

INTRODUCTION

This unit provides comfortable and effective sensible cooling to the space, featuring an optimized nozzle design that delivers high capacity while maintaining low noise levels. It is ideal for single-room hospitality environments and offers quick, simple installation. The system is available in nominal lengths up to 6 feet and includes 1/2" sweat or 1/2" MPT coil connections for flexible integration.

MODEL

BAB - Bulkhead Mounted Recessed Active Chilled Beam

FEATURES

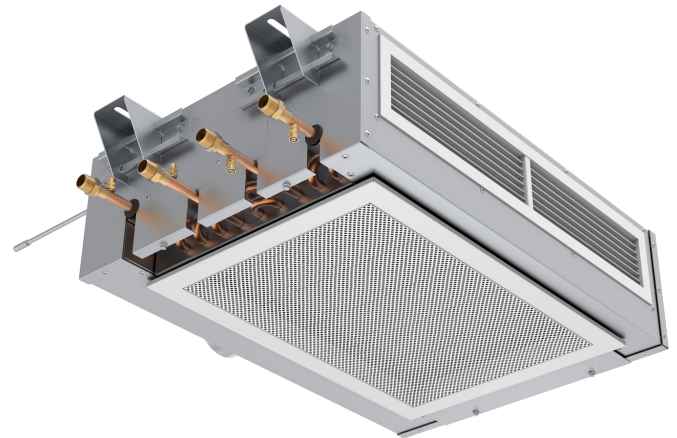
- 2' to 6' lengths
- Left hand or right hand coil connections
- Rear air inlet location
- Louvered supply grille
- Perforated return grille
- 2-pipe and 4-pipe coil configurations
- Configured nozzle geometry for capacity optimization
- Commissioning port with roomside access for balancing
- Mounting brackets with adjustments in two directions
- 1/2" Sweat water coil connections
- Coil air vent

OPTIONS

- Internal closed cell foam insulation
- Coil drain valve
- 1/2" or 3/4" MPT water coil connections
- 12", 18" or 24" stainless steel braided hoses
- Coil lint screen
- Constant volume regulator

ADVANTAGES

- Removal of high thermal loads is possible in this air/water system
- The height of the air duct system is reduced to a minimum, due to the low supply of primary air
- Substantial reduction in operating costs, due to low primary air volume
- Improvement of thermal comfort inside the room
- Contributing sound levels below NC-30



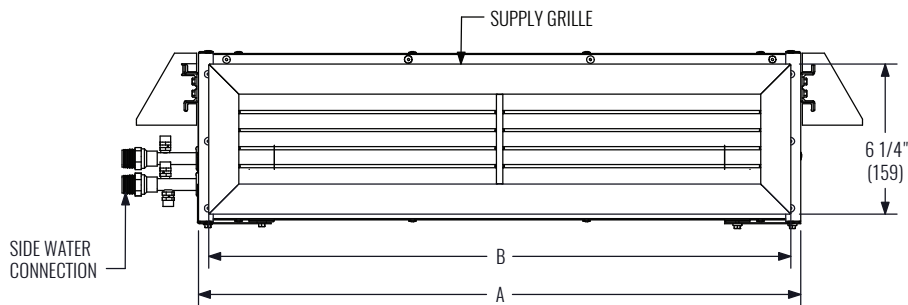
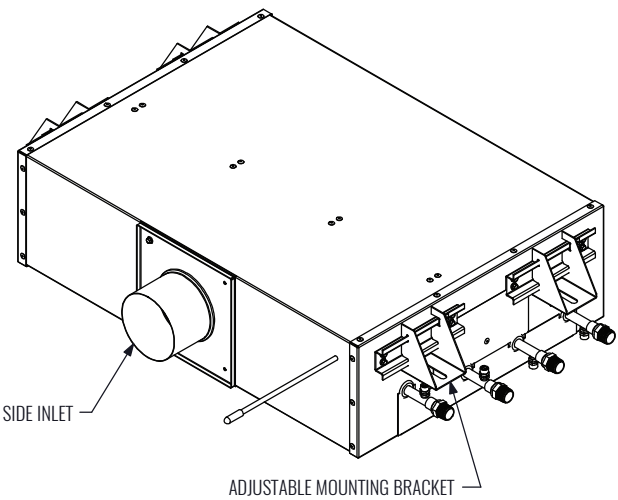
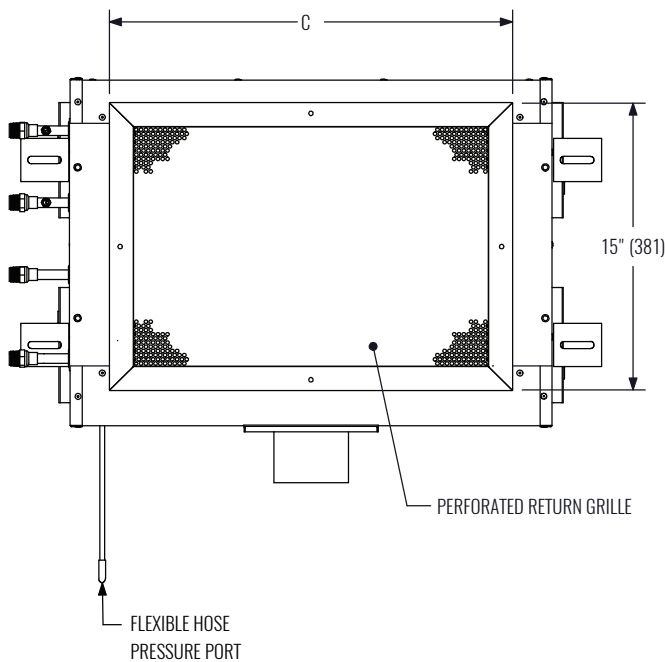
APPLICATION

