

# North American 7337A-3 High Pressure Gas Regulators

**7337A Regulators** reduce high gas supply pressures to practical use levels. Since capacities will vary with the pressure drop across the regulator (see Table D), due care must be exercised in properly sizing both the regulator and downstream piping. Outlet pressure of regulators (except where noted) may be varied through use of interchangeable compression springs within the groups indicated in selection Table B. Compression springs are identified by either color or part number. Products ending in "-SS" contain an integrated overpressure slam-shut device.

## SPECIFICATIONS

**Body Sizes and End Connections:** 1-1/2" NPT

**Orifice Diameter:** See Table C

**Maximum Operating Inlet Pressure:** See Table C

**Maximum Outlet (Casing) Pressure:** 15 psig

**Maximum Operating Outlet Pressure to Avoid Internal Parts Damage - The Outlet Pressure Rating:**  
3 psig above outlet pressure setting

**Temperature Capabilities:** -20° to 150°F

**Pressure Registration:** Internal registration

**Approximate Weight:** 25 lbs

## SELECTION

When selecting a regulator, specify its complete designation including pipe size code and spring designation or outlet pressure range.

*Example:* Select a regulator for 2000 scfh of 0.6 specific gravity natural gas from 5 psig supply pressure to 26" w.c. outlet pressure.

*Solution:* Entering Table D, the required spring range is 14 to 30" w.c. Further, the regulator with the appropriate capacity is determined to be the 7337A-3-GNS.



**Table A. Specific Gravity Correction Factor**

Sp Gr	Factor
0.4	1.22
0.6	1.00
1.0	0.774
1.5	0.632
2.0	0.547

If the specific gravity of the gas is other than 0.6, divide desired flow by gravity factor to get equivalent flow of natural gas; then select regulator from Table D.

Multiply a given size regulator's natural gas capacity by gravity factor to get regulator capacity with different gas.

## RELIEF VALVES

The 7337A-3 Regulator comes equipped with a non-adjustable internal limited capacity relief valve feature. This internal relief valve is intended to minimize overpressure that could occur due to seat leakage. If the downstream pressure exceeds the regulator setting by 7 to 56" w.c. depending on the main spring used (see Table B), the relief valve opens and excess gas is vented through the vent in the upper spring case.

## INSTALLATION

The North American 7337A-3 Regulator may be installed in any orientation as long as flow through it matches the direction arrow cast on the body. Also, the spring case vent should be pointed downward.

If gas escaping through the internal relief 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 use obstruction-free tubing or piping at least equal in size to the vent. The end of the vent pipe must be protected from anything that might clog it.

## OVERPRESSURE PROTECTION

Like most pressure-reducing regulators, the 7337A-3 Regulators have outlet pressure ratings that are lower than the inlet pressure ratings. Therefore, a pressure relieving or pressure limiting device is needed if the inlet pressure can exceed the outlet pressure rating, see "Specifications".

The regulators ending in "-SS" provide overpressure protection by shutting off the flow of gas to the downstream system. This slam-shut device requires an external sensing line.

The internal relief in this regulator does provide limited downstream overpressure protection, but it should not be

considered complete overpressure protection. Refer to the capacity information section to determine the required relief valve capacity.

## CAPACITY INFORMATION

Table D provides the natural gas regulating capacities of the 7337A-3 regulators at specific inlet pressures and outlet pressure settings. Flows are in SCFH (60°F and 14.7 psia) of 0.6 specific gravity gas. For specific gravity conversion factors to other gases, refer to the "Selection Section".

To determine wide-open flow capacity of regulator for relief sizing, use the following formula.

