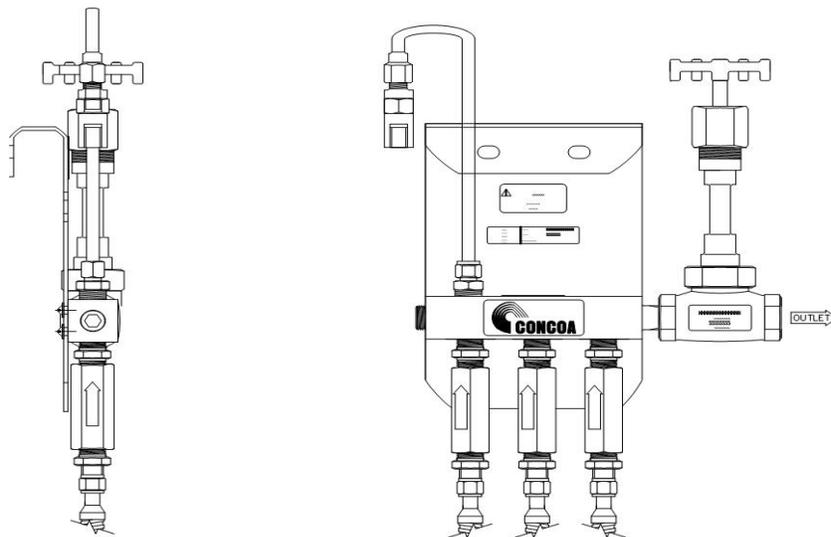




# 630 Series Cryogenic Manifold System



## **INSTALLATION AND OPERATION INSTRUCTIONS**

**Before Installing or Operating, Read and Comply with These Instructions**

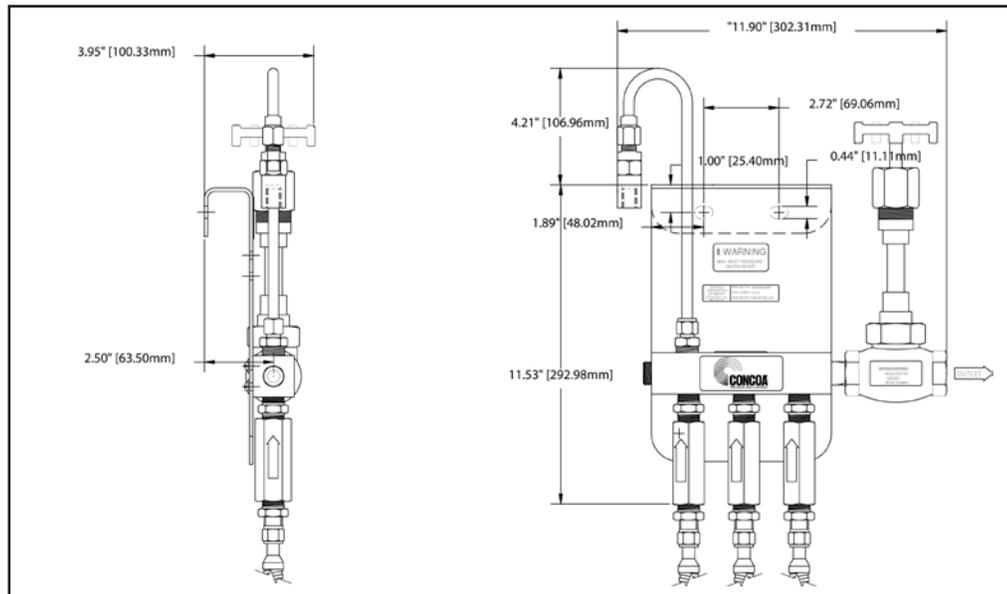
Controls Corporation of America  
1501 Harpers Road Virginia Beach, VA 23454  
To Order Call 1-800-225-0473 or 757-422-8330 • Fax 757-422-3125  
[www.concoa.com](http://www.concoa.com)

Date January 2007

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## DESCRIPTION OF PRODUCT

The 630 series cryogenic manifold incorporates a universal bracket that allows mounting on a wall or on an individual liquid cylinder neck ring. The manifold can accommodate up to six liquid cylinders. The 630 incorporates an extended stem isolation valve for reliability and an integral relief valve for maximum safety. Optimum performance is achieved by coupling each liquid cylinder's vent valve to CONCOA's 629 series vent manifold kit with auxiliary pusher circuit. This solution enables the operator to maximize liquid withdrawal while maintaining pressure to a vaporizer.



**Figure 1** 630-1XXX Micro Manifold

## 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, or distorted 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

Know the properties and special handling requirements of the gas being used. During the design phase the end user must consider the total manifold gas capacity in accordance with CGA P-12 1987 or newer. Equipment failure or misuse may lead to a sudden release of the service cryogenic liquid phase into the surrounding area. Proper safety measures should be established to handle these and other component failures.