Krueger active chilled beams benefit from the use of using hydronic coils and induced air to reduce energy consumption associated with removal of sensible thermal loads. The primary air is supplied to the chilled beam subsequent to it being discharged through a series of nozzles located along the length of the beam. The nozzles inject the primary air into the mixing chamber at velocities capable of inducing plenum or soffit air through the water coil, where it mixes with the primary supply air. This mixture of air is then discharged into the space through bar grilles. This provides high cooling outputs with low amounts of primary air. The reduced volume of air results in the reduction of the air handler capacity and size, smaller duct sizes, and the overall energy consumption.

The supplied air from the air handling unit is tempered and dehumidified to handle the latent load. The remaining loads in the space are addressed with the heat exchanger which is incorporated into the chilled beam. Applications with low latent cooling loads could use 100% outdoor air allowing for use of a dedicated outdoor air system with energy recovery, further reducing total system energy consumption.

The BAB bulkhead beams are the ideal solution for single room hospitality spaces, such as hotel, dorm, and hospital rooms. With their shallow height, ceiling heights can be maximized creating an open and inviting space. Bulkhead chilled beams are great for use in retrofit of buildings which were not originally built with HVAC systems installed.

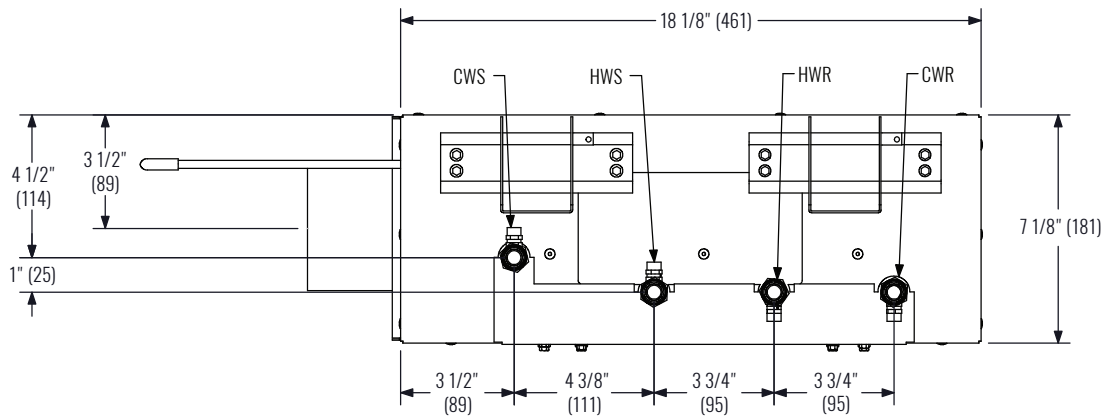
DIMENSIONAL DATA



NOMINAL LENGTH	A	B	C
2 ft	25 1/8" (638)	24 1/4" (616)	21" (534)
3 ft	37 1/8" (943)	36 1/4" (921)	33" (838)
4 ft	49 1/8" (1248)	48 1/4" (1226)	45" (1143)
5 ft	61 1/8" (1553)	60 1/4" (1531)	57" (1448)
6 ft	73 1/8" (1858)	72 1/4" (1835)	69" (1753)

NOTES: Screw holes on grilles not shown. Krueger's AF80 supply and S80P return shown, other options available. Dimensions in parentheses are in millimeters.

