	7.8
	WSA	53.9	17.8	45.9	8.8
	OPD	60	15	50	15
CW060	FLA	50.3	14.2	43.9	7.8
	WSA	62.9	17.8	54.9	8.8
	OPD	70	15	60	15
CW076	FLA	65.9	22.6	53.1	9.8
	WSA	82.4	28.3	66.4	11.0
	OPD	90	25	70	15
CW084	FLA	65.9	22.6	53.1	9.8
	WSA	82.4	28.3	66.4	11.0
	OPD	90	25	70	15
CW089	FLA	65.9	22.6	53.1	9.8
	WSA	82.4	28.3	66.4	11.0
	OPD	90	25	70	15
CW106	FLA	70.8	27.5	58.0	14.7
	WSA	88.5	34.4	72.5	15.9
	OPD	90	35	80	20
CW114	FLA	70.8	27.5	58.0	14.7
	WSA	88.5	34.4	72.5	15.9
	OPD	90	35	80	20
CW146	FLA	68.7	25.4	55.9	12.6
	WSA	85.9	31.8	69.9	13.7
	OPD	90	35	70	15
CW181	FLA	74.7	31.4	61.9	18.6
	WSA	93.4	39.3	77.4	20.2
	OPD	100	40	80	25

## 7.0 ANCILLARY ITEMS

**Figure 6 Floor stand dimensions, CW026-CW084 models with forward-curved blowers**



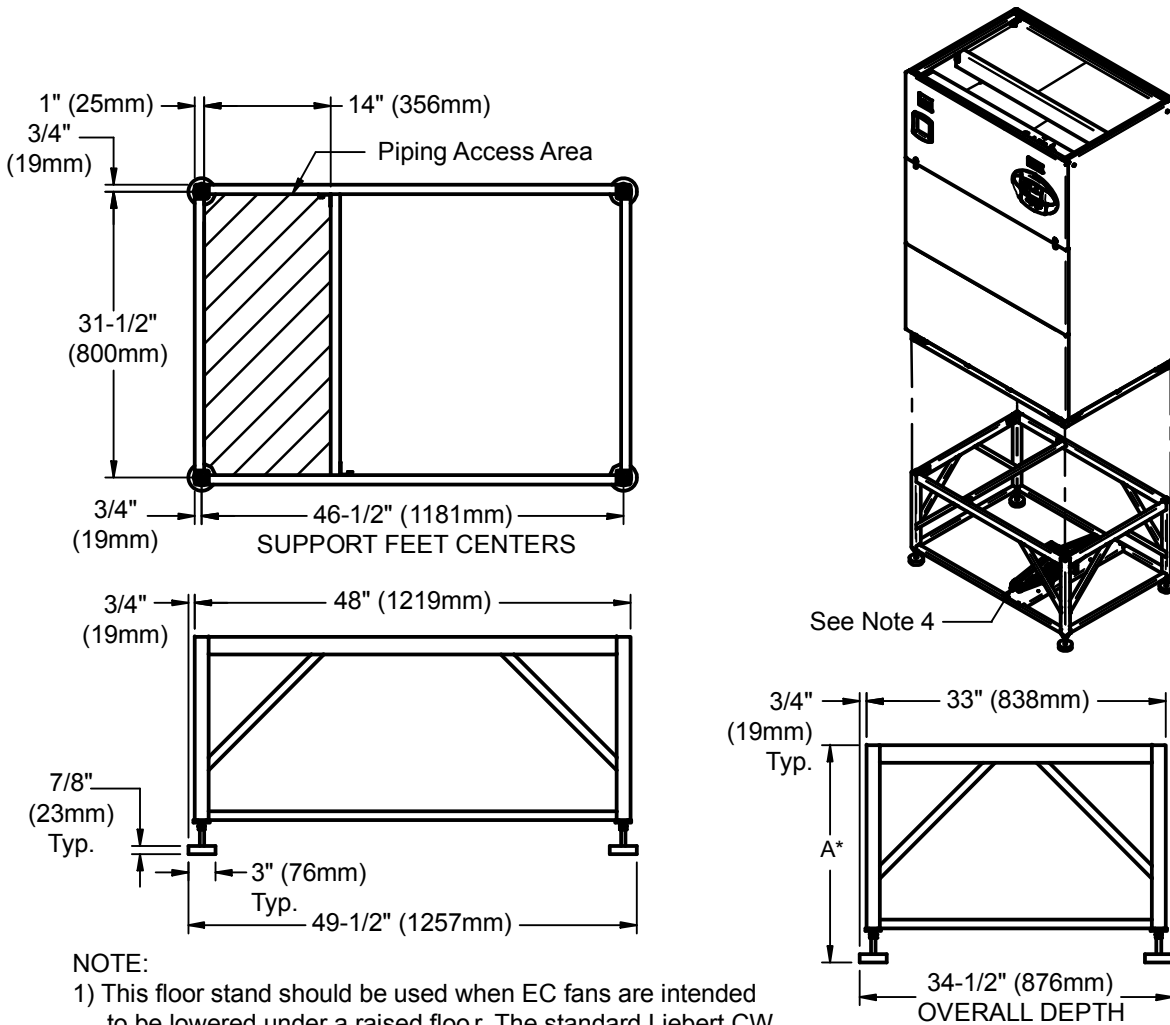
CROSS-BRACING LOCATION FOR 72" FRAMES ONLY

DPN001676  
Rev. 0

Dimensions, in. (mm)						
Model	Overall Width of Unit	A	B	C	D	E
CW026, CW038, CW041	50 (1270)	48 (1219)	0	0	36 (914)	8 (203)
CW051, CW060	74 (1880)	72 (1829)	0	0	60 (1524)	8 (203)
CW076, CW084	99 (2515)	97 (2464)	48-1/2 (1232)	48-1/2 (1232)	77-3/4 (1975)	15-1/4 (362)

Height in. (mm)	
H* Nominal	J
9 (229)	6-1/2 (165)
12 (305)	9 (229)
15 (381)	12 (305)
18 (458)	15 (381)
21 (553)	18 (458)
24 (610)	21 (553)

