

CBLV / 4-PIPE COOLING

Nominal Length ft	Nozzle Size	Primary Air			Sound NC	Coil Sensible Cooling (Btu/h)								Induction ratio	Throw ft.									
		Inlet Dia.	Flow Rate	Inlet ΔPS		1.0 GPM		2.0 GPM		3.0 GPM		4.0 GPM												
		Inches	CFM	(in. H2O)		qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL											
4	B1	5	12	0.18	15	619	0.35		674	1.39		694	3.13		704	5.56	4.2	0 - 0 - 2						
			18	0.41	23	831			938			979			1000			0 - 1 - 4						
			24	0.73	30	1000			1164			1230			1266			1 - 2 - 7						
	B2	6	20	0.20	15	1082			1203			1248			1272		1788	2241	2244	2444	3037	3.7	0 - 1 - 3	
			30	0.44	24	1426			1650			1740			1788		1758	1758	1758	1758	1758		1 - 2 - 7	
			40	0.78	30	1687			2022			2163			2163		2163	2163	2163	2163	2163		1 - 3 - 10	
	B3	8	40	0.22	15	1456			1646			1719			1719		1719	1719	1719	1719	1719	2.7	1 - 2 - 10	
			60	0.49	15	1881			2224			2366			2366		2366	2366	2366	2366	2366		2 - 6 - 15	
			80	0.87	21	2195			2697			2915			2915		2915	2915	2915	2915	2915		4 - 10 - 17	
	B4	8	70	0.21	15	1875			2215			2356			2356		2356	2356	2356	2356	2356	1.9	2 - 4 - 13	
			105	0.48	19	2318			2893			3147			3147		3147	3147	3147	3147	3147		4 - 8 - 17	
			140	0.86	25	2626			3421			3795			3795		3795	3795	3795	3795	3795		7 - 13 - 19	
6	B1	6	20	0.20	15	942	0.51		1068	2.04		1117	4.59		1142	8.16	4.2	0 - 1 - 3						
			30	0.44	23	1212			1454			1549			1601			1601	1601	1601	1601	1601	1 - 1 - 6	
			40	0.78	30	1429			1776			1925			2007			2007	2007	2007	2007	2007	1 - 3 - 10	
	B2	6	30	0.17	18	1500			1737			1827			1827		1827	1827	1827	1827	1827	3.7	1 - 1 - 5	
			45	0.39	27	1934			2351			2524			2524		2524	2524	2524	2524	2524		2 - 5 - 16	
			60	0.69	33	2238			2842			3108			3108		3108	3108	3108	3108	3108		1 - 3 - 11	
	B3	8	60	0.19	15	1993			2368			2511			2511		2511	2511	2511	2511	2511	2.7	1 - 3 - 12	
			90	0.43	17	2514			3140			3410			3410		3410	3410	3410	3410	3410		3 - 7 - 18	
			120	0.77	24	2866			3752			4157			4157		4157	4157	4157	4157	4157		5 - 12 - 21	
	B4	8	105	0.20	15	2506			3126			3394			3394		3394	3394	3394	3394	3394	1.9	2 - 6 - 17	
			160	0.46	22	3034			4034			4514			4514		4514	4514	4514	4514	4514		6 - 13 - 22	
			215	0.83	29	3300			4700			5391			5391		5391	5391	5391	5391	5391		10 - 18 - 25	
8	B1	8	25	0.16	15	1123	0.67		1305	2.68		1377	6.03		1415	1.37	4.2	0 - 1 - 3						
			40	0.41	15	1483			1845			1998			2082			2082	2082	2082	2082	2082	1 - 2 - 7	
			55	0.78	16	1725			2267			2512			2652			2652	2652	2652	2652	2652	1 - 3 - 13	
	B2	8	40	0.16	15	1863			2225			2372			2372		2372	2372	2372	2372	2372	3.7	1 - 1 - 6	
			60	0.36	15	2330			2963			3238			3238		3238	3238	3238	3238	3238		3238	1 - 3 - 12
			80	0.65	19	2641			3538			3953			3953		3953	3953	3953	3953	3953		2 - 6 - 18	
	B3	8	80	0.18	15	2459			3015			3244			3244		3244	3244	3244	3244	3244	2.7	2 - 3 - 14	
			120	0.41	20	2989			3926			4350			4350		4350	4350	4350	4350	4350		3 - 8 - 21	
			160	0.72	26	3240			4626			5251			5251		5251	5251	5251	5251	5251		6 - 14 - 24	
	B4	8	145	0.21	16	3047			3998			4439			4439		4439	4439	4439	4439	4439	1.9	3 - 7 - 21	
			215	0.45	25	3360			4958			5696			5696		5696	5696	5696	5696	5696		7 - 15 - 25	
			285	0.79	31	3660			5641			6661			6661		6661	6661	6661	6661	6661		12 - 20 - 29	



