



ADI 3174-E

Certified ISO 9001



620 Series Switchover System

(Shown with Optional Line
Regulator)

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

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Supersedes May 2000

DESCRIPTION OF PRODUCT

The 620 series switchover is an automatic switchover system designed to provide a continuous supply of LASER gas. This unit may be used with one cylinder per side, or used with a manifold that has increased storage capacity. The inlet of the switchover system may be purchased with open ports, diaphragm valves, manifold connectors, or flexible pigtailed. The system, when configured with manifold connectors, is for use with the 628 Series Maniflex system. If constant outlet pressure is required, a regulator will need to be installed as part of the switchover system (as with the 620 3XX8 or 620 4XX8 models) The standard switchover system will maintain a variable line pressure within the values shown in the table below:

MODEL NUMBER	OUTLET PRESSURE (without Line Regulator)	
620 2XXX	35-95 PSI	(2.4-6.5 BAR)
620 3XXX	65-135 PSI	(4.5-9.3 BAR)
620 4XXX	160-235 PSI	(11-16.2 BAR)
620 5XXX	260-360 PSI	(18.25 BAR)
620 7XXX	120-185 PSI	(9.0-12.8 BAR)

With the optional line regulator, the user will be able to maintain a constant line pressure by adjusting the line regulator knob.

MODEL NUMBER	OUTLET PRESSURE	
620 3XX8	0-100 PSI	(0-7 BAR)
620 4XX8	0-250 PSI	(0-17 BAR)

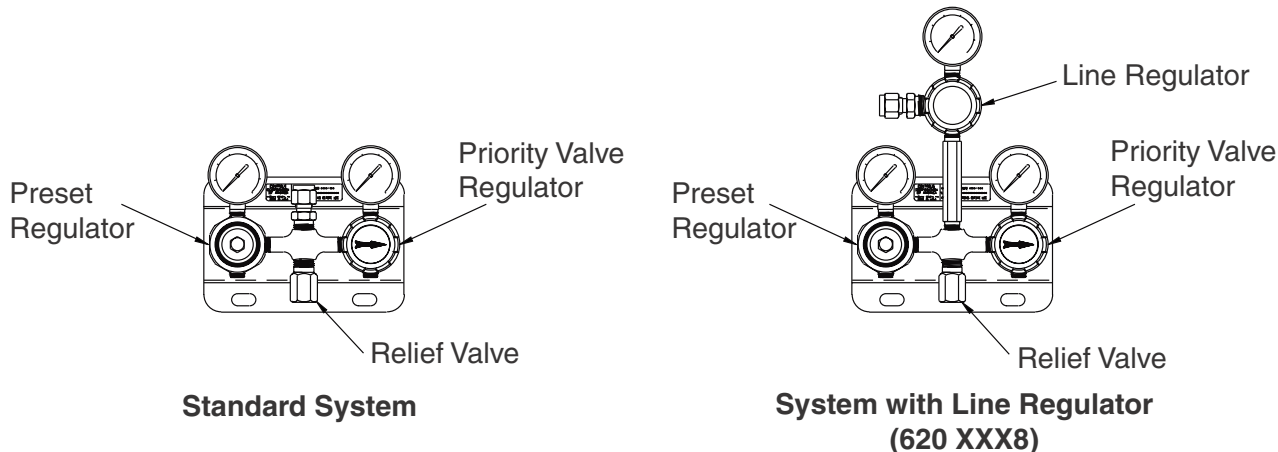


Figure 1. 620 System Configurations.

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.

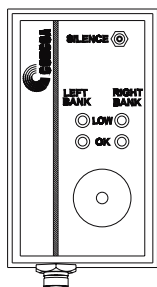


Figure 2. Optional remote alarm for the 620 Series Switchover.

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.

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: e-mail@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. 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.
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 optional. Purge devices are used to remove unwanted gases from the system before and after use. Purging is typically done with an inert gas such as nitrogen (grade 5.0 - 99.9991% pure). See the appendix for a sketch of the purge kit.

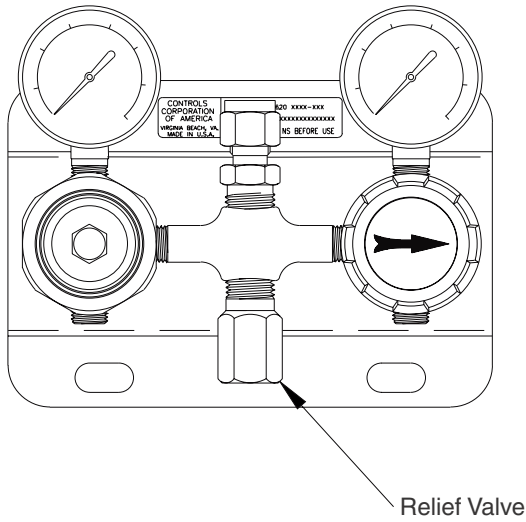


Figure 3. Relief valve location on the 620 Series Switchover.