**Figure 7 Floor stand and floor planning dimensions, CW026, CW038 and CW041 downflow models with EC fans**



**NOTE:**

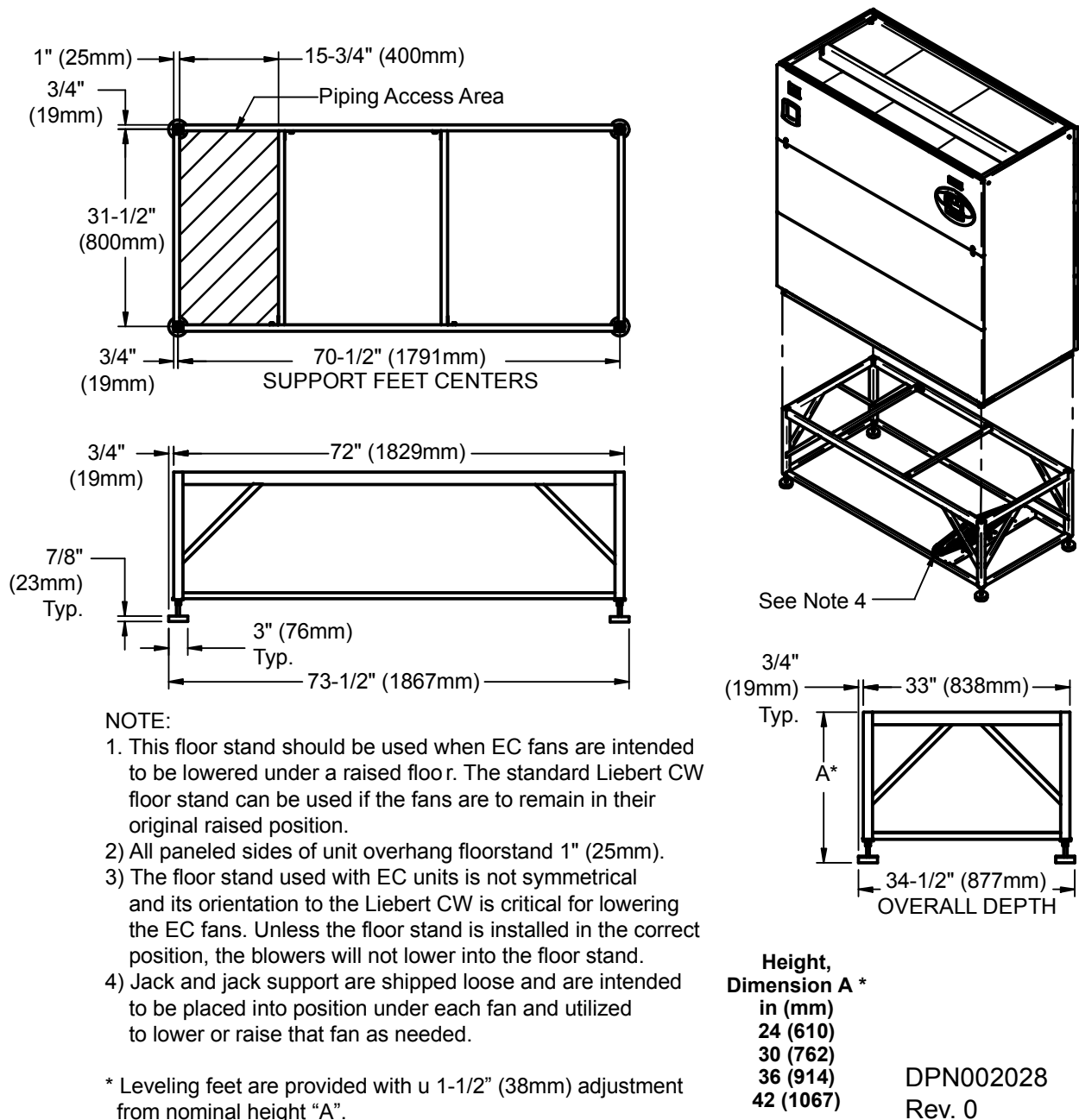
- 1) This floor stand should be used when EC fans are intended to be lowered under a raised floor. The standard Liebert CW floor stand can be used "if" the fans are to remain in their original raised position.
- 2) All paneled sides of unit overhang floorstand 1" (25mm).
- 3) The floor stand used with EC units is not symmetrical and its orientation to the Liebert CW is critical for lowering the EC fans. Unless the floor stand is installed in the correct position, the blowers will not lower into the floor stand.
- 4) Jack and jack support are shipped loose and are intended to be placed into position under each fan and utilized to lower or raise that fan as needed.

**Height,  
Dimension A \***  
**in (mm)**  
**24 (610)**  
**30 (762)**  
**36 (914)**  
**42 (1067)**

\*Leveling feet are provided with  $\pm 1\frac{1}{2}$ " (38mm) adjustment from nominal height "A".

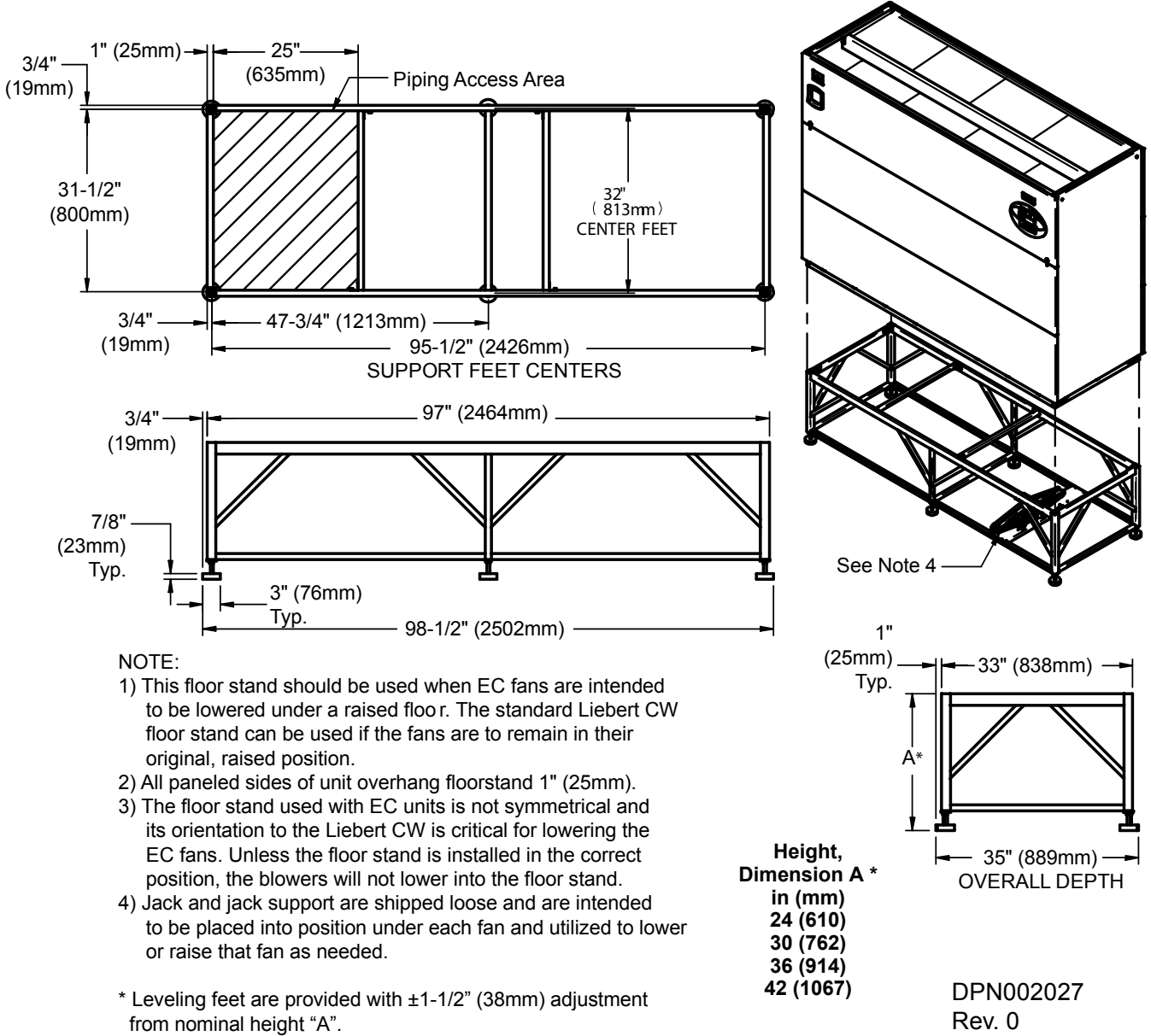
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**Figure 8 Floor stand and floor planning dimensions, CW051 and CW060 downflow models with EC fans**

