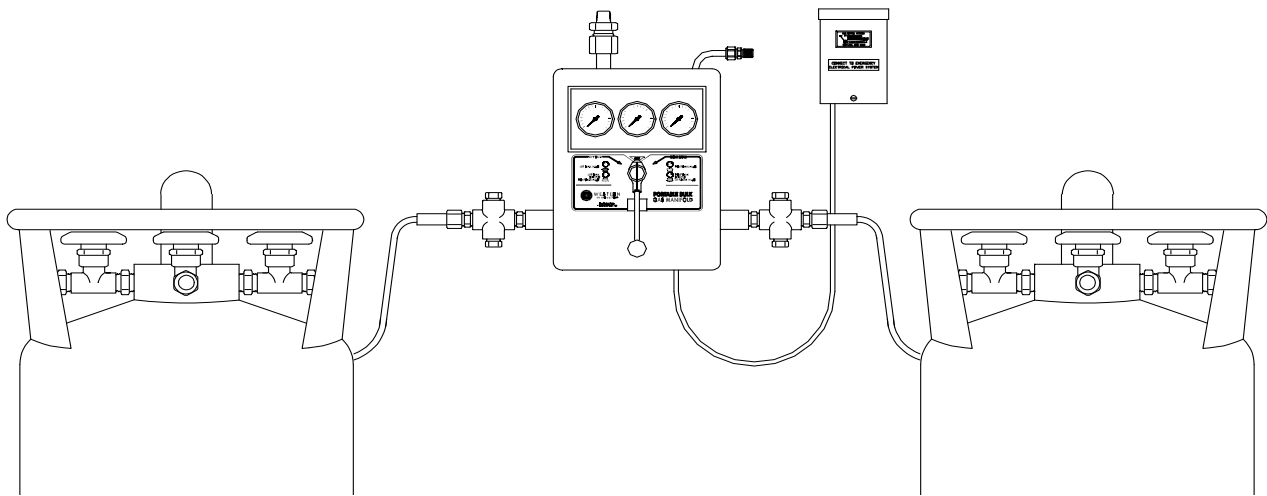


LC - Series**Automatic Manifolds for Cryogenic Liquid Cylinders in Industrial Applications**

The LC - series manifold systems are cleaned, tested and prepared for the indicated gas service and are built in accordance with the National Fire Protection Association and the Compressed Gas Association guidelines. The manifold is specifically designed to regulate and monitor vaporized gas from liquid cylinders with contents pressures of up to 235 psig. with the LC series and up to 350 psig. with the LCHP series and to provide an uninterrupted supply of gas for the specific gas application. The control is designed and built with features providing automatic changeover from the depleted "Service" supply bank to the "Secondary" supply with no loss or drop in delivery pressure. Pressure gauges, alarm signal connections and lights show system status and alert the need to replace depleted cylinders. An economizer control valve is contained within the cabinet to utilize accumulated pressure from the "Secondary" bank preventing the exhausting of useful product to the atmosphere. Features of the automatic system include an integral adjustable line regulator, 7/2" cryogenic flexible pigtails with check valves and complete mounting hardware.

The LC series manifold should be installed in accordance with guidelines stated by the National Fire Protection Association, the Compressed Gas Association, OSHA and all applicable local codes. The manifold should not be placed in a location where the temperature will exceed 120° F (49°C) or fall below 0° F (-17°C). A manifold placed in an open location should be protected against weather conditions including rain and heavy moisture. During winter, protect the manifold from ice and snow. In summer, shade the manifold and cylinders from continuous exposure to direct rays of the sun. The manifold should be located in a clean, well ventilated area which is free of oil and combustible materials.

**Specifications**

- All functional components (cryogenic regulators, check valves, relief valves and pressure switches) are enclosed in a tamper-resistant metal case.
- Manifold Outlet: 1/2 NPT male.
- Adjustable line regulator: 40-85 PSIG on LC.
40-120 PSIG on LCMP.
40-180 PSIG on LCHP.
(all gases except Nitrogen)
40-210 PSIG Nitrogen.
- 7/2" Cryogenic pigtails with check valves (nylon inner core with polyester braid) Maximum working pressure 1375 PSIG.
- System alarm lights with 115/24 VAC power supply box.
- Relief valve outlet: 1/4" NPT male.
- Inlet pressures from each liquid cylinder must be the same. If more than one cylinder is used per side a pigtail should be used to connect cylinder vent lines to ensure equalized cylinder pressure.
- LC systems with cryogenic liquid cylinders on both the service and secondary not recommended for applications using less than 50 SCFH.
- Minimum Inlet Pressure for LC: 125 PSIG.
- Minimum Inlet Pressure for LCMP: 160 PSIG.
- Minimum Inlet Pressure for LCHP: 250 PSIG.
- LC series units are designed for use with cryogenic liquid cylinders with 235 PSIG relief valves.
- LCMP series units are designed for use with cryogenic liquid cylinders with 235 PSIG relief valves.
- LCHP series units are designed for use with cryogenic liquid cylinders with 350 PSIG relief valve.
- Complete with wall mounting hardware and operating instructions.
- Control unit weight: 30 lbs. approximate.
- Current draw: .075 amps.