In the event of equipment failure, call the CONCOA Customer Assistance Line: 1-800-225-0473. 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 specialty gases are quite dangerous (flammable, toxic, corrosive, simple asphyxiant, or oxidizers). Equipment failure or misuse may lead to the sudden release of service gas into the surrounding area. 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 label provides the following information:
  - a. Model number
  - b. Serial number

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.

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

## GENERAL SAFETY PRACTICES

The vent manifold kit hoses (5290239-01-295 and 5290239-01-440) are intended to connect to the liquid can's gaseous vent use valve only. Use with any other gas phase is not safe. A typical liquid has a common flare connection for both the liquid use and vent use valves. Extreme caution must be taken to avoid cryogenic phase exposure to these hoses. Potential personal injury may be a result.

Do not remove the flow restrictors installed into the vent manifold. The restrictors are designed to prevent the hose from whipping while being depressurized.

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 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.

Always secure cylinders, whether in use or in reserve.

Always secure cylinders and liquid cans, whether in use or in reserve.

Always install a pressure relief device anywhere liquid may be trapped.

**WARNING: Excess accumulation of oxygen creates an oxygen enriched atmosphere (defined by the Compressed Gas Association as an oxygen concentration above 23 percent). In an oxygen enriched atmosphere, flammable items burn vigorously and could explode. Certain items considered non-combustible in air may burn rapidly in such an environment. Keep all organic materials and other flammable substances away from possible contact with oxygen; particularly oil, grease, kerosene, clothes, wood, paint, tar, coal dust, and dirt which may contain oil or grease. DO NOT permit smoking or open flames in any area where oxygen is stored, handled, or used. Failure to comply with this warning may result in serious personal injury.**

**WARNING: Nitrogen and argon vapors in air may dilute the concentration of oxygen necessary to support or sustain life. Exposure to such an oxygen deficient atmosphere can lead to unconsciousness and serious injury, including death.**

**WARNING: Before removing cylinder parts or loosening fittings, completely empty the liquid cylinder of liquid and release the entire vapor pressure in a safe manner. External valves and fittings can become extremely cold and may cause painful burns to personnel unless properly protected. Personnel must wear protective gloves and eye protection whenever removing parts or loosening fittings. Failure to do so may result in personal injury because of the extreme cold and pressure in the cylinder.**

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:



**Figure 2** - Over Pressure Warning Label

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.

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.

## **LOCATION**

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 additional location guidelines, see NFPA standard 50 and 55.

## **INSTALLATION**

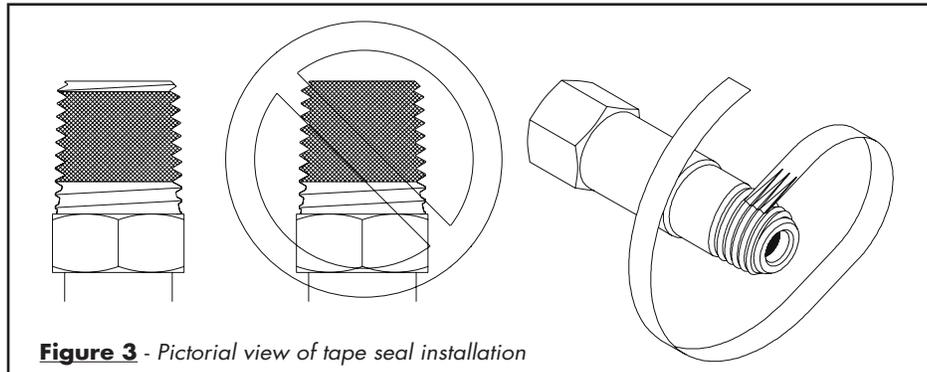
Installing the system:

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. Purge devices: These devices can be purchased as accessories. Purge devices are used to remove toxic, corrosive, or flammable gases from the customer's system to a safe discharge area. This is particularly helpful when an internal problem occurs (such as regulator malfunction).

