

LCS Series

Cryogenic Liquid Container, Automatic Changeover Systems

The LCS Series System is designed to provide a continuous supply of vaporized gas from two or more cryogenic liquid containers. It allows the user to deplete gas in a container without the concerns of gas outages and of wasting unused gas as a result of premature change-outs. When the system is in use, the built-in gas saver circuit directs accumulated pressure from the reserve supply container to the process before the container relief valve opens, venting useable product to the atmosphere. When the system is not operating, the gas saver circuit inactivates allowing both containers to accumulate pressure and vent to atmosphere. Adequate ventilation should therefore be provided to safely remove or dispense the gaseous discharge.

The unique design of the system incorporates two diffusion-resistant regulators housed in a single body acting as a changeover mechanism. In addition, a line regulator is attached to the outlet, which insures constant delivery pressure to the use point.

The LCS System is supplied with diaphragm packless isolation and vent valves, allowing for positive shut-off and purging of entrapped air and moisture from start-up, or after a container change-out. The unit is entirely installed on a 12-gauge, powder coated, silkscreen labeled panel with mounting slots. Two 5-foot flexible pigtailed and an outlet shut-off valve are provided as standard.

Note: See page 92 for additional LCS Alarm Changeover Systems with prewired switches and annunciators.



LCS Changeover

Standard Features

- Prevents Gas Outages and Wasted Gas due to premature container change-out.
- Gas Saver prevents reserve cylinder pressure from being wastefully discharged to atmosphere during operation.
- High-Purity Design makes this system ideally suited for gas chromatography and laboratory gas applications.
- Vent Valves Optimize System Purity by allowing line purge and cleaning during container change-outs.
- Check Valves prevent discharge of gas from manifold and pigtailed when changing containers.
- Wall Mount Panel Design affords easy on-site installation.

Optional Features

- Alarmed Changeover System with pre-wired pressure switches and annunciator allows for convenient and easy installation (see page 92)
- Relief Valves protect regulator components from the effects of overpressurization.

Specifications

Maximum Inlet Pressure: 550 psig
 Inlet Pressure Gauges (dual scale): 0–600 psig / 0–41 bar
 Minimum Inlet Pressure: See Note
 Delivery Pressure Gauge: 0–200 psig / 0–14 bar
 Delivery Pressure Range: See Note 10–150 psig / 0–7 bar (adjustable)
 Gauge Size: 2.5" Dial
 Operating Temperature Range: -40°F to 140°F
 Flow Coefficient: $C_v = 0.02$
 Flow Capacity: 200 scfh N_2 @220 psig minimum inlet pressure
 Container Leads: All Stn. Stl. Flexible Hose: 60" long
 Inlet Connections: CGA connections with integral check valve nipples (standard) as specified
 Outlet Connection: 1/4" compression
 Designed Leak Rate: Bubble-Tight (helium)
 Approximate Weight: 12 lbs.

Materials of Construction

Body: Nickel Plated Brass Bar Stock
 Gauges and Bonnets: Nickel Plated Brass
 Internal Metal Parts Exposed to Gas: Brass and Stainless Steel
 Seats: PCTFE
 Diaphragms: Type 316L Stainless Steel
 Container Leads: Type 316 SS inner-core and end fittings with Type 304 SS double over-braid
 CGA Connections: Brass
 Panel: 14-Gauge Powder Coated Steel

Note: To obtain a delivery pressure of 150 psig, the liquid container pressure build circuit must be set to maintain 220 psig or greater. A changeover used with a liquid container having a pressure build circuit set to maintain 160 psig will only provide a maximum delivery pressure of 90 psig.

Operation

When both sides of the changeover are connected to a gas supply, gas will flow only from the primary side (bank no. 1), which will be indicated by the "In-Service" arrow located on the hand knob. The secondary side (bank no. 2) will remain closed.

When the gas in the primary bank has been exhausted, the changeover regulator will automatically switch to the secondary, or reserve bank. A fluctuation in outlet pressure will occur at this point. The LCS Series changeover system incorporates a built-in line regulator, which eliminates the fluctuation and insures a constant delivery pressure to the use point.

Once a changeover has occurred, the hand knob on the changeover regulator should be rotated approximately 180° to indicate that bank no. 2 is now in service. This also resets the changeover regulator with bank no. 2 becoming the primary bank.

To replenish the gas supply in bank no. 1, the isolation valve is closed and the empty container(s) is replaced with a full container(s). The process gas and vent valves can then be used to purge and vent entrapped air and moisture from the pigtail. The isolation valve is then reopened, with bank no. 1 now functioning as the secondary, or reserve side.

Ordering Information

The LCS Series changeover is designed for use with cryogenic liquid containers having safety relief valve settings of either 230, 350 or 500 psig. The factory settings for the switching band, gas saver circuits and maximum adjustable delivery range are dependent on the safety relief valve and pressure build circuit settings for the liquid container. The changeover will not operate properly if the minimum container settings shown in Table I are not adhered to.

To order a changeover, first review the container settings with your gas supplier then select the part number from Table I.

Note: The LCS is factory preset. The outlet pressure is the only adjustment the operator can make on the panel. The primary switching band and the gas saver circuit settings are set at the factory and cannot be made in the field without technical assistance from ASGE. Contact your ASGE distributor if you require the unit to be reset.



Cryogenic container with flexible pigtail connected to gas use valve.

Table I

Part No.	Container Minimum Safety Relief Setting (psig)	Container Minimum Pressure Build Circuit Setting (psig)	Changeover Maximum Adjustable Delivery Pressure (psig)	Changeover Primary Switching Band Setting (psig)	Changeover Gas Saver Circuit (Economizer) Setting (psig)
LCS-B-230-(CGA)	230	160	90	130-100	190
LCS-B-350-(CGA)	350	220	150	200-180	290
LCS-B-500-(CGA)	500	240	150	220-200	440

Where "(CGA)" is indicated above, insert appropriate Compressed Gas Association connection number to complete the part number. Example: LCS-B-230-580. Order by complete part number.