Model 122 Regulator Brochure

UTILITY SOLUTIONS GROUP

Introduction

Who We Are

Utility Solutions Group is a manufacturer of natural gas regulators and relief valves based in Columbus, OH. All products are made in the USA and compliant with the requirements of the Build America, Buy America Act. Utility Solutions Group's Quality Management System is certified to ISO 9001 by Smithers Quality Assessments.

Model 122 Industrial Combustion Regulators

For an unbeatable combination of capacity, performance, and economy, install the Utility Solutions Group Model 122 industrial combustion-type gas pressure regulator.

Streamlined body passages provide large capacity. Carefully engineered internal sensing produces accurate pressure control without an external control line. And, just in case a particular application necessitates one, a handy tap on the 122 makes connection into an external control line a simple matter.

Diaphragm cases are high-strength, corrosion-resistant die-cast aluminum alloy. This makes a better looking regulator at a better price. In addition, on 1-inch through 2 ½-inch sizes, a large area double-acting damper in the vent ensures fast speed of response while maintaining stability, which is just the thing for those troublesome "snap-acting" loads.

Soft seats plus a precision machined "knife-edge" orifice provide positive tight shutoff, and the orifice is removable.

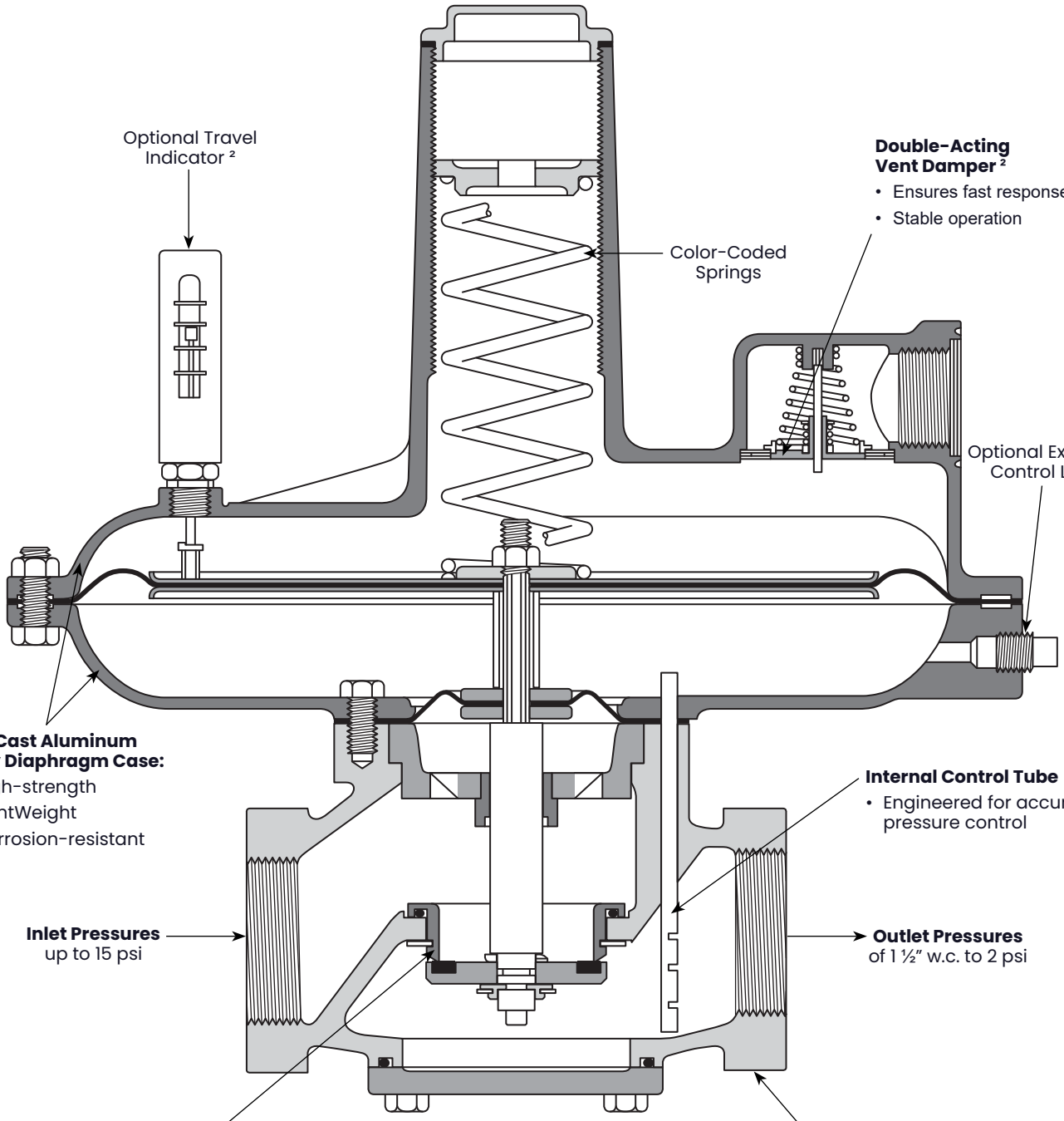
