

Type S201 and S202 Gas Regulators

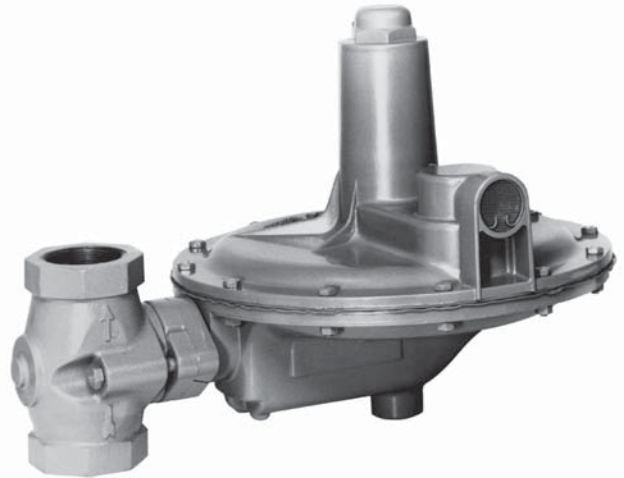


WARNING

Fisher regulators must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Fisher instructions. For LP-gas service, an approved regulator (such as one listed by U.L.) should be used. The installation, in most states, must comply with NFPA standards.

If the regulator vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Call a gas serviceman to service the unit. Only a qualified person must install or service the regulator.



W1919

Figure 1. Typical S200 Series Gas Regulator

Introduction

Scope of Manual

This instruction manual provides instructions and a parts list for Types S201, S201H, S201K, S202, and S202H gas service regulators.

Description

Type S201 and S202 Series regulators are typically installed on industrial and commercial applications. The Type S202 and S202H regulators contain an internal relief valve. Units with an "H" or "K" suffix are similar to the basic regulators but deliver a higher outlet pressure (1 to 10 psig).

Specifications

Table 1 lists the specifications for the regulators. The following information is stamped on the regulator at the factory: type number, date of manufacture, spring range, port size, maximum inlet pressure, maximum operating outlet pressure, and outlet pressure which may damage regulator parts.

Installation



WARNING

Personal injury or system damage may result if this regulator is installed, without appropriate overpressure protection, where service conditions could exceed the limits given on the regulator nameplate. Regulator installations should be adequately protected from physical damage.

All vents should be kept open to permit free flow of gas to the atmosphere. Protect openings against entrance of rain, snow, insects, or any other foreign material that may plug the vent or vent line. On outdoor installations, point the spring case vent downward to allow condensate to drain (see figure 2). This minimizes the possibility of freezing and of water or other foreign materials entering the vent and interfering with proper operation.

Type S201 and S202

Specifications

Body Sizes and End Connection Styles

1-1/2 or 2-inch NPT inlet and outlet and
2-inch ANSI Class 125 FF flanged

Maximum Allowable Inlet Pressures

See table 2

Maximum Emergency Outlet Pressure

15 psig (1,03 bar)

Outlet Pressure Range

2.0 inches w.c. to 10 psig (4.9 mbar to 0,69 bar)

Seat Ring Diameter

1/4, 3/8, 1/2, 1, and 1-3/16 inches

Temperature Capabilities

-20° to 150°F (-29° to 66°C)

Pressure Registration

Internal

Approximate Weight

22 pounds (10 kg)

Under enclosed conditions or indoors, escaping gas may accumulate and be an explosion hazard. In these cases, the vent should be piped away from the regulator to the outdoors.



CAUTION

Like most regulators, S201 and S202 regulators have an outlet pressure rating lower than their inlet pressure rating. If actual inlet pressure can exceed the outlet pressure rating, outlet overpressure protection is necessary. However, overpressuring any portion of the regulators beyond the limits in table 2 may cause leakage, damage to regulator parts, or personal injury due to bursting of pressure-containing parts.

Some type of external overpressure protection should be provided if inlet pressure will be high enough to damage downstream equipment. Common methods of external overpressure protection include relief valves, monitoring regulators, shutoff devices, and series regulation.

If the regulator is exposed to an overpressure condition, it should be inspected for any damage that may have occurred. Regulator operation below these limits does not preclude the possibility of damage from external sources or from debris in the pipeline.

