



619 Series Automatic Gas Switchover System

INSTALLATION AND OPERATION INSTRUCTIONS

Before Installing or Operating, Read and Comply with These Instructions

Controls Corporation of America
1501 Harpers Road Virginia Beach, VA 23454
To Order Call 1-800-225-0473 or 757-422-8330 • Fax 757-422-3125
www.concoa.com

DESCRIPTION OF PRODUCT

The 619 series switchover is an automatic switchover system designed to provide a continuous supply of LASER gas. The proven pressure differential technology enables failsafe operation with simple priority valve assignment. The inlet of the switchover system may be purchased with open ports, isolation valves, an integral two cylinder capacity manifold, an integral two cylinder capacity manifold with purge or flexible pigtailed. Consistent outlet pressure is achieved with the optional line regulator.

When configured with the remote alarm, the remote alarm provides audible and visual warning that a changeover is about to occur. Pressing a button on the front of the remote alarm silences the audible alarm. The LED's on the remote alarm indicate the status of the left and right banks.

INTENDED USE OF PRODUCT

This product is intended for use with Laser purity gases such as helium, nitrogen, carbon dioxide, or mixtures of these three gases and low ppm levels of carbon monoxide.

USER RESPONSIBILITY

This equipment will perform in conformity with the description contained in this manual and accompanying labels and/or inserts when installed, operated, maintained, and repaired in accordance with the instructions provided. This equipment must be checked periodically. Improperly working equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated, should be replaced immediately. CONCOA recommends that a telephone or written request for service advice be made to CONCOA Customer Service in Virginia Beach, Virginia, PHONE: 1-800-225-0473, FAX: 1-757-422-3125, or E-MAIL: info@concoa.com.

This equipment or any of its parts should not be altered without prior written approval by CONCOA. The user of this equipment shall have the sole responsibility for any malfunction that results from improper use, faulty maintenance, damage, improper repair, or alteration by anyone other than CONCOA or a service facility designated by CONCOA.

CUSTOMER ASSISTANCE

In the event of equipment failure, call CONCOA Customer Service. Please be prepared to provide the model number and serial number of the equipment involved, in addition to some details regarding its application. This would include inlet and outlet pressures, flow rate, environmental conditions, and gas service.

Things to consider before removing the system from the box....

1. Know the properties and special handling requirements of the gas being used. Many gases are quite dangerous (flammable, toxic, corrosive, simple asphyxiant, or oxidizers). Equipment failure or misuse may lead to problems such as a release of gas through the relief valve or regulator diaphragm. Proper safety measures should be established to handle these and other component failures.
2. Be sure that the assembly purchased is suitable for the gas and type of service intended. The system label provides the following information:
 - a. Model number
 - b. Serial number
 - c. Maximum inlet pressure

Be sure that the equipment received conforms to the order specifications. The user is responsible for selecting equipment compatible with the gas in use, and conditions of pressure, temperature, flow, etc. Selection information can be found in CONCOA technical data sheets. In addition, CONCOA representatives are trained to aid in the selection process.

3. Inspect the assembly upon receipt to be sure that there is no damage or contamination. Pay particular attention to connecting threads. While CONCOA assembles system components to exacting leak-tight standards, the customer should also inspect for any loosening of parts that may occur in shipping or installation. Loose parts may be dangerously propelled from an assembly. If there are adverse signs (leakage or other malfunction), return the assembly to the supplier. While it is advised that soiled regulators be returned for cleaning, simple external dust or grease may be removed by a clean cloth and if required with aqueous detergent suitable for the application. If there are signs of internal contamination, return to the supplier.
4. Before system startup, it is recommended that all systems be pressure tested, leak tested, and purged with an inert gas such as nitrogen. To accomplish this with connections other than a CGA 580, it will be necessary to use an adapter. The recommended use of an adapter is for temporary use, for start-up and system checks only. Adapters should never be used on a permanent basis.

GENERAL SAFETY PRACTICES

Comply with precautions listed in C.G.A. Pamphlet P-1, Safe Handling of Compressed Gases in Containers.

Consult the cylinder distributor for the proper use of cylinders and for any restrictions on their use (such as flow rate and temperature requirements).

Store cylinders with valve caps screwed on, and cylinders chained to a supporting wall or column.

Handle cylinders carefully and only with valve caps screwed on. The cap will reduce the chance that the cylinder valve will break off if the cylinder is accidentally dropped or falls over. The cap also protects the cylinder valve from damage to screw threads, which could cause leaky connections.

All manifolds used with flammable gases should be provided with approved flashback arrestors to stop any burning gas in the pipeline from getting back to the manifold or cylinders.

No smoking should be permitted near oxygen, nitrous oxide, any other oxidizer, flammable gases, or flammable mixtures, or in areas where cylinders are stored.

Where oxygen or nitrous oxide is used, the manifold and cylinders must be kept clean. No oil, grease, or combustible substances should come in contact with oxygen or nitrous oxide storage or handling equipment. Such materials in contact with oxygen or nitrous oxide are readily ignitable and when ignited, will burn intensely.

Never strike an electric arc on a gas cylinder of any kind.

