

HEATING VENTILATING AIR CONDITIONING GUIDE 1942

TABLE 7. 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									
	PIPE SIZES, INCHES									
	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2
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

^aSoft annealed copper tubing up to and including 3/4 in. outside diameter. Hard copper pipe 3/4 in. outside diameter and larger.

^bLength of tubing includes the average number of fittings.

control and regulating valves must be added to the other pipe losses to determine the total drop. All copper pipe referred to in these tables are of type L wall thickness and are designated by outside diameter.

The effect of the sizes of refrigerant lines on the system may be studied by referring to the preceding discussion on Characteristics of Compression Systems. It will be noted that any lowering of the suction pressure at the compressor lowers the capacity. Therefore, excessive pressure drop through the suction piping should be avoided. On the other hand, the suction line must not be made too large when using refrigerants which are soluble in oil, because under such circumstances the velocity of the returning refrigerant may become too low to carry back the entrained oil. Pressure drop in the discharge line also lowers the capacity of the system

CHAPTER 25. REFRIGERATION

TABLE 8. 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			
	1/4	3/8	1/2	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

^aLength of tubing includes the average number of fittings.

but not to the same extent as does the pressure drop in the suction line. The velocities of the refrigerant in either suction or discharge lines must not be excessive or noise will result. Velocities of 1000 to 2000 fpm are common in suction lines, and from 2000 to 3500 fpm are used in discharge lines. Velocities in the discharge lines as high as 5000 fpm can only be used where the fittings and bends are all stream-lined as noise will otherwise result.

The pressure drop in the liquid line affects the capacity of the expansion valve as the pressure drop across the valve is reduced by the amount of the pipe line drop. If the liquid line drop is sufficient to cause flashing (i.e. vaporizing) of some of the liquid refrigerant, a hissing noise in the lines and valves usually develops.