

299H Series Pressure Reducing Regulators

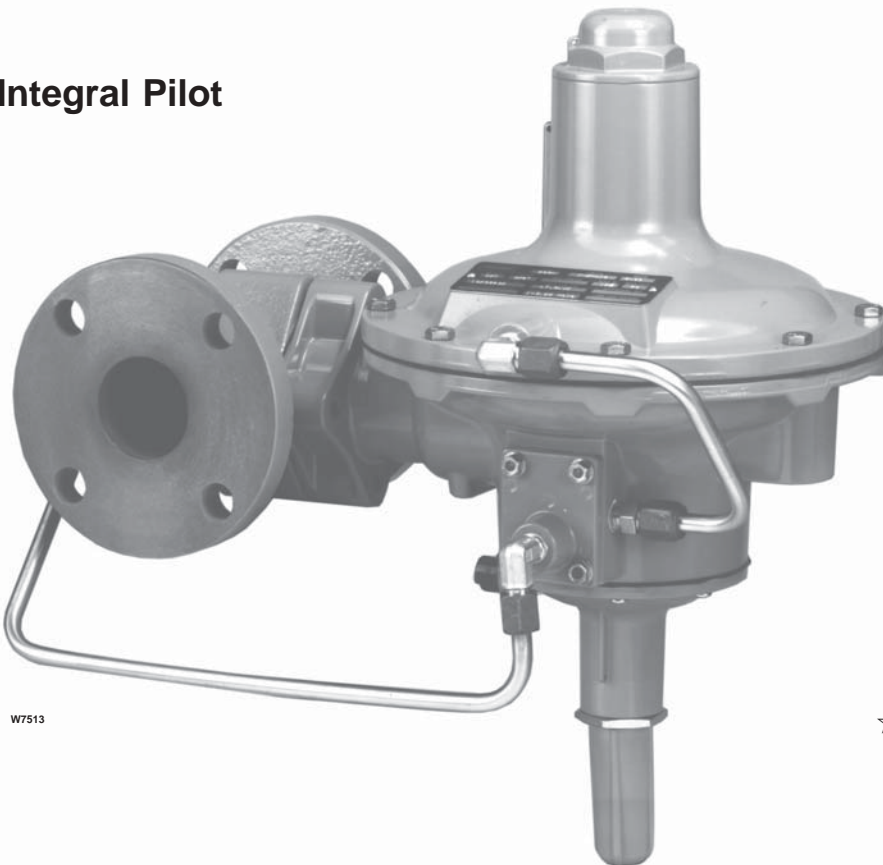
☆ Inlet Pressure up to 175 psig (12 bar)

☆ $\pm 1\%$ Accuracy for Fixed Factor Billing (PFM)

☆ Compact

☆ Integral Pilot

☆ Rugged Construction



W7513

☆ Easy to Maintain

☆ No Bleed Monitor

☆ High Capacity

☆ External, Internal, or Dual Registration

☆ Robust

☆ Outlet Pressures up to 60 psig (4 bar)

☆ Optional Token Relief

Features

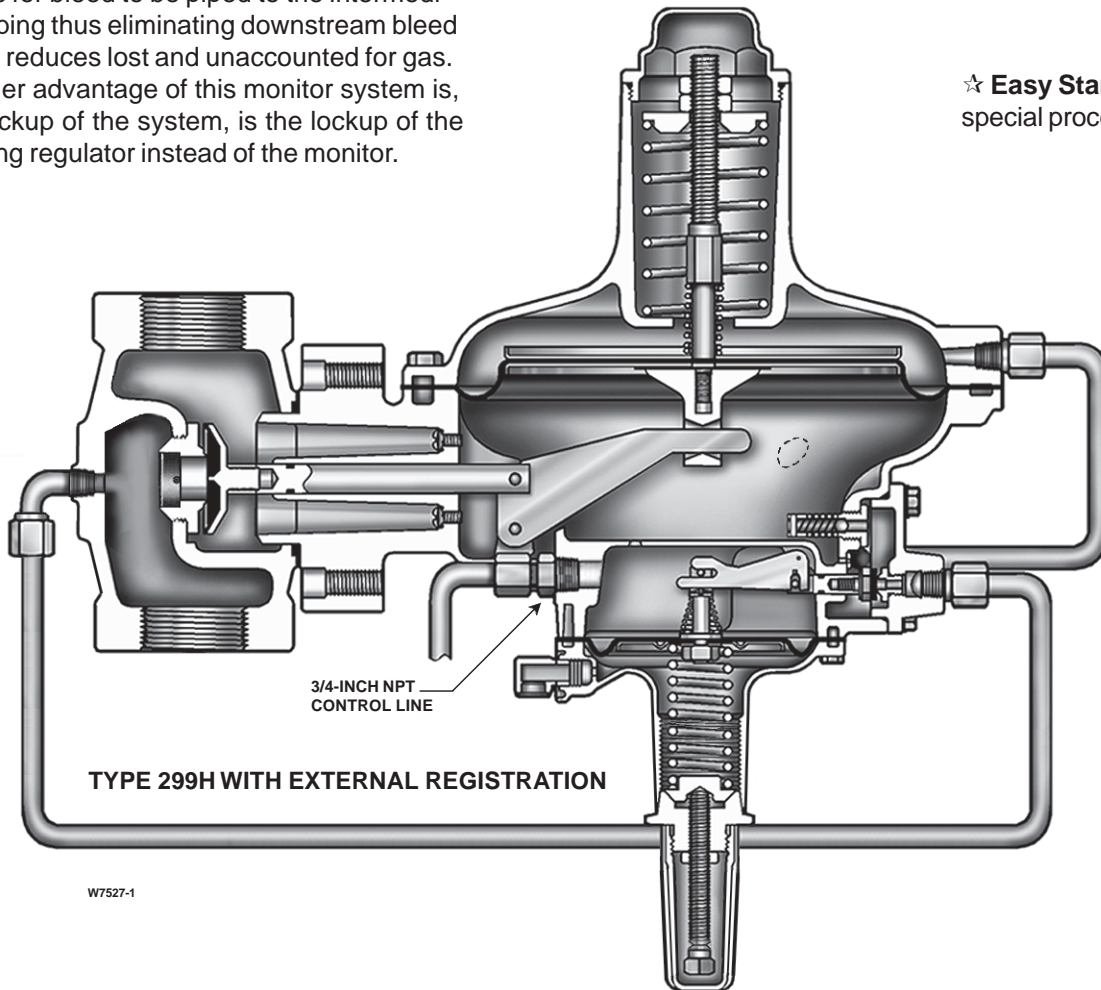
☆ **Compact in Size**—Small envelope because of the built-in pilot and internal registration.

☆ **Not an Adaptation of Existing Regulators**—New design of integrated cases and internal registration ports.

☆ **Easy Registration Conversion**—Two screws and O-rings change internal registration to external or dual registration.

☆ **Unique No Bleed Monitor System**—Flexible worker/monitor system setup that allows for bleed to be piped to the intermediate piping thus eliminating downstream bleed which reduces lost and unaccounted for gas. Another advantage of this monitor system is, the lockup of the system, is the lockup of the working regulator instead of the monitor.

☆ **Easy Startup**—No special procedure required.



☆ **Easy to Maintain**—Main valve disk and orifice can be inspected without removing body from pipeline. Easy access two bolt flange permits quick removal of actuator and pilot from body.

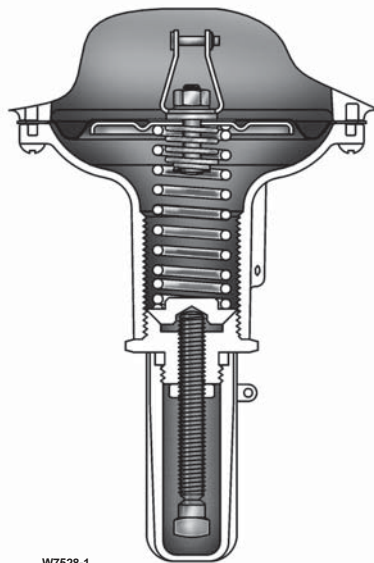
☆ **Economical, Labor-Saving Installation**—Supply pressure to pilot is factory-piped directly from inlet side of main regulator body, thus requiring no upstream pilot supply line on standard installations.

☆ **Wide Variety of Applications**—Natural gas distribution systems, gas supply to industrial boilers, furnaces, ovens, mixers, plant air service.

☆ **Rugged Construction**—With a two bolt connection of the regulator to the body and no union ring, the 299H Series regulators are designed for longer service life with minimal maintenance requirements.

☆ **Accuracy**—Keeps constant inlet pressures to downstream equipment by accurately controlling distribution system pressures at widely varying flow rates and supply pressures for maximum efficiency and best operation, or by eliminating the need for pressure-compensating meters by holding a steady pressure to the meter inlet.

☆ **Highest Quality**—
Designed and manufactured to ISO 9001 standards.



**TYPE 299HR PILOT WITH
OPTIONAL TOKEN RELIEF**

☆ **No gaskets**—
Reusable O-rings at all serviceable joints.

☆ **Startup Protection**—The main valve and the pilot are designed with reverse pressure mechanisms to prevent damage during startup or sudden increase in downstream pressure.

☆ **Optional Token Relief**—The Type 299HR with an integral token relief in the pilot is designed to relieve minor overpressure caused from thermal expansion.

☆ **Fewer Parts**—Fewer recommended parts needed for spare parts inventory.

☆ **High-Capacity Pressure Control**—Actuator diaphragm responds quickly to downstream pressure change, causing immediate correction in main valve position. Pilot responds simultaneously and controls final positioning of main valve. This action permits full main valve travel, resulting in higher capacity than could be obtained without a pilot.

Specifications

Available Configurations

Type 299H: Pilot-operated pressure reducing regulator with a pilot integrally mounted to the actuator casing

Type 299HR: A Type 299H with a token internal relief valve to relieve minor overpressure caused by thermal expansion.

Body Size And End Connection Styles

See table 1

Maximum Operating Inlet Pressure⁽¹⁾ by Orifice Size

1/4 x 3/8-inch (6,4 x 9,5 mm)	175 psig (12,1 bar)
3/8-inch (9,5 mm)	175 psig (12,1 bar)
1/2-inch (12,7 mm)	175 psig (12,1 bar)
3/4-inch (19,1 mm)	150 psig (10,3 bar)
7/8-inch (22,2 mm)	125 psig (8,6 bar)
1-inch (25,4 mm)	100 psig (6,9 bar)
1-3/16-inch (30,2 mm)	80 psig (5,5 bar)

Maximum Outlet Pressure⁽¹⁾

66 psig (4,6 bar)

Outlet (Control) Pressure Ranges⁽¹⁾⁽²⁾

See table 2

Flow Coefficients

See table 3

Flow Capacities

See tables 4 through 6

Pressure Control Accuracy (Fixed Factor)(PFM)

±1%⁽³⁾ of absolute control pressure

Minimum Differential Pressure For Full Stroke

1.5 psi (0,10 bar)

Control Line Connections

See figure 6

Temperature Capabilities⁽¹⁾

-20° to 150°F (-29° to 66°C)

Approximate Weight

21 pounds (9,5 kg)

Fixed Restriction Sizes

0.044-inch (1,12 mm), red	(standard gain)
0.071-inch (1,80 mm), green	(low gain)
0.082-inch (2,08 mm), blue	(lower gain)

Options

- **Filter⁽³⁾:** A P590 Series filter installed in the pilot supply tubing between main body and pilot
- **Filtered pilot supply regulator⁽³⁾⁽⁴⁾:** A 67 Series supply regulator with an internal 40 micron filter

Construction Materials

Actuator Upper Casings: Aluminum
Actuator Lower Casing: Aluminum
Pilot Spring Case: Aluminum
Actuator Diaphragm: Nitrile (NBR)
Pilot Diaphragm: Nitrile (NBR)
Pilot Inlet Screen: Stainless steel
Valve Body: Cast iron, Ductile iron, or Steel
Orifice and Valve Stem: Aluminum
Disk Holder: Aluminum holder with nitrile (NBR) disk
Main Disk Construction: Nitrile (NBR)
Metal Trim Parts For Pilot: Aluminum
Pilot Disk Construction: Nitrile (NBR)
O-Rings: Nitrile (NBR)
Fittings: Steel (standard) or Stainless steel
Tubing: Stainless steel

1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation should not be exceeded.
 2. For optimum performance, a pilot supply regulator may be installed in the pilot supply tubing between the main valve and pilot.
 3. A pilot supply regulator or a P590 Series filter (only one may be used, not both) may be ordered with the Type 299H, but not both.
 4. For inches w.c. use a pilot supply regulator if actual inlet pressure varies more than ±20 psi (1,4 bar) and published accuracy is required.