Never lift gas cylinders with a magnetic lifting device.

Never use an open flame when leak testing.

Always open valves slowly when high-pressure gases are being used.

Always be sure that a cylinder contains the correct gas before connecting it to any manifold.

Always leak-test any manifold or distribution pipeline before using.

Always be sure that the gas in a pipeline is the correct gas for the intended use.

Always close all cylinder valves before disconnecting cylinders from a manifold.

Always remove all empty cylinders from a manifold before connecting full cylinders.

Always test cylinders to be sure the cylinders are full before connecting to a manifold.

All gas distribution piping systems must meet the appropriate industrial standards for the intended service and must be thoroughly cleaned before using. For the United States, some applicable safety rules and precautions are listed below:

1. American National Standards Institute standard Z49.1, Safety in Welding and Cutting, American Welding Society, 2501 NW Seventh Street, Miami, Florida 33125
2. N.F.P.A. Standard 51, Oxygen-Fuel Gas systems for Welding and Cutting, N.F.P.A., 470 Atlantic Avenue, Boston, Massachusetts 02210
3. N.F.P.A. Standard 51B, Cutting and Welding Processes (same address as #2).
4. CONCOA publication ADE 872, Safety Precautions in Welding and Cutting.
5. Local Ordinances
6. O.S.H.A. Standard 29 CFR
7. C.G.A. Pamphlet C-4, American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained.
8. C.G.A. Pamphlet G-4, Oxygen – Information on the properties, manufacture, transportation, storage, handling, and use of oxygen.
9. C.G.A. Pamphlet G-4.1, Equipment Cleaned for oxygen service.
10. C.G.A. Pamphlet G-4.4, Industrial Practices for Gaseous Oxygen Transmission and Distribution Piping Systems.
11. C.G.A. Pamphlet G-5, Hydrogen – Information on the properties, manufacture, transportation, storage, handling, and use of hydrogen.
12. C.G.A. Pamphlet G-6, Carbon Dioxide – Information on the properties, manufacture, transportation, storage, handling, and use of carbon dioxide.
13. C.G.A. Pamphlet G-6.1, Standard for Low Pressure Carbon Dioxide Systems at Consumer Sites.
14. C.G.A. Pamphlet P-1, Safe Handling of Compressed Gases in Containers.
15. C.G.A. Safety Bulletin SB-2, Oxygen Deficient Atmospheres.

*C.G.A. pamphlets can be obtained from the Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202-3239, (703) 979-0900. Publications: (703) 979-4341. Fax: (703) 979-0134.

LOCATION

Keep all cylinders and manifolds away from any source of high temperature over 120°F (50°C) or possible fire hazards. High-pressure gas contained in a closed cylinder becomes increasingly dangerous when exposed to high temperature because pressure increases and the strength of the cylinder decreases. Manifolds installed in open locations should be protected from weather conditions. During winter, protect the manifold from ice and snow. In summer, shade the manifold and cylinders from continuous exposure to direct sunlight. Always leave access to the manifold for cylinder replacement.

The site chosen for the manifold installation shall be level, well ventilated, and at a safe distance from sources of flames, sparks, and excessive heat. The manifold should not be placed in an area that may subject the manifold to damage from passing trucks, cranes, or other heavy machines. Oxygen manifolds must not be installed under shafting, belting, or other places where oil can drip on them. Under no circumstances should liquid product be allowed into the hoses or manifold. For other location guidelines, see NFPA standard 51.

INSTALLATION

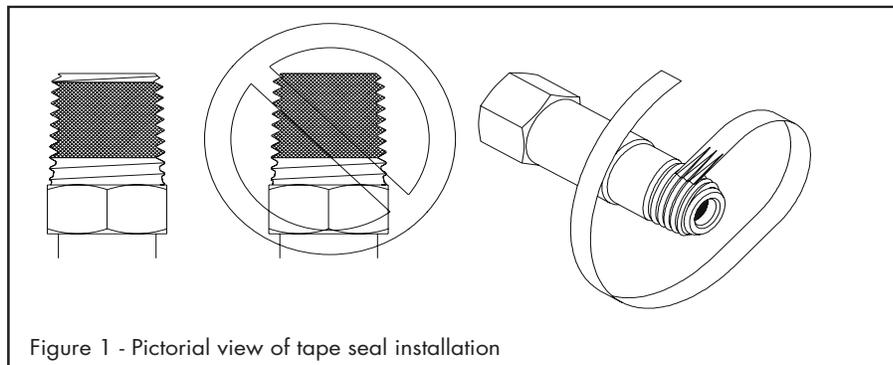
Installing the system:

1. Be sure to consider all factors when selecting materials.
2. Do not use oil or grease on fittings.
3. Be sure that all fittings are secure and leak tight. Teflon tape should be used on pipe threads as illustrated in Figure 1.
4. Relief valve: The purpose of the relief valve is to protect the autoswitch system and its components only. If there is pressure sensitive equipment downstream of the autoswitch system, it is recommended that a relief valve be installed in the line to protect this equipment.
5. Purge devices: These devices are recommended to ensure a contamination free system.. Purge devices are used to isolate and remove unwanted atmospheric contaminants that exist between the CGA gland check valve and cylinder valve during a cylinder exchange..

