

PERFORMANCE DATA | 4-PIPE COOLING

NOMINAL SIZE L x W ft	NOZZLE SIZE	PRIMARY AIR			SOUND	COIL SENSIBLE COOLING (Btu/h)								INDUCTION RATIO	THROW
		INLET DIA.	FLOW RATE	INLET ΔPs		0.5 GPM		1.0 GPM		1.5 GPM		1.7 GPM			
		in	CFM	(in H ₂ O)	NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL		
2 x 2	M13	4	11	0.13	15	521	0.50		590		606		619	3.1	0 - 0 - 2
			16	0.28	15	686			785		808		815		0 - 1 - 3
			21	0.49	15	869			1042		1072		1102		1 - 1 - 6
	M17	4	18	0.18	15	626			711		731		738	2.5	0 - 1 - 3
			24	0.33	15	793			934		962		982		1 - 1 - 5
			30	0.51	18	936			1096		1138		1160		1 - 2 - 8
	M23	5	30	0.19	19	813			940		968		981	1.9	1 - 1 - 5
			45	0.44	24	1106			1273		1329		1347		1 - 3 - 9
			60	0.77	28	1314			1505		1588		1581		2 - 5 - 12
	M31	6	55	0.17	16	1046			1239		1281		1311	1.5	1 - 3 - 9
			85	0.4	22	1358			1554		1639		1637		3 - 6 - 13
			115	0.73	26	1511			1689		1787		1791		5 - 9 - 16
4 x 2	M13	4	18	0.15	15	851	1.00		923		951		956	3.5	0 - 1 - 3
			27	0.33	15	1228			1368		1446		1487		1 - 2 - 6
			36	0.59	18	1497			1708		1804		1844		1 - 3 - 11
			25	0.14	15	916			999		1032		1038		0 - 1 - 4
	M17	5	40	0.36	18	1366			1543		1633		1675	3.0	1 - 2 - 10
			55	0.68	23	1645			1907		2033		2061		2 - 5 - 14
			50	0.22	23	1439			1609		1705		1756		1 - 2 - 9
	M23	6	75	0.49	28	1836			2123		2261		2294	2.6	2 - 5 - 15
			95	0.79	31	2158			2625		2814		2896		4 - 9 - 19
			90	0.18	20	1741			1991		2105		2149		2 - 5 - 14
	M31	8	135	0.41	25	2247			2749		2949		3040	1.8	5 - 11 - 20
			180	0.73	29	2611			3166		3481		3562		9 - 14 - 23

NOTES: Reference page C3-50 for operational conditions used for performance notes.

PERFORMANCE DATA | 4-PIPE HEATING

NOMINAL SIZE L x W ft	NOZZLE SIZE	PRIMARY AIR			SOUND	COIL HEATING (Btu/h)								INDUCTION RATIO	THROW
		INLET DIA.	FLOW RATE	INLET ΔPs		0.5 GPM		1.0 GPM		1.5 GPM		1.7 GPM			
		in	CFM	(in H ₂ O)	NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL		
2 x 2	M13	4	11	0.13	15	858	0.10	971	0.30	998	0.70	1019	1.00	3.1	0 - 0 - 2
			16	0.28	15	1130		1293		1331		1343			0 - 1 - 3
			21	0.49	15	1432		1716		1766		1815			1 - 1 - 6
	M17	4	18	0.18	15	1031		1171		1204		1216		2.5	0 - 1 - 3
			24	0.33	15	1306		1538		1584		1617			1 - 1 - 5
			30	0.51	18	1542		1805		1874		1911			1 - 2 - 8
	M23	5	30	0.19	19	1339		1548		1594		1615		1.9	1 - 1 - 5
			45	0.44	24	1821		2096		2189		2219			1 - 3 - 9
			60	0.77	28	2164		2478		2615		2604			2 - 5 - 12
	M31	6	55	0.17	16	1722		2040		2109		2160		1.5	1 - 3 - 9
			85	0.4	22	2237		2560		2700		2697			3 - 6 - 13
			115	0.73	26	2488		2782		2943		2949			5 - 9 - 16
4 x 2	M13	4	18	0.15	15	1402	0.20	1519	0.70	1566	1.50	1575	2.00	3.5	0 - 1 - 3
			27	0.33	15	2022		2253		2382		2448			1 - 2 - 6
			36	0.59	18	2465		2813		2971		3037			1 - 3 - 11
	M17	5	25	0.14	15	1509		1645		1699		1710		3.0	0 - 1 - 4
			40	0.36	18	2249		2541		2689		2758			1 - 2 - 10
			55	0.68	23	2710		3141		3349		3394			2 - 5 - 14
	M23	6	50	0.22	23	2369		2649		2808		2892		2.6	1 - 2 - 9
			75	0.49	28	3023		3497		3724		3778			2 - 5 - 15
			95	0.79	31	3554		4323		4635		4769			4 - 9 - 19
	M31	8	90	0.18	20	2867		3278		3466		3539		1.8	2 - 5 - 14
			135	0.41	25	3700		4527		4857		5007			5 - 11 - 20
			180	0.73	29	4300		5213		5732		5866			9 - 14 - 23

NOTES: Reference page C3-50 for operational conditions used for performance notes.

