

Fisher Controls

Instruction Manual

Types 1301F and 1301G High Pressure Regulators



January 1981

Form 1111

INTRODUCTION

Scope

This instruction manual provides instructions for the installation, adjustment, maintenance, and parts ordering of the Types 1301F and 1301G high-pressure regulators.

Description

Types 1301F and 1301G regulators are self-operated, high-pressure regulators, which can be used where high pressure gas must be reduced for use as pilot supply pressure in pilot-operated regulators or as loading pressure in pressure-loaded regulators. Types 1301F and 1301G regulators can also be used in many other applications as high-pressure reducing regulators for various gases.

The Type 1301F regulator (figure 1) provides outlet pressures to 225 psig (15.5 bar) in three spring ranges. The Type 1301G regulator provides outlet pressures to 500 psig (34.5 bar) in one spring range.

Specifications

Table 1 lists specifications for the Types 1301F and 1301G high-pressure regulators. The maximum outlet pressure for a given regulator as it comes from the factory is stamped on the regulator nameplate (key 20, figures 2 and 3).

INSTALLATION

WARNING

Overpressuring a regulator or associated equipment may cause leakage, part damage, or



Figure 1. Type 1301F Regulator

personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Do not install a regulator where service conditions can exceed the specifications listed in table 1 or the specifications of any applicable local, state or Federal codes and regulations.

Use qualified personnel when installing, operating, and maintaining these regulators. Make sure that there is no damage to or foreign material in the regulator and that all tubing and piping are clean and unobstructed. The regulator may be installed in any position. Apply pipe compound to the pipeline threads. Connect inlet piping or tubing to the 1/4-inch NPT screwed connection marked "In" and outlet piping or tubing to one of the 1/4-inch NPT screwed connections marked Out. Install a pressure gauge or pipe plug in the unused outlet connection.

If continuous operation of the system is required during inspection or maintenance, install a three-valve bypass around the regulator.

Types 1301F and 1301G

Table 1. Specifications

BODY SIZES AND END CONNECTION STYLES	1/4-inch NPT screwed (one inlet and two outlet connections)	MATERIAL TEMPERATURE CAPABILITIES	Nylon Valve Discs: –20 to 180°F (–29 to 82°C) TFE Valve Discs: –20 to 400°F (–29 to 204°C)
MAXIMUM ALLOWABLE INLET PRESSURE	6000 psig (414 bar)	PRESSURE REGISTRATION	Internal
OUTLET PRESSURE RANGES	Type 1301F: ■ 10 to 75 psig (0.7 to 5.2 bar) ■ 50 to 150 psig (3.4 to 10.3 bar) ■ 100 to 225 psig (6.9 to 15.5 bar) Type 1301G: 200 to 500 psig (13.8 to 34.5 bar)	PORT DIAMETER	5/64 inches (2mm)
MAXIMUM EMERGENCY OUTLET PRESSURE	Type 1301F: 250 psig (17.2 bar) Type 1301G: 550 psig (37.9 bar)	SPRING CASE VENTS	Type 1301F Brass Spring Case: ■ Four 5/32-inch (4 mm) holes (std) ■ One 1/4-inch NPT female connection (optional) Type 1301F Steel Spring Case: One 5/16-inch (8 mm) hole Type 1301G Spring Case: One 1/8-inch NPT female connection with screen
		APPROXIMATE WEIGHT	8 lb (3.6 kg)

WARNING

A regulator may vent some gas to the atmosphere. In hazardous gas service, vented gas may accumulate, causing personal injury or equipment damage due to fire or explosion. Vent a regulator in hazardous gas service to a remote, safe location.

The optional brass spring case of the Type 1301F regulator has one 1/4-inch NPT female connection. The Type 1301G regulator spring case has one 1/8-inch NPT female connection with a screen. To remotely vent the spring case, remove the screen, if present, and connect 1/4-inch or 1/8-inch NPT piping or tubing to the spring case connection. The piping or tubing should vent the spring case to a safe location, have as few bends as possible, and have a screened vent on its exhaust end.

Each regulator is factory-set for the pressure setting specified on the order. If no setting is specified, outlet pressure is factory-set at the midpoint of the regulator spring range. If pressure adjustment is necessary, refer to the "Startup" section. In all cases, check the spring setting to make sure it is correct for the application.

STARTUP

With installation completed and downstream equipment adjusted, slowly open the upstream and downstream block valves while using pressure gauges to monitor pressure.

