

October 2009

1305 Series Pressure Reducing Regulators



WARNING

Fisher® regulators must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. instructions.

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

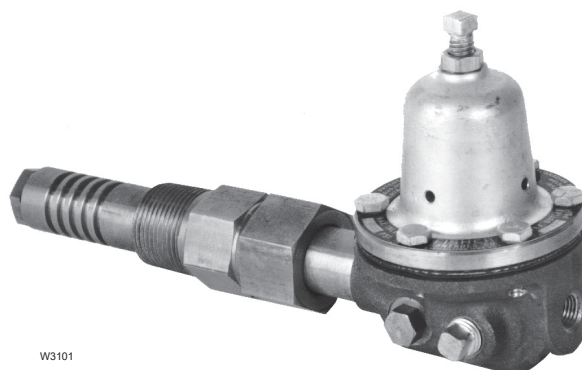


Figure 1. 1305 Series Regulator with Tapped Lower Casing Connection

Introduction

The 1305 Series regulators are direct-operated, pressure-reducing regulators that resist hydrate formation and regulator freeze-up. Regulator freeze-up resistance occurs as the pipeline gas warms the finned inlet adaptor and the orifice area. As the gas cools within the inlet adaptor due to pressure drop and volume expansion, the warm inlet adaptor helps keep the gas temperature above the freezing point of water and the hydrate formation temperature. The regulators are suitable for service with natural gas, air, propane, and other gases compatible with the internal parts.

Type 1305C—1 NPT inlet and 1/4 NPT outlet connections; 5/64-inch (2,0 mm) orifice diameter. Three springs provide 0 to 225 psig (0 to 15,5 bar) reduced pressure ranges.

Type 1305D—same as Type 1305C except with larger spring case and just one heavy spring for reduced pressure range of 200 to 500 psig (13,8 to 34,5 bar).

Principle of Operation

Downstream pressure is sensed by the diaphragm (see Figure 3) through a registration hole in the baffle. When downstream pressure rises, pressure under the diaphragm overcomes the spring compression and moves the valve lever upward. This action pushes the valve disk closer to the orifice, reducing flow through the body. Downstream pressure returns to the setpoint value. When downstream pressure decreases, the opposite action takes place. The valve disk moves away from the orifice, flow through the body increases, and the downstream pressure returns to the setpoint value.

1305 Series

Specifications

Piping Connections

Inlet: 1 NPT

Outlet: 1/4 NPT

Operative Ambient Temperature Limits⁽¹⁾

-20° to 200°F (-29° to 93°C)

Maximum Emergency Outlet (Casing) Pressure

Type 1305C: 250 psig (17,2 bar)

Type 1305D: 550 psig (37,9 bar)

Outlet Pressure Ranges

Type 1305C

With Spring 1D387227022 (Blue):

0 to 75 psig (0 to 5,2 bar)

With Spring 1B788527022 (Unpainted):

0 to 150 psig (0 to 10,3 bar)

With Spring 1D465127142 (Red):

0 to 225 psig (0 to 15,5 bar)

Type 1305D: 200 to 500 psig (13,8 to 34,5 bar)

Maximum Allowable Inlet Pressure⁽¹⁾

4000 psig (276 bar)

Maximum Operating Outlet Pressure

Type 1305C

With Spring 1D387227022 (Blue):

75 psig (5,2 bar)

With Spring 1B788527022 (Unpainted):

150 psig (10,3 bar)

With Spring 1D465127142 (Red):

225 psig (15,5 bar)

Type 1305D: 500 psig (34,5 bar)

Orifice Size

5/64-inch (2,0 mm)

Construction Materials

Lower Casing: Brass

Spring Case: Brass

Orifice: 416 Stainless steel

Valve Stem: 416 Stainless steel

Valve Disk: Nylon (PA)

O-rings: Nitrile (NBR)

NACE Construction

Lower Casing: Brass

Spring Case: Brass

Orifice: 316 Stainless steel

Valve Stem: 316 Stainless steel

Valve Disk: Nylon (PA)

O-rings: Nitrile (NBR)

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

The 1305 Series regulator inlet is installed directly in a high-pressure, warm-gas flow line. Heat from this line is transmitted through the fins in the inlet adaptor. The temperature of the reduced pressure gas is raised high enough to prevent formation of condensate and regulator freeze-up.