For critical flow: (P outlet absolute ≤ ½ P inlet absolute)

$$Q = P C_g * 1.29$$

For subcritical flow: (P outlet absolute > ½ P inlet absolute)

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

C<sub>g</sub> = See Table C

C<sub>1</sub> = See Table C

G = gas specific gravity (air = 1.0)

P = inlet pressure, psia

Q = flow rate, SCFH

T = absolute temperature of gas at inlet in °Rankine

ΔP = differential pressure, psi (*The difference between the regulator inlet pressure and the maximum outlet pressure that can be tolerated by downstream components*)

**Table B. 7337A-3 Regulator Springs**

Regulator Designation	End Connections	Outlet Pressure Range	Compression Spring Color Number		Droop *	Approx. point above pressure setting @ which internal relief starts to discharge	
						7337A-3	7337A-3 -SS
7337A-3-GYS, 7337A-3-GYS-SS	1½" NPT	8-12"wc	Purple	R690-5305	2"wc	11-18"wc	16-14"wc
7337A-3-GNS, 7337A-3-GNS-SS		14-30"wc	Dk. Green	R690-5304	3"wc	7-28"wc	8-16"wc
7337A-3-BS, 7337A-3-BS-SS ‡		1.2-2.5 psig	Blue	R690-5303	5"wc	7-56"wc	7-28"wc
7337A-3-2538, 7337A-3-2538-SS ‡		2.5-5.5 psig	Yellow	R690-5322	5"wc	7-69"wc	1-2 psig
7337A-3-LGY, 7337A-3-LGY-SS	1½" NPT	8-12"wc	Purple	R690-5305	2"wc	11-18"wc	6-14"wc
7337A-3-LGN, 7337A-3-LGN-SS		14-30"wc	Dk. Green	R690-5304	3"wc	7-28"wc	8-16"wc
7337A-3-LB, 7337A-3-LB-SS ‡		1.2-2.5 psig	Blue	R690-5303	5"wc	7-56"wc	7-28"wc
7337A-3-2534, 7337A-3-2534-SS ‡		2.5-5.5 psig	Yellow	R690-5322	5"wc	7-69"wc	1-2 psig
7337A-3-LGY1, 7337A-3-LGY1-SS	1½" NPT	8-12"wc	Purple	R690-5305	2"wc	11-18"wc	6-14"wc
7337A-3-LGNI, 7337A-LGNI-SS		14-30"wc	Dk. Green	R690-5304	3"wc	7-28"wc	8-16"wc
7337A-3-LB1, 7337A-3-LB1-SS ‡		1.2-2.5 psig	Blue	R690-5303	5"wc	7-56"wc	7-28"wc
7337A-3-2510, 7337A-3-2510-SS ‡		2.5-5.5 psig	Yellow	R690-5322	5"wc	7-69"wc	1-2 psig

‡ Within a grouping, by changing compression springs, the "B" regulator may be made into either of two regulators above it; and those two above may be changed into each other, but they cannot be changed into "B" regulators because they lack the high pressure diaphragm head assembly.

\* Droop is the difference between outlet pressure selected and that realized when operating at maximum capacities listed in this table.

**Table C. 7337A-3 Regulator Inlet Pressure Ratings and Flow Coefficients**

Regulator Designation	Orifice Size	Max. Inlet Pressure psig	Max. Emergency Inlet Pressure psig	C <sub>g</sub>	C <sub>1</sub>
7337A-3-GYS, 7337A-GYS-SS 7337A-3-GNS, 7337A-3-GNS-SS 7337A-3-BS, 7337A-3-BS-SS 7337A-3-2538, 7337A-3-2538-SS	3/8"	125	175	110	29.5
7337A-3-LGY, 7337A-3-LGY-SS 7337A-3-LGN, 7337A-3-LGN-SS 7337A-3-LB, 7337A-3-LB-SS 7377A-3-2534, 7337A-3-2534-SS	3/4"	80 60	175	450	34
7337A-3-LGY1, 7337A-3-LGY1-SS 7337A-3-LGNI, 7337A-LGNI-SS 7377A-3-LB1, 7337A-3-LB1-SS 7377A-3-2510, 7337A-3-2510-SS	1"	25 30	175	765	38.1