If adjustment is necessary, remove the closing cap, if one is used, loosen the locknut (key 18, figures 2 or 3), and turn the adjusting screw (key 15, figures 2 and 3) clockwise to increase the set pressure or counterclockwise to decrease the set pressure. Monitor pressure with gauges during adjustment. When adjustment is complete, tighten the locknut, and, if one is used, replace the closing cap. If the desired outlet pressure is not within the range of the regulator spring, install a spring with the desired range according to the "Maintenance" section.

SHUTDOWN

First, close the upstream shutoff valve, and then, close the downstream shutoff valve. Next, open the vent valve between the regulator and the downstream shutoff valve and open the vent valve between the regulator and the upstream shutoff valve. If vent valves are not installed, safely bleed off both inlet and outlet pressures and check that the regulator contains no pressure.

MAINTENANCE

Regulator parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and parts replacement depends on the severity

**Errata Sheet
for**

TYPES 1301F AND 1301G HIGH PRESSURE REGULATIONS INSTRUCTION MANUAL
Form 1111, January 1981

When replacing Type 1301F or 1301G regulator parts, the following parts must be used to provide the corrosion resistance capability detailed in National Association of Corrosion Engineers (NACE) standard NR-01-75. Please add these parts to the parts list on pages 4 and 5 or your Type 1301F and 1301G regulators instruction manual:

Key	Description	Part Number
1	Body (1/4-inch NPT only)	
	Steel	2J9200 X0032
	Stainless steel	2J9200 33092
3	Bottom Cap	
	Steel	1V1943 X0012
	Stainless steel	1J9196 35072
4	Yoke, stainless steel	1J9259 36042
5	Seat Ring, 316 stainless steel	1D3865 X0032
6	Valve Disk Assembly, stainless steel/TFE	1D4684 X0082
7	Diaphragm, K500 Monel ⁽¹⁾ (2 req'd)	1D3870 X0012
10	Valve Spring, steel	15A3522 X012
12	Body Gasket, fluoroelastomer	1D3729 04122
13	Diaphragm Plate Gasket, fluoroelastomer	1D3730 04122
17	Machine Screw, stainless steel (2 req'd)	1J9269 38992
21	Top Connector, 316 stainless steel	1J9260 35072
22	Valve Disk Collar, 316 stainless steel	1D4686 X0012
35	Nace Tag (not shown), 18-8 stainless steel	19A6034 X012
36	Tag Wire (not shown), 303 stainless steel	1U7581 X0022

Please make the following additional changes and additions to the manual:

1. On page 3 in the Disassembly procedure, refer to step 8 and change the part description from "diaphragm head" to "diaphragm plate".

2. On page 3 in the Assembly procedure, refer to steps 6 and 7 and change the part description from "diaphragm head" to "diaphragm plate".

3. In the Parts List section of the manual, please make the following changes and corrections:

a. The correct part number for both a Type 1301F and 1301G brass body with 1/4-inch NPT connections is now 39A1342 X012.

b. Under key 6, Valve Disk Assembly, add a brass holder/TFE disk construction for oxygen service with a part number of 1D4684 X0052.

c. Under key 13, change the part description from "Diaphragm Head Gasket" to "Diaphragm Plate Gasket".

d. Under key 14, change the part description from "Bottom Cap Gasket" to "Bottom Cap O-Ring". Delete the gasket part number.

e. Under key 15, Adjusting Screw, change the part number for a Type 1301G with T-handle construction to "19A8060 X012".

f. Under key 16, Spring Case Cap Screw, selection criteria and part numbers are erroneous. For all except panel mounted, T-handle, and bracket mounted constructions, order part number 1K7645 24052 (3 required). For a bracket mounted construction, order part number 1L9366 24052 (3 req'd).

g. Add key 37, Inlet Filter Disk part number 10B2023 X012. This part is for use only when specified for a 1/4-inch NPT body.

of service conditions and the requirements of local, state, and federal rules and regulations.

Instructions are given below for disassembly and assembly of parts.

WARNING

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

Disassembly

The following procedure describes how to completely disassemble the regulator. When part replacement or inspection is required, complete only those steps necessary to accomplish the job. Key numbers referenced are shown in figure 2 for the Type 1301F regulator and in figure 3 for the Type 1301G regulator unless otherwise indicated.