Table 1. Body Sizes and End Connection Styles

BODY SIZE, INCHES (DN)	BODY MATERIAL AND END CONNECTION STYLE		
	Cast Iron	Ductile Iron	Steel
1-1/4 (32)	NPT screwed	---	---
1-1/2 (40)	NPT screwed	NPT screwed	NPT screwed
2 (50)	NPT screwed; ANSI Class 125 ⁽¹⁾ FF and 250 RF flanged	NPT screwed; ANSI Class 125 FF and 250 RF flanged; and PN 10 and 16 flanged	NPT screwed; ANSI Class 150 RF and 300 RF flanged; and PN 16 flanged

1. This flange is available with a face-to-face dimension of 7.5-inches (191 mm) or 10-inches (254 mm).

Table 2. Outlet Pressure Ranges

OUTLET (CONTROL) PRESSURE RANGE	TYPE NUMBER		PILOT CONTROL SPRING			
	299H	299HR	Part Number	Color	Free Length, Inches (mm)	Wire Diameter, Inches (mm)
3.5 to 6-inches w.c. (9 to 15 mbar) ⁽¹⁾	X	X	T13707T0012	Black	1.86 (47,2)	0.055 (1,4)
6 to 9-inches w.c. (15 to 22 mbar) ⁽¹⁾	X	X	T13589T0012	Yellow	2.05 (52,0)	0.051 (1,3)
9 to 20-inches w.c. (22 to 49 mbar) ⁽¹⁾	X	X	1N31 12X0012	Silver	2.18 (55,4)	0.075 (1,9)
16 to 40-inches w.c. (40 to 99 mbar) ⁽¹⁾	X	X	1B413727222	Purple	2.12 (53,8)	0.092 (2,3)
1 to 3.25 psig (0,069 to 0,22 bar)	X	X	T13593T0012	Light blue	2.12 (53,8)	0.105 (2,7)
3.25 to 6 psig (0,22 to 0,41 bar)	X	X	T13671T0012	Orange	2.40 (61,1)	0.120 (3,0)
6 to 16 psig (0,34 to 1,10 bar)	X		T13600T0012	Red	2.10 (53,3)	0.142 (3,6)
16 to 35 psig (1,10 to 2,4 bar)	X		T13771T0012	Zinc	2.15 (54,6)	0.207 (5,3)
35 to 60 psig (2,41 to 4,14 bar)	X		T14096T0012	Green	2.75 (69,9)	0.225 (5,7)

1. Use a pilot supply regulator if actual inlet pressure varies more than ± 20 psi ($\pm 1,4$ bar) and the published accuracy is required.

Table 3. Flow Coefficients

ORIFICE DIAMETER, INCHES (mm)	WIDE-OPEN		REGULATING ⁽¹⁾		C ₁ WHEN $\Delta P < 10$ psi	C ₁ WHEN $\Delta P > 10$ psi
	C _g	C _v	C _g	C _v		
1/4 x 3/8 (6,4 x 9,5)	53	2.0	50	1.9	26	26
3/8 (9,5)	117	4.2	115	4.0	30	28
1/2 (12,7)	203	7.0	200	6.9	30	28
3/4 (19,1)	437	14.1	430	13.9	32	30
7/8 (22,2)	544	16.5	534	16.2	34	32
1 (25,4)	725	20.7	710	20.3	36	34
1-3/16 (30,2)	910	25.3	885	24.6	37	35

1. For external/dual registration only.

Description

The 299H Series pressure reducing regulators provide a broad capacity for controlled pressure ranges and capacities in a wide variety of distribution, industrial, and commercial applications. A 299H Series regulator has a pilot integrally mounted to the actuator casing. The 299H Series regulators can handle inlet pressures up to 175 psi (12,1 bar) depending on orifice size.

The integral token relief on the Type 299HR regulator is located in the pilot and alerts you to an increase in downstream pressure beyond the regulator setpoint.

Options

P590 Series Pilot Supply Filter

The optional P590 Series pilot supply filter prevents pipeline debris from entering the pilot; a primary cause of pilot clogging. When the upstream system is free of debris, the 299H Series regulators may be installed without a pilot supply filter.

67 Series Filtered Pilot Supply Regulator

When it is necessary to install a pilot supply regulator, an optional 67 Series filtered pilot supply regulator may be installed. For example, on applications with inches of water column setpoints and inlet pressure variations of more than ± 20 psig ($\pm 1,4$ bar) it may be necessary to install a 67 Series to maintain published accuracy.

Specifications



WARNING

Since a pilot-operated regulator is constructed of both a pilot and a main valve, do not exceed the maximum inlet pressure shown on the nameplate.

Specifications for 299H Series constructions are given on page 4. Some specifications for a given regulator as it originally comes from the factory are stamped on a nameplate located on the actuator upper casing.

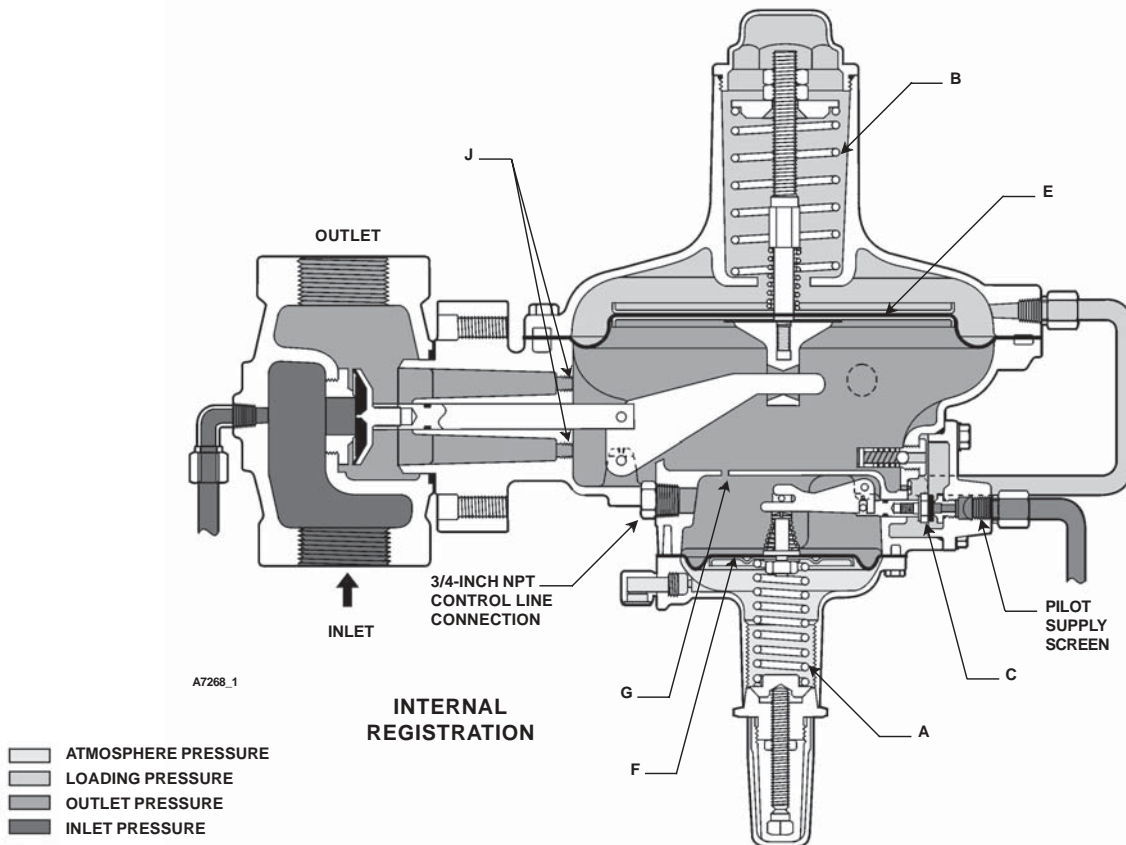


Figure 3. Principle of Operation Schematic

Principle of Operation

Letter keys in this section refer to figure 3 unless otherwise noted. Fast response and accuracy are made possible by the amplifying effect of the pilot and by the two-path control system. The function of the pilot is to sense change in the controlled outlet pressure and amplify it into a larger change in the loading pressure. Any changes in outlet pressure act quickly on both the actuator diaphragm and the loading pilot, thus providing the precise pressure control and fast speed of response that is characteristic of a two-path system.

Upstream or inlet pressure is utilized as the operating medium, which is reduced through pilot operation to load the main diaphragm chamber. Tubing connects the inlet pressure to the pilot. Downstream or outlet pressure registers underneath main diaphragm (E) and on top of pilot diaphragm (F). There are three different versions of registration for the Type 299H.

Internal registration (screws and O-rings (J) removed)—Outlet pressure is registered through the throat to the main diaphragm chamber and through a small port (G) to the top of the pilot diaphragm. Internal registration is used for ease of installation. Capacity is somewhat limited because of droop and/or boost associated with sensing pressure within the body.

External registration—Screws and O-rings (J) block the throat, and a downstream control line is connected to the pilot diaphragm chamber which is connected to the lower main diaphragm chamber by a small port (G). The other end of the control line connects to the downstream pipeline. External registration is used for higher capacity and/or the upstream regulator in a monitor set. It also allows monitoring for inlet pressures over 66 psig (4,6 bar). Capacity is increased because of better registration of pipeline pressure when a control line is used. The alternate 3/4-inch NPT screwed control line connection (in the side of the pilot) can be used for piping convenience, see figure 6.

Dual registration (screws and O-rings (J) removed)—The lower main diaphragm chamber registers outlet pressure through the throat and the pilot diaphragm chamber registers downstream pressure by use of a downstream control line. The port (G) between the chambers is blocked by inserting a screw and O-ring (J) that was removed from the throat and the control line runs from the pilot to the downstream pipeline. Dual registration is used to improve performance over internal pressure registration when there is a low flow rate and high pressure drop and a large orifice (control line must be piped to the primary 3/4-inch NPT connection on the

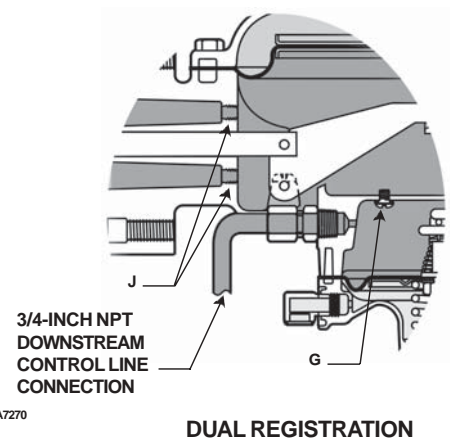
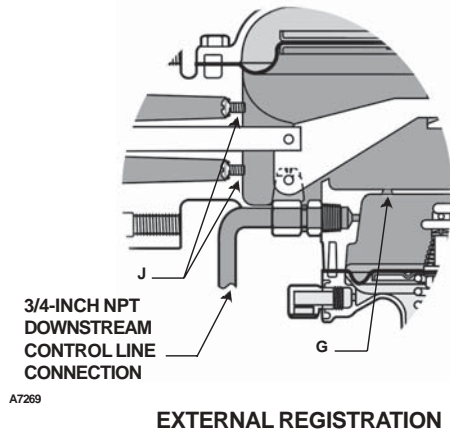


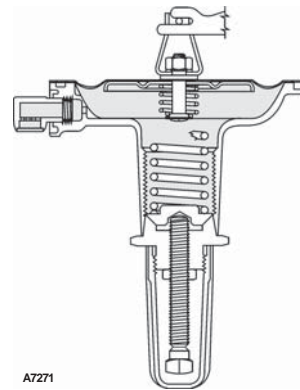
Figure 3. Principle of Operation Schematic (Continued)

side of the pilot). It is also used for no downstream bleed monitoring systems with inlet pressures up to 66 psig (4,6 bar).

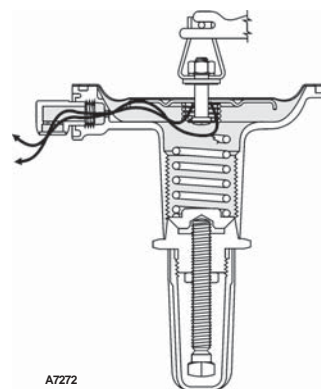
In operation, assume the outlet pressure is less than the setting of pilot control spring (A). The top side of pilot diaphragm assembly (F) will have a lower pressure than the setting of spring (A). Spring (A) forces the diaphragm assembly upward, opening the pilot orifice (C). Additional loading pressure is supplied to the top side of main diaphragm (E).