PERFORMANCE DATA | 2-PIPE COOLING

NOMINAL SIZE L x W ft	NOZZLE SIZE	PRIMARY AIR			SOUND	COIL SENSIBLE COOLING (Btu/h)								INDUCTION RATIO	THROW
		INLET DIA.	FLOW RATE	INLET ΔPs		0.5 GPM		1.0 GPM		1.5 GPM		1.7 GPM			
		in	CFM	(in H ₂ O)	NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL		
2 x 2	M13	4	11	0.13	15	556	0.60	629	2.40	646	5.40	660	6.90	3.1	0 - 0 - 2
			16	0.28	15	732		837		862		870			0 - 1 - 3
			21	0.49	15	927		1111		1144		1176			1 - 1 - 6
	M17	4	18	0.18	15	668		759		780		788		2.5	0 - 1 - 3
			24	0.33	15	846		996		1026		1047			1 - 1 - 5
			30	0.51	18	999		1169		1214		1238			1 - 2 - 8
	M23	5	30	0.19	19	868		1003		1033		1046		1.9	1 - 1 - 5
			45	0.44	24	1179		1357		1418		1437			1 - 3 - 9
			60	0.77	28	1402		1605		1694		1687			2 - 5 - 12
	M31	6	55	0.17	16	1115		1321		1366		1399		1.5	1 - 3 - 9
			85	0.4	22	1449		1658		1749		1747			3 - 6 - 13
			115	0.73	26	1611		1802		1906		1910			5 - 9 - 16
4 x 2	M13	4	18	0.15	15	908	1.20	984	4.80	1014	10.70	1020	13.70	3.5	0 - 1 - 3
			27	0.33	15	1309		1459		1543		1586			1 - 2 - 6
			36	0.59	18	1596		1822		1925		1967			1 - 3 - 11
	M17	5	25	0.14	15	977		1065		1101		1107		3.0	0 - 1 - 4
			40	0.36	18	1457		1646		1741		1786			1 - 2 - 10
			55	0.68	23	1755		2034		2169		2198			2 - 5 - 14
	M23	6	50	0.22	23	1535		1716		1819		1873		2.6	1 - 2 - 9
			75	0.49	28	1958		2265		2412		2447			2 - 5 - 15
			95	0.79	31	2302		2800		3002		3089			4 - 9 - 19
	M31	8	90	0.18	20	1857		2123		2245		2292		1.8	2 - 5 - 14
			135	0.41	25	2397		2932		3146		3243			5 - 11 - 20
			180	0.73	29	2785		3377		3713		3799			9 - 14 - 23

NOTES: Reference page C3-50 for operational conditions used for performance notes.

PERFORMANCE DATA | 2-PIPE HEATING

NOMINAL SIZE, L x W ft	NOZZLE SIZE	PRIMARY AIR			SOUND	COIL HEATING (Btu/h)								INDUCTION RATIO	THROW
		INLET DIA.	FLOW RATE	INLET ΔPs		0.5 GPM		1.0 GPM		1.5 GPM		1.7 GPM			
		in	CFM	(in H ₂ O)	NC	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL	TOTAL	ΔP COIL		
2 x 2	M13	4	11	0.13	15	1489	0.60	1685	2.40	1732	5.40	1769	6.90	3.1	0 - 0 - 2
			16	0.28	15	1962		2244		2311		2330			0 - 1 - 3
			21	0.49	15	2485		2978		3065		3151			1 - 1 - 6
	M17	4	18	0.18	15	1790		2033		2090		2111		2.5	0 - 1 - 3
			24	0.33	15	2267		2670		2749		2807			1 - 1 - 5
			30	0.51	18	2676		3133		3253		3317			1 - 2 - 8
	M23	5	30	0.19	19	2325		2687		2767		2803		1.9	1 - 1 - 5
			45	0.44	24	3161		3638		3799		3851			1 - 3 - 9
			60	0.77	28	3756		4301		4538		4520			2 - 5 - 12
	M31	6	55	0.17	16	2989		3541		3661		3748		1.5	1 - 3 - 9
			85	0.4	22	3883		4443		4686		4681			3 - 6 - 13
			115	0.73	26	4319		4829		5109		5119			5 - 9 - 16
4 x 2	M13	4	18	0.15	15	2433	1.20	2637	4.80	2718	10.70	2734	13.70	3.5	0 - 1 - 3
			27	0.33	15	3509		3910		4135		4250			1 - 2 - 6
			36	0.59	18	4278		4882		5158		5271			1 - 3 - 11
	M17	5	25	0.14	15	2619		2855		2949		2968		3.0	0 - 1 - 4
			40	0.36	18	3905		4410		4667		4788			1 - 2 - 10
			55	0.68	23	4703		5451		5813		5891			2 - 5 - 14
	M23	6	50	0.22	23	4113		4598		4875		5019		2.6	1 - 2 - 9
			75	0.49	28	5248		6070		6464		6558			2 - 5 - 15
			95	0.79	31	6168		7503		8045		8278			4 - 9 - 19
	M31	8	90	0.18	20	4977		5690		6017		6143		1.8	2 - 5 - 14
			135	0.41	25	6423		7858		8430		8691			5 - 11 - 20
			180	0.73	29	7463		9049		9950		10182			9 - 14 - 23

NOTES: Reference page C3-50 for operational conditions used for performance notes.

PERFORMANCE DATA

NOTES:

1. All performance data is 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.

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 heating 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 HEATING 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