

October 2009

1305 Series Regulators

Introduction

The 1305 Series regulators (Figure 1) are direct-operated, pressure-reducing regulators that resist hydrate formation and regulator freeze-up. The regulators are suitable for service with natural gas, air, propane, and other gases compatible with the internal parts. 1305 Series regulators are typically used on high-pressure lines from wellheads and separators.

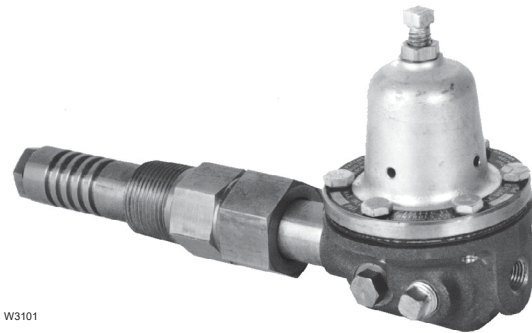
Regulator freeze-up resistance (see Figure 2) occurs as the pipeline gas warms the finned inlet adaptor and the orifice area. As the gas cools within the inlet adaptor due to pressure drop and volume expansion, the warm inlet adaptor helps keep the gas temperature above the freezing point of water and the hydrate formation temperature.

Features

- **Durable**—Brass inlet adaptor and spring case plus stainless steel trim parts make 1305 Series regulators rugged and corrosion-resistant.
- **Easy Maintenance**—Removing the regulator union nut (see Figure 2) allows valve disk maintenance while inlet adaptor remains in pipeline.
- **High Pressure Capabilities**—With brass and stainless steel construction, 1305 Series regulators handle up to 4000 psig (276 bar) inlet pressure at 100°F (38°C).
- **Resists Hydrate Formation and Regulator Freeze-up**—Design of finned inlet adaptor allows warming of reduced pressure gas.
- **Sour Gas Service Capabilities**—Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of NACE International Standards MR0175 and MR0103.

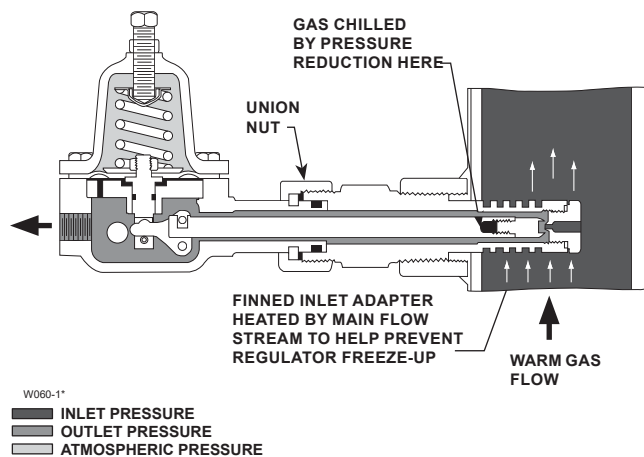
Overpressure Protection

Like most regulators, the 1305 Series have outlet pressure ratings lower than their inlet pressure ratings.



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Figure 1. 1305 Series Regulator with Tapped Lower Casing Connection



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Figure 2. Type 1305C Operational Schematic

Complete downstream overpressure protection is needed if the actual inlet pressure exceeds the outlet pressure rating.

Overpressuring any portion of a regulator or associated equipment may cause leakage, part damage, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Regulator operation within ratings does not preclude the possibility of damage from external sources or from debris in the pipeline. A regulator should be inspected for damage periodically and after any overpressure condition.

1305 Series

Specifications

Available Configurations, Body Sizes and Connection Styles

Type 1305C⁽¹⁾: 1/4 NPT outlet connection and 1 NPT inlet adaptor connection

Type 1305D⁽²⁾: 1/4 NPT outlet connection and 1 NPT inlet adaptor connection

Maximum Allowable Inlet Pressure⁽³⁾

4000 psig (276 bar)

Outlet Pressure Ranges

Type 1305C

With Spring 1D387227022 (Blue):

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

With Spring 1B788527022 (Silver):

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 Emergency Outlet (Casing) Pressure

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

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

Orifice Size

5/64-inch (2,0 mm)

Typical Regulating Capacities

See Capacity Information and Figure 3

Coefficients For Relief Sizing

Wide-open C_g: 5.5

Wide-open C₁: 38.5

Construction Materials

Inlet Adaptor: 416 Stainless steel

Union Nut: 416 Stainless steel

Lower Casing: Brass

Spring Case: Brass

Orifice: 416 Stainless steel

Valve Stem: 416 Stainless steel

Valve Disk: Nylon (PA)