Larger Sizes

The 122 is manufactured in 1-inch through 2 ½-inch pipe sizes only. For larger sizes, ask your Utility Solutions Group Representative or Authorized Distributor about the 3-inch and 4-inch Model 121 Combustion Regulators.

Pressure Ranges and Springs (Standard Regulator)

Size	Outlet Pressure Range	Spring Color	Spring Part Number	Maximum Inlet Pressure	Nominal Diaphragm Size
1" and 1 ¼" Model 122-8	1 ½" w.c. to 3 ½" w.c.	Blue-Black	143-82-021-01 (main spring)	15 psi	8"
	1 ½" w.c. to 3 ½" w.c.	Black	121-41-021-00 (counter spring)		
	1 ½" w.c. to 12" w.c.	Green-Black	143-82-021-02 (main spring)		
	1 ½" w.c. to 12" w.c.	Black	121-41-021-00 (counter spring)		
	3 ½" w.c. to 6 ½" w.c.	Red-Black	143-82-021-00		
	5" w.c. to 8 ½" w.c.	Blue-Black	143-82-021-01		
	6" w.c. to 14" w.c.	Green-Black	143-82-021-02		
	12" w.c. to 28" w.c.	Green	143-16-021-05		
	1 psi to 2 psi	Orange	143-16-021-06		
1 ½", 2", and 2 ½" Model 121-12	1 ½" w.c. to 3 ½" w.c.	Red	143-16-021-03 (main spring)	15 psi	12"
	1 ½" w.c. to 3 ½" w.c.	Red-Black	121-10-021-50 (counter spring)		
	1 ½" w.c. to 12" w.c.	Maroon	121-42-021-00 (main spring)		
	1 ½" w.c. to 12" w.c.	Red-Black	121-10-021-50 (counter spring)		
	3 ½" w.c. to 6 ½" w.c.	Red	143-16-021-03		
	5" w.c. to 8 ½" w.c.	Blue	143-16-021-04		
	6" w.c. to 14" w.c.	Green	143-16-021-05		
	12" w.c. to 28" w.c.	Orange	143-16-021-06		
	1 psi to 2 psi	Black	143-16-021-07		
	½ psi to 2 psi	Cadmium	143-16-021-08		

