

Fisher Controls

Instruction Manual

Type S301 & S302 Gas Regulators



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Form 5180

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.



Figure 1. Typical S301 Series Regulator

INTRODUCTION

Scope of Manual

This instruction manual provides instructions and a parts list for Types S301, S301H, S302, and S302H gas service regulators.

Description

Type S301 series regulators are typically installed on industrial and commercial applications. The S302 and S302H units contain an internal relief valve. Units with an "H" suffix are similar to the basic regulators but deliver a higher outlet pressure (1 to 8 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, and seat ring port size.

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 shown in tables 1-4 for a given construction. 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. This minimizes the possibility of freezing and of water or other foreign materials entering the vent and interfering with proper operation.

Type S301 and S302

Table 1. Specifications

BODY SIZES AND END CONNECTION STYLE	NPT screwed inlet and outlet 1-1/4 x 1-1/4 inch ■ 1-1/2 x 1-1/2 inch ■ 2 x 2 inch, 2 inch ANSI 125 lb. R. F. flange	SEAT RING DIAMETERS	5/32 x 3/16, 3/16, 7/32 x 1/4, 1/4, 7/32 x 3/8, 3/8, 1/2, 3/4, and 3/4 x 7/8 inches
MAXIMUM ALLOWABLE INLET PRESSURES	See table 2	TEMPERATURE CAPABILITIES	-20° to +170° F (-29° to 77° C)
MAXIMUM EMERGENCY OUTLET PRESSURE	15 psig (Spring case pressure)	PRESSURE REGISTRATION	Internal
MAXIMUM ALLOWABLE OUTLET PRESSURE	3 psi above outlet setting	APPROXIMATE WEIGHT	9 pounds (4.1 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, S301 series 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 tables 2 and 3 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 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 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 28, figure 3) 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, the Type 289H should be set 10" 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.

The Type S301 and S302 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 (S302 & S302H) must be large enough to vent all relief valve discharge to atmosphere without excessive back pressure 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 3 psi 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

CAUTION

Pressure gauges should always be used to monitor downstream pressure during start-up.

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.

Table 2. Inlet Pressure

Seat Ring Size		Maximum Inlet Pressure			
		S301 & S302		S301H & S302H	
Inches	mm	Psig	Bar	Psig	Bar
5/32 x 3/16	4.0 x 4.8	125	8.6	–	–
3/16	4.8	125	8.6	125	8.6
7/32 x 1/4	5.6 x 6.4	60	4.1	–	–
1/4	6.4	60	4.1	125	8.6
7/32 x 3/8	5.6 x 9.5	30	2.1	–	–
3/8	9.5	30	2.1	80	5.5
1/2	12.7	25	1.7	60	4.1
3/4	19.0	15	1.0	40	2.8
3/4 x 7/8	19.0 x 22.2	15	1.0	–	–

Table 3. Maximum Outlet Pressure Setting

Type Number	Maximum Outlet *
S301 & S302	28" W.C. (70 millibar)
S301H	8 psig (552 millibar)
S302H	3 psig (207 millibar)

* Maximum emergency outlet (casing) pressure for S300 Series is 15 psig.

Table 4. Spring Chart

Type Number	Spring Range		Part Number	Color Code
	Inches W.C.	Millibar		
S301, S302	1.5 - 3.5	3.7 - 8.7	T12609 T0012	Purple
	3.5 - 6.0	8.7 - 14.9	T11241 27222	Red
	5.0 - 8.5	12.5 - 21.2	T11221 27222	Cadmium
	6.0 - 14	14.9 - 34.9	T11236 37022	Blue
	12 - 28	29.9 - 69.7	T11237 27012	Green
S301H	2.5 - 5.5 psig	172 - 379	T11383 27142	Yellow
	4.5 - 8.0 psig	310 - 552	T11382 27142	Brown
S301H, S302H	1 - 2 psig	69 - 138	T11385 27142	Black
	1.5 - 3.0 psig	103 - 207	T11384 27142	Olive Drab