INSTALLING INLET AND OUTLET CONNECTIONS

Use an open-end wrench, not a pipe wrench, to install accessories to the system. The NPT connections require the use of PTFE tape on the threads to make a gas tight seal. On stainless steel connections, the PTFE tape helps prevent the connections from galling together when tightening or loosening. Follow these rules when using PTFE tape.

Taping procedure:



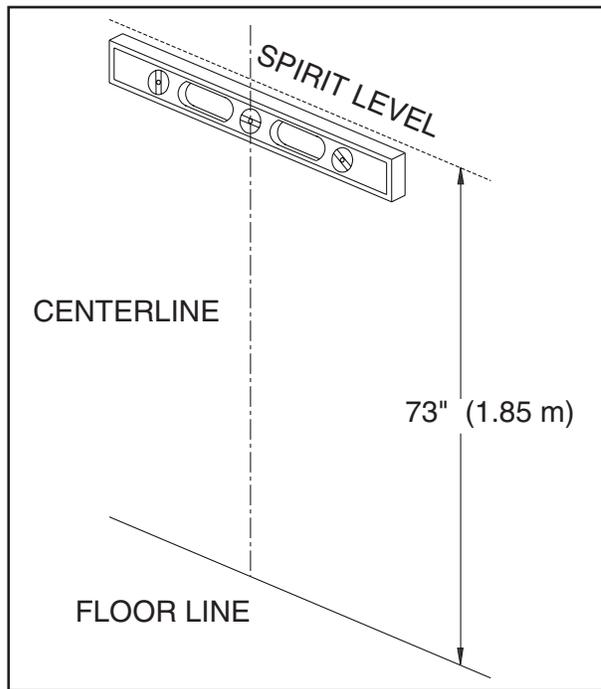
Before applying PTFE tape, inspect the NPT threads and if necessary, clean the fitting to remove any dirt or thread sealant that remains on the threads. Start the PTFE tape on the second thread as shown above; make sure the tape does not overlap the end of the fitting. As the tape is wrapped in the direction of the thread spiral, pull tightly on the end of tape so that the tape conforms to the threads. Apply two overlapping layers of PTFE tape. Cut off the excess tape and press the end firmly into the threads.

WALL MOUNTING

619 Installation With Single Hose

1. Determine and mark the vertical line of center for installation of the 619 system.
2. Measure from the floor 73" and make a mark on the line of center. Using a level, draw a horizontal line from the mark extending approximately 10 inches to the left and right of center as illustrated in Figure 2. The height of 73 inches is recommended; the typical installation for high-pressure cylinders needs 66 inches between the floor and the "Inlet" port. Leave enough space between the cylinder tops and the manifold.
3. Place the upper edge of the panel on the horizontal line so that the delivery regulator is centered with the vertical line.

Figure 2



- As illustrated in Figure 3, the 619 is secured to a panel that has mounting holes located at each corner.

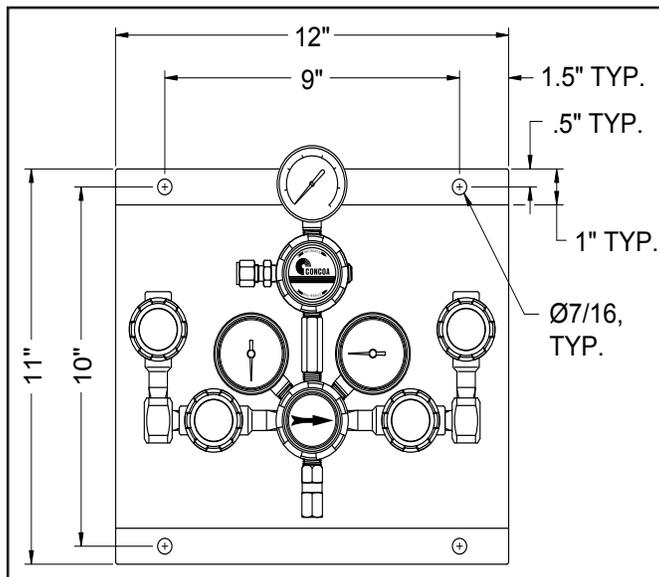


Figure 3

- Mark the location of the panel mounting holes.
- Using appropriate hardware, anchor the switchover-mounting bracket to the wall. Make sure the panel is level.
- Tape the $\frac{1}{4}$ " M-NPT thread of the cylinder pigtail.
- Secure the street elbow as illustrated in Figure 4 or micro-tee in Figure 5 (included with diaphragm inlet option) with a wrench while threading the taped male NPT end of the pigtail.
- Repeat steps 7-8 for the opposite inlet of the switchover.
- Refer to "Connecting a Cylinder" for directions on connecting the pigtail to the cylinder.
- Refer to "Pressure Testing the System" to confirm that there are no leaks in the system.

