

The S300 Series self-operated, spring-loaded regulators are used for pressure-reducing control in a variety of commercial, institutional, and industrial applications. Typical S300 Series regulators are shown in figure 1. All regulators in this series are used with natural, manufactured, or liquefied petroleum gases. However, characteristics such as registration method, allowable inlet pressure, outlet pressure range, and capacity vary according to construction.

Features

- **Application Flexibility**—Standard constructions with internal relief or relief monitoring are available to enhance service usefulness and comply with code requirements. In all regulators except those with relief monitoring, low-flow requirements can be satisfied with restricted-capacity seat rings. These seat rings help reduce relief sizing requirements (regulators without internal relief), or they help limit maximum flow through the spring case vent (internal relief regulators).

- **Installation Adaptability**—The four-position vent mounting and 360-degree rotation of the union ring facilitate vent positioning in awkward positions or limited spaces.

- **Easy Maintenance**—The union ring construction permits easy inspection and maintenance of critical parts without removing the body from the line.



Figure 1. Typical S300 Series Regulators

- **Control Accuracy**—These regulators use a dynamic boost that compensates for the droop caused by spring and diaphragm effect, resulting in more constant downstream pressure as demand increases.

- **Excellent Shock Characteristics and High Speed of Response**—The two-way stabilizer vent valve (figure 2) reacts quickly to minimize sudden shock caused by rapid load changes, thus providing a damping effect that enhances stability.

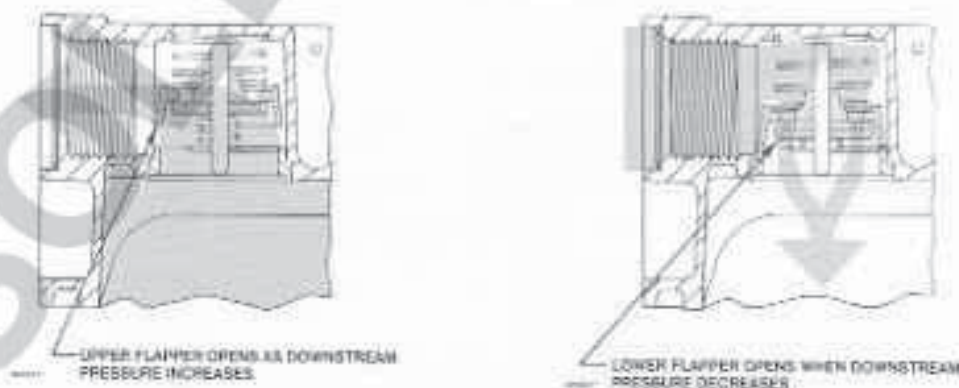


Figure 2. Two-Way Stabilizer Vent Valve Action Under Fast-Changing Loads.

Specifications

AVAILABLE CONFIGURATIONS	<p>Type S301: Basic regulator (figure 1)</p> <p>Type S301H: High-pressure version of Type S301 regulator</p> <p>Type S301HP: Blocked-throat version of Type S301H regulator for use with downstream control line</p> <p>Type S301P: Blocked-throat version of Type S301 regulator for use with downstream control line</p> <p>Type S302: Internal relief version (figure 3) of Type S301 regulator</p> <p>Type S302H: High-pressure version of Type S302 regulator</p> <p>Type S302P: Blocked-throat version of Type S302 regulator for use with downstream control line</p> <p>Type S303: Relief/monitor regulator (figures 1 and 3)</p> <p>Type S303H: High-pressure version of Type S303 regulator</p> <p>Type S303P: Blocked-throat version of Type S303 regulator for use with downstream control line</p>	INTERNAL RELIEF PERFORMANCE	<p>Approximate Points at Which Internal Relief Valve Starts to Open</p> <p>Type S302, S302P, S303, and S303P Regulators: 9 to 11 in. wc (22 to 27 mbar) above outlet pressure setting</p> <p>Type S302H and S303H Regulators: 0.4 to 1.0 psig (28 to 69 mbar) above outlet pressure setting</p> <p>Outlet Pressure Typically Produced by Given Inlet Pressure with Internal Relief in Operation: See figure 4</p>
BODY SIZES	<p>■ 1-1/4, ■ 1-1/2, or ■ 2 in.</p>	PORT DIAMETERS	See table 1
END CONNECTION STYLES	<p>■ NPT screwed pipe threads in all body sizes and types or ■ ANSI Class 125 flat-face flanges in 2 in. body only for all except Type S303, S303H, and S303P regulators</p>	TYPICAL REGULATING CAPACITIES	See tables 4 through 7 and Capacity Information section
ALLOWABLE INLET PRESSURES¹	<p>Emergency: 150 psig (10.3 bar)</p> <p>Maximum Operating to Obtain Good Performance: See table 1</p>	FLOW COEFFICIENTS	<p>Wide-Open C_v for Relief Sizing: See table 1</p> <p>C_v: 35</p>
ALLOWABLE OUTLET PRESSURES²	<p>Emergency (Casing): 15 psig (1.0 bar)</p> <p>Maximum Operating to Avoid Internal Part Damage: 5 psi (0.34 bar) above outlet pressure setting</p>	CONSTRUCTION MATERIALS	<p>Body: Cast Iron</p> <p>Spring Case, Diaphragm Case, Union Ring, Valve Disc Stem, Baffle, Disc Holder, Seat Ring, and Pusher Post or Relief Valve Seat: Aluminum</p> <p>Diaphragm(s), Disc(s), and O-Rings if Used: Nitrile</p> <p>Control Spring Diaphragm Plate, Spring(s), Spring Seat(s), Lever, and Relief Valve Stem if Used: Plated steel</p> <p>Valve Disc Stem Guide</p> <p>Type S301HP, S301P, S302P, and S303P Regulators: Aluminum</p> <p>All Other Types: Delrin³</p> <p>Closing Cap: Zinc</p> <p>Closing Cap Gasket and Relief Valve Pad if Used: Neoprene</p> <p>Adjusting Screw</p> <p>Type S301H, S301HP, S302H, and S303H Regulators: Aluminum</p> <p>All Other Types: Delrin</p> <p>Vent Flappers: Cycloac⁴</p> <p>Relief/Monitor Case, Diaphragm Plate, Spring Seat, O-Ring Retainer, and Pitot Tube: Aluminum</p> <p>Relief/Monitor Piston Ring: Graphite</p> <p>Relief/Monitor Pipe Plug: Brass</p> <p>All Other Metal Parts: Stainless steel</p>
OUTLET PRESSURE RANGES	See table 2		
RELIEF/MONITOR PERFORMANCE	See table 3		

