

CR4000 Series Service Regulators

Technical Bulletin



CR4000 Regulator Information

General Information

The American Meter Series CR4000 pressure regulator is designed for natural gas applications and features a compact, lightweight design for fast, easy installation. Interchangeable springs provide a wide range of outlet pressures and flow rates. Outlet pressures between 3.5" W.C. and 5 PSIG are available. Operating temperature range is -20° F to 150° F (-30° C to 65° C).

All models conform to ANSI Code B109.4-1998, and CGA Service-type Regulator Specification CAN/CGA-6.18-M95.

Integral Regulator / Valve Body

The aluminum regulator body of the CR4000 is available with pipe threads 3/4" x 3/4", 3/4" x 1" and 1" x 1" NPT in the 180° and 3/4" x 3/4" and 3/4" x 1" NPT in the 90° regulator body.

Features

In response to market surveys, the following features were designed into the CR4000 regulator to accommodate customer's needs, as indicated per users survey.

- Ease of installation.
- Inline 180° or angled 90°.
- Excellent relief performance.
- All aluminum.
- Low maintenance.

Application

The CR4000 features a full capacity internal relief valve with large passages to assure the fast release of gas (See performance graphs on page 3). The standard relief spring setting is 8.0" W.C. above preferred outlet pressure setpoint.

Regulator body configurations permit the CR4000 regulator to be supplied in 90° or 180° versions. The vent can be supplied in four different positions as shown on page 3.

The CR4000 regulator is designed with an extra large, removable weather and bug-proof stainless steel screened vent to resist freeze-ups and to exclude foreign matter. The vent is threaded 3/4 inch NPT.

Options

Vent Elbow- The regulator vent opening should face downward to minimize the chance of blockage from ice and snow. If not, a 3/4" NPT plastic, 90° vent elbow (Part number 78041P025) with separate protective screen (Part number 70400P017) may be screwed into the vent.



Construction

Lower Diaphragm Case - Precision die cast aluminum with a exclusive 7-step advanced conversion coating, single coat polyester primer and High Solid Polyurethane Top Coat.

Top Assembly - Precision die cast aluminum with a exclusive 7-step advanced conversion coating, single coat polyester primer and High Solid Polyurethane Top Coat.

Pressure Spring - Steel, Zinc plated and yellow chromate treated. Color coded for identification.

Diaphragm Plate - Steel, plated

Seat Disc - Buna-N.

Orifice - High strength, corrosion-resistant, aluminum.

Lever - Stamped aluminum.

Vent Screen - Stainless steel.

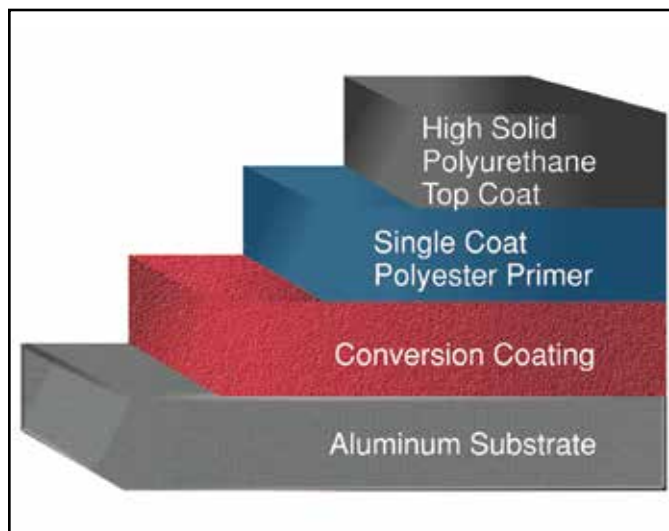
Seal Plug - Ultraviolet stabilized, mineral filled nylon.

Exclusive, 7 - Step Corrosion Protection

The protective finish on the CR4000 regulator more effectively resists corrosive effects of weather and harsh environments than do any others in the industry. Each precision die cast aluminum regulator is treated, inside and out, with a special conversion coating that is part of an exclusive, 7-step finishing process. This unique coating greatly inhibits oxidation of the metal surface. It also prevents finish paint from cracking and blistering.

A single coat polyester primer, followed by a high solid polyurethane top coat provides a long-lasting protection to all exterior regulator surfaces. The American Meter conversion coating process meets all environmental protection regulations.

