

Application Manual

Rated Speed (Minimum Allowable Rotating Speed)

Many factors affect how slow the compressor can be operated. These include oil supply pressure to the frame, crosshead pin load reversal, valve dynamics, and torsional / acoustical considerations.

Ariel Compressor frames are designed to have adequate frame oil supply pressure down to one half their rated rotating speed. If operation at less than half speed is desired, the addition of a motor driven auxiliary lube oil pump is required to maintain adequate lube oil pressure and flow. The additional flow of the auxiliary oil pump will maintain the frame oil pressure required for proper operation. Removal of the main frame oil pump is not necessary.

Lack of adequate <u>crosshead pin load reversal</u> can limit the minimum operating speed. An analysis of the crosshead pin forces must also be performed to ensure that the proper amount of pin force reversal is present at all operating speeds and load steps.

Compressor valves are selected for a specific operating condition with some flexibility for variations for speed and operating conditions. A general rule of thumb for valve selection is that a single selection can be operated within a 2:1 maximum speed range. Varying suction pressures, discharge pressures and gas analyses can further limit this speed range. Low lift valves may be necessary for speed ranges outside a 25% variation.

Speed ranges must be considered in the torsional and acoustical analyses. Wider speed ranges in combination with wide ranges in operating conditions and load steps may result in black out speeds due to natural frequency interferences.

All applications requiring rotative speeds that are lower than one half the rated speed of the frame, must be reviewed by Ariel Corporation Applications Engineering.

Also See:

Frame Driven Lube Oil Pumps

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