Mount the switchover system to a flat surface using the appropriate hardware at hole locations provided in the bracket. Dimensions for these holes are shown below:

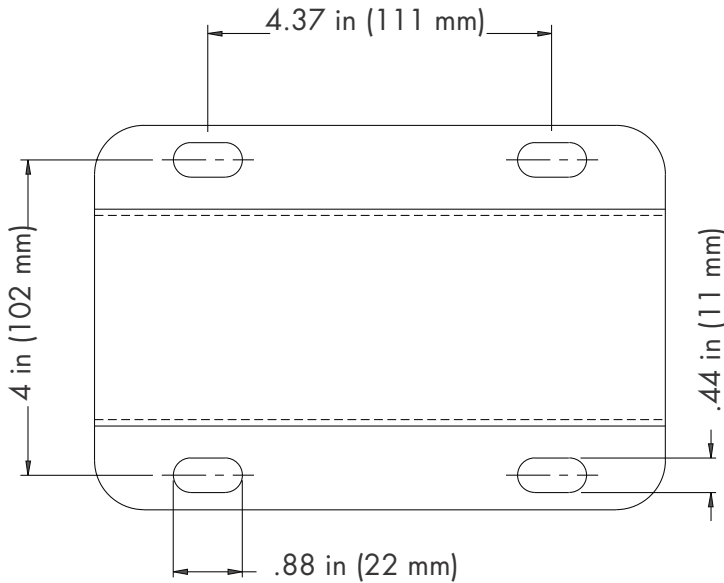


Figure 4. Mounting bracket for the 620 Switchover.

If installing to a 628 Series Maniflex manifold, install the inlet connection and then follow the instructions provided with the manifold. If installing for use with cylinders, provide enough clearance between the top of the cylinder and the switchover system. The typical installation for high-pressure cylinders needs 66 inches between the floor and the “INLET” port.

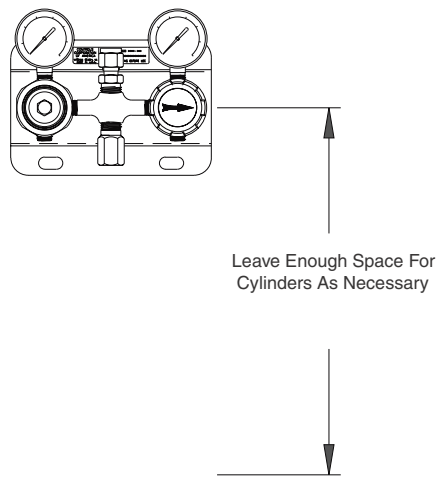


Figure 5. Switchover spacing.

When installing the inlet and outlet connections to the regulator, use an open-end wrench, not a pipe wrench. The $\frac{1}{4}$ NPT connections require the use of Teflon tape on the threads to make a gas tight seal. On stainless steel connections, the Teflon tape helps prevent the connections from galling together when tightening or loosening. Follow these rules when using Teflon tape.

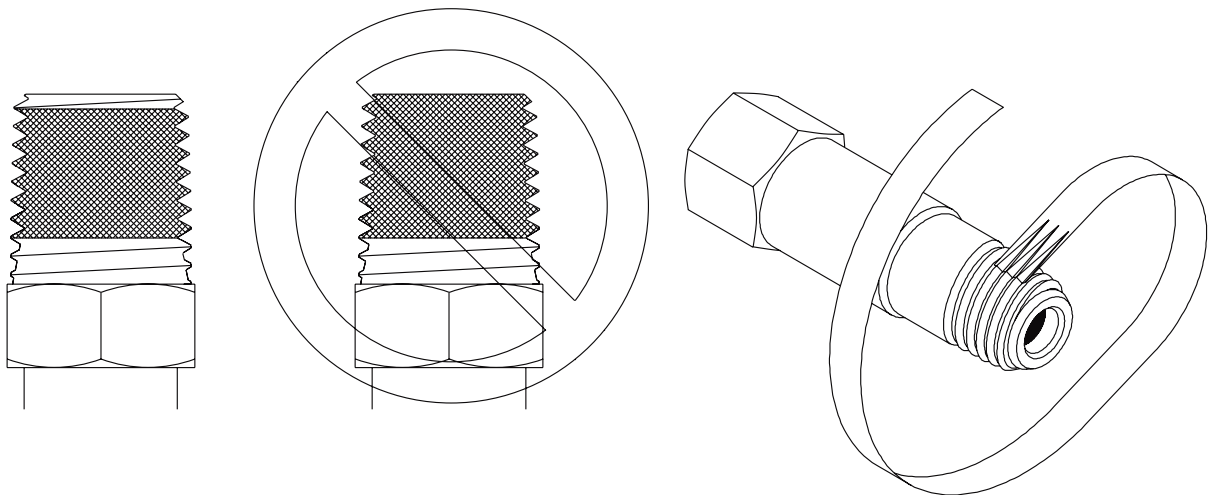


Figure 6. Tape Installation procedures.

Before applying Teflon 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 Teflon 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 Teflon tape. Cut off the excess tape and press the end firmly into the threads.

