

Single Phase Loads: (Where the loads on each phase are equal)  
Watts = Amps times Volts (P = I x E)  
Amps = Watts divided by Volts (I = P / E)  
Volts = Amps divided by Watts (E = P / I)

Three Phase Loads: (Where the loads on each phase are equal)  
Watts = 1.732 times Amps times Volts (P = 1.732 x I x E)  
Amps = Watts divided by Volts (I = P / (1.732 x E))  
Volts = Amps divided by Watts (E = P / I)

Electrical Formulas  
(Heaters, Resistive Loads)

Room Volume	Approximate	Room Volume	Approximate
4-10	1000	1-9-35	1900
11-18	1350	1-1-18	1900
19-35	2900	2-9-38	2600
36-55	4200	3-9-68	3500
56-75	4200	6-9-100	5700
76-100	5500	16 hours per day compressor	run time
18 hours per day compressor	run time	Based on a minimum 1-1/2 inch	urethane foam insulated fixture,

Battery operated load capacity, POUNDS	Heat gain per hour BTUH	Approx. weight of lift truck, POUNDS
2000	14000	6000
4000	21000	8000
6000	23000	12000
8000	26000	14000

If motor or loading conditions are not known then calculate one motor HP for each 16,000 cu. ft. in a storage cooler and 12,500 cu. ft. in a storage freezer. Loading docks and high distribution warehouses are heavier.

LIGHTS

Room Temperature	Volume Room Temp. Below 32°F	Volume Room Temp. Above 32°F	Room Temperature
50°F	250	44.0	33.5
30°F	400	29.5	22.5
20°F	600	23.0	18.0
10°F	800	20.0	15.3
0°F	1000	17.5	13.5
-10°F	1500	14.0	11.0
-20°F	2000	12.0	9.3

Floor Square Feet	BTUH	Room Temperature
100	93	35°F
200	185	30°F
300	277	25°F
400	369	20°F
500	461	15°F
600	553	10°F
700	645	5°F
800	737	0°F
900	829	-5°F
1000	921	-10°F
1200	1105	-20°F

Room Temperature	Volume Room Temp. Below 32°F	Volume Room Temp. Above 32°F	Room Temperature
50°F	250	44.0	33.5
30°F	400	29.5	22.5
20°F	600	23.0	18.0
10°F	800	20.0	15.3
0°F	1000	17.5	13.5
-10°F	1500	14.0	11.0
-20°F	2000	12.0	9.3

Room Temperature	Volume Room Temp. Below 32°F	Volume Room Temp. Above 32°F	Room Temperature
50°F	250	44.0	33.5
30°F	400	29.5	22.5
20°F	600	23.0	18.0
10°F	800	20.0	15.3
0°F	1000	17.5	13.5
-10°F	1500	14.0	11.0
-20°F	2000	12.0	9.3

DIMENSIONS (FEET)	ROOM AREA (SQ. FT.)	ROOM VOLUME (CU. FT.)	BTUH TYPICAL LOAD	BTUH HEAVY
4	16	64	800	1030
6	36	216	1800	2310
8	64	512	3200	4110
10	100	1000	4800	6110
12	144	1728	7200	9110
14	196	2548	10000	13110
16	256	4096	14400	18110
18	324	5832	19600	25110
20	400	8000	26400	34110
22	484	10648	33800	45110
24	576	13824	41800	58110
26	676	17512	50400	73110
28	784	21952	59600	89110
30	900	27000	69400	107110
32	1024	32768	79800	127110
34	1156	39324	90800	149110
36	1296	46656	102400	173110
38	1444	54752	114600	198110
40	1600	64000	127400	224110

DIMENSIONS (FEET)	ROOM AREA (SQ. FT.)	ROOM VOLUME (CU. FT.)	BTUH TYPICAL LOAD	BTUH HEAVY
4	16	64	800	1030
6	36	216	1800	2310
8	64	512	3200	4110
10	100	1000	4800	6110
12	144	1728	7200	9110
14	196	2548	10000	13110
16	256	4096	14400	18110
18	324	5832	19600	25110
20	400	8000	26400	34110
22	484	10648	33800	45110
24	576	13824	41800	58110
26	676	17512	50400	73110
28	784	21952	59600	89110
30	900	27000	69400	107110
32	1024	32768	79800	127110
34	1156	39324	90800	149110
36	1296	46656	102400	173110
38	1444	54752	114600	198110
40	1600	64000	127400	224110