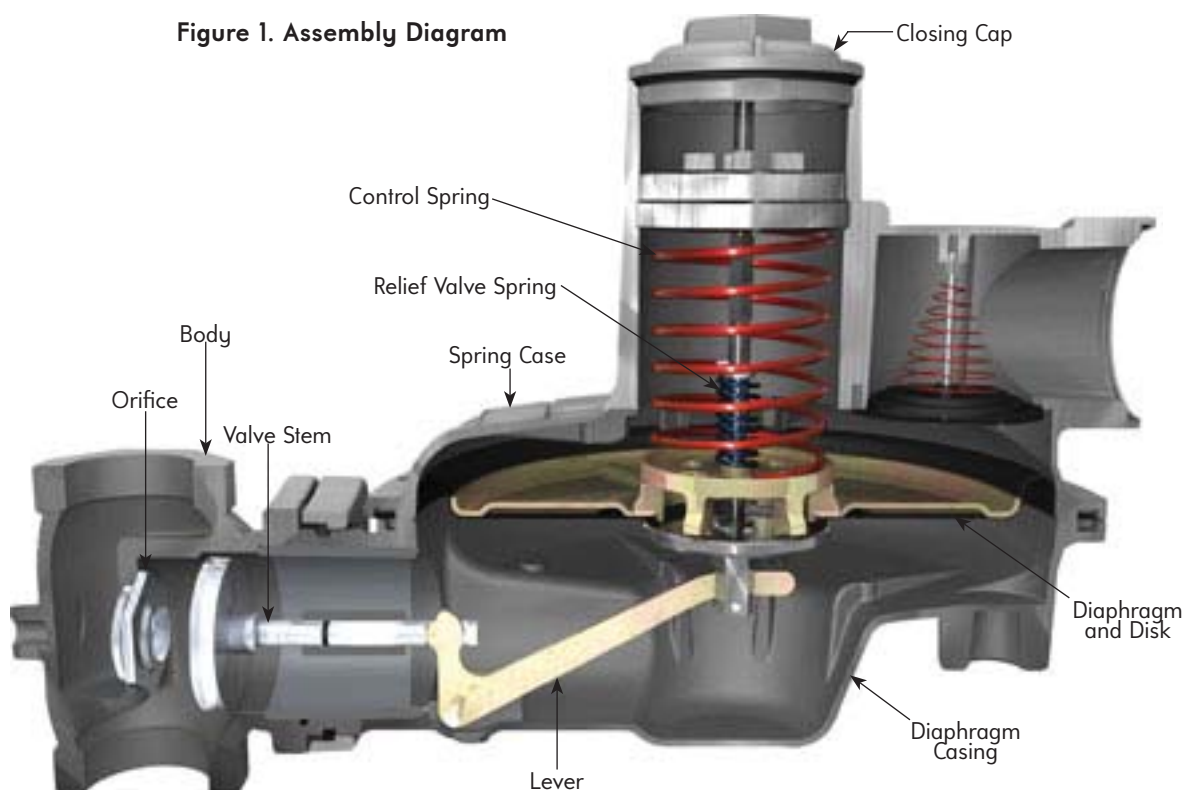
**Table D. 7337A-3 Capacities in scfh of 0.6 Specific Gravity Gas with Inlet Pressures in psig**