Installation

After the regulator has been removed from the shipping container, inspect the regulator for shipping damage. Be sure the body and connecting pipeline are free of foreign material. Coat external threads with a good grade of pipe compound. The regulator

can be installed in any position. To position the regulator, loosen the union nut (key 8, Figure 4) and turn the regulator to the desired position. Tighten the union nut.

Install these regulators as shown in Figure 2. Weld a 1-inch (25 mm) pipe coupling on the high-pressure, warm temperature supply line. Screw the inlet adaptor (key 3, Figure 4) into this pipe coupling so that the inlet and orifice are directly in the main flow line.

Note

The main flow pipeline must be at least 3-inches (76 mm) in diameter.

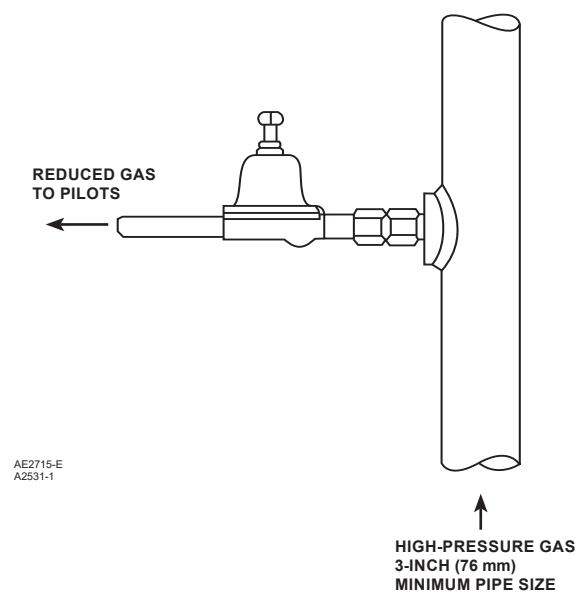


Figure 2. Installation of Type 1305 Regulator

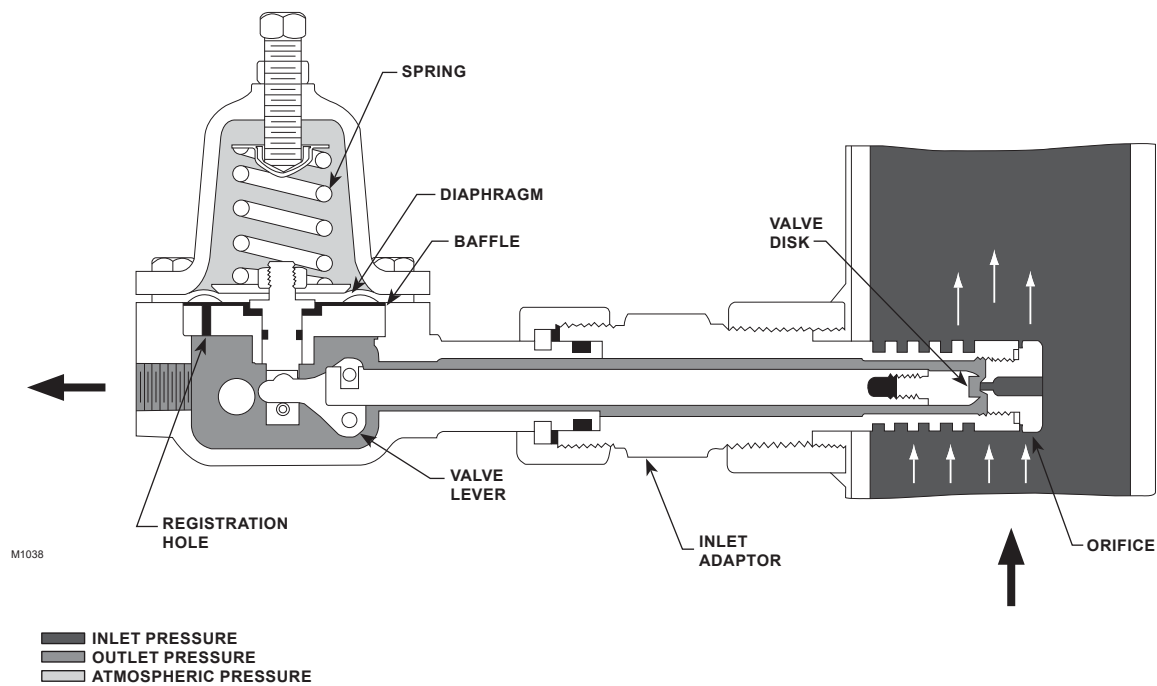


Figure 3. Type 1305C Operational Schematic

Overpressure Protection

1305 Series regulators have outlet pressure ratings that are lower than the inlet pressure ratings. Some type of overpressure protection (such as relief valve) is necessary if the actual inlet pressure can exceed the outlet pressure rating.

