North American 7339 High Pressure Gas Regulators

7339 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.

These regulators are pilot operated. Therefore they are an excellent choice when the application requires precise pressure control. Products ending in "1, 2 or 3" contain an integrated overpressure slam-shut device.

SPECIFICATIONS

Body Sizes and End Connections: 1-1/2" NPT, 2" NPT and 2" Class 125 FF Flanged
Capacities: See Table D
Maximum Emergency and Operating Inlet Pressure: See Table C
Maximum Emergency and Operating Outlet (Casing) Pressure: 66 psig
Temperature Capabilities: -20° to 150°F (-29° to 66° C)
Pressure Registration: Dual-registration

SELECTION

When selecting a regulator, specify its complete designation including: pipe size code, outlet pressure range, orifice size, body position, vent position and indicate if a slam-shut device is required.

Note, the 1½" and 2" sizes have the same capacities. Size selection should be based on piping preference and velocity through the piping.

Example: Select a regulator for 20,000 scfh of 0.6 specific gravity natural gas from 25 psig supply pressure to 2 psig outlet pressure. A slam-shut device is not required for this example.

Solution: Entering Table D, the required spring range is 1 to 3.25 psig. Further, the regulator with the appropriate capacity is determined to be the ¾" orifice size 7399-_. To determine the complete product number, refer to "ORDERING INSTRUCTIONS".

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

All North American 7339 Regulators, except the 14 to 35 psig spring range model, come with a non-adjustable internal limited capacity relief valve feature. This internal relief valve is intended to minimize overpressure that could occur due to thermal expansion. If the downstream pressure exceeds the relief valve's start to discharge pressure as indicated in Table B, the relief valve opens and excess gas is vented through the vent in the upper spring case.

INSTALLATION

The North American 7339 regulator may be installed in any orientation as long as the flow through it matches the direction arrow cast on the body.

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 7339 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 "Table C" and "SPECIFICATIONS". The internal relief in this regulator (all models except the 14 to 35 psig models) provides relief from minor overpressure caused by thermal expansion. It should not be considered complete overpressure protection. Refer to the capacity information section to determine the required relief valve capacity.

The regulators ending in "1, 2 or 3" provide overpressure protection by shutting off the flow of gas to the downstream system. This slam-shut device requires an external sensing line.

CAPACITY INFORMATION

Table D provides the natural gas regulating capacities of the 7339 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_g = See Table C
C_1 = 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 ºRankine
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. 7339 Regulator Control and Slam-Shut Spring Ranges

Control (Outlet) Spring		Slam Shut Spring (optional)	Approx. point at which internal relief starts to discharge
Pressure Range	**Color**	**Trip Range**	
1-3.5 psig	Lt. Blue	3.8-8.7 psig	2.75 psig above setpoint
2.75-6 psig	Orange	3.8-8.7 psig 5.8-16 psig	3.5 psig above setpoint
5-16 psig	Red	5.8-16 psig 11.6-23 psig	6 psig above setpoint
14-35 psig*	Zinc	—	—

* This spring is not available in the "slam-shut" versions.
— Not available

Table C. 7339 Regulator Inlet Pressure Ratings and Flow Cœfficients

Regulator Designation	Orifice Size	Max. Inlet Pressure psig	C_g	C_v	C1 (when ΔP<10 psi)	C1 (when ΔP>10 psi)
7339-_-0	3/8"	175	117	4.2	30	28
7339 w/slam-shut			117	4.1	30	28
7339-_-0	1/2"		203	7	30	28
7339 w/slam-shut			184	5	38	36
7339-_-0	3/4"	150	437	14.1	32	30
7339 w/slam-shut			421	11.9	36	35
7339-_-0	1"	100	725	20.7	36	34
7379-_-0	1-3/16"	80	910	25.3	37	35

