

# General Safety Instructions for Gas Regulators

Save these instructions  
for future reference.

## Avoid Overpressurization



### WARNING:

Do not exceed the regulator's pressure ratings. Over-pressuring the regulator could damage it internally, cause leaks, or even result in personal injury by bursting a pressure containing part.

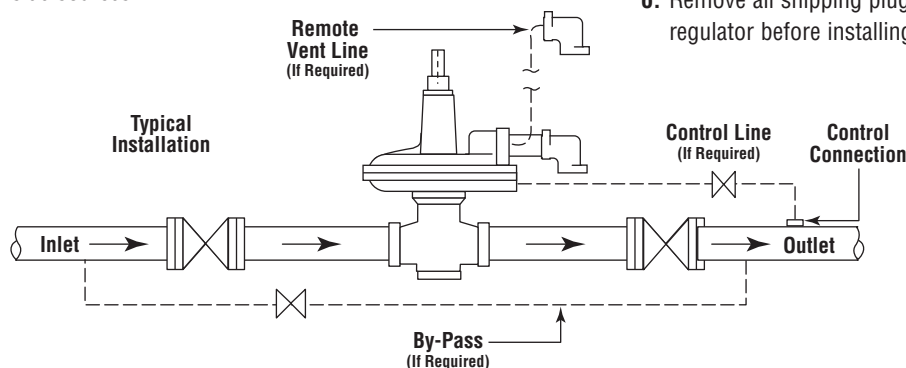
1. Refer to the appropriate REGULATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS bulletin for pressure ratings. The regulator outlet has a lower pressure rating than the inlet. Do not expose the regulator or outlet or control line to inlet pressure.
2. Regulators manufactured for use with a control line and having a diaphragm chamber sealed from the body outlet chamber may be used as the upstream regulator in a monitor set. The sealed body outlet chamber can be exposed to pressure higher than the normal outlet pressures. Do not use a regulator manufactured for internal control nor a regulator having a control line with an open throat as the upstream

regulator in a monitor set. Doing so could result in a system failure where damage could occur along with personal injury.

3. Overpressure protection such as relief valves, automatic shutoff valves, monitors, etc., are recommended to protect both the inlet and outlet side of the regulator. If the inlet pressure is, or could be, greater than the emergency pressure rating for the regulator outlet or diaphragm chamber, install suitable over-pressure protection to prevent regulator damage and possible personal injury (see "Maximum Emergency Pressures" in the REGULATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS bulletin). The use of an internal or external relief valve is recommended for installations subjected to no-flow for extended periods of time, such as pilotless ignition systems.

## Prior to Installation

1. Examine the regulator for shipping damage.
2. Check the name plate data. Make sure the regulator conforms with what was ordered.
3. Provide suitable shut-off valves, conveniently located.
4. Protect the regulator from damage by vehicles or other outside sources.
5. The inside of the regulator and piping must be clean. Remove all dirt and debris before installing the regulator. Failure to do this could result in regulator damage and improper operation. Where there are dirt problems in the gas, it may be necessary to install a suitable filter or strainer upstream from the regulator.
6. Remove all shipping plugs and covers from the regulator before installing. Do not let dirt get inside.



## Installation and Start-Up

1. Follow the appropriate REGULATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS bulletin for the regulator when installing, operating, maintaining and servicing it. KEEP THE BULLETIN FOR FUTURE REFERENCE. If any of these instructions are not understood or there are any questions, phone your Invensys sales representative.
2. Installation, operation, maintenance, and service must be done only by qualified persons.
3. Comply with all pertinent rules, regulations and codes (federal, state, local and insurance).
4. Make sure the inlet and outlet connections are correct. High pressure connects to the regulator inlet. The flow arrow on the body must point downstream.
5. Screwed connections must conform with good piping practice and be free of excess thread engagement (per ANSI B1.20.1). Apply pipe joint sealant to male threads only.
6. Tighten flanged joints evenly.
7. Before start-up, make sure the regulator is correctly connected, adequately supported and pipe joints are tight.
8. Check the regulator "set-point" and "lock-up" pressure. (Set-point is the outlet pressure the regulator is adjusted to deliver. Lock-up is the pressure where tight shutoff is achieved).

### IMPORTANT:

During start-up, a pressure gauge must be connected to the outlet piping between the regulator outlet and the downstream shutoff valve to closely monitor the outlet pressure. When checking the regulator for set-point and lock-up, provision must be made to PERMIT FREE FLOW of gas beyond the outlet valve.

