

HONEYWELL AMERICAN METER COMPANY 1800/2000

Large Volume Regulator

Brief information

Application: The 1800 and 2000 Series regulators are suitable for a wide range of large volume usage in commercial, industrial, and gas utility distribution station applications. All units are designed for natural, propane vapor, air, nitrogen, carbon dioxide, and other non-corrosive gases. The 1800 and 2000 Series can be installed in both horizontal and vertical pipelines.

Control: A comprehensive range of springs is available, as described overleaf. The outlet pressure can be easily and accurately adjusted by turning the spring adjustment unit located under the top cap. The 1800 Series can be ordered as Full Relief, Partial Relief or No Relief. 2000 Series Regulators are non-relieving. Both models are available with Over- pressure Shut off, Underpressure Shut off and monitor capabilities.

The design of this mechanism provides virtually frictionless adjustment and eliminates "spring wind up". The complete spring adjustment mechanism can be removed easily for maintenance and spring changes.

Technical Data:

Inlet Pressures up to 150 PSIG

Outlet Pressures: 1800 Series 3.5" W.C. to 5 PSIG.

2000 Series 0.5 PSIG to 15 PSIG.

Worker/Monitor: Commonly used to provide overpressure protection. A worker/monitor installation consists of a monitor with an external static connection and a worker with an internal static connection. The regulator selected to be the monitor is set at 2" to 5" W.C. above the worker. The external static connection is connected at a point free of turbulence and preferably a minimum of five pipe diameters downstream.

Four industrial monitor regulators are offered: the 1803M, 2003M, 1883M although all models can be configured as Monitor Regulators. All models are pre-machined to accept a monitor conversion kit.

When a regulator with an OPSO is converted to a monitor, a sense line must extend down- stream of the worker, as shown in the diagram below.

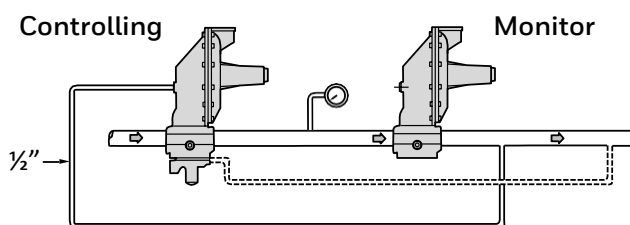


FEATURES & BENEFITS

- Sizes 1¼", 1½" and 2" screwed and 50mm flanged.
- Temperature range: -20°F to +140°F
- Threaded connections to NPT, BS EN 10226 (ISO 7) or. Flanged to ANSI or BS EN 1092-2 NP16
- Inlet and outlet pressure taps
- Spring loaded
- Excellent outlet pressure control

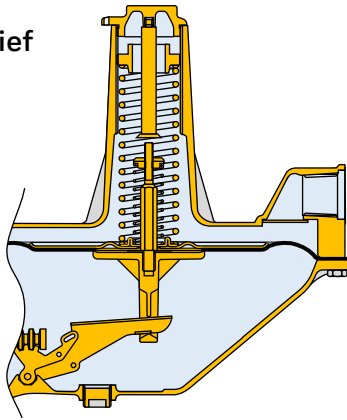
Options

- Full or partial relief valve
- Over pressure slam shut
- Under pressure slam shut
- Monitor version with external impulse on regulator and slam shut.