PIPING & HANDING

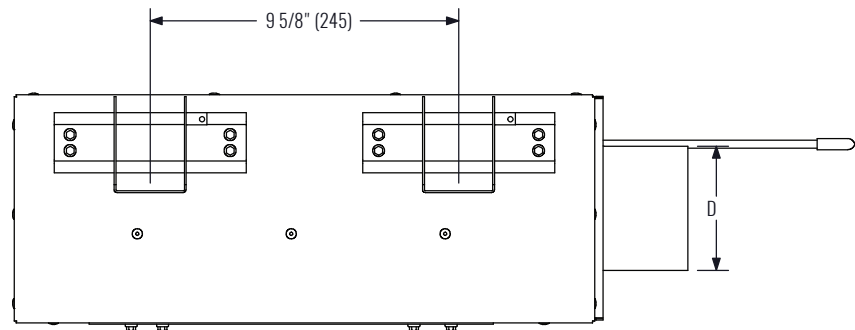


4 PIPE, RIGHT HAND, 2 FT LENGTH SHOWN

INLET	D
4" ROUND	3 7/8" (99)
5" ROUND	4 7/8" (124)
6" OVAL	5 1/4" (134) x 6 1/4" (159)
8" OVAL	5 1/4" (134) x 9 3/8" (238)

NOTE: Dimensions in parentheses are in millimeters.

CWS - Cold Water Supply
CWR - Cold Water Return
HWS - Hot Water Supply
HWR - Hot Water Return



PERFORMANCE DATA | 4-PIPE COOLING

NOMINAL LENGTH ft	NOZZLE SIZE	PRIMARY AIR			SOUND	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			
		in	CFM	(in H ₂ O)		NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL		
3	M17	4	8	0.21	15	560	0.70	609	2.90	621	6.60	627	1.50	6.0	1 - 2 - 8
			11	0.39	15	733		837		858		869			2 - 4 - 12
			14	0.63	20	889		1023		1057		1073			3 - 6 - 16
			17	0.93	26	1090		1244		1293		1317			4 - 9 - 18
	M23	4	15	0.20	15	965		1102		1131		1146		4.5	2 - 4 - 13
			20	0.36	15	1217		1403		1452		1475			4 - 8 - 17
			25	0.56	19	1584		1792		1868		1906			6 - 11 - 19
			30	0.81	25	1860		2131		2237		2292			8 - 13 - 21
	M31	4	30	0.23	15	1324		1522		1571		1594		2.7	4 - 8 - 17
			40	0.40	17	1791		2033		2117		2159			6 - 12 - 20
			50	0.63	24	2207		2529		2655		2720			10 - 15 - 22
			60	0.91	29	2492		2916		3085		3173			12 - 17 - 24
4	M17	4	11	0.20	15	741	1.00	819	3.80	840	8.60	851	1.90	6.0	1 - 2 - 10
			15	0.38	15	954		1113		1150		1169			2 - 5 - 15
			19	0.61	21	1176		1349		1405		1434			3 - 7 - 19
			23	0.89	27	1403		1611		1691		1732			5 - 11 - 21
	M23	4	21	0.21	15	1287		1500		1552		1579		4.5	2 - 6 - 16
			28	0.37	15	1665		1894		1981		2024			4 - 10 - 20
			35	0.58	21	2060		2401		2535		2604			7 - 13 - 23
			42	0.84	27	2379		2838		3024		3121			10 - 16 - 25
	M31	4	35	0.18	15	1528		1780		1842		1873		2.7	3 - 7 - 18
			50	0.36	15	2109		2414		2532		2592			6 - 13 - 22
			65	0.59	18	2671		3156		3350		3450			11 - 17 - 25
			80	0.90	25	3070		3730		4004		4147			14 - 20 - 28
5	M17	4	15	0.23	15	960	1.20	1093	4.70	1131	1.30	1150	2.40	6.0	1 - 3 - 13
			20	0.41	16	1205		1440		1502		1533			3 - 6 - 17
			25	0.65	23	1455		1713		1805		1852			4 - 9 - 22
			30	0.93	28	1709		2029		2157		2223			6 - 13 - 24
	M23	4	25	0.18	15	1252		1487		1548		1579		4.5	2 - 6 - 17
			35	0.36	15	1661		1950		2059		2115			5 - 11 - 23
			45	0.59	23	2082		2512		2686		2777			8 - 15 - 26
			55	0.87	24	2349		2996		3243		3374			12 - 19 - 28
	M31	6 *	40	0.14	15	1413		1666		1732		1766		2.7	3 - 6 - 18
			60	0.32	15	1984		2325		2457		2525			6 - 14 - 24
			80	0.57	15	2549		3115		3343		3462			11 - 18 - 28
			100	0.89	21	2850		3700		4027		4226			15 - 22 - 31
6	M17	4	20	0.28	15	1204	1.40	1423	5.50	1486	1.60	1518	2.80	6.0	2 - 4 - 16
			25	0.44	18	1429		1744		1837		1884			3 - 7 - 20
			30	0.63	23	1654		2001		2127		2193			4 - 10 - 24
			35	0.86	28	1879		2281		2446		2531			6 - 13 - 26
	M23	4	35	0.25	15	1921		2338		2469		2536		4.5	4 - 8 - 22
			45	0.41	17	2356		2843		3040		3143			6 - 14 - 26
			55	0.61	23	2797		3485		3774		3926			9 - 17 - 28
			65	0.83	23	3071		4019		4402		4607			13 - 20 - 31
	M31	6 *	60	0.22	15	2331		2834		2997		3080		2.7	5 - 11 - 24
			80	0.40	15	2953		3602		3869		4008			9 - 17 - 28
			100	0.62	15	3511		4471		4870		5081			13 - 21 - 31
			120	0.90	21	3814		5132		5664		5971			17 - 24 - 34