35°F. ROOM  
(add 15% to loads for 10' height)



QUICK CALCULATIONS for WALK-IN COOLERS and FREEZERS

BTUH LOADS for: 6' X 6' to 40' X 40' Rooms with 8' Ceilings at -20°F. to +35°F.  
Based on 95°F. Ambient

DIMENSIONS (FEET)	ROOM AREA (SQ. FT.)	ROOM VOLUME (CU. FT.)	BTUH TYPICAL LOAD	BTUH HEAVY
4	16	64	800	1030
6	36	216	1800	2310
8	64	512	3200	4110
10	100	1000	4800	6110
12	144	1728	7200	9110
14	196	2548	10000	13110
16	256	4096	14400	18110
18	324	5832	19600	25110
20	400	8000	26400	34110
22	484	10648	33800	45110
24	576	13824	41800	58110
26	676	17512	50400	73110
28	784	21952	59600	89110
30	900	27000	69400	107110
32	1024	32768	79800	127110
34	1156	39324	90800	149110
36	1296	46656	102400	173110
38	1444	54752	114600	198110
40	1600	64000	127400	224110

30°F. ROOM  
(add 15% to loads for 10' height)

DIMENSIONS (FEET)	ROOM AREA (SQ. FT.)	ROOM VOLUME (CU. FT.)	BTUH TYPICAL LOAD	BTUH HEAVY
4	16	64	800	1030
6	36	216	1800	2310
8	64	512	3200	4110
10	100	1000	4800	6110
12	144	1728	7200	9110
14	196	2548	10000	13110
16	256	4096	14400	18110
18	324	5832	19600	25110
20	400	8000	26400	34110
22	484	10648	33800	45110
24	576	13824	41800	58110
26	676	17512	50400	73110
28	784	21952	59600	89110
30	900	27000	69400	107110
32	1024	32768	79800	127110
34	1156	39324	90800	149110
36	1296	46656	102400	173110
38	1444	54752	114600	198110
40	1600	64000	127400	224110

QUICK CALCULATIONS for FREEZERS

DIMENSIONS (FEET)	ROOM AREA (SQ. FT.)	ROOM VOLUME (CU. FT.)	BTUH TYPICAL LOAD	BTUH HEAVY
4	16	64	800	1030
6	36	216	1800	2310
8	64	512	3200	4110
10	100	1000	4800	6110
12	144	1728	7200	9110
14	196	2548	10000	13110
16	256	4096	14400	18110
18	324	5832	19600	25110
20	400	8000	26400	34110
22	484	10648	33800	45110
24	576	13824	41800	58110
26	676	17512	50400	73110
28	784	21952	59600	89110
30	900	27000	69400	107110
32	1024	32768	79800	127110
34	1156	39324	90800	149110
36	1296	46656	102400	173110
38	1444	54752	114600	198110
40	1600	64000	127400	224110

QUICK CALCULATIONS for FREEZERS

DIMENSIONS (FEET)	ROOM AREA (SQ. FT.)	ROOM VOLUME (CU. FT.)	BTUH TYPICAL LOAD	BTUH HEAVY
4	16	64	800	1030
6	36	216	1800	2310
8	64	512	3200	4110
10	100	1000	4800	6110
12	144	1728	7200	9110
14	196	2548	10000	13110
16	256	4096	14400	18110
18	324	5832	19600	25110
20	400	8000	26400	34110
22	484	10648	33800	45110
24	576	13824	41800	58110
26	676	17512	50400	73110
28	784	21952	59600	89110
30	900	27000	69400	107110
32	1024	32768	79800	127110
34	1156	39324	90800	149110
36	1296	46656	102400	173110
38	1444	54752	114600	198110
40	1600	64000	127400	224110

QUICK CALCULATIONS for FREEZERS