122-12 Standard Regulator with Internal Control

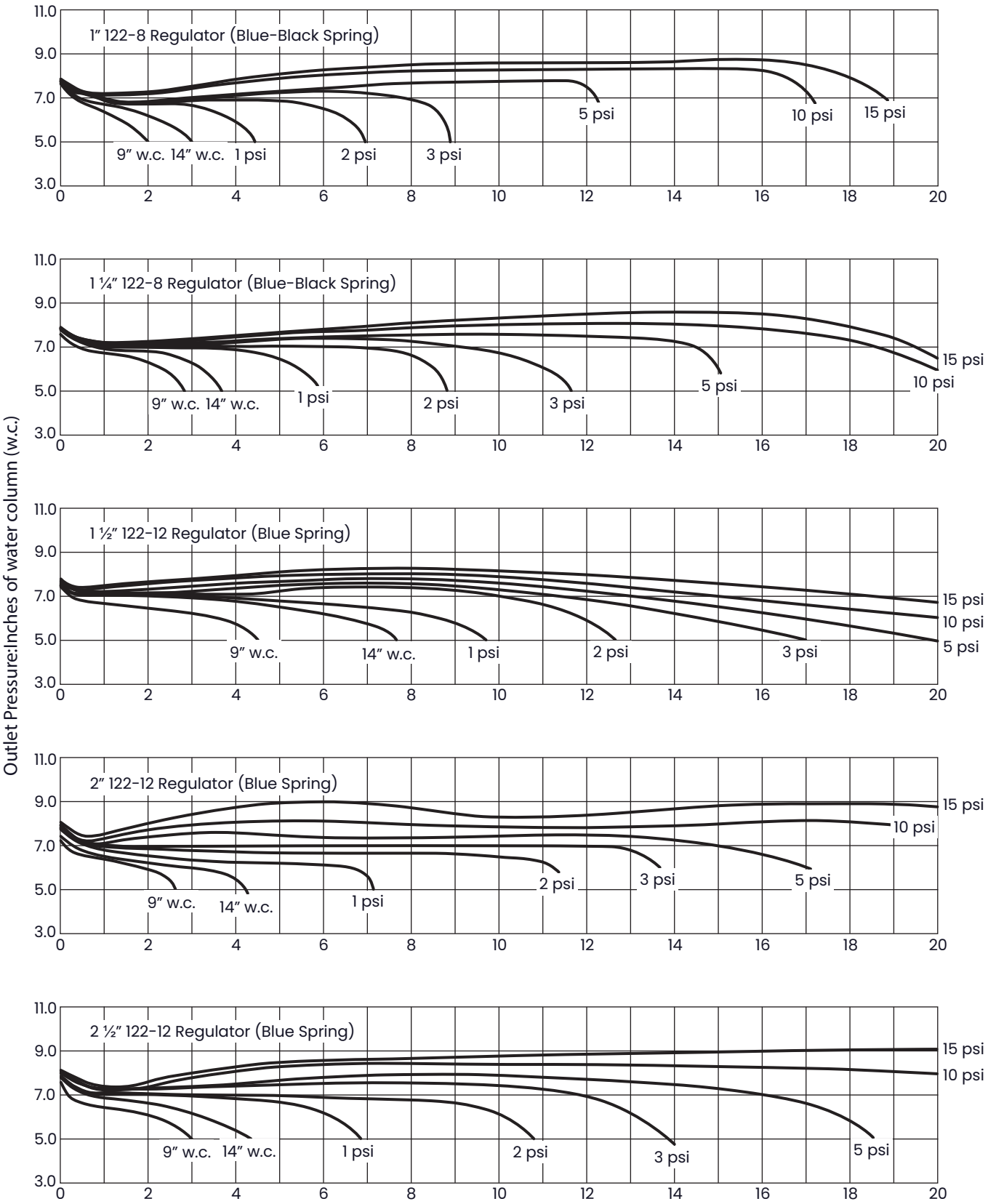


¹ Construction shown is 1 ½", 2", and 2 ½" pipe sizes.Orifice in ¾", 1", and 1 ¼" pipe sizes are thread-in.

² Applies to 1", 1 ¼", 1 ½", 2", and 2 ½" pipe sizes.