NOTES: Reference page C3-80 for operational conditions used for performance notes.

PERFORMANCE DATA | 4-PIPE HEATING

NOMINAL LENGTH ft	NOZZLE SIZE	Primary Air			SOUND	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			
		in	CFM	(in H ₂ O)		NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL		
3	M17	4	8	0.21	15	1245	0.12	1354	0.49	1381	1.10	1394	1.95	6.0	1 - 2 - 8
			11	0.39	15	1629		1860		1908		1932			2 - 4 - 12
			14	0.63	20	1975		2273		2348		2384			3 - 6 - 16
			17	0.93	26	2423		2764		2873		2926			4 - 9 - 18
	M23	4	15	0.20	15	2144		2450		2514		2547		4.5	2 - 4 - 13
			20	0.36	15	2704		3117		3226		3278			4 - 8 - 17
			25	0.56	19	3519		3981		4151		4236			6 - 11 - 19
			30	0.81	25	4133		4737		4972		5093			8 - 13 - 21
	M31	4	30	0.23	15	2943		3383		3490		3543		2.7	4 - 8 - 17
			40	0.40	17	3980		4517		4704		4797			6 - 12 - 20
			50	0.63	24	4904		5621		5900		6044			10 - 15 - 22
			60	0.91	29	5538		6479		6856		7052			12 - 17 - 24
4	M17	4	11	0.20	15	1648	0.16	1820	0.63	1868	1.41	1891	2.51	6.0	1 - 2 - 10
			15	0.38	15	2121		2474		2556		2597			2 - 5 - 15
			19	0.61	21	2614		2997		3123		3187			3 - 7 - 19
			23	0.89	27	3119		3580		3759		3850			5 - 11 - 21
	M23	4	21	0.21	15	2861		3333		3449		3508		4.5	2 - 6 - 16
			28	0.37	15	3700		4210		4401		4498			4 - 10 - 20
			35	0.58	21	4577		5335		5634		5787			7 - 13 - 23
			42	0.84	27	5286		6307		6720		6935			10 - 16 - 25
	M31	4	35	0.18	15	3395		3955		4093		4163		2.7	3 - 7 - 18
			50	0.36	15	4686		5365		5627		5760			6 - 13 - 22
			65	0.59	18	5936		7014		7445		7668			11 - 17 - 25
			80	0.90	25	6822		8290		8897		9216			14 - 20 - 28
5	M17	4	15	0.23	15	2134	0.19	2430	0.78	2514	1.75	2556	3.11	6.0	1 - 3 - 13
			20	0.41	16	2679		3199		3337		3407			3 - 6 - 17
			25	0.65	23	3234		3807		4011		4115			4 - 9 - 22
			30	0.93	28	3797		4509		4793		4940			6 - 13 - 24
	M23	4	25	0.18	15	2783		3306		3440		3509		4.5	2 - 6 - 17
			35	0.36	15	3692		4334		4575		4699			5 - 11 - 23
			45	0.59	23	4626		5581		5969		6171			8 - 15 - 26
			55	0.87	24	5220		6659		7208		7497			12 - 19 - 28
	M31	4	40	0.14	15	3139		3702		3849		3924		2.7	3 - 6 - 18
			60	0.32	15	4409		5167		5461		5612			6 - 14 - 24
			80	0.57	15	5664		6922		7428		7693			11 - 18 - 28
			100	0.89	21	6334		8222		8949		9391			15 - 22 - 31
6	M17	4	20	0.28	15	2676	0.23	3162	0.92	3303	2.06	3374	3.67	6.0	2 - 4 - 16
			25	0.44	18	3176		3875		4081		4186			3 - 7 - 20
			30	0.63	23	3675		4447		4727		4872			4 - 10 - 24
			35	0.86	28	4175		5070		5435		5625			6 - 13 - 26
	M23	4	35	0.25	15	4268		5196		5486		5635		4.5	4 - 8 - 22
			45	0.41	17	5236		6318		6756		6984			6 - 14 - 26
			55	0.61	23	6215		7745		8388		8725			9 - 17 - 28
			65	0.83	23	6825		8930		9783		10238			13 - 20 - 31
	M31	4	60	0.22	15	5180		6297		6659		6845		2.7	5 - 11 - 24
			80	0.40	15	6562		8005		8598		8907			9 - 17 - 28
			100	0.62	15	7802		9937		10823		11291			13 - 21 - 31
			120	0.90	21	8476		11405		12586		13269			17 - 24 - 34

