

Model 122 Industrial Combustion Regulators

Construction and Design Features

Model 122 Industrial Combustion Regulators

For an unbeatable combination of capacity, performance and economy, install the Sensus 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" through 2½" sizes a large area double acting damper in the vent assures 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.

Maximum Inlet Pressure Is 15 psig

Outlet pressure is easily adjusted throughout a range of inches w.c. to 2 psig. The springs are color coded for easy identification.

Temperature Limits

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

Buried Service

These regulators are designed for above ground or vault installations and are not recommended for direct earth burial.

Periodic Inspection

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

Maximum Emergency Pressures

The maximum inlet pressure that a Model 122 regulator may be subjected to under abnormal conditions without causing internal damage is 20 psi.

The maximum pressure the diaphragm may be subjected to under abnormal conditions without causing internal damage is set-point plus 2 psi. Set-point is defined as the outlet pressure that a regulator is adjusted to deliver.

If either of the above limits is exceeded then the regulator must be taken out of service and inspected. Damaged or otherwise unsatisfactory parts must be repaired or replaced before returning the regulator to service.

The maximum pressure that can be safely contained by the diaphragm case on a Model 122 regulator is 5 psi. Safely contained means no leakage as well as no bursting.

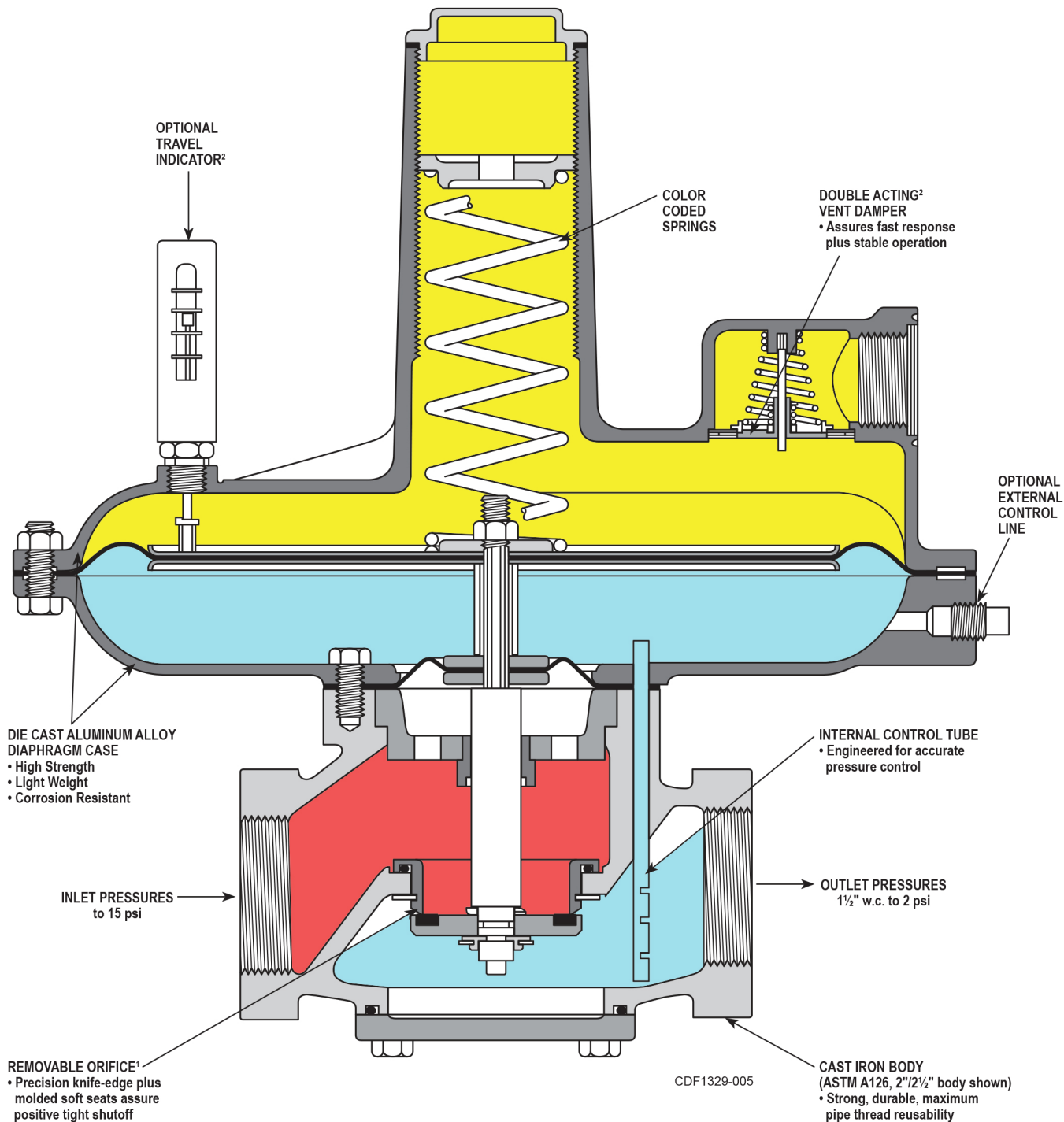
Before using any of the above data, make sure this entire section is clearly understood.

