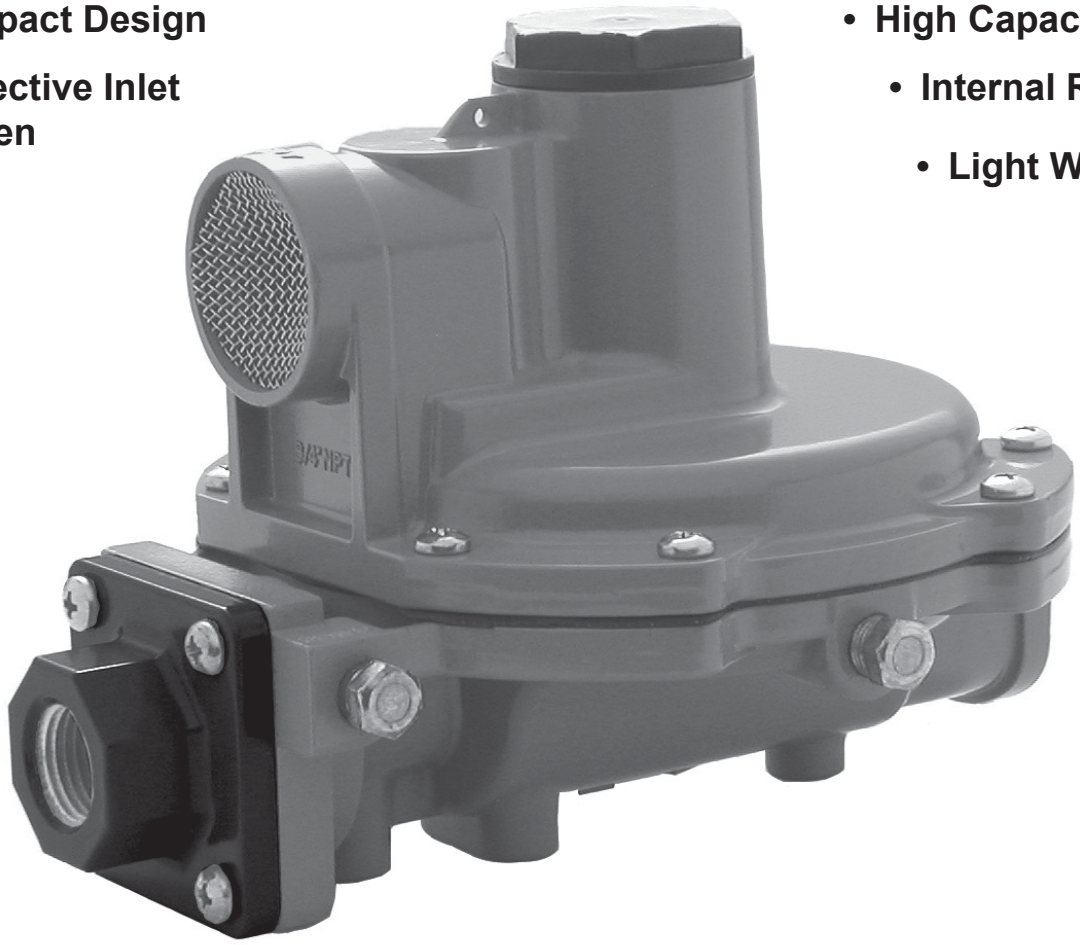
June 2010

Type R622 Pressure Reducing Regulator

- **Compact Design**
- **Protective Inlet Screen**
- **High Capacity**
- **Internal Relief**
- **Light Weight**



W8806

- **Inlet and Outlet Pressure Gauge Taps**

Figure 1. *Type R622 Pressure Reducing Regulator*

Introduction

Type R622 direct-operated, spring-loaded regulators provide economical pressure reducing control in a variety of residential, commercial, and industrial applications. These regulators can be used with natural, manufactured, or propane gases and have the same inlet and outlet pressure capabilities.