Specifications (Continued)

MATERIAL TEMPERATURE CAPABILITIES¹	-20 to 160°F (-29 to 71°C)	BODY/VENT MOUNTING POSITIONS	Diaphragm Case if Tapped for External Registration: 3/4 in. NPT female	
PRESSURE SETTING ADJUSTMENT	Adjusting screw		See figure 5.	
PRESSURE REGISTRATION	Type S301HP, S301P, S302P, and S303P Regulators: External All Other Types: Internal		APPROXIMATE WEIGHTS	Type S303, S303H, and S303P Regulators: 11 lb (6 kg) All Other Types: 9 lb (4 kg)
CONNECTIONS	Spring Case Vent: 1 in. NPT female with removable screen		OPTION	1/8 in. NPT tapped and plugged inlet test connection in all except Type S303, S303H, and S303P regulators.

1. Data for upper and lower limits, or end connections, provided to various national or international third standards, can usually be supplied. Contact the Fisher sales office or sales representative.
2. The pressure/temperature limits of this subject will vary according to standard or code.

3. Installation manual to be provided.
4. Trademark of Du Pont Co.
5. Trademark of Buss, Warner, Chatham.

Table 1. Additional Specifications

PORT DIAMETER		REGULATOR TYPE NUMBER								
		S301, S301P, S302, S302P, S303, S303P			S301H, S302H, S303H			S301HP		
In.	mm	Maximum Operating Inlet Pressure to Obtain Good Performance		Wide-Open C _v For Relief Sizing	Maximum Operating Inlet Pressure to Obtain Good Performance		Wide-Open C _v For Relief Sizing	Maximum Operating Inlet Pressure to Obtain Good Performance		Wide-Open C _v For Relief Sizing
		Psig	Bar		Psig	Bar		Psig	Bar	
5/32 x 3/16	4.0 x 4.8	125	8.6	20.7	---	---	---	---	---	---
3/16	4.8	125	8.6	28.5	125	8.6	28.5	125	8.6	28.5
7/32 x 1/4	5.6 x 6.4	60	4.1	35.3	---	---	---	---	---	---
1/4	6.4	60	4.1	49.5	125	8.6	49.5	125	8.6	49.5
7/32 x 5/8	5.6 x 9.5	30	2.1	38.0	---	---	---	---	---	---
3/8	9.5	30	2.1	116	60	4.1	112	60	4.1	112
1/2	12.7	25	1.7	200	60	4.1	200	60	4.1	200
3/4	19.1	15	1.0	300	40	2.8	360	40	2.8	360
3/4 x 7/8	19.1 x 22.2	15	1.0	350	40	2.8	410	40	2.8	380

Table 2. Outlet Pressure Range Data

OUTLET PRESSURE RANGE BY REGULATOR TYPE NUMBER					CONTROL SPRING	
In. wg (mbar)		Psig (mbar)			Part Number	Color Code
S301, S301P, S302, S302P	S303, S303P	S301H, S301HP	S302H	S303H		
3.5 to 3 (95 to 75)	4 to 5 (10 to 15)	---	---	---	T11241 27222	Red
5 to 5.5 (12 to 21)	5 to 5.5 (12 to 21)	---	---	---	T11221 27222	Cadmium
6 to 7 (15 to 25)	8 to 14 (20 to 35)	---	---	---	T11236 37022	Blue
12 to 25 (30 to 70)	12 to 25 (30 to 70)	---	---	---	T11237 27012	Green
---	---	1.0 to 7.0 (69 to 138)	1.0 to 2.0 (69 to 138)	1.0 to 1.6 (69 to 110)	T11305 27142	Black
---	---	1.5 to 3.0 (103 to 207)	1.5 to 3.0 (103 to 207)	1.5 to 2.25 (103 to 155)	T11384 27145	Olive drab
---	---	2.5 to 5.5 (172 to 378)	---	---	T11363 27142	Yellow
---	---	4.5 to 5.0 (310 to 553)	---	---	T11362 27142	Brown