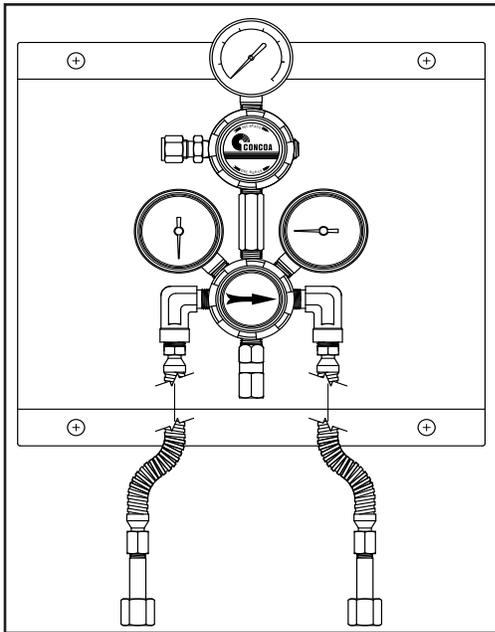


Figure 4

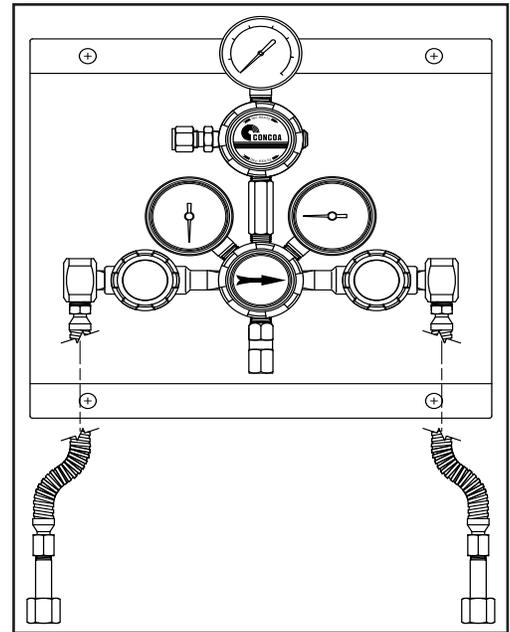


Figure 5

619 Installation With Integral Purge And Micro-Tee

1. Determine and mark the vertical line of center for installation of the 619 system.
2. Measure from the floor 73" and make a mark on the line of center. Using a level, draw a horizontal line from the mark extending approximately 10 inches to the left and right of center as illustrated in Figure 2. The height of 73 inches is recommended; the typical installation for high-pressure cylinders needs 66 inches between the floor and the "Inlet" port. Leave enough space between the cylinder tops and the manifold.
3. Place the upper edge of the panel on the horizontal line so that the delivery regulator is centered with the vertical line.
4. As illustrated in Figure 3, the 619 is secured to a panel that has mounting holes located at each corner.
5. Mark the location of the panel mounting holes.
6. Using appropriate hardware, anchor the switchover-mounting bracket to the wall. Make sure the panel is level.
7. Tape the 1/4" M-NPT thread of the cylinder pigtail.
8. Secure the micro-tee as illustrated in Figure 6 with a wrench while threading the taped male NPT end of the pigtail. If the 619 is configured with two cylinders per side, thread the second hose or pigtail into the elbow located on the backside of the micro-tee.

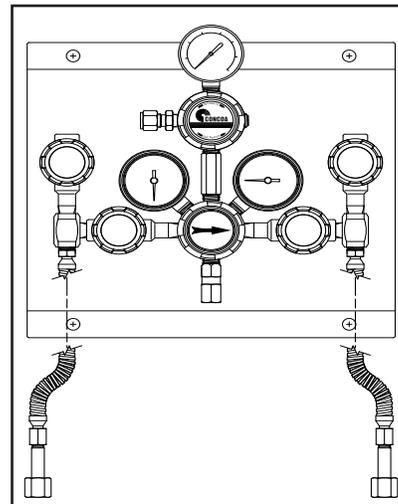


Figure 6

9. Repeat steps 7-8 for the opposite inlet of the switchover.
10. Refer to “Connecting a Cylinder” for directions on connecting the pigtail to the cylinder.
11. Refer to “Pressure Testing the System” to confirm that there are no leaks in the system.

CONNECTING A CYLINDER

Connecting High-pressure Cylinders

Read the next section before installing cylinders. The 619 is designed to deliver gaseous phase from high purity cylinders rated up to 4,500 Psi Max.