D103094X012

Specifications

Body Size and End Connection Style(1)
1/2 NPT inlet and outlet

Maximum Allowable Inlet Pressure(1)
Operating: 125 psig (8,6 bar)
Emergency: 125 psig (8,6 bar)
Except 1.8 to 2.2-inches w.c. (4 to 5 mbar) spring range which has operating and emergency pressures of 60 psig (4,1 bar)

Maximum Allowable Outlet (Casing) Pressure(1)
Operating to Avoid Internal Part Damage:
3 psid (0,21 bar d) above outlet pressure setting
Emergency: 20 psi (1,4 bar)

Outlet Pressure Ranges
See Table 1

Orifice Size
1/8-inch (3,2 mm) orifice

Flow Coefficients
Wide-Open C_g for Relief Sizing: 12.5
Wide-Open C_v for Relief Sizing: 0.36
C_1: 35

IEC Sizing Coefficients
X_T: 0.78
F_D: 0.82
F_L: 0.89

Flow Capacities
See Table 2

Pressure Registration
Internal

Relief Performance
See Figure 4

Internal Relief Performance
Start-to-Discharge is 8 to 22-inches w.c. (20 to 55 mbar) for setpoints from 1.8 to 20-inches w.c. (4 to 50 mbar)
Start-to-Discharge is 140 to 200% over setpoint from 20-inches w.c. to 2.2 psig (50 to 152 mbar)

Spring Case Vent Connections
3/4 NPT with removable screen

Temperature Capabilities(1)
-20° to 160°F (-29° to 71°C)

Approximate Weight
2.35 pounds (1 kg)

Construction Materials
Body, Spring Case, Diaphragm Plate, and Orifice: Aluminum
Diaphragm, Disk, and O-ring: Nitrile (NBR)
Adjusting Screw and Pushpost: Delrin®
Closing Cap: ASA Thermoplastic (UV-Ray Resistant)
Control Spring: Zinc-plated steel
Machine Screw, Spring Seat, and Lever: Zinc-plated steel
Valve Stem: Zinc
Relief Valve Spring, Relief Spring Retainer, Lever Pin, and Vent Screen: Stainless steel

1. The pressure/temperature limits in this Bulletin or any applicable standard limitation should not be exceeded.

In addition, Type R622 regulators have internal relief across the diaphragm to help minimize overpressure. Any outlet pressure above the start-to-discharge point of the non-adjustable relief valve spring moves the diaphragm off of the relief valve seat, allowing excess pressure to bleed out through the screened spring case vent.

Specifications

The Specifications section lists specifications for Type R622 Pressure Reducing Regulators. As it originally comes from the factory, specifications for a given regulator are stamped on the spring case nameplate.

Table 1. *Outlet Pressure Ranges*

OUTLET PRESSURE RANGE	CONTROL SPRING PART NUMBER	CONTROL SPRING COLOR CODE	SPRING WIRE DIAMETER, INCHES (mm)	SPRING FREE LENGTH, INCHES (mm)
1.8 to 2.2-inches w.c. (4 to 5 mbar)	T14453T0012	Purple	0.051 (1,30)	3.40 (86,4)
5 to 7-inches w.c. (12 to 17 mbar)	T14398T0012	Orange	0.062 (1,58)	3.40 (86,4)
6.5 to 9-inches w.c. (16 to 22 mbar)	T14399T0012	Yellow	0.067 (1,70)	3.61 (91,7)
9 to 13-inches w.c. (22 to 32 mbar)	T14400T0012	Silver	0.072 (1,83)	4.10 (104)
13 to 20-inches w.c. (32 to 50 mbar)	T14401T0012	Gray	0.080 (2,03)	3.60 (91,4)
16 to 35-inches w.c. (40 to 87 mbar)	T14402T0012	Pink	0.093 (2,36)	3.52 (89,4)
1 to 2.2 psig (69 to 152 mbar)	T14403T0012	Light Blue	0.105 (2,67)	3.66 (93,0)