Outlet Pressure Ranges and Springs – Standard Regulator

| SIZE | OUTLET PRESSURE RANGE | SPRING COLOR | SPRING PART NUMBER | NOMINAL DIAPHRAGM SIZE |
|---------------------------------|---|--------------------------------|---|------------------------|
| 1" and 1¼" Model 122-8 | 1½" to 3½" w.c. | Blue-black Black | 143-82-021-01 (main spring) 143-41-021-00 (counter spring) | 8" |
| | 1½" to 12" w.c. | Green-black Black | 143-82-021-02 (main spring) 143-41-021-00 (counter spring) | |
| | 3½" to 6½" w.c. | Red-black | 143-82-021-00 | |
| | 5" to 8½" w.c. | Blue-black | 143-82-021-01 | |
| | 6" to 14" w.c. 12" to 28" w.c. 1 psi to 2 psi | Green-black Green Orange | 143-82-021-02 143-16-021-05 143-16-021-06 | |
| 1½", 2" and 2½" Model 122-12 | 1½" to 3½" w.c. | Red Red-black | 143-16-021-03 (main spring) 121-10-021-50 (counter spring) | 12" |
| | 1½" to 12" w.c. | Maroon Red-black | 121-42-021-00 (main spring) 121-10-021-50 (counter spring) | |
| | 3½" to 6½" w.c. | Red | 143-16-021-03 | |
| | 5" to 8½" w.c. | Blue | 143-16-021-04 | |
| | 6" to 14" w.c. | Green | 143-16-021-05 | |
| | 12" to 28" w.c. | Orange | 143-16-021-06 | |
| | 1 psi to 2 psi ½ psi to 2 psi | Black Cadmium | 143-16-021-07 143-16-021-08 | |

122-12 Standard Regulator with Internal Control

(See IN-G-REG-1329-0312-01-A for Other Variations)