Adjustment

To increase the outlet pressure setting of the regulator, the adjusting screw (key 3, figure 3) must be turned clockwise. This requires removal of the closing cap (key 4). To reduce the outlet pressure setting, turn the adjusting screw counterclockwise. A pressure gauge should always be used to monitor downstream pressure while adjustments are being made. Do not adjust the spring to produce an outlet pressure setting above the limit stamped on the closing cap. If the required pressure setting is not within the range of the spring being used, substitute with the correct spring, see table 4. (Note: High pressure springs of 1 psig or more cannot be used in the low pressure regulators.) When changing the spring, also change the range stamped on the closing cap to indicate the actual pressure range of the spring in use. After the spring adjustment has been completed, replace the closing cap.

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 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.

PRINCIPAL OF OPERATION

Refer to figure 2. 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 S302 and S302H regulators include an internal relief valve for overpressure protection. If the downstream pressure exceeds the regulator setting by 7 inches W.C. to 1 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

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 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

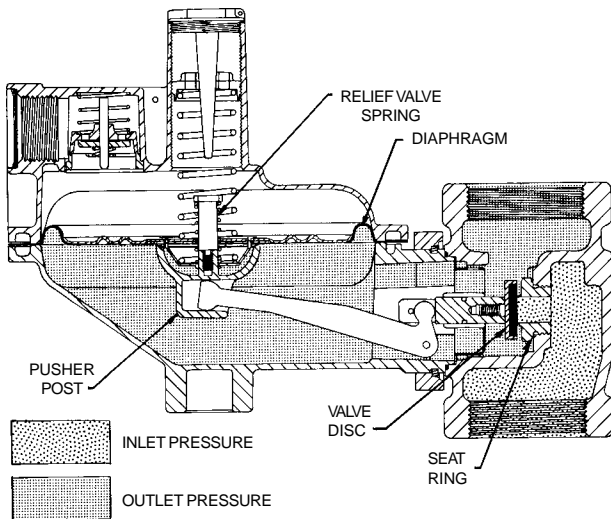


Figure 2. Operational Schematic

parts depends upon the severity of service conditions or the requirements of local, state, and federal rules and regulations.

Disassembly to Replace Diaphragm

Refer to figure 3.

1. Remove closing cap (key 4) and adjusting screw (key 3).
2. Take out the spring case screws and lift the spring case (key 1) and spring (key 2) off the lower casing (key 10).
3. Lift the diaphragm assembly slightly so that the pusher post (key 7) can release the valve lever (key 14).
4. On S301's, remove the screw (key 9); on S302's, remove the relief valve stem (key 30).
5. The diaphragm can be disassembled by removing the spring seat (key 6).
6. Reassemble in the reverse order of the above procedures. Before tightening the screw (key 9) or relief valve stem (key 30) into the pusher post (key 7) to secure the new diaphragm, place the loosely assembled diaphragm and head unit into position in the lower casing (key 10), being sure the pusher post is properly hooked on the lever (key 14). Rotate the diaphragm so that diaphragm and lower casing holes align. Tighten the screw (key 9) or relief valve stem (key 30) and proceed with reassembly.

CAUTION

Before tightening cap screws (key 21), replace the spring and adjusting screw. Turn the adjusting screw to about mid position. This will stretch the oversized diaphragm to ensure slack in the assembled diaphragm. The slack created by this method is necessary for good regulation.

Be sure the diaphragm does not fold over at the flange when reassembling.

