64 and 67C Series Direct-Operated Regulators

WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher™ equipment must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies, Inc. The installation in most states must also comply with NFPA No. 54 and 58 standards.

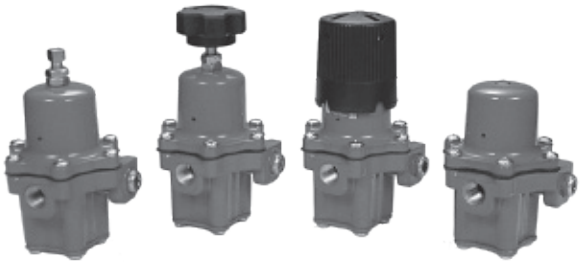
Only personnel trained in the proper procedures, codes, standards and regulations of the LP-Gas industry should install and service this equipment.

CALIFORNIA PROPOSITION 65

This product can expose you to chemicals including lead, nickel and cobalt, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

THINGS TO TELL THE GAS CUSTOMER:

1. Point out the regulator's vent to the customer (or vent assembly or vent tube) and **stress that this opening must remain unobstructed at all times.** Tell the customer to be sure to check the vent opening after a freezing rain, sleet storm or snow to make sure ice has not formed in the vent.
2. Show the customer the shutoff valve on the container. The customer should close this valve immediately if gas is smelled, appliance pilot lights fail to stay on or appear higher than usual or any other abnormal situation occurs.
3. Tell the customer to call your company to service the regulator if the regulator vents gas or a leak develops in the system. **Only a qualified gas service person should install or service the regulator.**



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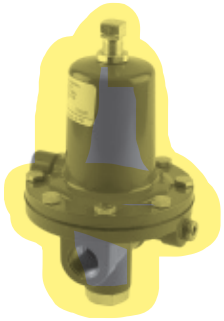
67C SERIES REGULATORS



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64 SERIES REGULATOR

Figure 1. *64 and 67C Series Regulators*

CAUTION

Do not use the 67C, 64 or 64SR Series regulators in anhydrous ammonia (NH_3) service. They contain brass materials that are not compatible with anhydrous ammonia (NH_3).

Introduction

Scope of the Manual

This manual provides instructions and maintenance for the following high-pressure regulators: Types 64, 64KB, 64SR, 67CW, 67CH, 67CD and 67CN regulators.

Description

The 64 and 67C Series direct-operated regulators (Figure 1) are designed for high-pressure (pounds per square inch) service and can be used on either vapor applications in LP-Gas, Natural Gas and Air or liquid LP-Gas applications. Depending upon type, outlet pressure ranges from 3 to 135 psig / 0.21 to 9.3 bar. Type 64SR can be used as a First Stage LP-Gas regulator–reducing tank pressure to 10 psig / 0.69 bar for a Second Stage regulator. Type 64KB is the only regulator in this series suitable for anhydrous ammonia (NH_3) service. The regulators are normally painted red.

Installation

WARNING

Failure to follow these instructions and warnings could result in personal injury or property damage.

All vents should be kept open to permit free flow of air into and out of the regulator.

Protect openings against the entrance of rain, snow, ice formation, paint, mud, insects or any other foreign material that could plug the vent or vent lines.

Specifications

Some general 64 and 67C Series ratings and other specifications are given on Specifications section. A spring case label gives the spring range for the regulator as it comes from the factory.

Body Sizes, Inlet and Outlet Connection Style
64 Series: 1/2 NPT, inlet and outlet
67C Series: 1/4 NPT, inlet and outlet

Side Outlet Connection Style (Plugged)
1/4 NPT; pressure gauge can be installed

Maximum Inlet Pressure (Body Rating)(1)
250 psig / 17.2 bar

Maximum Emergency Outlet Pressure(1)
64 Series: 220 psig / 15.2 bar
67C Series: 50 psig / 3.4 bar over outlet pressure

Pressure Registration
Internal

Wide-Open Flow Coefficients
64 Series: C_g: 35.6; C_v: 0.91; C_1: 39.0
67C Series: C_g: 11.7; C_v: 0.36; C_1: 32.2

Regulator Temperature Capabilities
64 Series: -20 to 150°F / -29 to 66°C
67C Series: -20 to 180°F / -29 to 82°C

Spring Case Vent Location
64 Series: 1/4 NPT screened over side outlet tap
67C Series: Aligned with inlet, other positions optional

Approximate Unit Weights
64 Series: 2.25 lbs / 1 kg
67C Series: 1 lbs / 0.5 kg

1. The pressure/temperature limits in this Instruction Manual or any applicable standard limitation should not be exceeded.

Table 1. *Available Configurations*

TYPE	DESCRIPTION
64	Basic regulator with four spring ranges from 3 to 100 psig / 0.21 to 6.9 bar.
64SR	Internal relief version with three spring ranges from 3 to 35 psig / 0.21 to 2.4 bar.
64KB	For use with anhydrous ammonia (NH_3) with handwheel adjustment and five spring ranges from 3 to 100 psig / 0.21 to 6.9 bar. Includes a special diaphragm protector.
67CW	Basic regulator with wrench adjustment and four spring ranges from 3 to 135 psig / 0.21 to 9.3 bar; no relief.
67CH	Basic regulator with handwheel adjustment.
67CD	Basic regulator with dial cap adjustment.
67CN	Basic regulator, factory set with no field adjustment.