1. Before removing the cylinder cap, move the cylinder with a cylinder cart to the work site:
 - a. Secure cylinder to the floor, wall, stand or bench with the appropriate chain or strap to prevent toppling.
 - b. Remove the cap if using a high-pressure cylinder.
 - c. Be sure the cylinder valve is tightly closed. (clockwise)
 - d. Remove the cylinder valve plug, if any.
 - e. Inspect the cylinder valve and threads for damage or contamination.
2. If replacing an empty cylinder,
 - a. Close the manifold isolation valve (if equipped).
 - b. Close the gas use valves on each cylinder on the depleted cylinder bank.
 - c. Loosen the pigtail CGA connection to the cylinder's gas use valve a quarter turn to depressurize.
WARNING: The operator should secure the pigtail with one hand until exhausting of gas has subsided.
 - d. Finish removing the CGA connection from the gas use valve.
 - e. Repeat process for each additional cylinder to be used on the manifold.
 - f. Replace the empty cylinders.
3. Secure the pigtail cylinder connection to the high-pressure cylinder valve in the following manner:
 - a. Remove pigtail plastic cap if present.
 - b. Thread the nut into the cylinder valve CGA connection. Do not cross thread or force. If it does not fit, the connection may be wrong for the type of gas being used.
 - c. Left-hand threads are used on flammable type cylinder connections. The notch in the middle of the hex nut can identify them.
 - d. Teflon gaskets or washers are used for some cylinder connections such as carbon dioxide CGA 320. Be sure the gasket is in good shape. Do not over-tighten to avoid deforming the gasket which may create a leak or failure.
WARNING: Never use oil or grease on regulator or cylinder fittings, as it may contaminate pure gases or create a fire hazard.
4. If installing a new system, proceed to "Pressure testing the system". Otherwise, open each cylinder gas use valve after all new cylinders have been properly connected and secured.
5. Check all joints for leaks using oxygen compatible leak detection solution.
6. If a leak is detected, depressurize the system and fix leaking connection. Never attempt to fix a leak under pressure.
7. Once all connections are secure and leak free continue to the next step.
8. Open each cylinder gas use valve after all new cylinders have been properly connected and secured.
9. Open the purge valve for 5 seconds to evacuate atmospheric containments (as illustrated in Figure 8B, if equipped).
10. Close purge valve (if equipped).
11. Open the isolation valve (if equipped).
12. The 619 is ready for use.

Installing the outlet connection:

The standard system has the outlet connection at the left or right of the delivery regulator. The connection is a ¼” or 6mm stainless steel tube connection. Connect suitable tubing to the connection that is rated to the pressure of the system. See the appendix for instructions on making up the Swagelok tube connection.

Pressure testing the system:

Before system startup, it is recommended that all systems be pressure tested, leak tested, and purged with a clean, dry inert gas like helium or argon.

1. Wear safety glasses and gloves.
2. Connect last pigtail on the manifold to a test cylinder regulated to 50 psi as illustrated in Figure 7. Do not open the cylinder valves yet.

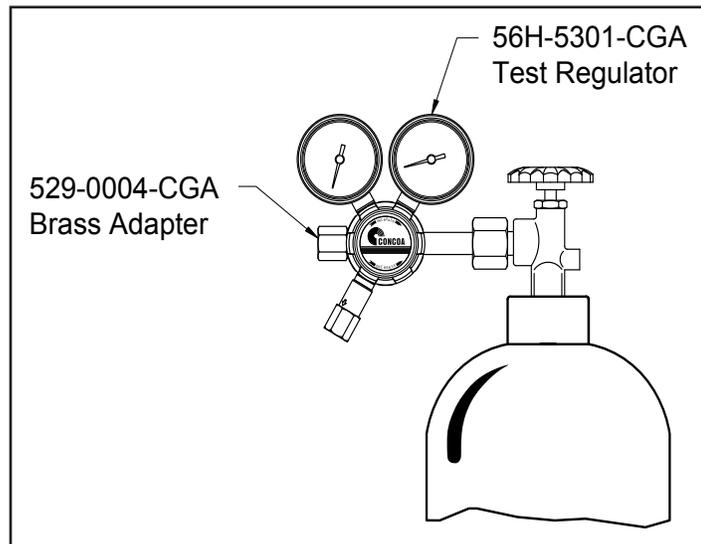


Figure 7

3. Make sure all pigtails have been properly secured to the 619 manifold.
4. Isolate the outlet of the pressure control device (Regulator or Switchover) from the piping leading to the point of use. This will allow you to confirm that the manifold and pressure control device is leak free. It is not uncommon for there to be a small leak in the pipe line or point of use.
5. When first pressurizing, do not stand in front or in contact with regulator or switchover system.
Warning: If the attached regulator is preset, or a switchover is without a line regulator, gas will escape from the delivery side of the pressure control device.
6. Turn the adjusting screw or knob of the test regulator counter clockwise until it disengages the adjusting spring.
7. Slowly, open the test cylinder valve.
8. Next, adjust the test regulator to 50 psi.
9. Wait 5-10 seconds for the system pressure to equalize.
10. Close the test cylinder valve.
11. Inspect all connections for leaks and fix any leaks. A leak detection solution may be applied to the connections (if compatible with the application), which indicates leaks by bubbling. To further check for leaks or if a leak detection solution cannot be used, keep test cylinder valve closed for a period of time (24 hours) and observe the test regulator's low pressure gauge for a drop in pressure.
12. If a drop in pressure is observed, recheck all connections.
13. Depressurize the system and fix leaking connection. Never attempt to fix a leak under pressure.
14. Once all connections are secure and leak free continue to the next step.
15. Now set the outlet pressure of the pressure control device and open any isolation valve to allow the pipeline to pressurize.