**LC - Series****Automatic Manifolds for Cryogenic Liquid Cylinders in Industrial Applications****Manifold Operation**

The LC series manifold control includes the following components and features: green “System Normal”, and red “Replace Depleted Bank” indicator lights, cylinder pressure gauges, line pressure gauge, inlet relief valves, supply bank control indicator lever and automatic bank switching. Supply banks consist of a tee with 72” cryogenic flexible pigtailed with check valves. The cylinder bank that supplies the piping system is known as the “Service” supply, while the cylinders on stand-by are referred to as the “Secondary” supply. The service side gas flows through the manifold control directly through the line regulator. Delivery pressure is controlled by the line regulator and is adjustable via the access hole in the upper left hand side of the cabinet. Changeover from the “Service” to “Secondary” side is controlled by the intermediate regulator. As cylinder contents are depleting, pressure passing through the manifold will drop. When this pressure drops to the set pressure of the intermediate regulator, a pressure switch is activated causing the green “System Normal” light to go out and a red “Replace Depleted Bank” light to come on. The “Secondary” bank will automatically begin to flow without any interruption in service line delivery pressure. There are two definite indicators as to which bank should be changed; (1) the arrow on the control lever in conjunction with the red “Replace Depleted Bank” light and (2) the cylinder bank pressure gauge. After replacing empty cylinders, open cylinder valves. Because the cylinder pressure will actuate the pressure switch, the red “Replace Depleted Bank” light will be extinguished. The lever indicator must be turned to its opposite position to make the old secondary bank the new service bank. Moving the indicator lever to its new position after replacement of an empty bank is the only action that must be taken to reset the manifold. The indicator lever must always be in the extreme right or left position.

Flow Capability

The flow capability of the manifold will depend upon conditions at the installation site, demands of the delivery system and the number of containers in supply service. Maximum capability is 750 SCFH at 50 PSIG delivery and 125 PSIG inlet pressure. Maximum capability is 800 SCFH at 160 PSIG delivery and 250 PSIG inlet pressure. Installing the manifold in a location which exposes it to ambient temperatures below those specified on page 1 is not recommended.

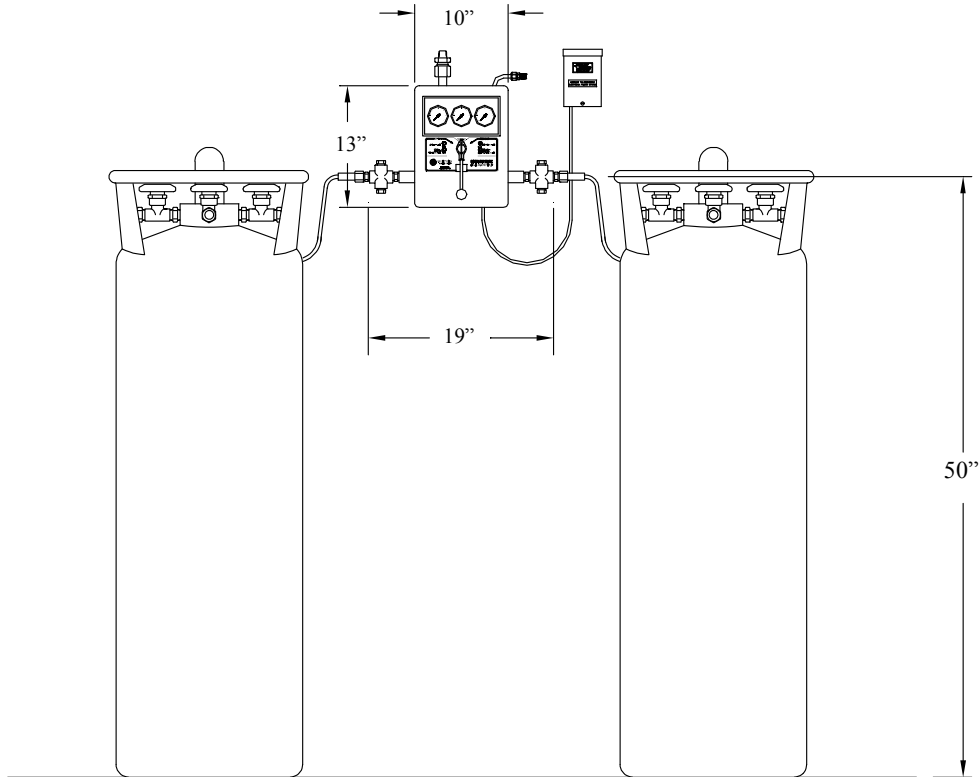
Argon:	750 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 125 PSIG inlet pressure. 500 SCFH maximum at 50 PSIG delivery with a 5 PSI pressure drop and 125 PSIG inlet pressure.
Oxygen:	750 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 125 PSIG inlet pressure. 500 SCFH maximum at 50 PSIG delivery with a 5 PSI pressure drop and 125 PSIG inlet pressure.
Nitrogen:	800 SCFH maximum at 160 PSIG delivery with a 15 PSI pressure drop and 250 PSIG inlet pressure.
Nitrous Oxide:	750 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 125 PSIG inlet pressure. 500 SCFH maximum at 50 PSIG delivery with a 5 PSI pressure drop and 125 PSIG inlet pressure.
Carbon Dioxide:	750 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 125 PSIG inlet pressure. 500 SCFH maximum at 50 PSIG delivery with a 5 PSI pressure drop and 125 PSIG inlet pressure.