Note: Reference page U47 for operational conditions used for performance notes

CBLV / 4-PIPE HEATING

Nominal Length ft	Nozzle Size	Primary Air			Sound NC	Coil Heating (Btu/h)								Induction ratio	Throw ft.									
		Inlet Dia.	Flow Rate	Inlet ΔPS		1.0 GPM		2.0 GPM		3.0 GPM		4.0 GPM												
		Inches	CFM	(in. H2O)		qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL											
4	B1	5	12	0.18	15	1377	0.11	0.45	1.00	1.79	1498	1541	1565	4.2	0 - 0 - 2									
			18	0.41	23	1847					2084	2175	2223		0 - 1 - 4									
			24	0.73	30	2223					2586	2734	2813		1 - 2 - 7									
	B2	6	20	0.20	15	2405					2673	2773	2827		2.7	2877	2977	3077	3.7	0 - 1 - 3				
			30	0.44	24	3170					3666	3866	3974			1 - 2 - 7								
			40	0.78	30	3749					4494	4807	4979			1 - 3 - 12								
	B3	8	40	0.22	15	3236					3657	3820	3907			1.9	4943	5259	5430	2.7	1 - 2 - 10			
			60	0.49	15	4180					4943	5259	5430				2 - 6 - 15							
			80	0.87	21	4878					5994	6478	6750				4 - 10 - 17							
	B4	8	70	0.21	15	4166					4922	5235	5405				2.7	6430	6994		7315	1.9	2 - 4 - 13	
			105	0.48	19	5151					6430	6994	7315					4 - 8 - 17						
			140	0.86	25	5836					7602	8433	8913					7 - 13 - 19						
6	B1	6	20	0.20	15	2094	0.15	0.62	1.39	2.48	2374	2483	2538	4.2				0 - 1 - 3						
			30	0.44	23	2694					3230	3443	3559					1 - 1 - 6						
			40	0.78	30	3174					3946	4278	4461					1 - 3 - 10						
	B2	6	30	0.17	18	3333					3859	4060	4166		3.7			4224	4609		4819		2.7	1 - 1 - 5
			45	0.39	27	4298					5224	5609	5819					1 - 3 - 11						
			60	0.69	33	4972					6315	6906	7238					2 - 5 - 16						
	B3	8	60	0.19	15	4428					5262	5579	5751			1.9		6977	7577	7909	2.7			1 - 3 - 12
			90	0.43	17	5588					6977	7577	7909					3 - 7 - 18						
			120	0.77	24	6368					8338	9238	9755					5 - 12 - 21						
	B4	8	105	0.20	15	5569					6948	7542	7871				2.7	8965	10031	10652		1.9		2 - 6 - 17
			160	0.46	22	6698					8965	10031	10652					6 - 13 - 22						
			215	0.83	29	7407					10445	11979	12903					10 - 18 - 25						
8	B1	8	25	0.16	15	2495	0.20	0.80	1.80	3.21	2900	3060	3145	4.2				0 - 1 - 3						
			40	0.41	15	3296					4100	4439	4627					1 - 2 - 7						
			55	0.78	16	3834					5038	5583	5893					1 - 3 - 13						
	B2	8	40	0.16	15	4140					4944	5271	5447		3.7			5584	6195	6537			2.7	1 - 1 - 6
			60	0.36	15	5178					6584	7195	7537					1 - 3 - 12						
			80	0.65	19	5870					7862	8785	9315					2 - 6 - 18						
	B3	8	80	0.18	15	5464					6699	7210	7490			1.9		8724	9666	10202	2.7			2 - 3 - 14
			120	0.41	20	6641					8724	9666	10202					3 - 8 - 21						
			160	0.72	26	7412					10280	11668	12481					6 - 14 - 24						
	B4	8	145	0.21	16	6728					8884	9865	10425				2.7	11017	12659	13639		1.9		3 - 7 - 21
			215	0.45	25	7736					11017	12659	13639					7 - 15 - 25						
			285	0.79	31	8331					12535	14803	16209					12 - 20 - 29						