Installing the inlet connection:

620 X1XX or 620 X2XX – configured for multiple cylinders per side: See the appendix for the pictorial representations of the system. Tape all NPT connections as described in the procedure above. If purchased with a purge kit and multiple cylinders per side, install the purge kit into the inlet port. The $\frac{1}{4}$ male NPT end of the manifold connector will need to be installed in the “INLET” port of the regulator, purge kit, or the diaphragm valve port. The other end of the manifold connector will connect to the starter block of the 628 series Maniflex system. Please follow the instructions provided with the Maniflex system when connecting and operating the manifold system.

Configured for single cylinder use: See the appendix for the pictorial representations of the system. If purchased with the purge kit, install the purge kit into the “AUX INLET”. If purchased with pigtails, the male ¼ NPT end of the pigtail is installed into the “AUX. INLET “ port or in the open port of the diaphragm valve or purge kit.

The CGA or foreign inlet connection available at the other end of the pigtail is dependent on the purchased system. The cylinder connection is specific to the particular cylinder of gas to be used. Some cylinder connections do require the use of a gasket. Please note that the material of the gasket must also be compatible with the type of gas being used. Be familiar with the type of connection being used, and its proper procedures for installation. Also note that the pigtails supplied with the system have check valves installed on the cylinder connection end.

Connecting to a cylinder:

1. Before removing the cylinder cap, move the cylinder of gas to the work site:
 - a. Secure cylinder to the floor, wall, or bench with appropriate chain, strap, or stand to prevent toppling.
 - b. Remove the cylinder cap.
 - 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. Secure the cylinder connection to the cylinder in the following manner:
 - a. Threading the nut onto the cylinder connection should be easy. Do not force. If it doesn't fit, the connection may be wrong for the type of gas being used.
 - b. Left-hand threads are used on some cylinder connections. A notch in the middle of the hex nut typically indicates a left-hand thread.
 - c. Gaskets are used on some inlet connections. Be sure the gasket is in good shape. Do not over-tighten to avoid squashing the gasket into the gas line. Keep extra gaskets on hand.
 - d. Never use oil or grease on regulator or cylinder fittings, as it may contaminate pure gases, or create a fire hazard.

Installing the outlet connection:

The standard system has the outlet connection at the top of the switchover system. The connection is a ¼” 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.

Pressurizing the system for the first time:

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 only, for system start up and checks. Adapters should never be used on a permanent basis.

1. Wear safety glasses and gloves.
2. Be sure that both ends of all hoses or pigtails are secured before pressurizing. On systems with the optional line regulator, turn the line regulator knob counterclockwise until the knob stops turning.
3. When first pressurizing, do not stand in front of or contact the switchover system. Slowly open the cylinder valve. Observe the high pressure gauge for a rise in pressure up to full cylinder pressure. Warning - if this system is not equipped with the optional line regulator, the gas will flow from the outlet when the cylinder valve is opened.
4. Keep the hand wheel or wrench on the open cylinder valve at all times, to allow prompt emergency shut-off.

5. 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 the leak detection solution can not be used - after pressurizing the system - close the cylinder valve for a period of time (recommended 24 hours), and observe the high pressure gauge for a drop in pressure. If so indicated, recheck the CGA connection and all other high-pressure port connections. If equipped without the line regulator, the outlet connections will also need to be rechecked.
6. Never attempt to fix a leak under pressure. If leaks are detected, depressurize the system and retighten the connection. Begin again at step 3.
7. If equipped with the optional line regulator, slowly turn the line regulator knob clockwise. This will increase the pressure on the delivery side of the system. Adjust to the desired working pressure and again check for leaks using the methods described above.

OPERATION

The arrow on the priority valve always points to the primary side; the bank opposite the primary side is considered the reserve side. Starting with the arrow pointing to the right side, gas will flow from the right side cylinder. As the gas in the primary side is depleted, the gas pressure will drop on the gauge of the primary regulator. When the pressure drops to the pressure setting of the reserve side regulator, flow will begin from the reserve cylinder. This is called a changeover. At this point, the gas pressure on the reserve side (preset regulator) will drop. This indicates that its time to change the cylinders on the primary side. Before removing the nearly depleted primary cylinder, the priority valve should be rotated 180°. This makes the reserve cylinder, the primary source. Remove the depleted cylinder and replace with a full cylinder. Before removing the cylinder be sure to close the cylinder valve and any other valves that connect the cylinder to the system. The full, replacement cylinder is now the reserve cylinder.

Note: while changing cylinders on one side, there will be no interruption in flow. A depleted cylinder will have the following gas pressure remaining:

MODEL NUMBER	OUTLET PRESSURE (Without Optional Line Regulator)	
620 2XXX	35-95 PSI	(2.4-6.5 BAR)
620 3XXX	65-135 PSI	(4.5-9.3 BAR)
620 4XXX	160-235 PSI	(11-16.2 BAR)
620 5XXX	260-360 PSI	(18.25 BAR)
620 7XXX	120-185 PSI	(9.0-12.8 BAR)

MODEL NUMBER	OUTLET PRESSURE (With Optional Line Regulator)	
620 3XX8	160-235 PSI	(11-16.2 BAR)
620 4XX8	445-545 PSI	(30.7-37.6 BAR)

Gas will continue to flow from the primary side until the outlet pressure of the preset regulator matches the pressure of the priority valve regulator. (The pressure setting of the priority valve regulator changes when the knob is turned 180°). When the gas pressure stops dropping on the preset regulator and starts to drop on the priority valve regulator, it is time to change the left cylinder. The knob is rotated 180° to the right before the left cylinder is changed. It is helpful to maintain a log of cylinder pressure, noting which direction the arrow is pointing on the priority valve. When the pressure gauge is very low and the reserve side indicates that gas has begun to flow from the reserve cylinder, it is time to rotate the knob and attach a full cylinder in reserve.