16. Repeat steps 5-14.
17. When all leaks are fixed, close the test cylinder valve. Bleed system pressure to zero.
18. Repeat steps 1-17 with test regulator set at 500 psi.
19. Disconnect the test cylinder and regulator.
20. Connect service gas cylinders to the manifold by following the section titled "Connecting a Cylinder"

OPERATION

1. At start up connect full cylinders to the left and right cylinder bank by following the appropriate sections titled "Connecting a Cylinder" and "Pressure testing the system".
2. Rotate the priority valve to the high-pressure cylinder bank that you establish as primary.
3. Set the desired line pressure as required by the application. The 619 will automatically withdrawal gas from the primary cylinder bank.
4. The 619 50-psi and 100-psi models will automatically switch over to the left cylinder bank at 200 psi when the priority arrow is pointing to the right bank. The 619 will switch over to the right bank at 170 psi with the arrow to the left. The 200 psi model will switch at 312 psi and 275 psi respectively.
5. Bank depletion is conveyed by either a remote alarm or the inlet pressure gauge value has reached the respective switching pressure listed in step 4.
6. Isolate the side that has depleted by closing its isolation valve (if equipped) as illustrated in Figure 8A.
7. Rotate the 619 priority valve away from the depleted cylinder bank illustrated in Figure 8B.
8. Replace the empty cylinders by following the section titled "Connecting High-pressure Cylinders".

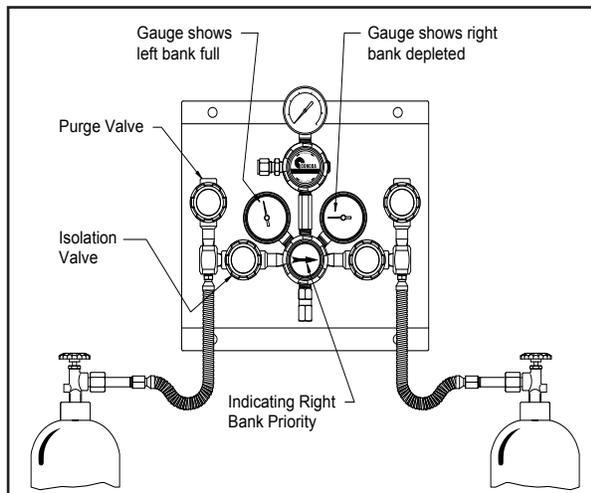


Figure 8A

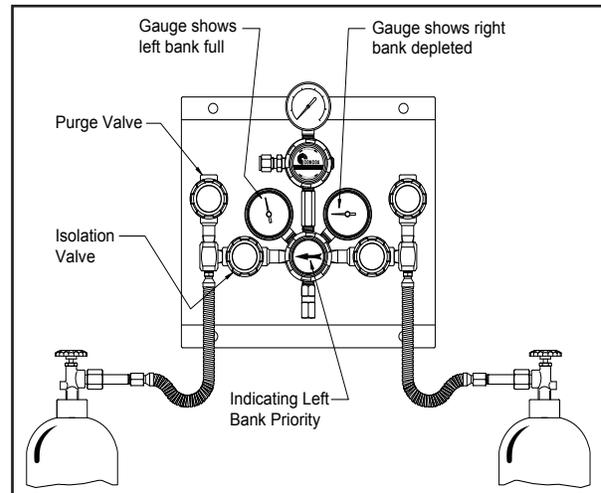


Figure 8B

MAINTENANCE

At regular intervals, the system should be checked for leaks and proper function (see trouble shooting). Any leaks in the system should be corrected immediately. At no time should the preset regulator's or priority valve regulator's pressure settings be changed.

TROUBLESHOOTING

Typical symptoms listed below indicate regulator malfunctions needing repair. Replace immediately with a clean, repaired and tested, or new system.

1. Gas leakage at the line regulator outlet when the adjusting screw of the line regulator is completely backed out.
2. With no flow through the system (downstream valves closed and adjusting screw in) line pressure steadily increases above set pressure.

3. Gas leakage from spring case (adjusting screw/knob end off regulator).
4. Gas leakage from any joint.
5. Excessive drop in working pressure with regulator flowing gas.
6. Gas leakage from relief valve.
7. Gas leakage from gauge
8. Gauge does not return to zero when not under gas pressure
9. Gauge does not consistently repeat the same reading.
10. The system makes a noise or hums.

If the switchover system seems to be using gas from the primary and reserve cylinders (pressure is decreasing on both inlet gauges at the same time), do the following:

1. Make sure the priority valve knob is turned fully to the right or left.
2. Observe the inlet pressure. It may be necessary to do this during the heaviest use of the system. If the inlet pressure is below the switchover point, replace the high-pressure cylinders. Additional capacity may be added to the system to prevent this.
3. If the above does not fix the problem, please contact CONCOA customer service.