## 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 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.

Taping procedure:

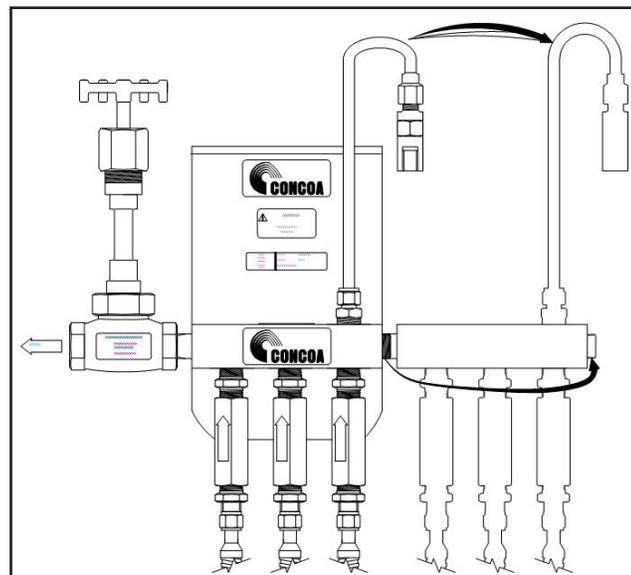


Before applying Teflon tape, inspect the NPT threads and if necessary, clean the fitting to remove any dirt or thread sealant that remains on the threads. Start the Teflon tape on the second thread as shown above; make sure the tape does not overlap the end of the fitting. As the tape is wrapped in the 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.

## GAS MANIFOLD INSTALLATION

### WALL MOUNTING

1. Determine and mark the vertical center line for installation of the IntelliSwitch system.
2. Measure from the floor 73" and make a mark on the center line. Using a level, draw a horizontal line from the mark extending approximately 10 inches to the left and right of center. The height of 73" 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. (See Figure 4)



**Figure 4** - Manifold extension assembly

3. If the manifold capacity consists of four or more liquid cylinders remove the manifold block's end ½" pipe plug.
4. Apply Teflon tape to the male NPT end of the manifold extension. Then install the manifold extension kit into the ½" F-NPT end of the previous manifold block. Remember to secure both blocks while tightening the NPT connection.
5. Clean and apply new Teflon tape to the ½" pipe plug. Secure extension block while installing plug into the end female NPT port.
6. Use the mounting template on page 15 to locate the bracket's 3/8th mounting holes on the wall. Align the template cross hairs on the horizontal line so that it is centered with the vertical line. Mark the location of the two mounting bolt holes.
7. Use appropriate hardware when anchoring the mounting bracket in the level position on the wall.
8. Attached the pre-swaged relief goose neck to the male compression tube fitting located at the top right hand side of the manifold block.
9. Make sure that all connections are tightened.
10. Close the cryogenic valve by rotating handle clockwise till it stops.
11. Install the cryogenic hoses to the flare adapter located beneath each cryogenic check valve finger tight.
12. While securing the flare adapter tighten the cryogenic hose swivel adapter wrench tight.
13. Install the remainder of the cryogenic hoses in the same manner.
14. Connection to an appropriately sized vaporizer is to be made at the ½" F-NPT connection located on the cryogenic isolation valve.

**WARNING: Remember that an approved pressure relief device is required anywhere liquid may be trapped.**

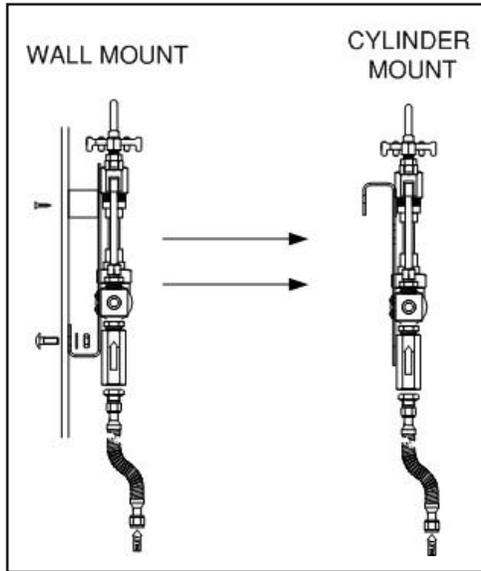
15. Refer to "Connecting a Cylinder" for directions on connecting the cryogenic transfer hose to the liquid cylinder.