Disassembly to Replace Valve Disk and Seat Ring

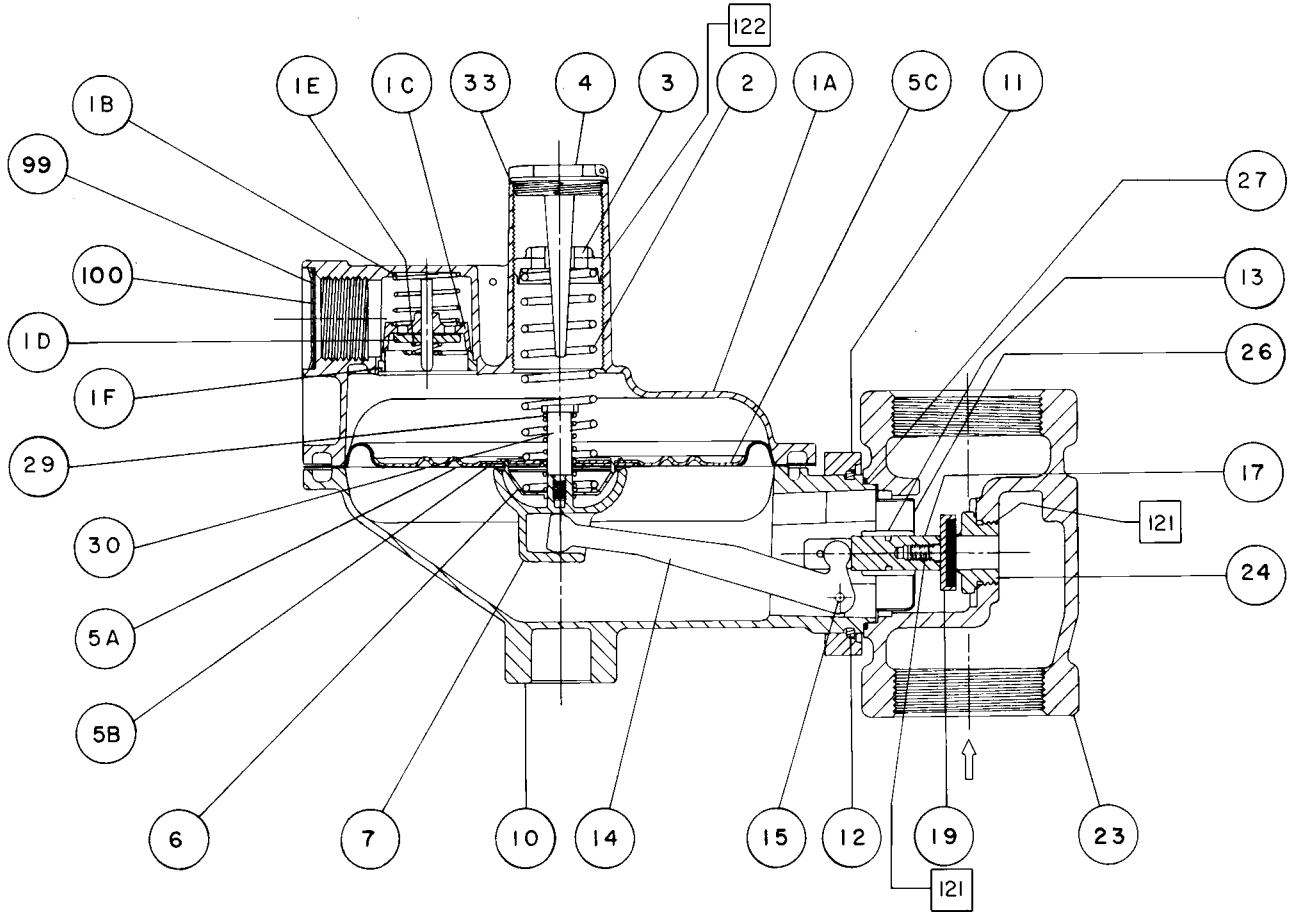
Refer to figure 3.

1. Remove the bolts (key 28) which hold the union ring (key 11) portion of the lower casing to the body (key 23).
2. The regulator can be removed from the body, exposing the disk holder and disk (key 19) and the seat ring (key 24).
3. Examine the disk portion of the disk holder assembly. If it is nicked, cut, or otherwise damaged, the disk holder can be unscrewed from the valve stem (key 17).
4. Examine the seating edge of the seat ring (key 24). If it is nicked or rough, it should be unscrewed from the body with a 1-1/16 inch socket wrench and replaced with a new seat ring to provide proper shutoff. Treat the male threads of the new seat ring with pipe compound before reassembling.