1. Remove the closing cap (if one is used), and loosen the locknut (key 18).
2. Turn the adjusting screw (key 15) counterclockwise to remove spring compression.
3. Remove the bottom cap (key 3), bottom cap gasket (key 14), and spring (key 10).
4. Unscrew the valve disk assembly (key 6) from the yoke (key 4).
5. Remove the valve disk collar (key 22) from the valve disk assembly.
6. Remove the spring case cap screws (key 16), and separate the spring case (key 2) from the body (key 1).
7. Remove the upper spring seat and spring (keys 9 and 11).
8. Refer to figure 4. Unscrew the diaphragm locknut (key 19), and remove the diaphragm plate (key 8), the two diaphragms (key 7), and the diaphragm plate gasket (key 13).
9. Remove the screws (key 17) from the yoke, and take the lower and upper halves of the yoke out of the body.
10. Unscrew the orifice (key 5). Examine seating edge of orifice. Replace with a new part if worn or nicked.

Assembly

This procedure assumes that the regulator was completely disassembled. If not, start these instructions at the appropriate step. Key numbers used are shown in figure 2 for the Type 1301F regulator and in figure 3 for the Type 1301G regulator unless otherwise indicated.

1. Screw the orifice (key 5) into the regulator.
2. Insert both halves of the yoke (key 4) into the regulator, and fasten them together with the cap screws (key 17).
3. The valve disc assembly (key 6) has two valve discs, one on each end. Inspect both valve disks, and select the one to be used. Thread the valve disk assembly into the yoke so that the disc to be used is positioned against the orifice. Thread the valve disk collar (key 22) onto the exposed end of the valve disc assembly.
4. Place the bottom cap gasket (key 14) on the bottom cap (key 3). Place the spring (key 10) in the bottom cap, and thread it into the regulator.
5. Put the body gasket (key 12) on the regulator body (key 1).
6. Refer to figure 4. Place the diaphragm plate gasket (key 13), the two diaphragms (key 7), and the diaphragm plate (key 8) on the yoke (key 4). Make sure the diaphragm convolutions are toward the spring, and secure the parts by threading the diaphragm locknut (key 19) onto the yoke.
7. Place the regulator spring (key 11) and upper spring seat (key 9) on the diaphragm plate.
8. Position the spring case (key 2) over the spring and on the regulator body. Orient the spring case vent or vents as necessary. Insert the cap screws (key 16), and tighten them only finger-tight.
9. Thread the adjusting screw and locknut (keys 15 and 18) into the spring case just far enough to slightly compress the spring. Securely tighten the cap screws (key 16), and refer to the Startup section for adjustment procedures.

PARTS ORDERING

When corresponding with your Fisher sales office or sales representative about this regulator, include the type number and all other pertinent information stamped on the bottom cap and on the nameplate. Specify the complete 11-character part number from the following parts list when ordering replacement parts.