## **630 CRYOGENIC MANIFOLD INSTALLATION (CYLINDER MOUNT)**

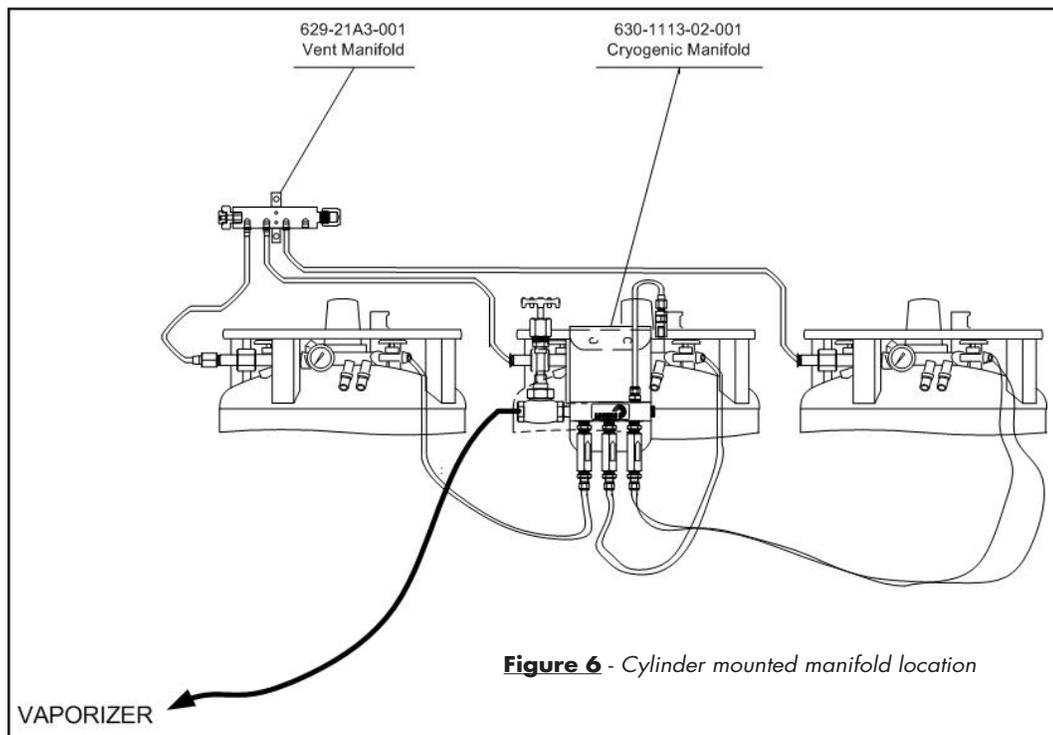
1. If the manifold capacity consists of four or more liquid cylinders remove the manifold block's end ½" pipe plug.
2. Apply Teflon tape to the male NPT end of the manifold extension. Then install the manifold extension kit into the ½" F-NPT end of the previous manifold block. Remember to secure both blocks while tightening the NPT connection.
3. Clean and apply new Teflon tape to the ½" pipe plug. Secure extension block while installing plug into the end female NPT port.
4. Attach the pre-swaged relief goose neck to the male compression tube fitting located at the top right hand side of the manifold block.
5. Make sure that all connections are tightened.
6. If necessary, rotate manifold bracket as illustrated in Figure 5 by removing the four screws located in the back of the manifold.
7. Re-insert and tighten screws.
8. Hang bracket assembly on the center most cylinder as illustrated in Figure 6.
9. Close cryogenic valve by rotating handle clockwise till it stops.
10. Install each cryogenic hose to the flare adapter located beneath each cryogenic check valve finger tight.
11. While securing the flare adapter tighten the cryogenic hose swivel adapter wrench tight.
12. Install the remainder of the cryogenic hoses in the same manner.
13. Connection to an appropriately sized vaporizer is to be made at the ½" female NPT port located on the cryogenic isolation valve.

**WARNING:** Remember that an approved pressure relief device is required anywhere liquid may be trapped.

14. Refer to “Connecting a Cylinder” for directions on connecting the hoses to the cylinder.



**Figure 5** - Mounting Orientation

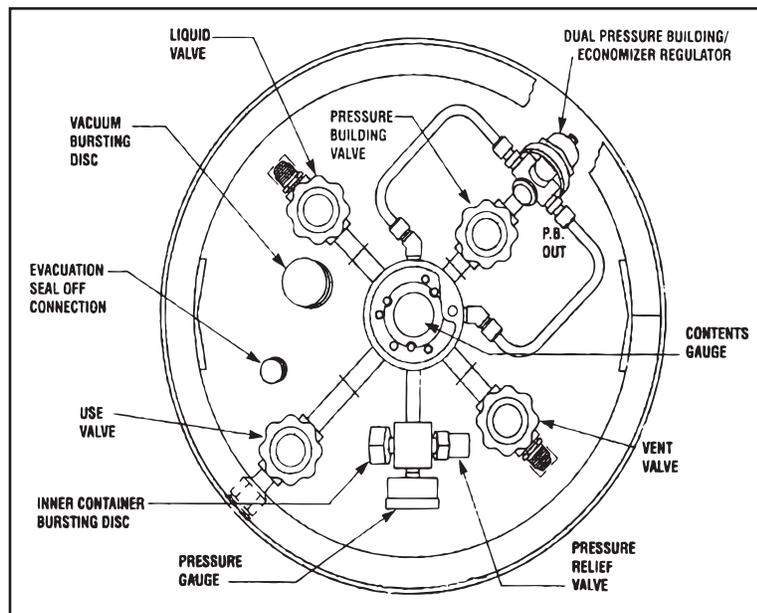


**Figure 6** - Cylinder mounted manifold location

## CONNECTING A LIQUID CYLINDER

Read the next section before replacing empty cylinders. The 630 series cryogenic manifold is to be used with a vaporizer rated for a minimum of 600 psi service. The vaporizer should be cleaned for the appropriate gas service. Tap water should not be used to flush the internal porting of the vaporizer due to the potential for mineral deposits. The vaporizer should have 1 ½ the vaporization capacity as the maximum flow rate for an eight hour period. Optimum performance is achieved when the 630 is used in conjunction with a 629-2xxx series vent manifold to equalize the head space of each liquid cylinder.

