



Freon™ 410A

Refrigerant (R-410A)

Piping Guide for Freon™ 410A (ENG Units)

Technical Information

Suction Line Size—Evaporator to Compressor

System Capacity Btu/Hr	System Capacity Tons/Hr	50 °F through 30 °F (145 through 99 psig)					29 °F through 10 °F (97 through 64 psig)					9 °F through -10 °F (62 through 38 psig)					System Capacity Tons/Hr	System Capacity Btu/Hr		
		Suggested Allowable Pressure Drop in psig = 2 °F																		
		4.6 lb (2 °F)			3.5 lb (2 °F)					2.5 lb (2 °F)										
		Equivalent Suction Line Length—Feet																		
		25	50	75	100	150	25	50	75	100	150	25	50	75	100	150				
18,000	1.50	1/2	5/8	5/8	5/8	3/4	5/8	5/8	3/4	3/4	3/4	5/8	3/4	3/4	7/8	7/8	1.50	18,000		
24,000	2.00	1/2	5/8	3/4	3/4	3/4	5/8	3/4	3/4	7/8	7/8	3/4	7/8	7/8	11/8	11/8	2.00	24,000		
30,000	2.50	5/8	3/4	3/4	3/4	7/8	3/4	3/4	7/8	7/8	11/8	3/4	7/8	11/8	11/8	11/8	2.50	30,000		
36,000	3.00	5/8	3/4	3/4	7/8	7/8	3/4	7/8	7/8	11/8	11/8	7/8	11/8	11/8	11/8	11/8	3.00	36,000		
42,000	3.50	3/4	3/4	7/8	7/8	11/8	7/8	7/8	11/8	11/8	11/8	7/8	11/8	11/8	11/8	13/8	3.50	42,000		
48,000	4.00	3/4	7/8	7/8	7/8	11/8	7/8	7/8	11/8	11/8	11/8	7/8	11/8	11/8	13/8	13/8	4.00	48,000		
60,000	5.00	7/8	7/8	11/8	11/8	11/8	7/8	11/8	11/8	11/8	13/8	11/8	11/8	13/8	13/8	13/8	5.00	60,000		
92,000	7.50	7/8	11/8	11/8	11/8	13/8	11/8	11/8	13/8	13/8	13/8	11/8	13/8	13/8	15/8	15/8	7.50	92,000		
120,000	10.00	11/8	11/8	13/8	13/8	13/8	11/8	13/8	13/8	13/8	15/8	13/8	15/8	15/8	15/8	21/8	10.00	120,000		
150,000	12.50	11/8	13/8	13/8	13/8	15/8	13/8	13/8	15/8	15/8	15/8	13/8	15/8	15/8	21/8	21/8	12.50	150,000		
180,000	15.00	11/8	13/8	13/8	15/8	15/8	13/8	13/8	15/8	15/8	21/8	15/8	15/8	21/8	21/8	21/8	15.00	180,000		
240,000	20.00	13/8	13/8	15/8	15/8	21/8	13/8	15/8	21/8	21/8	21/8	15/8	21/8	21/8	21/8	25/8	20.00	240,000		
300,000	25.00	13/8	15/8	15/8	21/8	21/8	15/8	21/8	21/8	21/8	21/8	21/8	21/8	21/8	25/8	25/8	25.00	300,000		
360,000	30.00	13/8	15/8	21/8	21/8	21/8	15/8	21/8	21/8	21/8	25/8	21/8	21/8	25/8	25/8	25/8	30.00	360,000		
420,000	35.00	15/8	21/8	21/8	21/8	21/8	21/8	21/8	21/8	25/8	25/8	21/8	25/8	25/8	25/8	31/8	35.00	420,000		
480,000	40.00	15/8	21/8	21/8	21/8	25/8	21/8	21/8	25/8	25/8	25/8	21/8	25/8	25/8	31/8	31/8	40.00	480,000		
540,000	45.00	15/8	21/8	21/8	21/8	25/8	21/8	21/8	25/8	25/8	25/8	21/8	25/8	25/8	31/8	31/8	45.00	540,000		
600,000	50.00	21/8	21/8	21/8	25/8	25/8	21/8	25/8	25/8	25/8	31/8	25/8	25/8	31/8	31/8	35/8	50.00	600,000		

- Equivalent length is actual length plus friction losses caused by fittings and accessories.
- Line sizes are expressed in outside diameter of type "L" copper tubing and calculated at rated full load system capacity.
- All selections are based on a maximum of 65 °F return gas entering the compressor and a refrigerant condensing and liquid line temperature of 105 °F.

