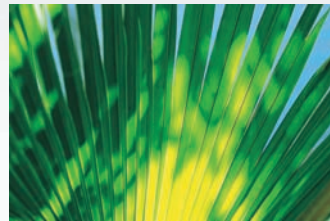




HCB, VCB, VCB-FB Series 50Hz

Chilled Water Air Handling Units

Air Volume: 750 to 18700 cfm (1274 to 31775 m³/hr)



HCB



VCB

DUNHAM-BUSH®

Products that perform...By people who care

SPECIFICATIONS AND FEATURES

General Description

The VCB and HCB series of chilled water blowers are available in thirteen sizes covering 750 to 18700 cfm [1274 to 31775 m³/hr]. Each unit has two sections; the coil section which include chilled water coil and filters; the blower and drive package section which can be either vertical or horizontal supply air discharge.

Casing

- ✿ Constructed of heavy gauge steel sheet and insulated with 1/2" [13mm] thick x 1 1/2 lb per cu.ft [24 kg per cu meter] linacoustic fiberglass.
- ✿ Aesthetically coated with powder coating to provide excellent finish, weatherability and corrosion resistance.
- ✿ Removable panels on the left and right hand side of the unit to provide access to critical parts and components.

Cooling Coil

Dunham-Bush coils have been designed and tested to assure maximum efficiency of heat transfer between circulating water and air. The two basic criteria for heat transfer on the airside of the coil have been perfected by fin contour and staggered tube configuration.

Coils are circuited to optimize performance and fluid pressure drop limitations. Standard coils are constructed of aluminum fins and 1/2"[13mm] O.D. copper tubes. Casing is made from heavy gauge steel sheet.

Each model can be either 3 or 4 rows deep coil.

Standard coils are suitable for 250 psig [17 bar] working pressure and are tested under water with 350 psig air pressure. The following are available as options for special applications:

- ✿ Pre-coated aluminum fins or copper finned coils
- ✿ Higher design working and test pressures
- ✿ Custom made coils for heating or cooling

Drive Package and Blowers

✿ HCB 30 to HCB 95

Units are equipped with direct driven motor blower, statically and dynamically balanced and operate at low rotation per minute to assure smooth and quiet performance.

✿ HCB/VCB 145 to VCB 760

Belt driven drive package offers flexibility on various air flow rate and various static pressure application. Single large diameter double inlet double width blowers (AMCA certified) reduce the noise level and eliminate the need for common transition and eliminate air unbalance.

Filters

VCB / HCB : 1" [25mm] thick washable filters (70% arrestance efficiency).

VCB-FB : 1/2" [13mm] thick washable filters (70% arrestance efficiency).

PHYSICAL SPECIFICATIONS

Evaporator Units (Vertical and Horizontal Casing Type – HCB-D & VCB-D)