If the knob is not rotated before the empty cylinder is changed, two things can happen. First, gas may flow from the fully charged cylinder to the in-use cylinder. This is because the pressure setting of the regulator on the primary side allows the regulator main valve to remain open. Second, when the cylinder is changed, gas will begin to flow from the new cylinder, stopping flow from the cylinder in use. This means the “in-use” cylinder may be partially empty. After several cycles, it is possible that the reserve cylinder may empty shortly after a switchover occurs. Always remember to rotate the knob on the priority valve regulator **before** changing a depleted cylinder.

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 values listed below, replace the high-pressure cylinders. If liquid cylinders are used and the inlet pressure increases significantly when the system is not in use, then the system is over-withdrawing the liquid cylinders. Additional capacity may be added to the system to prevent this.

MODEL NUMBER	OUTLET PRESSURE (Without Optional Line Regulator)	
620 2XXX	35-95 PSI	(2.4-6.5 BAR)
620 3XXX	65-135 PSI	(4.5-9.3 BAR)
620 4XXX	160-235 PSI	(11-16.2 BAR)
620 5XXX	260-360 PSI	(18.25 BAR)
620 7XXX	120-185 PSI	(9.0-12.8 BAR)

MODEL NUMBER	OUTLET PRESSURE (With Optional Line Regulator)	
620 3XX8	235 PSI	(16 BAR)
620 4XX8	545 PSI	(37.6 BAR)

3. If the above does not fix the problem, please contact CONCOA customer service. Please be prepared to give the following:
 - Model number
 - Gas service
 - Inlet pressure and type of gas supply (high pressure or liquid)
 - Outlet pressure
 - Approximate gas usage

SERVICE

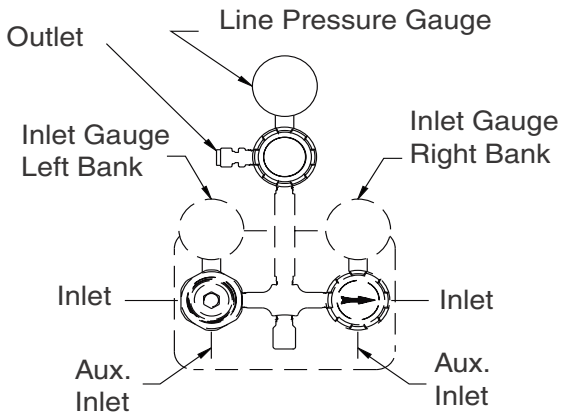
A unit that is not functioning properly should not be used. It is recommended that all servicing be done by a service facility authorized by CONCOA. Contact CONCOA Customer Service in Virginia Beach, Virginia for systems still covered by the warranty. For items not covered by the warranty, contact the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

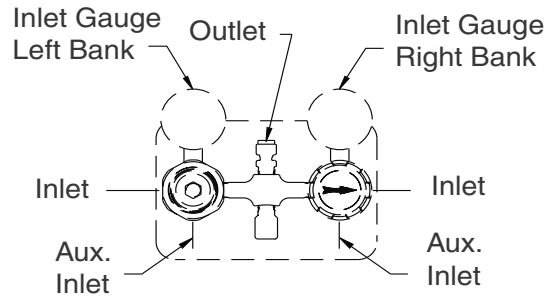
1. Adequately package the system. If possible package in the original shipping container.
2. Ship prepaid.
3. Include a statement of the observed deficiency.
4. Indicate the gas service that the equipment was used on.
5. Purge all equipment before shipment to protect the transporter and service personnel. 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.

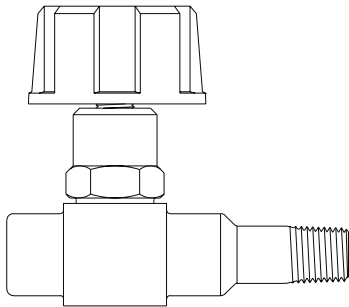
APPENDIX



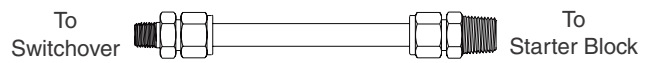
System with Line Regulator
(620 XXX8)