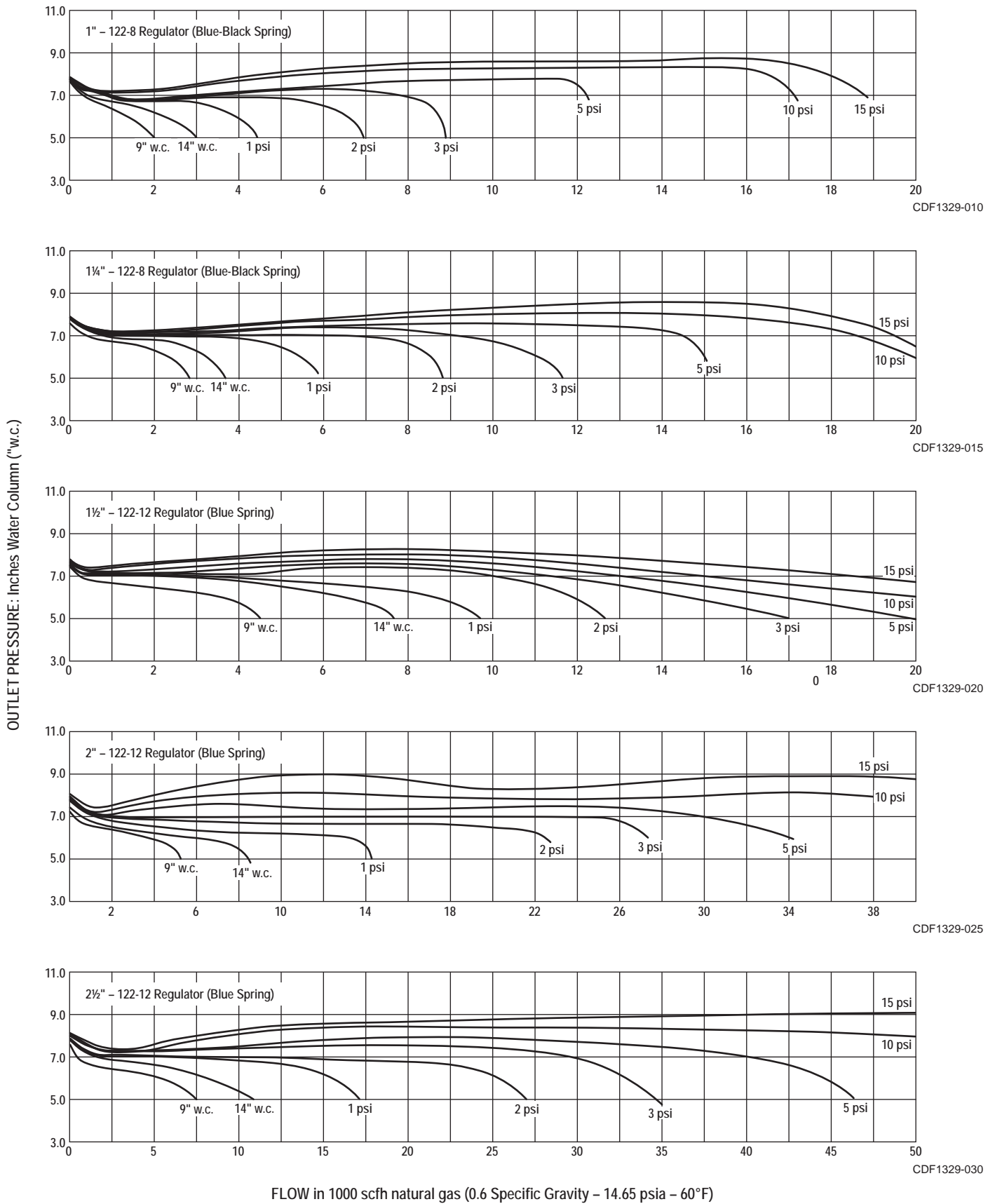


¹Construction shown is for 1½", 2" and 2½" pipe sizes. Orifice in ¾", 1" and 1¼" pipe size is screwed-in.

²Applies to 1", 1¼", 1½", 2" and 2½" pipe sizes.

Typical Performance Curves

Pressure label for each curve is INLET PRESSURE.



Capacity in SCFH of Natural Gas (0.6 Specific Gravity – 14.65 psia – 60°F)