NOTES: Reference page C3-80 for operational conditions used for performance notes.

PERFORMANCE DATA | 2-PIPE COOLING

NOMINAL LENGTH ft	NOZZLE SIZE	PRIMARY AIR			SOUND	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							
		in	CFM	(in H ₂ O)		NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL			ΔP COIL			
3	M17	4	8	0.21	15	598	0.90	650	3.70	663	8.30	669	1.90	6.0	1 - 2 - 8				
			11	0.39	15	782		893		916		927			2 - 4 - 12				
			14	0.63	20	948		1091		1127		1144			3 - 6 - 16				
			17	0.93	26	1163		1327		1379		1405			4 - 9 - 18				
	M23	4	15	0.20	15	1029		1176		1207		1222		4.5	1574	2033	2445	4.5	2 - 4 - 13
			20	0.36	15	1298		1496		1548		1574			4 - 8 - 17				
			25	0.56	19	1689		1911		1992		2033			6 - 11 - 19				
			30	0.81	25	1984		2274		2386		2445			8 - 13 - 21				
	M31	4	30	0.23	15	1413		1624		1675		1701		2.7	1701	2303	2901	2.7	4 - 8 - 17
			40	0.40	17	1910		2168		2258		2303			6 - 12 - 20				
			50	0.63	24	2354		2698		2832		2901			10 - 15 - 22				
			60	0.91	29	2658		3110		3291		3385			12 - 17 - 24				
4	M17	4	11	0.20	15	791	1.20	874	4.80	896	1.40	907	2.40	6.0	1 - 2 - 10				
			15	0.38	15	1018		1187		1227		1247			2 - 5 - 15				
			19	0.61	21	1255		1439		1499		1530			3 - 7 - 19				
			23	0.89	27	1497		1718		1804		1848			5 - 11 - 21				
	M23	4	21	0.21	15	1373		1600		1656		1684		4.5	1684	2159	2778	4.5	2 - 6 - 16
			28	0.37	15	1776		2021		2113		2159			4 - 10 - 20				
			35	0.58	21	2197		2561		2704		2778			7 - 13 - 23				
			42	0.84	27	2538		3027		3226		3329			10 - 16 - 25				
	M31	4	35	0.18	15	1629		1899		1965		1998		2.7	1998	2765	3680	2.7	3 - 7 - 18
			50	0.36	15	2249		2575		2701		2765			6 - 13 - 22				
			65	0.59	18	2849		3367		3573		3680			11 - 17 - 25				
			80	0.90	25	3275		3979		4270		4424			14 - 20 - 28				
5	M17	4	15	0.23	15	1025	1.50	1166	5.80	1206	1.70	1227	3.00	6.0	1 - 3 - 13				
			20	0.41	16	1286		1536		1602		1635			3 - 6 - 17				
			25	0.65	23	1552		1827		1925		1975			4 - 9 - 22				
			30	0.93	28	1823		2164		2301		2371			6 - 13 - 24				
	M23	4	25	0.18	15	1336		1587		1651		1684		4.5	1684	2256	2962	4.5	2 - 6 - 17
			35	0.36	15	1772		2080		2196		2256			5 - 11 - 23				
			45	0.59	23	2220		2679		2865		2962			8 - 15 - 26				
			55	0.87	24	2506		3196		3460		3599			12 - 19 - 28				
	M31	6 *	40	0.14	15	1507		1777		1847		1883		2.7	1883	2694	3693	2.7	3 - 6 - 18
			60	0.32	15	2116		2480		2621		2694			6 - 14 - 24				
			80	0.57	15	2719		3322		3566		3693			11 - 18 - 28				
			100	0.89	21	3040		3946		4296		4508			15 - 22 - 31				
6	M17	4	20	0.28	15	1285	1.70	1518	6.90	1585	2.00	1620	3.50	6.0	2 - 4 - 16				
			25	0.44	18	1525		1860		1959		2009			3 - 7 - 20				
			30	0.63	23	1764		2134		2269		2339			4 - 10 - 24				
			35	0.86	28	2004		2433		2609		2700			6 - 13 - 26				
	M23	4	35	0.25	15	2049		2494		2633		2705		4.5	2705	3352	4188	4.5	4 - 8 - 22
			45	0.41	17	2513		3033		3243		3352			6 - 14 - 26				
			55	0.61	23	2983		3718		4026		4188			9 - 17 - 28				
			65	0.83	23	3276		4286		4696		4914			13 - 20 - 31				
	M31	6 *	60	0.22	15	2486		3023		3196		3285		2.7	3285	4275	5420	2.7	5 - 11 - 24
			80	0.40	15	3150		3842		4127		4275			9 - 17 - 28				
			100	0.62	15	3745		4770		5195		5420			13 - 21 - 31				
			120	0.90	21	4069		5475		6041		6369			17 - 24 - 34				