SERVICE

A unit that is not functioning properly should not be used. It is recommended that all servicing be done by a service facility authorized by CONCOA. For items not covered by the warranty, contact the nearest CONCOA District Sales Office for assistance. Please contact a Customer Service Representative at 1-800-225-0473 for systems still covered by the warranty. A Return Material Authorization (RMA) number must be issued for any product returned to CONCOA for service. The Customer Service Representative will give you your RMA number. You will be asked to provide:

1. Model number
2. Gas service
3. Inlet pressure and type of gas supply (high pressure or liquid)
4. Outlet pressure
5. Approximate gas usage

When shipping product back to CONCOA for repair the following steps should be followed:

1. Package the product sufficiently to prevent damage. If possible package in the original shipping container.
2. Include RMA number on the outside of the carton.
3. Ship prepaid.
4. Include a written description of the problem you encountered with the product inside the package.
5. Indicate the gas service that the equipment was used on.
6. Purge all equipment before shipment to protect the transporter and service personnel. The purging is especially important if the equipment has been in hazardous or corrosive gas service.

Return trip transportation charges are to be paid by the Buyer. In all cases where the warranty has expired, repairs will be made at current list price for the replacement part(s), plus a reasonable labor charge.

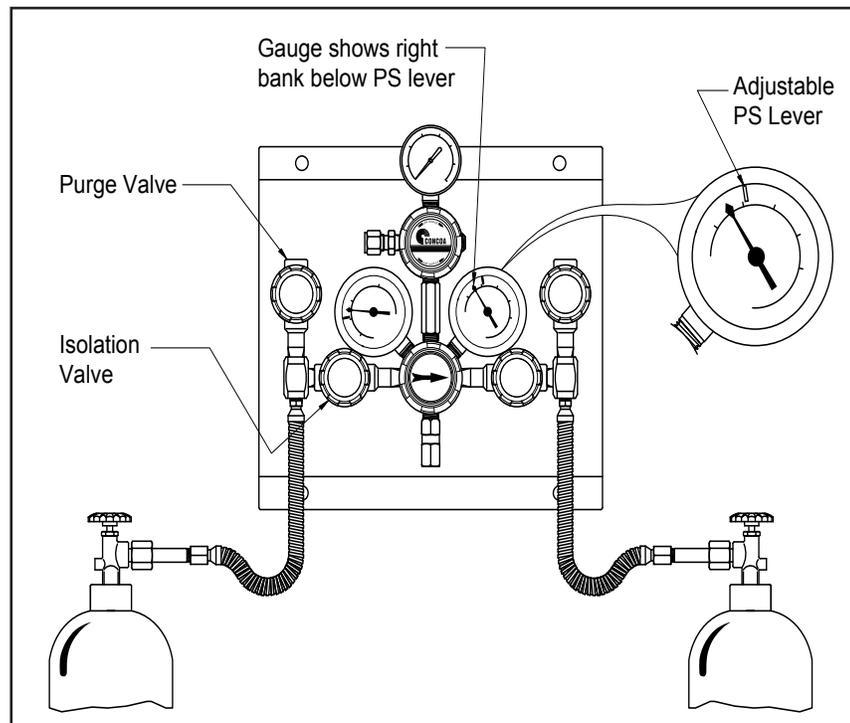
Optional Remote Alarm

DESCRIPTION OF PRODUCT

The 619 is compatible with the Advantium 8 and 2 remote alarms. The 619 must be ordered with alarm capability to receive the appropriate pressure switch gauges and 6-pin male bulkhead electrical connector. Each alarm provides audible, visual indicators and auxiliary relay output. Consult the alarm ADI for further wiring instructions. The visual alarm is indicated by LED's. The audible alarm is indicated by a piezo speaker. The audible alarm is silenced by pressing the "SILENCE" button on the front of the remote alarm. The red, right/left bank LED illuminates when the bank pressure is below the set point pressure on the inlet gauge. The piezo alarm also sounds when the bank pressure is below the set point pressure on the inlet gauge. Connections to the remote alarm and switchover are made using connectors supplied by CONCOA. The customer will supply the cabling between the remote alarm and switchover. Optional pre-assembled electrical cables (529-5316-length) are available from CONCOA for both Advantium series remote alarms. Optional pre-assembled D-25x4-6 pin (529-5314) or D-25x 1-6 pin (529-5315) adapter cables are available from CONCOA for the Advantium 8 only.

The alarm point operates independently of the pressure differential switching mechanism. The alarm point may be adjusted to the appropriate pressure above the switching pressure by moving the adjusting lever illustrated in Figure 9. Access to the pressure switch adjusting lever is obtained by rotating the gauge protective plate bezel counter clockwise.

Figure 9



GENERAL SAFETY PRACTICES

When using the remote alarm, basic safety precautions must be followed to reduce the risk of fire, electrical shock, and injury. Do the following:

1. Read and understand all instructions. Follow all warnings and instructions marked on the product.
2. Do not use the remote alarm where it may be subjected to water, condensation, or rain. Unplug or disconnect the power, when liquids are spilled on or in these products.
3. Do not use the remote alarm where it may be subjected to temperature extremes. The remote alarm may be installed in locations where the temperature varies between 0° and 140°F.