This creates a higher pressure on the top side of main diaphragm (E) than on the bottom side, forcing the diaphragm downward. This motion is transmitted through a lever, which pulls the valve disk open, allowing more gas to flow through the valve.

When the gas demand in the downstream system has been satisfied, the outlet pressure increases. The increased pressure is transmitted through the downstream control line and acts on top of the pilot diaphragm (F). This pressure exceeds the pilot spring setting and forces the diaphragm down, closing orifice (C). The loading pressure acting on main diaphragm (E) bleeds to the downstream system through a bleed restriction (H).



TOKEN RELIEF CLOSED



TOKEN RELIEF OPEN

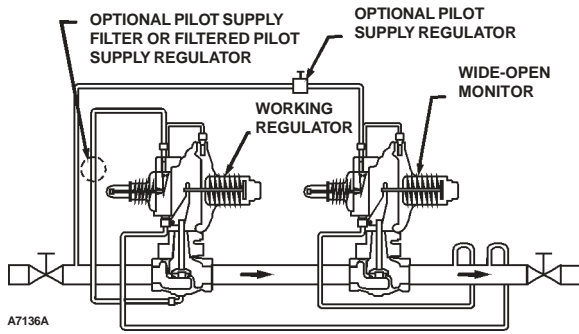
Figure 4. Type 299HR Operational Schematic

With a decrease in loading pressure on top of main diaphragm (E), main spring (B) exerts an upward force on the diaphragm post connected to main diaphragm (E), pulling it upward. This moves the main valve toward its seat, decreasing flow to the downstream system.

The Type 299HR provides an integral token relief valve. During an overpressure condition the spring on the pilot post will allow the diaphragm head to travel to the spring case. As the diaphragm head moves a small amount of gas is relieved. Note the Type 299HR is not a full capacity relief device. Approximate start-to-discharge pressure is dependent on set pressure, see figure 6.

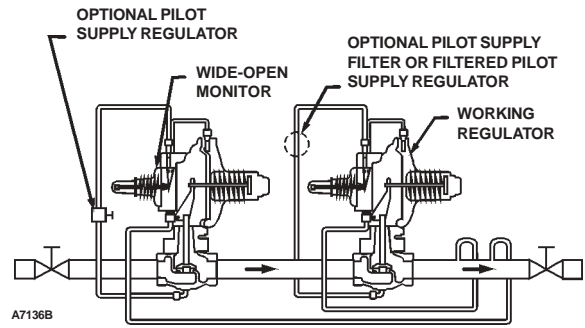
During normal operation the Type 299HR performance is identical to the Type 299H. If an overpressure condition occurs the pilot diaphragm head will separate from the pilot diaphragm post and travels until it contacts the pilot spring case. The movement of the diaphragm head creates a path and a token, or noticeable amount of gas will be released.

When the overpressure condition ceases the pilot diaphragm head will return to the diaphragm post, and the regulator will return to normal operation.



Note: If used, the pilot supply regulator should be set 3 psig (0,21 bar) above the monitor outlet pressure setting.

WIDE-OPEN DOWNSTREAM MONITOR



Note: If used, the pilot supply regulator should be set 3 psig (0,21 bar) above the monitor outlet pressure setting.

WIDE-OPEN UPSTREAM MONITOR

Figure 5. Typical Monitor Installations

Overpressure Protection

Like most regulators, the Type 299H has outlet pressure ratings lower than the inlet pressure ratings. Complete downstream overpressure protection is needed if the actual inlet pressure exceeds the outlet pressure rating.

Overpressure protection for internal parts is built into the main and pilot diaphragms by means of a small spring on each post. The springs will allow the diaphragm heads to move farther on the posts avoiding damage to or bending of the valve trim.

Overpressuring any portion of a regulator or associated equipment may cause leakage, parts damage, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Regulator operation within ratings does not preclude 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.

The pilot vent is provided with a 1/4-inch NPT tapped connection in the spring case.

Monitoring Systems

Monitoring regulators serve as overpressure protection devices to limit system pressure in the event of open failure of a working regulator feeding the system.

Wide-Open Monitor

The control line of the upstream regulator is connected downstream of the second regulator (figure 5), so that during normal operation the monitoring regulator is standing wide-open with the reduction to distribution

pressure being taken across the working regulator. Only in case of open failure of the working regulator does the wide-open monitoring regulator take control at its slightly higher setting. A pressure buildup above the monitor set pressure is required for the monitor to take control in the event of an overpressure situation. Installing a pilot supply regulator on the monitor will minimize the pressure buildup. The pilot supply regulator should be set 3 psig (0,21 bar) above the monitor setpoint.

The minimum set pressure difference between the worker and monitor should be greater than the proportional band. Small set pressure differences may cause the worker and monitor to function independently.

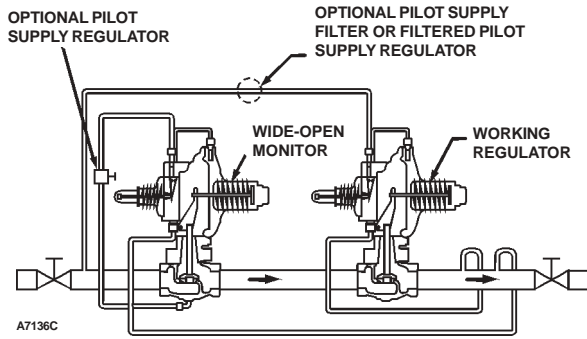
The upstream regulator can easily be field converted or ordered with screws and O-rings in the throat (figure 3). This seals off the path that otherwise would let line pressure ahead of the working regulator inlet and try to close the wide-open monitoring regulator.

No Downstream Bleed Monitor

The no bleed monitor is a wide-open upstream monitor which works like a conventional wide-open upstream monitor except for registration. The no bleed monitor utilizes a dual registration construction as opposed to the external registration construction of the conventional monitor. This ensures that the lockup of the monitor system is the lockup of the downstream working monitor at zero flow during normal operation.

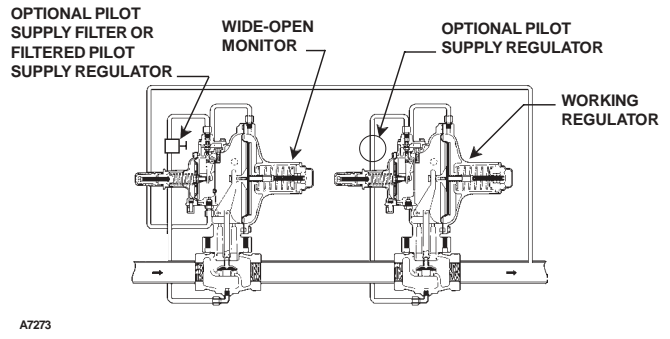
Capacity Information

Tables 4 through 6 give the 299H Series natural gas regulating capacities at selected inlet pressures and outlet pressure settings. Flows are in scfh (60°F and 14.7 psia) and m³/h(n) (0°C and 1,0 bar) of 0.6



Note: The pilot supply regulator should be set 3 psig (0,21 bar) above the monitor outlet pressure setting.

WIDE-OPEN UPSTREAM MONITOR



Note: The pilot supply regulator should be set 3 psig (0,21 bar) above the monitor outlet pressure setting.

NO DOWNSTREAM BLEED MONITOR SYSTEM

Figure 5. Typical Monitor Installations (continued)

specific gravity natural gas. To determine equivalent capacities for air, propane, butane, or nitrogen, multiply the capacity number in the tables 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.

For critical flow:

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:

$$Q = P_{1abs}(C_g)(1.29)$$

For subcritical flow:

If pressure drops are lower than critical (absolute outlet pressure greater than approximately one-half the absolute inlet pressure), use the following formula and convert according to the factors in the preceding paragraph if necessary:

$$Q = \sqrt{\frac{520}{GT}} C_g P_1 \text{SIN} \left(\frac{3417}{C_1} \sqrt{\frac{\Delta P}{P_1}} \right) \text{DEG}$$

where:

- $C_1 = C_g / C_v$ (see table 3)
- $C_g =$ Gas sizing coefficient (see table 3)
- $G =$ Gas specific gravity (air = 1.0)
- $P_1 =$ Regulator inlet pressure, psia
- $\Delta P =$ Pressure drop across regulator, psi
- $Q =$ Gas flow rate, scfh
- $T =$ Absolute temperature of gas at inlet, degrees Rankine

Note

Due to boost, the above formulas cannot be used to obtain correct regulating capacities for regulators with internal registration.

The published capacities were obtained using inlet and outlet piping the same size as the regulator body size.

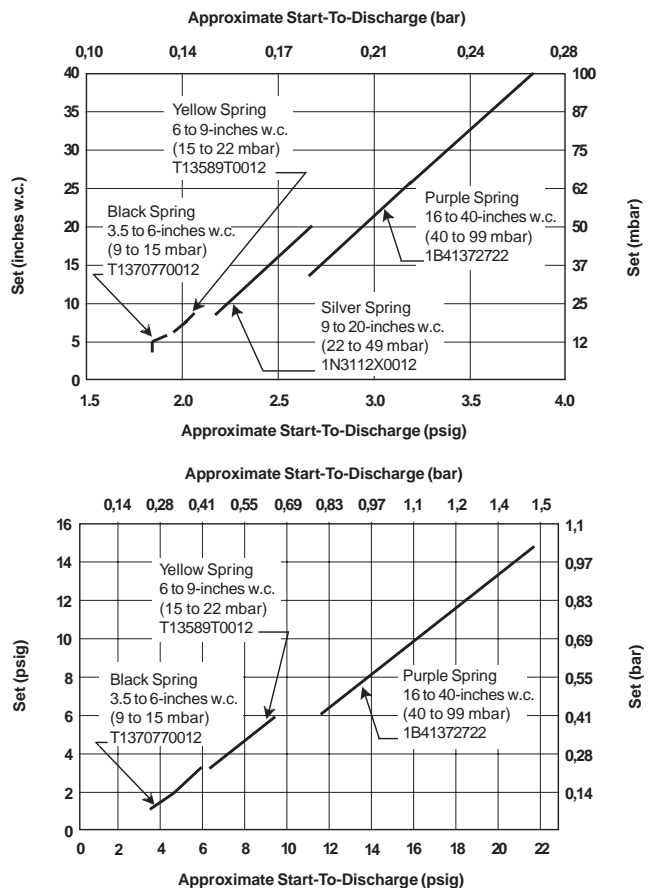


Figure 6. Type 299TR Approximate Start-to-Discharge

Bulletin 71.2:299H

Table 4. Flow Capacities for 1-1/2-inch (DN 40) and 2-inch (DN 50) External/Dual Registration