Before installing the regulator, check for damage which might have occurred in shipment. Also check for dirt or foreign matter which may have accumulated in the regulator body or in the pipeline. Apply pipe compound to the male threads of the pipeline and install the

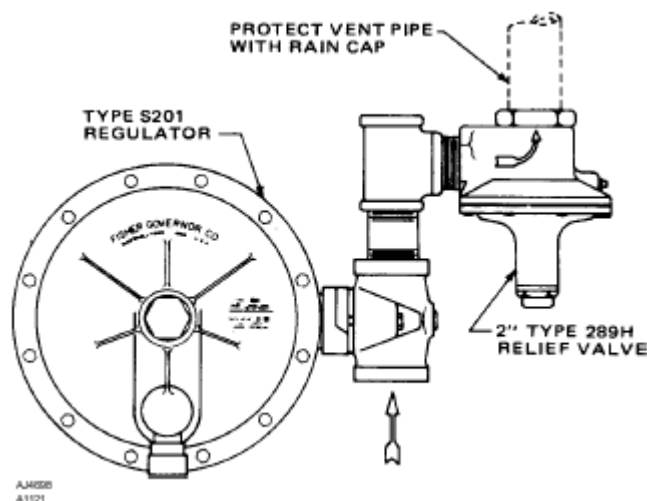


Figure 2. Type S201 Regulator Installed with the Vent Pointed Downward and with a Type H289 Relief Valve for High Capacity Relief

regulator so that flow is in the direction of the arrow cast on the body. The diaphragm casing assembly can be rotated to any position relative to the body. Loosen the two cap screws (key 18, figure 4) in order to rotate the diaphragm casing assembly.

Do not install the regulator in a location where there can be excessive water accumulation, such as directly beneath a down spout.

If the regulator is used in conjunction with a 289H relief valve, it should be installed as shown in figure 2. The outside end of the vent line should be protected with a rain-proof assembly.

The Type 289H should be set 10 inches w.c. higher than the outlet pressure setting of the regulator, up to 30 inches w.c. reduced pressure. For pressure greater than this, set the 289H 3/4 psi higher than the outlet pressure setting of the regulator.

Table 2. Inlet Pressure

Seat Ring Size		Inlet Pressure Setting			
Inches	mm	Optimum		Maximum	
		Psig	Bar	Psig	Bar
1/4	6.3	125	8.6	125	8.6
3/8	9.5	100	6.9	125	8.6
1/2	12.7	60	4.1	100	6.9
3/4	19.0	25	1.7	60	4.1
1	25.4	13	.9	25	1.7
1-3/16	30.2	5	.3	13	.9

Table 3. Maximum Outlet Pressure Setting

Type Number	Diaphragm Head	Maximum Outlet*
S201, S202	Light	30" W.C. (74.7 millibar)
S201H, S202H	Heavy	5 psig (0.34 bar)
S201K	Heavy	10 psig (0.69 bar)

* Maximum emergency outlet (casing) pressure for Series S200 is 15 psig.

Table 4. Spring Chart

Type Number	Spring Range		Part Number	Color Code
	Inches W.C.	Millibar		
S201, S202	2.0- 4.5	4.9-11.2	1D8925 27022	Brown
	3.5- 6.5	8.7-16.2	1D8926 27022	Red
	5.0- 9.0	12.4-22.4	1D8927 27012	Black
	8.5- 18.0	21.2-44.8	1D8932 27032	Gray
	14.0-30.0	34.9-74.7	1D8933 27032	Dark Green
S201H, S202H	1.0- 2.0 psig	.07-.14 bar	1H9758 27032	Dark Blue
	1.5- 3.25 psig	.10-.22 bar	1H9759 27032	Orange
	2.0- 5.0 psig	.14-.34 bar	1P6154 27142	Yellow
S201K	2.0-5.5 psig	.14-.38 bar	OY0664 27022	Green Stripe
	4.0-10.0 psig	.28-.69 bar	1H8024 27032	Cadmium

The Type S201 and S202 regulators have 1-inch NPT screened vent openings in the spring case. If necessary to vent escaping gas away from the regulator, install a remote vent line in the spring case tapping. Vent piping should be as short and direct as possible with a minimum number of bends and elbows. The remote vent line should have the largest practical diameter. Vent piping on regulators with internal relief (S202 & S202H) must be large enough to vent all relief valve discharge to atmosphere without excessive backpressure and resulting excessive pressure in the regulator.

Periodically check all vent openings to be sure that they are not plugged.

Maximum outlet pressure settings are shown in table 3. Outlet pressure more than 2 psi (light diaphragm head) or 3 psi (heavy diaphragm head) above the set point

may damage internal parts such as the diaphragm head and valve disk. **The maximum emergency (casing) outlet pressure is 15 psig.**

Startup



Pressure gauges should always be used to monitor downstream pressure during startup. Procedures used in putting this regulator into operation must be planned accordingly if the downstream system is pressurized by another regulator or by a manual bypass.

If the downstream system is not pressurized by another regulator or manual bypass valve, use the following procedure to start-up the regulator.

1. Check to see that all appliances are turned off.
2. Slowly open the upstream plug cock.
3. Check all connections for leaks.
4. Light the appliance pilots.

Adjustment

The range of allowable pressure settings is stamped on the nameplate. If the required setting is not within this range, substitute the correct spring (as shown in table 4). If the spring is changed, change the nameplate to indicate the new pressure range.