Maximum pressure ratings are stamped on the nameplate. Maximum emergency outlet (casing) pressures are 250 psig (17,2 bar) for Type 1305C regulator and 550 psig (37,9 bar) for Type 1305D regulator.



WARNING

Overpressuring any portion of this equipment may cause personal injury, damage to regulator parts, or leaks in the regulator due to bursting of pressure-containing parts or explosion of accumulated gas.

To avoid overpressure, provide an appropriate overpressure protection device to ensure that the pressure limitations will not be exceeded.

The regulator should be inspected for damage after any overpressure condition.

Adjustments

The regulator can be adjusted within the setting limits stamped on the nameplate. Loosen the locknut (key 20, Figure 4). To increase the outlet pressure setting, turn the adjusting screw (key 19, Figure 4) clockwise. Turn the adjusting screw counterclockwise to decrease the outlet pressure setting.

If a different setting range is desired, choose an appropriate spring from the parts list and substitute it for the spring that is in the regulator. Be sure to indicate the change on the nameplate.

Maintenance



WARNING

To avoid personal injury or equipment damage from sudden release of pressure or uncontrolled gas, do not attempt any maintenance or disassembly without

first isolating the regulator from system pressure. Cautiously release all internal pressure from the regulator before attempting disassembly.

Parts such as the valve disk, orifice, diaphragm, and O-rings wear out even under normal conditions. Normal wear of the valve disk and orifice is accelerated by high-pressure drops and large amounts of impurities in the flow stream. External sources may also cause damage to the regulator.

Inspect the regulator periodically or after any unusual condition. Replace parts as necessary. The frequency of inspection and replacement depends upon the severity of service conditions or the requirements of state and federal laws.

Instructions are given below for disassembly and reassembly of these regulators. Figure 4 shows key numbers for the 1305 Series regulators.

Disassembly

1. Disconnect the outlet piping.
2. Unscrew the union nut (key 8) and slide the regulator out of the inlet adaptor (key 3).
3. The disk holder assembly (key 5) can be unscrewed from the stem (key 6). Replace the disk holder assembly if the seating surface is worn or nicked.
4. Check, and replace if necessary, O-ring (key 7).
5. Loosen hex nut (key 20) and turn the adjusting screw (key 19) counterclockwise to ease the spring compression on the diaphragm.
6. Remove the machine screws (key 21). Lift off the spring case (key 2), spring (key 17), and upper spring seat (key 18).
7. Take hex nut (key 16) off of the pusher post (key 11).
8. Lift off the diaphragm head (key 15) and diaphragms (key 14).
9. An O-ring (key 13, not shown) is mounted on the lever pin (key 12). Unscrew the lever pin from the body and check the O-ring.
10. Take the baffle (key 28), pusher post assembly (key 11), and lever assembly (key 10) out of the body. Separate the lever from the pusher post. Slip the baffle off of the pusher post to check O-ring (key 30, if present).

11. Inspect the orifice (key 4) of the regulator by unscrewing the inlet adaptor (key 3) and removing it from the coupling. Unscrew the orifice. Check O-ring (key 23) also.

Reassembly

Coat external threads with a good grade of pipe compound when reassembling the regulator.

1. Place the O-ring on the inlet adaptor and screw in the orifice.
2. Reassemble the pusher post, baffle and lever unit. Put the unit into the body and connect the lever to the stem. Place an O-ring on the lever pin and screw it into the body and through the lever.
3. Set the diaphragms on the pusher post. The composition diaphragm goes on first, with the metal diaphragm placed over it. (In Type 1305D regulators, both diaphragms are metal).
4. Set the diaphragm head over the diaphragms and screw the hex nut onto the pusher post.
5. Put the spring and upper spring seat onto the diaphragm head. Set the spring case on the body. Insert the machine screws, tightening them finger-tight only.
6. Screw the disk holder into the stem.
7. Slide the regulator into the inlet adaptor and tighten the union nut.
8. To ensure proper slack in the diaphragm, apply spring compression by turning the adjusting screw clockwise. Finish tightening the machine screws.
9. Connect the inlet and outlet piping to the body connections.