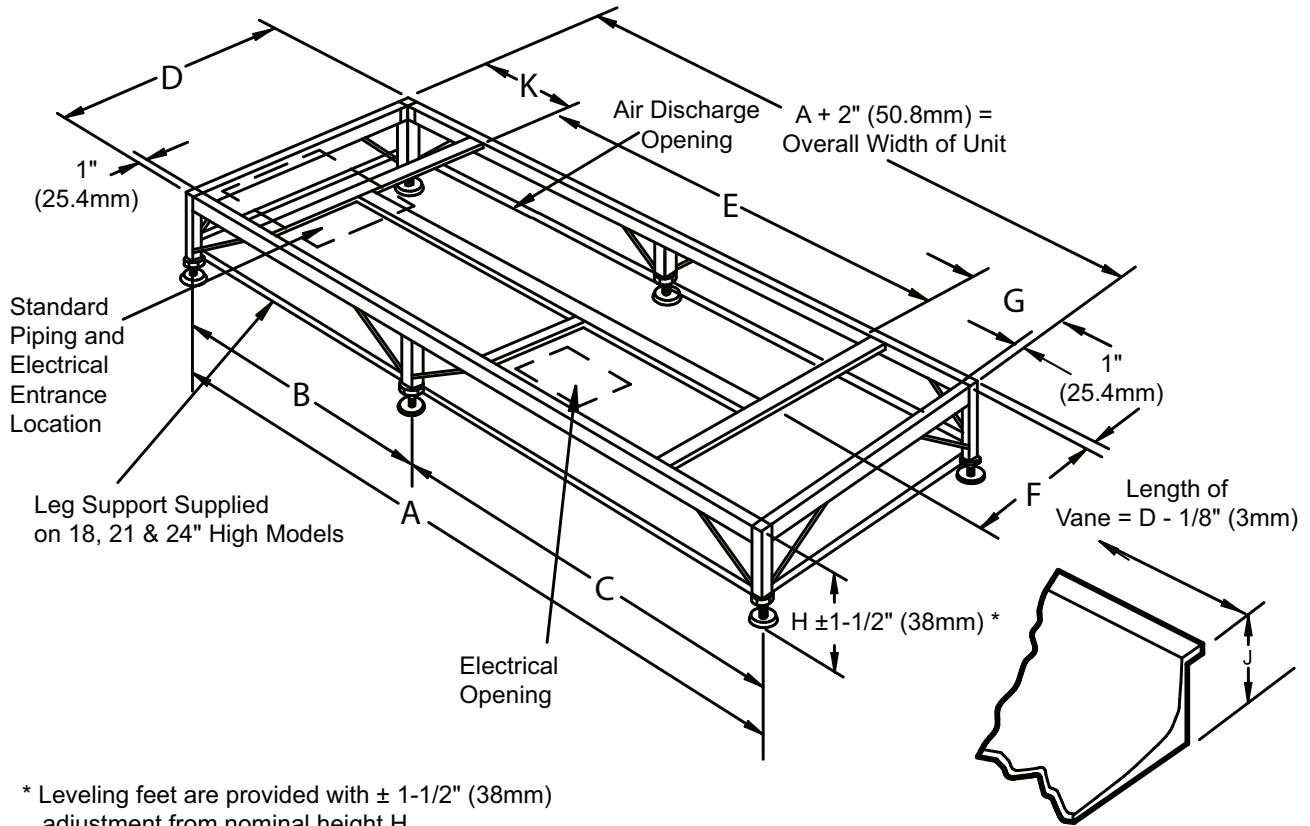




**Figure 9** Floor stand and floor planning dimensions, CW076 and CW084 downflow models with EC fans



**Figure 10 Floor stand dimensions, CW106 and CW114 with forward curve blowers only**



\* Leveling feet are provided with  $\pm 1\text{-}1/2"$  (38mm) adjustment from nominal height H.

This drawing pertains CW106 and CW114 with forward curve blowers only.

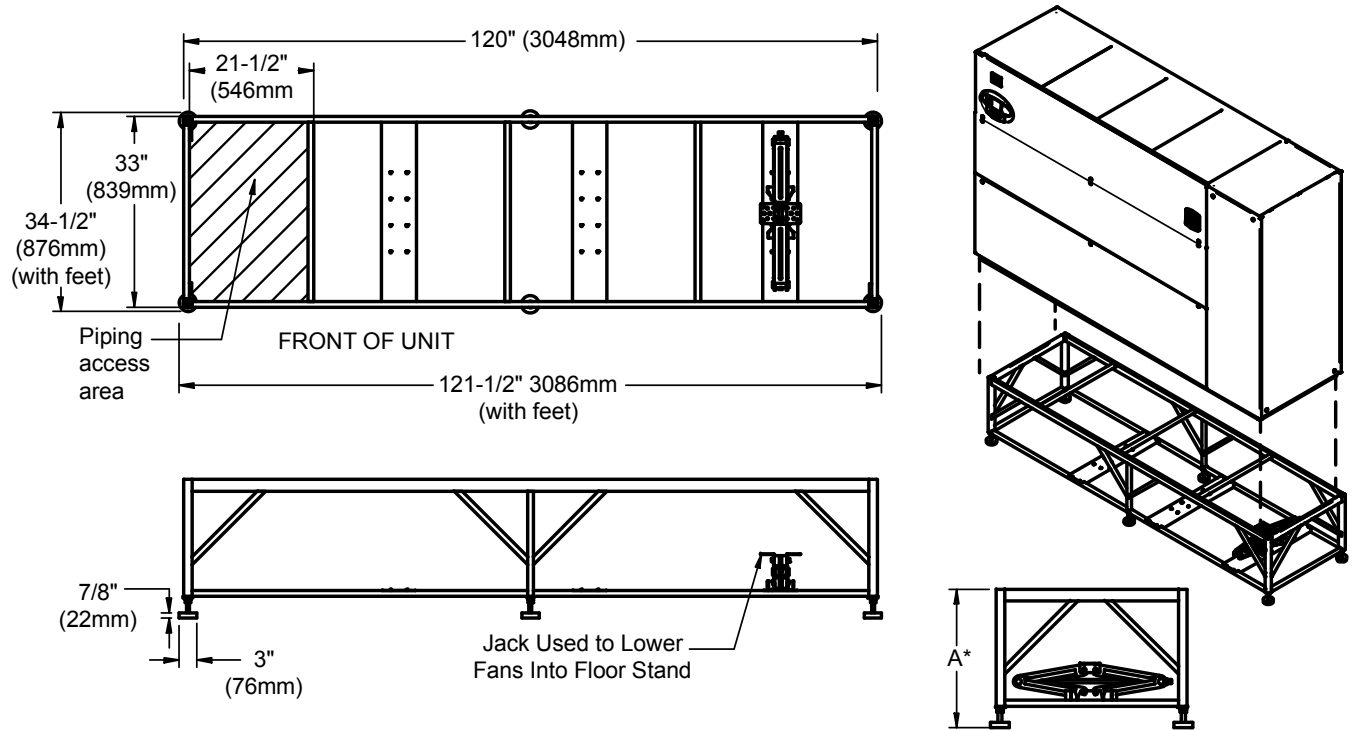
Optional Turning Vane  
Field-Installed in  
Fan Discharge Opening  
For Rear or Front Air  
Discharge