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS						
		Orifice Size, Inches (mm)						
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	7/8 (22,2)	1 (25,4)	1-3/16 (30,2)
3.5 to 6-inches w.c. (8,8 to 15 mbar) 3.5-inches w.c. (8,8 mbar) +2 -1-inches w.c. (+0,50 -0,25 mbar) T13707T0012 Black	2 (0,14)	760 (20)	1560 (42)	2700 (72)	5490 (147)	6460 (173)	8170 (219)	9940 (266)
	5 (0,34)	1160 (31)	2460 (66)	4270 (114)	8790 (236)	10350 (277)	13310 (357)	16250 (436)
	10 (0,69)	1590 (43)	3580 (96)	6230 (167)	13060 (350)	15270 (409)	20300 (544)	24900 (667)
	15 (1,0)	1920 (51)	4410 (118)	7670 (206)	16480 (442)	19450 (521)	25780 (691)	31730 (850)
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	19250 (516)	24110 (646)	31790 (852)	39620 (1062)
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	22030 (590)	27110 (727)	36370 (975)	45330 (1215)
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24800 (665)	31110 (834)	40950 (1097)	51040 (1368)
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)
80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
175 (12,1)	12240 (328)	28150 (754)	48950 (1312)					
6 to 9-inches w.c. (15 to 22 mbar) 7-inches w.c. (17,5 mbar) +2 -1 inches w.c. (+0,50 -0,25 mbar) T13589T0012 Yellow	2 (0,14)	750 (20)	1520 (41)	2650 (71)	5380 (144)	6270 (168)	8000 (214)	9730 (261)
	5 (0,34)	1160 (31)	2440 (65)	4240 (114)	8730 (234)	10250 (275)	13220 (354)	16130 (432)
	10 (0,69)	1590 (43)	3580 (96)	6220 (167)	13040 (349)	15220 (408)	20250 (543)	24830 (665)
	15 (1,0)	1920 (51)	4410 (118)	7670 (206)	16480 (442)	19420 (520)	25750 (690)	31690 (849)
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	19250 (516)	24110 (646)	31790 (852)	39620 (1062)
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	22030 (590)	27110 (727)	36370 (975)	45330 (1215)
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24800 (665)	31110 (834)	40950 (1097)	51040 (1368)
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)
80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
175 (12,1)	12240 (328)	28150 (754)	48950 (1312)					
9 to 20-inches w.c. (22 to 49 mbar) 14-inches w.c. (35 mbar) +2 -2 inches w.c. (+0,50 -0,50 mbar) 1N3112X0012 Silver	2 (0,14)	700 (19)	1430 (38)	2480 (66)	5040 (135)	5850 (157)	7480 (200)	9090 (244)
	5 (0,34)	1140 (31)	2400 (64)	4170 (112)	8570 (230)	10040 (269)	12950 (347)	15800 (423)
	10 (0,69)	1580 (42)	3560 (95)	6190 (166)	12970 (348)	15110 (405)	20110 (539)	24640 (660)
	15 (1,0)	1920 (51)	4410 (118)	7670 (206)	16480 (442)	19350 (519)	25660 (688)	31560 (846)
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	19250 (516)	24110 (646)	31790 (852)	39620 (1062)
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	22030 (590)	27110 (727)	36370 (975)	45330 (1215)
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24800 (665)	31110 (834)	40950 (1097)	51040 (1368)
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)
80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
175 (12,1)	12240 (328)	28150 (754)	48950 (1312)					
16 to 40-inches w.c. (40 to 99 mbar) 28-inches w.c. (70 mbar) +4 -4 inches w.c. (+9,95 -9,95 mbar) 1B413727222 Purple	5 (0,34)	1110 (30)	2320 (62)	4020 (108)	8250 (221)	9580 (257)	12430 (333)	15150 (406)
	10 (0,69)	1570 (42)	3530 (95)	6140 (165)	12830 (344)	14870 (399)	19830 (531)	24290 (651)
	15 (1,0)	1920 (51)	4410 (118)	7670 (206)	16170 (433)	19220 (515)	25480 (683)	31320 (839)
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	19250 (516)	24110 (646)	30670 (822)	37820 (1014)
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	22030 (590)	27110 (727)	36370 (975)	45330 (1215)
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24800 (665)	31110 (834)	40950 (1097)	51040 (1368)
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)
100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
175 (12,1)	12240 (328)	28150 (754)	48950 (1312)					

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Table 4. Flow Capacities for 1-1/2-inch (DN 40) and 2-inch (DN 50) External/Dual Registration (continued)

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS							
		Orifice Size, Inches (mm)							
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	7/8 (22,2)	1 (25,4)	1-3/16 (30,2)	
1.0 to 3.25 psig (69 to 224 mbar) 2 psig (138 mbar) ±1% psia (bar) T13593T0012 Light Blue	5 (0,34)	1020 (27)	2100 (56)	3640 (98)	7440 (199)	8650 (232)	11140 (299)	13560 (363)	
	10 (0,69)	1550 (42)	3340 (90)	5810 (156)	12040 (323)	14410 (386)	18460 (495)	22570 (605)	
	15 (1,0)	1920 (51)	4360 (117)	7580 (203)	15990 (429)	18950 (508)	25050 (671)	30760 (824)	
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	19250 (516)	24110 (646)	30380 (814)	37410 (1003)	
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	22030 (590)	27110 (727)	36370 (975)	45330 (1215)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24800 (665)	31110 (834)	40950 (1097)	51040 (1368)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)					
175 (12,1)	12240 (328)	28150 (754)	48950 (1312)						
3.25 to 6 psig (224 to 414 mbar) 5 psig (345 mbar) ±1% psia (bar) T13671T0012 Orange	10 (0,69)	1390 (37)	2910 (78)	5050 (135)	10350 (277)	12700 (340)	15600 (418)	19030 (510)	
	15 (1,0)	1870 (50)	4190 (112)	7280 (195)	15150 (406)	17950 (481)	23310 (625)	28530 (765)	
	20 (1,4)	2240 (60)	5090 (136)	8850 (237)	18640 (500)	22970 (616)	29180 (782)	35820 (960)	
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	22030 (590)	27110 (727)	34550 (926)	42530 (1140)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24800 (665)	31110 (834)	40950 (1097)	51040 (1368)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
175 (12,1)	12240 (328)	28150 (754)	48950 (1312)						
6 to 16 psig (0,41 to 1,10 bar) 10 psig (0,69 bar) ±1% psia (bar) T13600T0012 Red	15 (1,0)	1580 (42)	3280 (88)	5690 (152)	11640 (312)	12640 (339)	17470 (468)	21280 (570)	
	20 (1,4)	2130 (57)	4720 (126)	8210 (220)	17000 (456)	20380 (546)	25940 (695)	31690 (849)	
	25 (1,7)	2540 (68)	5710 (153)	9930 (266)	20790 (557)	24570 (658)	32220 (863)	39480 (1058)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24150 (647)	29540 (792)	37900 (1016)	46550 (1248)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	30350 (813)	38100 (1021)	50100 (1343)	62450 (1674)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	59260 (1588)	73870 (1980)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)					
6 to 16 psig (0,41 to 1,10 bar) 15 psig (1,03 bar) ±1% psia (bar) T13600T0012 Red	20 (1,4)	1750 (47)	3620 (97)	6290 (169)	12830 (344)	15830 (424)	19190 (514)	23360 (626)	
	25 (1,7)	2360 (63)	5220 (140)	9070 (243)	18700 (501)	22040 (591)	28360 (760)	34610 (928)	
	30 (2,1)	2820 (76)	6290 (169)	10940 (293)	22790 (611)	27870 (747)	35050 (939)	42890 (1149)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	29650 (795)	36530 (979)	46610 (1249)	57270 (1535)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	44100 (1182)	57080 (1530)	70350 (1885)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	68420 (1834)	85290 (2286)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)					
	16 to 35 psig (1,10 to 2,41 bar) 20 psig (1,38 bar) ±1% psia (bar) T13771T0012 Zinc	25 (1,8)	1920 (51)	3930 (105)	6840 (183)	13930 (373)	14960 (401)	20800 (557)	25310 (678)
30 (2,1)		2580 (69)	5680 (152)	9870 (265)	20280 (544)	24090 (646)	30630 (821)	37340 (1001)	
40 (2,8)		3480 (93)	7830 (210)	13610 (365)	28440 (762)	34480 (924)	43980 (1179)	53880 (1444)	
50 (3,4)		4180 (112)	9600 (257)	16700 (448)	35140 (942)	41940 (1124)	55310 (1482)	67980 (1822)	
60 (4,1)		4820 (129)	11090 (297)	19280 (517)	41440 (1111)	51090 (1369)	65780 (1763)	81060 (2172)	
80 (5,5)		6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)	
100 (6,9)		7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)		
125 (8,6)		9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)			
150 (10,3)		10630 (285)	24440 (655)	42500 (1139)	91360 (2448)				
175 (12,1)		12240 (328)	28150 (754)	48950 (1312)					

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Bulletin 71.2:299H

Table 4. Flow Capacities for 1-1/2-inch (DN 40) and 2-inch (DN 50) External/Dual Registration (continued)

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS						
		Orifice Size, Inches (mm)						
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	7/8 (22,2)	1 (25,4)	1-3/16 (30,2)
16 to 35 psig (1,10 to 2,41 bar) 25 psig (1,72 bar) ±1% psia (bar) T13771T0012 Zinc	30 (2,1)	2070 (55)	4230 (113)	7360 (197)	14980 (401)	18330 (491)	22310 (598)	27140 (727)
	40 (2,8)	3320 (89)	7350 (197)	12780 (343)	26420 (708)	32120 (861)	40220 (1078)	49120 (1316)
	50 (3,4)	4140 (111)	9340 (250)	16250 (436)	34040 (912)	40400 (1083)	52830 (1416)	64770 (1736)
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	40630 (1089)	48920 (1311)	64010 (1715)	78690 (2109)
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	86740 (2325)	108120 (2898)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
16 to 35 psig (1,10 to 2,41 bar) 30 psig (2,07 bar) ±1% psia (bar) T13771T0012 Zinc	40 (2,8)	2980 (80)	6520 (175)	11330 (304)	23190 (621)	27330 (732)	34790 (932)	42370 (1136)
	50 (3,4)	4020 (108)	8950 (240)	15560 (417)	32300 (866)	37410 (1003)	49460 (1326)	60480 (1621)
	60 (4,1)	4800 (129)	10850 (291)	18870 (506)	39600 (1061)	46980 (1259)	61630 (1652)	75590 (2026)
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	52540 (1408)	65080 (1744)	83170 (2229)	102470 (2746)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
16 to 35 psig (1,10 to 2,41 bar) 35 psig (2,41 bar) ±1% psia (bar) T13771T0012 Zinc	40 (2,8)	2350 (63)	4790 (128)	8330 (223)	16920 (453)	20530 (550)	25150 (674)	30580 (820)
	50 (3,4)	3770 (101)	8300 (222)	14430 (387)	29690 (796)	34220 (917)	44890 (1203)	54750 (1467)
	60 (4,1)	4700 (126)	10510 (282)	18270 (490)	38050 (1020)	44960 (1205)	58520 (1568)	71620 (1919)
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	51600 (1383)	62470 (1674)	81400 (2182)	100090 (2682)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	79060 (2119)	105060 (2816)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	96050 (2574)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
35 to 60 psig (2,41 to 4,14 bar) 40 psig (2,76 bar) ±1% psia (bar) T14096T0012 Green	50 (3,4)	3340 (90)	7290 (195)	12670 (340)	25840 (693)	30500 (817)	38590 (1034)	46950 (1258)
	60 (4,1)	4500 (121)	9970 (267)	17340 (465)	35820 (960)	42700 (1144)	54480 (1460)	66530 (1783)
	80 (5,5)	6100 (163)	13840 (371)	24070 (645)	50670 (1358)	61300 (1643)	79160 (2121)	97160 (2604)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	77250 (2070)	100560 (2695)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	95700 (2565)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
35 to 60 psig (2,41 to 4,14 bar) 50 psig (3,45 bar) ±1% psia (bar) T14096T0012 Green	60 (4,1)	3680 (99)	7990 (214)	13900 (373)	28290 (758)	33300 (892)	42110 (1129)	51210 (1372)
	80 (5,5)	5900 (158)	13170 (353)	22900 (614)	47570 (1275)	57000 (1528)	72950 (1955)	89220 (2391)
	100 (6,9)	7400 (198)	16830 (451)	29260 (784)	61700 (1654)	74800 (2005)	96630 (2590)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)	94400 (2530)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
35 to 60 psig (2,41 to 4,14 bar) 60 psig (4,14 bar) ±1% psia (bar) T14096T0012 Green	80 (5,5)	5380 (144)	11810 (317)	20540 (550)	42160 (1130)	50000 (1340)	63540 (1703)	77440 (2075)
	100 (6,9)	7260 (195)	16270 (436)	28290 (758)	59000 (1581)	70900 (1900)	90970 (2438)	
	125 (8,6)	9020 (242)	20730 (556)	35860 (961)	75900 (2034)	92300 (2474)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	91360 (2448)			
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				
	175 (12,1)	12240 (328)	28150 (754)	48950 (1312)				

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Table 5. Flow Capacities for 1-1/2-inch (DN 40) Internal Registration

