

LACO TECHNOLOGIES

VACUUM CHAMBER MANUAL



INDUSTRIAL VACUUM CHAMBERS

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CONTENTS

- 1. SCOPE 1
- 2. SAFETY 1
- 3. OVERVIEW 2
- 4. BASIC OPERATION 2
- 5. MAINTENANCE 2
- 6. TROUBLESHOOTING 3
- 7. SPARE PARTS LIST 4

1. SCOPE

This guide applies to industrial vacuum chambers designed and operated at pressures (vacuum levels) from atmosphere to approximately 0.001 Torr (1 Torr absolute equals approximately 29.88" Hg relative at sea level). The vacuum chamber may achieve a deeper vacuum level with the appropriate vacuum pump, however, this guide is intended for use only when operating within this range.

2. SAFETY



Unless otherwise specified and designed, this vacuum chamber is designed to only be used under vacuum and not positive pressure. If the vacuum chamber is used in positive pressure applications the warranty is voided and the user will place themselves, other individuals, and the equipment in an unsafe condition.

CAUTION Use care when handling the vacuum chamber. Many of the chambers are very heavy. Use proper lifting equipment and safety devices. Do not lift or handle the chamber by the chamber ports, lid or associated valves. Use the provided lifting eyes or the chamber body itself to move larger chambers.

CAUTION Before running a vacuum process, ensure the process has been sufficiently researched and tested in order to prevent unsafe or adverse conditions from occurring. Never place objects or materials in a vacuum chamber that might explode or otherwise become a hazard when exposed to vacuum conditions.

CAUTION Keep all equipment associated with the vacuum chamber in proper and safe working conditions. Ensure all electrical wiring associated with the chamber is done in accordance to standardized electrical codes. If using electricity in or near a metal vacuum chamber ensure the chamber itself is grounded.

If the chamber is equipped with a view port, DO NOT operate the vacuum chamber if the view port material is cracked or damaged with deep scratches or gouges.

3. OVERVIEW

Most LACO industrial vacuum chambers include three main ports:

1. Vacuum port with valve to provide a vacuum source, such as a vacuum pump, to the chamber,
2. Vent port with valve to admit air into the chamber after the vacuum cycle has completed,
3. Gauge port to attach a vacuum gauge.

Additional ports are often included for a variety of purposes.

4. BASIC OPERATION

With chamber lid or door closed, open the vacuum valve to evacuate the chamber. The chamber air will evacuate and the vacuum pressure can be read via the gauge on the gauge port. Under vacuum conditions the valve can be left open to reach ultimate vacuum or the valve can be closed to maintain the current vacuum (Note that some vacuum pumps might not be designed nor well suited to operating in “blank-off” conditions and may require a vacuum relief valve to bleed air into the pump. Refer to pump manufacturer manual.) When the chamber is ready to be vented first ensure the vacuum valve is closed and then open the vent valve to vent the chamber back to atmospheric pressure. Never have the vacuum and vent valves open at the same time.

If using an oil-sealed mechanical pump with your vacuum chamber never turn off the vacuum pump unless the vacuum valve has first been closed (An alternate method is to close the vacuum valve AND vent the vacuum line before turning off the vacuum pump.). This will minimize the chance of pump oil to be sucked into and contaminate the vacuum chamber.

5. MAINTENANCE

Inspect the chamber gasket regularly to ensure no defects or wear have occurred. If cracks begin to appear in the gasket replace it immediately. See the spare parts section for ordering replacement gaskets. Do not clean your gaskets with any solvents as this will shorten the gasket life. To clean gaskets, wipe down gasket with a lint free wipe and DI water. A vacuum grease can be applied to the gasket to help enhance gasket life (see spare parts section). Apply the grease sparingly to the gasket to achieve a smooth, thin film.

Regularly clean your chamber to keep your vacuum process running at optimum performance. A dirty chamber may adversely affect your vacuum process, your vacuum pump, chamber gasket, or other vacuum components. Clean your chamber with mild detergent and rinse with DI water. Methanol or other mild solvents can also be used to clean or wipe

down the chamber but should NOT be used to clean acrylic chambers. Solvents will cause the acrylic to craze, thereby affecting visibility and chamber life. Use lint free wipes to wipe out chamber.

To attain good pump-down performance, ensure the vacuum pump you are using is properly sized for your application and chamber size. If using an oil-sealed pump change the oil regularly (see spare parts section for information on LACO pump oils).

6. TROUBLE-SHOOTING

The troubleshooting table below provides assistance to common vacuum problems.

Table 1: Troubleshooting

PROBLEM	CAUSE	SOLUTION
Chamber will not pump down	Leak in vacuum line	Check hose, hose connections, and clamps
	Door and gasket not sealing flat	Adjust hinge – contact LACO for assistance
	Defect in Gasket	Replace Gasket. See Spare Parts Section.
	Vent valve or other valve left open	Close Valve
Chamber evacuates slow	Poor vacuum pump performance	Change pump oil.
		Vacuum pump needs rebuild
	Outgassing of product	Minimize outgassing effect, remove offending part
	Outgassing of vacuum chamber	Clean vacuum chamber and components
	Leak in system	Inspect all components of connections. Helium Leak test chamber system, if possible. Perform rate of rise test to see if you have a leak or outgassing problems.

7. SPARE PARTS LIST

Refer to the table below for a list of replacement gaskets and o-rings for common vacuum chambers. For ordering specialty gaskets or other vacuum chamber replacement parts contact the LACO sales department.

Table 2: Spare Parts List

P/N	DESCRIPTION	WHERE USED
LG06B	L Gasket, BUNA, VAC, 6" DIA	All 6" OD chambers
LG08B	L Gasket, BUNA, Bell Jar, 7.25"	All 8" OD chambers
LG10B	L Gasket, BUNA, Bell Jar, 9.5"	All 10" OD chambers
LGR12.75	L Gasket, O-ring, 12.75" OD	All 12.75" OD chambers
LGR18B	L Gasket, O-ring, 18" OD	All 18" OD chambers
LGR24B	L Gasket, O-ring, 24" OD	All 24" OD chambers
LGO11.75B	O-ring, BUNA, 12"	All 12" clear chambers
LGO7.75B	O-ring, BUNA, 8"	All 8" clear chambers
LVODC150	Grease, vacuum, silicone, 5.3 OZ	All gaskets and o-rings