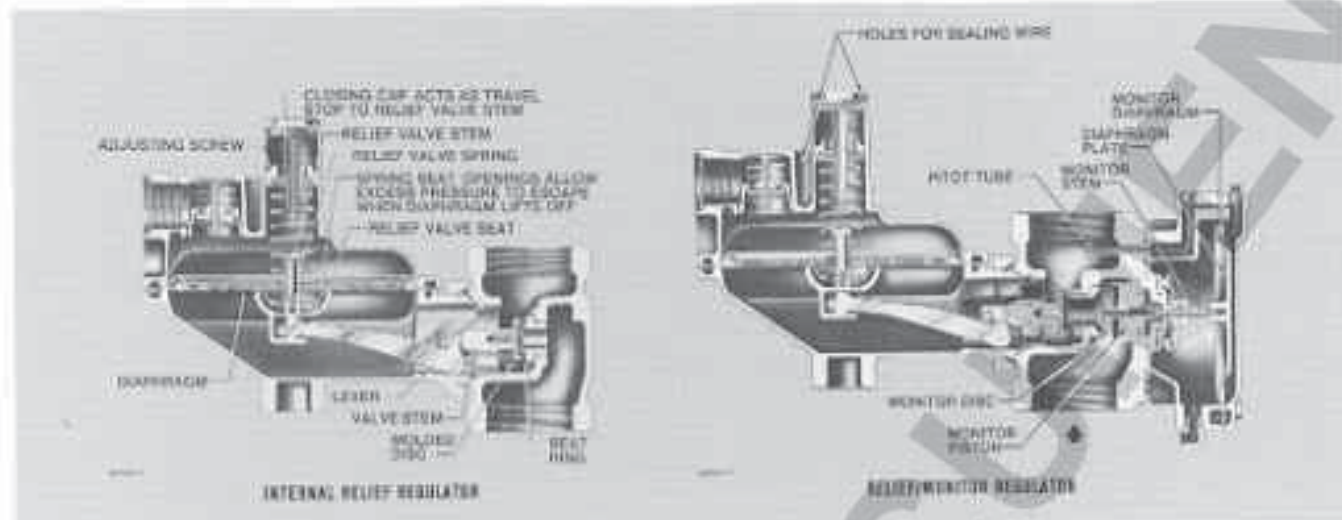


Figure 3. Construction Features

Overpressure Protection

Like most regulators, S300 Series regulators have outlet pressure ratings lower than their inlet pressure ratings. Although the Type S302, S302H, and S302P internal relief valves and the Type S303, S303H, and S303P relief/monitor assemblies provide limited downstream overpressure protection, additional downstream overpressure protection is necessary if the actual inlet pressure exceeds the outlet pressure rating.

The wide-open C_v for relief sizing (table 1) in conjunction with the Capacity Information section should be used in choosing appropriate overpressure protection devices. Overpressuring any portion of a regulator or associated equipment may cause leakage, part damage, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas.

Regulator operation within ratings does not prevent the possibility of damage from external sources or from debris in the pipeline. A regulator should be inspected for damage periodically and after any overpressure condition.

Construction Features

External Registration

An S300 Series regulator with P suffixed to the type number has a blocked boget channel and a 3/4-inch NPT diaphragm-case connection for attaching a downstream control line. This regulator is used for monitoring installations or for applications where equipment is located between the regulator and the pressure control point.

Internal Relief

Type S302, S302H, and S302P regulators have limited-capacity internal relief across the diaphragm to help minimize overpressure. Outlet pressure above the start-to-open point of the nonadjustable relief valve spring moves the diaphragm off the relief valve seat, allowing excess pressure to bleed out through the screened spring case vent.

A backup means of opening the internal relief valve is provided by the extension on the closing cap (figure 3). Should emergency conditions prevent normal operation (for instance, linkage becoming disconnected or disc broken off), the closing cap extension will act as a travel stop to the relief valve stem. Since the diaphragm will continue to rise as pressure builds, it will lift off the relief valve seat to provide limited relief operation.

Relief Monitoring

Single-unit overpressure protection is available with the Type S303, S303H, and S303P relief/monitor regulators. Any of these regulators can take the place of two separate service regulators on monitoring applications. The relief/monitor construction provides the following important features:

- **Minimizing of Hazardous Venting**—Required relief capacity is cut down without restricting total regulator capacity. The relief valve and monitor work in combination to limit relief discharge to atmosphere.
- **Lower Controlled Downstream Pressure**—In the event of regulator failure, a relief/monitor regulator will limit downstream pressure as shown in table 3.

Table 3. Relief/Monitor Data

Type Number	Control Spring Part Number	Maximum Downstream Pressure with Relief/Monitor in Operation		Maximum Flow Through Internal Relief Valve with Relief/Monitor in Operation		Monitor Spring			
		Psig	mbar	scfh*	m ³ /hr†	Range	Part Number	Color Code	Number of Spring Seats Required
S300, S303P	T11241 27222 or T11241 27222	1.0	69	1000	26.8	4 to 9.5 in. wc (10 to 24 mbar)	1L2557 27132	Green	1
	T11246 27022	1.25	86	1200	32.2	6 to 14 in. wc (20 to 35 mbar)	1L2557 27132	Green	2
	T11247 27012	1.8 2.0	124 207	1600 2000	42.9 53.6	10 to 20 in. wc (25 to 60 mbar) 15 to 33 in. wc (45 to 82 mbar)	1L2560 27132 1L2560 27132	Red Blue	1 1
1000H	T11395 27142	4.0	276	2500	67.0	0.75 to 1.6 psig (20 to 110 mbar)	1V2342 27012	Cadmium	1
	T11384 27142	5.0	345	3000	80.4	1.25 to 2.25 psig (35 to 155 mbar)	1V2342 27012	Cadmium	2

*Of 0.6 specific gravity natural gas at 60°F and 14.7 psia.
†Of 0.6 specific gravity natural gas at 0°C and 1.01325 bar.

• **All-Dynamic Operation with Automatic Reset**—Monitor diaphragm and piston are in motion under normal operating conditions, prepared to provide overpressure protection when needed. No manual reset procedure is required to return the regulator to normal operation after relief of the overpressure condition.

As downstream pressure registers under the main diaphragm, it also registers on top of the monitor diaphragm through the pitot tube located near the body outlet (figure 3.) Thus, under normal conditions as downstream pressure fluctuates due to load changes, the main regulator disc and the monitor piston move toward or away from the seat ring.

If downstream pressure reaches 7 to 28 inches water column (17 to 69 mbar) above the outlet pressure setting, depending on the control spring, the internal relief valve opens. At the same time, downstream pressure on the monitor diaphragm moves the monitor piston further into the body, restricting the seat ring. This minimizes further flow through the seat ring and enables the internal relief valve to relieve the downstream overpressure conditions. As downstream pressure drops back to normal, the piston moves back away from the seat ring, and the internal relief valve closes, automatically allowing normal operation again.

The combination of a restriction in the internal relief valve and the monitor piston positioned near the inlet side of the seat ring limits the maximum downstream pressure and the related flow through the internal relief valve to the values shown in table 3.