5. Reassemble in the reverse order of the above procedure.

ORDERING PARTS

The type number, seat ring (port) size, spring range, and date of manufacture are stamped on the closing cap. Always provide this information in any correspondence with your Fisher representative regarding replacement parts or technical assistance. If construction changes are made in the field, be sure that the closing cap is also changed to reflect the most recent construction.



121 – Apply Never-Seez

122 – Apply Lubriplate Mag-1

Figure 3. Type S302

Type S301—S302

PARTS LIST

Key	Description	Part Number	Key	Description	Part Number
			10	Lower Casing, aluminum S301 & S302 S301H & S302H	T80061 08012 T20389 08012
1	Spring Case, aluminum S301 & S302 S301H & S302H (Spring T11385 or T11384) S301H (Spring T11382 or T11383)	T11238 000A2 T11389 000A2 T11390 000A2	11	Union Ring, Aluminum	T11216 08012
2	Spring – See table 4		12	Split Ring, SST	T11206 37022
3	Adjusting Screw S301 & S302 S301H & S302H	T11225 06642 T11388 09012	13	Stem Guide	T20286 06992
4	Closing Cap, Zinc	T20290 44012	14	Valve Lever, steel S301 & S302 S301H & S302H	T11205 25062 T11386 25062
5A*	Diaphragm, Syn. Rubber	T11227 02532	15	Pivot Pin, SST	1E9837 35032
5B*	Diaphragm Pad, Syn. Rubber	T11210 03162	16	Screw, Steel (2 req'd) S301 & S302 S301H & S302H	T11214 28982 T11539 28982
5C	Diaphragm Head, Steel	T20289 25062	17	Valve Stem, aluminum S301 & S302 S301H & S302H	T11197 000A2 T11391 000A2
6	Spring Seat, Steel	T11226 25062	19*	Disc Holder & Disc	T12523 T0012
7	Pusher Post, aluminum S301 & S301H S302 & S302H	T40095 08012 T40091 08012	21	Cap Screw, steel (8 req'd)	T10708 24912
8	Retainer, steel S301 & S301H	T11231 24132	22	Nut, steel (8 req'd)	1E9853 24142
9	Screw, steel S301 & S301H	1B2855 28982	23	Body, cast iron 1-1/4" 1-1/4" with gauge tap 1-1/2" 1-1/2" with gauge tap 2" 2" with gauge tap 2" Flanged 2" Flanged with gauge tap	T20288 19012 T20292 19012 T20287 19012 T20291 19012 T20354 19012 T20355 19012 T40119 19012 T40120 19012
			24	Seat Ring, aluminum 3/16" 1/4" 3/8" 1/2" 3/4"	T11224 09012 T12522 T0012 T11223 09012 T11220 09012 T11219 09012
			26	Baffle, aluminum	T11229 11992
			27*	O-Ring, Syn. Rubber	T11211 06992
			28	Cap Screw, steel (2 req'd)	T11208 28982
			29	Relief Valve Spring, Spring Wire S302 & S302H	T11215 27012
			30	Relief Valve Stem, Steel, S302 & S302H	T11207 24272
			32	Slip Disc, aluminum S301H & S302H	T11510 11992
			33*	Gasket, Syn. Rubber	T13095 T0012
			99	Vent Screen, SST	T11213 38982
			100	Retaining Ring, Steel	T11209 25072

* Recommended Spare Parts

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Type S201 and S202 Gas Regulators