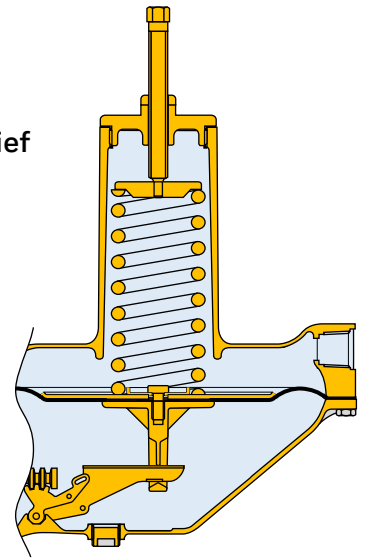


Regulator Models

1813 Partial Relief



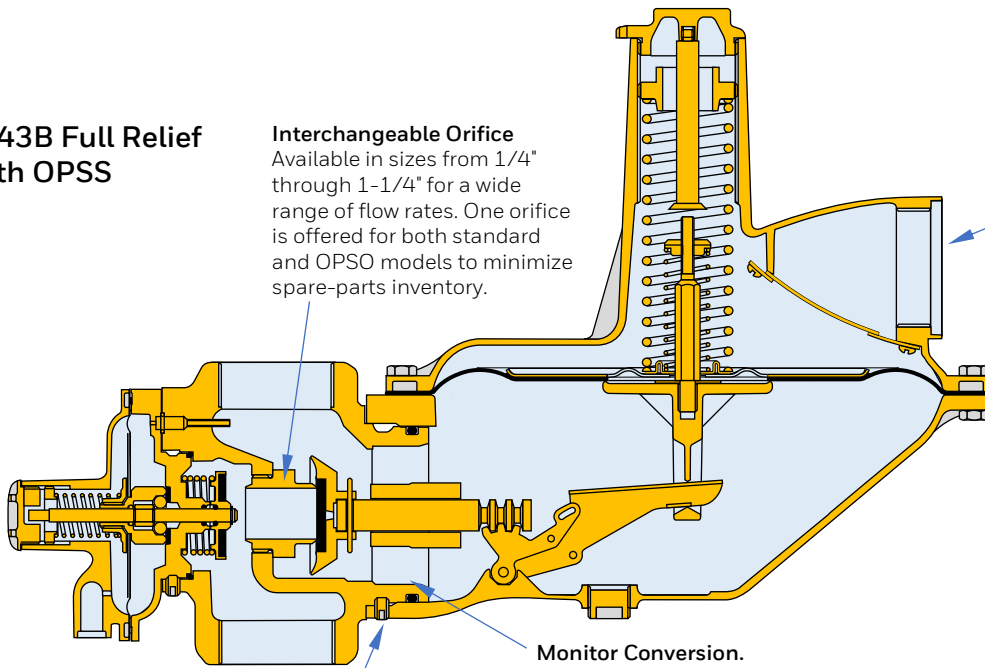
2003 No Relief



1843B Full Relief With OPSS

Interchangeable Orifice
Available in sizes from 1/4" through 1-1/4" for a wide range of flow rates. One orifice is offered for both standard and OPSO models to minimize spare-parts inventory.

Relief Vent
A 2" vent for Full Relief overpressure protection in three models, such as the 1813B. Partial Relief has 1" vent and 2000 Series has 3/4". See page 10 for relief performances.



Maintenance
Three setscrews hold diaphragm case to the valve head, providing the easiest orifice and seat disc inspection in the industry.

Monitor Conversion.
The body and valve head are pre-machined to allow easy conversion to a monitor model. See page 1 for more information.

OPSS.

Overpressure shutoff regulator models prevent excessive gas pressure from entering a building causing a hazardous condition. The shutoff device closes if the regulator outlet pressure rises above a maximum set point or set pressure

OPSS Operation.

When line or static pressure increases to the specified overpressure shutoff setting, the pressure on the underside of the shutoff diaphragm over-balances the spring, forcing the diaphragm stem outward, releasing the plunger. This permits the shutoff spring to force the shut-off disc against the orifice, closing off gas flow. The OPSO assembly is part of the regulator but is not connected to the regulator operating mechanism.

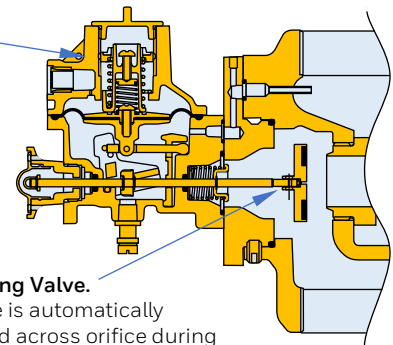
When selecting a shutoff spring, a minimum differential of 14" W.C. between normal operating pressures and the shutoff pressure setting should be provided.