DPN001677  
Rev. 0

Dimensions, in. (mm)									
Model	Overall Width of Unit	A	B	C	D	E	F	G	K
CW106, CW114	122 (3099)	120 (3048)	60 (1524)	60 (1524)	33 (838)	100-3/4 (2559)	16-1/4 (413)	8-1/4 (210)	11 (279)

Height in. (mm)	
H* Nominal	J
9 (229)	6-1/2 (165)
12 (305)	9 (229)
15 (381)	12 (305)
18 (458)	15 (381)
21 (553)	18 (458)
24 (610)	21 (553)

**Figure 11 Floor stand and floor planning dimensions downflow, CW089, CW106 and CW114 with EC fans**



**NOTE:**

- 1) This floor stand should be used when EC fans are intended to be lowered into the floor stand. The standard Liebert CW floor stand can be used if the fans are to remain in their original raised position.
- 2) All paneled sides of unit overhang the floor stand by 1" (25mm).
- 3) The floor stand used with EC units is not symmetrical, and its orientation to the Liebert CW is critical to lowering the EC fans. Unless the floor stand is installed in the correct position, the blowers will not lower into the floor stand.

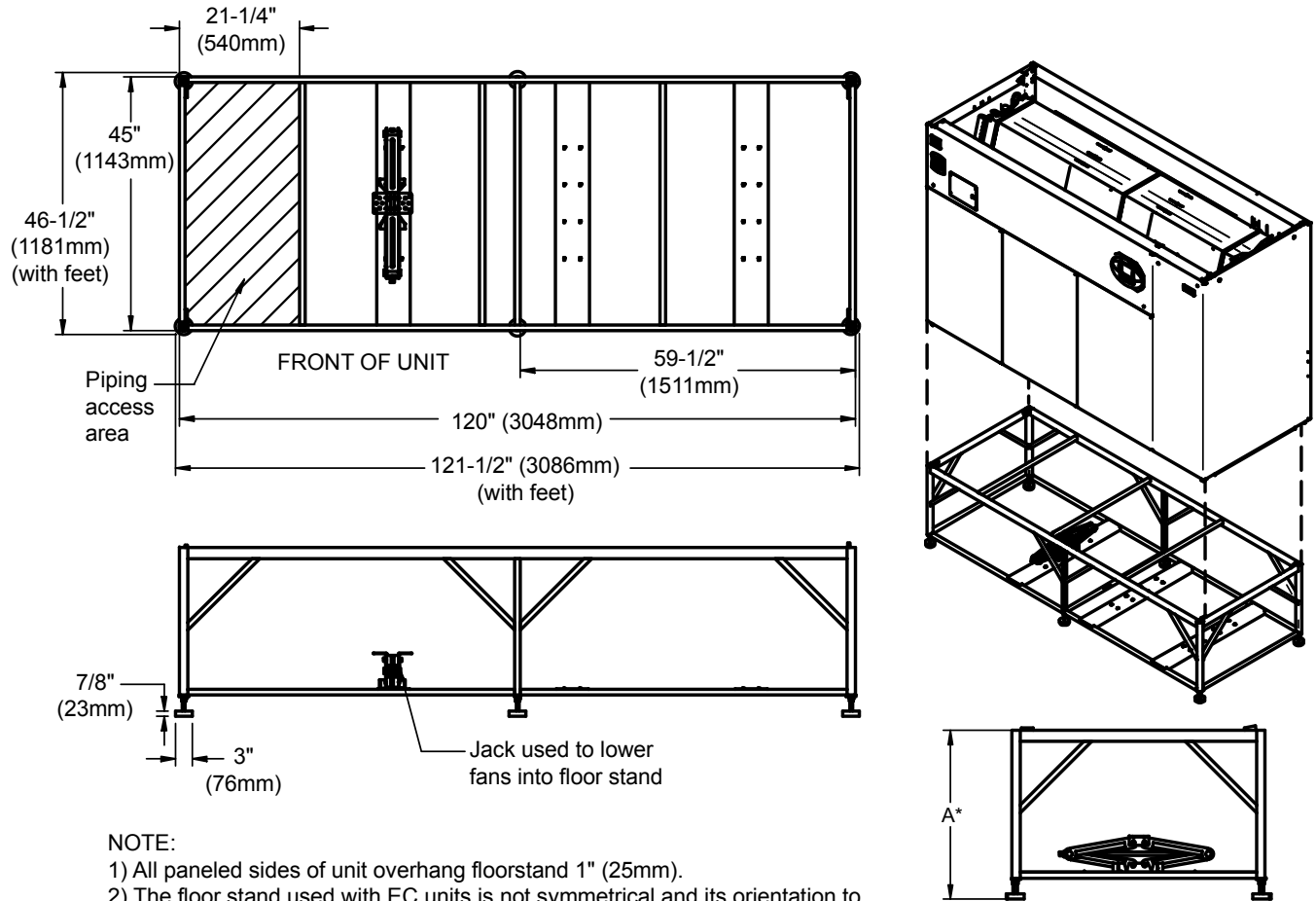
\* Leveling feet are provided with  $\pm 1\text{-}1/2"$  (38mm) adjustment from nominal height A.