Note: Reference page U47 for operational conditions used for performance notes

CBLV / 2-PIPE COOLING

Nominal Length ft	Nozzle Size	Primary Air			Sound NC	Coil Sensible Cooling (Btu/h)								Induction ratio	Throw ft.			
		Inlet Dia.	Flow Rate	Inlet ΔPS		1.0 GPM		2.0 GPM		3.0 GPM		4.0 GPM						
		Inches	CFM	(in. H2O)		qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL					
4	B1	5	12	0.18	15	661	0.47		1.88	4.23	4.23	7.52	4.2	0 - 0 - 2				
			18	0.41	23	887								0 - 1 - 4				
			24	0.73	30	1067								1 - 2 - 7				
	B2	6	20	0.20	15	1154								1283	1331	1357	3.7	0 - 1 - 3
			30	0.44	24	1521								1760	1856	1907		1 - 2 - 7
			40	0.78	30	1800								2157	2307	2390		1 - 3 - 10
	B3	8	40	0.22	15	1553								1755	1834	1875	2.7	2 - 2 - 15
			60	0.49	15	2006								2372	2524	2607		4 - 8 - 17
			80	0.87	21	2342								2877	3110	3240		7 - 13 - 19
	B4	8	70	0.21	15	1999								2363	2513	2594	1.9	2 - 4 - 13
			105	0.48	19	2473								3086	3357	3511		4 - 8 - 17
			140	0.86	25	2801								3649	4048	4278		7 - 13 - 19
6	B1	6	20	0.20	15	1005	0.68		2.73	6.14	6.14	1.39	0 - 1 - 3					
			30	0.44	23	1293							1140	1192	1218	1 - 1 - 6		
			40	0.78	30	1524							1551	1653	1708	1 - 3 - 10		
	B2	6	30	0.17	18	1600							1894	1949	2000	3.7	1 - 1 - 5	
			45	0.39	27	2063							1852	1949	2000		1 - 3 - 11	
			60	0.69	33	2387							2507	2692	2793		2 - 5 - 16	
	B3	8	60	0.19	15	2126							3031	3315	3474	2.7	1 - 3 - 12	
			90	0.43	17	2682							2526	2678	2761		3 - 7 - 18	
			120	0.77	24	3045							3349	3637	3796		5 - 12 - 21	
	B4	8	105	0.20	15	2673							4002	4434	4682	1.9	2 - 6 - 17	
			160	0.46	22	3224							3335	3620	3778		6 - 13 - 22	
			215	0.83	29	3506							4303	4815	5113		10 - 18 - 25	
8	B1	8	25	0.16	15	1198	0.90		3.58	8.06	8.06	1.83	0 - 1 - 3					
			40	0.41	15	1582							1392	1469	1510	1 - 2 - 7		
			55	0.78	16	1840							1968	2131	2221	1 - 3 - 13		
	B2	8	40	0.16	15	1987							2418	2680	2828	3.7	1 - 1 - 6	
			60	0.36	15	2485							2373	2530	2614		1 - 3 - 12	
			80	0.65	19	2817							3160	3454	3618		2 - 6 - 18	
	B3	8	80	0.18	15	2623							3774	4217	4471	2.7	2 - 3 - 14	
			120	0.41	20	3175							3216	3461	3595		3 - 8 - 21	
			160	0.72	26	3443							4188	4640	4897		6 - 14 - 24	
	B4	8	145	0.21	16	3237							4934	5601	5991	1.9	3 - 7 - 21	
			215	0.45	25	3570							4264	4735	5004		7 - 15 - 25	
			285	0.79	31	3889							5288	6076	6547		12 - 20 - 29	