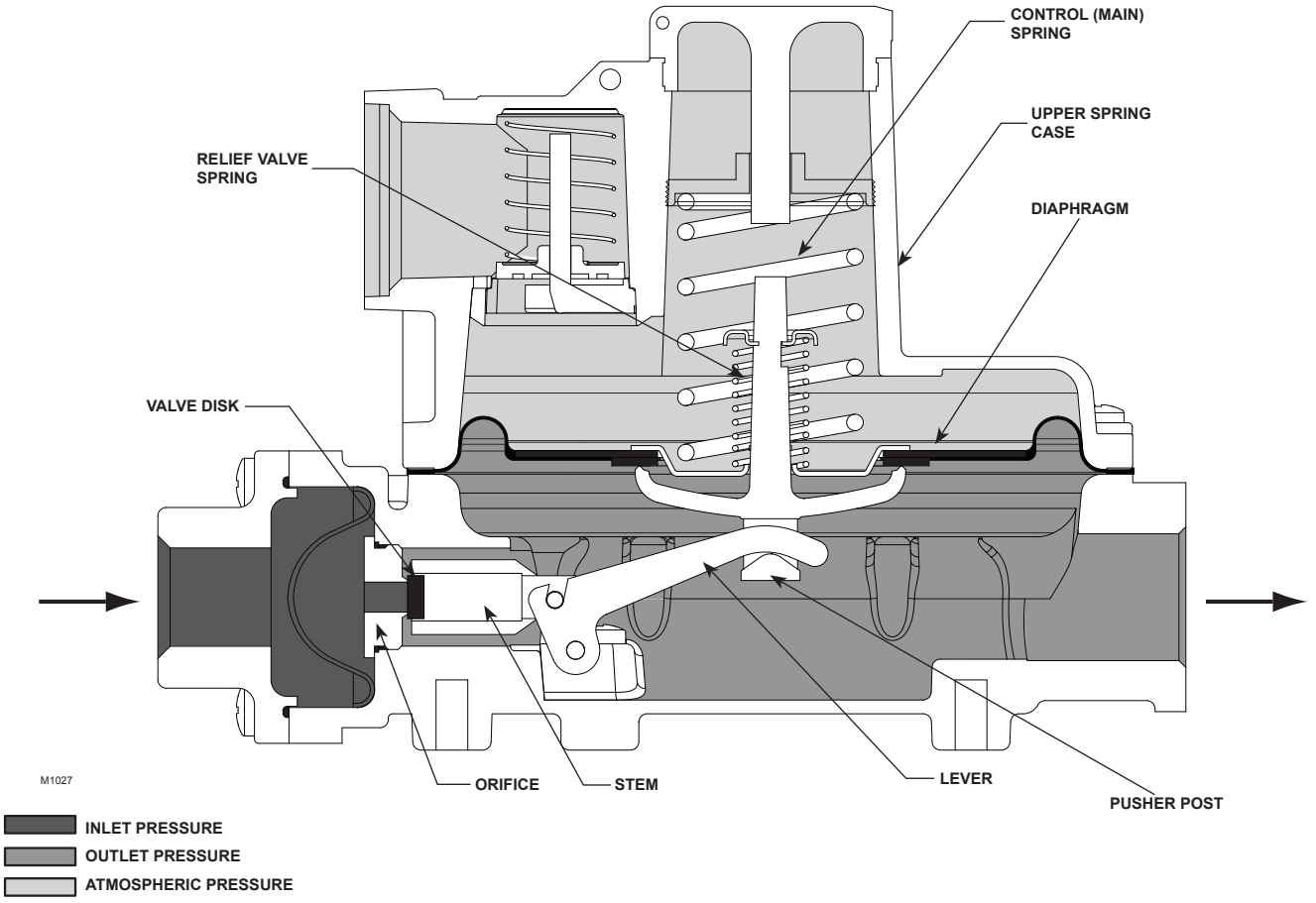


Figure 2. *Type R622 Operational Schematic*

Principle 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 the control spring). Through the action of the pusher post assembly, lever, and valve stem, the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward and the valve disk moves away from the orifice allowing flow through the body to the downstream system. Type R622 regulators include an internal relief valve for overpressure protection.

Installation

Type R622 regulator may be installed in any position. However, the spring case vent should be pointed downward. If gas escaping through the Type R622 internal relief valve could constitute a hazard, the spring case vent must be piped to a location where escaping gas will not be hazardous. If the vented gas will be piped to another location, obstruction-free tubing or piping at least equal to the vent, and the end of the vent pipe must be protected from anything that might clog it.

Dimensions are shown in Figure 5.

