System design / Pipe sizing

Correct pipe sizing is an important factor in the design of an installation: the incorrect selection, particularly of the suction line can lead to malfunctioning of the compressor due to insufficient oil return especially where there is a long pipe run.

The return of oil to the compressor can only occur if the oil/refrigerant mixture is good and the velocity of the refrigerant is sufficient.

If, however, the velocity is too high the pressure drop within the system will be too high affecting the overall performance of the system.

The recommended velocities in the suction lines are as follows:

- horizontal or suction drops: 4 m/sec minimum (8 m/sec max.)
- risers: 8 m/sec minimum (12 to 13 m/sec max.)
- do not exceed 15 m/sec to prevent refrigerant noise in the lines.

Remote Installation

In some installations with long runs, it may be necessary to add oil in order to compensate for that permanently circulating in the system.

This should be kept to a minimum as too much oil in the compressor can be just as damaging as to little.

For pipe work over 10 m use the following guidelines for the amount of oil to be added:

OD Ø 1/2'' 10 ml / m

5/8'' 20 ml / m

3/4'' 30 ml / m

7/8'' 40 ml / m

1'' 50 ml / m.

oil change :

After a complete oil change, use only the following oils or their direct equivalents:

- R12 and R22 compressors: 2444RC mineral TE code 685013

- R502 (BP) compressors: akylbenzene TE code 8685016

- R134a or R404A compressors: polyolester TE code 8685015

For top ups with R12 and R22 compressors it is possible to add up to 25% of the original charge with an equivalent oil e.g. SUNISO 3GS.