Note: Reference page U47 for operational conditions used for performance notes

CBLV / 2-PIPE HEATING

Nominal Length ft	Nozzle Size	Primary Air			Sound NC	Coil Heating (Btu/h)								Induction ratio	Throw ft.			
		Inlet Dia.	Flow Rate	Inlet ΔPS		1.0 GPM		2.0 GPM		3.0 GPM		4.0 GPM						
		Inches	CFM	(in. H2O)		qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL	qTOTAL	ΔCOIL					
4	B1	5	12	0.18	15	1835	0.47	1998	1.88	2055	4.23	2087	7.52	4.2	0 - 0 - 2			
			18	0.41	23	2463									2778	2900	2964	0 - 1 - 4
			24	0.73	30	2964									3448	3645	3751	1 - 2 - 7
	B2	6	20	0.20	15	3206									3564	3697	3769	0 - 1 - 3
			30	0.44	24	4226									4888	5154	5298	1 - 2 - 7
			40	0.78	30	4999									5992	6409	6639	1 - 3 - 12
	B3	8	40	0.22	15	4315									4876	5093	5209	1 - 2 - 10
			60	0.49	15	5573									6590	7012	7240	2 - 6 - 15
			80	0.87	21	6505									7992	8638	9000	4 - 10 - 17
	B4	8	70	0.21	15	5554									6563	6981	7207	2 - 4 - 13
			105	0.48	19	6868									8573	9325	9753	4 - 8 - 17
			140	0.86	25	7782									10137	11244	11884	7 - 13 - 19
6	B1	6	20	0.20	15	2791	0.68	3166	2.73	3310	6.14	3385	1.39	0 - 1 - 3				
			30	0.44	23	3592								4307	4591	4745	1 - 1 - 6	
			40	0.78	30	4233								5261	5704	5948	1 - 3 - 10	
	B2	6	30	0.17	18	4444								5145	5413	5555	1 - 1 - 5	
			45	0.39	27	5730								6965	7478	7759	1 - 3 - 11	
			60	0.69	33	6630								8420	9208	9650	2 - 5 - 16	
	B3	8	60	0.19	15	5904								7016	7439	7668	1 - 3 - 12	
			90	0.43	17	7450								9303	10103	10546	3 - 7 - 18	
			120	0.77	24	8491								11117	12318	13007	5 - 12 - 21	
	B4	8	105	0.20	15	7426								9263	10056	10495	2 - 6 - 17	
			160	0.46	22	8931								11953	13375	14203	6 - 13 - 22	
			215	0.83	29	9876								13927	15972	17204	10 - 18 - 25	
8	B1	8	25	0.16	15	3326	0.90	3867	3.58	4080	8.06	4193	1.83	0 - 1 - 3				
			40	0.41	15	4395								5467	5919	6170	1 - 2 - 7	
			55	0.78	16	5112								6717	7444	7857	1 - 3 - 13	
	B2	8	40	0.16	15	5520								6592	7027	7262	1 - 1 - 6	
			60	0.36	15	6904								8778	9594	10049	1 - 3 - 12	
			80	0.65	19	7826								10483	11713	12420	2 - 6 - 18	
	B3	8	80	0.18	15	7286								8932	9613	9987	2 - 3 - 14	
			120	0.41	20	8855								11632	12888	13603	3 - 8 - 21	
			160	0.72	26	9882								13706	15557	16641	6 - 14 - 24	
	B4	8	145	0.21	16	8970								11846	13154	13900	3 - 7 - 21	
			215	0.45	25	10315								14689	16878	18185	7 - 15 - 25	
			285	0.79	31	11108								16713	19737	21612	12 - 20 - 29	