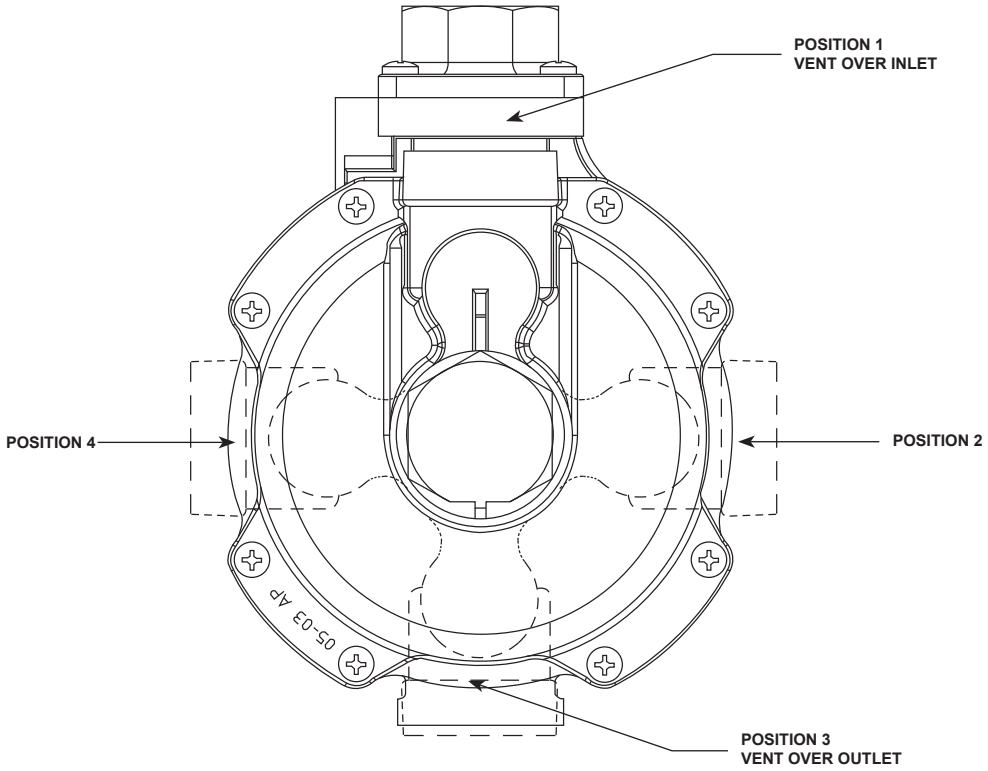


Figure 3. *Vent Position*

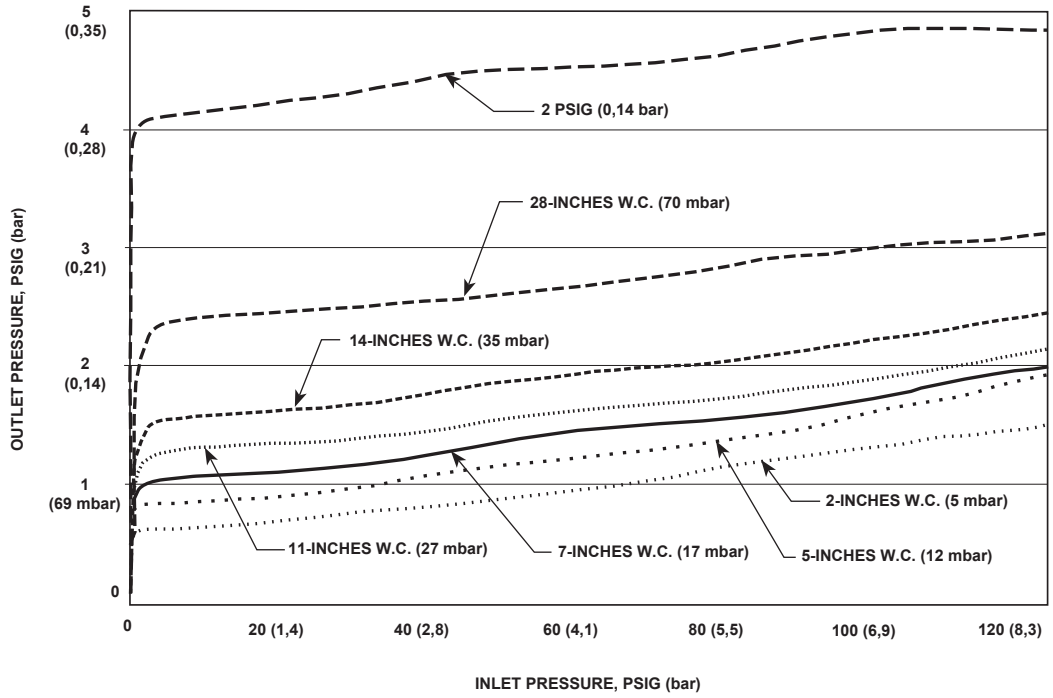
Overpressure Protection

The wide-open C_g for relief sizing (see Specifications section) along with the capacity information should be used in choosing appropriate overpressure protection devices to ensure that none of the limits in the Specifications section are exceeded.