A pressure gauge should always be used to monitor downstream pressure while adjustments are being made.

1. Remove the closing cap (key 4, figure 4) or loosen the hex locknut.
2. To increase the outlet setting, turn the adjusting screw (key 3, figure 4) clockwise. To decrease the outlet setting, turn the adjusting screw counterclockwise.
3. Replace the closing cap or tighten the hex locknut.

Shutdown

Installation arrangements may vary, but in any installation it is important that the valves be opened or closed slowly and that the outlet pressure be vented before venting inlet pressure to prevent damage caused by

Type S201 and S202

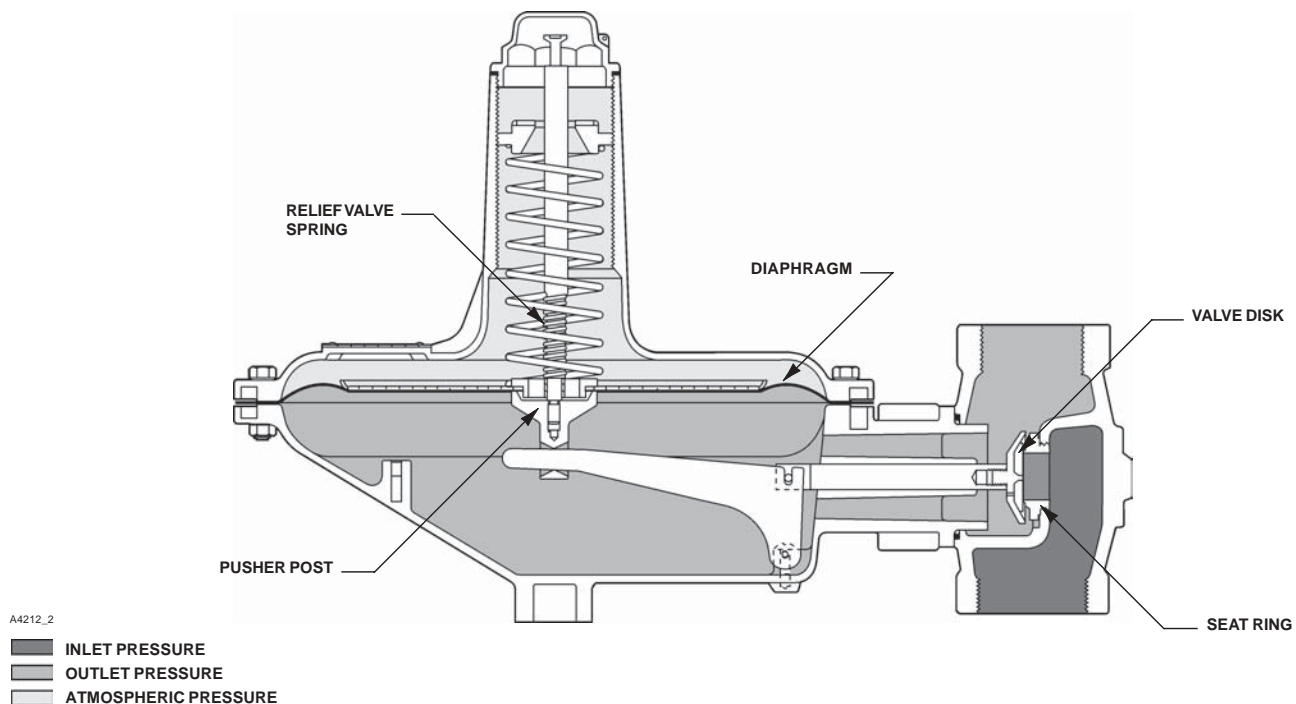


Figure 3. Type S202 Regulator Operational Schematic

reverse pressurization of the regulator. The steps below apply to the typical installation as indicated.

1. Open valves downstream of the regulator.
2. Slowly close the upstream shutoff valve.
3. Inlet pressure will automatically be released downstream as the regulator opens in response to the lowered pressure on the diaphragm.

Principle of Operation

Refer to figure 3. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring). Through the action of the pusher post assembly, the valve disk moves closer to the seat ring and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward, the valve disk moves away from the seat ring, and the gas flow increases.

The Type S202 and S202H regulators include an internal relief valve for over pressure protection. If the downstream pressure exceeds the regulator setting by 7 inches w.c. to 2 psig (depending on the main spring used), the relief valve opens and excess gas is vented through the stabilizer vent in the upper spring case.

Maintenance



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 as described in “Shutdown”.

Regulators that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Fisher 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, this regulator should be inspected and maintained periodically. The frequency of inspection and replacement of parts depends upon the severity of service conditions or the requirements of local, state, and federal rules and regulations.