Note: Reference page U47 for operational conditions used for performance notes

NOTES:

1. All performance data based on test performed in accordance with ASHRAE Standard 200-2015
2. ΔP_s values are measured in inches of water
3. NC values are based on room absorption of 10 dB. A dash (-) indicates an NC value less than 15.
4. Throw values are based on isothermal supply air and represent throw distances to terminal velocities of 150, 100 and 50 fpm respectively
5. ΔP_{Coil} values are measured in feet of water. ΔP_{Coil} values in shaded cells indicate use of a two circuit coil. All other values represent a single circuit coil.
6. Induction ratio is multiplied by the volume flow rate of primary air to estimate the volume flow rate of room air entrained through the coil

Cooling performance:

- Cooling capacity listed (qTOTAL) is the total sensible heat removal by the beam’s integral coil. It does not include any contribution or offset by the primary air.
- Capacity is based on 18°F ΔT between the induced air and the chilled water supply. Table 1 provides correction factors for other temperature differentials.
- Primary air sensible cooling contribution can be calculated by the following equation:

$$q_{SENSPA} = 1.085 \times CFM_{PA} \times (T_{ROOM} - T_{PA})$$

- Primary air latent cooling can be calculated by the following equation:

$$q_{LATENT} = 0.69 \times CFM_{PA} \times (W_{ROOM} - W_{PA})$$

where W_{ROOM} and W_{PA} are the humidity ratio of the room and primary air respectively expressed in Grains of moisture per pound dry air

TABLE 4: CORRECTION FOR (ΔT) BETWEEN ENTERING AIR AND ENTERING CHILLED WATER

Actual ΔT	10	12	14	16	18	20	22	24
Multiply Table Value by:	0.56	0.67	0.78	0.89	1.00	1.11	1.22	1.33

Heating performance:

- Heating capacity listed (qTOTAL) is the sensible heat removal by the beam’s integral coil. It does not include any contribution or offset by the primary air
- Capacity is based on 50°F ΔT between the induced air and the chilled water supply. Table 2 provides correction factors for other temperature differentials.
- Primary air sensible heating offset (or contribution) can be calculated by the following equation:

$$q_{SENSPA} = 1.085 \times CFM_{PA} \times (T_{PA} - T_{ROOM})$$

if the primary air temperature is lower than that of the room, it will offset the coil’s heating

if the primary air temperature is higher than that of the room, it will contribute to the coil’s heating

TABLE 2: CORRECTION FOR (ΔT) BETWEEN ENTERING AIR AND ENTERING CHILLED WATER

Actual ΔT	20	30	40	50	60	70	80	90	100	110	120
Multiply Table Value by:	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40

Legend:

ΔP_s = Unit Inlet Pressure [in wg]

q_{SENSPA} = Sensible Capacity, Primary Air [Btu/h]

T_{ROOM} = Temperature Room Air [°F]

qCoil = Sensible Capacity, Coil [Btu/h]

CFM_{PA} = Air Flowrate, Primary Air [CFM]

q_{SENSPA} = Latent Capacity, Primary Air [Btu/h]

$\Delta Coil$ = Water coil pressure drop [ft wg]

T_{PA} = Temperature Primary Air [°F]