| INLET PRESSURE | SET POINT 5" w.c. | SET POINT 7" w.c. | SET POINT 11" w.c. | SET POINT 18" | SET POINT 28" w.c. | SET POINT 2 psi | REGULATOR SIZE AND MODEL |
|----------------|--------------------------------|---------------------------------|----------------------------------|-----------------------------|-----------------------------|----------------------------|--------------------------|
| | RED/BLACK SPRING 1" w.c. DROOP | BLUE/BLACK SPRING 1" w.c. DROOP | GREEN/BLACK SPRING 2" w.c. DROOP | GREEN SPRING 2" w.c. droop | GREEN SPRING 3" w.c. DROOP | ORANGE SPRING ¼" psi DROOP | |
| 8" w.c. | 1550 | 1000 | - | - | - | - | 1" Model 122-8 |
| 14" w.c. | 2500 | 2300 | 2000 | - | - | - | |
| 1 psi | 4200 | 4000 | 3600 | 2500 | - | - | |
| 2 psi | 5700 | 5500 | 5300 | 4000 | 4500 | - | |
| 3 psi | 7300 | 7000 | 6000 | 4900 | 5200 | 4000 | |
| 5 psi | 8000 | 8000 | 8400 | 7800 | 8000 | 7500 | |
| 10 psi | 9000 | 9500 | 10000 | 9500 | 9700 | 9000 | |
| 15 psi | 9000 | 9500 | 11000 | 11500 | 11500 | 11000 | |
| 8" w.c. | 2000 | 15000 | - | - | - | - | 1¼" Model 122-8 |
| 14" w.c. | 3500 | 3000 | 2200 | - | - | - | |
| 1 psi | 5000 | 4800 | 4000 | 3600 | - | - | |
| 2 psi | 7300 | 7000 | 6400 | 5700 | 6000 | - | |
| 3 psi | 9000 | 8700 | 8000 | 6900 | 7200 | 6300 | |
| 5 psi | 10000 | 9800 | 9500 | 8800 | 9100 | 8100 | |
| 10 psi | 15000 | 15700 | 15200 | 14500 | 14900 | 13800 | |
| 15 psi | 15000 | 15700 | 15800 | 15000 | 15000 | 14000 | |
| INLET PRESSURE | SET POINT 5" w.c. | SET POINT 7" w.c. | SET POINT 11" w.c. | SET POINT 18" w.c. | SET POINT 28" w.c. | SET POINT 2 psi | REGULATOR SIZE AND MODEL |
| | RED SPRING 1" w.c. DROOP | BLUE SPRING 1" w.c. DROOP | GREEN SPRING 2" w.c. DROOP | ORANGE SPRING 2" w.c. DROOP | ORANGE SPRING 3" w.c. DROOP | BLACK SPRING ¼" psi DROOP | |
| 8" w.c. | 4000 | 3000 | - | - | - | - | 1½" Model 122-12 |
| 14" w.c. | 4900 | 4500 | 3700 | - | - | - | |
| 1 psi | 6600 | 6500 | 6000 | 5750 | - | - | |
| 2 psi | 10500 | 10000 | 9800 | 9000 | 9500 | - | |
| 3 psi | 12000 | 12000 | 11100 | 10000 | 10500 | 8900 | |
| 5 psi | 14500 | 14500 | 13900 | 12000 | 12700 | 10000 | |
| 10 psi | 16000 | 16000 | 15000 | 13500 | 14000 | 12700 | |
| 15 psi | 18000 | 18000 | 19000 | 19000 | 20000 | 18000 | |
| 8" w.c. | 5000 | 4000 | - | - | - | - | 2" Model 122-12 |
| 14" w.c. | 8800 | 8000 | 6600 | - | - | - | |
| 1 psi | 12200 | 12000 | 11500 | 10700 | - | - | |
| 2 psi | 18200 | 18000 | 17300 | 16500 | 16900 | - | |
| 3 psi | 25000 | 25000 | 24000 | 22300 | 23000 | 18000 | |
| 5 psi | 32000 | 32000 | 30000 | 28100 | 29000 | 27400 | |
| 10 psi | 38000 | 38000 | 35000 | 32200 | 33000 | 30000 | |
| 15 psi | 38000 | 38000 | 40000 | 39000 | 40000 | 36000 | |
| 8" w.c. | 5500 | 4500 | - | - | - | - | 2½" Model 122-12 |
| 14" w.c. | 9600 | 9000 | 7300 | - | - | - | |
| 1 psi | 13600 | 13400 | 12100 | 11300 | - | - | |
| 2 psi | 20700 | 20000 | 19200 | 18200 | 18800 | - | |
| 3 psi | 27000 | 27000 | 26500 | 24900 | 25400 | 20000 | |
| 5 psi | 35000 | 35000 | 32000 | 30200 | 31000 | 29000 | |
| 10 psi | 42000 | 42000 | 39000 | 36000 | 37000 | 33000 | |
| 15 psi | 48000 | 48000 | 48000 | 42000 | 45000 | 39900 | |