To reset the overpressure shutoff device, unscrew the seal cap, which opens the regulator orifice, permitting gas flow. Pull out on the seal cap until the overpressure shutoff device latches completely. Tighten the seal cap.

Do not trip the shutoff valve unless the seal cap is installed.

USSA with Over Pressure and/or Under Pressure Cut Off

USSA Slam Shut.
Available as OPSS only, UPSS only or OPSS and UPSS.



Equalising Valve.
Pressure is automatically stabilised across orifice during reset for easy operation.

USSA Slam Shut Valve

The Universal Safety Shut-off Assembly (USSA) can be fitted to an AMCO 1800/2000 Industrial Regulator on the inlet side of the valve head. This provides over pressure and/or under pressure protection with immediate shut-off at the regulator inlet. It uses well proven principles to give exceptional consistency of operation and an unrivalled insensitivity to nuisance tripping. The USSA senses downstream regulator pressure through a brass sensing tube (standard models) or is piped to a remote sensing port (monitor versions). In the event of an Overpressure or Underpressure occurrence, there is excess motion of the diaphragm, which causes the USSA mechanism to trip. Shutoff occurs when the spring-loaded seat disc is released to seal off the inlet side of the main regulator orifice.

The OPSS and UPSS loading springs are fitted concentrically and can be adjusted independently.

The USSA is constructed as either OPSS or OPSS/UPSS – UPSS. It is not practicable to convert from one variant to the other.

There is also a special High Pressure OPSS only version for trip pressures above 7 PSIG.

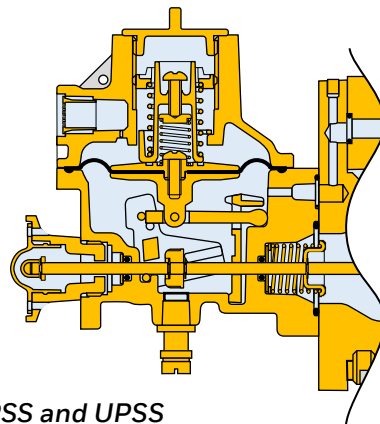
USSA Specifications

Under Pressure Shutoff Assemblies (USSAs) can be fitted to AMCO Industrial Regulators with inlet pressures from 1/2 PSIG to 150 PSIG.

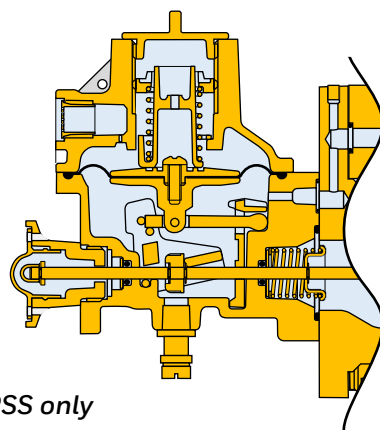
The USSA has the following features:

- Diaphragm Molded Buna N with Sealing Ring Minimum burst pressure >100 psig
- Shutoff Pressures OPSO (7.5" W.C. to 7 PSIG) UPSO (3.0" W.C. to 60" W.C.).
- Repeatability OPSO (< 1% absolute pressure – " W.C. units) (< 1/2% absolute pressure – PSIG units) UPSO (< 2% absolute pressure – all units)
- Response Time Less than one second
- Service Life Type approval of 3000 on/shutoff/reset cycles USSA rated for 20-year average service life
- Temperature Range Operates at -20°F to +140°F
- Optional Equipment
 - Monitor adaptor plate for remote pressure sensing
 - Vent flow limiter (meets EN334 flow limit). Vent bug shield is standard equipment.