Table D. 7339 Regulator Capacities in scfh of 0.6 Specific Gravity Gas

Outlet Press. Range, psig	Outlet Press. Setting, psig	Inlet Press. psig	7339 Regulators Ending in -0 Orifice Size 3/8"	1/2"	3/4"	1"	1-3/16"	7339 Regulators Ending in 1, 2 or 3 Orifice Size 3/8"	1/2"	3/4"
1 to 3.25 psig Lt. Blue	2 psig +/- 1% psia	5	2100	3640	7440	11140	13560	2090	2690	6500
		10	3340	5810	12040	18460	22570	3330	4500	10780
		15	4360	7580	15990	25050	30760	4350	6160	14420
		20	5150	8960	19250	30380	37410	5140	8050	18570
		25	5890	10250	22030	36370	45330	5880	9210	21250
		30	6670	11540	24800	40950	51040	6630	10370	23930
		40	8120	14120	30350	50100	62450	8110	12700	29280
		50	9600	16700	35890	59360	73870	9590	15020	34630
		60	11090	19280	41440	68420	85290	11080	17340	39990
		80	14050	24440	52540	86740	108120	14040	21980	50690
		100	17020	29600	63630	105060	—	17010	26630	61400
		125	20730	36050	77500	—	—	20720	32430	74780
		150	24440	42500	91360	—	—	24430	38240	88170
		175	28150	48950	—	—	—	28140	44040	—
2.75 to 6 psig Orange	5 psig +/- 1%	10	2910	5050	10350	15600	19030	2890	3780	9110
		15	4190	7280	15150	23310	28530	4180	5690	13370
		20	5090	8850	18640	29180	35820	5080	7170	16790
		25	5890	10250	22030	34550	42530	5880	9210	21250
		30	6640	11540	24800	40950	51040	6630	10370	23930
		40	6120	14120	30350	50100	62450	8110	12700	29280
		50	9600	16700	35890	59260	73870	9590	15020	34630
		60	11090	19280	41440	68420	85290	11080	17340	39990
		80	14050	24440	52540	86740	108120	14040	21980	50690
		100	17020	29600	63630	105060	—	17010	26630	61400
		125	20730	36050	77500	—	—	20720	32430	74780
		150	24440	42500	91360	—	—	24430	38240	88170
		175	28150	48950	—	—	—	28140	44040	—
5 to 16 psig Red	10 psig +/- 1%	15	3280	5690	11640	17470	21280	3270	4220	10200
		20	4720	8210	17000	25940	31690	4710	6310	14850
		25	5710	9930	20790	32220	39480	5700	7890	18510
		30	6640	11540	24150	37900	46550	6630	10370	21820
		40	8120	14120	30350	50100	62450	8110	12700	29280
		50	9600	16700	35890	59260	73870	9590	15020	34630
		60	11090	19280	41440	68420	85290	11080	17340	39990
		80	14050	24440	52540	86740	108120	14040	21980	50690
		100	17020	29600	63630	105060	—	17010	26630	61400
		125	20730	36050	77500	—	—	20720	32430	74780
		150	24440	42500	91360	—	—	24430	38240	88170
		175	28150	48950	—	—	—	28140	44040	—