Standard System

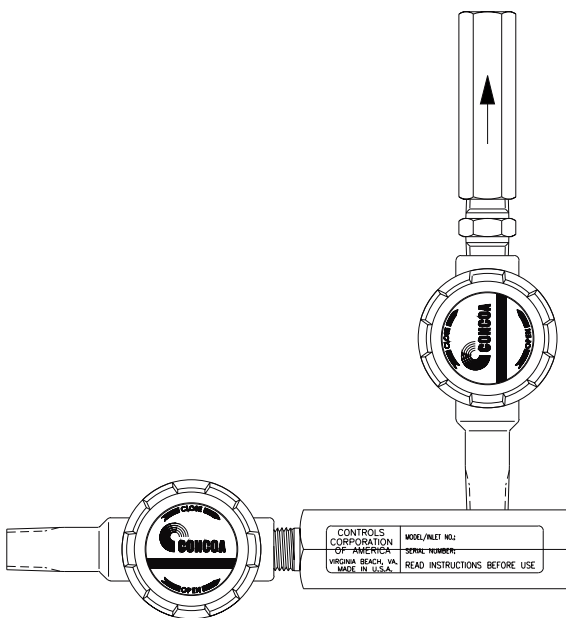


DIAPHRAGM VALVE

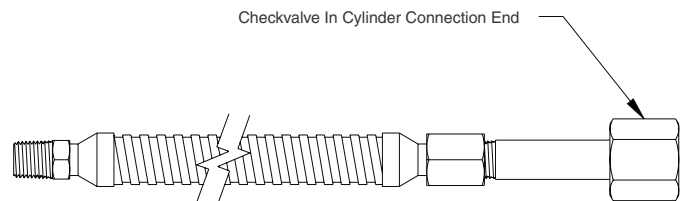


Manifold Connector

(529 0024)