Regulator Designation	Orifice Size	Spring	Inlet Pressure (PSIG)										
			3	5	10	15	20	25	30	40	50	60	80
7337A-3-GYS, 7337A-3-GYS-SS 7337A-3-GNS, 7337A-3-GNS-SS 7337A-3-BS, 7337A-3-BS-SS 7337A-3-2538, 7337A-3-2538-SS	3/8"	Purple 8-12"wc	1230	1920	3160	4150	4910	5680	6370	7830	9010	9040	9620
		Dk. Green 14-30"wc	1400	2100	2800	3750	4600	5000	6000	7350	8450	9050	11000
		Blue 1.0-2.5 psig	1000	1160	1980	2690	3370	4050	4720	6280	7550	8960	10320
		Yellow 2.5-5.5 psig	—	—	940	1220	1590	1900	2200	2760	3310	4160	5290
7337A-3-LGY, 7337A-3-LGY-SS 7337A-3-LGN, 7337A-3-LGN-SS 7337A-3-LB 7337A-3-LB-SS 7337A-3-2534, 7337A-3-2534-SS	3/4"	Purple 8-12"wc	2810	4130	5950	7110	7770	8220	8560	8770	9000	9070	—
		Dk. Green 14-30"wc	2900	3800	5600	6900	8150	9050	9400	9500	10300	10550	11000
		Blue 1.0-2.5 psig	1600	2440	4280	5580	6870	7580	8570	9450	10220	10420	11180
		Yellow 2.5-5.5 psig	—	—	1910	2660	3110	3890	4290	5110	6500	7410	9230
7337A-3-LGY1, 7337A-3-LGY1-SS 7337A-3-LGNI, 7337A-3-LGNI-SS 7337A-3-LB1, 7337A-3-LB1-SS 7337A-3-2510, 7337A-3-2510-SS	1"	Purple 8-12"wc	3680	4850	6650	7520	8010	8330	—	—	—	—	—
		Dk. Green 14-30"wc	2960	4600	5800	7300	8000	8600	—	—	—	—	—
		Blue 1.0-2.5 psig	1800	3300	5250	6920	7870	8440	—	—	—	—	—
		Yellow 2.5-5.5 psig	—	—	2390	3570	4580	5790	6200	—	—	—	—

**Table E. Materials of Construction (see Figure 1.)**

Body	Diaphragm Casing, and Spring Case	Orifice, Closing Cap and Valve Stem	Control Spring	Lever	Diaphragm and Disk	Relief Valve Spring
Cast Iron, Ductile Iron (-SS version)	Aluminum	Aluminum	Stainless Steel	Plated Steel	Nitrile (NBR)	Stainless Steel