Parts Ordering

When corresponding with your local Sales Office about this equipment, be sure to include the type number and other information stamped on the nameplate.

When ordering replacement parts, reference the key number of each needed part as found in the following parts list.

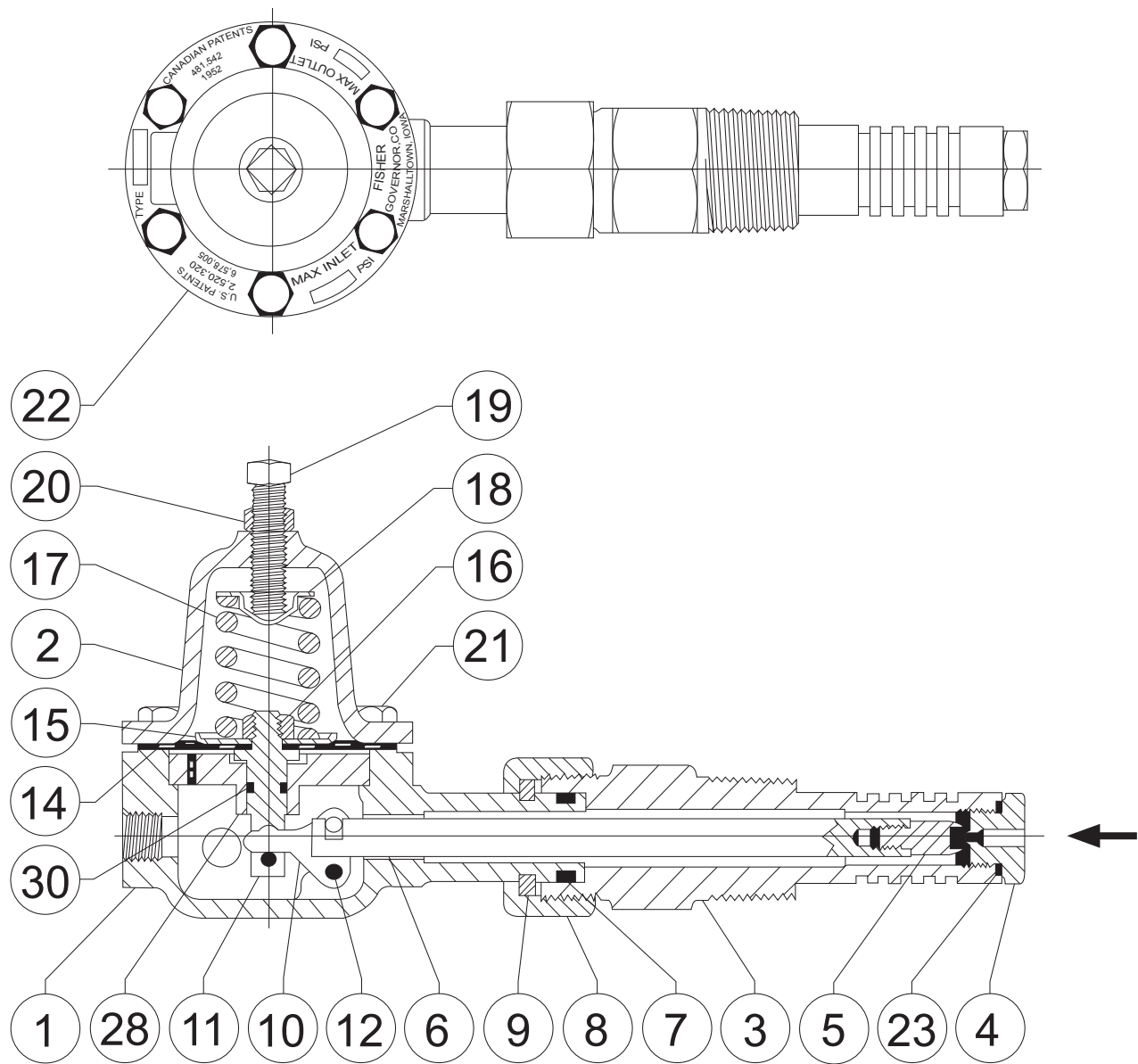
Parts List

Note

In this parts list, parts marked NACE are intended for corrosion-resistant service as detailed in the NACE International standard MR0175.

