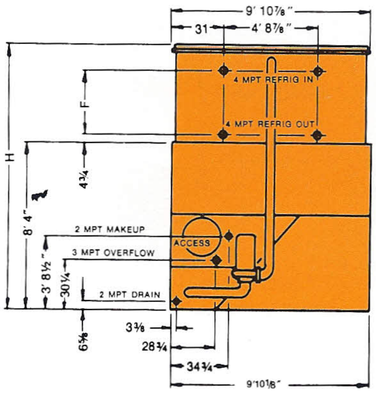
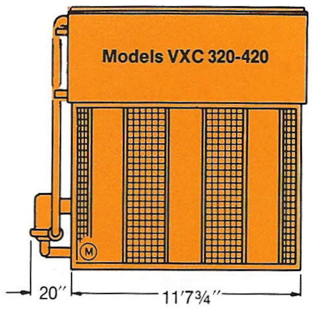
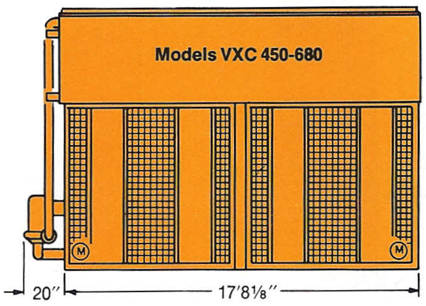
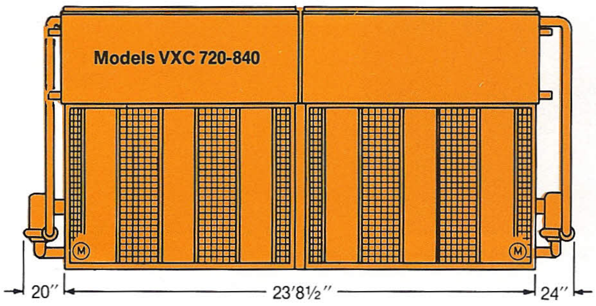
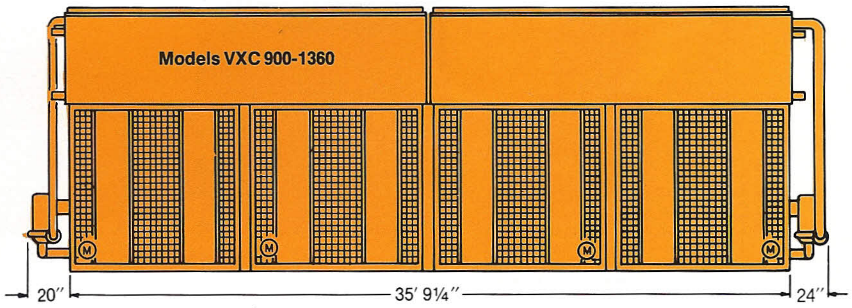