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

Capacity Information

The high efficiency flow-through design provides maximum capacity for a given orifice size. Table 2 gives Type R622 regulator flow capacities at selected inlet pressures and outlet pressure settings. Flows are in SCFH (at 60°F and 14.7 psia) and Nm^3/h (at 0°C and 1,01325 bar) of 0.6 specific gravity natural gas. To determine equivalent capacities for air, propane, butane, or nitrogen, multiply the listed SCFH capacity by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane, or 0.789 for nitrogen. For gases of other specific gravities, multiply the given SCFH capacity by 0.775 and divide by the square root of the appropriate specific gravity. If capacity is desired in Nm^3/h, multiply SCFH by 0.0268.



NOTE: TESTED UNDER THE FOLLOWING CONDITIONS: 10 PSIG (0,69 bar) INLET PRESSURE, 7-INCHES W.C. (17 mbar) OUTLET PRESSURE SETTING, AND 50 SCFH (1,3 Nm^3/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS

Figure 4. *Industrial Relief Performance*

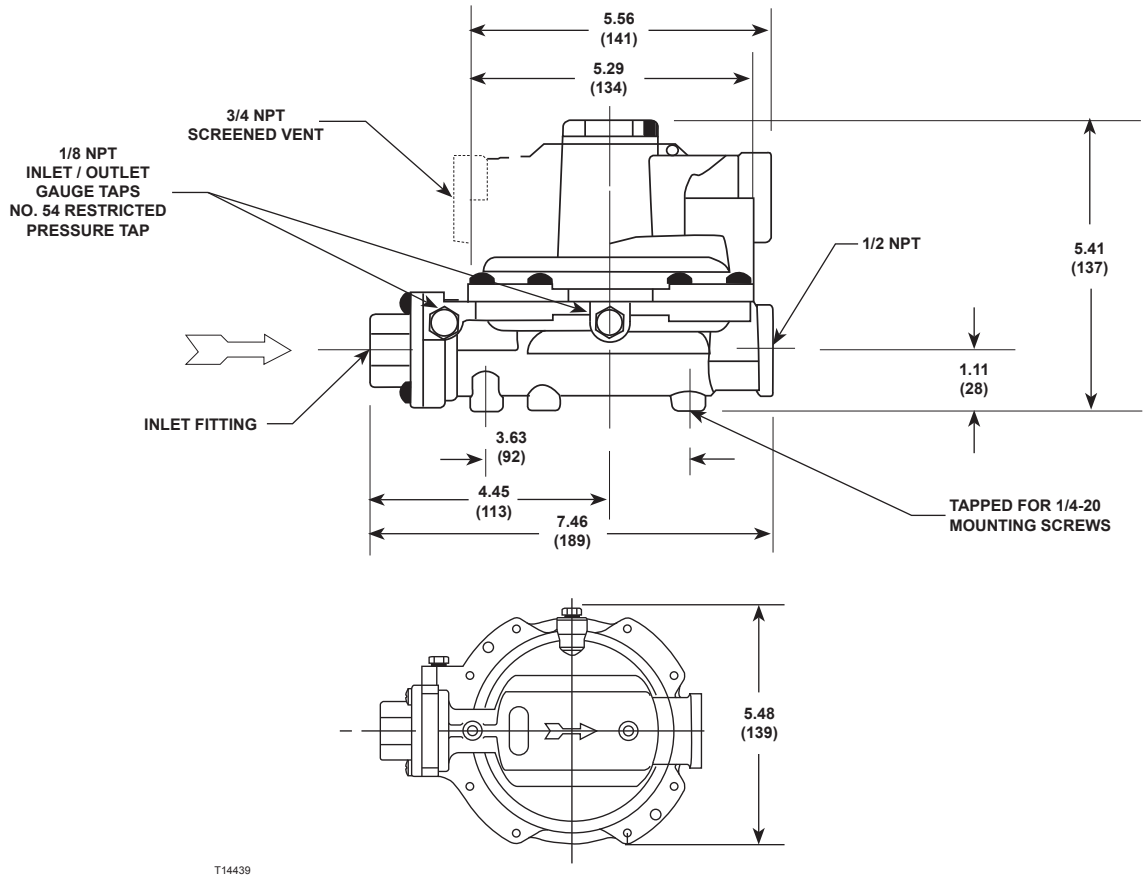


Figure 5. *Dimensions*

Table 2. *Typical Regulating Capacities in SCFH (Nm^3/h) of 0.6 Specific Gravity Natural Gas for Type R622 Regulator*

OUTLET PRESSURE SETTING, CONTROL SPRING RANGE, SPRING PART NUMBER, COLOR CODE, AND DROOP	INLET PRESSURE, PSIG (bar)	1/2 NPT INLET AND OUTLET
Setting: 2-inches w.c (5 mbar) Range: 1.8 to 2.2-inches w.c. (4 to 5 mbar) T14453T0012, Purple Droop: 1-inch w.c. (2 mbar)	5 (0,35)	287 (7,7)