Model	Blower Section				Evaporator Section			Filters		Approx. Operating Weight lbs[kg]
	Blower		Motor Max HP	Air Flow Min - Max cfm[m³/hr]	Coil		Water Inlet/ Outlet Conn. O.D. inches[mm]			
	Qty.	Dia. X Width			Rows Deep	Face Area ft²[m²]		Qty.	Size inches [mm]	
HCB 30D	1	9x7 (inches)	315W	750-900 [1274-1529]	3, 4	2.2 [0.2]	1 [25]	1	16x20x1 [406x508x25]	110 [50]
HCB 40D	1	9x7 (inches)	425W	1200-1500 [2039-2549]	3, 4	3.2 [0.3]	1 1/2 [38]	1	20x25x1 [508x635x25]	120 [54]
HCB 50D	1	9x9 (inches)	425W	1450-1700 [2464-2889]	3, 4	4.2 [0.4]	1 1/2 [38]	2	20x16x1 [508x406x25]	140 [64]
HCB 81D	1	10x10 (inches)	750W	2050-2200 [3483-3738]	3, 4	4.4 [0.4]	1 1/2 [38]	2	16x20x1 [406x508x25]	275 [125]
HCB 95D	1	10x10 (inches)	750W	2300-2600 [3908-4418]	3, 4	5.0 [0.5]	1 1/2 [38]	2	20x20x1 [508x508x25]	340 [154]
HCB 145D	1	12x12 (inches)	4.0	2070-4140 [3517-7035]	3, 4	6.9 [0.6]	1 1/2 [38]	1 1	20x25x1 [508x635x25] 25x25x1 [635x635x25]	400 [181]
VCB 145D	1	12x12 (inches)	4.0	2070-4140 [3517-7035]	3, 4	6.9 [0.6]	1 1/2 [38]	2	25x25x1 [635x635x25]	474 [215]
HCB 190D	1	15x15 (inches)	5.5	2760-5520 [4690-9380]	3, 4	9.2 [0.9]	1 1/2 [38]	2	25x25x1 [635x635x25]	500 [227]
VCB 190D	1	15x15 (inches)	5.5	2760-5520 [4690-9380]	3, 4	9.2 [0.9]	1 1/2 [38]	1 2	25x16x1 [635x406x25] 20x25x1 [508x635x25]	560 [254]
HCB 250D	1	15x15 (inches)	10.0	3900-7800 [6627-13254]	3, 4	13.0 [1.2]	2 [51]	1 2	20x25x1 [508x635x25] 25x25x1 [635x635x25]	680 [308]
VCB 250D	1	15x15 (inches)	10.0	3900-7800 [6627-13254]	3, 4	13.0 [1.2]	2 [51]	4	20x25x1 [508x635x25]	767 [348]
VCB 320D	1	18x13 (inches)	15.0	5100-10200 [8666-17332]	3, 4	17.0 [1.6]	2 [51] 2 1/2 [64]	3 3	16x25x1 [406x635x25] 20x25x1 [508x635x25]	920 [417]
VCB 435D	1	450x450 (mm)	15.0	6570-13140 [11164-22327]	3, 4	21.9 [2.0]	2 1/2 [64]	3 3	25x25x1 [635x635x25] 20x25x1 [508x635x25]	1150 [522]
VCB 480D	1	500x500 (mm)	20.0	8750-17520 [14868-29770]	3, 4	29.2 [2.7]	2 1/2 [64]	9	20x25x1 [508x635x25]	1450 [658]
VCB 570D	1	500x500 (mm)	20.0	8750-17520 [14868-29770]	3, 4	29.2 [2.7]	2 1/2 [64]	9	20x25x1 [508x635x25]	1600 [726]
VCB 760D	1	560x560 (mm)	30.0	10200-20400 [17332-34664]	3, 4	34.0 [3.2]	2 1/2 [64] 3 [76]	3 6	20x25x1 [508x635x25] 25x25x1 [635x635x25]	1900 [862]

Note: Power supply for HCB 30D to 95D is 240-1-50hz.

Evaporator Free Blow Units (VCB-D-FB)

Model	Blower Section				Filter		Water Inlet / Outlet Connection O.D. inches[mm]
	Blower		Motor HP (Each)	cfm[m³/hr]			
	Qty	Dia. X Width (inches)			Qty	Size - inches[mm]	
VCB 68D-FB	1	10 - 10	1/2	2100 [3568]	1	20 7/8 x 18 1/8 x 1/2 [530x460x13]	1 1/2 [38]
VCB 95D-FB	2	9 - 7	1/3	2400 [4078]	2	20 7/8 x 18 1/8 x 1/2 [530x460x13]	1 1/2 [38]
VCB 145D-FB	2	10 - 8	1 1/2	3500 [5947]	2	27 3/4 x 18 1/8 x 1/2 [705x460x13]	1 1/2 [38]
VCB 190D-FB	2	10 - 10	1 1/2	4400 [7476]	2	32 5/8 x 18 1/8 x 1/2 [829x460x13]	1 1/2 [38]

Note : VCB 68D - FB and VCB 95D - FB are 240-1-50hz.