Types 1301F and 1301G

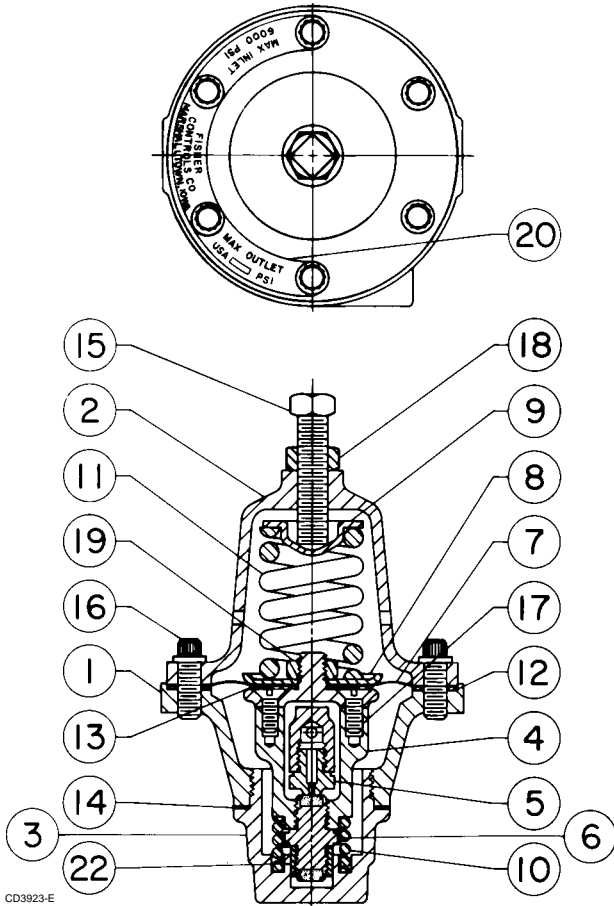


Figure 2. Type 1301F Regulator

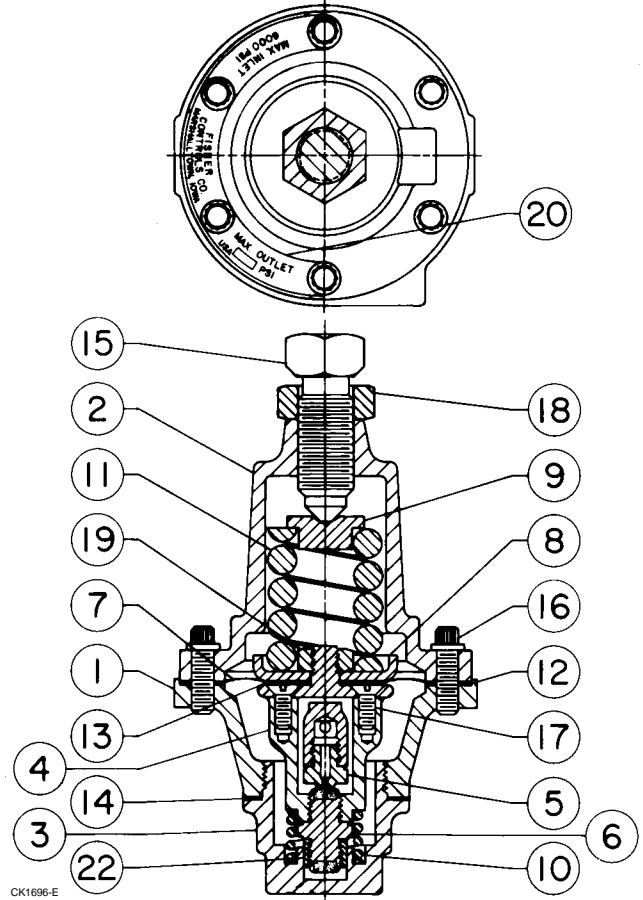


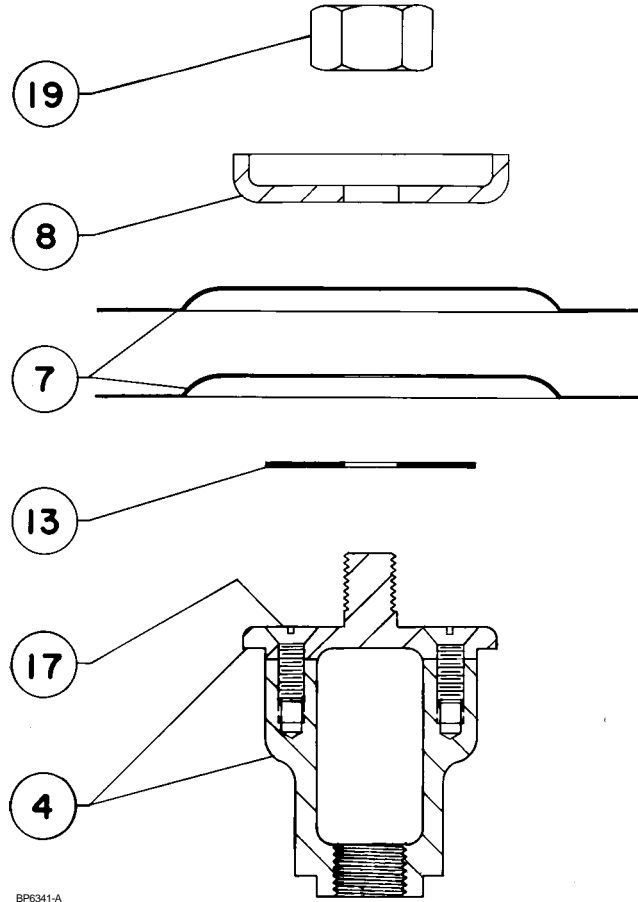
Figure 3. Type 1301G Regulator

PARTS LIST

Key	Description	Part Number	Key	Description	Part No.
1	Body		2	Spring Case (Continued)	
	Brass			1301G	
	1301F			Std or W/handwheel	
	1/4" NPT	2D3835 13012		Brass	2P1957 13022
	1301G			Steel	21A637 7X022
	1/4" NPT	2D3835 000A2		SST	21A637 7X012
	1301F & 1301G		3	Bottom Cap	
	SST			Brass	1D4685 13012
	1/4" NPT	2J9200 33092		Steel	1V1943 24092
	Steel			SST	1J9196 35072
	1/4" NPT	2J9200 22012	4	Yoke	
2	Spring Case			Brass	1D3833 13012
	1301F			SST	1J9259 36042
	Brass		5	Seat Ring, 303 SST	1D3865 35032
	Std	1D3831 13012	6*	Valve Disk Ass'y	
	W/handwheel	1F2448 13012		Brass/nylon	1D4684 000A2
	W/1/4" NPT vent			Brass/TFE	1D4684 X0012
	connection	1H8080 000A2		SST/nylon	1D4684 000C2
	W/closing cap	1K7768 000A2		SST/TFE	1D4684 000B2
	Steel		7*	Diaphragm, 302 SST	
	Std, w/handwheel or			(2 req'd)	1D3870 36012
	T-handle	1J9198 22042	8	Diaphragm Head, steel	
				1301F	1D3873 25072
				1301G	1K1557 25072
			9	Upper Spring Seat, steel	
				1301F	1B7985 25062
				1301G	1K1558 28982
			10	Valve Spring	
				302 SST	1D3871 37022
			11	Spring, Cd pl steel	
				1301F	
				0-75 psig (0 to 5.2 bar)	
				blue	1D3872 27022
				0-150 psig (0 to 10.3 bar)	
				cadmium	1B7885 27022
				0-225 psig (0 to 15.5 bar)	
				red	1D4651 27142
				1301G	
				200-500 psig (13.8 to 34.5 bar)	
				cadmium	1K1560 27142
			12*	Body Gasket	
				Neoprene	1D3729 03012
				Viton†	1D3729 04122
			13*	Diaphragm Head Gasket	
				Neoprene	1D3730 03012
				Viton	1D3730 04122
			14*	Bottom Cap Gasket	
				Brass bottom cap	
				Viton	1D3864 04122
				SST bottom cap	
				Viton O-Ring	1J9268 06382

*Recommended spare part.
†Trademark of DuPont Co.

Types 1301F and 1301G



BP6341-A

Figure 4. Exploded View of the Diaphragm Head Assembly and Yoke

Key	Description	Part Number	Key	Description	Part Number	Key	Description	Part Number
