

Engineering Recommendation on:  
**REFRIGERANT LINE SIZES  
 FOR REMOTE SYSTEMS  
 (R-22, Air Conditioning, and Heat Pump Applications)**

ER-1  
 Revised 6/16/99

Condensers and evaporators should be designed and circuited to maintain adequate velocity to prevent oil trapping.

The tube sizes suggested below are for connecting lines of remote systems. The basis for selection is to maintain adequate velocity which assures oil return to the compressor, an acceptable pressure drop to assure compressor capacity and minimum tubing cost.

Nominal Compressor Cooling Capacity BTU/Hr.	Suction Line O.D.		Liquid Line O.D.	Discharge Line Length & O.D.		
	Vertical Up Flow	Vertical Down Flow or Horiz.		25'	50'	100'
5,700 - 9,400	3/8	1/2	1/4	5/16	5/16	3/8
8,000 - 13,000	1/2	1/2	1/4	5/16	3/8	3/8
11,200 - 18,500	1/2	5/8	5/16	3/8	3/8	1/2
17,000 - 30,000	5/8	3/4	5/16	3/8	1/2	1/2
27,000 - 44,000	3/4	7/8	3/8	3/8	1/2	5/8
38,000 - 67,000	7/8	1 1/8	3/8	1/2	5/8	5/8
38,000 - 67,000	7/8	1 1/8	1/2	1/2	5/8	5/8
60,000 - 102,000	1 1/8	1 3/8	1/2	5/8	3/4	3/4
96,000 - 156,000	1 1/8	1 5/8	5/8	3/4	3/4	7/8
144,000 - 228,000	1 5/8	2 1/8	5/8	3/4	7/8	1 1/8

To assure adequate oil return, suction line velocities should be minimum of 750 fpm for horizontal or down flow and 1500 fpm for up flow. Gas velocities of 3000 fpm or more will create noise problems and should be avoided.

Where a choice of line sizes is possible because of the overlap in the compressor capacity table, the larger sized lines are suggested to minimize the system pressure drop.

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NOTES:

1. Suction line sizes (up flow) provide adequate gas velocities to assure oil return to the compressor and therefore remain constant in size regardless of length. Suction line traps are not required. Horizontal suction lines are sized larger to reduce pressure drop.
2. Suction line lengths in excess of 100 feet may require additional oil be added to the compressor. **All** applications exceeding 100 feet suction lines shall be referred to your Tecumseh sales engineer for assistance.
3. For heat pump remote systems, the suggested suction lines (up flow) should be used as the combined suction-discharge line.
4. Liquid line sizes are based on pressure drops that will not permit gas formation and therefore remain constant in size regardless of length.
5. These recommendations are based on the use of standard refrigeration grade tubing and do not include considerations for additional pressure drop due to elbows, valves or reduced joint sizes.

Tecumseh Engineering Department

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