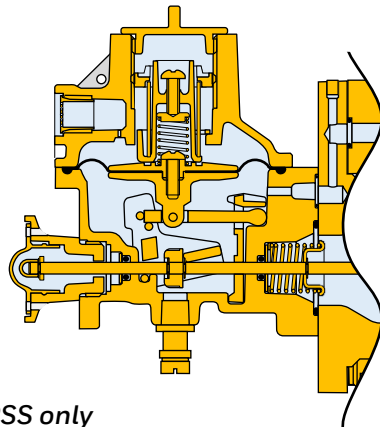
All USSA models have a Green "Flag" Visual Flow Indicator that shows proper Regulator flow. When the OPSO or UPSO trips, the Green Flag is withdrawn into the USSA, showing that the unit needs to be reset.



OPSS and UPSS

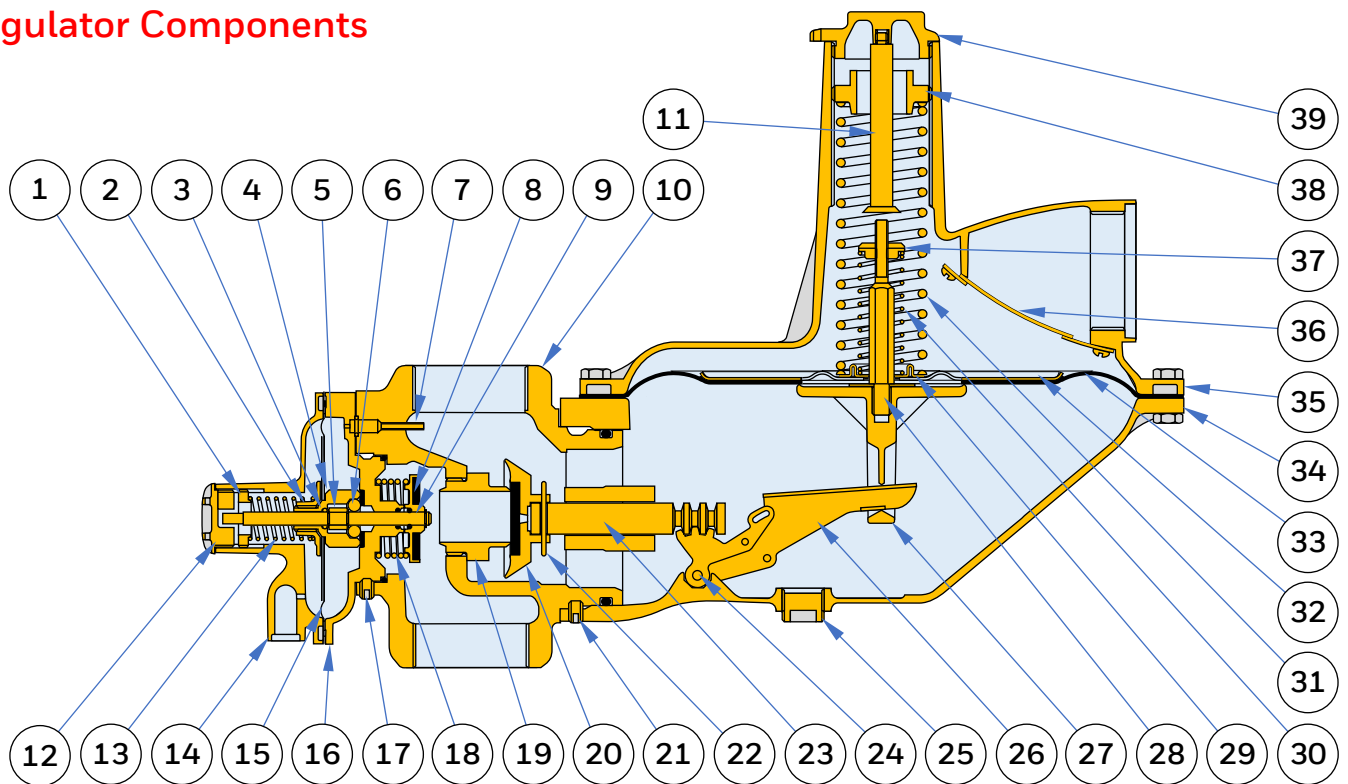


OPSS only



UPSS only

Regulator Components



Item No.	Description	Material	Notes
1	OPSO Pressure Adjuster	Diecast Aluminum	
2	OPSO Diaphragm Nut	Gray Cast Iron	
3	Loading Spring	Spring Steel	
4	OPSO Ball Cage	Steel	
5	Diaphragm Plate	Steel	
6	OPSO Ball		
7	OPSO Impulse Tube		
8	Valve Discs	Buna N	
9	Diaphragm Stop		
10	Valve Body	Gray Cast Iron	
11	Plunger Valve		
12	Regulator Pressure Adjuster		
13	OPSO Loading Spring	Stainless Steel	
14	OPSO Top Cover	Diecast Aluminum	
15	OPSO Diaphragm	Buna N	
16	OPSO Diaphragm Case	Diecast Aluminum	
17	Grub Screw	Steel	
18	OPSO Actuating Spring	Spring Steel	
19	Orifice	Aluminum	
20	Valve Disc Holder	Aluminum	
21	Grub Screw	Steel	
22	Cotter Pin		
23	Valve Spindle	Stainless Steel	
24	Lever Pin	Carbon Steel	
25	Seal Plug		
26	Lever Arm		
27	Relief Valve	Diecast Aluminum	
28	Relief Valve Stem		
29	Bottom Spring Holder	Steel	
30	Relief Valve Spring	Spring Steel	
31	Regulator Loading Spring	Spring Steel	
32	Diaphragm Plate	Steel	
33	Regulator Diaphragm	Buna N	
34	Diaphragm Case	Diecast Aluminum	
35	Top Cover	Diecast Aluminum	
36	Vent Valve		
37	Relief Spring Adjuster		
38	Regulator Loading Spring	Spring Steel	
39	Regulator Top Cap		

1½” Series 1800 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

	Orifice Size								Inlet PSIG (bar)	Orifice Size								
	1¼”	1”	¾”	¾”	½”	¾”	¾”	¼”		1¼”	1”	¾”	¾”	½”	¾”	¼”		
	2,000 (56.6)	1,600 (45.3)	1,300 (36.8)	1,100 (31.1)	900 (25.5)	550 (15.6)			½ (0.03)	1,900 (53.8)	1,550 (43.9)	1,300 (36.8)	1,100 (31.1)	1,000 (28.3)	600 (17.0)			
	2,850 (80.7)	2,300 (65.1)	2,100 (59.5)	1,800 (51.0)	1,400 (39.6)	1,100 (31.1)	750 (21.2)		1 (0.07)	2,750 (77.9)	2,300 (65.1)	1,850 (52.4)	1,800 (51.0)	1,300 (36.8)	1,150 (32.6)	700 (19.8)		