Table 2. *Outlet Pressure Ranges*

SPRING RANGE(1)		TYPE NUMBER AND FACTORY SETPOINT							
		67CW, 67CD and 67CH		67CN		64SR		64 and 64KB	
psig	bar	psig	bar	psig	bar	psig	bar	psig	bar
3 to 15	0.21 to 1.0	----	----	----	----	10	0.69	10	0.69
3 to 20	0.21 to 1.4	15	1.0	----	----	15	1.0	15 64KB only	1.0 64KB only
5 to 35	0.34 to 2.4	20	1.4	10, 15 or 20	0.69, 1.0 or 1.4	20	1.4	20	1.4
20 to 50	1.4 to 3.4	40 67CD only	2.8 67CD only	----	----	----	----	----	----
30 to 60	2.1 to 4.1	40 67W and 67CH only	2.8 67W and 67CH only	----	----	----	----	40	2.8
35 to 100	2.4 to 6.9	50 67CD only	3.4 67CD only	----	----	----	----	50	3.4
35 to 135	2.4 to 9.3	50 67W and 67CH only	3.4 67W and 67CH only	----	----	----	----	----	----

1. All springs can be backed off to 0 psig / 0 bar except Type 67CN. However, for the highest capacity and most accurate control, use the lowest spring that can be adjusted to the required setpoint.

LP-Gas may discharge to the atmosphere through the vent of a Type 64SR. The internal relief valve of the Type 64SR regulator does not provide full overpressure protection, but is designed for minor seat leakage only. An obstructed vent which limits air or gas flow can cause abnormally high outlet pressure. A vent line to a remote, safe location outdoors is required on permanent indoor installations or on installations where there can be a hazardous accumulation of gas.

Never use a 64 or 67C Series (pounds to pounds) regulator on low-pressure (in. w.c.) service.

1. Regulator operation within ratings does not preclude the possibility of damage from debris in the lines or from external sources. Regulators should be inspected for damage periodically and after any overpressure condition.
2. Only personnel qualified through training and experience should install, operate and maintain a regulator. Make sure that there is no damage to or foreign material in the regulator. Also, ensure that all tubing and piping is free of debris.
3. Install the regulator so that flow is from the IN to the OUT connection as marked on the regulator body.
4. Protect the regulator from vehicular traffic or damage from other external sources.
5. Install the regulator high enough above ground level, at least 18 in. / 457 mm, so that rain splatter cannot freeze in the vent. Do not install the regulator in a location where there can be excessive water accumulation or ice formation, such as directly beneath a downspout, gutter or roof line or a building.
6. A regulator installed outdoors without a protective hood must have its vent pointed vertically down to prevent clogging and moisture accumulation. A clogged spring case vent hole

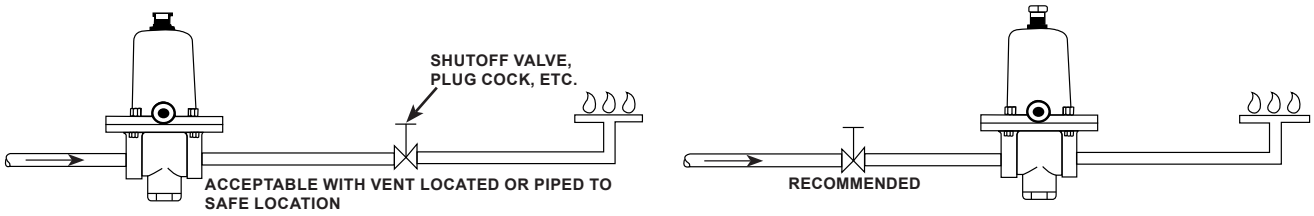

Figure 2. *Type 64SR on Liquid Service Requires Care with Downstream Restrictions*

may cause the regulator to function improperly. To keep this vent hole from being plugged (and to keep the spring case from collecting moisture, corrosive chemicals or other foreign material) orient the vent to the lowest possible point on the spring case or point it vertically down or install the regulator under a protective cover so that it is protected from the elements. Inspect the vent hole regularly to make sure it is not plugged. Spring case vent hole orientation may be changed by rotating the spring case with respect to the body. A 1/4 NPT spring case vent may be remotely vented by installing obstruction-free tubing or piping into the vent. Protect the remote vent by installing a screened vent cap on the remote end of the vent pipe.