Key	Description	Part Number
1	Lower Casing, Brass (standard or NACE)	2R139212012
2	Spring Case, Brass Type 1305C	1D383113012
	Type 1305D (standard or NACE)	2P195713022
3	Inlet Adaptor 416 Stainless steel	1D900235132
	316 Stainless steel (NACE)	1D9002X0012
4*	Orifice 416 Stainless steel	1D900335132
	316 Stainless steel (NACE)	1D9003X0012
5*	Valve Disk Assembly Stainless steel/Nylon (PA)	1F1005000A2
	Stainless steel/Nylon (PA) (NACE)	1F1005X0012
6	Valve Stem 416 Stainless steel	1F108835132
	316 Stainless steel (NACE)	1F1088X0012
7*	O-ring, Nitrile (NBR) (standard or NACE)	1D237506992
8	Union Nut, 416 Stainless steel (standard or NACE)	1D900535132
9	Split Ring, 416 Stainless steel (standard or NACE)	1D900635132
10	Valve Lever Assembly Steel/303 Stainless steel	1R1394000A2
	Steel (NACE)	1R1394X0012
10A	Valve Lever Steel	1R139332992
	Steel, Zinc-plated steel (NACE)	1R1393X0012
10B	Valve Lever Pin 303 Stainless steel	1D900835032
	316 Stainless steel (NACE)	1D9008X0012
11	Pusher Post Assembly Brass/steel	1R1397000A2
	Stainless steel/Inconel® (NACE)	1R1397X0012
11A	Pusher Post, Brass (standard or NACE)	1R139514012
11B	Roll Pin Carbon steel	1R139628992
	Inconel® X750 (NACE)	1R1396X0012
12	Lever Support Pin 416 Stainless steel	1F100835132
	316 Stainless steel (NACE)	1F1008X0012
13*	O-ring, Nitrile (NBR) (not shown), (standard or NACE)	1D687506992
14*	Diaphragm (1 of each required for Type 1305C) Type 1305C Neoprene (CR)	1D900702112
	302 Stainless steel	1D387036012
	Diaphragm Type 1305D (standard or NACE)	
	302 Stainless steel (2 required)	1D387036012
	Neoprene (CR) (1 required)	1D900702112
15	Diaphragm Head, Steel Type 1305C	1D387325072
	Type 1305D (standard or NACE)	1K155725072
16	Hex Nut, Steel (standard or NACE)	1A309324122

*Recommended Spare Parts
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CR1399-A

Figure 4. 1305 Series Regulator

Key	Description	Part Number	Key	Description	Part Number
17	Spring, Steel, Zinc-plated steel		21	Machine Screw, Steel (6 required)	
	Type 1305C			Type 1305C	1A407824052
	0 to 75 psig (0 to 5,2 bar), Blue	1D387227022		Type 1305D (standard or NACE)	1K764524052
	0 to 150 psig (0 to 10,3 bar), Unpainted	1B788527022	22	Nameplate, Brass (standard or NACE)	1P216818992
	0 to 225 psig (0 to 15,5 bar), Red	1D465127142	23*	O-Ring, Nitrile (NBR) (standard or NACE)	1E5914X0052
	Type 1305D (standard or NACE)		24	Pipe Plug, Brass (not shown),	
	200 to 500 psig (13,8 to 34,5 bar)	1K156027142		(standard or NACE)	1A6495X0052
18	Upper Spring Seat, Steel		27	Vent Screen, Monel®	
	Type 1305C	1B798525062		Type 1305D (standard or NACE)	0W086343062
	Type 1305D (standard or NACE)	1K155828982	28	Baffle, Brass (standard or NACE)	1R139814012
19	Set Screw, Steel		29	Machine Screw, not shown (2 required)	
	Type 1305C	1A368728982		Carbon-plated steel	1E382728992
	Type 1305D (standard or NACE)	1K140624092		304 Stainless steel (NACE)	1E3827X0012
20	Hex Nut		30*	O-ring, Nitrile (NBR) (optional)	1H292306992
	Type 1305C, Brass	1A518014012			
	Type 1305D, Steel (standard or NACE)	1A354024122			

*Recommended Spare Parts
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1305 Series

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