O-Rings: Nitrile (NBR)

Spring: Zinc-plated steel

NACE Construction

Inlet Adaptor: 316 Stainless steel

Union Nut: 416 Stainless steel

Lower Casing: Brass

Spring Case: Brass

Orifice: 316 Stainless steel

Valve Stem: 316 Stainless steel

Valve Disk: Nylon (PA)

O-Rings: Nitrile (NBR)

Spring: Zinc-plated steel

Temperature Capabilities

-20° to 200°F (-29° to 93°C)

Pressure Setting Adjustment

Outlet pressure adjusted by turning set screw

Pressure Registration

Outlet pressure registers internally under diaphragm

Approximate Weight

6 pounds (3 kg)

Options

1/4 NPT connection for optional reduced pressure gauge or relief valve

1. Type 1305C regulators have three spring ranges.

2. Type 1305D regulators have one spring range.

3. The pressure/temperature limits in this Bulletin and any applicable code limitations should not be exceeded.

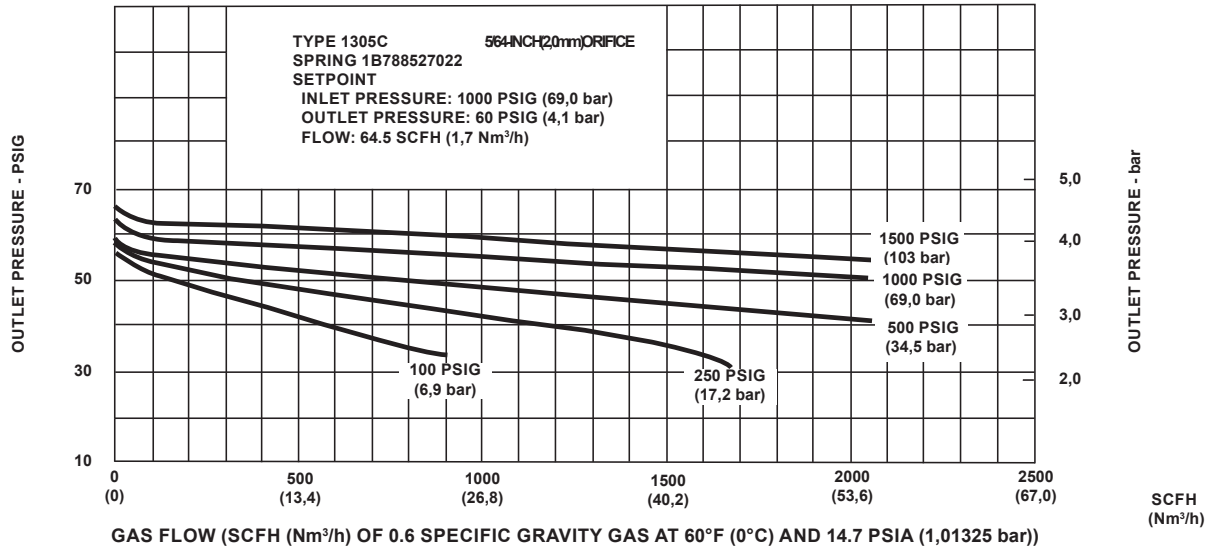
Capacity Information

Figure 3 provides 1305 Series regulator capacities. The initial setting was made with an initial inlet pressure of 1000 psig (69,0 bar) and then the inlet pressure was varied to obtain the different capacity curves. To determine capacities for gases of other specific gravities, multiply the given capacity by 0.775 and divide by the square root of the appropriate specific gravity. Then, if capacity is desired in normal

cubic meters per hour (Nm³/h) at 0°C and 1,01325 bar, multiply SCFH obtained in Figure 3 by 0.0268.

To determine wide-open flow capacity for relief valve sizing of 0.6 specific gravity gas at temperature of 60°F, use the equation below for critical pressure drops (absolute outlet pressure equal to one-half or less than one-half the absolute inlet pressure).

$$Q = P_{1abs} C_g (1.29)$$



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NOTE:
 INLET PRESSURE INDICATED ON EACH CURVE

Figure 3. Typical 1305 Series Regulator Capacities

where,

- Q = Gas flow, SCFH⁽¹⁾ (60°F and 14.7 psia)
- P_{1abs} = Absolute inlet pressure, psia (add 14.7 psi to gauge inlet pressure to obtain absolute inlet pressure)
- C_g = Wide-open gas sizing coefficient from Specifications Table

Installation

1305 Series regulators may be installed with any orientation; however, the spring case vent must be kept free of foreign material and weather conditions that could clog the vent or vents, affecting regulator operation.