Ⓜ Fan Motor Location





MODEL NO.	APPROX. SHPG. WEIGHT	APPROX. OPER. WEIGHT	HEAVIEST SECTION (COIL)	CFM	FAN MOTOR HP (0" ESP)	GPM	PUMP MOTOR HP	R-717 CHARGE (LBS.)	REMOTE SUMP		F	H
									BOTTOM DRAIN SIZE	APPROX. OPER. WEIGHT		
VXC 320	14890	18530	9760	63800	20	490	5	380	8	15840	37¾	157⅞
VXC 340	15030	18660	9900	68700	25	490	5	400	8	15970	37¾	157⅞
VXC 360	16760	20480	11580	58700	20	490	5	460	8	17790	48¼	168⅜
VXC 380	16890	20610	11720	63200	25	490	5	480	8	17920	48¼	168⅜
VXC 420	18790	22580	13400	65600	30	490	5	550	8	19890	58¾	178⅞
VXC 450	21640	27010	14750	84500	(2) 10	740	5	560	10	23170	37¾	157⅞
VXC 490	21900	27250	15010	93500	(2) 15	740	5	600	10	23400	37¾	157⅞
VXC 530	22150	27490	15260	101000	(2) 20	740	5	640	10	23640	37¾	157⅞
VXC 550	24470	29970	17430	94000	(2) 15	740	5	700	10	26130	48¼	168⅜
VXC 590	24750	30230	17710	101500	(2) 20	740	5	740	10	26380	48¼	168⅜
VXC 620	25020	30490	17990	106000	(2) 25	740	5	770	10	26640	48¼	168⅜
VXC 650	27650	33240	20230	104000	(2) 25	740	5	830	10	29400	58¾	178⅞
VXC 680	27950	33520	20530	110200	(2) 30	740	5	860	10	29680	58¾	178⅞
VXC 720	32300	40900	11580	117400	(2) 20	980	(2) 5	920	10	35450	48¼	168⅜
VXC 760	32710	41280	11720	126400	(2) 25	980	(2) 5	960	10	35820	48¼	168⅜
VXC 840	37520	45110	13400	131200	(2) 30	980	(2) 5	1100	10	39660	58¾	178⅞
VXC 900	43220	53810	14750	169000	(4) 10	1480	(2) 5	1120	12	46160	37¾	157⅞
VXC 980	43720	54280	15010	187000	(4) 15	1480	(2) 5	1200	12	46630	37¾	157⅞
VXC 1060	44230	54760	15260	202000	(4) 20	1480	(2) 5	1280	12	47110	37¾	157⅞
VXC 1100	48900	59720	17430	188000	(4) 15	1480	(2) 5	1400	12	52080	48¼	168⅜
VXC 1180	49450	60240	17710	203000	(4) 20	1480	(2) 5	1480	12	52600	48¼	168⅜
VXC 1240	50000	60720	17990	212000	(4) 25	1480	(2) 5	1540	12	53070	48¼	168⅜
VXC 1300	55230	66270	20230	208000	(4) 25	1480	(2) 5	1660	12	58620	58¾	178⅞
VXC 1360	55830	66820	20530	220400	(4) 30	1480	(2) 5	1720	12	59170	58¾	178⅞

Selection

Two methods of selection are presented in this section, *the heat rejection method* shown on these two pages, and *the evaporator ton method* shown on Pages 14 and 15. Selections may be made from the heat rejection method for any type of positive displacement compressor: open reciprocating, hermetic reciprocating, or rotary screw. The evaporator ton method is based on evaporator heat input only, and is limited to systems utilizing open reciprocating compressors.

Heat Rejection Method

In a mechanical refrigeration system, the function of an evaporative condenser is to reject heat to the environment. The heat to be rejected is the sum of the heat input at the evaporator and the energy input at the compressor. For a given set of operating conditions, the energy input through the compression process can vary for the several types of compressors—centrifugal, rotary screw, open reciprocating, and hermetic reciprocating. Therefore, in order to accurately determine the proper evaporative condenser required, it is necessary to establish the compressor energy input as well as the heat absorbed in the evaporator.

Frequently the total heat rejection of a system is specified. When it is not specified, it can be readily calculated. Total heat rejection is the sum of the compressor evaporator capacity in BTUH at the specified operating conditions, and the energy corresponding to the compressor brake horsepower in BTUH.

For open compressors:

Total heat rejection = Compressor evaporator capacity (BTUH) + Compressor BHP × 2545

For multi-stage open compressor systems, total heat rejection is calculated from the *high stage* compressor capacity and brake horsepower, expressed in BTUH.

In the case of hermetic compressors, compressor input is commonly expressed in KW and must be converted to BTUH:

Total heat rejection = Compressor evaporator capacity (BTUH) + Compressor KW × 3415

The base heat rejection of each Baltimore Aircoil evaporative condenser is shown in Tables 1 and 2. This represents the total heat rejection of each unit when operating at 105°F condensing temperature and 78°F wet bulb temperature, using refrigerants R-12, R-22, R-500, or R-502. Tables 3 and 4 present correction factors to be applied to the system heat rejection for other operating conditions of condensing temperature, wet bulb temperature, and refrigerant.

VXC and VXMC units which have the letter "N" preceeding the model number have a maximum width of eight (8) feet at the base. Units which do not have the letter "N", and have model numbers greater than 185, are ten (10) feet wide at the base.

Selection Procedure

1. Establish total heat rejection required by the system (See above).
2. Determine the refrigerant and design conditions for condensing temperature and wet bulb temperature.
3. Using the appropriate factor (Tables 3 and 4) for the proper refrigerant, determine the correction factor to be applied to the system heat rejection.
4. Multiply the correction factor by the total system heat rejection.