PERFORMANCE DATA

Capacity Based On 44°F EWT, 54°F LWT

Model	Supply Air cfm [m³/hr]	Coil Row	80°FDB / 67°FWB				75°FDB / 62°FWB				72°FDB / 60°FWB			
			Capacity (MBH)		Flow Rate USgpm	Press. Drop ft.wg	Capacity (MBH)		Flow Rate USgpm	Press. Drop ft.wg	Capacity (MBH)		Flow Rate USgpm	Press. Drop ft.wg
			Total	Sensible			Total	Sensible			Total	Sensible		
HCB 30D	800 [1359]	3	25.1	18.6	5.0	3.7	17.3	16.3	3.5	1.9	14.5	14.5	2.9	1.4
		4	29.6	21.1	5.9	3.1	20.3	18.4	4.1	1.6	17.0	16.5	3.4	1.2
HCB 40D	1300 [2209]	3	35.9	28.2	7.2	1.7	25.0	25.0	5.0	0.9	21.0	21.0	4.2	0.7
		4	42.7	32.1	8.6	1.5	29.5	28.3	5.9	0.8	24.8	24.8	5.0	0.6
HCB 50D	1550 [2634]	3	43.9	34.1	8.8	1.5	30.4	30.4	6.1	0.8	25.6	25.6	5.1	0.6
		4	56.4	40.5	11.3	2.8	38.7	35.3	7.8	1.5	32.5	31.8	6.5	1.1
HCB 81D	2100 [3568]	3	57.4	44.8	11.5	3.1	40.0	40.0	8.0	1.7	33.8	33.8	6.8	1.2
		4	73.7	53.4	14.8	5.9	50.9	46.7	10.2	3.1	42.8	42.0	8.6	2.3
HCB 95D	2400 [4078]	3	65.6	51.2	13.1	3.2	45.7	45.7	9.2	1.7	38.6	38.6	7.7	1.3
		4	84.2	61.0	16.9	6.1	58.1	53.4	11.6	3.2	48.9	48.9	9.8	2.4
VCB 145D HCB 145D	3500 [5947]	3	96.8	74.9	19.4	4.8	67.4	66.7	13.5	2.6	56.9	56.9	11.4	1.9
		4	123.6	89.0	24.7	9.0	85.4	77.9	17.1	4.7	72.0	70.2	14.4	3.5
VCB 190D HCB 190D	4400 [7476]	3	129.6	97.4	25.9	7.7	89.8	86.2	18.0	4.1	75.8	75.8	15.2	3.0
		4	163.1	115.3	32.7	13.9	112.6	100.4	22.5	7.3	94.9	90.4	19.0	5.4
VCB 250D HCB 250D	6400 [10875]	3	185.8	140.6	37.2	5.7	128.8	124.5	25.8	3.0	108.7	108.7	21.8	2.2
		4	239.5	168.4	47.9	14.8	165.5	146.6	33.1	7.8	139.6	131.8	27.9	5.9
VCB 320D	8000 [13594]	3	235.8	177.5	47.2	5.7	163.4	157.2	32.7	3.0	137.9	137.9	27.6	2.3
		4	280.8	203.2	56.2	5.4	193.8	178.2	38.8	2.8	163.1	160.3	32.6	2.0
VCB 435D	10500 [17842]	3	307.4	231.9	61.5	6.1	213.1	205.3	42.7	3.2	179.8	179.8	36.0	2.4
		4	395.0	277.4	79.1	15.0	272.9	241.6	54.6	7.9	230.0	217.2	46.0	5.9
VCB 480D	12000 [20390]	3	371.3	275.0	74.3	4.8	255.8	242.0	51.2	2.5	215.5	215.5	43.1	1.9
		4	472.4	327.2	94.6	11.9	325.5	282.9	65.2	6.3	273.8	254.5	54.8	4.7
VCB 570D	14000 [23789]	3	409.8	309.2	82.1	5.7	284.1	273.8	56.9	3.0	239.7	239.7	48.0	2.3
		4	526.6	369.9	105.4	14.4	363.9	322.1	72.9	7.6	306.6	289.6	61.4	5.7
VCB 760D	17000 [28886]	3	490.2	371.3	98.1	6.1	340.5	330.1	68.2	3.3	287.5	287.5	57.6	2.4
		4	632.6	445.9	126.6	15.6	437.2	388.3	87.5	8.2	368.8	349.7	73.8	6.1

NOTES:

1.) To correct for different air flow, use this multiplier:

Air Flow Variation	Total Capacity	Sensible Capacity
0.9	0.93	0.92
1.0	1.00	1.00
1.1	1.07	1.08

2.) To correct for altitude, use this multiplier:

Altitude Above Sea Level - ft	Cooling Capacity
0	1.00
2000	0.98
3000	0.97
4000	0.96
5000	0.95
6000	0.93
7000	0.92

BLOWER PERFORMANCE

Available External Static Pressure (in.wg)

A) HCB 30D to 95D

HCB 30D		HCB 40D		HCB 50D		HCB / VCB 81D		HCB / VCB 95D	
DD 9/7 – 315W		DD 9/7 – 425W		DD 9/9 – 425W		DD 10/10 – 750W		DD 10/10 – 750W	
cfm	ESP	cfm	ESP	cfm	ESP	cfm	ESP	cfm	ESP
750	0.74	1200	0.68	1450	0.54	2050	0.84	2300	0.52
800	0.72	1300	0.56	1550	0.41	2100	0.82	2400	0.47
850	0.69	1400	0.39	1650	0.23	2150	0.76	2500	0.27
900	0.66	1500	0.18	1700	0.08	2200	0.70	2600	0.11

BLOWER PERFORMANCE

B) HCB / VCB 145D to 760D

RPM	Air flow in cfm										Fan Model
	ESP	BHP	ESP	BHP	ESP	BHP	ESP	BHP	ESP	BHP	
VCB / HCB 145D											
	3100		3300		3500		3700		3900		12 – 12 (Inches)
800	0.39	1.05	0.34	1.15	0.28	1.27	0.19	1.38	0.10	1.50	
900	0.68	1.26	0.63	1.38	0.58	1.50	0.50	1.65	0.43	1.78	
1000	1.01	1.51	0.96	1.64	0.90	1.77	0.82	1.92	0.76	2.08	
1100	1.32	1.77	1.31	1.93	1.27	2.08	1.18	2.24	1.11	2.40	
VCB / HCB 190D											
	3800		4100		4400		4700		5000		15 – 15 (Inches)
700	0.50	1.18	0.42	1.31	0.37	1.47	0.31	1.64	0.24	1.80	
800	0.82	1.47	0.76	1.62	0.71	1.80	0.64	1.98	0.57	2.17	
900	1.18	1.84	1.13	2.01	1.08	2.17	1.03	2.36	0.96	2.59	
1000	1.54	2.23	1.51	2.41	1.48	2.64	1.44	2.86	1.37	3.04	
VCB / HCB 250D											
	5600		6000		6400		6800		7200		15 – 15 (Inches)
900	1.12	3.07	1.06	3.45	0.99	3.79	0.82	4.20	0.31	4.68	
950	1.33	3.34	1.27	3.71	1.20	4.12	1.12	4.50	0.92	4.95	
1000	1.56	3.61	1.48	3.99	1.42	4.41	1.34	4.87	1.28	5.31	
1050	1.79	3.87	1.72	4.29	1.65	4.75	1.57	5.20	1.5	5.71	
VCB 320D											
	6600		7300		8000		8700		9400		18 – 13 (Inches)
850	1.77	4.36	1.59	5.00	1.43	5.67	1.25	6.39	0.6	7.29	
900	2.07	4.81	1.93	5.46	1.75	6.26	1.61	6.98	1.28	7.84	
950	2.37	5.23	2.28	6.02	2.10	6.77	1.92	7.65	1.76	8.47	
1000	2.70	5.70	2.61	6.55	2.47	7.33	2.29	8.32	2.08	9.22	
VCB 435D											
	9000		9750		10500		11250		12000		450 – 450 (mm)
650	0.71	4.06	0.56	4.60	0.42	5.17	0.24	5.76	0.05	6.39	
700	0.98	4.53	0.82	5.13	0.71	5.76	0.54	6.39	0.36	7.10	
750	1.27	5.07	1.13	5.67	1.00	6.35	0.84	7.05	0.67	7.80	
800	1.55	5.63	1.44	6.29	1.32	7.01	1.17	7.79	1.01	8.59	
VCB 480D											
	8000		10000		12000		14000		16000		500 – 500 (mm)
650	1.20	3.54	1.06	4.71	0.83	6.09	0.50	7.72	0.07	9.58	
700	1.46	4.06	1.33	5.31	1.13	6.81	0.82	8.58	0.42	10.60	
750	1.72	4.64	1.62	5.99	1.44	7.60	1.15	9.50	0.79	11.68	
800	1.98	5.27	1.93	6.73	1.76	8.46	1.50	10.48	1.15	12.80	
VCB 570D											
	12000		13000		14000		15000		16000		500 – 500 (mm)
650	0.83	6.09	0.67	6.89	0.50	7.72	0.31	8.65	0.07	9.58	
700	1.13	6.81	0.98	7.68	0.82	8.58	0.65	9.57	0.42	10.60	
750	1.44	7.60	1.30	8.51	1.15	9.50	0.99	10.56	0.79	11.68	
800	1.76	8.46	1.97	10.40	1.50	10.48	1.34	11.60	1.15	12.80	
VCB 760D											
	15300		16150		17000		17850		18700		560 – 560 (mm)
550	0.60	7.04	0.50	7.65	0.39	8.30	0.25	8.97	0.12	9.66	
600	0.94	8.02	0.83	8.67	0.73	9.41	0.61	10.15	0.49	10.92	
650	1.30	9.09	1.21	9.83	1.10	10.59	0.98	11.41	0.87	12.27	
700	1.67	10.27	1.58	11.02	1.49	11.86	1.38	12.75	1.26	13.65	

