



**MATHESON  
TRI•GAS**

ask. . .The Gas Professionals™

**INSTRUCTION MANUAL**

**LAB GAS SYSTEMS**

## **TABLE OF CONTENTS**

SERVICE	1
LIMITED WARRANTY	1-2
USER RESPONSIBILITY	2
SAFETY PRECAUTIONS	3
L01 REGULATOR SECTION	4-6
L03 OUTLET SECTION	7
MAINTENANCE	8

## **SERVICE**

### General Service

A unit which is not functioning in a normal manner should be removed from service until such time that repairs or replacement can be made. Upon completion of repair, full testing should be performed to assure the user that the regulator has been returned to its original operating parameters. Matheson offers a repair service to its customers for all products that Matheson sells. To arrange for repair service, call 215-641-2700 and ask for the Warranty Administrator. **NO PRODUCT WILL BE RECEIVED BY MATHESON WITHOUT INDICATION OF GAS SERVICE AND WITHOUT PROPER RETURN MATERIAL AUTHORIZATION PROVIDED BY THE WARRANTY ADMINISTRATOR. (All repairs must be made by Matheson or an assigned and approved facility to maintain any warranties or guarantees)**

If the unit is under an applicable warranty, return the unit to Matheson for repair or replacement. To arrange for warranty service, call 215-641-2700 and ask for the Warranty Administrator. **NO PRODUCT WILL BE RECEIVED BY MATHESON WITHOUT INDICATION OF GAS SERVICE AND WITHOUT PROPER RETURN MATERIAL AUTHORIZATION PROVIDED BY THE WARRANTY ADMINISTRATOR.**

If advised by the Warranty Administrator to return the product to Matheson, prepare the product for shipment and write, in large lettering the RMA Number assigned by the Warranty Administrator on the outside of the box. Also, if required by the Warranty Administrator, supply the completed RMA form with the product. Make sure that the product is adequately packaged, in the original shipping container if possible, and shipped prepaid (Matheson will not accept COD freight) with a description of the observed deficiency to the attention of the:

Warranty Administrator  
Matheson Gas Products  
166 Keystone Drive  
Montgomeryville, PA 18936

The user is expected to periodically inspect the product for leaks, loose or worn parts, broken or non-functioning components and to address those situations immediately. If the user would require verbal assistance in ascertaining the potential of a problem with any Matheson product, contact the local Matheson branch for assistance or your Matheson Sales Representative.

## **LIMITED WARRANTY**

This equipment is sold by Matheson Gas Products (Matheson) under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to the purchase of this equipment directly from Matheson or Matheson's Authorized Agent as new merchandise and are extended to the first Buyer thereof other for than the purpose of resale.

For a period of one year from date of original delivery (ninety 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 this equipment is properly operated under the conditions of normal use

and that regular and periodic maintenance and service is performed or replacements are made in accordance with the instructions provided. Expendable parts of this equipment are similarly 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. The foregoing warranties shall not apply if the equipment has been repaired other than by Matheson or a service facility designated by Matheson, or if this equipment has not been operated and maintained in accordance with written instructions provided by Matheson, or has been altered by anyone other than Matheson, or if the equipment has been subject to abuse, misuse, negligence or accident.

Matheson's sole and exclusive obligation and the Buyer's sole and exclusive remedy under the above warranties is limited to repairing or replacing, free of charge, at Matheson's sole discretion, the equipment or part which is telephonically reported to be a problem to the local Matheson Branch Location, and which if so advised, is returned with a written statement of the observed deficiency, not later than seven days after the expiration of the applicable warranty, to the Matheson Gas Equipment Technology Center during normal business hours, transportation charges prepaid, and which, upon examination, is found to comply with the above warranties. Return trip transportation charges for the equipment or part shall be paid by the Buyer.

**MATHESON 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. MATHESON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE EQUIPMENT OR PARTS THEREOF.**

**ACCEPTANCE OF THE EQUIPMENT BY THE FINAL BUYER INDICATES THE FINAL BUYER'S ACCEPTANCE OF ALL WARRANTIES AND LIMITATIONS SET FORTH ABOVE.**

## **USER RESPONSIBILITY**

This equipment will perform in conformity with the description thereof 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, with the frequency of such inspections depending upon the scope of use. Damaged, worn or contaminated equipment should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, Matheson Gas Products recommends that a telephonic or written request for service advice be made to the Matheson Equipment Engineering Group in Montgomeryville Pennsylvania or to the nearest Matheson Gas Products Branch location.