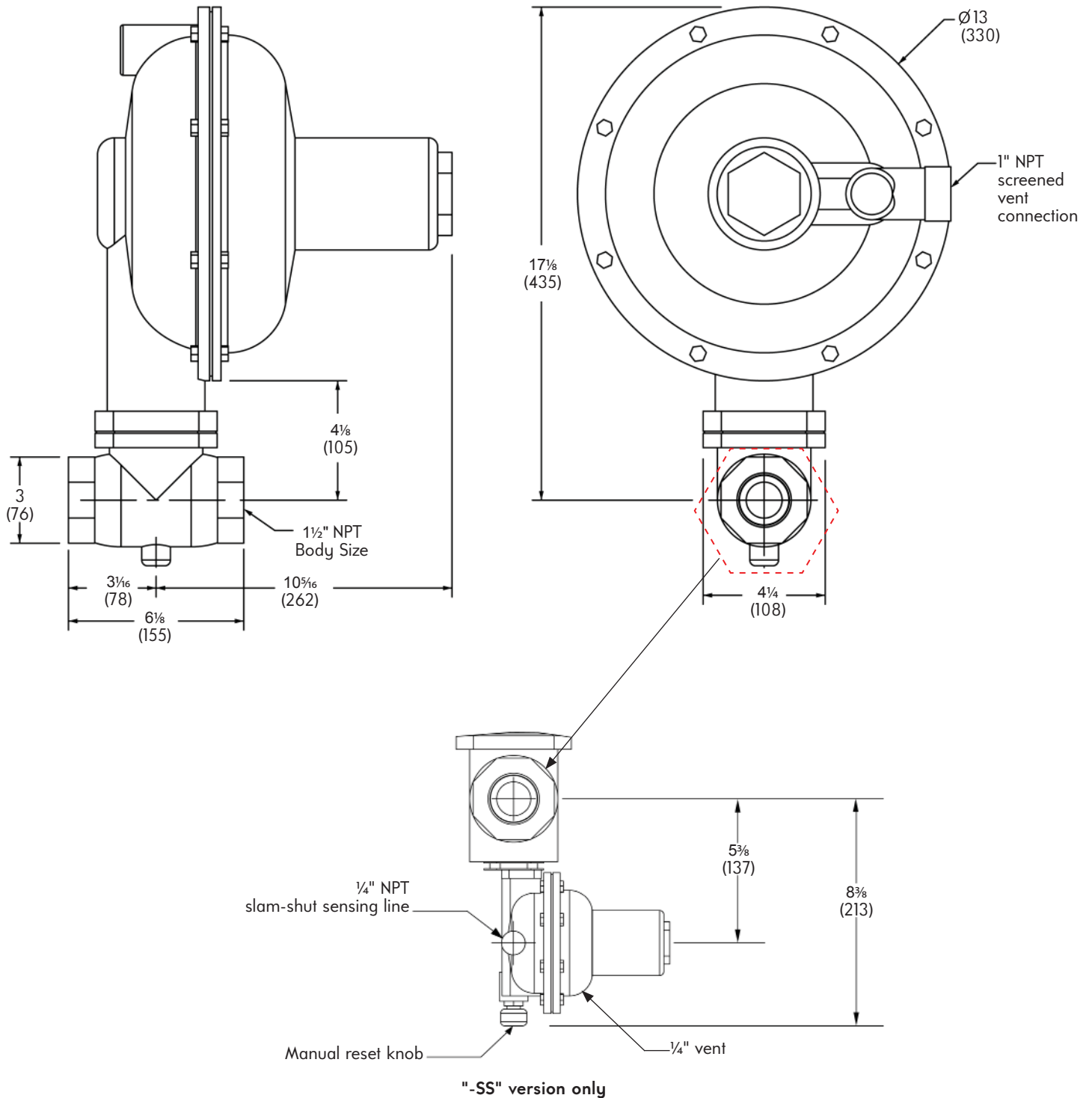
**Figure 1. Assembly Diagram**



**Table F. 7337A-3 Regulator and Slam-Shut Overpressure Shutoff (OPSO) Pressure Ranges**

Regulator Designation	Control Spring		Slam-Shut Over Pressure Shut-off Device	
	Factory Setpoint	Spring Range	Factory Setpoint	Spring Range
<b>7337A-3-GYS, 7337A-GYS-SS</b>	11"wc	8-12"wc	25"wc	16-44"wc
<b>7337A-3-GNS, 7337A-3-GNS-SS</b>	1 psig	14-30"wc	2 psig	1.4-4.1 psig
<b>7337A-3-BS, 7337A-3-BS-SS</b>	2 psig	1.2-2.5 psig	3.5 psig	2-7.3 psig
<b>7337A-3-2538, 7337A-3-2538-SS</b>	5 psig	2.5-5.5 psig	7 psig	3.2-8.5 psig
<b>7337A-3-LGY, 7337A-3-LGY-SS</b>	11"wc	8-12"wc	25"wc	16.44"wc
<b>7337A-3-LGN, 7337A-3-LGN-SS</b>	1 psig	14-30"wc	2 psig	1.4-4.1 psig
<b>7337A-3-LB, 7337A-3-LB-SS</b>	2 psig	1.2-2.5 psig	3.5 psig	2-7.3 psig
<b>7337A-3-2534, 7337A-3-2534-SS</b>	5 psig	2.5-5.5 psig	7 psig	3.2-8.5 psig
<b>7337A-3-LBI, 7337A-3-LGY1-SS</b>	11"wc	8-12"wc	25"wc	16-44"wc
<b>7337A-3-LGNI, 7337A-LGNI-SS</b>	1 psig	14-30"wc	2 psig	1.4-4.1 psig
<b>7337A-3-LBI, 7337A-3-LBI-SS</b>	2 psig	1.2-2.5 psig	3.5 psig	2-7.3 psig
<b>7337A-3-2510, 7337A-3-2510-SS</b>	5 psig	2.5-5.5 psig	7 psig	3.2-8.5 psig

DIMENSIONS inches (mm)



**WARNING:** Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and Insurance Underwriters' recommendations, and care in operation.



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