NOTES: Reference page C3-80 for operational conditions used for performance notes.

PERFORMANCE DATA | 2-PIPE HEATING

NOMINAL LENGTH ft	NOZZLE SIZE	PRIMARY AIR			SOUND	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			
		in	CFM	(in H ₂ O)		TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL		
3	M17	4	8	0.21	15	1660	0.92		1805		1841		1859	6.0	1 - 2 - 8
			11	0.39	15	2172			2480		2544		2576		2 - 4 - 12
			14	0.63	20	2634			3031		3131		3179		3 - 6 - 16
			17	0.93	26	3230			3685		3830		3902		4 - 9 - 18
	M23	4	15	0.20	15	2859			3267		3352		3396	4.5	2 - 4 - 13
			20	0.36	15	3605			4157		4301		4371		4 - 8 - 17
			25	0.56	19	4692			5309		5534		5648		6 - 11 - 19
			30	0.81	25	5510			6315		6629		6791		8 - 13 - 21
	M31	4	30	0.23	15	3924			4510		4654		4724	2.7	4 - 8 - 17
			40	0.40	17	5306			6023		6272		6396		6 - 12 - 20
			50	0.63	24	6539			7494		7866		8059		10 - 15 - 22
			60	0.91	29	7384			8639		9142		9403		12 - 17 - 24
4	M17	4	11	0.20	15	2197	1.19		2427		2490		2521	6.0	1 - 2 - 10
			15	0.38	15	2827			3298		3408		3463		2 - 5 - 15
			19	0.61	21	3485			3996		4164		4249		3 - 7 - 19
			23	0.89	27	4158			4774		5012		5133		5 - 11 - 21
	M23	4	21	0.21	15	3814			4444		4599		4678	4.5	2 - 6 - 16
			28	0.37	15	4933			5613		5868		5998		4 - 10 - 20
			35	0.58	21	6103			7114		7512		7716		7 - 13 - 23
			42	0.84	27	7049			8409		8960		9247		10 - 16 - 25
	M31	4	35	0.18	15	4526			5274		5458		5551	2.7	3 - 7 - 18
			50	0.36	15	6248			7153		7502		7680		6 - 13 - 22
			65	0.59	18	7915			9352		9926		10224		11 - 17 - 25
			80	0.90	25	9096			11053		11862		12288		14 - 20 - 28
5	M17	4	15	0.23	15	2846	1.46		3240		3351		3408	6.0	1 - 3 - 13
			20	0.41	16	3572			4266		4449		4543		3 - 6 - 17
			25	0.65	23	4311			5076		5348		5487		4 - 9 - 22
			30	0.93	28	5063			6012		6390		6586		6 - 13 - 24
	M23	4	25	0.18	15	3710			4407		4587		4679	4.5	2 - 6 - 17
			35	0.36	15	4923			5779		6101		6266		5 - 11 - 23
			45	0.59	23	6168			7442		7959		8228		8 - 15 - 26
			55	0.87	24	6960			8878		9610		9996		12 - 19 - 28
	M31	4	40	0.14	15	4185			4936		5132		5232	2.7	3 - 6 - 18
			60	0.32	15	5878			6890		7281		7482		6 - 14 - 24
			80	0.57	15	7552			9229		9904		10257		11 - 18 - 28
			100	0.89	21	8446			10962		11932		12522		15 - 22 - 31
6	M17	4	20	0.28	15	3568	1.72		4215		4404		4499	6.0	2 - 4 - 16
			25	0.44	18	4235			5167		5442		5581		3 - 7 - 20
			30	0.63	23	4900			5929		6303		6496		4 - 10 - 24
			35	0.86	28	5567			6760		7247		7500		6 - 13 - 26
	M23	4	35	0.25	15	5691			6928		7315		7513	4.5	4 - 8 - 22
			45	0.41	17	6981			8424		9008		9312		6 - 14 - 26
			55	0.61	23	8286			10326		11184		11633		9 - 17 - 28
			65	0.83	23	9100			11907		13044		13650		13 - 20 - 31
	M31	4	60	0.22	15	6906			8396		8879		9126	2.7	5 - 11 - 24
			80	0.40	15	8749			10674		11464		11876		9 - 17 - 28
			100	0.62	15	10403			13249		14431		15055		13 - 21 - 31
			120	0.90	21	11302			15207		16781		17692		17 - 24 - 34