	3,800 (108)	3,250 (92.0)	2,900 (81.2)	2,700 (76.5)	2,000 (56.6)	1,700 (48.1)	1,200 (34.0)		2 (0.14)	3,750 (106)	3,300 (93.4)	2,600 (73.6)	2,600 (73.6)	2,000 (56.6)	1,800 (51.0)	1,100 (31.1)		
	4,500 (127)	3,900 (110)	3,400 (96.3)	3,400 (96.4)	2,500 (70.8)	2,200 (62.3)	1,400 (39.6)		3 (0.21)	4,500 (127)	3,900 (110)	3,300 (93.4)	3,200 (90.6)	2,500 (70.8)	2,100 (59.5)	1,300 (36.8)		
SPRING NO. 71424P017 3.5” to 6” W.C.	5,700 (161)	5,100 (114)	4,400 (125)	4,300 (122)	3,300 (93.4)	2,900 (82.1)	2,000 (56.6)	1,100 (31.1)	5 (0.34)	5,700 (161)	5,100 (114)	4,300 (122)	4,000 (113)	3,400 (96.3)	2,950 (83.5)	1,800 (51.0)	1,000 (28.3)	
Set: 6” W.C. Droop: 1” W.C. Max. Compound: 2” W.C.		7,500 (212)	6,200 (176)	6,100 (173)	4,800 (136)	4,400 (125)	3,000 (84.9)	1,550 (43.9)	10 (0.7)		7,400 (210)	6,300 (178)	6,000 (170)	5,000 (142)	4,400 (125)	3,000 (84.9)	1,600 (45.3)	
		9,100 (258)	7,900 (224)	7,500 (213)	6,200 (176)	5,400 (153)	3,850 (109)	1,900 (53.8)	15 (1.0)		9,150 (259)	7,800 (221)	7,500 (212)	6,300 (178)	5,500 (156)	3,850 (109)	1,900 (53.8)	
			9,200 (260)	8,700 (246)	7,200 (204)	6,300 (178)	4,600 (130)	2,300 (65.1)	20 (1.4)			9,300 (263)	8,600 (243)	7,250 (205)	6,400 (181)	4,550 (129)	2,200 (62.3)	
(8.7 to 15mbar Set: 15mbar Droop: 2.5 mbar Max. Compound: 5mbar)			11,750 (333)	11,100 (314)	9,000 (255)	7,700 (218)	5,900 (167)	2,850 (80.7)	30 (2.0)			11,800 (334)	10,700 (303)	8,900 (252)	8,100 (229)	5,800 (164)	2,800 (79.3)	(13.7 to 20mbar Set: 17.4mbar Droop: 2.5 mbar Max. Compound: 5mbar)
				12,300 (348)	10,800 (306)	9,200 (260)	7,200 (204)	3,400 (96.3)	40 (2.8)				12,300 (348)	11,000 (311)	9,300 (263)	7,150 (202)	3,400 (96.3)	
						12,000 (340)	9,400 (266)	4,500 (127)	60 (4.1)						12,000 (340)	9,400 (266)	4,500 (127)	
								5,850 (165)	80 (5.5)								5,800 (164)	
								7,000 (198)	100 (6.9)								7,000 (198)	
								8,400 (238)	125 (8.6)								8,300 (235)	