15	Adjusting Screw 1301F		18	Adjusting Screw Locknut 1301F		26	Vent Screen, Monel† (not shown) 1301G only	0W0863 43062
	Std	1A3687 28982		Brass spring case (none req'd w/handwheel)	1A5180 14012	27	Mounting Post, steel (3 req'd) (not shown)	
	Handwheel for brass spring case	1B7992 000A2		Steel spring case 1301G	1A3522 24122 1A3540 24122		1301F T-handle panel mounting only	1F2449 X0012
	Handwheel for steel spring case	1N4114 35132	19	Diaphragm Locknut Cd pl steel	1A3093 24122		1301G panel mounting only	1L2629 X0012
	T-handle for steel spring case	1F2236 000A2	20	Nameplate, SST	1F1043 18992	28	Mounting Screw, steel (3 req'd) Use with key 27 (not shown)	1B2958 X0012
	With closing cap	1C2160 32992	21	Top Connector, 316 SST Use with SST yoke only	1J9260 35072	29	Screw, steel (not shown) 1301F w/handwheel & steel spring case	1A3408 28992
	1301G		22	Valve Disk Collar 303 SST	1D4686 35032		1301G w/handwheel	1A8517 28982
	Std	1K1406 24092	23	Closing Cap, brass (not shown)	1H2369 14012	30	Washer, steel (not shown) 1301F w/handwheel & steel spring case	1L4494 28982
	Handwheel	1L5255 24092	24	Handwheel (not shown) 1301F	1L2175 44992		1301G	1A3523 32992
16	Spring Case Cap Screw, steel Panel mounting (3 req'd)	1K7645 24052		1301G	1J4961 44012			
	All others (6 req'd)	1K645 24052						
17	Machine Screw (2 req'd) Steel, for brass yoke	1D3869 28982						
	SST, for SST yoke	1J9269 38992						

Types 1301F and 1301G

While this information is presented in good faith and believed to be accurate, Fisher Controls does not guarantee satisfactory results from reliance upon such information. *Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding the performance, merchantability, fitness*

or any other matter with respect to the products, nor as a recommendation to use any product or process in conflict with any patent. Fisher Controls reserves the right, without notice, to alter or improve the designs or specifications of the products described herein.

FISHER

Fisher Controls

For information, write:
P.O. Box 190, Marshalltown, Iowa 50158 U.S.A.
or Brenchley House, Maidstone, Kent ME 14 1UQ, England