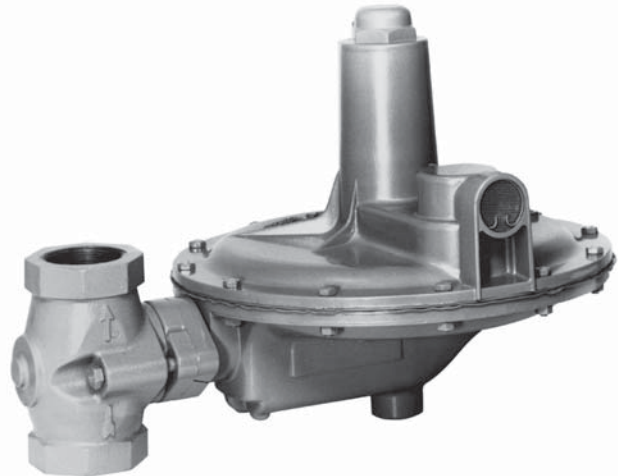


WARNING

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

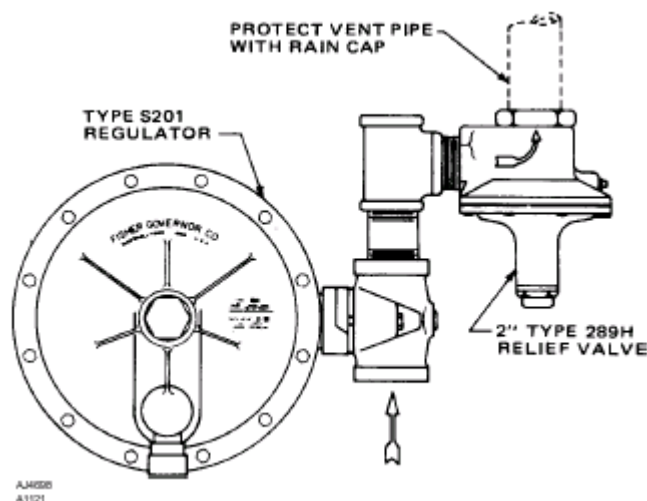


Figure 2. Type S201 Regulator Installed with the Vent Pointed Downward and with a Type H289 Relief Valve for High Capacity Relief