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS					
		Orifice Size, Inches (mm)					
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	1 (25,4)	1-3/16 (30,2)
3.5 to 6-inches w.c. (8,8 to 15 mbar) 3.5-inches w.c. (8,8 mbar) +2 -1-inches w.c. (+0,50 -0,25 mbar) T13707T0012 Black	2 (0,14)	760 (20)	1560 (42)	2700 (72)	4050 (109)	4340 (116)	4540 (122)
	5 (0,34)	1200 (32)	2600 (70)	4500 (121)	8490 (228)	10690 (286)	7290 (195)
	10 (0,69)	1700 (46)	3800 (102)	6500 (174)	7140 (191)	8570 (230)	10570 (283)
	15 (1,0)	2000 (54)	4600 (123)	8000 (214)	7120 (191)	10860 (291)	9020 (242)
	20 (1,4)	2350 (63)	5300 (142)	9250 (248)	7060 (189)	11250 (302)	9810 (263)
	25 (1,7)	2700 (72)	6000 (161)	10010 (268)	7100 (190)	11170 (299)	9760 (262)
	30 (2,1)	3040 (81)	6740 (181)	10330 (277)	8030 (215)	11660 (312)	9700 (260)
	40 (2,8)	3700 (99)	8200 (220)	11640 (312)	9610 (258)	10790 (289)	11150 (299)
	50 (3,4)	4400 (118)	9700 (260)	11650 (312)	10530 (282)	9460 (254)	10100 (271)
	60 (4,1)	5100 (137)	11200 (300)	11380 (305)	11590 (311)	9010 (241)	10200 (273)
	80 (5,5)	4700 (126)	4680 (125)	4510 (121)	15210 (408)	6250 (168)	8900 (239)
	100 (6,9)	4300 (115)	3040 (81)	3990 (107)	14510 (389)	7700 (206)	
	125 (8,6)	4300 (115)	3200 (86)	4390 (118)	8640 (232)		
	150 (10,3)	4320 (116)	3200 (86)	4810 (129)	2650 (71)		
175 (12,1)	5600 (150)	5050 (135)	7300 (196)				
6 to 9 inches w.c. (15 to 22 mbar) 7 inches w.c. (17,5 mbar) +2 -1 inches w.c. (+0,50 -0,25 mbar) T13589T0012 Yellow	2 (0,14)	750 (20)	1520 (41)	2650 (71)	5380 (144)	5610 (150)	5790 (155)
	5 (0,34)	1300 (35)	2600 (70)	4250 (114)	7110 (191)	7600 (204)	6620 (177)
	10 (0,69)	1600 (43)	3800 (102)	6500 (174)	8150 (218)	8210 (220)	10320 (277)
	15 (1,0)	2000 (54)	4400 (118)	8000 (214)	6180 (166)	10770 (289)	9040 (242)
	20 (1,4)	2300 (62)	5100 (137)	9500 (255)	6520 (175)	11510 (308)	9510 (255)
	25 (1,7)	2600 (70)	5800 (155)	10660 (286)	6190 (166)	10920 (293)	9850 (264)
	30 (2,1)	2970 (80)	6600 (177)	10410 (279)	7420 (199)	10850 (291)	10080 (270)
	40 (2,8)	3700 (99)	8200 (220)	10170 (273)	12030 (322)	10310 (276)	10170 (273)
	50 (3,4)	4400 (118)	9700 (260)	11170 (299)	12160 (326)	10430 (280)	10000 (268)
	60 (4,1)	5100 (137)	11200 (300)	11710 (314)	10620 (285)	8230 (221)	10200 (273)
	80 (5,5)	4850 (130)	4700 (126)	4570 (122)	3610 (97)	8000 (214)	8500 (228)
	100 (6,9)	4600 (123)	2800 (75)	3790 (102)	3380 (91)	6400 (172)	
	125 (8,6)	4600 (123)	3200 (86)	4190 (112)	3440 (92)		
	150 (10,3)	4600 (123)	3640 (98)	4590 (123)	2400 (64)		
175 (12,1)	5400 (145)	5050 (135)	7300 (196)				
9 to 20-inches w.c. (22 to 49 mbar) 14-inches w.c. (35 mbar) +2 -2-inches w.c. (+0,50 -0,50 mbar) 1N3112X0012 Silver	2 (0,14)	700 (19)	1430 (38)	2480 (66)	5040 (135)	6900 (185)	7050 (189)
	5 (0,34)	1100 (29)	2200 (59)	4000 (107)	7180 (192)	7280 (195)	8860 (237)
	10 (0,69)	1700 (46)	3600 (96)	6500 (174)	8310 (223)	9330 (250)	10320 (277)
	15 (1,0)	1900 (51)	4600 (123)	8000 (214)	7000 (188)	11940 (320)	9530 (255)
	20 (1,4)	2150 (58)	5300 (142)	8500 (228)	7410 (199)	11850 (318)	11060 (296)
	25 (1,7)	2400 (64)	6000 (161)	9000 (241)	6900 (185)	11330 (304)	11080 (297)
	30 (2,1)	2740 (73)	6740 (181)	10000 (268)	6500 (174)	11270 (302)	10780 (289)
	40 (2,8)	3400 (91)	8200 (220)	10900 (292)	9220 (247)	10820 (290)	11220 (301)
	50 (3,4)	4250 (114)	9700 (260)	10210 (274)	12580 (337)	10820 (290)	10450 (280)
	60 (4,1)	5100 (137)	11000 (295)	9650 (259)	11750 (315)	8840 (237)	11100 (297)
	80 (5,5)	5250 (141)	5210 (140)	4060 (109)	4970 (133)	8550 (229)	9400 (252)
	100 (6,9)	5400 (145)	4580 (123)	4410 (118)	4970 (133)	6780 (182)	
	125 (8,6)	5400 (145)	4400 (118)	5290 (142)	4330 (116)		
	150 (10,3)	5900 (158)	5020 (135)	6170 (165)	3130 (84)		
175 (12,1)	5550 (149)	5200 (139)	6500 (174)				
16 to 40-inches w.c. (40 to 99 mbar) 28-inches w.c. (70 mbar) +4 -4-inches w.c. (+9,95 -9,95 mbar) 1B413727222 Purple	5 (0,34)	1200 (32)	2400 (64)	4000 (107)	6010 (161)	9210 (247)	9070 (243)
	10 (0,69)	1600 (43)	3700 (99)	6500 (174)	8130 (218)	10300 (276)	10650 (285)
	15 (1,0)	2000 (54)	4400 (118)	8000 (214)	10340 (277)	13020 (349)	12890 (345)
	20 (1,4)	2300 (62)	5100 (137)	9250 (248)	11980 (321)	14790 (396)	13170 (353)
	25 (1,7)	2600 (70)	5800 (155)	10500 (281)	12390 (332)	14570 (390)	14180 (380)
	30 (2,1)	2800 (75)	6600 (177)	11840 (317)	12500 (335)	14050 (377)	13770 (369)
	40 (2,8)	3200 (86)	8200 (220)	14060 (377)	13350 (358)	13290 (356)	14110 (378)
	50 (3,4)	4100 (110)	9750 (261)	14010 (375)	14530 (389)	12860 (345)	12050 (323)
	60 (4,1)	5000 (134)	11100 (297)	14040 (376)	13440 (360)	13020 (349)	10950 (293)
	80 (5,5)	6300 (169)	5910 (158)	6140 (165)	9950 (267)	8500 (228)	10200 (273)
	100 (6,9)	7600 (204)	5220 (140)	5420 (145)	7780 (209)	6500 (174)	
	125 (8,6)	9200 (247)	5690 (152)	6010 (161)	8220 (220)		
	150 (10,3)	10700 (287)	7380 (198)	5970 (160)	4900 (131)		
	175 (12,1)	5510 (148)	5100 (137)	7250 (194)			

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Bulletin 71.2:299H

Table 5. Flow Capacities for 1-1/2-inch (DN 40) Internal Registration (continued)

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND SPRING COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS						
		Orifice Size, Inches (mm)						
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	1 (25,4)	1-3/16 (30,2)	
1 to 3.25 psig (69 to 224 mbar) 2 psig (138 mbar) ±1% psia (bar) T13593T0012 Light Blue	5 (0,34)	1020 (27)	2100 (56)	3640 (98)	7020 (188)	10790 (289)	10820 (290)	
	10 (0,69)	1550 (42)	3340 (90)	5840 (157)	8990 (241)	12180 (326)	11180 (300)	
	15 (1,0)	1920 (51)	4360 (117)	7580 (203)	11260 (302)	13580 (364)	11960 (321)	
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	12950 (347)	13630 (365)	12750 (342)	
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	13090 (351)	13890 (372)	13370 (358)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	14830 (397)	13740 (368)	14000 (375)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	13500 (362)	13470 (361)	15250 (409)	
	50 (3,4)	4180 (112)	9600 (257)	15010 (402)	13780 (369)	13970 (374)	12500 (335)	
	60 (4,1)	4820 (129)	10890 (292)	15740 (422)	14050 (377)	14080 (377)	12300 (330)	
	80 (5,5)	6110 (164)	9000 (241)	12230 (328)	11100 (297)	12750 (342)	10500 (281)	
	100 (6,9)	7400 (198)	5200 (139)	5200 (139)	5200 (139)	6400 (172)		
	125 (8,6)	8170 (219)	5040 (135)	5200 (139)	5200 (139)			
	150 (10,3)	8450 (226)	5870 (157)	5200 (139)	5600 (150)			
	175 (12,1)	7750 (208)	5250 (141)	5730 (154)				
3.25 to 6 psig (224 to 414 mbar) 5 psig (345 mbar) ±1% psia (bar) T13671T0012 Orange	10 (0,69)	1390 (37)	2910 (78)	5050 (135)	8470 (227)	12010 (322)	12190 (327)	
	15 (1,0)	1870 (50)	4190 (112)	7280 (195)	11290 (303)	14300 (383)	12400 (332)	
	20 (1,4)	2240 (60)	5090 (136)	8850 (237)	12590 (337)	13820 (370)	13260 (355)	
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	13210 (354)	14500 (389)	14310 (384)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	13820 (370)	15290 (410)	15370 (412)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	15060 (404)	15650 (419)	16630 (446)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	15400 (413)	16010 (429)	14000 (375)	
	60 (4,1)	4820 (129)	11090 (297)	16290 (437)	15750 (422)	16370 (439)	13250 (355)	
	80 (5,5)	6110 (164)	14050 (377)	14000 (375)	13620 (365)	14000 (375)	14000 (375)	
	100 (6,9)	7400 (198)	17020 (456)	9020 (242)	9610 (258)	14000 (375)		
	125 (8,6)	9020 (242)	7690 (206)	7690 (206)	7890 (211)			
	150 (10,3)	10630 (285)	6330 (170)	6360 (170)	5500 (147)			
	175 (12,1)	6800 (182)	6050 (162)	8200 (220)				
	6 to 16 psig (0,41 to 1,10 bar) 10 psig (0,69 bar) ±1% psia (bar) T13600T0012 Red	15 (1,0)	1580 (42)	3280 (88)	5690 (152)	9930 (266)	13230 (355)	13570 (364)
20 (1,4)		2130 (57)	4720 (126)	8210 (220)	11990 (321)	14130 (379)	14100 (378)	
25 (1,7)		2540 (68)	5740 (154)	9940 (266)	13400 (359)	15990 (429)	15870 (425)	
30 (2,1)		2890 (77)	6580 (176)	11440 (307)	14810 (397)	17850 (478)	17640 (473)	
40 (2,8)		3530 (95)	8120 (218)	14120 (378)	17640 (473)	18630 (499)	18920 (507)	
50 (3,4)		4180 (112)	9600 (257)	16700 (448)	18110 (485)	19400 (520)	16400 (440)	
60 (4,1)		4820 (129)	11090 (297)	17200 (461)	18580 (498)	20170 (541)	16600 (445)	
80 (5,5)		6110 (164)	14050 (377)	16950 (454)	17810 (477)	15750 (422)	17600 (472)	
100 (6,9)		7400 (198)	17020 (456)	15350 (411)	15900 (426)	15950 (427)		
125 (8,6)		9020 (242)	20730 (556)	16740 (449)	16270 (436)			
150 (10,3)		6790 (182)	6790 (182)	6830 (183)	5800 (155)			
175 (12,1)		6200 (166)	5600 (150)	5700 (153)				
6 to 16 psig (0,41 to 1,10 bar) 15 psig (1,03 bar) ±1% psia (bar) T13600T0012 Red		20 (1,4)	1750 (47)	3620 (97)	6290 (169)	11380 (305)	114450 (3067)	14980 (401)
		25 (1,7)	2360 (63)	5220 (140)	9070 (243)	13590 (364)	17440 (467)	17430 (467)
	30 (2,1)	2820 (76)	6290 (169)	10940 (293)	15810 (424)	20430 (548)	19910 (534)	
	40 (2,8)	3540 (95)	8070 (216)	14020 (376)	20230 (542)	21610 (579)	21220 (569)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	20820 (558)	22800 (611)	20500 (549)	
	60 (4,1)	4820 (129)	11090 (297)	18110 (485)	21410 (574)	23890 (640)	21600 (579)	
	80 (5,5)	6110 (164)	14050 (377)	19910 (534)	22000 (590)	19500 (523)	19900 (533)	
	100 (6,9)	7400 (198)	17020 (456)	21710 (582)	22600 (606)	22200 (595)		
	125 (8,6)	9020 (242)	20730 (556)	23960 (642)	23190 (621)			
	150 (10,3)	10630 (285)	24440 (655)	26210 (702)	21200 (568)			
	175 (12,1)	7400 (198)	6750 (181)	7100 (190)				
	16 to 35 psig (1,10 to 2,41 bar) 20 psig (1,38 bar) ±1% psia (bar) T13771T0012 Zinc	25 (1,7)	1920 (51)	3930 (105)	6840 (183)	12840 (344)	15670 (420)	16320 (437)
		30 (2,1)	2580 (69)	5690 (152)	9870 (265)	15200 (407)	20740 (556)	20760 (556)
		40 (2,8)	3480 (93)	7830 (210)	13610 (365)	22820 (612)	24600 (659)	23510 (630)
50 (3,4)		4180 (112)	9550 (256)	16610 (445)	20950 (561)	23620 (633)	22200 (595)	
60 (4,1)		4820 (129)	11090 (297)	18080 (485)	23330 (625)	26120 (700)	25000 (670)	
80 (5,5)		6110 (164)	14050 (377)	20980 (562)	25120 (673)	24500 (657)	24900 (667)	
100 (6,9)		7400 (198)	17020 (456)	23680 (635)	26930 (722)	26200 (702)		
125 (8,6)		9020 (242)	20730 (556)	26980 (723)	28020 (751)			
150 (10,3)		10630 (285)	24440 (655)	30280 (812)	21600 (579)			
175 (12,1)		7500 (201)	8200 (220)	8600 (230)				