**Height,  
Dimension A \***

<b>in (mm)</b>
<b>24 (610)</b>
<b>30 (762)</b>
<b>36 (914)</b>
<b>42 (1067)</b>

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Rev. 02

**Figure 12 Floor stand and floor planning dimensions downflow, CW146 and CW181 with EC fans**



**NOTE:**

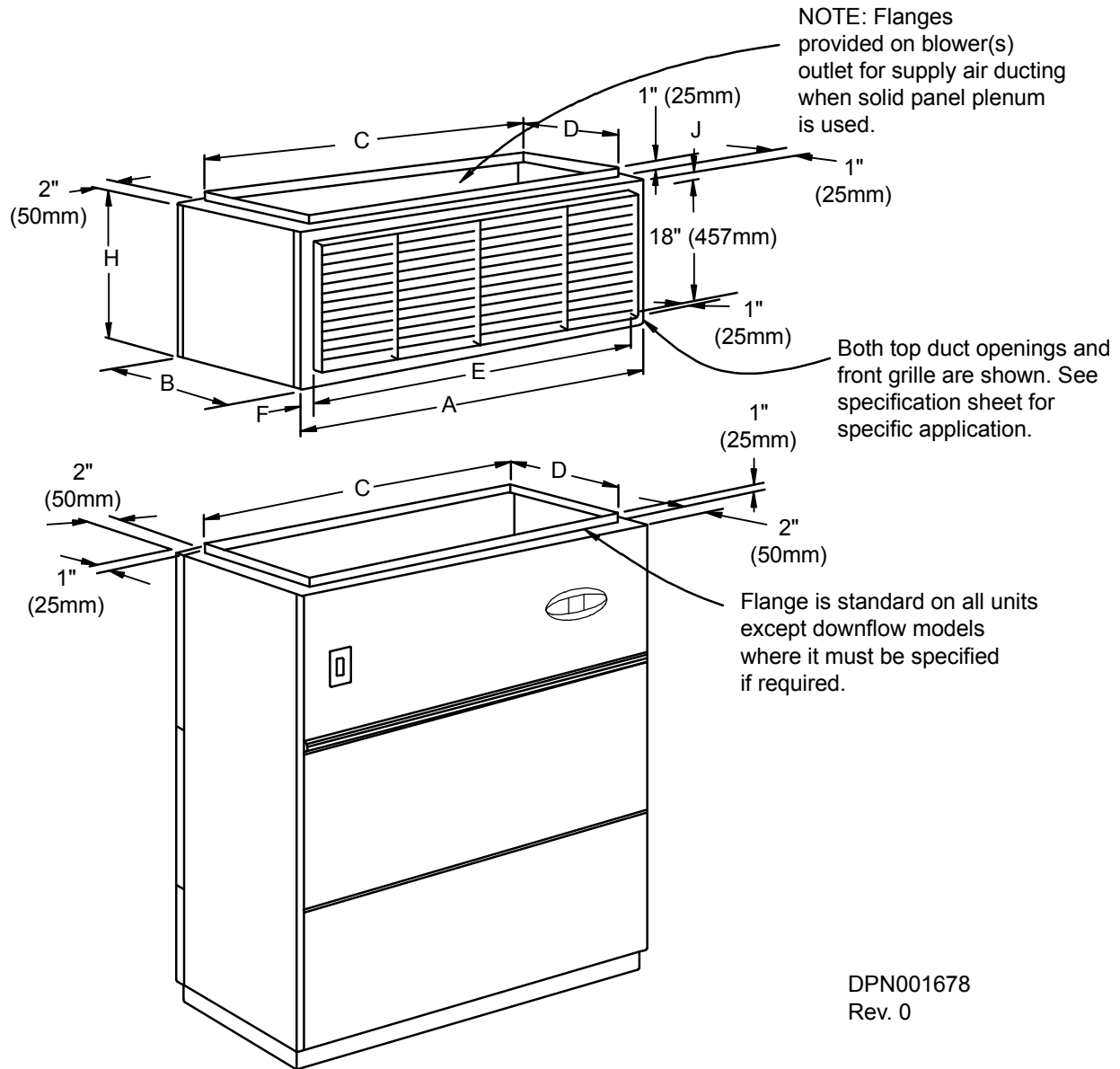
- 1) All paneled sides of unit overhang floorstand 1" (25mm).
- 2) The floor stand used with EC units is not symmetrical and its orientation to the Liebert CW is critical to lowering the EC fans. Unless the floor stand is installed in the correct position, the blowers will not lower into the floor stand.

\* Leveling feet are provided with  $\pm 1\text{-}1/2"$  (38mm) adjustment from nominal height A.

**Height,  
Dimension A \***  
in (mm)  
24 (610)  
30 (762)  
36 (914)  
42 (1067)  
48 (1219)

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Rev. 02

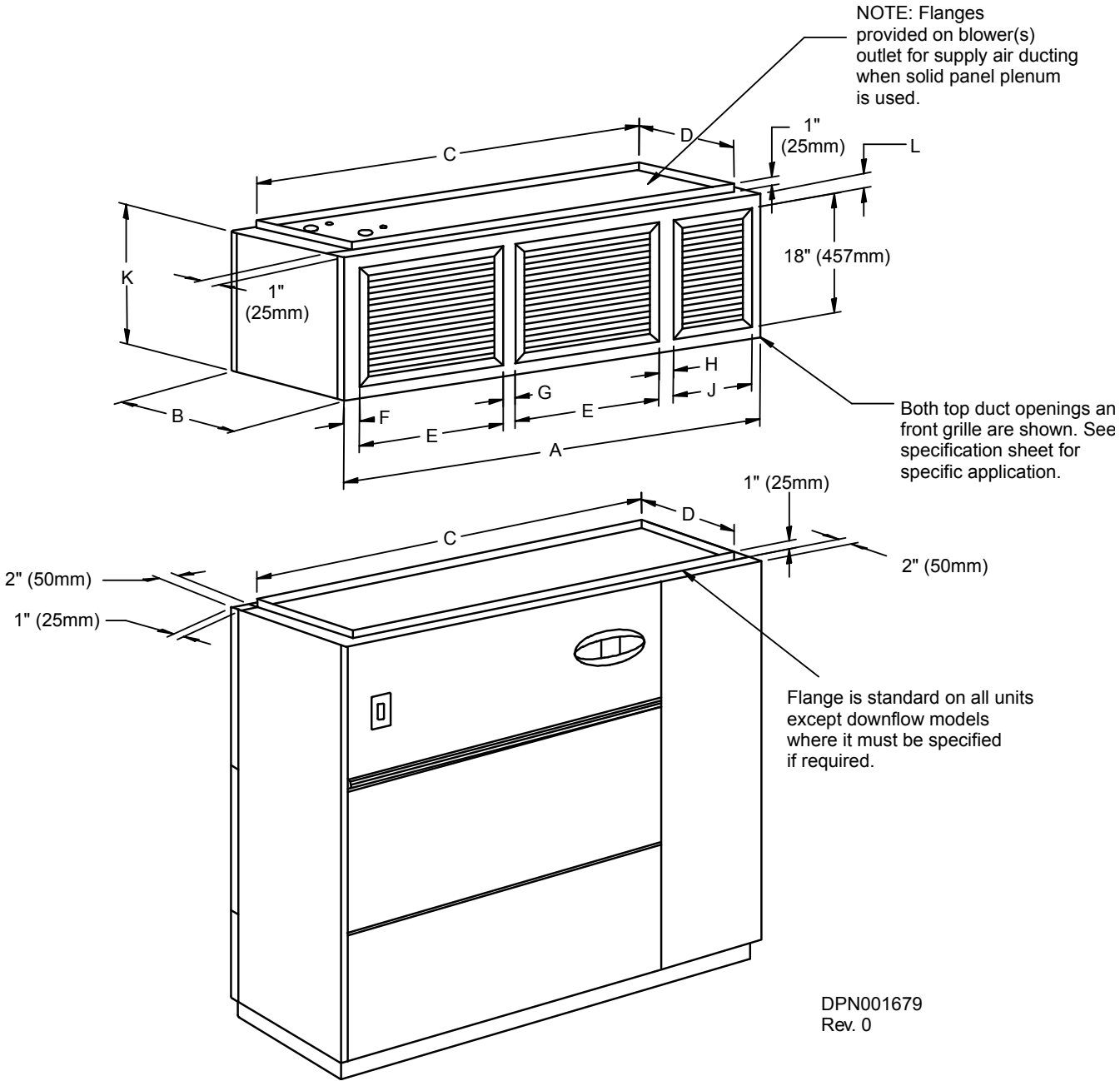
Figure 13 Plenum dimensions



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Rev. 0

Dimensions, in. (mm)							Plenum Height in. (mm)		Grille Free Area, ft <sup>2</sup> (m <sup>2</sup> )
Model	A	B	C	D	E	F	H* Nominal	J	
CW026, CW038, CW041	50 (1270)	34 (864)	46 (1168)	32 (813)	44 (1118)	3 (76)	20 (508)	1 (25)	4.29 (.4)
CW051, CW060	74 (1880)	34 (864)	70 (1778)	32 (813)	60 (1524)	7 (178)	22-3/4 (578)	2-3/8 (60)	5.85 (.54)
CW076, CW084	99 (2515)	34 (864)	95 (2413)	32 (813)	70 (1778)	14-1/2 (368)	34-3/4 (883)	2-3/8 (60)	6.83 (.63)