Notes: 1. Values based on four row wet and standard washable filter.
2. For three row of wet coil, add 0.08" wg of external static pressure.

DIMENSIONAL DATA

Evaporator Free Blow Unit (VCB-D-FB)

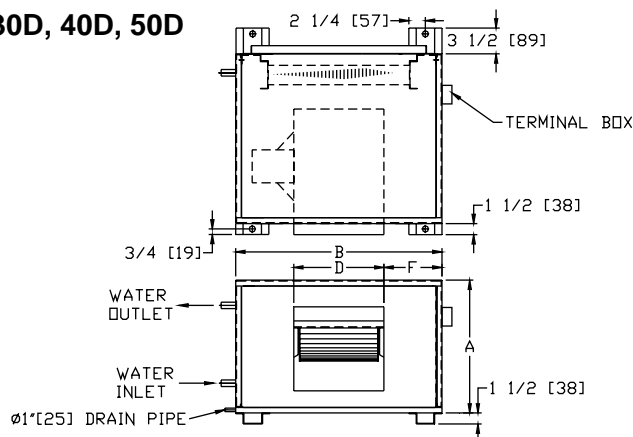
VCB 68D-FB, 95D-FB, 145D-FB, 190D-FB					Model VCB	A	B	C
					68D-FB	48 [1219]	22 [559]	79 [2007]
					95D-FB	48 [1219]	22 [559]	79 [2007]
					145D-FB	61 [1549]	24 [610]	81 [2057]
					190D-FB	72 [1829]	30 [762]	86 [2184]

Notes: 1.) All dimensions are in inches[mm].
2.) Units shown are right hand piping connection.
3.) Standard water inlet and outlet comes with BS males threaded connection.

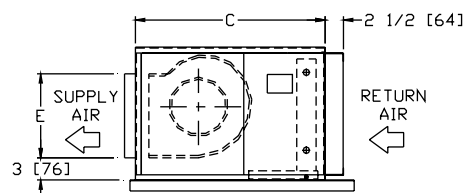
DIMENSIONAL DATA

Evaporator Units (Horizontal Casing Type – HCB-D)