Capacity Information

Tables 4 through 7 give S300 Series natural gas regulating capacities at selected inlet pressures and outlet pressure settings. Flows are in scfh (60°F and 14.7 psia) of 0.6 specific gravity natural gas at 60°F. To determine equivalent capacities for air, propane, butane, or nitrogen, multiply the table 4, 5, 6, or 7 capacity by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane, or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775, and divide by the square root of the appropriate specific gravity. Then, if capacity is desired in normal cubic meters per hour at 0°C and 1.01325 bar, multiply scfh by 0.0268.

To determine wide-open flow capacities for relief sizing of 0.6 specific gravity natural gas at 60°F at critical pressure drops (absolute outlet pressure equal to approximately one-half or less than one-half of the absolute inlet pressure), use the following formula, and convert according to the factors in the preceding paragraph if necessary:

$$Q = (P_{1, abs}) (C_2) \quad (1.23)$$

where,

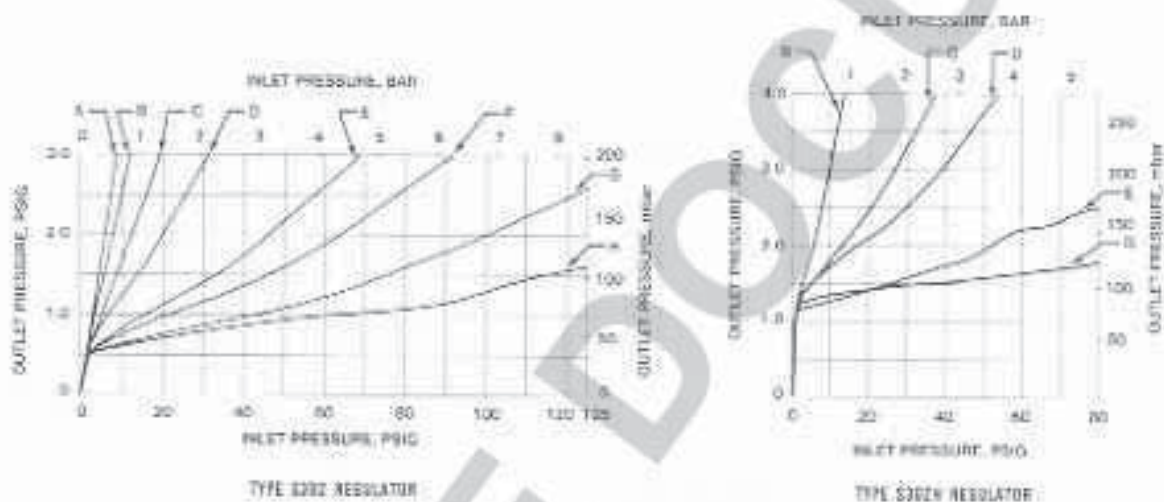
Q = Flow capacity in scfh

$P_{1, abs}$ = Absolute inlet pressure in psia ($P_{1, gauge}$ plus 14.7)

C_2 = Relief gas sizing coefficient from table 1

If pressure drops will be lower than critical (absolute outlet pressure greater than approximately one-half the absolute inlet pressure), use the Fisher valve-sizing slide rule or the sizing nomographs in Catalog 10.

CURVE	PORT DIAMETER	
	in.	mm
A	3/4 x 7/8	19.1 x 22.2
B	3/4	19.1
C	1/2	12.7
D	3/8	9.5
E	1/4	6.4
F	7/32 x 1/4 or 7/32 x 3/8	5.8 x 6.4 or 5.8 x 9.5
G	3/16	4.8
H	5/32 x 3/16	4.0 x 4.8



NOTE:
MEASUREMENTS MADE WITH REGULATOR BLOTTED WIDE OPEN
VENTING DIRECTLY TO ATMOSPHERE, AND CONTROL
SPRING T11221 27222 SET AT 7 IN. WC (1.7 mmHg).

NOTE:
MEASUREMENTS MADE WITH REGULATOR BLOTTED OPEN BY
1/8 IN. (3.2 mm) WIRE ATTACHED TO SEAT RING, VENTING
DIRECTLY TO ATMOSPHERE, AND CONTROL SPRING
T11225 27142 SET AT 1 PSIG (69 mmHg).

Figure 4. Typical Internal Relief Performance Curves

Table 4. Typical Regulating Capacities in Scfh of 0.6 Specific Gravity Natural Gas* for 1-1/4 inch Type S301, S301P, S302, S302P, S303, and S303P Regulators