Typical Inlet Curves

NOTE: Pressure label for each curve is inlet pressure



Flow in 1000 SCFH (0.6 Specific Gravity - 14.65 psi - 60°F)

Capacity in SCFH of Natural Gas

(0.6 Specific Gravity - 14.65 psi - 60°F)

Inlet Pressure	Set-Point 5" w.c. Red-Black Spring 1" w.c. Droop	Set-Point 7" w.c. Blue-Black Spring 1" w.c. Droop	Set-Point 11" w.c. Green-Black Spring 2" w.c. Droop	Set-Point 18" w.c. Green Spring 2" w.c. Droop	Set-Point 28" w.c. Green Spring 3" w.c. Droop	Set-Point 2 psi Orange Spring ¼ psi Droop	Regulator Size and Model
8" w.c.	1,550	1,000	-	-	-	-	1" Model 122-8
14" w.c.	2,500	2,300	2,000	-	-	-	
1 psi	4,200	4,000	3,600	2,500	-	-	
2 psi	5,700	5,500	5,300	4,000	4,500	-	
3 psi	7,300	7,000	6,000	4,900	5,200	4,000	
5 psi	8,000	8,000	8,400	7,800	8,000	7,500	
10 psi	9,000	9,500	10,000	9500	9,700	9,000	
15 psi	9,000	9,500	11,000	11500	11,500	11,000	
8" w.c.	2,000	1,500	-	-	-	-	1 ¼" Model 122-8
14" w.c.	3,500	3,000	2,200	-	-	-	
1 psi	5,000	4,800	4,000	3,600	-	-	
2 psi	7,300	7,000	6,400	5,700	6,000	-	
3 psi	9,000	8,700	8,000	6,900	7,200	6,300	
5 psi	10,000	9,800	9,500	8,800	9,100	8,100	
10 psi	15,000	15,700	15,200	14,500	14,900	13,800	
15 psi	15,000	15,700	15,800	15,000	15,000	14,000	

Inlet Pressure	Set-Point 5" w.c. Red-Black Spring 1" w.c. Droop	Set-Point 7" w.c. Blue-Black Spring 1" w.c. Droop	Set-Point 11" w.c. Green-Black Spring 2" w.c. Droop	Set-Point 18" w.c. Green Spring 2" w.c. Droop	Set-Point 28" w.c. Green Spring 3" w.c. Droop	Set-Point 2 psi Orange Spring ¼ psi Droop	Regulator Size and Model
8" w.c.	4,000	3,000	-	-	-	-	1 ½" Model 122-12
14" w.c.	4,900	4,500	3,700	-	-	-	
1 psi	6,600	6,500	6,000	5,750	-	-	
2 psi	10,500	10,000	9,800	9,000	9,500	-	
3 psi	12,000	12,000	11,100	10,000	10,500	8,900	
5 psi	14,500	14,500	13,900	12,000	12,700	10,000	
10 psi	16,000	16,000	15,000	13,500	14,000	12,700	
15 psi	18,000	18,000	19,000	19,000	20,000	18,000	
8" w.c.	5,000	4,000	-	-	-	-	2" Model 122-12
14" w.c.	8,800	8,000	6,600	-	-	-	
1 psi	12,200	12,000	11,500	10,700	-	-	
2 psi	18,200	18,000	17,300	16,500	16,900	-	
3 psi	25,000	25,000	24,000	22,300	23,000	18,000	
5 psi	32,000	32,000	30,000	28,100	29,000	27,400	
10 psi	38,000	38,000	35,000	32,200	33,000	30,000	
15 psi	38,000	38,000	40,000	39,000	40,000	36,000	
8" w.c.	5,500	4,500	-	-	-	-	2 ½" Model 122-12
14" w.c.	9,600	9,000	7,300	-	-	-	
1 psi	13,600	13,400	12,100	11,300	-	-	
2 psi	20,700	20,000	19,200	18,200	18,800	-	
3 psi	27,000	27,000	26,500	24,900	25,400	20,000	
5 psi	35,000	35,000	32,000	30,200	31,000	29,000	
10 psi	42,000	42,000	39,000	36,000	37,000	33,000	
15 psi	48,000	48,000	48,000	42,000	45,000	39,900	

NOTE: The above performance data is based on normal testing at 70°F flowing temperature. Changes in performance can occur at low flowing temperature extremes.