This equipment or any of its parts should not be altered without the prior written approval of Matheson Equipment Engineering Group. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than Matheson Gas Products or a service facility designated by Matheson Gas Products. Further, the ultimate user of the equipment is responsible for the training and safe operation of the equipment by personnel in his/her employ.

## **SAFETY PRECAUTIONS**

1. Many Specialty Gases are hazardous in nature. It is important that the user of the equipment carefully review the hazards associated with the gas to be used with the equipment. **BEFORE INSTALLING THE EQUIPMENT INTO ANY SYSTEM OR ON ANY CYLINDER OF COMPRESSED OR LIQUIFIED GAS, REFER TO THE MSDS THAT WAS SHIPPED WITH THE GAS, OR ON FILE IN YOUR FACILITY, AS TO THE SPECIFIC HAZARDS ASSOCIATED WITH THE GAS TO BE USED. ALSO, REFER TO ALL APPLICABLE INSERTS CONTAINED WITH THE EQUIPMENT FOR ADDITIONAL PRECAUTIONS AND OPERATING INSTRUCTIONS.**
2. Before using any equipment on toxic, corrosive, pyrophoric, flammable or other type of hazardous gas, test the leak integrity of the equipment using an inert gas.
3. Make certain that the equipment purchased is suitable for the application intended. Typically equipment supplied by Matheson has a model number, and pressure limitation labels and/or stampings. If not apparent refer to other sections of this manual or product literature. Carefully review this information to establish the equipment is fit for service in the desired application.
4. Make certain that the equipment purchased or delivered to the ultimate end user conforms to the specifications of the user. The user is responsible for selecting equipment compatible with gases that are to be used, physical parameters of operation and performance and normal material compatibilities. Selection information can be found in Matheson Catalogs, Matheson Tech Briefs and in the Matheson Gas Data Book. In addition, any Matheson representative would be pleased to aid in the selection of specific equipment.
5. Before installation of the equipment into any system or onto the cylinder of compressed or liquified gas, carefully inspect the equipment for visible signs of damage or contamination. Close attention should involve visual inspection of all exposed and connecting threads for visible signs of wear and abuse. Also examine the equipment for any loose parts outside of those that must swivel for connection to the gas system, cylinder or outlet lines. Also examine the equipment for signs of contamination with dirt, grease or any other foreign material. Close attention should be given to the external appearance and the view of the equipment from the inlet and the outlet. If any foreign materials are present and cannot be removed from the equipment easily with a cloth, or if the threads on the equipment appear to be abused as indicated above, or any of the components appear to be loose, return the equipment immediately for service.
6. Before connecting a cylinder source of compressed or liquified gas to the equipment, move the cylinder(s) to the work location and secure the cylinder before removing the cylinder valve cap. Check the cylinder valve as in step 5 for possible contamination and defective or loose parts. If for any reason the cylinder appears to be faulted as noted here, return the cylinder cap to the top of the cylinder, tighten down and remove the cylinder from the work area and call the supplier of the cylinder for immediate pick-up.
7. When using any hazardous gas, the cylinder of the gas should be placed under an exhaust hood or be placed in a suitable safety enclosure.

## **L01 REGULATOR SECTION**

### **REGULATOR SECTION INSTALLATION**

**BEFORE ATTACHMENT OF THE REGULATOR SECTION TO THE SOURCE SUPPLY CYLINDER, READ CAREFULLY THE "USER RESPONSIBILITY" AND "SAFETY PRECAUTIONS" SECTIONS OF THIS MANUAL**

