TABLE 1. PRESSURE LOSSES IN DICHLORODIFLUOROMETHANE DISCHARGE OR HOT GAS LINES[a]

CAPACITY BTU PER HOUR	PRESSURE DROP IN POUNDS PER SQUARE INCH PER 100 FT[b]									
	LINE SIZES, INCHES									
	5/8	3/4	7/8	1 1/8	1 3/8	1 5/8	2 1/8	2 5/8	3 1/8	3 5/8
10,000	2.3	1.0	0.6							
15,000	4.9	2.0	1.0							
20,000	8.5	3.4	1.7	0.6						
25,000		5.3	2.6	0.9						
30,000		7.5	3.6	1.2	0.5					
40.000			6.4	2.1	0.7					
50,000			9.8	3.1	1.0	0.5				
60,000				4.4	1.3	0.7				
70,000				6.0	1.9	0.9				
80,000				8.0	2.5	1.1				
90,000				10.2	3.1	1.4				
100,000					3.8	1.7	0.5			
125,000					6.0	2.6	0.7			
150,000					8.5	3.8	1.0			
175,000					11.6	5.1	1.3			
200,000						6.7	1.7	0.6		
250,000						10.4	2.6	0.9		
300,000							3.7	1.2	0.5	
400,000							6.7	2.2	0.9	
500,000							10.5	3.5	1.5	0.7
600,000								5.0	2.1	1.0
800,000								9.0	3.8	1.8
1,000,000									5.8	2.9
1,250,000									9.5	4.4
1,500,000										6.4
2,000,000										11.3

[a]Soft annealed copper tubing up to and including 3/4 in. outside diameter. Hard copper pipe 7/8 in. outside diameter and larger.

[b]Length of tubing includes the average number of fittings.

unit capacity may be reduced by using back pressure regulating valves, by-pass valves, or variable speed compressors.

Another method of providing for economy of operation is to have storage capacity which can be utilized during the peak period. The refrigerating system can be operated for a longer period at maximum efficiency with tanks to store cold water or brine for supplementing the actual output of the refrigerating equipment. However, storage tanks require space and extra apparatus, which increase the cost of the entire system, and further, it is difficult to determine the exact size of the compressor because of the other variables which enter the problem. Depending upon the availability of storage space, the compressor may be designed for any reasonable percentage of the maximum load. On this basis of selection, the smaller the compressor, the larger the storage space, and vice versa.

TABLE 2. PRESSURE LOSSES IN DICHLORODIFLUOROMETHANE LIQUID REFRIGERANT LINES

CAPACITY BTU PER HOUR	PRESSURE DROP IN POUNDS PER SQUARE INCH PER 100 FT[a]			
	PIPE SIZES, INCHES			
	7/8	1 1/8	1 3/8	1 5/8
100,000	0.6			
125,000	0.9			
150,000	1.3			
175,000	1.8			
200,000	2.3	0.6		
225,000	2.9	0.8		
250,000	3.6	1.0		
275,000	4.3	1.2		
300,000	5.1	1.4		
325,000	5.9	1.6		
350,000	6.9	1.8		
375,000	7.9	2.1		
400,000	9.0	2.3	0.8	
450,000		2.9	1.0	
500,000		3.5	1.3	
550,000		4.3	1.5	0.7
600,000		5.0	1.8	0.8
700,000		6.7	2.4	1.1
800,000		8.7	3.1	1.4
900,000			3.9	1.7
1,000,000			4.7	2.1
1,200,000			6.7	3.0
1,400,000			9.0	4.0
1,600,000				5.1
1,800,000				6.3
2,000,000				7.9
2,200,000				9.2

[a]Length of tubing includes the average number of fittings.

There is a further method of controlling the compressor output which is particularly adaptable to the centrifugal type of machine. This is accomplished by varying the amount of condensing water used with the fluctuation in load demand. Because of the characteristics of the centrifugal type of apparatus, as the condensing water quantity is reduced and the condensing temperature consequently raised, the discharge pressure of the centrifugal machine rises correspondingly and the horsepower input to the machine drops proportionately. While this reduces the total power input to the machine, it does not necessarily reduce the power input per ton of refrigeration developed, as the power input does not drop with a rising discharge pressure as fast as the refrigerating effect is reduced.