TABLE 1 – Base Heat Rejection – Model VXC

(MBH — THOUSANDS OF BTU'S PER HOUR)

MODEL NO. VXC	HEAT REJECTION MBH	MODEL NO. VXC	HEAT REJECTION MBH	MODEL NO. VXC	HEAT REJECTION MBH
10	147.0	185	2,719.5	590	8,673.0
15	220.5	N205	3,013.5	N600	8,820.0
20	294.0	N230	3,381.0	620	9,114.0
25	367.5	N250	3,675.0	650/N650	9,555.0
30	441.0	N275	4,042.5	680	9,996.0
38	558.6	N300	4,410.0	720/N720	10,584.0
46	676.2	320	4,704.0	760/N760	11,172.0
52	764.4	N325	4,777.5	N800	11,760.0
58	852.6	340	4,998.0	840	12,348.0
65	955.5	360/N360	5,292.0	900	13,230.0
72	1,058.4	380/N380	5,586.0	980	14,406.0
80	1,176.0	N400	5,880.0	1060	15,582.0
90	1,323.0	420	6,174.0	1100	16,170.0
100	1,470.0	450	6,615.0	1180	17,346.0
110	1,617.0	N460	6,762.0	1240	18,228.0
125	1,837.5	490	7,203.0	1300	19,110.0
135	1,984.5	N500	7,350.0	1360	20,000.0
150	2,205.0	530	7,791.0		
165	2,425.5	550/N550	8,085.0		

TABLE 2 – Base Heat Rejection – Model VXMC

(MBH — THOUSANDS OF BTU'S PER HOUR)

MODEL NO. VXMC	HEAT REJECTION MBH	MODEL NO. VXMC	HEAT REJECTION MBH	MODEL NO. VXMC	HEAT REJECTION MBH
10	147.0	150	2,205.0	N530	7,791.0
15	220.5	170	2,499.0	560	8,232.0
20	294.0	N195	2,866.5	N570	8,379.0
25	367.5	N215	3,160.5	585	8,599.5
30	441.0	N235	3,454.5	600	8,820.0
38	558.6	N265	3,895.5	620	9,114.0
46	676.2	N285	4,189.5	N630	9,261.0
51	749.7	300	4,410.0	680	9,996.0
57	837.9	N315	4,630.5	N690	10,143.0
65	955.5	340	4,998.0	760	11,172.0
71	1,043.7	N345	5,071.5	860	12,642.0
80	1,176.0	380	5,586.0	920	13,524.0
90	1.323.0	N390	5,733.0	1020	14,994.0
100	1,470.0	430/N430	6,321.0	1120	16,464.0
110	1,617.0	460	6,762.0	1170	17,199.0
125	1,837.5	N470	6,909.0	1240	18,228.0
138	2,028.6	510	7,497.0		

5. Using Table 1 or 2, select the evaporative condenser whose base total heat rejection equals or exceeds the corrected heat rejection calculated in Step 4.

Desuperheaters

Because of space limitations, it is occasionally necessary to specify a desuperheater coil on an ammonia evaporative condenser to obtain the required capacity. (See Page 24 for details.) A desuperheater will remove most of the superheat from the refrigerant prior to its entry into the condensing coil, thus permitting additional condensing capacity in the unit.

Table 5 provides additional capacity factors that must be used when selecting an ammonia evaporative condenser with a desuperheater. To determine the selection of an ammonia evaporative condenser with desuperheater, follow Steps 1 through 4 as outlined above, but in addition, multiply by the appropriate desuperheater selection factor from Table 5. Then from Table 1 or 2, select the evaporative condenser whose base heat rejection equals or exceeds the corrected heat rejection. Add the suffix "D" to the condenser model number to indicate a unit with a desuperheater (Example: VXC-450D).

Notes:

1. Consult your B.A.C. representative for evaporative condenser selections for systems utilizing:
   a. Hydrocarbon refrigerants such as propane, butane, or propylene.
   b. Centrifugal compressors.
   c. Rotary screw compressors with water-cooled oil coolers.
2. Desuperheaters provide no capacity benefit when used on systems with rotary screw compressors, due to the low discharge gas temperatures that are characteristic of this type of compressor.