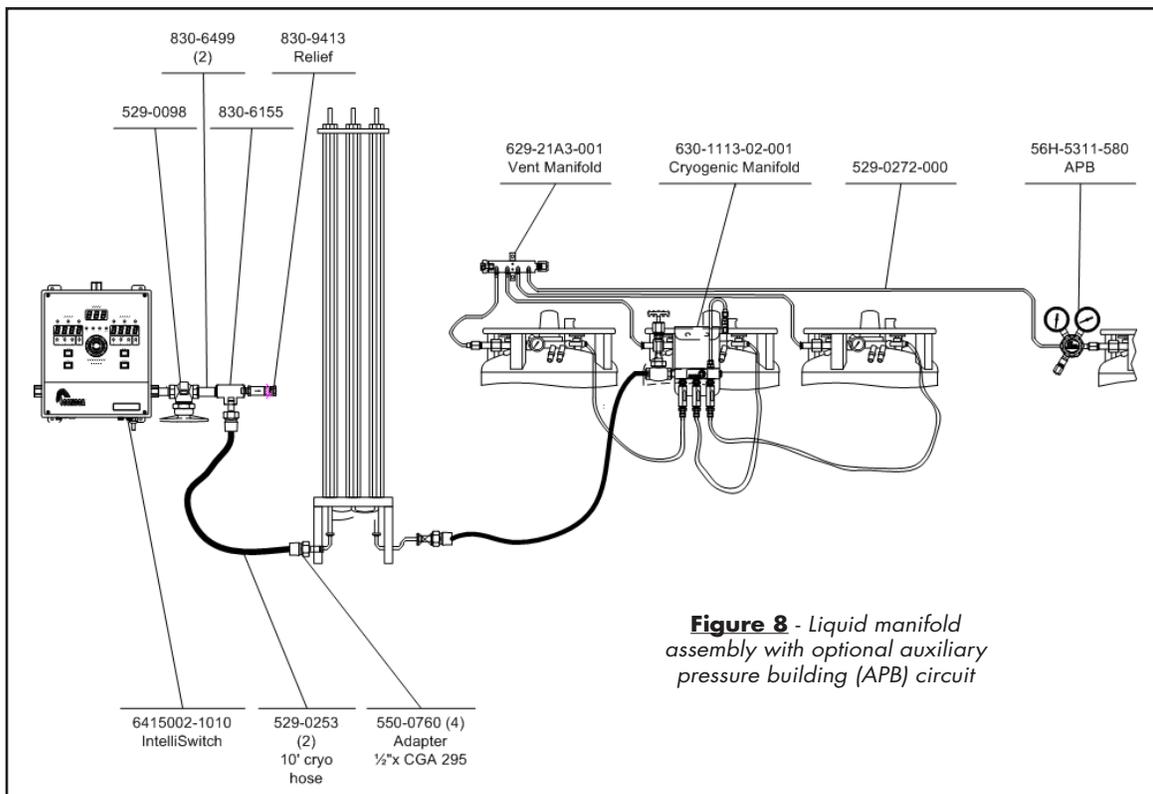
1. Before connection, move all cylinders with a cylinder cart to the work site:
  - a. Secure cylinder to the floor, wall, stand or bench with the appropriate chain or strap to prevent toppling.
  - b. The large diameter ring located at the top of the liquid cylinder protects the piping and valves.
  - c. Be sure all cylinder valves are tightly closed. (clockwise)
  - d. Remove the cylinder valve plug, if any.
  - e. Pay careful attention when connecting hoses to each cylinder valve because the liquid and vent use valves utilize the same flare connection.
  - f. Always close valves before removing hose connections.
  - g. Always maintain control of the disconnected hose end while pressure dissipates to prevent whipping.
  - h. Always wear the proper safety attire rated for cryogenic exposure.
  - i. Exposure to cryogenic gas will cause severe damage to your health.
2. If the 630 cryogenic-manifold is used in conjunction with a 629 vent manifold kit as illustrated in Figure 9 follow steps 2a-i. Connect the 629-2xxx hoses to the liquid cylinder's vent use valve in the following manner:
  - a. Use Figure 7 for the following instructions.
    - i. **WARNING: Pay extreme caution when connecting the 629 vent-manifold hose to the vent use valve because the liquid use valve utilizes the same CGA connection. Cryogenic exposure to the vent hose Teflon core may cause premature failure.**