7. For use in regulator shutdown, install upstream block and vent valves and downstream block and vent valves (if required) or provide some other suitable means of properly venting the regulator inlet and outlet pressures. Install a pressure gauge to monitor instruments on startup.
8. Apply a good grade of pipe compound to the male pipe threads before making connections, making sure not to get the pipe compound inside the regulator.
9. Install tubing fitting or piping into the NPT inlet and outlet connections on the body.
10. The second 1/4 NPT side outlet can be used for a gauge or other use. If not used, it must be plugged.
11. On liquid service, it is recommended that shutoff valves be installed on the inlet side of the regulators. Figure 2 shows a typical installation using the Type 64SR. If other regulator models are used, an external relief valve is required downstream of the regulator and before any shutoff valve. Installations with shutoffs downstream of the regulator can trap liquid between the regulator and the shutoff. The trapped liquid can vaporize, opening the internal or external relief valve. On installations where it is impossible to install the regulator without using shutoffs between the regulator and the burner, either install the regulator in a safe location or run a vent line from the Type 64SR vent or the discharge point of the relief valve to a safe location so that any discharge through the relief valve will not create a hazard.

Overpressure Protection

WARNING

Personal injury or system damage may result if these regulators are installed without appropriate overpressure protection. If maximum inlet pressure to the 64 and 67C Series exceeds maximum pressure ratings of the downstream equipment or exceeds maximum allowable outlet pressure of the 64 and 67C Series, then additional overpressure protection is required. Outlet pressures greater than Maximum Emergency Outlet Pressure limits may cause damage to regulator parts, leaks in the regulator or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas.

If these regulators are exposed to an overpressure condition, they must be inspected for damage that may have occurred.

Large volumes of gas may discharge through the Type 64SR regulator vent during internal relief valve operation, which can result in fire or explosion from accumulated gas.

A relief valve is required downstream of all these regulator to provide overpressure protection to prevent damage to downstream equipment and systems or when used in liquid service. The Type 64SR has an internal relief valve that opens when downstream pressure reaches approximately 125% to 250% of the setpoint. Gas discharge is through the regulator vent. The Type 64SR gives overpressure protection against excessive buildup resulting from seat leakage due to worn parts or chips of foreign material on the orifice. Additional external relief valves may be required to prevent overpressure damage to downstream equipment or systems.

Startup and Adjustment

1. With proper installation completed and downstream equipment properly adjusted, slowly open the upstream and downstream shutoff valve (when used) while using pressure gauges to monitor pressure.

WARNING

To avoid personal injury, property damage or equipment damage caused by bursting of pressure-containing parts or explosion of accumulated gas, never adjust the control spring to produce an outlet pressure higher than the upper limit of the outlet pressure range for that particular spring. If the desired outlet pressure is not within the range of the control spring, install a spring of the proper range according to the Diaphragm Parts Maintenance procedure.

2. If outlet pressure adjustment is necessary, monitor outlet pressure with a gauge during the adjustment procedure. The regulator, except for the Type 67CN which is not field adjustable, is adjusted by loosening the locknut, if used and turning the adjusting screw or handwheel clockwise to increase or counterclockwise to decrease the outlet pressure setting. Re-tighten the locknut to maintain the adjustment position.

Shutdown

First, close the nearest upstream block valve and then close the nearest downstream block valve (when used). Next, open the downstream vent valve. Since the regulator remains open in response to the decreasing downstream pressure, pressure between the closed block valves will be released through the open vent valve.

Maintenance

WARNING

To avoid personal injury or equipment damage, do not attempt any maintenance or disassembly without first isolating the regulator from system pressure and relieving all internal pressure.

Regulators that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Emerson should be used for repairing Fisher™ regulators. Relight pilot lights according to normal startup procedures.

Due to normal wear or damage that may occur from external sources, these regulators must be inspected and maintained periodically. The frequency of inspection and replacement of the regulators depends upon the severity of service conditions or the requirements of local, state and federal regulations. Even under ideal conditions, these regulators should be replaced after 15 years from date of manufacture or sooner should inspection reveal the need.

Failure to do the following could result in personal injury or property damage. Visually inspect the regulator each time a gas delivery is made for:

1. Improper installation;
2. Plugged or frozen vent;
3. Wrong regulator or no regulator in the system;
4. Internal or external corrosion;
5. Age of the regulator;
6. Any other condition that could cause the uncontrolled escape of gas.

Make sure the regulator vent, vent assembly or vent tube does not become plugged by mud, insects, ice, snow, paint, etc. The vent screen aids in keeping the vent from becoming plugged and the screen should be clean and properly installed.

Replace any regulators that have had water in their spring case or show evidence of external or internal corrosion. Checking for internal corrosion may require complete removal of the adjusting screw and shutdown of the gas system. Closely examine regulators directly connected to the container valve by means of a solid POL adaptor (horizontal mounting) for signs of corrosion. Correct any improper installations.

Older regulators are more likely to catastrophically fail because of worn or corroded parts. Replace regulators over 15 years of age; other service or environmental conditions may dictate replacement of the regulator before it becomes 15 years old, refer to Fisher Bulletin LP-32.

Regulator Repair

Regulators that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Emerson should be used to repair Fisher regulators. Be sure to give the complete type number of the regulator when corresponding with the factory.

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