1. Close the regulator by rotating the adjusting knob or handle in a counterclockwise direction. As the knob or handle is turned, the movement of the assembly should be easier.
2. Close the regulator outlet valve by turning clockwise, if the regulator is equipped with one.
3. Make the connections between the inlet of the regulator section and the source supply.
4. **COMPRESSION TUBE FITTINGS** are supplied as standard connections on L01 regulator sections. These connections are for use with rigid metal tubing of the appropriate size. Dependent upon the application, the tubing material will be either Brass, Copper, Stainless Steel or Monel. Connect the rigid tubing to the inlet of the regulator section and then to the equipment utilizing the manufacturer's instructions for making compression tube connections. **WARNING: MOST APPROVED AND RELIABLE COMPRESSION TUBE CONNECTIONS UTILIZE FERRULES FOR COMPRESSION OF THE FITTING ONTO THE TUBE. THESE FERRULES ARE TO BE USED FOR ONE (1) CONNECTION ONLY. ADDITIONAL CONNECTIONS SHOULD ALWAYS UTILIZE NEW FERRULES. NEVER USE TEFLON TAPE IN MAKING A COMPRESSION TUBE CONNECTION.**
5. **BEFORE OPERATION** of the regulator section and associated equipment, **IT IS STRONGLY RECOMMENDED** that the user leak check the entire system to be pressurized using an inert gas and an approved method. **WARNING: THIS STEP IS REQUIRED WHEN USING ANY HAZARDOUS MATERIAL.**

### **REGULATOR SECTION OPERATION**

**READ THE "SAFETY" AND "REGULATOR SECTION INSTALLATION" SECTIONS BEFORE OPERATION OF THE EQUIPMENT**

1. It is strongly recommended that high purity gas systems be thoroughly purged or evacuated before injecting high purity gases into the system.
2. The regulator control knob or handle should be closed as described in "REGULATOR SECTION INSTALLATION" sections above. The outlet valve (if supplied) should also be in the closed position as described in the "REGULATOR SECTION INSTALLATION" sections above.
3. The user should then put on appropriate safety apparel such as, but not limited to, safety glasses and gloves.
4. To avoid damage to the regulator section's internal parts, open the source supply valve SLOWLY. Observe the high pressure gauge for a rise in pressure to full cylinder pressure.

5. Observe all high pressure connections in the pressurized system for leaks.
6. An approved soap solution, if compatible with materials and applications in use, can be used to check connections for leaks.
  - 6.1 An approved leak detecting device can be used to check for leaks. Consult the manufacturer's instructions for applications and hazards associated with the gas to be used in the system.
  - 6.2 If neither method above can be utilized, re-close the source supply valve for a minimum of five minutes and observe the high pressure gauge for a drop in pressure.
  - 6.3 If a leak is indicated, by any of the methods listed above, recheck the source supply connection to the regulator section and all other high pressure connections.
  - 6.4 If all of the connections indicate no leak and the regulator and outlet valve are still closed, and the pressure continues to fall on the inlet gauge, reduce pressure in the system as outlined in the "SHUTDOWN PROCEDURES". Return the regulator for replacement (if new) or repair (if out of warranty) by following the procedure in the "WARRANTY REPAIR" section.
7. If the system has been leak checked as in step 6 and is found to be acceptable, proceed to operate the regulator section.
8. Adjust the hand knob to raise the delivery pressure to the desired working pressure while observing the delivery pressure gauge. **DO NOT EXCEED THE MAXIMUM DELIVERY PRESSURE INDICATED BY THE MODEL NUMBER OR ANY ADDITIONAL LABELS.**
  - 8.1 Observe all low pressure connections in the pressurized system for leaks.
  - 8.2 Check connections for leaks with an approved soap solution, if compatible with materials and applications in use.
  - 8.3 An approved leak detecting device can be used to check for leaks. Consult the manufacturer's instructions for applications and hazards associated with the gas to be used in the system.
  - 8.4 If neither method above can be utilized, re-close the source supply valve for a minimum of five minutes and observe the low pressure gauge for a drop in pressure.
9. Again set the delivery pressure and open the outlet valve on the regulator. **CHECK THE REST OF THE SYSTEM FOR LEAKS AS DESCRIBED ABOVE FOR LOW PRESSURE CHECK.**
10. Upon completion of the leak check, open the inlet gas valve on the equipment to be supplied gas and begin use.
  - 10.1 With the gas flowing through the system, some adjustment to delivery pressure may be needed. Make adjustments in accordance with the final equipment manufacturer's instructions.
  - 10.2 TWO STAGE regulators will usually require no further adjustment.
  - 10.3 SINGLE STAGE regulators will require adjustment as the cylinder pressure decreases. Periodically check the regulator for a change in the delivery pressure.

10.4 AS A GENERAL RULE, the cylinder should be considered empty when the cylinder pressure falls to twice (2x) the usable delivery pressure.