	10 (0,69)	380 (10,2)
	25 (1,7)	451 (12,1)
	50 (3,4)	493 (13,2)
	60 (4,1)	506 (13,6)
Setting: 5-inches w.c. (12 mbar) Ranges: 5 to 7-inches w.c. (12 to 17 mbar) T14398T0012, Orange Droop: 1-inch w.c. (2 mbar)	5 (0,35)	271 (7,3)
	10 (0,69)	367 (9,8)
	25 (1,7)	468 (12,5)
	50 (3,4)	484 (13,0)
	60 (4,1)	428 (11,5)
	75 (5,2)	444 (11,9)
	100 (6,9)	536 (14,4)
	125 (8,6)	536 (14,4)
Setting: 7-inches w.c. (17 mbar) Range: 6.5 to 9-inches w.c (16 to 22 mbar) T14399T0012, Yellow Droop: 1-inch w.c. (2 mbar)	5 (0,35)	246 (6,6)
	10 (0,69)	347 (9,3)
	25 (1,7)	451 (12,1)
	50 (3,4)	469 (12,6)
	60 (4,1)	477 (12,8)
	75 (5,2)	445 (11,9)
	100 (6,9)	507 (13,6)
	125 (8,6)	511 (13,7)
Setting: 11-inches w.c. (27 mbar) Range: 9 to 13-inches w.c. (22 to 32 mbar) T14400T0012, Silver Droop: 2-inches w.c. (5 mbar)	5 (0,35)	274 (7,3)
	10 (0,69)	401 (10,8)
	25 (1,7)	623 (16,7)
	50 (3,4)	708 (19,0)
	60 (4,1)	735 (19,7)
	75 (5,2)	676 (18,1)
	100 (6,9)	721 (19,3)
	125 (8,6)	738 (19,8)
Setting: 14-inches w.c. (35 mbar) Range: 13 to 20-inches w.c. (32 to 50 mbar) T14401T0012, Grey Droop: 2-inches w.c. (5 mbar)	5 (0,35)	246 (6,6)
	10 (0,69)	364 (9,8)
	25 (1,7)	551 (14,8)
	50 (3,4)	641 (17,2)
	60 (4,1)	661 (17,7)
	75 (5,2)	614 (16,5)
	100 (6,9)	677 (18,1)
	125 (8,6)	727 (19,5)

- continued -

Table 2. *Typical Regulating Capacities in SCFH (Nm³/h) of 0.6 specific gravity natural gas for Type R622 Regulator (continued)*