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

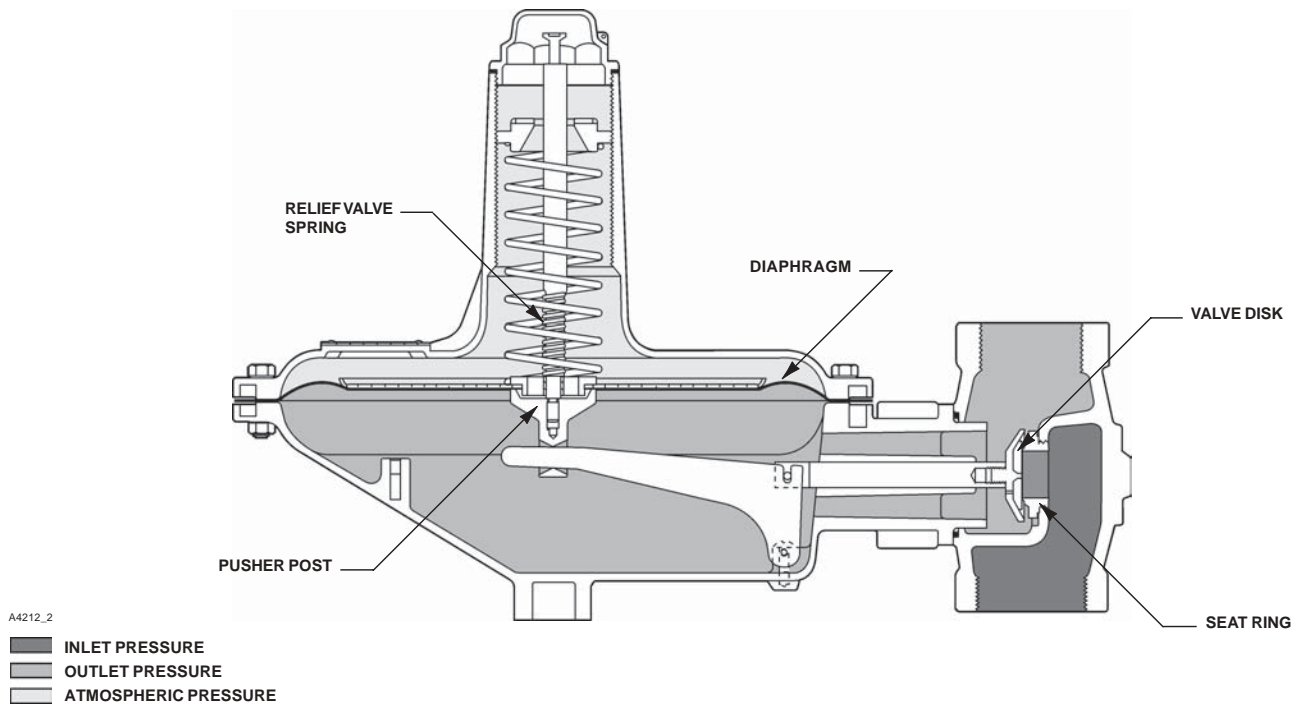


Figure 3. Type S202 Regulator Operational Schematic

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.

Disassembly to Replace Diaphragm

1. Remove the closing cap (key 4, figure 4) or loosen hex locknut. Turn the adjusting screw or nut (key 3) counter-clockwise to ease spring compression.

2. On S201, S201H, S202, and S202H units, remove the adjusting screw and spring (key 2).

From Type S201K remove the adjusting screw, hex locknut, the closing cap (key 4), the upper spring seat (key 6), and spring (key 2).

3. Remove hex nuts (key 15) and cap screws (key 14). Separate the upper spring case (key 1) from the lower casing assembly (key 9).

Note

If disassembling a Type S202 or S202H regulator, lift the upper spring case straight up in order to avoid hitting the stem (key 24).

4. Slide the diaphragm and diaphragm head assembly (key 7) away from the body (key 21) to unhook the pusher post (key 8) from the lever (key 10). Lift off the diaphragm and diaphragm head assembly.

5. Unscrew the cap screw or stem (key 24) which fastens the lower spring seat (key 6) to the pusher post and separate the lower spring seat, diaphragm and diaphragm head assembly, and pusher post. (The relief valve spring, key 25, will also have to be removed from Type S202 and S202H regulators.)

6. Reassemble the spring case unit in the reverse order of the above steps. Before tightening the cap screw or stem into the pusher post, place the loosely-assembled diaphragm assembly into position in the lower casing, being sure that the pusher post is hooked on the lever. Rotate the diaphragm so that the diaphragm and lower casing holes are aligned. Tighten the screw or stem.

Disassembly to Replace Valve Disk and Seat Ring

1. Remove the bolts (key 18, figure 4) which hold the lower spring casing (key 9) to the body (key 21). Separate the lower spring casing from the body.

2. Check the body O-ring (key 19) for wear.

3. Examine the valve disk (key 16) for nicks, cuts, and other damage. Unscrew the disk holder assembly from the valve stem assembly (key 13) and replace it with a new part if necessary.

4. If the seating edge of the seat ring (key 20) is nicked or rough, remove the seat ring from the body. Change to a new part when reassembling the regulator. (If the seat ring is being replaced with a different sized port, change the nameplate to state the new size and maximum inlet pressure.)