Over-Pressurization Protection

The methods of protection can be a relief valve, monitor regulator, shutoff device, or similar mechanism. These protect the downstream piping system and the regulator slow pressure chambers against over-pressurization, due to possible regulator malfunction or failure to achieve complete lockup. The allowable outlet pressure is the lowest of the maximum pressures permitted by federal and state codes, Utility Solutions Group document USG-IG-038, or other applicable standards.

Construction Materials

Component	Materials Used
Body	Cast Iron
Diaphragm Case	Die Cast Aluminum Alloy
Stem Bushing and Plate	Plated Steel
Main Seal and Diaphragms	Buna-N with Nylon Fabric Insert
Orifice:	Aluminum Alloy
¾", 1", and 1 ¼" Models	Brass
1 ½", 2", and 2 ½" Models	Cast Iron
Valve	Plated Steel with Molded Buna-N Soft Seat
Stem	Stainless Steel
Diaphragm Pan, Collars, and Washers	Plated Steel
O-rings and Tetraseals	Buna-N
Adjustment Spring Button:	
1" through 2 ¾" Models	Zinc Die Casting
¾" Model	Thermo-Set Plastic
Seal Cap:	
1" through 2 ½" Models	Zinc Die Casting
¾" Model	Thermo-Set Plastic

Full Open Capacity

Capacity of the Model 122 in the wide-open position can be calculated using the following formula and K factors:

$Q = K\sqrt{P_o(P_i - P_o)}$ ..... (for P_i/P_o less than 1.894)

$Q = \frac{K P_i}{2}$ ..... (for P_i/P_o less than 1.894)

Q = Full open capacity in SCFH of 0.6 specific gravity natural gas

P_i = absolute inlet pressure (psi)

P_o = absolute outlet pressure (psi)

1" Model 122-8 ..... K= 1,400
1 ¼" Model 122-8 ..... K= 1,750
1 ½" Model 122-12 ..... K= 2,750
2" Model 122-12 ..... K= 4,750
2 ½" Model 122-12 ..... K= 5,250

NOTE: At the above full open capacities, the droop is significantly greater than specified in the capacity tables. When checking 122 regulator capacity to provide adequate relief valve capacity, use the above calculated full open capacity. Capacities for pressure reductions not listed in the table can be calculated with the above formula.

Other Gases

Model 121 Regulators are most widely used with natural gas. However, they perform equally well with LP gas, nitrogen, dry carbon-dioxide (CO_2), and air.

For other gas capacities, multiply the table values on page 4, 5, 6, and 7 by the applicable correction factors:

Pipe Sizes

Type of Gas	Correction Factor
Air (Specific Gravity 1.0)	0.77
Propane (Specific Gravity 1.53)	0.63
1350 BTU Propane-Air Mix (Specific Gravity 1.20)	0.71
Nitrogen (Specific Gravity 0.97)	0.79
Dry Carbon Dioxide (Specific Gravity 1.52)	0.63

For other non-corrosive gases, use the following formula:

$$\text{Correction factor} = \sqrt{\frac{0.60}{\text{Specific gravity of the gas}}}$$

When used with gases not listed above, please contact your Utility Solutions Group representative or Industrial Distributor for recommendations.

CAUTION

It is the user's responsibility to ensure all regulator vents and/or vent lines exhaust to a non-hazardous location away from ANY POTENTIAL sources of ignition. Where vent lines are used, it is the user's responsibility to ensure each regulator is individually vented and that common vent lines ARE NOT used.

Temperature Limits

Model 122 regulators can be used for temperatures from -20°F to +150°F.

Buried Service

Model 122 Field Regulators are not suitable for buried (underground) service.

Periodic Inspection

Regulators are pressure control devices with numerous moving parts subject to wear that is independent upon particular operating conditions. To ensure continuous satisfactory operation, a periodic inspection schedule must be adhered with the frequency of inspection determined by the severity of service and applicable laws and regulations.