**Figure 7** - Top view of a typical liquid cylinder valve arrangement

- ii. Please note that Figure 7 represents typical valve arrangements from both Chart (MVE) and Taylor Wharton.
- b. If connecting a full cylinder proceed to step 4.
- c. Close the vent use valve (clockwise) of each cylinder connected to the vent manifold.  
If equipped with an auxiliary pressure building (APB) circuit turn off the APB's gas use valve as illustrated in Figure 8.
- d. Loosen the pigtail flare connection to the cylinder's vent use valve a quarter turn to depressurize the vent manifold. A restrictive flow orifice has been installed between the manifold block and the pigtail to prevent whipping during a cylinder exchange.

**WARNING: The operator should secure the pigtail with one hand until exhausting of gas has subsided.**



- e. Finish removing the flare connection.
- f. Repeat process for each empty cylinder connected to the manifold.
3. Next disconnect the 630 cryogenic manifold hoses in the following manner.
  - a. Close the 630 main isolation valve attached to the manifold block.
  - b. Close liquid use valve (clockwise) of each liquid cylinder connected to the cryogenic manifold.
  - c. If replacing an empty cylinder, loosen the hose flare connection to the cylinder's liquid use valve and quarter turn to depressurize the hose.

**WARNING:** The operator should secure the hose above the swivel flare connection while exhausting of liquid/gas phase.

**WARNING:** Always wear the proper safety attire designed to protect against cryogenic exposure.

**WARNING:** Exposure to cryogenic gas will cause severe damage to your health.

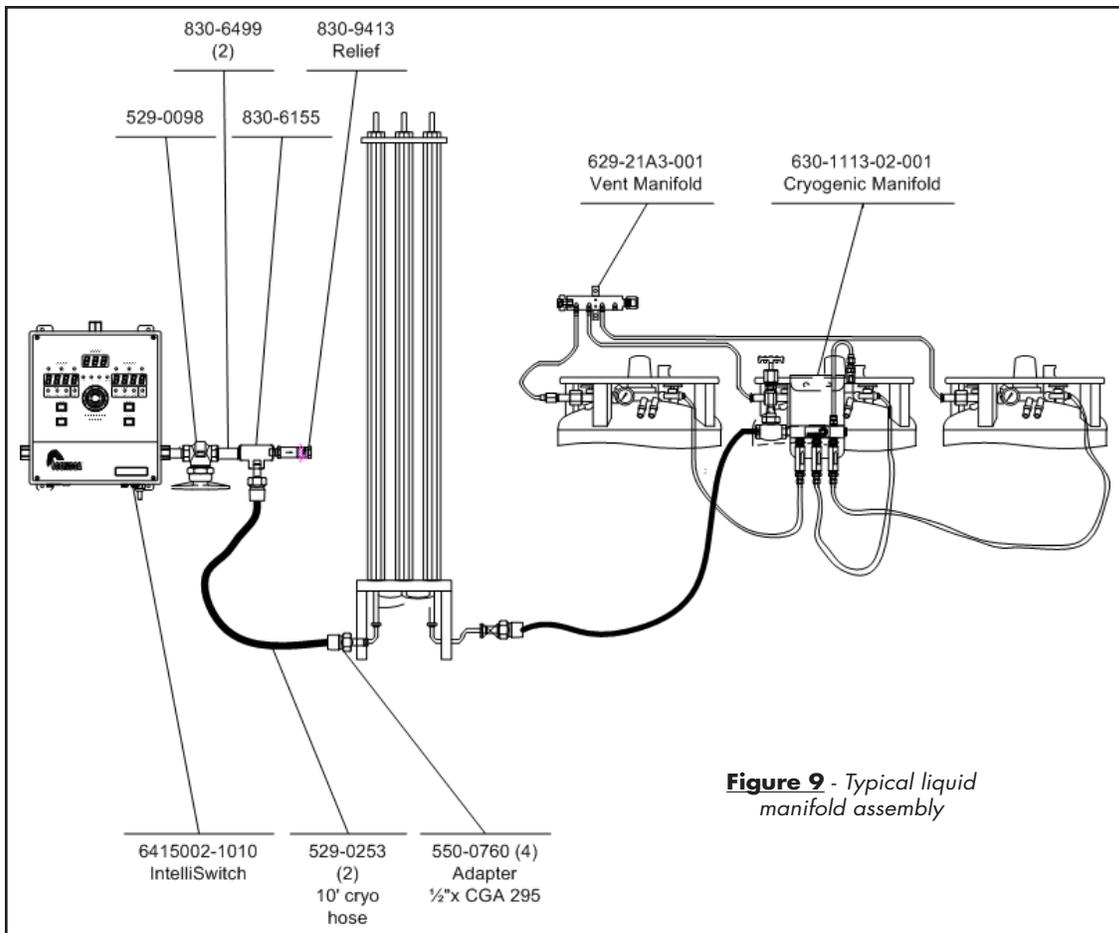
- d. Finish removing the flare connection.
- e. Repeat process for each additional liquid cylinder to be used on the manifold.
- f. Replace the empty cylinders.
4. Identify the full cylinder's liquid use valve. It is typically 180 degrees opposite the vent use valve as illustrated in figure 7.
5. Tighten each 630 cryogenic hose flare nut onto each full cylinder liquid use valve connection. Do not cross thread or force. If it does not fit, the connection may be incorrect for the type of Gas.
6. Connect each remaining full cylinder in like manner.