5. Reassemble the regulator in reverse order of the above steps.

Ordering Parts

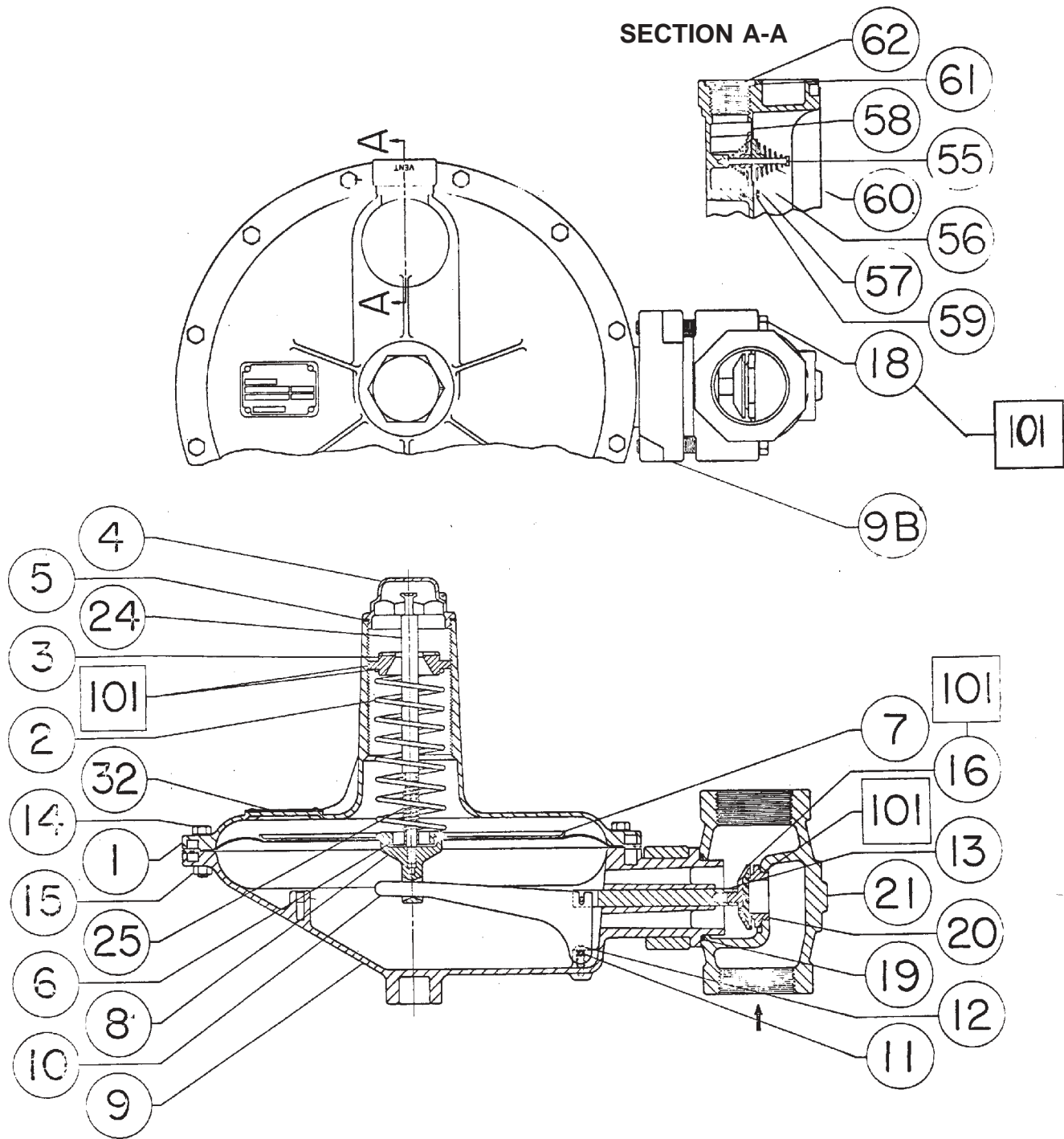
The type number, seat ring size, spring range, and date of manufacture are stamped on the nameplate. Always provide this information in any correspondence with your Fisher Sales Representative or Sales Office regarding replacement parts or technical assistance. If construction changes are made in the field, be sure that the nameplate is also changed to reflect the most recent construction.



CAUTION

Before tightening cap screws (key 14), replace the spring and adjusting screw. Turn the adjusting screw to about mid position. This will stretch the oversized diaphragm to ensure slack in the assembled diaphragm. The slack created by this method is necessary for good regulation. Be sure the diaphragm does not fold over at the flange when reassembling.