	Orifice Size								Inlet PSIG (bar)	Orifice Size								
	1¼”	1”	¾”	¾”	½”	¾”	¾”	¼”		1¼”	1”	¾”	¾”	½”	¾”	¼”		
	2,800 (79.3)	2,300 (65.1)	1,900 (53.8)	1,800 (51.0)	1,300 (36.8)	1,100 (31.1)	750 (21.2)		1 (0.07)	2,550 (72.2)	2,100 (59.5)	1,700 (48.1)	1,500 (42.5)	1,300 (36.8)	1,000 (28.3)	700 (19.8)		
	4,300 (122)	3,500 (99.1)	2,800 (79.3)	2,500 (70.8)	2,000 (56.6)	1,700 (48.1)	1,200 (34.0)		2 (0.14)	3,800 (108)	3,200 (90.6)	2,600 (73.6)	2,400 (68.0)	1,900 (53.8)	1,500 (42.8)	1,000 (28.3)		
	5,800 (164)	4,000 (113)	3,550 (100)	3,200 (90.6)	2,550 (72.2)	2,100 (59.5)	1,400 (39.6)		3 (0.21)	4,750 (134)	4,000 (113)	3,200 (90.6)	3,100 (87.7)	2,500 (70.8)	2,000 (56.6)	1,350 (38.2)		
	6,100 (173)	5,300 (150)	4,500 (127)	4,200 (119)	3,600 (102)	2,800 (79.3)	2,000 (56.6)	1,000 (28.3)	5 (0.34)	5,700 (161)	5,400 (153)	4,400 (125)	4,100 (116)	3,300 (93.4)	2,600 (73.6)	1,800 (51.0)	1,000 (28.3)	
SPRING NO. 71424P019 8.5” to 14” W.C.	8,000 (226)	7,600 (215)	6,600 (187)	6,200 (176)	5,100 (144)	4,300 (122)	2,900 (82.1)	1,500 (42.5)	10 (0.7)	8,200 (232)	7,800 (221)	6,400 (181)	6,100 (173)	4,900 (139)	4,100 (116)	2,800 (79.3)	1,500 (42.5)	
Set: 11” W.C. Droop: 2” W.C.		9,300 (263)	8,100 (229)	7,800 (221)	6,500 (184)	5,400 (153)	3,800 (108)	1,850 (52.4)	15 (1.0)		9,400 (266)	8,000 (226)	7,600 (215)	6,250 (177)	5,200 (147)	3,700 (105)	1,900 (53.8)	
			9,500 (269)	9,000 (255)	7,350 (208)	6,500 (184)	4,500 (127)	2,150 (60.9)	20 (1.4)			9,600 (272)	8,800 (249)	7,500 (212)	6,200 (176)	4,300 (122)	2,200 (62.3)	
(21 to 35mbar Set: 27.4mbar Droop: 5 mbar Max)			12,300 (348)	11,100 (314)	9,200 (260)	8,100 (229)	5,800 (164)	2,700 (76.5)	30 (2.0)			12,200 (345)	11,100 (314)	9,400 (266)	8,000 (226)	5,600 (159)	2,800 (79.3)	(21 to 35mbar Set: 34.8mbar Droop: 5 mbar Max)
				12,700 (360)	11,400 (323)	9,500 (268)	7,200 (204)	3,300 (93.4)	40 (2.8)				12,800 (362)	11,200 (317)	9,300 (263)	7,100 (201)	3,300 (93.4)	
					13,900 (394)	12,500 (354)	9,600 (272)	5,800 (164)	60 (4.1)					13,800 (391)	12,300 (348)	9,400 (266)	4,500 (127)	
						14,100 (399)	11,800 (344)	5,700 (161)	80 (5.5)						14,000 (396)	11,800 (334)	5,700 (161)	
								7,000 (198)	100 (6.9)								7,000 (198)	
								8,200 (232)	125 (8.6)								8,100 (229)	