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Table 5. Flow Capacities for 1-1/2-inch (DN 40) Internal Registration (continued)

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND SPRING COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS					
		Orifice Size, Inches (mm)					
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	1 (25,4)	1-3/16 (30,2)
16 to 35 psig (1,10 to 2,41 bar) 25 psig (1,72 bar) ±1% psia (bar) T13771T0012 Zinc	30 (2,1)	2070 (55)	4230 (113)	7360 (197)	14300 (383)	16880 (452)	17700 (474)
	40 (2,8)	3320 (89)	7350 (197)	12780 (343)	16810 (451)	24040 (644)	24090 (646)
	50 (3,4)	4140 (111)	9340 (250)	16250 (436)	21090 (565)	24430 (655)	23500 (630)
	60 (4,1)	4830 (129)	11030 (296)	18050 (484)	25240 (676)	28260 (757)	27400 (734)
	80 (5,5)	6110 (164)	14050 (377)	22050 (591)	28250 (757)	30200 (809)	28500 (764)
	100 (6,9)	7400 (198)	17020 (456)	25650 (687)	31260 (838)	27000 (724)	
	125 (8,6)	9020 (242)	20730 (556)	30000 (804)	32840 (880)		
	150 (10,3)	10630 (285)	24440 (655)	34360 (921)	27000 (724)		
16 to 35 psig (1,10 to 2,41 bar) 30 psig (2,07 bar) ±1% psia (bar) T13771T0012 Zinc	40 (2,8)	2980 (80)	6520 (175)	11330 (304)	15750 (422)	18100 (485)	19080 (511)
	50 (3,4)	4020 (108)	8950 (240)	15560 (417)	21220 (569)	25240 (676)	22500 (603)
	60 (4,1)	4800 (129)	10850 (291)	18020 (483)	27150 (728)	30390 (814)	28000 (750)
	80 (5,5)	6110 (164)	14050 (377)	23130 (620)	31370 (841)	30500 (817)	32300 (866)
	100 (6,9)	7400 (198)	17020 (456)	27630 (740)	35690 (956)	32500 (871)	
	125 (8,6)	9020 (242)	20730 (556)	33030 (885)	37670 (1010)		
	150 (10,3)	10630 (285)	24440 (655)	38430 (1030)	32000 (858)		
	175 (12,1)	10600 (284)	24500 (657)	31500 (844)			
16 to 35 psig (1,10 to 2,41 bar) 35 psig (2,41 bar) ±1% psia (bar) T13771T0012 Zinc	40 (2,8)	2350 (63)	4790 (128)	8330 (223)	13640 (366)	19570 (524)	20850 (559)
	50 (3,4)	3770 (101)	8300 (222)	14430 (387)	21350 (572)	26060 (698)	22000 (590)
	60 (4,1)	4700 (126)	10510 (282)	18270 (490)	29060 (779)	32530 (872)	29000 (777)
	80 (5,5)	6120 (164)	14000 (375)	24350 (653)	34490 (924)	34500 (925)	33600 (900)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	39920 (1070)	38200 (1024)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	42500 (1139)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	32100 (860)		
	175 (12,1)	10900 (292)	24800 (665)	37000 (992)			
35 to 60 psig (2,41 to 4,14 bar) 40 psig (2,76 bar) ±1% psia (bar) T14096T0012 Green	50 (3,4)	2400 (64)	6000 (161)	10000 (268)	14000 (375)	20000 (536)	20000 (536)
	60 (4,1)	3470 (93)	8000 (214)	13670 (366)	22000 (590)	26000 (697)	22667 (607)
	80 (5,5)	5600 (150)	12000 (322)	21000 (563)	38000 (1018)	30000 (804)	28000 (750)
	100 (6,9)	6400 (172)	14500 (389)	27000 (724)	38000 (1018)	34000 (911)	
	125 (8,6)	7600 (204)	19500 (523)	33000 (884)	38000 (1018)		
	150 (10,3)	9500 (255)	22750 (610)	37000 (992)	42000 (1126)		
	175 (12,1)	11400 (306)	26000 (697)	41000 (1099)			
	175 (12,1)	11400 (306)	26000 (697)	41000 (1099)			
35 to 60 psig (2,41 to 4,14 bar) 50 psig (3,45 bar) ±1% psia (bar) T14096T0012 Green	60 (4,1)	3000 (80)	6500 (174)	9500 (255)	16250 (436)	22500 (603)	25000 (670)
	80 (5,5)	5250 (141)	10750 (288)	17750 (476)	28750 (771)	31250 (838)	32500 (871)
	100 (6,9)	6750 (181)	15000 (402)	26000 (697)	41250 (1106)	40000 (1072)	
	125 (8,6)	8250 (221)	17500 (469)	32500 (871)	43750 (1173)		
	150 (10,3)	9500 (255)	21750 (583)	37750 (1012)	46250 (1240)		
	175 (12,1)	10750 (288)	26000 (697)	43000 (1152)			
	175 (12,1)	10750 (288)	26000 (697)	43000 (1152)			
	175 (12,1)	10750 (288)	26000 (697)	43000 (1152)			
35 to 60 psig (2,41 to 4,14 bar) 60 psig (4,14 bar) ±1% psia (bar) T14096T0012 Green	80 (5,5)	2750 (74)	7200 (193)	13000 (348)	18750 (503)	27500 (737)	32500 (871)
	100 (6,9)	2750 (74)	10600 (284)	15500 (415)	25000 (670)	40000 (1072)	
	125 (8,6)	3250 (87)	3000 (80)	22000 (590)	46250 (1240)		
	150 (10,3)	3130 (84)	2900 (78)	18000 (482)	11250 (302)		
	175 (12,1)	3000 (80)	2800 (75)	14000 (375)			
	175 (12,1)	3000 (80)	2800 (75)	14000 (375)			
	175 (12,1)	3000 (80)	2800 (75)	14000 (375)			
	175 (12,1)	3000 (80)	2800 (75)	14000 (375)			

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Bulletin 71.2:299H

Table 6. Flow Capacities for 2-inch (DN 50) Internal Registration

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND SPRING COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS					
		Orifice Size, Inches (mm)					
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	1 (25,4)	1-3/16 (30,2)
3.5 to 6-inches w.c. (8,8 to 15 mbar)	2 (0,14)	760 (20)	1560 (42)	2700 (72)	4050 (109)	5740 (154)	6350 (170)
	5 (0,34)	1200 (32)	2600 (70)	4500 (121)	8600 (230)	11500 (308)	12000 (322)
	10 (0,69)	1700 (46)	3800 (102)	6500 (174)	9500 (255)	14750 (395)	17000 (456)
	15 (1,0)	2000 (54)	4600 (123)	8000 (214)	10600 (284)	18000 (482)	15500 (415)
3.5-inches w.c. (8,8 mbar)	20 (1,4)	2350 (63)	5300 (142)	9250 (248)	11400 (306)	19700 (528)	16000 (429)
	25 (1,7)	2700 (72)	6000 (161)	10500 (281)	12200 (327)	20400 (547)	17300 (464)
	30 (2,1)	3030 (81)	6730 (180)	11500 (308)	14630 (392)	21100 (565)	18600 (498)
+2 -1-inches w.c. (+0,50 -0,25 mbar)	40 (2,8)	3700 (99)	8200 (220)	13500 (362)	19500 (523)	20400 (547)	21800 (584)
	T13707T0012 Black	50 (3,4)	4400 (118)	9700 (260)	17000 (456)	20000 (536)	19700 (528)
60 (4,1)		5100 (137)	11200 (300)	20500 (549)	20500 (549)	14833 (398)	12500 (335)
80 (5,5)		4700 (126)	7500 (201)	12750 (342)	19600 (525)	5100 (137)	12000 (322)
100 (6,9)		4300 (115)	3800 (102)	5000 (134)	18700 (501)	3500 (94)	
125 (8,6)		4300 (115)	4000 (107)	5500 (147)	11150 (299)		
6 to 9-inches w.c. (15 to 22 mbar)	150 (10,3)	4300 (115)	4000 (107)	6000 (161)	3600 (96)		
	175 (12,1)	4300 (115)	4000 (107)	6500 (174)			
6 to 9-inches w.c. (15 to 22 mbar)	2 (0,14)	750 (20)	1520 (41)	2650 (71)	5380 (144)	6260 (168)	6680 (179)
	5 (0,34)	1300 (35)	2600 (70)	4250 (114)	8500 (228)	10500 (281)	10000 (268)
	10 (0,69)	1600 (43)	3800 (102)	6500 (174)	12500 (335)	14350 (385)	17000 (456)
	15 (1,0)	2000 (54)	4400 (118)	8000 (214)	10500 (281)	18200 (488)	16000 (429)
7-inches w.c. (17,5 mbar)	20 (1,4)	2300 (62)	5100 (137)	9500 (255)	11500 (308)	20600 (552)	16000 (429)
	25 (1,7)	2600 (70)	5800 (155)	11000 (295)	12500 (335)	20500 (549)	17750 (476)
	30 (2,1)	2970 (80)	6600 (177)	11170 (299)	16830 (451)	20400 (547)	19500 (523)
+2 -1-inches w.c. (+0,50 -0,25 mbar)	40 (2,8)	3700 (99)	8200 (220)	11500 (308)	25500 (683)	20200 (541)	20200 (541)
	T13589T0012 Yellow	50 (3,4)	4400 (118)	9700 (260)	15750 (422)	22500 (603)	20000 (536)
60 (4,1)		5100 (137)	11200 (300)	20000 (536)	19500 (523)	14800 (397)	12500 (335)
80 (5,5)		4850 (130)	7350 (197)	12380 (332)	4500 (121)	4400 (118)	12500 (335)
100 (6,9)		4600 (123)	3500 (94)	4750 (127)	4500 (121)	2800 (75)	
125 (8,6)		4600 (123)	4000 (107)	5250 (141)	4500 (121)		
9 to 20-inches w.c. (22 to 49 mbar)	150 (10,3)	4600 (123)	4560 (122)	5750 (154)	4500 (121)		
	175 (12,1)	4600 (123)	5120 (137)	6500 (174)			
9 to 20-inches w.c. (22 to 49 mbar)	2 (0,14)	700 (19)	1430 (38)	2480 (66)	5040 (135)	7440 (199)	8460 (227)
	5 (0,34)	1100 (29)	2200 (59)	4000 (107)	8500 (228)	11800 (316)	12400 (332)
	10 (0,69)	1700 (46)	3600 (96)	6500 (174)	12500 (335)	15850 (425)	17000 (456)
	15 (1,0)	1900 (51)	4600 (123)	8000 (214)	11500 (308)	19900 (533)	17000 (456)
14-inches w.c. (35 mbar)	20 (1,4)	2150 (58)	5300 (142)	8500 (228)	12500 (335)	21000 (563)	19100 (512)
	25 (1,7)	2400 (64)	6000 (161)	9000 (241)	13250 (355)	21150 (567)	19750 (529)
	30 (2,1)	2730 (73)	6730 (180)	10000 (268)	14000 (375)	21300 (571)	20400 (547)
±2-inches w.c. (+0,50 -0,50 mbar)	40 (2,8)	3400 (91)	8200 (220)	12000 (322)	19500 (523)	21150 (567)	21650 (580)
	1N3112X0012 Silver	50 (3,4)	4250 (114)	9700 (260)	13500 (362)	25000 (670)	21000 (563)
60 (4,1)		5100 (137)	11200 (300)	15000 (402)	22050 (591)	16330 (438)	14100 (378)
80 (5,5)		5250 (141)	8200 (220)	10000 (268)	5620 (151)	7000 (188)	12400 (332)
100 (6,9)		5400 (145)	5200 (139)	5000 (134)	6000 (161)	8300 (222)	
125 (8,6)		5400 (145)	5000 (134)	6000 (161)	6000 (161)		
16 to 40-inches w.c. (40 to 99 mbar)	150 (10,3)	5900 (158)	5700 (153)	7000 (188)	6000 (161)		
	175 (12,1)	6400 (172)	6400 (172)	7000 (188)			
16 to 40-inches w.c. (40 to 99 mbar)	5 (0,34)	1200 (32)	2400 (64)	4000 (107)	7500 (201)	9500 (255)	11400 (306)
	10 (0,69)	1600 (43)	3700 (99)	6500 (174)	11750 (315)	14850 (398)	16850 (452)
	15 (1,0)	2000 (54)	4400 (118)	8000 (214)	16000 (429)	20200 (541)	22300 (598)
	20 (1,4)	2300 (62)	5100 (137)	9250 (248)	19000 (509)	24500 (657)	21800 (584)
28-inches w.c. (70 mbar)	25 (1,7)	2600 (70)	5800 (155)	10500 (281)	21750 (583)	25600 (686)	23900 (641)
	30 (2,1)	2800 (75)	6600 (177)	11830 (317)	24500 (657)	25230 (676)	24130 (647)
	40 (2,8)	3200 (86)	8200 (220)	14500 (389)	26750 (717)	24500 (657)	24600 (659)
±4-inches w.c. (+9,95 -9,95 mbar)	50 (3,4)	4100 (110)	9750 (261)	16500 (442)	29000 (777)	24000 (643)	26000 (697)
	60 (4,1)	5000 (134)	11300 (303)	18500 (496)	24170 (648)	23500 (630)	27200 (729)
1B413727222 Purple	80 (5,5)	6300 (169)	9150 (245)	12880 (345)	14500 (389)	24500 (657)	30000 (804)
	100 (6,9)	7600 (204)	7000 (188)	7250 (194)	14500 (389)	22400 (600)	
	125 (8,6)	9200 (247)	7000 (188)	7380 (198)	14500 (389)		
	150 (10,3)	10700 (287)	9300 (249)	7500 (201)	15500 (415)		
	175 (12,1)	12200 (327)	11600 (311)	15250 (409)			