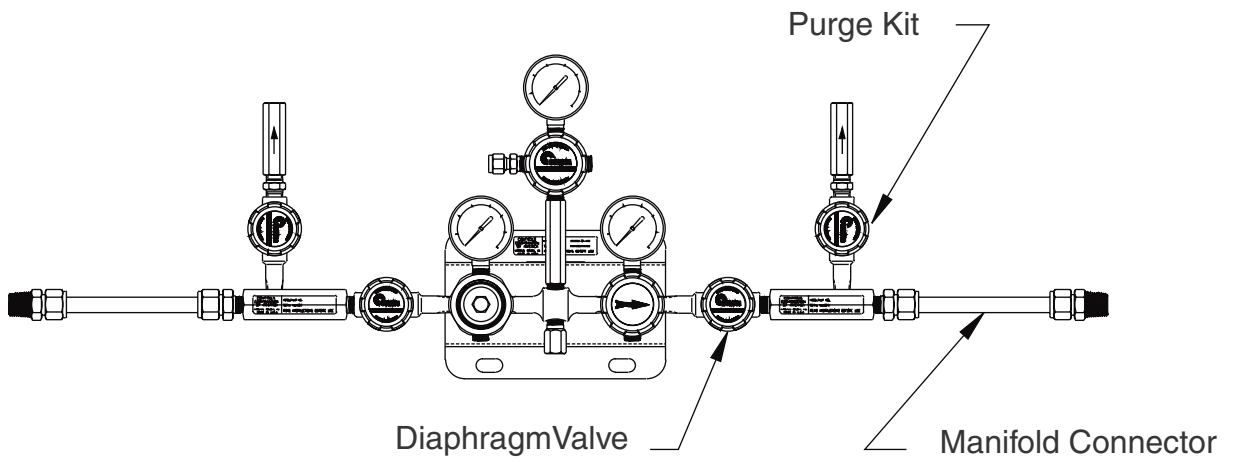


Purge Kit

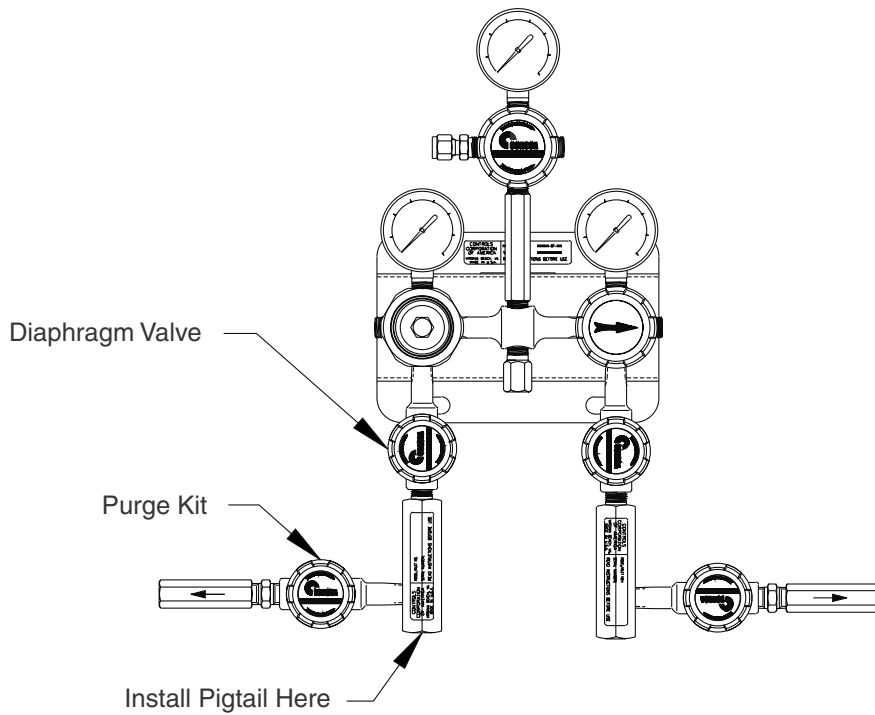


Pigtail with Cylinder Connection

APPENDIX CONTINUED



620 X6XX Configured with Purge Kit (Shown For Manifold Use)



626 X6XX Configured With Purge Kit
(Shown For Single Cylinder Use)

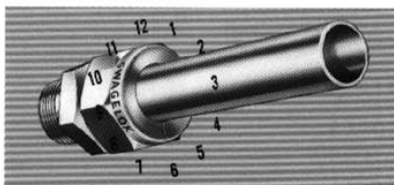
Swagelok® TUBE FITTINGS

INSTALLATION INSTRUCTIONS

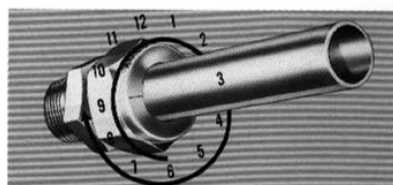
SWAGELOK Tube Fittings are installed in three easy steps.



1 Simply insert the tubing into the SWAGELOK tube fitting. **Make sure that the tubing rests firmly on the shoulder of the fitting and that the nut is finger-tight.**



2 Before tightening the SWAGELOK nut, scribe the nut at the 6 o'clock position.



3 Now while holding the fitting body steady with a back-up wrench, tighten the nut 1-1/4 turns.* While watching the scribe mark, make one complete revolution and continue to the 9 o'clock position.

By scribing the nut at the 6 o'clock position as it appears to you, there will be no doubt as to the starting position. When tightened 1-1/4 turns* to the 9 o'clock position you can easily see that the fitting has been properly installed.

Use the Gap Inspection Gage (1-1/4 turns from finger-tight to assure sufficient pull-up).

*For 1/16", 1/8", 3/16", 2, 3 & 4 mm size tube fittings, only 3/4 turns from finger-tight is necessary.

GAP INSPECTION GAGES



Fitting Size (Inches) or (mm)	Series Fractional	Metric	Inspection Gage Part Number
1/8"	3"	200	-3M0 MS-IG-200
3/16"	4"	300	-4M0 MS-IG-300
1/4"	6"	400	-6M0 MS-IG-400
5/16"	8"	500	-8M0 MS-IG-500
3/8"	—	600	— MS-IG-600
—	10	—	-10M0 MS-IG-10M0
1/2"	12	810	-12M0 MS-IG-810
5/8"	16	1010	-16M0 MS-IG-1010
3/4"	18	1210	-18M0 MS-IG-1210
7/8"	22	1410	-22M0 MS-IG-1410
1"	25	1610	-25M0 MS-IG-1610

*For 1/16", 1/8", 3/16", 2, 3 & 4 mm size tube fittings, only 3/4 turns from finger-tight is necessary.

SWAGELOK Tube Fittings are made to exacting tolerances. Without such close tolerances, the interaction of the nut, two ferrules, and body would not be successful.

If good quality tubing is used with SWAGELOK Tube Fittings, successful connections will result if installation instructions are followed.

SWAGELOK GAP INSPECTION GAGES are designed to assure the installer or inspector that a fitting has been sufficiently pulled up. They are particularly applicable to systems where fittings are to be tightened in difficult or inaccessible locations or systems where insufficient pull-up could cause potentially dangerous or expensive consequences.

SWAGELOK GAP INSPECTION GAGES are inserted between the nut and body of a tube fitting **after pull-up**. If the GAP INSPECTION GAGE will not fit in the gap between the nut and body hex, the SWAGELOK fitting nut has been tightened sufficiently.



INSTALLATION INSTRUCTIONS

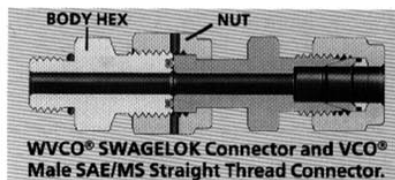
SAE/MS STRAIGHT THREAD POSITIONABLE ELBOWS & TEES



1. Lubricate O-Ring with a lubricant compatible with the system fluid, environment and O-Ring material. (Standard O-Ring material is Viton. Buna and other O-Ring materials are also available on request.)
2. Turn the fitting into the straight thread boss until the metal back-up washer contacts the face of the boss.
3. Position the fitting by backing it out (**not more than 1 turn counter clockwise**) until the SWAGELOK or VCO end is oriented in the proper direction.
4. Hold the wrench pad with a back-up wrench and tighten the locknut until the washer is against the face of the boss.

NOTE: Positionable elbows and tees are compatible with SAEJ514, MS16142 or JIC female straight thread or O-Ring bosses.

CAJON VCO & WVCO ZERO CLEARANCE ASSEMBLIES



Pull-up the Zero Clearance assembly by tightening the **nut** 1/8 turn past finger-tight, using a back-up wrench on the body hex to insure full metal-to-metal contact.

NOTE: When soldering, welding or brazing is performed on the body or gland of the VCO O-Ring Face Seal Fitting, the O-Ring should be removed to prevent damage.