OUTLET PRESSURE SETTING		CONTROL SPRING PART NUMBER (SEE TABLE 3 FOR RANGE)	DROOP	INLET PRESSURE		PORT DIAMETER, IN. (mm)									
						Full-Size Seat Rings					Restricted Capacity Seat Rings (Not Available with Type S303 and S303P Regulators)				
in. w.c.	mbar			Psig	Bar	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	5/32 x 3/16 (4.0 x 4.8)	7/32 x 1/4 (5.6 x 6.4)	7/32 x 3/8 (5.6 x 9.5)	3/4 x 7/8 (19.1 x 22.2)	
5	12	T11224 27222	1 in. w.c. (2.5 mbar), except 2 in. w.c. (5 mbar) for Type S301P, S302P, and S303P regulators.	0.5	0.034	...	...	...	...	...	520	...	...	...	700
				2	0.14	...	...	700	1000	1500	...	...	...	...	1900
				4	0.28	...	...	1200	1700	2450	...	...	...	...	2600
				5	0.34	...	700	1400	1900	2600	...	...	...	575	2500
				10	0.69	...	1000	2000	3000	3500	...	...	325	1175	3500
				15	1.0	1000	1900	3000	3500	...	...	750	1275	1475	3500
				20	1.7	1400	2400	3500	3500	...	...	1000	1545	1900	...
				30	2.1	1550	2700	3600	...	...	1100	1675	2150	...	...
				60	4.1	2300	3500	...	...	...	1900	3500	...	...	...
				80	5.5	3000	...	...	...	...	2400	...	...	...	...
100	6.9	3200	...	...	...	...	2900	...	...	...	...
125	8.6	3500	...	...	...	...	3400	...	...	...	...
7	17	T11221 27222	1 in. w.c. (2.5 mbar), except 2 in. w.c. (5 mbar) for Type S301P, S302P, and S303P regulators.	0.5	0.034	...	...	...	...	...	850	...	...	...	500
				2	0.14	...	...	...	...	...	1400	...	...	...	1500
				4	0.28	...	...	1000	1400	2000	...	...	...	...	2500
				5	0.34	...	...	1100	1700	2400	...	...	...	750	2900
				10	0.69	...	750	2100	2400	2500	...	...	750	1100	3500
				15	1.0	1000	1050	3000	3500	...	...	700	1000	1400	3500
				20	1.7	1250	1950	3000	3500	...	...	1000	1500	1800	...
				30	2.1	1540	2300	3500	...	...	1000	2000	2500	...	...
				60	4.1	2500	3500	...	...	...	1800	3400	...	...	...
				80	5.5	2700	...	...	...	...	2000	...	...	...	...
100	6.9	3000	...	...	...	...	3000	...	...	...	...
120	8.6	3500	...	...	...	...	3400	...	...	...	...
11	27	T11226 37022	2 in. w.c. (5 mbar), except 4 in. w.c. (10 mbar) for Type S301P, S302P, and S303P regulators.	2	0.14	...	...	500	700	1200	...	...	...	...	1400
				4	0.28	...	...	350	1250	1900	...	...	...	750	2100
				5	0.34	...	...	1100	1500	2100	...	...	...	800	2500
				10	0.69	...	...	1700	2500	3300	...	...	...	1000	3500
				15	1.0	...	1200	2500	3400	3500	...	...	1000	1400	3500
				20	1.7	...	1300	3500	3500	...	...	1400	1400	1900	...
				30	2.1	1500	2100	3500	...	...	1100	1600	1900	...	...
				40	2.8	1900	2600	...	...	...	1400	2000	...	...	...
				60	4.1	2300	3500	...	...	...	1900	3500	...	...	...
				80	5.5	2700	...	...	...	...	2400	...	...	...	...
100	6.9	3100	...	...	...	...	2900	...	...	...	...
125	8.6	3500	...	...	...	...	3400	...	...	...	...
20	50	T11237 77012	2 in. w.c. (5 mbar), except 0 in. w.c. (0 mbar) for Type S301P, S302P, and S303P regulators.	4	0.28	...	...	...	...	1350	...	...	...	...	1300
				5	0.34	...	...	...	...	1300	1900	...	...	...	1650
				10	0.69	...	...	1100	1600	2600	...	...	...	1800	3000
				10	1.0	...	...	1650	2700	3400	...	...	...	1300	3600
				25	1.7	...	1150	2100	3500	...	...	...	...	...	...
				30	2.1	1300	1400	3000	...	...	...	650	1150	1900	...
				40	2.8	1350	2000	...	...	...	1050	1550	...	...	...
				60	4.1	1900	2900	...	...	...	1450	2600	...	...	...
				80	5.5	2600	...	...	...	...	2100	...	...	...	...
				100	6.9	3000	...	...	...	...	2600	...	...	...	...
125	8.6	3500	...	...	...	...	3000	...	...	...	...

*See General Information section for conversion to regulated capacities in other units and for other gas.

OBSOLETE

Table 5. Typical Regulating Capacities in Soft of 0.6 Specific Gravity Natural Gas* for 1-1/2 and 2-Inch Type 5301, 5301B, 5302, 5302P, 5303, and 5303P Regulators

OUTLET PRESSURE SETTING		CONTROL SPRING PART NUMBER (SEE TABLE 2 FOR RANGE)	DROOP	INLET PRESSURE		PORT DIAMETER, IN. (mm)										
						Full-Size Seat Rings					Restricted Capacity Seat Rings (Not Available with Type 5303 and 5303P Regulators)					
in. wc	mbar			Psi	Bar	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	5/32 x 3/16 (4.0 x 4.8)	7/32 x 1/8 (5.6 x 6.4)	7/32 x 3/8 (5.6 x 9.5)	3/4 x 7/8 (19.1 x 22.2)		
5	12	T11241 27222	1 in. wc (2.5 mbar), except 2 in. wc (5 mbar) for Type 5301P, 5302P, and 5303P regulators	0.5	0.034	...	...	...	...	...	525	...	...	...	710
				2	0.14	...	...	750	1100	1700	...	...	...	...	2000
				4	0.28	...	...	1350	1900	3000	...	...	...	...	3000
				5	0.34	...	700	1350	2250	2500	...	...	675	...	3500
				10	0.69	...	1400	2400	3500	3500	...	...	950	1175	3500
				15	1.0	1050	1850	3000	3500	...	...	750	1275	1425	3500
				25	1.7	1450	2450	3300	2000	...	...	1000	1650	1900	...
				30	2.1	1600	2750	1900	...	...	...	1150	2175	2150	...
				60	4.1	2600	3500	...	...	...	...	1925	3500	...	...
				100	6.9	3500	...	...	...	...	...	2475	...	...	...
125	8.6	3500	...	...	...	...	...	2925	...	...	...		
7	17	T11221 27222	1 in. wc (2.5 mbar), except 2 in. wc (5 mbar) for Type 5301P, 5302P, and 5303P regulators	0.5	0.034	...	...	...	...	400	...	...	...	...	500
				2	0.14	...	...	...	...	1400	...	...	...	...	1500
				4	0.28	...	...	1000	1650	2300	...	...	...	...	2400
				5	0.34	...	1200	2000	3200	...	...	...	800	...	3400
				10	0.69	...	1000	2400	3500	3000	...	...	750	1175	3500
				15	1.0	1050	1400	3300	3600	3500	775	1000	1425	3500
				25	1.7	1400	2600	3500	2400	...	...	1000	1650	1900	...
				30	2.1	1600	2700	2400	...	...	...	1100	2150	2150	...
				60	4.1	2600	3600	...	...	...	...	1900	3500	...	...
				100	6.9	3300	...	...	...	...	...	2400	...	...	...
125	8.6	3500	...	...	...	...	...	2900	...	...	...		
11	27	T11236 37022	2 in. wc (5 mbar), except 4 in. wc (10 mbar) for Type 5301P, 5302P, and 5303P regulators	2	0.14	...	...	600	800	1200	...	...	...	...	1600
				4	0.28	...	...	1000	1400	2200	...	...	...	750	2400
				5	0.34	...	...	1150	1700	2500	...	...	...	800	2600
				10	0.69	...	...	2000	3100	3500	...	...	...	1000	3000
				15	1.0	1250	3000	3500	3500	...	...	...	1000	1400	3500
				25	1.7	1650	3000	3500	...	...	...	...	1450	1800	...
				30	2.1	1550	2300	3500	...	...	...	1100	1650	1950	...
				40	2.6	1900	3200	...	...	...	...	1400	2200	...	...
				80	4.1	2500	3500	...	...	...	...	1850	3500	...	...
				100	6.9	3200	...	...	...	...	...	2400	...	...	...
125	8.6	3500	...	...	...	...	...	2900	...	...	...		
20	60	T11237 27012	3 in. wc (7.5 mbar), except 6 in. wc (12 mbar) for Type 5301P, 5302P, and 5303P regulators	4	0.28	...	...	...	...	1400	...	...	...	...	1300
				5	0.34	...	...	...	1050	1800	...	...	...	...	2000
				10	0.69	...	...	1300	1900	3100	...	...	...	1000	3500
				15	1.0	...	...	1900	2800	3500	...	...	...	1400	3500
				25	1.7	...	1250	3100	3500	...	...	...	...	1800	...
				30	2.1	1300	3000	3500	...	...	...	900	1100	1950	...
				40	2.6	1650	2700	...	...	...	...	1100	1740	...	...
				60	4.1	2300	3300	...	...	...	...	1540	2600	...	...
				80	5.5	2800	...	...	...	...	...	2200	...	...	...
				100	6.9	3200	...	...	...	...	...	2700	...	...	...
125	8.6	3500	...	...	...	...	...	3500	...	...	...		