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Table 6. Flow Capacities for 2-inch (DN 50) Internal Registration (continued)

OUTLET PRESSURE RANGE, SETTING, ACCURACY, SPRING PART NUMBER, AND SPRING COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS						
		Orifice Size, Inches (mm)						
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	1 (25,4)	1-3/16 (30,2)	
1 to 3.25 psig (69 to 224 mbar) 2 psig (138 mbar) ±1% psia (bar) T13593T0012 Light Blue	5 (0,34)	1020 (27)	2100 (56)	3640 (98)	7440 (199)	10980 (294)	13800 (370)	
	10 (0,69)	1550 (42)	3340 (90)	5840 (157)	12040 (323)	15460 (414)	17710 (475)	
	15 (1,0)	1920 (51)	4360 (117)	7580 (203)	15990 (429)	20900 (560)	20670 (554)	
	20 (1,4)	2240 (60)	5150 (138)	8960 (240)	19250 (516)	22470 (602)	21620 (579)	
	25 (1,7)	2670 (72)	5890 (158)	10250 (275)	22030 (590)	24000 (643)	22410 (601)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	27800 (745)	24860 (666)	24170 (648)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	27070 (725)	25640 (687)	26160 (701)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	28970 (776)	26390 (707)	26900 (721)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	25770 (691)	26000 (697)	29000 (777)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	25500 (683)	12800 (343)	30000 (804)	
	100 (6,9)	7400 (198)	17020 (456)	29840 (800)	14260 (382)	28300 (758)		
		125 (8,6)	8170 (219)	12360 (331)	17520 (470)	13260 (355)		
	150 (10,3)	8450 (226)	13750 (369)	18580 (498)	17000 (456)			
	175 (12,1)	12400 (332)	7100 (190)	20000 (536)				
3.25 to 6 psig (224 to 414 mbar) 5 psig (345 mbar) ±1% psia (bar) T13671T0012 Orange	10 (0,69)	1390 (37)	2910 (78)	5050 (135)	10350 (277)	13200 (354)	16070 (431)	
	15 (1,0)	1870 (50)	4190 (112)	7280 (195)	15150 (406)	21850 (586)	21370 (573)	
	20 (1,4)	2240 (60)	5090 (136)	8850 (237)	18640 (500)	21350 (572)	21390 (573)	
	25 (1,7)	2570 (69)	5890 (158)	10250 (275)	21260 (570)	24540 (658)	22740 (609)	
	30 (2,1)	2890 (77)	6640 (178)	11540 (309)	24340 (652)	26500 (710)	25870 (693)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	27670 (742)	28300 (758)	28930 (775)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	30570 (819)	29870 (801)	30000 (804)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	29390 (788)	30390 (814)	31000 (831)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	31410 (842)	28000 (750)	34000 (911)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	22150 (594)	32000 (858)		
		125 (8,6)	9020 (242)	20730 (556)	36050 (966)	21590 (579)		
		150 (10,3)	10630 (285)	17170 (460)	26560 (712)	17000 (456)		
	175 (12,1)	11800 (316)	15400 (413)	21500 (576)				
6 to 16 psig (0,41 to 1,10 bar) 10 psig (0,69 bar) ±1% psia (bar) T13600T0012 Red	15 (1,0)	1580 (42)	3280 (88)	5690 (152)	11640 (312)	15420 (413)	18340 (492)	
	20 (1,4)	2130 (57)	4720 (126)	8210 (220)	17000 (456)	19500 (523)	21000 (563)	
	25 (1,7)	2540 (68)	5740 (154)	9940 (266)	20790 (557)	25440 (682)	23290 (624)	
	30 (2,1)	2890 (77)	6580 (176)	11440 (307)	24150 (647)	29250 (784)	28700 (769)	
	40 (2,8)	3530 (95)	8120 (218)	14120 (378)	28660 (768)	32780 (879)	33540 (899)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	33230 (891)	35680 (956)	33100 (887)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	35410 (949)	37700 (1010)	33100 (887)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	41270 (1106)	38000 (1018)	37000 (992)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	35310 (946)	35000 (938)		
		125 (8,6)	9020 (242)	20730 (556)	36050 (966)	35740 (958)		
		150 (10,3)	10630 (285)	20590 (552)	34530 (925)	22000 (590)		
		175 (12,1)	11200 (300)	18100 (485)	25000 (670)			
6 to 16 psig (0,41 to 1,10 bar) 15 psig (1,03 bar) ±1% psia (bar) T13600T0012 Red	20 (1,4)	1750 (47)	3620 (97)	6290 (169)	12830 (344)	17640 (473)	20640 (553)	
	25 (1,7)	2360 (63)	5220 (140)	9070 (243)	18700 (501)	26350 (706)	23850 (639)	
	30 (2,1)	2820 (76)	6290 (169)	10940 (293)	22790 (611)	31990 (857)	31540 (845)	
	40 (2,8)	3540 (95)	8070 (216)	14020 (376)	29650 (795)	37270 (999)	38150 (1022)	
	50 (3,4)	4180 (112)	9600 (257)	16700 (448)	35890 (962)	41490 (1112)	43000 (1152)	
	60 (4,1)	4820 (129)	11090 (297)	19280 (517)	41440 (1111)	45020 (1207)	39000 (1045)	
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	51120 (1370)	49000 (1313)	43000 (1152)	
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	48470 (1299)	46000 (1233)		
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	49780 (1334)			
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	60000 (1608)			
	175 (12,1)	11800 (316)	27400 (734)	48000 (1286)				
	16 to 35 psig (1,10 to 2,41 bar) 20 psig (1,38 bar) ±1% psia (bar) T13771T0012 Zinc	25 (1,7)	1920 (51)	3930 (105)	6840 (183)	13930 (373)	20800 (557)	21940 (588)
30 (2,1)		2580 (69)	5680 (152)	9870 (265)	20280 (544)	30630 (821)	32630 (874)	
40 (2,7)		3480 (93)	7830 (210)	13610 (365)	28440 (762)	33040 (885)	35700 (957)	
50 (3,4)		4180 (112)	9550 (256)	16610 (445)	35140 (942)	41800 (1120)	40520 (1086)	
60 (4,1)		4820 (129)	11090 (297)	19280 (517)	41440 (1111)	47530 (1274)	40520 (1086)	
80 (5,5)		6110 (164)	14050 (377)	24440 (655)	51240 (1373)	41800 (1120)	41000 (1099)	
100 (6,9)		7400 (198)	17020 (456)	29600 (793)	52260 (1401)	41800 (1120)		
125 (8,6)		9020 (242)	20730 (556)	36050 (966)	56710 (1520)			
150 (10,3)		10630 (285)	24440 (655)	42500 (1139)	65000 (1742)			
175 (12,1)		11600 (311)	26300 (705)	47000 (1260)				

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

Bulletin 71.2:299H

Table 6. Flow Capacities for 2-inch (DN 50) Internal Registration (continued)

OUTLET PRESSURE RANGE, SETTING, SPRING PART NUMBER, AND SPRING COLOR	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (m ³ /h(n)) OF 0.6 SPECIFIC GRAVITY NATURAL GAS					
		Orifice Size, Inches (mm)					
		1/4 x 3/8 (6,4 x 9,5)	3/8 (9,5)	1/2 (12,7)	3/4 (19,1)	1 (25,4)	1-3/16 (30,2)
16 to 35 psig (1.10 to 2.41 bar) 25 psig (1.72 bar) +/- 1% psia T13771T0012 Zinc	30 (2,1)	2070 (55)	4230 (113)	7360 (197)	14980 (401)	22310 (598)	23270 (624)
	40 (2,8)	3320 (89)	7350 (197)	12780 (343)	23420 (628)	40220 (1078)	33260 (891)
	50 (3,4)	4140 (111)	9340 (250)	16250 (436)	34040 (912)	42110 (1129)	50000 (1340)
	60 (4,1)	4830 (129)	11030 (296)	19190 (514)	40630 (1089)	50050 (1341)	54000 (1447)
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	51360 (1376)	62000 (1662)	60000 (1608)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	56050 (1502)	60000 (1608)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	63640 (1706)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	77000 (2064)		
175 (12,1)	11000 (295)	26500 (710)	46000 (1233)				
16 to 35 psig (1.10 to 2.41 bar) 30 psig (2.07 bar) +/- 1% psia T13771T0012 Zinc	40 (2,8)	2980 (80)	6520 (175)	11330 (304)	23190 (621)	24580 (659)	30810 (826)
	50 (3,4)	4020 (108)	8950 (240)	15560 (417)	32300 (866)	42430 (1137)	50000 (1340)
	60 (4,1)	4800 (129)	10850 (291)	18870 (506)	39600 (1061)	52560 (1409)	54000 (1447)
	80 (5,5)	6110 (164)	14050 (377)	24440 (655)	51480 (1380)	72000 (1930)	72000 (1930)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	59840 (1604)	76000 (2037)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	70570 (1891)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	84000 (2251)		
	175 (12,1)	10200 (273)	25000 (670)	48000 (1286)			
16 to 35 psig (1.10 to 2.41 bar) 35 psig (2.41 bar) +/- 1% psia T13771T0012 Zinc	40 (2,8)	2350 (63)	4790 (128)	8330 (223)	16920 (453)	20350 (545)	28360 (760)
	50 (3,4)	3770 (101)	8300 (222)	14430 (387)	29690 (796)	42740 (1145)	48000 (1286)
	60 (4,1)	4700 (126)	10510 (282)	18270 (490)	38050 (1020)	55080 (1476)	60000 (1608)
	80 (5,5)	6120 (164)	14000 (375)	24350 (653)	51600 (1383)	70000 (1876)	74000 (1983)
	100 (6,9)	7400 (198)	17020 (456)	29600 (793)	63630 (1705)	76000 (2037)	
	125 (8,6)	9020 (242)	20730 (556)	36050 (966)	77500 (2077)		
	150 (10,3)	10630 (285)	24440 (655)	42500 (1139)	87000 (2332)		
	175 (12,1)	11200 (300)	25500 (683)	49000 (1313)			
35 to 60 psig (2.41 to 4.14 bar) 40 psig (2.76 bar) +/- 1% psia T14096T0012 Green	50 (3,4)	1600 (43)	6500 (174)	9000 (241)	20000 (536)	28000 (750)	34000 (911)
	60 (4,1)	2800 (75)	8170 (219)	17000 (456)	33000 (884)	48000 (1286)	52000 (1394)
	80 (5,5)	5200 (139)	11500 (308)	23000 (616)	48000 (1286)	66000 (1769)	68000 (1822)
	100 (6,9)	7600 (204)	13500 (362)	29000 (777)	31000 (831)	76000 (2037)	
	125 (8,6)	8200 (220)	19000 (509)	35000 (938)	76000 (2037)		
	150 (10,3)	9800 (263)	22750 (610)	42000 (1126)	91000 (2439)		
	175 (12,1)	11400 (306)	26500 (710)	47000 (1260)			
	175 (12,1)	11400 (306)	26500 (710)	47000 (1260)			
35 to 60 psig (2,41 to 4,14 bar) 50 psig (3,45 bar) +/- 1% psia T14096T0012 Green	60 (4,1)	3400 (91)	7000 (188)	10000 (268)	21000 (563)	32000 (858)	45000 (1206)
	80 (5,5)	5800 (155)	11000 (295)	21000 (563)	45000 (1206)	69000 (1849)	74000 (1983)
	100 (6,9)	6200 (166)	15000 (402)	26000 (697)	59000 (1581)	88000 (2358)	
	125 (8,6)	8400 (225)	19500 (523)	35000 (938)	77000 (2064)		
	150 (10,3)	9600 (257)	23000 (616)	42000 (1126)	89000 (2385)		
	175 (12,1)	10800 (289)	26500 (710)	49000 (1313)			
	175 (12,1)	10800 (289)	26500 (710)	49000 (1313)			
	175 (12,1)	10800 (289)	26500 (710)	49000 (1313)			
35 to 60 psig (2,41 to 4,14 bar) 60 psig (4,14 bar) +/- 1% psia T14096T0012 Green	80 (5,5)	2800 (75)	3500 (94)	17000 (456)	36000 (965)	52000 (1394)	53000 (1420)
	100 (6,9)	3600 (96)	9500 (255)	23000 (616)	50000 (1340)	64000 (1715)	
	125 (8,6)	2800 (75)	15000 (402)	22000 (590)	69000 (1849)	90000 (2412)	
	150 (10,3)	4600 (123)	11000 (295)	18000 (482)	89000 (2385)		
	175 (12,1)	6400 (172)	7000 (188)	18000 (482)			
	175 (12,1)	6400 (172)	7000 (188)	18000 (482)			
	175 (12,1)	6400 (172)	7000 (188)	18000 (482)			
	175 (12,1)	6400 (172)	7000 (188)	18000 (482)			