The regulator set-point is factory adjusted as specified on the order. Set-point should be checked with small gas flow (10% of maximum regulator capacity or less). Open the valve downstream of the regulator before turning on gas. Slowly open the inlet valve while monitoring the outlet pressure gauge. Small flow should be set by adjusting the outlet valve.



### WARNING:

Always closely monitor the outlet pressure gauge during start-up while opening or closing valves and making adjustments. If the outlet pressure continues to increase above the specified lock-up pressure, open the downstream valve to discharge the excess pressure and close the inlet valve.

Only adjust set-point when gas is flowing through the regulator. DO NOT adjust if regulator is locked-up (tight shutoff).

### IMPORTANT:

Small flow during set-point adjustment is particularly important where set-point is in the top third of the spring range. Large flow could result in over-stressing the spring or loss of lock-up from the spring compressing solid. If the set-point adjustment must be made at large flow (60% to 100% of maximum regulator capacity) and set-point is in upper third of spring range, use the next higher range spring.

After set-point has been determined to be correct, check for lock-up by slowly closing the outlet valve. Again closely monitor the regulator outlet pressure gauge. Regulator must be fully capable of tight lock-up. If outlet pressure continues to rise above the lock-up pressure, open the downstream valve to discharge excess pressure and close the inlet shutoff valve. If the pressure goes above lock-up, the regulator is not closing properly. Make the necessary corrections before resuming start-up.

9. Prompt attention is essential if there is regulator trouble, if gas leaks from the vent or elsewhere from the regulator, or if leaks develop in the piping. Failure to shut down the regulator may cause serious hazards.

10. The outlet of the vent piping must allow for the free and unobstructed passage of air and gas.

The diaphragm case vent must be positioned to protect against flooding, drain water, ice formation, traffic, tampering, etc. The vent must be protected against nest building animals, bees, insects, etc. to prevent vent blockage and minimize the chances for foreign material from collecting in the vent side of the regulator diaphragm.



**It is the user's responsibility to assure that all regulator vents and/or vent lines exhaust to a non-hazardous location away from any potential sources of ignition. Where vent lines are used, it is the user's responsibility to assure that each regulator is individually vented and that common vent lines are not used.**

## Monitor Regulators and External Control Lines

When bypassing a regulator with an external control line, the control line valve must be closed before the bypass valve is opened. Failure to do so could result in the diaphragm being exposed to the inlet pressure.

### Use With Other Gases

1. Do not use Sensus regulators on corrosive gases unless authorized by Sensus for a specific corrosive condition.
2. Where the gas is propane or butane (LPG) and the regulator has an internal relief valve (IRV), special care is required with the regulator vent. Because propane and butane are heavier than air, they do not disperse readily in the atmosphere. Instead, they tend to collect in low places. Since large volumes can discharge from the regulator vent at times of emergency, care must be taken to pipe any such discharge to atmosphere at a safe place to prevent any gathering or migration of explosive mixtures in low areas.

## General Inspection and Service Instructions

1. Inspect the regulator periodically to make sure it is in satisfactory working condition. Establish the frequency of inspection on the basis of severity of service and applicable laws and regulations. As a minimum recommendation, pressure regulating and limiting equipment should be inspected at intervals not exceeding 15 months, but at least once each calendar year.
2. If the regulator is to be moved to another location, make sure its construction is compatible with the new pressure and flow conditions.



### WARNING:

Before any disassembly of the regulator, make sure it is completely depressurized. Pressure must be fully released from the inlet, the outlet, and any control line connections. Failure to adequately depressurize could result in serious injury.

3. Carefully note the location and position of all disassembled parts to be certain reassembly is correct. Inspect each part carefully and replace any that are worn, damaged or otherwise unsatisfactory.
4. Adjustment screw lubrication should be checked whenever the regulator is serviced. Make sure the threads are fully coated with lubricant. Where there is evidence of thread wear, such as loose fit or excessive sideplay, the worn parts must be replaced.



### WARNING:

Failure from worn threads can result in serious personal injury. Even at 10 psig outlet pressure, the force exerted on the adjustment screw by spring compression can be great. Therefore, adjustment screw lubrication and thread condition must be given careful attention.

5. Upon completion of servicing, make certain that the regulator installation is entirely free of leaks.



805 Liberty Boulevard  
DuBois, PA 15801  
800-375-8875  
Fax: (814) 375-8460  
www.sensus.com  
(open "North American Gas")