Figure 14 Plenum dimensions, CW106, CW114



Dimensions, in. (mm)										Plenum Height in. (mm)		Grille Free Area, ft <sup>2</sup> (m <sup>2</sup> )
Model	A	B	C	D	E	F	G	H	J	K	L	
CW106	122	34	118	32	44	3-1/2	4	7	16	20	1	
CW114	(3099)	(864)	(2997)	(813)	(1118)	(89)	(102)	(178)	(406)	(508)	(25)	
										22-3/4	2-3/8	10.14 (.94)
										(578)	(60)	
										34-3/4	2-3/8	
										(883)	(60)	

## GUIDE SPECIFICATIONS

### 1.0 GENERAL

#### 1.1 Summary

These specifications describe requirements for a precision environmental control system. The system shall be designed to maintain temperature conditions in the rooms containing electronic equipment.

The manufacturer shall design and furnish all equipment to be fully compatible with heat dissipation requirements of the room.

#### 1.2 Design Requirements

The precision environmental control system shall be a Liebert® self-contained factory assembled unit with (upflow) (down-flow) air delivery. The system shall have a total cooling capacity of \_\_\_\_ BTU/H, (kW) with a sensible cooling capacity of \_\_\_\_ BTU/ HR (kW) based on an entering air temperature of \_\_\_\_ °F (°C) dry bulb and \_\_\_\_ °F (°C) wet bulb. The unit is to be supplied with \_\_\_\_ volt \_\_\_\_ ph \_\_\_\_ Hz electrical service.

#### 1.3 Submittals

Submittals shall be provided with the proposal and shall include: Single-Line Diagrams; Dimensional, Electrical, and Capacity Data; Piping and Electrical Connection Drawings.

### 2.0 PRODUCT

#### 2.1 Cabinet and Frame Construction

The frame shall be constructed of heliarc welded tubular steel. It shall be painted using the autophoretic coating process for maximum corrosion protection. The exterior panels shall be insulated with a minimum 1 in. (25.4mm), 1.5 lb. (0.68 kg) density fiber insulation. The main front panel shall have captive 1/4 turn fasteners. The main unit color shall be \_\_\_\_\_. The accent color shall be \_\_\_\_\_. The exterior panels shall be powder coated.

#### 2.2 Filter Chamber

The filter chambers shall be an integral part of the system, located within the cabinet serviceable from either end of the unit. The filters shall be rated not less than \_\_\_\_% efficiency (based on ASHRAE 52.1).

For models CW106 and CW114, the filters shall be serviceable from the front of the unit. Filters shall be located in an 18" plenum, field-mounted on the top of the cooling unit, for CW146 and CW181 models.

#### 2.3 Fan Section

The fan shall be the centrifugal type, double width double inlet, and shall be factory-balanced as a completed assembly. The shaft shall be heavy duty steel with self-aligning ball bearings with a minimum life span of 100,000 hours. The fan motor shall be \_\_\_\_ hp at 1750 RPM at 60 Hz (1450 RPM at 50 Hz) and mounted on an adjustable slide base. The drive package shall be two-belt, variable speed, sized for 200% of the fan motor horsepower. The fans shall be located to draw air over the A-frame coil to ensure even air distribution and maximum coil performance.

**ELECTRONICALLY COMMUTATED (EC) FANS** are plug/plenum type, single inlet and shall be dynamically balanced. The drive package shall be direct drive, electronically commutated and variable speed. The fans shall be located to draw air over the A-frame coil to ensure even air distribution and maximum coil performance. Fans shall be capable of being lowered into the raised floor, with minimum floor height of 24".

CW026-CW041: The fan motor(s) shall be 4.15 hp with a maximum operating speed of 1510rpm.

CW051 and CW060: The fan motor(s) shall be 3.62 hp with a maximum operating speed of 2150rpm.

CW076-CW114: The fan motor(s) shall be 4.15 hp with a maximum operating speed of 1510rpm.

CW146: The fan motor(s) shall be 3.75 hp with a maximum operating speed of 1200rpm.

CW181: The fan motor(s) shall be 5.36 hp with a maximum operating speed of 1370rpm.

### Acceptable Power Supplies for Liebert CW181

- 208V and 230V—any Wye or Delta power supply type
- 380V—Wye with solidly grounded neutral and 220V line to ground
- 460V—Wye with solidly grounded neutral and 266V line to ground
- 480V—Wye with solidly grounded neutral and 277V line to ground

## 2.4 Liebert® iCOM® Microprocessor Control With Small Graphic Display

The Liebert iCOM unit control shall be factory-set for Intelligent Control which uses “fuzzy logic” and “expert systems” methods. Proportional and Tunable PID shall also be user selectable options. Internal unit component control shall include the following:

**System Auto Restart** - The auto restart feature will automatically restart the system after a power failure. Time delay is programmable.

**Sequential Load Activation** - On initial startup or restart after power failure, each operational load is sequenced with a minimum of one second delay to minimize total inrush current.

**Hot Water Flush Cycles** - Hot water reheat coils and Econ-O-Coils are periodically flushed to prevent a buildup of contaminants.

**Predictive Humidity Control** - calculates the moisture content in the room and prevents unnecessary humidification and dehumidification cycles by responding to changes in dew point temperature.

The Liebert iCOM control shall be compatible with Liebert remote monitoring and control devices. Options are available for BMS interface via MODbus, Jbus, BACNet, Profibus and SNMP.

The Liebert iCOM control processor shall be microprocessor based with a 128x64 dot matrix graphic front monitor display and control keys for user inputs mounted in an ergonomic, aesthetically pleasing housing. The display & housing shall be viewable while the unit panels are open or closed. The controls shall be menu driven. The display shall be organized into three main sections: User Menus, Service Menus and Advanced Menus. The system shall display user menus for: active alarms, event log, graphic data, unit view/status overview (including the monitoring of room conditions, operational status in % of each function, date and time), total run hours, various sensors, display setup and service contacts. A password shall be required to make system changes within the service menus. Service menus shall include: setpoints, standby settings (lead/lag), timers/sleep mode, alarm setup, sensor calibration, maintenance/wellness settings, options setup, system/network setup, auxiliary boards and diagnostics/service mode. A password shall be required to access the advanced menus which include the factory settings and password menus.

### The User Menus Shall be Defined as Follows

**Active Alarms:** Unit memory shall hold the 200 most recent alarms with time and date stamp for each alarm.

**Event Log:** Unit memory shall hold the 400 most recent events with ID number, time and date stamp for each event.

**Graphic Data View:** Eight graphic records shall be available: return air temperature, return air humidity, supply air temperature, outdoor temperature and four custom graphs.

**Unit View - Status Overview:** Simple or Graphical “Unit View” summary displays shall include temperature and humidity values, active functions (and percent of operation) and any alarms of the host unit.