NOTES: Reference page C3-80 for operational conditions used for performance notes.

PERFORMANCE DATA

NOTES:

1. All performance data based on tests performed in accordance with ASHRAE Standard 200-2018.
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 at terminal velocities of 150, 100 and 50 fpm, respectively.
5. ΔP_{Coil} values are measured in inches 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.
7. * denotes oval inlet air connection.

COOLING PERFORMANCE:

- Cooling capacity listed (TOTAL) 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 (TOTAL) is the sensible heat added 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_{Coil} = Sensible Capacity, Coil [Btu/h]

ΔP_{Coil} = Water coil pressure drop [ft wg]

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

W_{ROOM} = Humidity Ratio of the Room

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

T_{PA} = Temperature Primary Air [°F]

T_{ROOM} = Temperature Room Air [°F]

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

W_{PA} = Humidity Ratio of the Primary Air

ENGINEERING SPECIFICATION & CONFIGURATION

Furnish and install active chilled beams in the sizes, configurations and capacities indicated on the project schedules and plans. Unit shall be comprised of a primary air connection, a pressurized inlet plenum feeding a series of room air induction nozzles, and an associated heat transfer coil contained in a single unit housing. A hinged perforated room air induction grille shall be provided for easy access to the unit heat transfer coil.

UNIT CASING

The unit casing shall be constructed from a minimum 20-gauge galvanized sheet steel. Units shall have a maximum casing height of 9 7/8".

FACE

The face of the beam shall consist of a perforated room air induction section of 51% free area flanked by louvered grilles. The face section shall include hinged fastening that allows the face to be swung opened for coil cleaning.

FINISH

The entire visible face sections and all visible internal surfaces shall be finished in white powder coat paint or as specified by the architect (OPTIONAL). Concealed surfaces shall be G90 galvanized steel.

PRIMARY AIR INLETS

Manufacturer shall provide round or oval inlet collars of diameter(s) as indicated on the project plans and schedules and suitable for connection to common flexible or rigid ductwork sizes. The inlet collar shall be roll-formed to facilitate the connection of flexible or rigid ductwork. Inlet location is on the side, as indicated on the project plans and schedules. Nozzles shall be of a fixed size, selected with respect to cooling and heating requirements, and constructed of formed sheet metal.

PRIMARY AIR PLENUM PRESSURE TAP

A plenum air pressure tap shall be mounted within the pressurized plenum for measuring the pressure differential between the primary air plenum and the room. The pressure tap manometer connection port shall be fitted to the end of a plastic tube accessible from the diffuser face. Airflow calibration charts that relate the pressure differential reading with the primary airflow rates, shall be furnished with the IOM's.