**WARNING:** Pay special attention when reconnecting the hose to the new liquid cylinder liquid use valve because both the vent and liquid use valves incorporate the same connection.

7. Next connect the vent use manifold hoses in the following manner.
  - a. Identify the full cylinders vent use valve. It is typically 180 degrees opposite the liquid use valve as illustrated in figure 7.
  - b. Tighten the vent hose flare nut onto the vent use valve connection of each cylinder. Do not cross thread or force. If it does not fit, the connection may be wrong for the type of gas being used.

**WARNING: Pay extra caution when reconnecting the pigtail to the new liquid cylinder vent use valve because both the vent and liquid use valves incorporate the same connection.**

- c. Connect each remaining full cylinder in like manner.
8. Open each vent use valve (counter clockwise).
9. If equipped with an auxiliary pressure building (APB) circuit as illustrated in Figure 8, open the APB's gas use valve. Otherwise go to step 10.
  - a. Adjust the APB regulator output to at least 50 psi above the pressure control device's (regulator or switchover) line pressure.
10. If not equipped with an auxiliary pressure building circuit as illustrate in Figure 9, open each cylinder's pressure building (PB) valve and adjust the PB regulator at least 50 psi above the pressure control device line pressure. A greater pressure differential may be required for higher flow requirement.



**Figure 9** - Typical liquid manifold assembly

11. Check all vent use manifold joints for leaks. If leaks are observed tighten joint, otherwise continue to step 14.
12. If the leak can not be repaired depressurize the vent manifold system and repair joint.
13. When no leaks are observed repeat steps 8-10.
  - a. The vent manifold is ready to use.
14. Fully open each cylinder's liquid use valve (counter clockwise).
15. Check all 630 cryogenic manifold joints for leaks. If leaks are observed tighten joint.
16. If the leak can not be repaired depressurize the cryogenic manifold system and repair joint.
17. When no leaks are observed open each cylinder's liquid use valve (counter clockwise)
  - a. The cryogenic manifold is ready for use.
18. Fully open the 630 cryogenic manifold's main isolation valve.
19. The system is ready for use.

## **OPERATION**

The 630 cryogenic manifold requires an external vaporizer rated for 600 psi service with 1 ½ the vaporization capacity as the maximum flow rate for an eight hour period. For optimal performance the delivery system should include a 629 vent kit with an auxiliary pressure building (APB) circuit and a pressure control device as illustrated in Figure 8. The 641 IntelliSwitch is ideal for continuous operation, where as the 623 series regulator works well in periodic service. Utilizing the 629 vent kit with APB the 630 is capable of delivering an equivalent of 4,000 cfh to an appropriately sized vaporizer. If configured with just the 629 vent kit the 630 is capable of doubling the liquid cylinders gaseous flow capacity. Typically, a 180-200 liter liquid cylinder is capable of delivering 350-400 cfh gas for one hour without a significant drop in pressure.

The operator should follow the instructions in the “Connecting a Liquid Cylinder” section for manifold operation.

When the system is not in use the operator should shut off the 630's main isolation valve, each liquid cylinder's pressure building, vent and liquid use valves. Then if equipped, the APB circuit liquid cylinder's pressure building, and gas use valves must be closed. Finally, the APB's regulator adjusting knob must be backed out to disengage the adjusting spring.

## **MAINTENANCE**

At regular intervals, the Manifold system should be checked for leaks and proper function (see Troubleshooting). The pigtail check valve should also be checked for leaks when a depleted cylinder is removed. Note: the system inlet and pigtail should be pressurized when checking for leaks. Any leaks in the system should be corrected immediately.

## **TROUBLESHOOTING**

Typical symptoms listed below indicate the 630 cryogenic system malfunctions needing repair. Replace immediately with a clean, repaired, tested or new part if the following occurs:

1. Gas or liquid phase leaking from a joint.
2. Manifold main isolation valve does not shut off the liquid flow to the down stream vaporizer.
3. The cryogenic relief does not reseal.
4. The spring loaded non-return check valve does not stop the back flow of liquid phase when a hose is disconnected from the cylinder. This may take approximately 3-5 minutes depending on the length of hose.