*See Capacity Information section for conversion to equivalent capacities of other gases and conditions. Shaded values for the 3/8 and 1/2 in. (9.5 and 12.7) reduced seat rings. †Values that capacities peak before inlet pressure do have an inlet effect.

OBSOLETE

Table 5. Typical Regulating Capacities in Both of 0.6 Specific Gravity Natural Gas* for All Sizes of Type S301H, S302H, and S303H Regulators

REGULATOR TYPE NUMBER	OUTLET PRESSURE SETTING		CONTROL SPRING PART NUMBER (SEE TABLE 2 FOR RANGE)	INLET PRESSURE		10% DROOP					20% DROOP					
						Port Diameter, In. (mm)					Port Diameter, In. (mm)					
	Psig	mbar		Psig	Bar	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	
S301H; S302H; S303H	1	49	T11385-27142	2	0.34	103	160	285	400	525	655	180	305	435	565	695
				5	0.34	300	381	440	748	1240	625	925	960	1300	1600	1900
				10	0.69	460	485	890	1420	2200	730	105	1580	2270	3360	4450
				15	1.0	555	740	1290	2070	3050	1280	1580	2170	3180	4200	
				20	1.4	710	920	1880	2750	4500	1230	1600	3040	4000	5000	
				30	2.1	970	1160	3040	4180	5000	1570	2320	4320	5000	5000	
	40	2.8	1310	1620	4170	5000	5000	1940	2740	5000	5000	5000				
	60	4.1	1950	3000	5000	5000	...	2550	4180	5000	5000	...				
	80	5.8	2710	3400	5000	...	...	3070	4840	5000	...	...		
	100	6.9	3100	3900	...	...	...	3910	5000	...	...			
	125	8.8	3760	4500	...	...	...	4440	5000	...	...			
	S301H; S302H; S303H	3	207	T11384-27142	4	0.28	303	207	478	648	1060	884	407	853	1292	1940
5					0.34	374	452	806	805	1295	685	645	1100	1610	2400	
10					0.69	515	570	1130	1740	2450	825	1300	2040	2940	4260	
15					1.0	735	605	1600	2260	3070	1080	1740	2810	3800	5000	
20					1.4	970	1030	2000	2770	4130	1250	2070	3430	4540	5000	
30					2.1	1400	1755	2970	3870	5000	1570	2710	4780	5000	5000	
40		2.8	1700	2200	4030	5000	5000	1940	3290	5000	5000	5000				
60		4.1	2360	3070	5000	5000	...	2630	4480	5000	5000	...				
80		5.8	3030	4000	5000	...	...	3000	5000	5000	...	...		
100		6.9	3580	4380	...	...	...	4000	5000	...	...			
125		8.8	4180	4870	...	...	...	4600	5000	...	...			
S301H only		5	345	T11380-27142	7	0.48	...	...	...	1480	...	...	...	...	2710
	1				0.69	570	723	1030	1480	2040	750	1120	1800	2580	3740	
	15				1.0	775	1040	1500	2130	3100	1040	1610	2580	3680	5000	
	25				1.4	985	1300	1940	2640	4080	1350	2000	3300	4640	5000	
	30				2.1	1390	1875	2710	3740	5000	1610	2630	4580	5000	5000	
	40				2.8	1740	2200	3480	4870	5000	1910	3090	5000	5000	5000	
	60	4.1	2380	3200	5000	5000	...	2510	4650	5000	5000	...				
	80	5.8	2970	4000	5000	...	...	3200	5000	5000	...	...		
	100	6.9	3470	4850	...	...	...	3900	5000	...	...			
	125	8.8	3980	5000	...	...	...	4670	5000	...	...			
	B	414	T11362-27142	10	0.69	485	677	905	1360	1940	270	1030	1680	2400	3520	
				15	1.0	735	981	1380	1940	2840	1030	1550	2520	3400	5000	
20				1.4	970	1225	1740	2500	3850	1220	1840	3120	4300	5000		
30				2.1	1300	1680	2520	3660	5000	1650	2580	4420	5000	5000		
40				2.8	1650	2100	3620	4700	5000	1910	3230	5000	5000	5000		
60				4.1	2270	3100	5000	5000	...	2610	4380	5000	5000	...		
80	5.8	3070	3870	5000	...	...	3280	5000	5000	...	...			
100	6.9	3420	4500	...	...	...	3940	5000	...	...				
125	8.8	4000	5000	...	...	...	4670	5000	...	...				