4. Do not install the remote alarm or dual regulator switchover in hazardous locations.
5. Do not drop the remote alarm. Do not use if damaged or dropped.
6. Operate the remote alarm with the type of power source indicated on the remote alarm transformer. If you are not sure of your power source, contact your dealer or local power company.
7. Do not overload wall outlets and extensions cords; this may result in the risk of electrical shock or fire. Check the wall transformer for the voltage and current rating.
8. Never push objects of any kind inside the remote alarm case as the objects may touch dangerous voltage points or may short parts that could result in the risk of electrical shock or fire.
9. Do not allow objects to cause damage to the power cord or any other connecting cables. Do not use if any wires are frayed, damaged, or loose.

INSTALLATION

The following components are required to install the remote alarm:

1. One remote alarm
2. One switchover system equipped with pressure switch gauges
3. Two connector assemblies (830 9170-17) .
4. Soldering iron & solder
5. 4 wire cable – Use wire that can be inserted into the pins of the connector assembly (22 gauge wire is recommended). For the switchover cable connection to be water resistant, a cable with outside diameter .195 - .265 must be used. Follow the appropriate Alarm ADI wiring instructions for installation.

OPERATION

Adjusting the alarm set point, does not affect the switchover point of the autoswitch. The alarm is used to provide an audible and visual warning that a changeover is about to occur. If the nearly depleted cylinders are changed when the alarm LED's illuminate, the cylinders will not be as empty as if the actual changeover had occurred. Slide the red tab seen on the inlet gauge to adjust the alarm set point. The lowering of the alarm set point pressure may cause the alarm not to work properly. When adjustments are made, check the function of the system. With the knob arrow turned fully clockwise, pressurize the system and shut off the inlet pressure to both sides. Allow the inlet pressure on the right side to decrease by allowing a small flow (50 CFH). Observe both inlet gauges. When the right bank is low (below the set point on the gauge), the red LED will illuminate. Make sure the red LED illuminates before the pressure on the opposite side starts to decrease. Re-pressurize system and check the opposite side of the system in the same manner (the knob arrow must be turned fully counter-clockwise).

TROUBLE SHOOTING

If the green remote alarm LED's do not illuminate when the transformer is plugged in and the remote alarm is not connected to the switchover, check the fuse. Disconnect the transformer from the power source. Remove the four screws on the rear of the remote alarm. Remove the rear panel. Replace the fuse with the one indicated on the label. Replace the rear cover and screws. Plug in the wall transformer. Check the remote alarm.

SERVICE

A unit that is not functioning properly should not be used. It is recommended that all servicing be done by a service facility authorized by CONCOA. Contact CONCOA Customer Service in Virginia Beach, Virginia for systems still covered by the warranty. For items not covered by the warranty, contact the nearest CONCOA District Sales Office for assistance.

If so advised, the unit should be sent to a service facility authorized by CONCOA. Do the following before shipping:

1. Adequately package the system. If possible package in the original shipping container.
2. Ship prepaid.
3. Include a statement of the observed deficiency.

Return trip transportation charges are to be paid by the Buyer. In all cases where the warranty has expired, repairs will be made at current list price for the replacement part(s), plus a reasonable labor charge

Warranty Information

This equipment is sold by CONTROLS CORPORATION OF AMERICA under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to the purchase of this equipment directly from CONTROLS CORPORATION OF AMERICA or its Authorized Distributors as new merchandise and are extended to the first Buyer thereof other than for the purpose of resale.

For a period of one (1) year from the date of original delivery (90 days in corrosive service) to Buyer or to Buyer's order, this equipment is warranted to be free from functional defects in materials and workmanship and to conform to the description of this equipment contained in this manual and any accompanying labels and/or inserts, provided that the same is properly operated under conditions of normal use and that regular periodic maintenance and service is performed or replacements made in accordance with the instructions provided. The foregoing warranties shall not apply if the equipment has been repaired: other than by CONTROLS CORPORATION OF AMERICA or a designated service facility or in accordance with written instructions provided by CONTROLS CORPORATION OF AMERICA, or altered by anyone other than CONTROLS CORPORATION OF AMERICA, or if the equipment has been subject to abuse, misuse, negligence or accident.

CONTROLS CORPORATION OF AMERICA's sole and exclusive obligation and Buyer's sole and exclusive remedy under the above warranties is limited to repairing or replacing, free of charge, at CONTROLS CORPORATION OF AMERICA's option, the equipment or part, which is reported to its Authorized Distributor from whom purchased, and which if so advised, is returned with a statement of the observed deficiency, and proof of purchase of equipment or part not later than seven (7) days after the expiration date of the applicable warranty, to the nearest designated service facility during normal business hours, transportation charges prepaid, and which upon examination, is found not to comply with the above warranties. Return trip transportation charges for the equipment or part shall be paid by Buyer.

CONTROLS CORPORATION OF AMERICA SHALL NOT BE OTHERWISE LIABLE FOR ANY DAMAGES INCLUDING BUT NOT LIMITED TO: INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, OR SPECIAL DAMAGES, WHETHER SUCH DAMAGES RESULT FROM NEGLIGENCE, BREACH OF WARRANTY OR OTHERWISE.

THERE ARE NO EXPRESS OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTIES HEREINABOVE SET FORTH. CONTROLS CORPORATION OF AMERICA MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE EQUIPMENT OR PARTS THEREOF.

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