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

Overpressurization Protection

Protect the downstream piping system and the regulator’s low pressure chambers against overpressurization due to possible regulator malfunction or failure to achieve complete lock up.

The allowable outlet pressure is the lowest of the maximum pressures permitted by federal codes, state codes, Sensus Metering Systems IN-G-REG-1498, or other applicable standards.

The method of protection can be a relief valve, monitor regulator, shutoff device, or similar mechanism.

Materials of Construction

- Body Cast Iron
- Diaphragm Case Die Cast Aluminum Alloy
- Stem Bushing and Plate Plated Steel
- Main and Seal Diaphragms Buna-N with (Vitron Not Available) Nylon Fabric Insert
- Orifice Cast Iron (1½" and 2½" Model 122)
- Orifice Brass (1" and 1¼" Model 122)
- Valve Plated Steel with Molded Buna-N Soft Seat
- Stem Plated Steel
- Diaphragm Pans, Collars and Washers Plated Steel
- O-Rings and Tetra Seals Buna-N
- Adjustment Spring Button Zinc Die Casting (1" and 2½" Model 122)
- Seal Cap, 243-8HP Zinc Die Casting (1" through 2½")

Full Open Capacity

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

1. $Q = K\sqrt{P_o(P_i - P_o)}$
 Q = Full open capacity in SCFH of 0.6 specific gravity natural gas).
 P_i = **Absolute** inlet pressure (psia)
 P_o = **Absolute** outlet pressure (psia)
2. K Factors =
 - 1" Model 122-8 K = 1400
 - 1¼" Model 122-8 K = 1750
 - 1½" Model 122-12 K = 2750
 - 2" Model 122-12 K = 4750
 - 2½" Model 122-12 K = 5250

Remember, 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 full open capacity. Do not use 122 capacity from the tables.

Other Gases

Standard Model 122 regulators are most widely used on natural gas. However, they perform equally well on LP gas, nitrogen, dry CO₂, and air.

For capacities, multiply the table values on page 4 by the following correction factors:

| 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:

$$\text{CORRECTION FACTOR} = \sqrt{\frac{0.60}{\text{Specific gravity of the gas}}}$$

For use with gases not listed above, please contact your Sensus representative or industrial distributor for recommendations.

CAUTION

It is the user’s responsibility to assure that all residential service regulator vents and/or vent lines exhaust to a non-hazardous location away from any potential sources of ignition. Refer to Sensus Bulletin IN-G-REG-1329 for more detailed information.

122 Variations

The following variations of the Model 122 are also available:

Atmospheric Regulator/Zero Governor

All pipe sizes through 2½".

Set-point pressures:

-1" w.c. to +1½" w.c (1" through 2½" Model 122)

Differential Regulator

All pipe sizes through 2½".

Set points to maximum differential of 1 psi.

Back Pressure Regulator/Relief Valve

All pipe sizes through 2½".

Set-point pressures:

3" w.c. to 2 psi (1" and 1¼" Model 122-8)

3" w.c. to 1¾" psi (1½" and 2½" Model 122-12)

For more complete information refer to IN-G-REG-1329. For other variations or special applications, please contact your Sensus Representative or industrial distributor.

Larger Sizes

The 122 is manufactured in 1" through 2½" pipe sizes only. For larger sizes, see the 3" and 4" Model 121.