*See Capacity Information section for conversion to equivalent capacities of other gases and/or normal liquid. Shaded cells for the 1/4 in. (6.4 mm) size are for 10% droop only.

Cells that contain dashes below inlet pressure: Cells because of actual wheel.

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Table 7. Typical Regulating Capacities of 0.6 Specific Gravity Natural Gas* for All Sizes of Type S301 HP Regulator at 20% Droop

OUTLET PRESSURE SETTING		CONTROL SPRING PART NUMBER (SEE TABLE 2 FOR RANGE)	INLET PRESSURE		1-1/4 IN. BODY					1-1/2 OR 2 IN. BODY							
					Port Diameter, in. (mm)					Port Diameter, in. (mm)							
					3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/4 (19.1)			
1	69	T11305 27142	2	0.14	50	80	110	200	200	100	100	50	80	150			
			5	0.34	55	150	180	600	1000	200	250	200	280	1000			
			10	0.69	100	300	360	1550	2000	300	450	650	1225	2000			
			15	1.0	110	600	1250	2250	3000	400	600	1275	1750	3500			
			20	1.4	115	600	1750	3000	4000	500	900	1750	2250	3500			
			30	2.1	250	900	2250	3600	5000	750	2000	2500	3000	4000			
			40	2.8	450	2000	3000	4000	6000	1000	2500	3300	4000	4500			
			60	4.1	500	3000	4000	5000	...	2250	3500	4000	5000	...			
			80	5.5	2500	4000	5000	...	...	3000	4000	5000	...	...	
			100	6.9	3150	5000	...	...	...	3750	4500	...	...		
			125	8.6	4000	5000	...	...	...	4500	5000	...	...		
			3	207	T11304 27142	4	0.28	250	300	480	600	1000	250	300	500	500	850
5	0.34	310				450	650	900	1400	300	400	650	650	1200			
10	0.69	600				900	1500	1950	3250	700	900	1500	2000	3050			
15	1.0	800				1150	2500	3000	4500	850	1150	2250	3400	4750			
20	1.4	1000				1400	3150	3750	5800	1000	1500	3500	4250	5000			
30	2.1	1350				2100	3600	5000	5000	1550	2000	4750	5000	5000			
40	2.8	1700				3150	4500	5000	5000	2050	3400	5000	5000	5000			
60	4.1	2150				4100	5000	5000	...	2500	4400	5000	5000	...			
80	5.5	3280				5000	5000	...	...	3400	5000	5000	...	...	
100	6.9	4100				5000	...	...	...	4150	5000	...	...		
125	8.6	5000				5000	...	...	...	5000	5000	...	...		
5	345	T11303 27142				7	0.46	400
			10	0.69	550	800	1500	2100	3200	550	750	1200	2150	2400			
			15	1.0	750	1200	2400	4000	6000	800	1100	2500	3550	3350			
			20	1.4	1000	1550	3000	5000	6000	1000	1400	3250	4000	5000			
			30	2.1	1350	2050	4200	5000	5000	1400	2150	4000	5000	5000			
			40	2.8	1750	3250	5000	5000	5000	1750	2650	5000	5000	5000			
			60	4.1	2850	4600	5000	5000	...	2400	4400	5000	5000	...			
			80	5.5	3400	5000	5000	...	...	3400	5000	5000	...	...	
			100	6.9	4200	5000	...	...	...	4200	5000	...	...		
			125	8.6	5000	5000	...	...	...	5000	5000	...	...		
			8	414	T11302 27142	10	0.69	500	750	1275	2000	3000	550	750	1250	1600	1650
						15	1.0	750	1100	2150	3300	4000	800	1100	2250	3300	4350
20	1.4	1000				1500	3150	4200	5000	1000	1500	3750	4250	5000			
30	2.1	1350				2100	4500	5000	5000	1300	2500	4350	5000	5000			
40	2.8	1750				3100	5000	5000	5000	1700	3100	5000	5000	5000			
60	4.1	2850				4200	5000	5000	...	2350	4000	5000	5000	...			
80	5.5	3400				5000	5000	...	...	3500	5000	5000	...	...	
100	6.9	4100				5000	...	...	...	4050	5000	...	...		
125	8.6	5000				5000	...	...	...	5000	5000	...	...		

*See Capacity Information section for conversion to equivalent capacities of other gases and of 207, 345 and 414.