1. Downstream piping may effect actual capacity. It may be necessary to use enlarged downstream piping to obtain published capacities.

DIMENSION	END CONNECTION STYLE AND FACE-TO-FACE DIMENSION, INCHES (mm)						
	NPT	125 FF ⁽¹⁾	125 FF	150 RF	250 RF	300 RF	PN 10 or 16
A	6.12 (155)	7.50 (191)	10.00 (254)	10.00 (254)	10.50 (267)	10.50 (267)	9.06 (230)

1. Available in cast iron only.

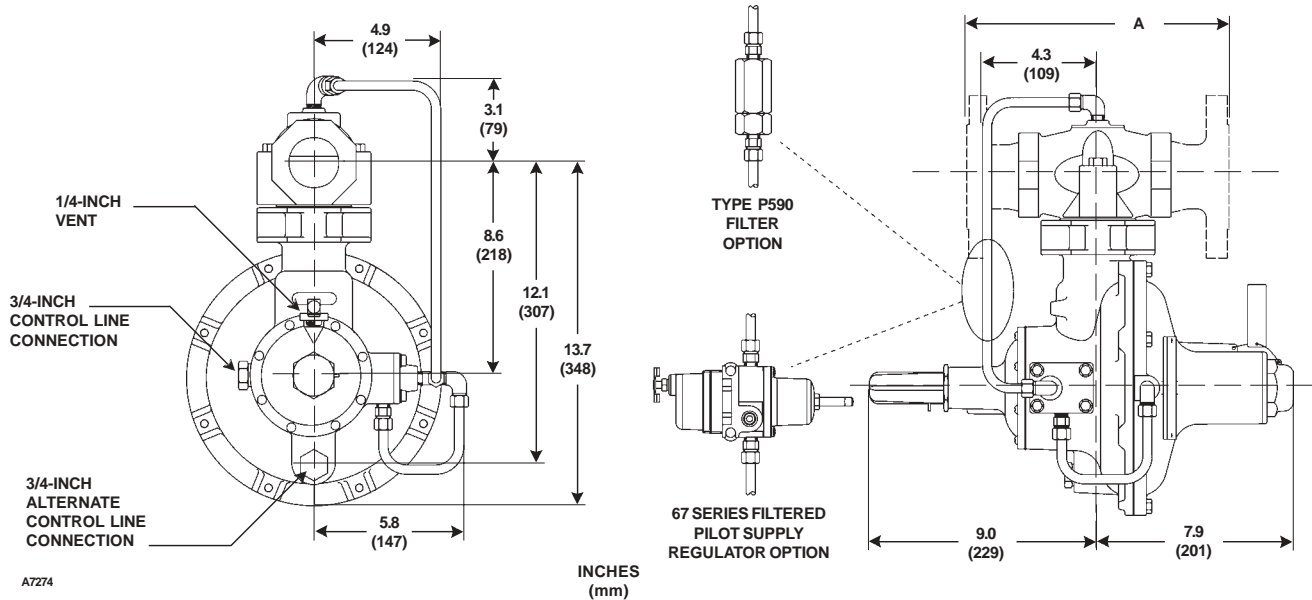


Figure 6. Dimensions

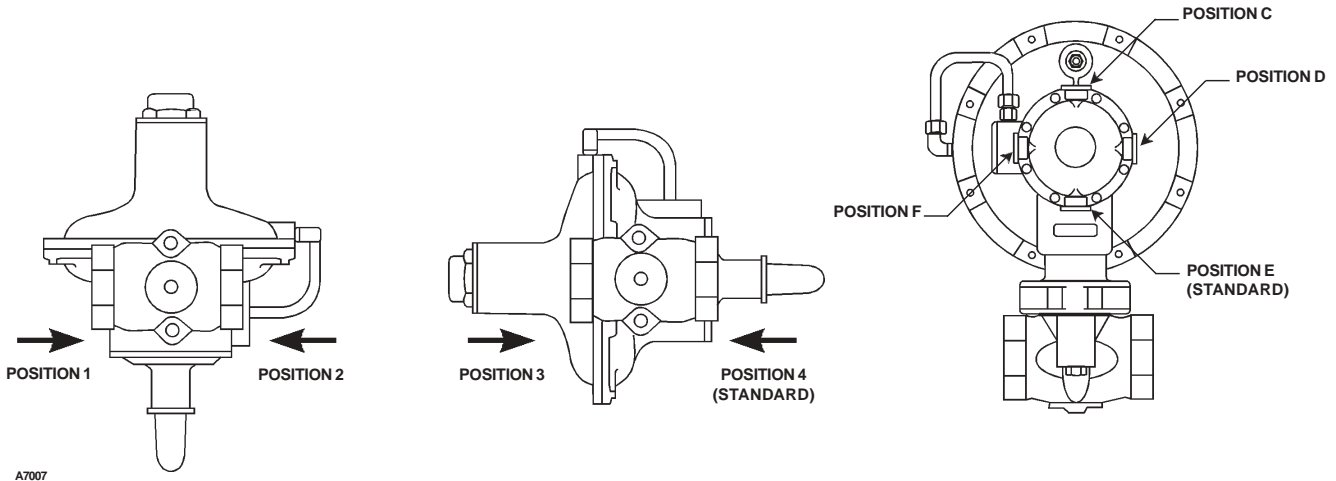


Figure 7. Body and Vent Positions

Installation

Although the actuator and pilot can be mounted in 90° increments relative to the body, the normal installation is with the body in a horizontal run of pipe and the pilot hanging vertically from the bottom of the actuator.

Control and vent lines necessary for installation are not supplied with a Type 299H regulator. Control and vent connection locations are shown in figure 6. In many instances good piping practice will require that outlet piping be swaged up above the body size to

prevent excessive pressure drop along the outlet line. The piping should be expanded as close to the regulator outlet as possible.

Ordering Information

To order, complete the Ordering Guide on page 20. Carefully review the Specifications section on page 4, specify the desired selection whenever there is a choice to be made.

Bulletin 71.2:299H

299H Series Ordering Guide

Type (Select One)

- Type 299H***
- Type 299HR***

Body Size, Material, and End Connection Style (Select One)

1-1/4-inch (DN 32)

- Cast iron, NPT ***

1-1/2-inch (DN 40)

- Cast iron, NPT***
- Ductile iron, NPT***
- Steel, NPT***

2-inch (DN 50)

Cast Iron

- NPT***
- ANSI Class 125 FF - 7.5-inches (191 mm)***
- ANSI Class 125 FF - 10-inches (254 mm)***
- ANSI Class 250 RF***

Ductile Iron

- NPT***
- ANSI Class 125 FF - 10-inches (254 mm)***
- ANSI Class 250 RF***
- PN 10 RF*
- PN 16 RF*

Steel

- NPT***
- ANSI Class 150 RF***
- ANSI Class 300 RF***
- PN 16 RF*

Orifice Size (Select One)

- 1/4 x 3/8-inch (6,4 x 9,5 mm)***
- 3/8-inch (9,5 mm)***
- 1/2-inch (12,7 mm)***
- 3/4-inch (19,1 mm)***
- 7/8-inch (22,2 mm)***
- 1-inch (25,4 mm)***
- 1-3/16-inch (30,2 mm)***

Fisher Regulators Quick Order Guide

***	Standard - Readily Available for Shipment
**	Non-Standard - Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult Your Fisher Sales Representative for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Outlet Pressure Range (Select One)

- 3.5 to 6-inches w.c. (9 to 15 mbar)***
- 6 to 9-inches w.c. (15 to 22 mbar)***
- 9 to 20-inches w.c. (22 to 49 mbar)***
- 16 to 40-inches w.c. (40 to 99 mbar)***
- 1 to 3.25 psig (0,069 to 0,22 bar)***
- 3.25 to 6 psig (0,22 to 0,41 bar)***
- 6 to 16 psig (0,34 to 1,10 bar)***
- 16 to 35 psig (1,10 to 2,4 bar)***
- 35 to 60 psig (2,41 to 4,14 bar)***

Fixed Restriction (Select One)

- 0.044-inch (1,12 mm), red **standard** gain***
- 0.071-inch (1,80 mm), green **low** gain***
- 0.082-inch (2,08 mm), blue **lower** gain***

Type P590 Pilot Supply Filter (Optional)

- Yes, please add a Type P590 to this order.

67 Series Filtered Pilot Supply Regulator (Optional)

- Yes, please add a 67 Series regulator to this order.

Main Valve Parts Kit (Optional)

- Yes, please send one parts kit to match this order.

Pilot Parts Kit (Optional)

- Yes, please send one parts kit to match this order.

Specification Worksheet

Application (Please designate units):

Specific Use _____
 Line Size _____
 Gas Type and Specific Gravity _____
 Gas Temperature _____
 Does the Application Require Overpressure Protection?
 No Yes, if so, which is preferred:
 Relief Valve Monitor Regulator Shutoff Device
 Is overpressure protection equipment selection assistance desired? _____

Pressure (Please designate units):

Maximum Inlet Pressure (P_{1max}) _____
 Minimum Inlet Pressure (P_{1min}) _____
 Downstream Pressure Setting(s) (P_2) _____
 Maximum Flow (Q_{max}) _____

Performance Required:

Accuracy Requirements? _____
 Need for Extremely Fast Response? _____

Other Requirements:

©Fisher Controls International, Inc., 1999; All Rights Reserved

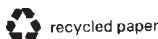
Fisher and Fisher Regulators are marks owned by Fisher Controls International, Inc. The Emerson logo is a trade mark and service mark of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

For information, contact Fisher Controls:

Marshalltown, Iowa 50158 USA
 28320 Gallardon, France
 Sao Paulo 05424 Brazil
 Singapore 128461

Printed in U.S.A.



www.FISHERregulators.com