Corrosion Protection



CR4000 Regulator Capacity Performance

CR4000 Regulator, 1/8" Orifice Set Point 7.0" W.C. @ 50 SCFH

SCFH 0.60 specific gravity gas @ 60° F & 14.7 PSIA. Pressure spring 70017P083.
Outlet pressure variance not to exceed +2" -1" W.C. from set point, horizontal position.

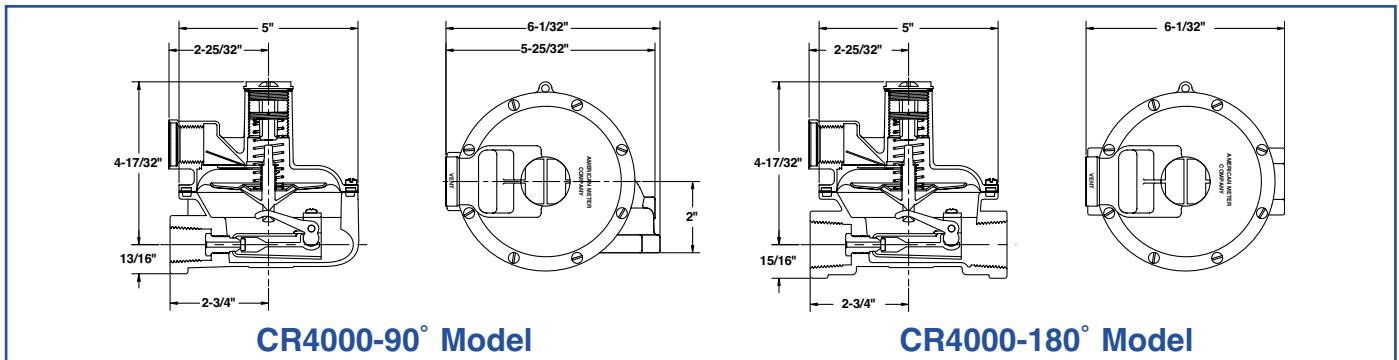
Outlet Type	Inlet (PSIG)										
	3	5	10	15	25	35	50	60	75	100	125
90° - 3/4"	200	250	350	425	550	700	850	1000	1100	1700	2000
90° - 1"	225	275	375	450	600	750	900	1000	1100	1700	2100
180° - 3/4"	200	250	350	425	550	700	850	1000	1100	1200	1200
180° - 1"	225	275	375	450	600	750	900	1000	1100	1200	1200

CR4000 Regulator, 1/8" Orifice Set Point 2 PSIG @ 50 SCFH

SCFH 0.60 specific gravity gas @ 60° F & 14.7 PSIA. Pressure spring 70017P085.
Outlet pressure variance not to exceed ±10% from set point, horizontal position.

Outlet Type	Inlet (PSIG)										
	3	5	10	15	25	35	50	60	75	100	125
90° - 3/4"	100	150	225	275	350	450	500	600	600	800	1200
90° - 1"	100	150	250	325	450	550	600	700	800	1000	1400
180° - 3/4"	100	150	225	275	350	450	500	600	600	800	1200
180° - 1"	100	150	250	325	450	550	600	700	800	1000	1400