Typical installation is shown in Figure 4. Dimensions are shown in Figure 5.

The regulator and its installation should be checked for compliance with all applicable codes.

Universal NACE Compliance

Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of NACE International sour service standards.

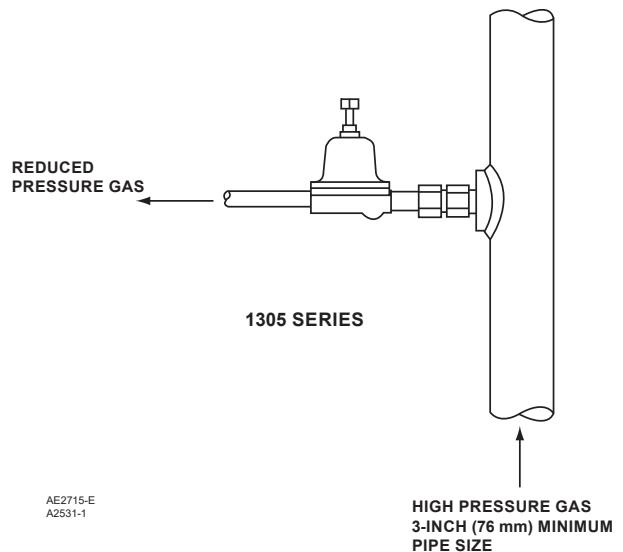
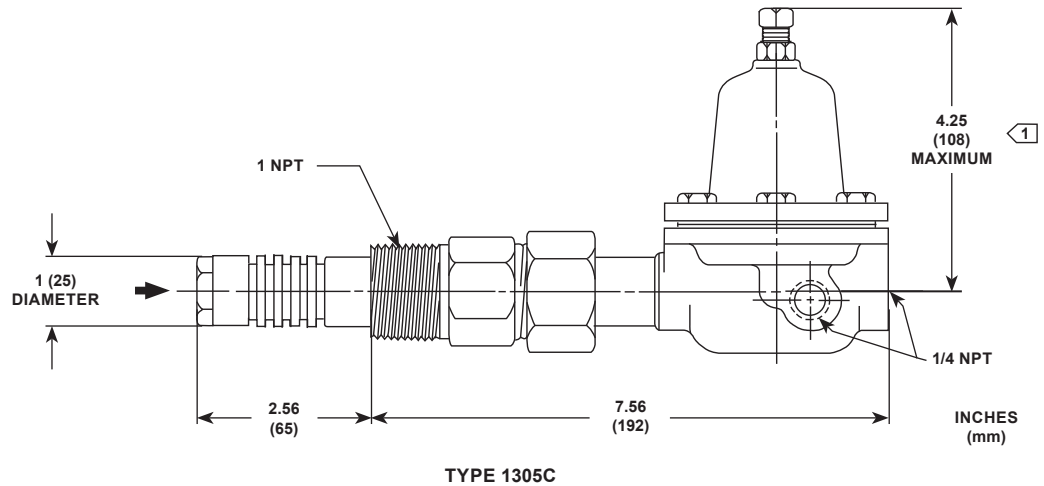


Figure 4. Typical Regulator Installation

The manufacturing processes and materials used by Emerson assure that all products specified for sour gas service comply with the chemical, physical, and metallurgical requirements of NACE MR0175 and/or NACE MR0103. Customers have the responsibility to specify correct materials. Environmental limitations may apply and shall be determined by the user.

1. Multiply the flow obtained by 0.0268 to convert to normal cubic meters per hour (Nm³/h) at 0°C and 1,01325 bar.

1305 Series



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NOTE:

1 THIS DIMENSION IS 4.94 INCHES (126 mm) ON TYPE 1305D REGULATORS. ALL OTHER DIMENSIONS FOR TYPE 1305D REGULATORS ARE THE SAME AS THE DIMENSIONS SHOWN FOR TYPE 1305C REGULATORS.

Figure 5. Dimensions

Ordering Information

When ordering, specify:

Application

1. Composition and specific gravity of gas
2. Range of temperatures
3. Flowing inlet pressures (maximum, minimum, nominal)
4. Desired outlet pressure setting or range
5. Range of flow rates (minimum controlled, maximum, normal)
6. Piping size(s)

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