**Total Run Hours:** Menu shall display accumulative component operating hours for major components including fan motor, humidifier and reheat.

**Various Sensors:** Menu shall allow setup and display of optional custom sensors. The control shall include four customer accessible analog inputs for sensors provided by others. The analog inputs shall accept a 4 to 20mA signal. The user shall be able to change the input to 0 to 5VDC or 0 to 10VDC if desired. The gains for each analog input shall be programmable from the front display. The analog inputs shall be able to be monitored from the front display.



**Display Setup:** Customer shall pre-select the desired grouping of display languages at the time of the order from the following choices:

- Group 1: English, French, Italian, Spanish, German
- Group 2: English, Russian, Greek
- Group 3: English, Japanese, Chinese, Arabic
- Service Contacts: Menu shall allow display of local service contact name and phone number.

### **The Service Menus Shall be Defined as Follows**

**Setpoints:** Menu shall allow setpoints within the following ranges:

- Temperature Setpoint 65-85°F (18-29°C)\*
- Temperature Sensitivity +1-10°F (0.6-5.6°C)
- Humidity Setpoint 20-80% RH\*
- Humidity Sensitivity 1-30% RH
- High Temperature Alarm 35-90°F (2-32°C)
- Low Temperature Alarm 35-90°F (2-32°C)
- High Humidity Alarm 15-85% RH
- Low Humidity Alarm 15-85% RH

\* The microprocessor may be set within these ranges, however, the unit may not be able to control to extreme combinations of temperature and humidity.

**Standby Settings/Lead-Lag:** Menu shall allow planned rotation or emergency rotation of operating and standby units.

**Timers/Sleep Mode:** Menu shall allow various customer settings for turning on/off unit.

**Alarm Setup:** Menu shall allow customer settings for alarm notification (audible/local/remote). The following alarms shall be available:

- High Temperature
- Low Temperature
- High Humidity
- Low Humidity
- Main Fan Overload (Optional)
- Humidifier Problem
- Change Filter
- Fan Failure
- Unit Off

**Audible Alarm:** The audible alarm shall annunciate any alarm that is enabled by the operator.

**Common Alarm:** A programmable common alarm shall be provided to interface user selected alarms with a remote alarm device.

**Remote Monitoring:** All alarms shall be communicated to the Liebert® monitoring system with the following information: Date and time of occurrence, unit number and present temperature and humidity.

**Sensor Calibration:** Menu shall allow unit sensors to be calibrated with external sensors.

**Maintenance/Wellness Settings:** Menu shall allow reporting of potential component problems before they occur.

**Options Setup:** Menu shall provide operation settings for the installed components.

**System/Network Setup:** Menu shall allow Unit-to-Unit (U2U) communication and setup for teamwork modes of operation (up to 32 units).

**Teamwork Modes of Operation:** Saves energy by preventing operation of units in opposite modes multiple units.

**Auxiliary Boards:** Menu shall allow setup of optional expansion boards.

**Diagnostics/Service Mode:** The iCOM control shall be provided with self-diagnostics to aid in troubleshooting. The microcontroller board shall be diagnosed and reported as pass/not pass. Control inputs shall be indicated as on or off at the front display. Control outputs shall be able to be turned on or off from the front display without using jumpers or a service terminal. Each control output shall be indicated by an LED on a circuit board.

### **Advanced Menus**

**Factory Settings:** Configuration settings shall be factory-set based on the pre-defined component operation.

**Change Passwords:** Menu shall allow new passwords to be set or changed.

#### **2.4.1 Liebert® iCOM™ Microprocessor Control With Large Graphic Display (Optional)**

The Liebert iCOM unit control with large graphic display shall include all of the features as the Liebert iCOM with small graphic display, except that it includes a larger graphical display and shall include the additional features of:

“System View”, Spare Parts List, Unit Diary.

The Liebert iCOM control processor shall be microprocessor based with a 320x240 dot matrix graphic front monitor display panel and control keys for user inputs mounted in an ergonomic, aesthetically pleasing housing.

**System View - Status Overview:** “System View” shall display a summary of operation for the total number of operating units within a Unit-to-Unit (U2U) configuration.

**Spare Parts List:** Menu shall include a list of critical spare parts, their quantity and part numbers.

**Unit Diary:** Menu shall include a free field area within the unit memory where unit history may be stored for reference.

#### **2.5 Liebert iCOM Wall-Mount Large Graphic Display—Optional**

The Liebert iCOM Large Graphic Display Kit shall include an ergonomic, aesthetically pleasing housing, a 320x240 dot matrix graphic display and a 120V power supply. The Wall-Mount Large Graphic Display shall be used to allow remote location of a “System View” display and all features of the Large Graphic User, Service and Advanced menus for use with Liebert iCOM controlled products connected for Unit-to-Unit (U2U) communications.

##### **2.5.1 Control**

The control system shall allow programming of the following room conditions:

- Temperature Setpoint: 65-85°F (18-29°C)
- Temperature Sensitivity: ±1° to 9.9°F (0.6 to 5.6°C) in 0.1°F (0.1°C) increments

All setpoints shall be adjustable from the individual unit front monitor panel. Temperature and humidity sensors shall be capable of being calibrated using the front monitor panel controls to coordinate with other temperature and humidity sensors in the room.

In addition, the system shall provide the following internal controls:

##### **2.5.1.1 System Auto-Restart**

For startup after power failure, the system shall provide automatic restart with a programmable (up to 9.9 minutes in 6-second increments) time delay. Programming can be performed either at the unit or from the central site monitoring system.

##### **2.5.1.2 Sequential Load Activation**

During startup or after a power failure, the Liebert iCOM control shall sequence operational load activation to minimize inrush current. Systems allowing multiple loads to start simultaneously are unacceptable.

### **2.5.1.3 Front Monitor Display Panel**

The Liebert iCOM control shall provide a front monitor LCD, backlit display panel with 4 rows of 20 characters with adjustable contrast. This display (along with nine front-mounted control keys) shall be the only operator interface required to obtain all available system information such as room conditions, operational status, alarms, control and alarm setpoints and all user selections including alarm delays, sensor calibration, DIP switch selections and diagnostics. All indicators shall be in language form. No symbols or codes shall be acceptable.

### **2.5.1.4 Alarms**

The iCOM control shall activate an audible and visual alarm in event of any of the following conditions:

- High Temperature
- Low Temperature
- High Humidity
- Low Humidity
- Main Fan Overload (opt)
- Change Filters
- Loss of Air Flow
- Loss of Power
- Custom Alarm (#1 to #4)

Custom alarms are four customer accessible alarm inputs to be indicated on the front panel. Custom alarms can be identified with prepared (programmed) labels for the following frequently used inputs:

- Leak Under Floor
- Smoke Detected
- Loss of Water Flow
- Standby Unit On

User customized text can be entered for two of the four custom alarms.

Each alarm (unit and custom) can be separately enabled or disabled, selected to activate the common alarm, and programmed for a time delay of 0 to 255 seconds.

### **2.5.1.5 Audible Alarm**

The audible alarm shall annunciate any alarm that is enabled by the operator.

### **2.5.1.6 Common Alarm**

A programmable common alarm shall be provided to interface user selected alarms with a remote alarm device.

### **2.5.1.7 Remote Monitoring**

All alarms shall be communicated to the Liebert® site monitoring system with the following information: date and time of occurrence, unit number and current temperature and humidity.