TABLE 3 – Heat Rejection Capacity Factors/Refrigerants 12, 22, 500, and 502

Condensing Pressure (PSIG)		Cond. Temp. (°F)	Entering Air Wet Bulb Temperature (°F)											
R-12	R-22		50	55	60	65	68	70	72	75	78	80	85	90
91.8	155.7	85	1.10	1.22	1.39	1.67	1.94	2.13	2.45	2.94	—	—	—	—
99.8	168.4	90	.93	1.02	1.14	1.32	1.47	1.59	1.75	2.00	2.38	2.78	—	—
108.3	181.8	95	.80	.87	.95	1.08	1.16	1.22	1.32	1.45	1.61	1.79	2.56	—
117.2	195.9	100	.71	.76	.82	.89	.93	.98	1.03	1.12	1.23	1.33	1.72	2.50
126.6	210.8	105	.63	.66	.70	.76	.79	.83	.86	.93	1.00	1.05	1.27	1.61
136.4	226.4	110	.56	.59	.62	.66	.70	.71	.75	.79	.84	.88	1.01	1.19
146.8	242.7	115	—	.52	.55	.58	.60	.62	.64	.67	.70	.73	.81	.92
157.7	259.9	120	—	—	—	.51	.53	.54	.55	.57	.60	.62	.68	.75

TABLE 4 – Heat Rejection Capacity Factors/Refrigerant 717 (Ammonia)

Cond. Press. (PSIG)	Cond. Temp. (°F)	Entering Air Wet Bulb Temperature (°F)											
		50	55	60	65	68	70	72	75	78	80	85	90
151.7	85	1.00	1.11	1.26	1.52	1.76	1.93	2.23	2.68	—	—	—	—
165.9	90	.85	.93	1.03	1.19	1.33	1.45	1.59	1.82	2.17	2.50	—	—
181.1	95	.73	.79	.87	.98	1.06	1.11	1.19	1.32	1.47	1.61	2.33	—
185.1	96.3	.71	.76	.83	.91	.98	1.04	1.11	1.23	1.36	1.49	2.13	—
197.2	100	.64	.69	.75	.81	.85	.89	.93	1.02	1.12	1.20	1.57	2.27
214.2	105	.57	.60	.64	.69	.73	.76	.79	.84	.91	.96	1.15	1.47
232.3	110	.51	.53	.56	.60	.63	.65	.68	.71	.76	.80	.92	1.08
251.5	115	—	.47	.50	.53	.55	.56	.58	.61	.64	.66	.74	.84
271.7	120	—	—	—	.46	.48	.49	.50	.52	.54	.56	.62	.68

Selection Examples

1. Given:

R-22 refrigerant, hermetic reciprocating compressor
Compressor evaporator capacity = 80 tons
Compressor KW input = 58
Condensing temperature = 95°F
Wet bulb temperature = 75°F

Solution:

1. Determine the total heat rejection of the system

Compressor evaporator capacity	= 80 × 12,000 =	960,000 BTUH
Compressor KW input	= 58 × 3415 =	198,000 BTUH
	Total heat rejection =	1,158,000 BTUH

2. Determine the heat rejection capacity factor for R-22 at 95°F condensing temperature and 75°F wet bulb temperature from Table 3, which is 1.45.
3. Multiply: 1,158,000 × 1.45 = 1,679,000 BTUH (1,679 MBH)
4. From Table 1 or 2, select a unit with a base total heat rejection equal to or greater than 1,679 MBH. In this case, select a VXC-125 or a VXMC-125, with a heat rejection rating of 1,837.5 MBH.

2. Given:

R-717 refrigerant, rotary screw compressor (refrigerant-cooled)
Compressor evaporator capacity = 480 tons
Compressor BHP = 600
Condensing temperature = 90°F
Wet bulb temperature = 72°F

Solution:

1. Determine the total heat rejection of the system

Compressor evaporator capacity	= 480 × 12,000 =	5,760,000 BTUH
Compressor BHP input	= 600 × 2545 =	1,527,000 BTUH
	Total heat rejection =	7,287,000 BTUH

2. Determine the heat rejection capacity factor for R-717 at 90°F condensing temperature and 72°F wet bulb temperature from Table 4, which is 1.59.
3. Multiply: 7,287,000 × 1.59 = 11,586,000 BTUH (11,586 MBH)
4. From Table 1 or 2, select a unit with a base total heat rejection equal to or greater than 11,586 MBH. In this case, select a VXC-800 (or VXMC-860), with a heat rejection rating of 11,760 MBH (12,642 MBH).

TABLE 5 – Ammonia Desuperheater Heat Rejection Capacity Factors

Suction Pressure (PSIG)	Suction Temp. (°F)	Capacity Factor
3.6	−20	0.86
9.0	−10	0.88
15.7	0	0.89
23.8	+10	0.90
33.5	+20	0.91
45.0	+30	0.92
58.6	+40	0.93