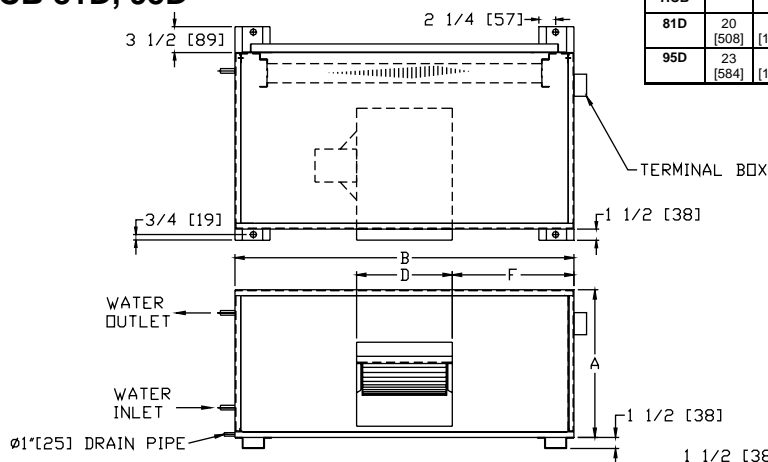
HCB 30D, 40D, 50D



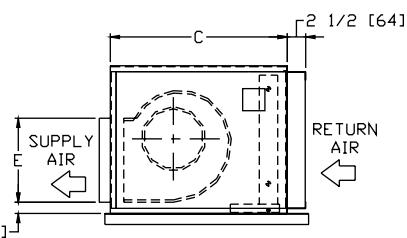
Model HCB	A	B	C	D	E	F	Water Inlet/Outlet Conn. O.D. 3R / 4R
30D	17 1/2 [445]	28 [711]	23 [584]	9 1/4 [235]	10 1/2 [267]	9 3/8 [238]	Ø 7/8 [22]
40D	22 [559]	32 [813]	24 [610]	9 1/4 [235]	10 1/2 [267]	11 3/8 [289]	Ø 1 3/8 [35]
50D	22 [559]	39 [991]	26 1/2 [673]	11 3/4 [298]	10 1/2 [267]	13 5/8 [346]	Ø 1 3/8 [35]



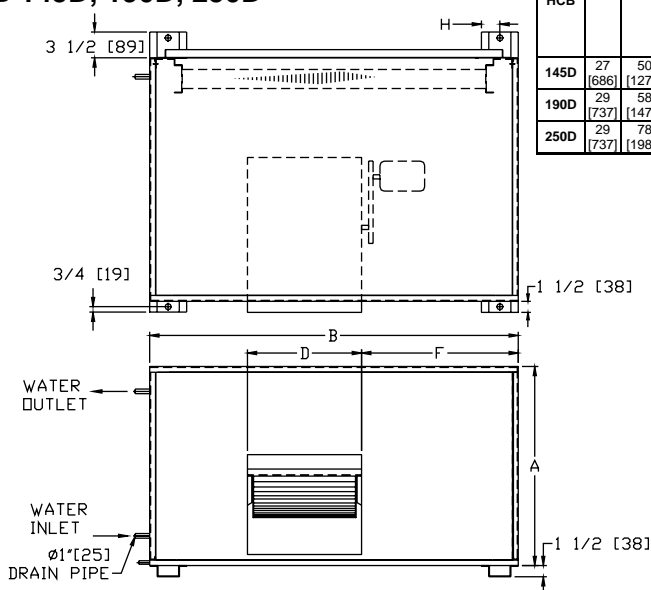
HCB 81D, 95D



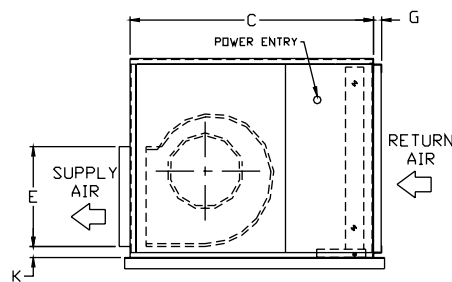
Model HCB	A	B	C	D	E	F	Water Inlet/Outlet Conn. O.D. 3R	Water Inlet/Outlet Conn. O.D. 4R
81D	20 [508]	46 [1168]	24 [610]	13 [330]	11 3/8 [289]	16 1/2 [419]	Ø 1 3/8 [35]	Ø 1 5/8 [41]
95D	23 [584]	46 [1168]	30 [762]	13 [330]	11 3/8 [289]	16 1/2 [419]	Ø 1 3/8 [35]	Ø 1 5/8 [41]



