



SECTION 10 - START-UP, SERVICE, PARTS

Packager Responsibilities

1. Trained mechanics that have experience on Ariel rotary compressors must be used for field start-up and service.
2. The packager must train operators on equipment and control panel operation.
3. The Ariel compressor start-up checklist ER-10.4.3, or checklist as found in the appropriate Compressor Technical Manual's section 3 "start-up", must be used.
4. The Ariel "Compressor Warranty Notification and Installation List Data" form must be completely filled out and returned to Ariel for warranty coverage within 30 days of installation.
5. The compressor unit operator must be provided with the appropriate Ariel compressor Technical Manual and parts lists by the packager. The operator shall be informed about compressor operating requirements such as pressure limitations, lubricating oil used, adjusting capacity control devices and lubrication system pressures, along with the setting of alarm/shutdown points. The operator shall be provided with proper operating procedures for start-up, idle, blowdown, by-pass, run, and purging if a combustible gas is being compressed. Every possible effort shall be made to train the unit operator to perform normal preventive maintenance.
6. The packager start-up mechanic/operator shall double check the parts and predicted performance runs to see if the correct compressor oil and gear ratio/oil pump combination are used for start-up and operating conditions. Advise the unit operator of warning tags located on the compressor or other components. (See "Start Up Procedure" below).
7. The packager must provide clean, dry storage for compressors and parts held in inventory. See ER-25.1

Start Up Procedure

When starting the compressor a positive pressure is required at the pump inlet. Once the oil reaches normal operating temperature and the driver reaches full speed, the compressor oil pump supply pressure is to be 15 psig (1.0 bar_g) minimum to be sure the pump will not cavitate to allow full volume delivery.

NOTE: SEE ALSO "ELECTRIC MOTORS" IN ER-58.05.

1. Set the compressor filter differential pressure shutdown to 260 psid (18 bar_d) and the bearing lube oil differential pressure shutdown to 35 psid (2.4 bar_d).

5	Primary changes - Page 1: Delete #8. Page 2: Replace #5 verbiage, delete #7. Page 3: Add Operation Guidelines. See EC documentation for other change details.	4	014966	11-13-08			
		3	014394	5-4-07			
		2	013029	6-20-06			
		1	010774	1-15-03			
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2. Set the compressor capacity valve at the minimum load position. If necessary, use pre-lube pump to shift the capacity valve to the minimum load position. Set the position of the Vi valve to 5.0 at start-up.
3. At start up, set the rotor injection valve to allow as much oil as possible to flow through the oil supply piping. This will help warm-up the piping. Trim rotor injection oil flow after the oil temperature reaches 100°F (38°C) to increase the discharge temperature. This helps to remove water that may have condensed in the oil.
4. While the engine is warming up (at idle speed) and the compressor capacity valve is at its minimum load position the bearing lube oil differential pressure shutdown can be as low as 35 psid (2.4 bar_d). When the oil is cold and viscous the differential pressure is usually higher but falls as the temperature rises.
5. A minimal differential pressure of 50 psid (3.4 bar_d) above the compressor suction pressure must be maintained in the gas/oil separator, from compressor start-up until the system reaches normal operating pressures. This minimal differential pressure is to be sure that an adequate flow of scavenge line gas and oil will prevent the collapse of the coalescing filter elements, that a gearbox differential pressure will allow the gearbox oil to drain at low operating differentials, and that adequate pressure to flow oil, especially when cold, to the inlet of the lube oil pump will prevent cavitation or inadequate oil flow to the journal bearings and mechanical seal.
6. When the engine water jacket and engine oil temperature permissives are met, the engine will ramp-up to minimum load speed to begin loading the compressor. For electric motors, see ER-58.05.
7. When the compressor oil temperature reaches 150°F (65°C):
 - Set the compressor bearing lube filter differential pressure shutdown to 35 psid (2.4 bar_d).
 - If equipped with a rotor injection filter, set the filter differential pressure shutdown to 11 psid (0.76 bar_d).
 - Begin loading the compressor up to 20% of the capacity valve axial position to help increase the oil temperature faster.
 - Ramp the engine speed to 100%. The bearing lube oil differential pressure control valve setting is 60 psid (4.1 bar_d) when the compressor oil reaches operating temperature, at 100% engine speed.
8. After the engine reaches 100% speed, set the bearing lube oil differential pressure shutdown to 45 psid (3.1 bar_d) and load the compressor with the capacity valve to the allowable engine load (manifold pressure).

Operation Guidelines

Once the compressor completes the start-up sequence and the compressor lube oil reaches 150° F (65°C), the compressor can begin steady operation:



1. Ramp the engine to 100% speed.
2. Load the compressor to the available engine power using the capacity slide valve.
3. The PLC should calculate optimum Vi position based on P1 and P2 (measured at the suction and discharge flanges), capacity slide valve axial position, and the gas ratio of specific heats.
4. After establishing steady operating conditions, Ariel recommends the PLC check Vi valve position every 30 minutes. Changing the Vi valve axial position appreciably improves compressor performance only under one of these conditions:
 - Suction or discharge pressures change more than 10%.
 - The capacity slide valve axial position changes ¼" or more.

Compressor Manual Content

Ariel Rotary Screw Compressor Manuals as assembled by the Packager should include:

1. Warranty Registration Form (from Ariel Web site, public area).
2. Start-Up Check List (from Ariel Web site, public area).
3. Appropriate Vendor Literature (from Ariel Web site, public area). Ref ER-87.2 in Appendix G for information on Vendor Literature Selection.
4. Ariel Technical Manual (for appropriate Model, from Ariel Web site, public area).
5. Recommended Spares (S/N specific, from Ariel Web site, members only area).
6. Parts book - Parts lists and Assembly Drawings (S/N specific, from Ariel Web site, members only area).
7. Standard Abbreviations List (Ariel Web site, public area).

Collect the information directly from the Ariel web site each time it is needed for new equipment Manuals, so that the latest information is incorporated into each new Manual.

S/N specific information is posted in the Packager's Folder in the "Members Only" area on the Ariel website for approximately six months after a compressor ships from the Ariel factory. This information is stored in the permanent Ariel unit packet files.