VITON — TM E. I. DuPont
NUPRO — TM Nupro Company
WHITEY — TM Whitey Co.
VCO, WVCO — TM Cajon Company



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SWG-0864-C
12-91-BL
MS-01-30

Optional Remote Alarm for Dual Regulator Switchovers

DESCRIPTION OF PRODUCT

The remote alarm is used when audible and visual alarms are desired. 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.

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 dual regulator switchover system equipped with pressure switch gauges
3. Two connector assemblies (830 9004-6) as shown below
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 autoswitch cable connection to be water resistant, a cable with outside diameter .195-.265 must be used.

The following procedure is required to install the remote alarm:

1. Locate the two connector assemblies. Slide all of the cable components onto the wire cable as shown in Figure 1.
2. Solder the cable wires to the plug. Note that both ends of the cable's wires must be identically attached to the connector assemblies. Pin 1 must match pin 1; pin 2 must match pin 2; pin 3 must match pin 3; and pin 4 must match pin 4.

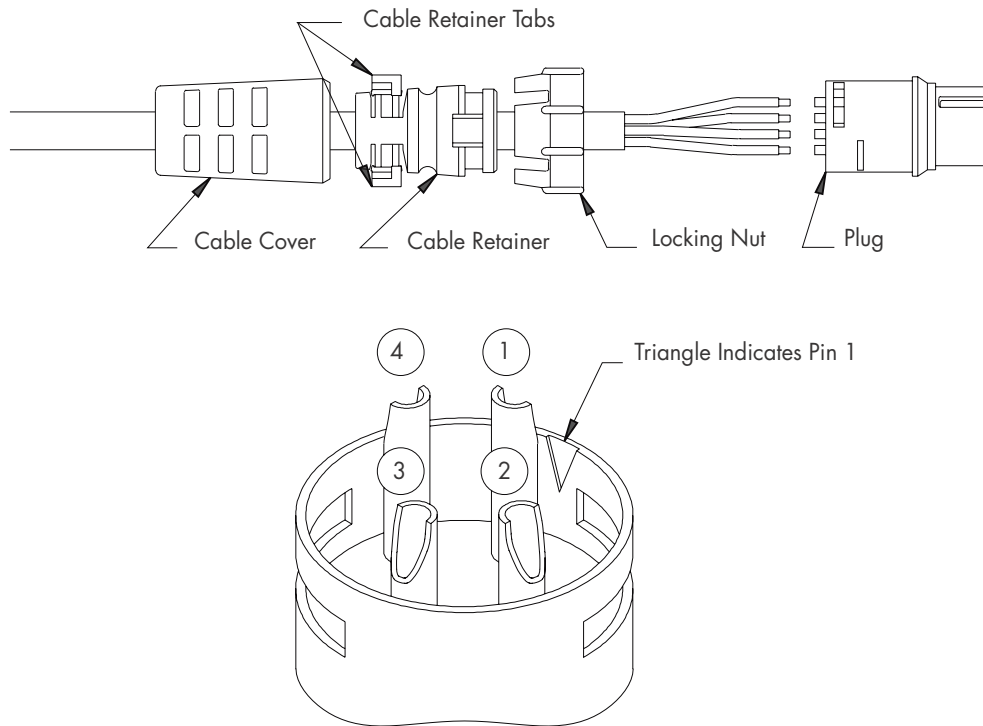


Figure 1. Connector Assembly

3. Push the locking nut onto the plug.
4. Push the cable retainer into the plug until it snaps in.
5. Clamp cable retainer tabs with pliers until tabs lock in place on the outside cable insulation.
6. Stretch the cable cover over the cable retainer and plug. The cable cover must cover the holes on the plug.
7. Plug the cable into the male connector located on the bottom of the switchover system bracket. Plug the other wire end into the male connector located on the remote alarm. (See Figure 2.)
8. Connect the wall transformer to the remote alarm and plug in the wall transformer.
9. With no inlet pressure on either side of the system, the red LED's should be lit. The buzzer should also be sounding. Press the silence button to turn off the buzzer.
10. Check the function of the switchover system by pressurizing the system and allowing the system to depressurize. When the right bank is low (below the set point on the gauge), the green LED for the right side should turn off and the red LED will illuminate. The buzzer will also sound. The buzzer may be silenced on the remote alarm by pressing the remote alarm's silence button. Check the left side of the system in the same manner.

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).