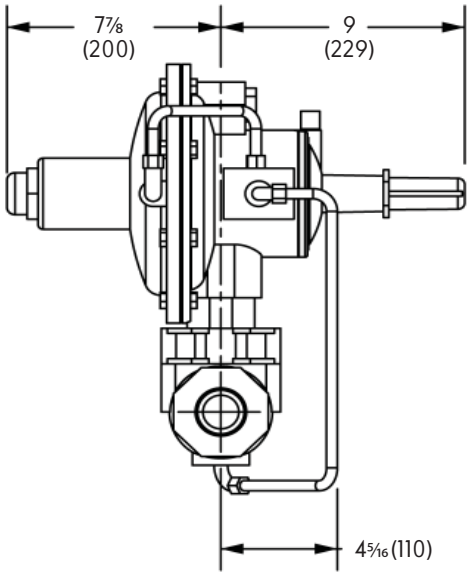
continued on next page

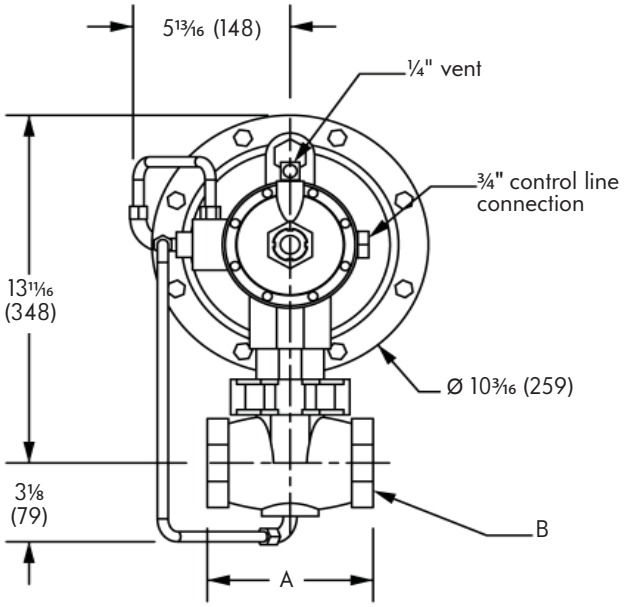
Outlet Press. Range, psig	Outlet Press. Setting, psig	Inlet Press. psig	7339 Regulators Ending in -0 Orifice Size 3/8"	1/2"	3/4"	1"	1-3/16"	7339 Regulators Ending in 1, 2 or 3 Orifice Size 3/8"	1/2"	3/4"
5 to 16 psig Red	15 psig +/- 1%	20	3620	6290	12830	19190	23360	3610	4640	11210
		25	5220	9070	18700	28360	34610	5210	6890	16220
		30	6290	10940	22790	35050	42890	6280	8560	20110
		40	8120	14120	29650	46610	57270	8110	12700	26850
		50	9600	16700	35890	57080	70350	9590	15020	34630
		60	11090	19280	41440	68420	85290	11080	17340	39990
		80	14050	24440	52450	86740	108120	14040	21980	50690
		100	17020	29600	63630	105060	—	17010	26630	61400
		125	20730	36050	77500	—	—	20720	32460	74780
		150	24440	42500	91360	—	—	24430	38240	88170
		175	28150	48950	—	—	—	28140	44040	—
14 to 35 psig Zinc	25 psig +/- 1%	30	4230	7360	14980	22310	27140			
		40	7350	12780	26420	40220	49120			
		50	9340	16250	34040	52830	64770			
		60	11090	19280	40630	64010	78690			
		80	14050	24440	52540	86740	108120			
		100	17020	29600	63630	105060	—			
		125	20730	36050	77500	—	—			
		150	24440	42500	91360	—	—			
		175	28150	48950	—	—	—			
	30 psig +/- 1%	40	6520	11330	23190	34790	42370			
		50	8950	15560	32300	49460	60480			
		60	10850	18870	39600	61630	75590			
		80	14050	24440	52540	83170	102470			
		100	17020	29600	63630	105060	—			
		125	20730	36050	77500	—	—			
		150	24440	42500	91360	—	—			
		175	28150	48950	—	—	—			
	35 psig +/- 1%	40	4790	8330	16920	25150	30580			
		50	8300	14430	29690	44890	54750			
		60	10510	18270	38050	58520	71620			
		80	14050	24440	51600	81400	100090			
		100	17020	29600	63630	105060	—			
		125	20730	36050	77500	—	—			
		150	24440	42500	91360	—	—			
		175	28150	48950	—	—	—			

Table E. Materials of Construction

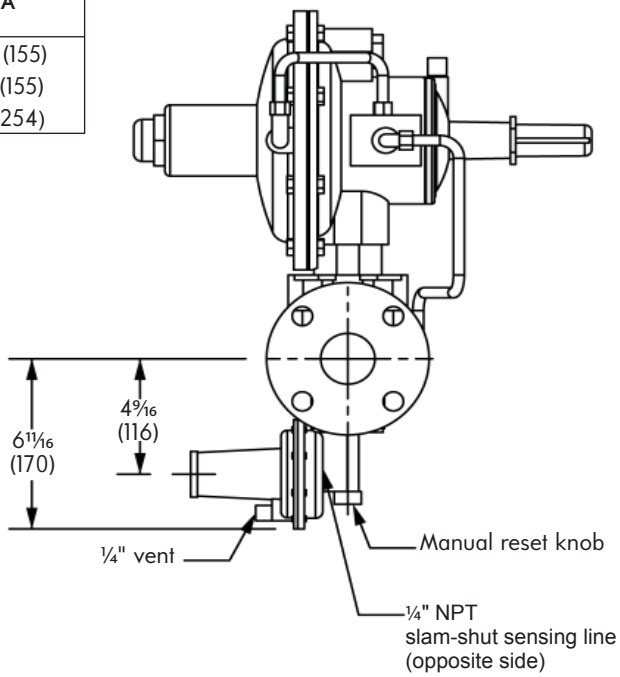
Body	Casings	Diaphragm and Disk	Orifice
Ductile Iron	Aluminum	Nitrile (NBR)	Aluminum