Metrication

Use the following for metric conversions:

| |
|---|
| $\text{std. meters}^3/\text{hr.} \times 35.31 = \text{std. ft.}^3/\text{hr. (SCFH)}$ $\text{std. ft.}^3/\text{hr. (SCFH)} \times 0.0283 = \text{std. meters}^3/\text{hr.}$ |
| $\text{kilograms/centimeter}^2(\text{kg/cm}^2) \times 14.22 = \text{psig}$ $\text{psig} \times 0.0703 = \text{kilograms/centimeter}^2(\text{kg/cm}^2)$ |
| $\text{kilopascals (kPa)} \times 0.145 = \text{psig}$ $\text{psig} \times 6.90 = \text{kilopascals (kPa)}$ |
| $\text{bars} \times 14.50 = \text{psig}$ $\text{psig} \times 0.69 = \text{bars}$ |
| $\text{millimeters water (mm H}_2\text{O)} \times .0394 = \text{in. w.c.}$ $\text{in. w.c.} \times 25.4 = \text{millimeters water (mm H}_2\text{O)}$ |
| $\text{millimeters mercury (mm Hg)} \times 0.535 = \text{in. w.c.}$ $\text{in. w.c.} \times 1.868 = \text{millimeters mercury (mm Hg)}$ |

How to Order

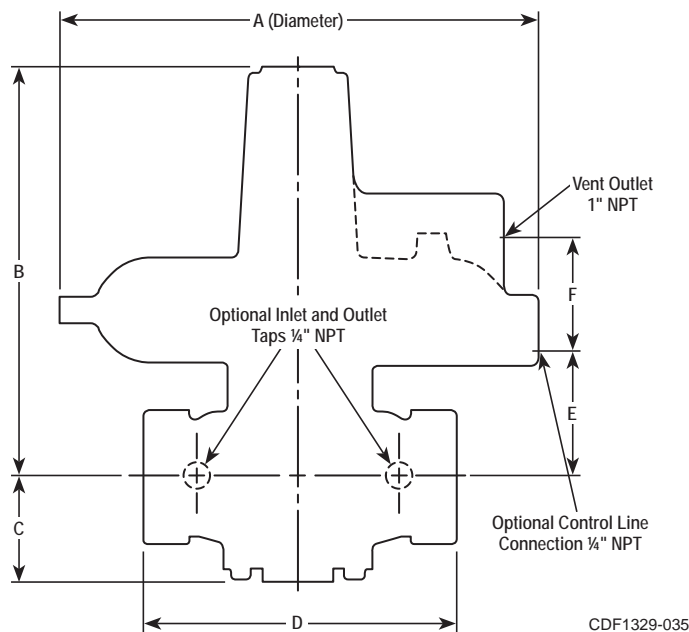
Specify:

1. Model number
2. Pipe size
3. Inlet pressure
4. Outlet pressure
5. Capacity required, SCFH
6. Kind 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 the diaphragm with a sudden surge of inlet pressure. Monitor the outlet pressure during start-up to prevent an outlet pressure overload.

Dimensions



| | A | B | C | D | E | F | SHPG. WT. |
|------------|---------|---------|--------|--------|----------|---------|-----------|
| 1" NPT | 10 1/4" | 11 5/8" | 1 1/8" | 5 3/4" | 2 1/2" | 3 7/16" | 15 lbs. |
| 1 1/4" NPT | 10 1/4" | 11 5/8" | 1 1/8" | 5 3/4" | 2 1/2" | 3 7/16" | 15 lbs. |
| 1 1/2" NPT | 14" | 13" | 2 3/8" | 7 1/2" | 3 15/16" | 3 7/16" | 28 lbs. |
| 2" NPT | 14" | 13" | 2 3/8" | 7 1/2" | 3 15/16" | 3 7/16" | 28 lbs. |
| 2 1/2" NPT | 14" | 13" | 2 3/8" | 8 1/4" | 3 15/16" | 3 7/16" | 30 lbs. |

Model 122 Industrial Combustion Regulators

Construction and Design Features



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