## **SERVICE**

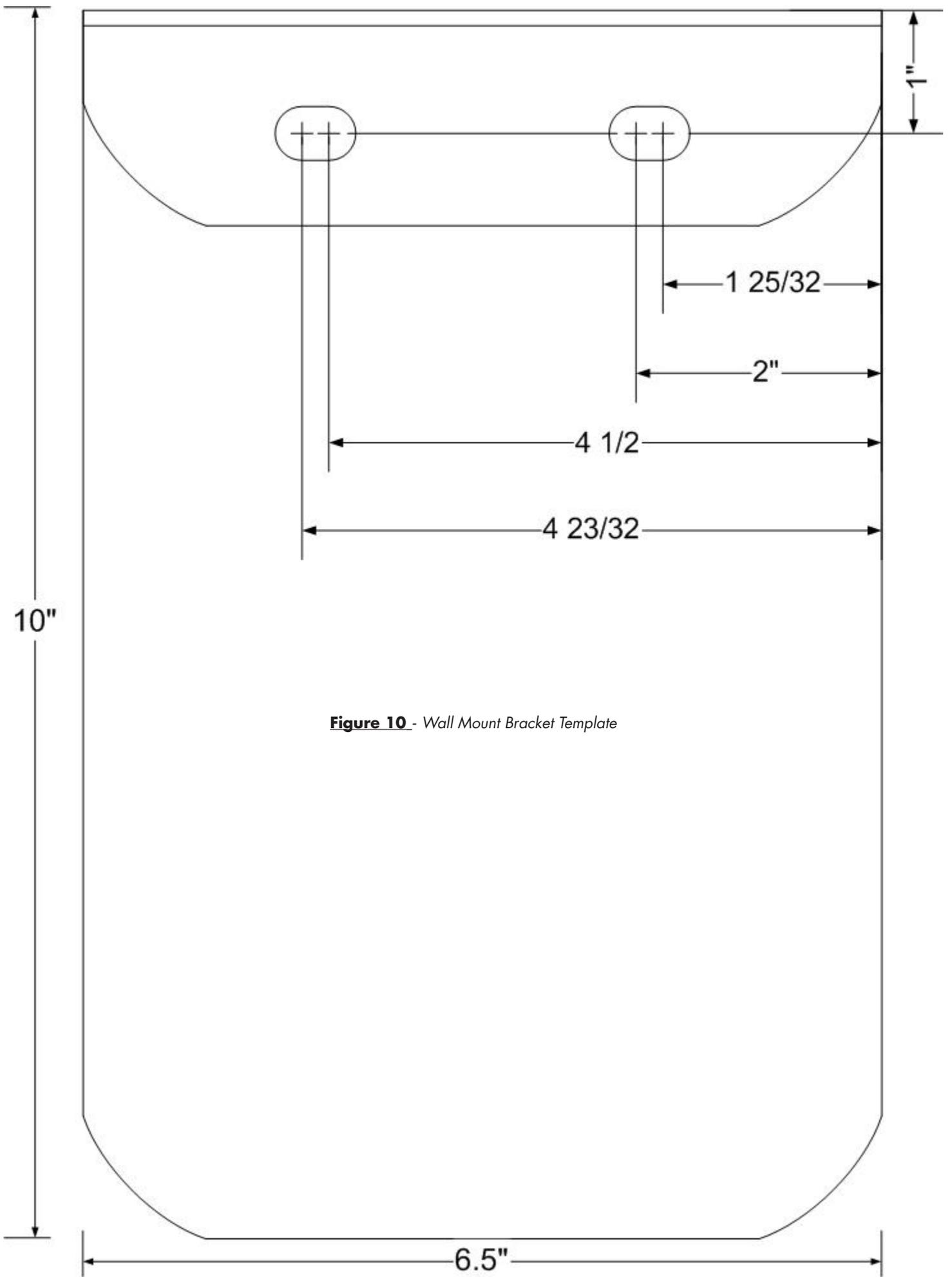
A Unit that is not functioning properly should not be used and should be returned to CONCOA for service. A Return Material Authorization (RMA) number must be issued for any product returned to CONCOA for service. Please contact a Customer Service Representative at 1-800-225-0473 to receive this number. You will be asked to provide:

1. Model Number
2. Gas Service
3. Inlet pressure and type of gas supply
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 return product in its original packing.
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. Include a statement of the gas service the product was used in.
6. Purge all equipment before shipping to protect the transporter and service personnel. 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.



**Figure 10** - Wall Mount Bracket Template



## 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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