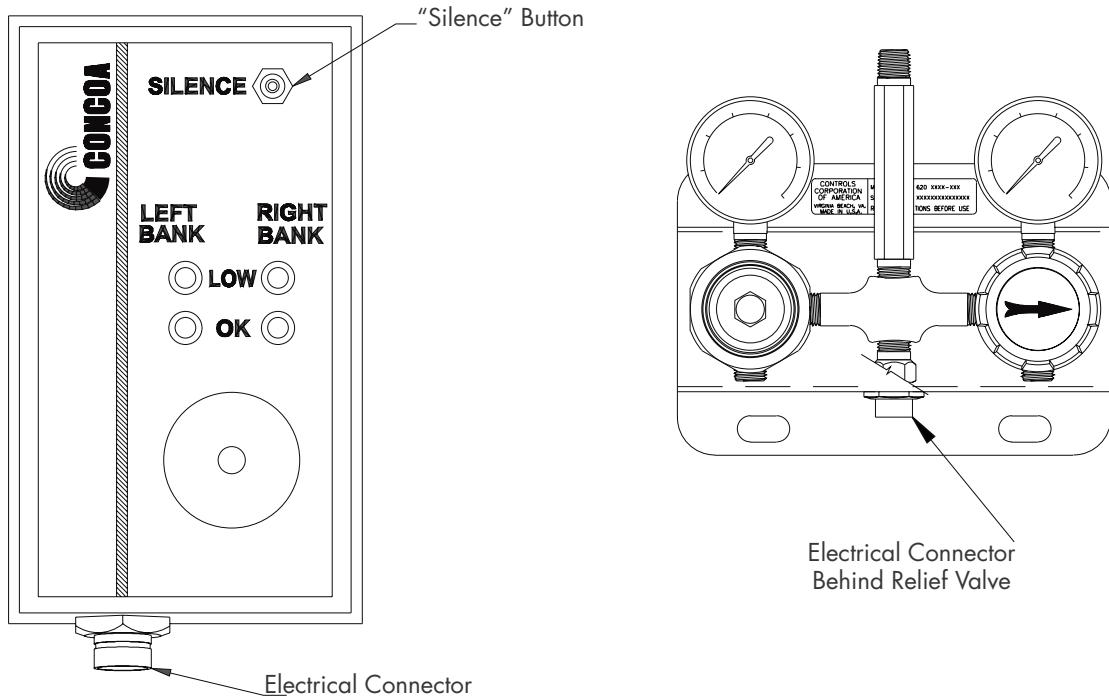


Figure 2. Electrical Connector Locations

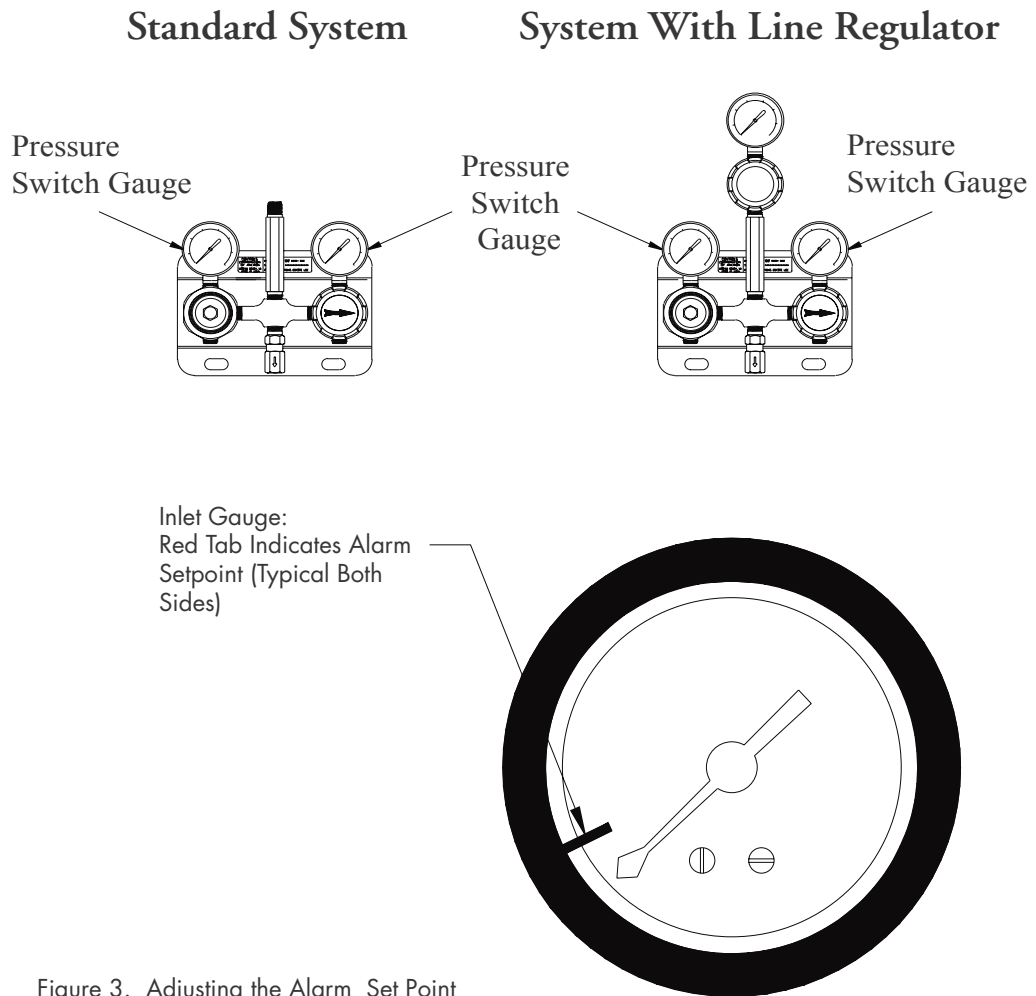


Figure 3. Adjusting the Alarm Set Point

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.

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