OUTLET PRESSURE SETTING, CONTROL SPRING RANGE, SPRING PART NUMBER, COLOR CODE, AND DROOP	INLET PRESSURE, PSIG (bar)	1/2 NPT INLET AND OUTLET
Setting: 1 psig (69 mbar) Range: 16 to 35-inches w.c. (40 to 87 mbar) T14402T0012, Pink Droop: 10%	5 (0,35)	174 (4,7)
	10 (0,69)	337 (9,0)
	25 (1,7)	533 (14,3)
	50 (3,4)	679 (18,2)
	60 (4,1)	708 (19,0)
	75 (5,2)	756 (20,3)
	100 (6,9)	762 (20,4)
	125 (8,6)	796 (21,3)
Setting: 2 psig (0,14 bar) Range: 1.2 to 2.2 psi (83 to 152 mbar) T14403T0012, Light Blue Droop: 10%	5 (0,35)	222 (5,9)
	10 (0,69)	381 (10,2)
	25 (1,7)	630 (16,9)
	50 (3,4)	923 (24,7)
	60 (4,1)	976 (26,2)
	75 (5,2)	1007 (27,0)
	100 (6,9)	1285 (34,4)
	125 (8,6)	1028 (27,6)

For Critical Pressure Drops

Use the following equation for critical pressure drops (absolute outlet pressure equal to or less than one-half of the absolute inlet pressure):

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

For Non-Critical Pressure Drops

For pressure drops lower than critical (absolute outlet pressure greater than one-half of absolute inlet pressure), use the following formula:

$$Q = \sqrt{\frac{520}{GT}}\ C_g P_1 SIN\left(\frac{3417}{C_1}\sqrt{\frac{\Delta P}{P_1}}\right) DEG$$

where,

Q = gas flow rate, SCFH
G = specific gravity of the gas
T = absolute temperature of gas at inlet, °Rankine
C_g = gas sizing coefficient
P_1 = absolute inlet pressure, psia
C_1 = flow coefficient
ΔP = pressure drop across the regulator, psi

Then, if capacity is desired in normal cubic meters per hour at 0°C and 1,01325 bar, multiply SCFH by 0.0268.

Ordering Information

Carefully review each specification and complete the Ordering Guide. Send the Ordering Guide to your local Sales Office.

Ordering Guide

Outlet Pressure Range (Select One)

- ☐ 1.8 to 2.2-inches w.c. (4 to 5 mbar), Purple***
- ☐ 5 to 7-inches w.c. (12 to 17 mbar), Orange***
- ☐ 6.5 to 9-inches w.c. (16 to 22 mbar), Yellow***
- ☐ 9 to 13-inches w.c. (22 to 32 mbar), Silver***
- ☐ 13 to 20-inches w.c. (32 to 50 mbar), Gray***
- ☐ 16 to 35-inches w.c. (40 to 87 mbar), Pink***
- ☐ 1 to 2.2 psig (69 to 152 mbar), Light Blue***

Vent Position (Select One)

- ☐ Position 1 (vent over inlet)***
- ☐ Position 2***
- ☐ Position 3 (vent over outlet) ***
- ☐ Position 4***

Regulators Quick Order Guide	
* * *	Readily Available for Shipment
* *	Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Specification Worksheet

Application:

Specific Use _____

Line Size _____

Fluid Type _____

Specific Gravity _____

Temperature _____

Does the Application Require Overpressure Protection?

☐ Yes ☐ No

Pressure:

Maximum Inlet Pressure _____

Minimum Inlet Pressure _____

Differential Pressure _____

Set Pressure _____

Maximum Flow _____

Accuracy Requirements:

Less Than of Equal To:

☐ 5% ☐ 10% ☐ 20% ☐ 40%

Construction Material Requirements (if known):

_____

_____

Industrial Regulators

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872 USA
Tel: 1-800-558-5853
Outside U.S. 1-972-548-3574

Asia-Pacific
Shanghai, China 201206
Tel: +86 21 2892 9000

Europe
Bologna, Italy 40013
Tel: +39 051 4190611

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

Natural Gas Technologies

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872 USA
Tel: 1-800-558-5853
Outside U.S. 1-972-548-3574

Asia-Pacific
Singapore, Singapore 128461
Tel: +65 6777 8211

Europe
Bologna, Italy 40013
Tel: +39 051 4190611
Gallardon, France 28320
Tel: +33 (0)2 37 33 47 00

TESCOM

Emerson Process Management
Tescom Corporation

USA - Headquarters
Elk River, Minnesota 55330-2445 USA
Tel: 1-763-241-3238

Europe
Selmsdorf, Germany 23923
Tel: +49 (0) 38823 31 0

For further information visit www.fisherregulators.com