Practical Continuous Gas Withdrawal rate from Liquid Containers at 70° F:

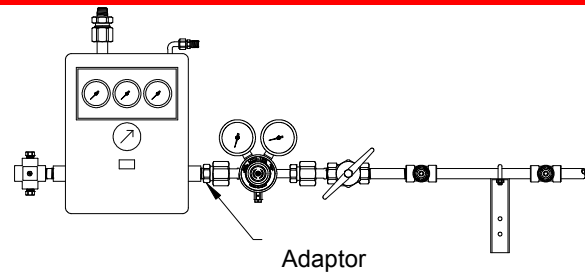
Argon	375 SCFH max. from the first container, 180 SCFH from each additional container.
Carbon Dioxide:	110 SCFH max. from the first container, 55 SCFH from each additional container.
Nitrogen:	375 SCFH max. from the first container, 180 SCFH from each additional container.
Nitrous Oxide:	80 SCFH max. from the first container, 40 SCFH from each additional container.
Oxygen:	375 SCFH max. from the first container, 180 SCFH from each additional container.

Power Source Requirements

A 115 VAC to 24 VAC power supply is provided with the manifold to operate the alarm lights on the manifold. Under normal operation the manifold will draw a maximum of 75 millamperes (.075 amperes).

LC - Series**Automatic Manifolds for Cryogenic Liquid Cylinders in Industrial Applications**

For applications that do not justify using portable bulk vessels as both the service and reserve, the LC control unit may be used in conjunction with Western models MS or MSHP high pressure reserve manifolds to prevent excess product flow from the “secondary” bank and/or loss. System allows manifolding up to three (3) liquid supply cylinders and an unlimited number of high pressure reserve cylinders. Unit will automatically switch from the exhausted “service” bank (portable bulk cylinders) to the “secondary” bank (high pressure cylinders) without any interruption of line service. Inlet pressure from the high pressure reserve manifold must be set at 125 PSIG when used with model LC, 160 PSIG when used with model LCMP, and 250 PSIG when used with model LCHP.



Note: LC series units used in combination with MS series units are two separate manifolds which must be ordered as two separate line items. Please see the MS technical data for information on ordering the MS manifold.

How to Order: Specify; Control type (W) - Service (X) - Number of Cylinders (Y) Mounting (Z)

Example: LC-3-4F represents LC with argon service of 4 liquid cylinders with 235 psig. pressure relief valves, and includes floor stands.

Control Type (W)	Gas Service (X)	Number of Cylinders (Y)	Mounting (Z)
LC (40 - 85 PSIG)	(3) Argon CGA 580		Blank = Wall Mount (standard)
LCMP (40 - 120 PSIG)	(4) Carbon Dioxide CGA 320		
LCHP (40 - 180 PSIG (all gases except Nitrogen))	(5) Helium CGA 580		F = Floor Stand
	(7) Nitrogen CGA 580		
	(8) Nitrous Oxide CGA 326		
LCHP Nitrogen (40 - 210 PSIG)	(9) Oxygen CGA 540		

Warranty

All Western manifolds are warranted against defects in materials and workmanship for the period of one year from the date of shipment. For complete information on the warranty please see the back cover of the Installation and Operations manual.