Maximum Emergency Pressures

The maximum inlet pressure a Model 122 regulator may be subjected to under abnormal conditions without causing internal damage is:

Maximum Inlet Pressure ..... 20 psi

The maximum pressure the diaphragm may be subjected to under abnormal conditions without causing internal damage is:

Maximum Diaphragm Pressure ..... Set-Point +2 psi

NOTE: Set-point is defined as the outlet pressure a regulator is adjusted to deliver.

The maximum pressure that can be safely contained by the diaphragm case on a Model 122 regulator is:

Maximum Safe Pressure ..... 5 psi

NOTE: "Safely contained" means no leakage as well as no bursting.

Metrication

Use the following for metric conversions:

Std. Meters³/hr × 35.31 = ft³/hr (SCFH)
Std. Ft³/hr (SCFH) × 0.0283 = m³/hr
kilograms/centimeter² (kg/cm²) × 14.22 = psi
psi × 0.0703 = kilograms/centimeter² (kg/cm²)
kilo-pascals (kPa) × 0.145 = psi
psi × 6.90 = kilo-pascals (kPa)
bars × 14.50 = psi
psi × 0.69 = bars
millimeters water (mm H_2O) × 0.0394 = in. w.c.
in. w.c. × 25.4 = millimeters water (mm H_2O)
millimeters mercury (mm Hg) × 0.535 = in. w.c.
in. w.c. × 1.868 = millimeters mercury (mm Hg)
in. w.c. × 27.7076 = psi
psi × 0.03609 = in. w.c.

How to Order

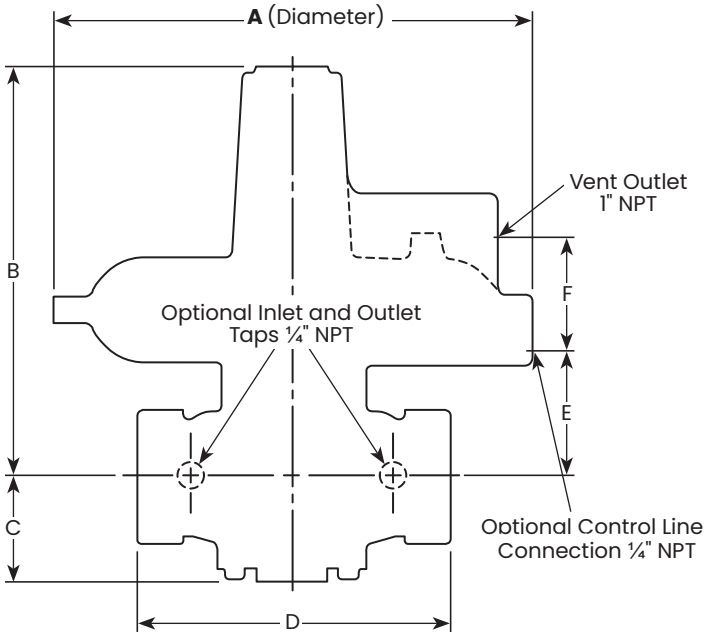
Specify:

1. Model number
2. Pipe size
3. Inlet pressure
4. Outlet pressure
5. Capacity required, SCFH
6. Type of gas (natural gas, propane, air, etc.)

CAUTION

Turn gas on very slowly. If an outlet stop valve is used, it should be opened first. Do not overload diaphragm with a sudden surge of inlet pressure. Monitor the outlet pressure during start-up to prevent an outlet pressure overload.

Dimensions



Pipe Size	A	B	C	D	E	F	Shipping Weight
1" NPT	10 ¼"	11 ⅝"	1 ⅞"	5 ¾"	2 ½"	3 7⁄16"	15 lb
1 ¼" NPT	10 ¼"	11 ⅝"	1 ⅞"	5 ¾"	2 ½"	3 7⁄16"	15 lb
1 ½" NPT	14"	13"	2 ⅜"	7 ½"	3 15⁄16"	3 9⁄16"	28 lb
2" NPT	14"	13"	2 ⅜"	7 ½"	3 15⁄16"	3 9⁄16"	28 lb
2 ½" NPT	14"	13"	2 ⅜"	8 ¼"	3 15⁄16"	3 9⁄16"	30 lb

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