CR4000 Dimensions

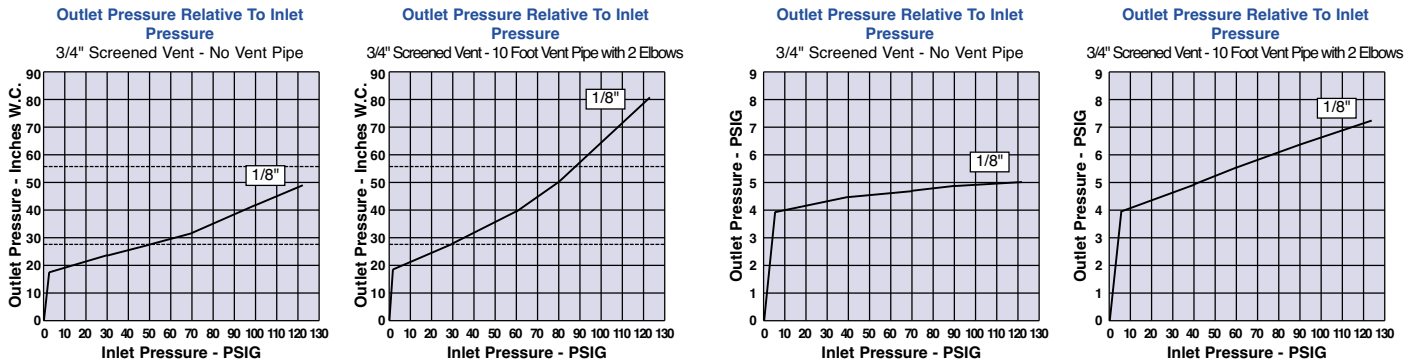


CR4000-90° Model

CR4000-180° Model

CR4000 Regulator Relief Valve Performance

There are several methods of measuring the relief performance of a regulator. For the CR4000 service regulator, the worst case scenario would occur if the lever were to be disconnected. The data presented in the tables below represent this condition.



CR4000 Pressure Springs, Orifices and Vent Positions

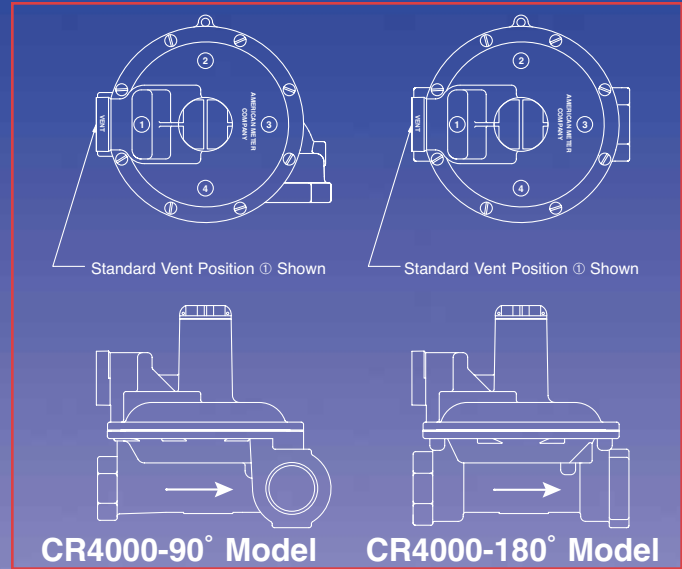
Pressure Springs

Outlet Pressure	Color Code	Part Number CR4000
3.5" to 7" W.C.	Light Blue	70017P083
5" to 9" W.C.	Lavender	70017P084
9" to 15" W.C.	Light Gray	70017P088
18" to 2 PSIG	Light Green	70017P085
2 to 4 PSIG	Pink	70017P086
4 to 5 PSIG	Turquoise	70017P087

Maximum Recommended Inlet Pressure

Orifice Size	Part Number	Max. Inlet Pressure (PSIG)
1/8"	72494P044	125

CR4000 Vent Positions



CR4000 Full Open Regulator Relief Capacity

For sizing downstream relief valves, use the following formulas to determine the regulator full open capacity:

For critical flow rates

For sub-critical flows

$$Q = 14 \times \frac{P_1}{\sqrt{G}}$$

$$Q = 28 \frac{\sqrt{P_2 h}}{\sqrt{G}}$$

Key:

- Q = Maximum capacity of regulator
- P₁ = Inlet absolute pressure (PSIA)
- P₂ = Outlet absolute pressure (PSIA)
- h = Differential pressure (P₁ - P₂)
- G = Specific gravity of gas

CR4000 Regulator Order Information and Pressure Rating

Ordering Information

- 1 Model number.
- 2 Type and specific gravity of gas.
- 3 Size of inlet and outlet.
- 4 Inlet pressure, psi.
- 5 Outlet pressure, inches W.C. (or PSIG).
- 6 Flow, scfh.
- 7 Regulator vent position number.

Shipping Weight -

17 lbs/carton of eight regulators

Regulator Pressure Rating

125 PSIG = Maximum recommended inlet pressure for normal service. Maximum recommended pressure may vary with orifice size.

175 PSIG = Maximum inlet pressure for abnormal or emergency service, without causing damage to regulator case.

5 PSIG = Maximum outlet pressure for normal service.

10 PSIG = Maximum outlet pressure which can be contained by pressure carrying components (no flange leakage to atmosphere except for normal relief action).

If regulator is subjected to these conditions, it should be removed from service.

50 PSIG = Maximum outlet pressure for abnormal service without damage to internal components. **If regulator is subjected to these conditions, it should be removed from service.**



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