**NOTE: THE OUTLET VALVE ON THE REGULATOR (IF SUPPLIED) IS MEANT TO BE USED AS A TEMPORARY SHUT OFF VALVE ONLY. IT IS NOT INTENDED TO THROTTLE OR CONTROL PRESSURE OR FLOW IN ANY WAY WHATSOEVER.**

#### REGULATOR SECTION SHUTDOWN

**THE FOLLOWING PROCEDURE IS TO BE USED WITH NORMALLY OPEN SYSTEMS OR FOR COMPLETE SYSTEM DISASSEMBLY. THIS PROCEDURE IS TO BE USED ONLY WHEN THERE IS NO CONCERN FOR INTRUSION OF AMBIENT AIR INTO THE SYSTEM**

1. Shut off the source supply valve completely.
2. Shut down any additional gas supplies that may be supplying gas to the system.
3. Open the regulator valve and the outlet valve to drain the contents of the regulator section through the system in use. The regulator section gauge should descend to zero.
4. When using a toxic or other hazardous gas, run an inert gas through the regulator and system as a means to purge the toxic or hazardous gas out of the system before breaking any of the system connections
5. After venting (and purging when necessary), close the regulator valve and the outlet valve.
6. Disconnect the regulator section from the system or downstream equipment.



## L03 OUTLET SECTION

### OUTLET SECTION INSTALLATION

**BEFORE ATTACHMENT OF THE L03 OUTLET SECTION TO THE SOURCE SUPPLY, READ CAREFULLY THE "USER RESPONSIBILITY" AND "SAFETY PRECAUTIONS" SECTIONS OF THIS MANUAL**

1. Turn all outlet valves to the off position
2. Make the connections between the source supply and the inlet of the outlet section, and the outlet section and the equipment to be supplied gas.
3. **COMPRESSION TUBE FITTINGS** are supplied as standard connections on L03 outlet sections. These connections are for use with rigid metal tubing of the appropriate size. Dependent upon the application, the tubing material will be either Brass, Copper, Stainless Steel or Monel. Connect the rigid tubing to the inlet of the L03 outlet section and then to the equipment utilizing the manufacturer's instructions for making compression tube connections. **WARNING: MOST APPROVED AND RELIABLE COMPRESSION TUBE CONNECTIONS UTILIZE FERRULES FOR COMPRESSION OF THE FITTING ONTO THE TUBE. THESE FERRULES ARE TO BE USED FOR ONE (1) CONNECTION ONLY. ADDITIONAL CONNECTIONS SHOULD ALWAYS UTILIZE NEW FERRULES. NEVER USE TEFLON TAPE IN MAKING A COMPRESSION TUBE CONNECTION.**

### OUTLET SECTION OPERATION

1. Leak check the outlet section in the same manner as described in the REGULATOR SECTION OPERATING INSTRUCTIONS.
2. If the system has been leak checked to be acceptable, proceed to operate the outlet section by turning the valve(s) to the ON (or GAS) position.

### OUTLET SECTION SHUTDOWN

**THE FOLLOWING PROCEDURE IS TO BE USED WITH NORMALLY OPEN SYSTEMS OR FOR COMPLETE SYSTEM DISASSEMBLY. THIS PROCEDURE IS TO BE USED ONLY WHEN THERE IS NO CONCERN FOR INTRUSION OF AMBIENT AIR INTO THE SYSTEM**

1. Shut off the source supply valve completely.
2. Shut down any additional gas supplies that may be supplying gas to the system.
3. Open the outlet valve(s) to drain the contents of the outlet section through the system in use.
4. When using a toxic or other hazardous gas, run an inert gas through the outlet section as a means to purge the toxic or hazardous gas out of the section before breaking any of the system connections
5. After venting (and purging when necessary), close the outlet valve(s).
6. Disconnect the outlet section from the system and downstream equipment.

## MAINTENANCE

### REGULATOR SECTION MAINTENANCE

1. In the event the regulator section is not operating properly refer to the SERVICE section of this manual.
2. The ON-OFF valve(s) may require periodic packing adjustment in order to maintain leak integrity.

### PURIFIER SECTION MAINTENANCE

1. In the event the Oxygen, moisture, or hydrocarbon traps need to be replaced order the appropriate replacement trap from the REPLACEMENT PARTS list.
2. Replace the traps according to the instructions in L02 Purifier Section of this manual.

### REGULATOR SECTION MAINTENANCE

1. In the event the outlet section is not operating properly refer to the SERVICE section of this manual.
2. The ON-OFF valve(s) may require periodic packing adjustment in order to maintain leak integrity.