DIMENSIONS inches (mm)

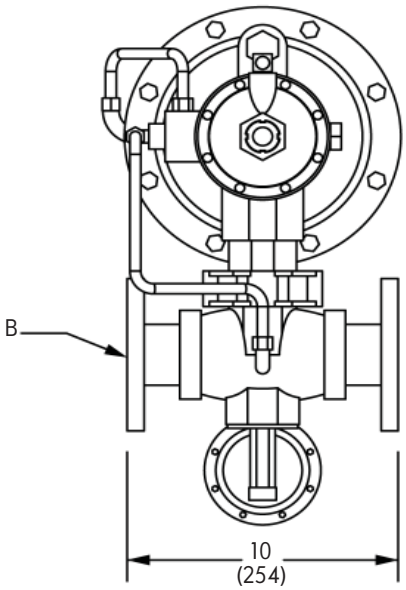




B (end connections)	A
1½" NPT	6⅛ (155)
2" NPT	6⅛ (155)
2" CL125 FF	10 (254)



"Slam-Shut" Dimensions



Flanged Dimensions

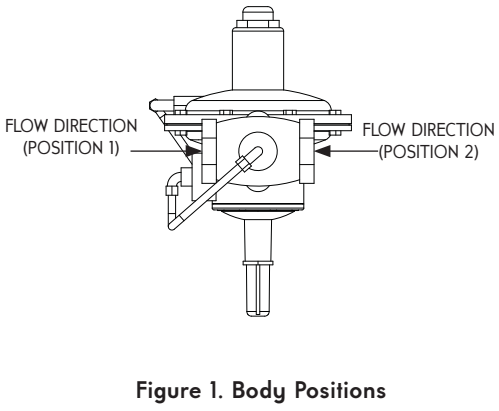


Figure 1. Body Positions

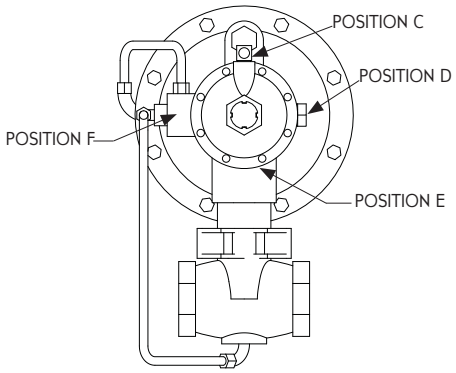


Figure 2. Vent Positions

ORDERING INSTRUCTIONS

7339 - __ - __ - __ - __ - __ - __

Body Size
3 = 1½" NPT
4 = 2" NPT
4F = 2" Class 125 FF flanged

Control Spring Range
1 = 1 to 3.25 psig
2 = 2.75 to 6 psig
3 = 5 to 16 psig
4 = 14 to 35 psig (not avail. w/slam-shut)♦

Orifice Size
1 = ⅜"
2 = ½"
3 = ¾"
4 = 1" (not avail. w/slam-shut)
5 = 1⅜₁₆" (not avail. w/slam-shut)

Body Position (1 is standard)
1, 2, 3 or 4 (see Figure 1)

Vent Position (C is standard)
C, D, E or F (see Figure 2)

Slam-Shut High Pressure Trip Range (Optional)*
1 = 3.8 to 8.7 psig
2 = 5.8 to 16 psig
3 = 11.6 to 23 psig
0 = No slam-shut

* See Table B for possible combinations of control and slam-shut spring ranges.
♦ Regulators with this spring range do not have an internal relief feature.

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.

fives ultimate machines ultimate factory

CONTACT US:
Fives North American Combustion, Inc.
4455 East 71st Street - Cleveland, OH 44105 - USA
Tel: +1 216 271 6000 - Fax: +1 216 373 4237
Email: fna.sales@fivesgroup.com

www.fivesgroup.com