Suction Line Size—Evaporator to Compressor (cont'd)

		-11 °F through -30 °F (37 through 19 psig)					-31 °F through -50 °F (18 through 6 psig)						
		Suggested Allowable Pressure Drop in psig = 2 °F											
		1.9 lb (2 °F)					1.3 lb (2 °F)						
		Equivalent Suction Line Length—Feet											
System Capacity Btu/Hr	System Capacity Tons/Hr	25	50	75	100	150	25	50	75	100	150	System Capacity Tons/Hr	System Capacity Btu/Hr
18,000	1.50	3/4	7/8	7/8	1 1/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8	1 3/8	1.50	18,000
24,000	2.00	7/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	2.00	24,000
30,000	2.50	7/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 3/8	1 3/8	1 5/8	2.50	30,000
36,000	3.00	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 1/8	1 3/8	1 3/8	1 5/8	1 5/8	3.00	36,000
42,000	3.50	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	3.50	42,000
48,000	4.00	1 1/8	1 3/8	1 3/8	1 3/8	1 5/8	1 3/8	1 3/8	1 5/8	1 5/8	2 1/8	4.00	48,000
60,000	5.00	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 3/8	1 5/8	1 5/8	2 1/8	2 1/8	5.00	60,000
92,000	7.50	1 3/8	1 5/8	1 5/8	2 1/8	2 1/8	1 5/8	1 5/8	2 1/8	2 1/8	2 5/8	7.50	92,000
120,000	10.00	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	10.00	120,000
150,000	12.50	1 5/8	2 1/8	2 1/8	2 1/8	2 5/8	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	12.50	150,000
180,000	15.00	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8	2 1/8	2 5/8	2 5/8	2 5/8	3 1/8	15.00	180,000
240,000	20.00	2 1/8	2 1/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	3 5/8	20.00	240,000
300,000	25.00	2 1/8	2 5/8	2 5/8	2 5/8	3 1/8	2 5/8	3 1/8	3 1/8	3 1/8	3 5/8	25.00	300,000
360,000	30.00	2 1/8	2 5/8	2 5/8	3 1/8	3 1/8	2 5/8	3 1/8	3 5/8	3 5/8	3 5/8	30.00	360,000
420,000	35.00	2 5/8	2 5/8	3 1/8	3 1/8	3 5/8	3 1/8	3 5/8	3 5/8	3 5/8	4 1/8	35.00	420,000
480,000	40.00	2 5/8	3 1/8	3 1/8	3 1/8	3 5/8	3 1/8	3 5/8	3 5/8	4 1/8	4 1/8	40.00	480,000
540,000	45.00	2 5/8	3 1/8	3 1/8	3 5/8	3 5/8	3 1/8	3 5/8	3 5/8	4 1/8	5 1/8	45.00	540,000
600,000	50.00	2 5/8	3 1/8	3 5/8	3 5/8	4 1/8	3 5/8	3 5/8	4 1/8	4 1/8	5 1/8	50.00	600,000

- Equivalent length is actual length plus friction losses caused by fittings and accessories.
- Line sizes are expressed in outside diameter of type "L" copper tubing and calculated at rated full load system capacity.
- All selections are based on a maximum of 65 °F return gas entering the compressor and a refrigerant condensing and liquid line temperature of 105 °F.