### **2.5.1.8 Diagnostics**

The control system and electronic circuitry shall be provided with self-diagnostics to aid in troubleshooting. The microcontroller board shall be diagnosed and reported as pass/not pass. Control inputs shall be indicated as on or off at the front monitor panel. Control outputs shall be able to be turned On or Off from the front monitor panel without using jumpers or a service terminal.

### **2.5.1.9 Data Collection**

The control system shall maintain accumulative operating hours of compressors, fan motor and Econ-O-Coil. The 10 most recent alarms shall be retained.

### **2.5.1.10 Communication**

The Liebert iCOM® control shall be compatible with Liebert remote monitoring and control devices.

## 2.6 Chilled Water Control Valve

The water circuit shall include a 3-way (2-way) modulating valve. The Liebert iCOM positions the valve in response to room conditions. Cooling capacity will be controlled by bypassing chilled water around the coil.

## 2.7 High Pressure Chilled Water Control Valve—Optional

The chilled water circuit shall include a 3-way (2-way) high pressure modulating valve. The valve shall be designed for up to 400 PSI (2758 kPa) water pressure. CW146 and CW181 models shall be rated for 400psi, as standard.

## 2.8 A-Frame Chilled Water Coil

The cooling coil shall be of A-frame design with a minimum of \_\_\_\_ sq. ft. (sq.m.) face area, \_\_\_\_ rows deep.

The coil shall be controlled by a 3-way modulating control valve. It shall be constructed of copper tubes and aluminum fins and have a maximum face velocity of \_\_\_\_ ft. per minute (m/s) at \_\_\_\_ CFM (CMH).

The water circuit shall be designed to distribute water into the entire coil face area. The coil shall be supplied with \_\_\_\_ °F (°C) entering water temperature, with a \_\_\_\_ °F (°C) temperature rise. The coil shall require \_\_\_\_ GPM (l/s) of chilled water and the pressure drop shall not exceed \_\_\_\_ PSI (kPa). The entire coil assembly shall be mounted in a stainless steel condensate drain pan. The coil end sheets shall be constructed of galvanized G90 steel.

The coil in models CW106 and CW114 shall be removable from either side of the unit.

## 2.9 Flow Switch—Optional

The flow switch shall activate the alarm system should the chilled water supply be interrupted. The switch shall be factory mounted and wired.

## 2.10 Variable Speed Drive—Optional

A variable speed drive (VSD) is available to reduce energy consumption. The fan motor speed shall be varied from 100% to 60% of rated speed in response to room conditions. This shall be controlled automatically by the iCOM control. The variable speed drive option shall be available with an infrared humidifier.

### 2.10.1 OSHPD Certification—Optional

IBC 2006 test results shall be stamped by a California Structural Engineer to enable customer to submit documentation to code authorities. IBC 2006 bracing and IBC 2006 floor stand are required.

### 2.10.2 IBC 2006 Certification—Optional

Precision cooling unit shall be factory-modified, certified and labeled compliant with IBC 2000, 2003 and 2006, to a maximum  $SDS \leq 1.93$ , importance factor (IP) of 1.5,  $ap/Rp \leq 1.25$ ,  $z/h \leq 1.0$ . Soil Site Class A, B, C, D and E, seismic use groups I, II, III, IV and seismic design categories A, B, C, D, E and F are all covered under the certification. Certification shall be based on shake table testing in accordance with ICC-ES AC-156. IBC 2006 floor stand must be installed with this option.

## 2.11 Optional Components

The computer room environmental control system shall be equipped with the following optional components.

### 2.11.1 Disconnect Switch—Non-Locking Type

The manual disconnect switch shall be mounted in the high voltage section of the electrical panel. The switch shall be accessible with the door closed.

### **2.11.2 Disconnect Switch—Locking Type**

The manual disconnect switch shall be mounted in the high voltage section of the electrical panel. The switch shall be accessible from the outside of the unit with the door closed, and prevent access to the high voltage electrical components until switched to the “OFF” position.

### **2.11.3 High Temp Stat**

The high temp stat shall immediately shut down the environmental control system when activated. The high temp stat shall be mounted in the electrical panel with the sensing element in the return air.

### **2.11.4 Condensate Pump, Dual Float**

The pump has capacity of 6 GPM (23 l/m) at 20 ft. head (58 kPa). (Consult factory for 200V or 230V, 50Hz applications.) The pump is complete with integral dual float switch, pump, motor assembly and reservoir. The secondary float shall send a signal to the local alarm and shut down the unit upon high water condition. The unit is shipped loose for field installation on chilled water units that are upflow with bottom return. They are also shipped loose for under-floor field installation on CW026-CW060 units with EC fans.

### **2.11.5 Liebert® Liqui-tect® Sensors (Max. of Two Per Unit)**

Provide \_\_\_\_ (quantity) solid state water sensors under the raised floor.

### **2.11.6 Floor Stand**

The floor stand shall be constructed of a heliarc-welded, tubular steel frame. The floor stand shall have adjustable legs with vibration isolation pads. The floor stand shall be \_\_\_\_ inches high.

#### **2.11.6.1 IBC Seismic Floor Stands—Optional**

Seismic floor stand shall be certified and labeled with IBC 2000, 2003 and 2006, to a maximum SDS<=1.93, importance factor (IP) of 1.5, ap/Rp<=1.25,z/h<=1.0. Soil Site Class A, B, C, D and E, seismic use groups I, II, III, IV and seismic design categories A, B, C, D, E and F. Anchorage configurations available include; rigid mount, neoprene isolated or spring isolated with neoprene snubber.

#### **2.11.6.2 Floor Stand Turning Vane**

A factory-supplied, field-mounted turning vane shall be provided.

### **2.11.7 Smoke Sensor**

The smoke sensor shall immediately shut down the environmental control system and activate the alarm system when activated. The smoke sensor shall be mounted in the electrical panel with the sensing element in the return air compartment.

### **2.11.8 Liebert SiteScan® Site Monitoring System**

The manufacturer shall provide a Liebert SiteScan monitor system with the Liebert CW™. The Liebert SiteScan™ shall have the capability to monitor and change (at the user direction) the temperature setpoints and sensitivities of each unit. The printer shall provide the user with chronological alarm information. It shall also be capable of being programmed to print out environmental conditions or operating modes at each unit.

## **3.0 EXECUTION**

### **3.1 Installation of Precision Cooling Units**

#### **3.1.1 General**

The user shall install Precision Cooling units in accordance with manufacturer's installation instructions. The units shall be installed plumb and level, firmly anchored in locations indicated and shall maintain manufacturer's recommended clearances.

#### **3.1.2 Electrical Wiring**

The user shall install and connect electrical devices furnished by manufacturer but not specified to be factory-mounted. The manufacturer shall furnish copy of manufacturer's electrical connection diagram submittal to electrical contractor.

#### **3.1.3 Piping Connections**

The user shall install and connect devices furnished by manufacturer but not specified to be factory-mounted. The manufacturer shall furnish a copy of piping connection diagram submittal(s) to the piping contractor.

### **3.2 Field Quality Control**

The user shall startup Precision Cooling units in accordance with the manufacturer's startup instructions. The manufacturer shall test controls and demonstrate compliance with requirements.



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