Type S201 and S202



PARTS NOT SHOWN: 46, 9C

APPLY LUBRICATION COMPOUND

Figure 4. Type S202 Regulator

Type S201 and S202

Parts List

Key	Description	Part Number	Key	Description	Part Number
1	Spring Case Aluminum Pinned for heavy spring	4L1423 08032 1J7186 99002	21	Body Cast Iron 1-1/2-inch NPT 2-inch NPT 2-inch 125 lb. Flanged 2-inch 250 lb. Flanged With 1/8-inch NPT Test Gauge Connection	1J1903 19012 1H974919012 2K1842 19012 2K1845 19012
2	Spring, steel, see table 4				
3	Adjusting Screw Aluminum (S201, S201H, S202, S202H) Steel (S201K)	1L9286 08012 1P8085 T0012			1P7992 19012 1P7993 19012 2P8061 19012 2P8062 19012
4	Closing Cap Aluminum (S201, S201H, S202, S202H) Brass (S201K)	1L9283 08012 1H7987 14012			
5*	Closing Cap Gasket, Neoprene	1N4462 06992			1K7879 22012 1K7921 22012
6	Upper/Lower Spring Seat Aluminum (S201, S201H, S202, S202H) Brass S201K (2 required)	1L9287 08012 1H7974 14012			With 1/8-inch NPT Test Gauge Connection 1-1/2-inch NPT 2-inch NPT 1P7991 22012 1P7994 22012
7A*	Diaphragm, nitrile S201, S202 - Use with 1D8933 & lighter springs	1H9781 02072	24	Cap Screw, plated steel S201 S201H S201K Stem, plated steel S202, S202H	1H9754 24272 1A6678 24052 1K4278 28982 1H9692 24272
	S201H, S202H	1L1543 02052			
	S201K	1K6496 02052			
7B*	Diaphragm Head, steel S201, S202 - Use with 1D8933 & lighter springs	1H9779 28892	25	Relief Valve Spring, plated steel (S202, S202H) Standard For U.L. listed units with 1D8933 or lighter springs	1H9760 27012 1R1004 27012
	S201H, S202H	1H9780 25032			
	S201K	1A3478 25022			
8	Pusher Post, aluminum S201, S201H, S201K S202, S202H	2H9806 08012 2H9752 08012	32	Nameplate, aluminum	-----
9	Lower Casing Assembly, aluminum	1H9751 X0012	46	Pipe Plug, 1/8-inch NPT, brass	1A6219 14012
9B	Union Ring, aluminum (2 required)	2H9734 08022	53	Hex Nut, plated steel, S201K only	1A3524 24112
10	Lever, steel	1H9740 28992	55	Flapper Stem, 302 stainless steel	1H9763 35022
11	Pin, 303 SST	1H9729 35032	56	Lower Flapper, nylon	1H9764 06992
12	Machine Screw, steel (2 required)	1B4204 28982	57	Upper Flapper, nylon	1H9765 06992
13	Valve Stem Assembly 1H9748 000A2		58	Seat Ring, 302 stainless steel	1H9766 36012
14	Cap Screw, steel (12 required)	1B1363 24052	59	Self-tapping Screw, steel (3 required)	1H9767 28982
15	Hex Nut, plated steel (12 required)	1A3093 24122	60	Spring, 302 stainless steel (2 required)	1H9768 37022
16*	Disk Holder Assembly For Natural Gas Service For Manufactured Gas (3/4" larger seat rings)	1P7349 000A2 1J1680 X0012	61	Screen, Monel†	1E5648 43122
17	Diaphragm Plate, steel (S201K only)	1A3478 25022	62	Snap Ring, 302 stainless steel	1E5649 37022
18	Cap Screw, plated steel (2 required)	1H9747 24052			
19*	O-Ring, nitrile	T12587 T0012			
20	Seat Ring, aluminum 1/4-inch Port Diameter 3/8-inch Port Diameter 1/2-inch Port Diameter 3/4-inch Port Diameter 1-inch Port Diameter 1-3/16-inch Port Diameter	1H9792 09022 1H9793 09022 1H9794 09022 1H9795 09022 1H9796 09022 1H9797 09022			

*Recommended spare part.

† Trademark of International Nickel Company

Type S201 and S202

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