MOUNTING RAILS

Factory installed mounting rails shall incorporate slotted holes for hanging using threaded rods.

HYDRONIC HEAT TRANSFER COIL

Integral heat transfer coils shall be provided with connections for either 2 or 4 pipe water connections as indicated on plans and schedules. Four pipe configurations shall require separate supply and return connections for chilled and hotwater. The coil shall be mounted horizontally and shall be manufactured with seamless copper tubing (1/2" or 3/4"

outside diameter as indicated on the plans and schedules) with minimum .016" wall thickness mechanically fixed to aluminum fins. The aluminum fins shall be limited to no more than ten (10) fins per inch. The coil shall have a working pressure of at least 360 PSI, and be factory tested for leakage at a minimum pressure of 500 PSI.

Each chilled beam shall be provided with factory integrated manual air vents.

COILS

- **(Optional)** Coil shall be provided with factory integrated drain fittings. Unless otherwise specified, coil connections shall be bare copper for field sweating to the water supply circuit(s).
- **(Optional)** The chilled water coil shall be provided with NPT male threaded fittings. These fittings must be suitable for field connection to a similar NPT female flexible hose spigot and shall be at least 1 1/2" long to facilitate field connection (by others).

Connections shall face upwards to avoid issues with coordination of ceiling installation. The coil shall be rated and certified in accordance with AHRI Standard 410.

PACKAGING

Beams shall be delivered to site clean with hydronic coils flushed and fitted with protective caps. Protective film shall be applied to the entire beam face to prevent ingress of dirt. Units shall be shipped to site in cartons and labeled with identification tagging.

THE MANUFACTURER SHALL PROVIDE THE FOLLOWING ACCESSORIES

- **(Optional) Water Connection Hoses:** Manufacturer shall provide 1/2" or 3/4" dia. x (12"), (18") or (24") long stainless-steel braided hoses with female swivel connections. Hoses shall be constructed with a KEVLAR® reinforced EPDM core with stainless steel ferrules. Hoses shall be tested for working pressures up to 400 PSIG (at max. operating temperature of 248°F) with a burst pressure of 1600 PSIG.
- **(Optional) Airflow Regulators:** Manufacturer shall supply UL94 V-0 rated ABS polymer and UL2043 listed constant volume regulators (BFR's). BFR's shall be designed to fit inside rigid round ductwork and located at a minimum distance of three duct diameters upstream of the active chilled beam primary air inlet.

ENGINEERING SPECIFICATION & CONFIGURATION

- | | |
|---|---|
| <p>1. SERIES: (XXX)
BAB - Bulkhead Mounted, Recessed Active Chilled Beam</p> <p>2. BEAM LENGTH: (X)
2 - 2 ft
3 - 3 ft
4 - 4 ft
5 - 5 ft
6 - 6 ft</p> <p>3. AIR PATTERN-NOZZLE TYPE: (XXX)
M13 - M13
M17 - M17
M23 - M23
M31 - M31</p> <p>4. THROW PATTERN: (X)
0 - None
L1 - Louvered Grille</p> <p>5. COIL TYPE: (XXXX)
2P1C - 2 Pipe Coil - 1 Circuit
2P2C - 2 Pipe Coil - 2 Circuit
4P1C - 4 Pipe Coil - 1 Circuit
4P2C - 4 Pipe Coil - 2 Circuit</p> <p>6. COIL ACC1: (X)
M - Manual Air Vent</p> | <p>7. COIL ACC2: (X)
0 - None
D - Drain Pan</p> <p>8. WATER CONNECTION: (X)
L - Left Handing
R - Right Handing</p> <p>9. PIPING TYPE: (XXX)
3PT - 3/4" Male Pipe Thread
SWT - Sweat
MPT - 1/2" Male Pipe Thread</p> <p>10. INLET SIZE: (X)
4 - 4" Round
5 - 5" Round
6 - 6" Round
8 - 8" Oval</p> <p>11. RETURN GRILLE TYPE: (X)
0 - None
CP - Circular Perforated Face</p> <p>12. INSULATION: (X)
0 - None
I - Internal Closed Foam Insulation</p> <p>13. ACCESSORY 1: (XX)
00 - None</p> |
|---|---|

SAMPLE CONFIGURATION: BAB - 24 - 4 - M13 - 2 - 2P1C - L - M - 0 - SWT - 6 - CP - 0 - 0