System Capacity Btu/Hr	System Capacity Tons/Hr	Discharge Line Size Compressor to Condenser 1 °F (5 psi) pressure drop maximum					Liquid Condensate Line Condenser to Receiver Condensate drain/vent					Liquid Line Size Receiver to TXV 1 °F (5 psi) pressure drop maximum					System Capacity Tons/Hr	System Capacity Btu/Hr
		Equivalent Suction Line Length—Feet																
		25	50	75	100	150	25	50	75	100	150	25	50	75	100	150		
18,000	1.50	1/2	1/2	1/2	5/8	5/8	1/2	1/2	1/2	1/2	1/2	3/8	3/8	3/8	3/8	3/8	1.50	18,000
24,000	2.00	1/2	5/8	5/8	5/8	5/8	1/2	1/2	1/2	5/8	5/8	3/8	3/8	3/8	1/2	1/2	2.00	24,000
30,000	2.50	1/2	5/8	5/8	5/8	3/4	1/2	1/2	5/8	5/8	5/8	3/8	3/8	1/2	1/2	1/2	2.50	30,000
36,000	3.00	5/8	5/8	5/8	3/4	3/4	1/2	1/2	5/8	5/8	5/8	3/8	3/8	1/2	1/2	1/2	3.00	36,000
42,000	3.50	5/8	5/8	3/4	3/4	3/4	1/2	5/8	5/8	5/8	5/8	3/8	1/2	1/2	1/2	1/2	3.50	42,000
48,000	4.00	5/8	3/4	3/4	3/4	7/8	5/8	5/8	5/8	5/8	3/4	1/2	1/2	1/2	1/2	5/8	4.00	48,000
60,000	5.00	3/4	3/4	7/8	7/8	7/8	5/8	5/8	5/8	3/4	3/4	1/2	1/2	1/2	5/8	5/8	5.00	60,000
92,000	7.50	3/4	7/8	7/8	1 1/8	1 1/8	5/8	3/4	3/4	3/4	7/8	1/2	5/8	5/8	5/8	3/4	7.50	92,000
120,000	10.00	7/8	1 1/8	1 1/8	1 1/8	1 1/8	5/8	3/4	3/4	7/8	7/8	1/2	5/8	5/8	3/4	3/4	10.00	120,000
150,000	12.50	7/8	1 1/8	1 1/8	1 1/8	1 3/8	3/4	3/4	7/8	7/8	1 1/8	5/8	5/8	3/4	3/4	7/8	12.50	150,000
180,000	15.00	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	3/4	7/8	7/8	1 1/8	1 1/8	5/8	3/4	3/4	7/8	7/8	15.00	180,000
240,000	20.00	1 1/8	1 3/8	1 3/8	1 3/8	1 5/8	7/8	7/8	1 1/8	1 1/8	1 3/8	3/4	3/4	7/8	7/8	1 1/8	20.00	240,000
300,000	25.00	1 1/8	1 3/8	1 3/8	1 5/8	1 5/8	7/8	1 1/8	1 1/8	1 3/8	1 3/8	3/4	7/8	7/8	1 1/8	1 1/8	25.00	300,000
360,000	30.00	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	7/8	1 1/8	1 3/8	1 3/8	1 3/8	3/4	7/8	1 1/8	1 1/8	1 1/8	30.00	360,000
420,000	35.00	1 3/8	1 5/8	1 5/8	1 5/8	2 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8	35.00	420,000
480,000	40.00	1 3/8	1 5/8	1 5/8	2 1/8	2 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 5/8	7/8	1 1/8	1 1/8	1 1/8	1 3/8	40.00	480,000
540,000	45.00	1 3/8	1 5/8	1 5/8	2 1/8	2 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 5/8	7/8	1 1/8	1 1/8	1 1/8	1 3/8	45.00	540,000
600,000	50.00	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	50.00	600,000

- Equivalent length is actual length plus friction losses caused by fittings and accessories.
- Line sizes are expressed in outside diameter of type “L” copper tubing and calculated at rated full load system capacity.
- All selections are based on a maximum of 65 °F return gas entering the compressor and a refrigerant condensing and liquid line temperature of 105 °F.

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