HCB 145D, 190D, 250D



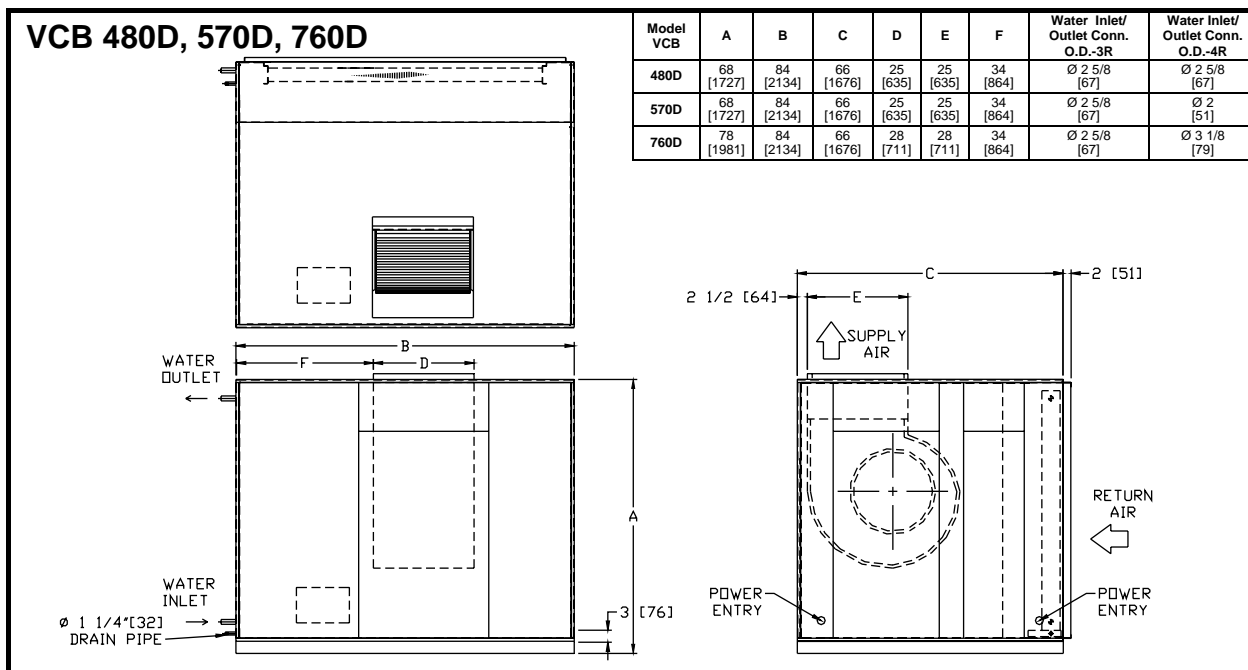
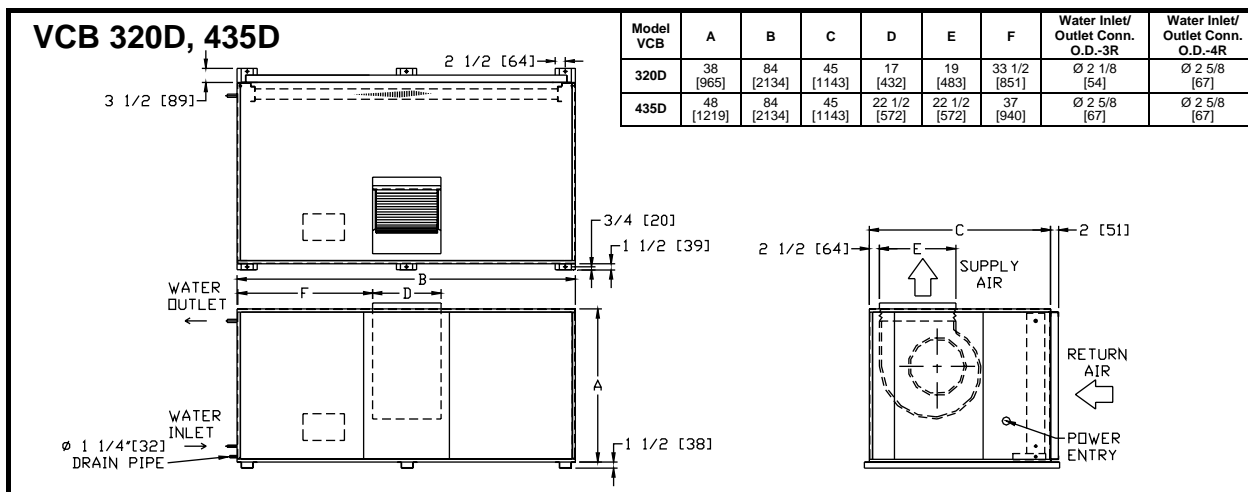
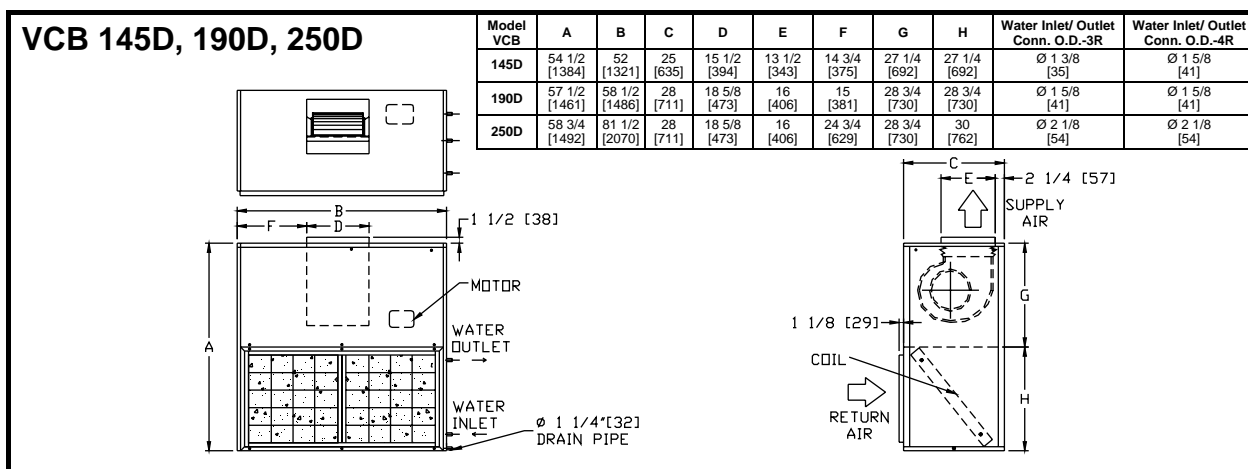
Model HCB	A	B	C	D	E	F	G	H	K	Ø	Water Inlet/Outlet Conn. O.D. 3R	Water Inlet/Outlet Conn. O.D. 4R
145D	27 [686]	50 [1270]	33 [838]	15 1/2 [394]	13 1/2 [343]	21 1/4 [540]	2 1/2 [64]	2 1/4 [57]	5 1/2 [140]	1 [25]	Ø 1 3/8 [35]	Ø 1 5/8 [41]
190D	29 [737]	58 [1473]	40 [1016]	18 1/2 [470]	16 [406]	24 3/8 [619]	2 1/2 [64]	2 1/4 [57]	3 1/4 [83]	1 [25]	Ø 1 5/8 [41]	Ø 1 5/8 [41]
250D	29 [737]	78 [1981]	40 [1016]	18 1/2 [470]	16 [406]	30 [762]	2 [51]	2 1/2 [64]	3 1/4 [83]	1 1/4 [32]	Ø 2 1/8 [54]	Ø 2 1/8 [54]



- Notes : 1.) All dimensions are in inches[mm].
2.) Units shown are right hand piping connection.
3.) Standard water inlet and outlet comes with BS males threaded connection.

DIMENSIONAL DATA

Evaporator Units (Vertical Casing Type – VCB-D)



Notes :
1.) All dimensions are in inches[mm].
2.) Units shown are right hand piping connection.
3.) Standard water inlet and outlet comes with BS males threaded connection.



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