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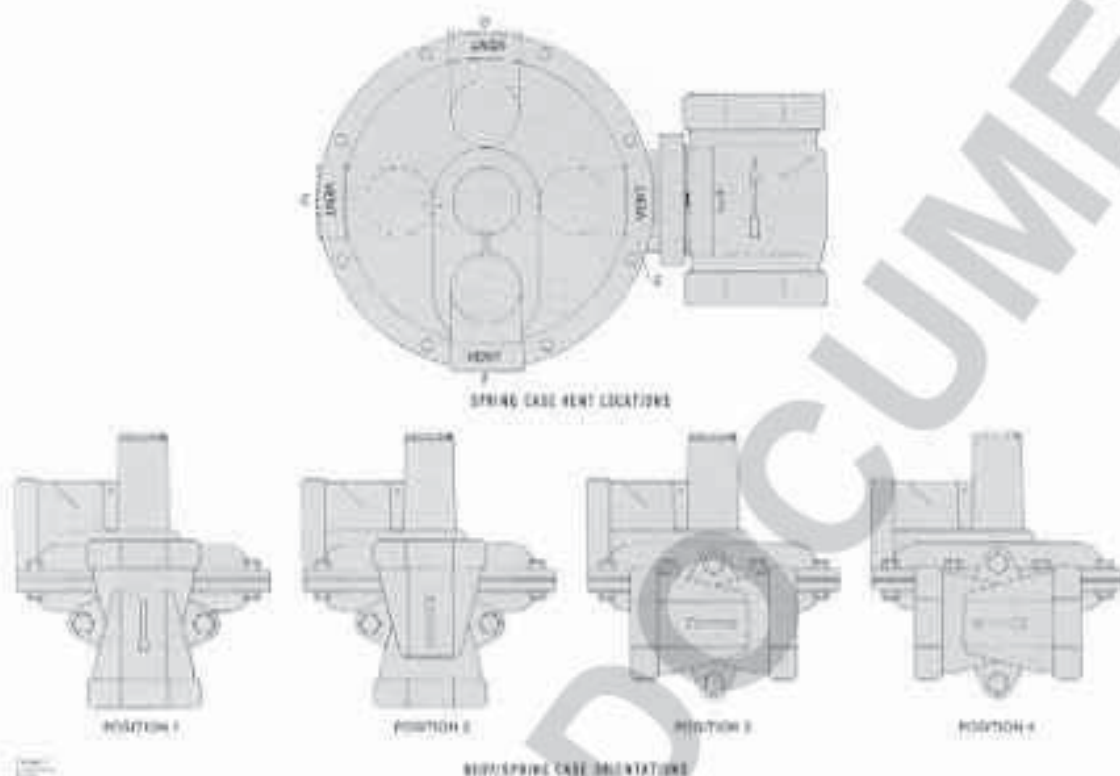


Figure 5. Assembly Positions

Installation

These regulators may be installed in any position as shown in figure 5. However, the following particulars should be noted. In outside installations, the spring case vent opening should face down. Additionally, if gas escaping through the internal relief valve could be hazardous, as with a regulator installed indoors, the spring case vent (except on Type S301, S301H, S301HP, or S301P regulators) must be piped outdoors or to an otherwise safe location. If the vent will be piped to another location, obstruction-free piping should be used, and a

screened vent should be installed on the end of the vent pipe. On all installations, the vent or the end of the vent pipe must be protected from anything that might clog it.

To obtain maximum flow capacities and other performance characteristics, the length of pipe from the regulator outlet to the meter—or for the first 18 inches (457 mm), whichever is closer—should have no bends and should be the same size as the regulator outlet.

Dimensions and connection locations are shown in figure 6.

BODY SIZE, IN.	A				B				D		E		F (BASIC REGULATOR ONLY)		G				
	Basic Regulator		Relief/Monitor Regulator		Basic Regulator		Relief/Monitor Regulator								Basic Regulator		Relief/Monitor Regulator		
	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.			
1-1/4, 1-1/2	114	4.50	132	5.19	56	2.20	65	2.56	154	6.06	252	9.92	206	8.09	38	1.52	118	4.62	
2	Screwed	124	4.88	132	5.19	62	2.45	66	2.59	166	6.54	255	10.05	210	8.27	42	1.64	118	4.62
	Flanged	254	10.00	127	5.00	151	5.94	250	9.83	274	10.80	42	1.67

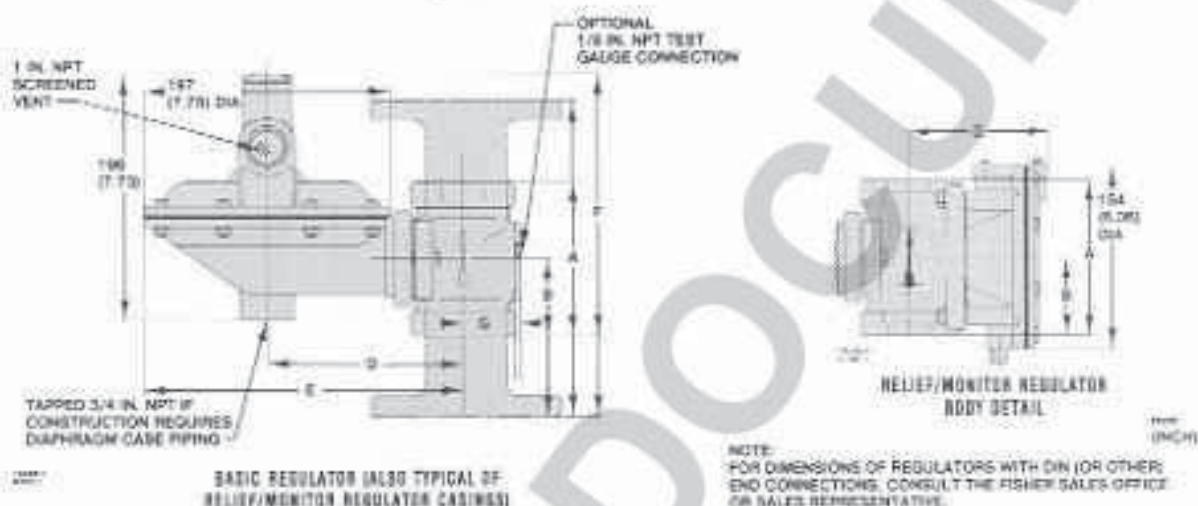


Figure 6. Dimensions

Ordering Information

When ordering, specify:

Application

- Description of controlled fluid
- Specific gravity of controlled fluid
- Fluid temperature
- Maximum and minimum inlet pressures
- Normal and maximum flow rates required
- Line size and end connection style

Selection

To determine what ordering information is needed, refer to the Specifications on page 2. Review the description at the right of each specification and in the referenced tables and figures, and write down your selection whenever there is a choice to be made. Always specify the type number being ordered. Assembly position 3F as shown in figure 5 will be supplied automatically unless some other position is specified.

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