For optimum performance, regulator should be operated above solid line.

1½” Series 1800 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

	Orifice Size								Inlet PSIG (bar)	Orifice Size											
	1¼"	1"	¾"	¾"	⅝"	½"	⅜"	¼"		1¼"	1"	¾"	¾"	⅝"	½"	⅜"	¼"				
SPRING NO. 71424P020 14.5" to 28" W.C. Set: 1 PSIG Droop: 6" W.C. (36 to 70mbar Set: 69mbar Droop: 15 mbar Max)	6,300 (178)	4,900 (139)	4,200 (119)	3,400 (96.3)	3,000 (85.0)	2,300 (65.1)	1,500 (42.5)		3 (0.21)												
	8,000 (226)	6,650 (188)	5,600 (159)	4,700 (133)	4,100 (116)	3,200 (90.6)	2,000 (56.6)	1,000 (28.3)	5 (0.34)	7,200 (204)	5,800 (164)	4,900 (139)	4,400 (125)	3,600 (102)	2,800 (79.3)	1,750 (49.6)	900 (25.5)				
	11,000 (311)	9,400 (266)	8,100 (229)	7,000 (198)	6,300 (178)	4,900 (139)	2,800 (79.3)	1,500 (42.5)	10 (0.7)	11,000 (311)	9,200 (260)	7,800 (221)	7,000 (198)	5,900 (167)	4,700 (133)	2,900 (82.1)	1,500 (42.5)				
		11,300 (320)	10,000 (283)	8,700 (246)	7,800 (221)	6,200 (176)	3,700 (105)	1,900 (53.8)	15 (1.0)	13,000 (368)	11,500 (326)	9,750 (276)	8,700 (246)	7,600 (215)	6,300 (178)	3,800 (108)	1,900 (53.8)				
		12,700 (360)	11,400 (323)	10,000 (283)	9,200 (260)	7,300 (207)	4,300 (122)	2,250 (63.7)	20 (1.4)	14,900 (422)	12,800 (362)	11,900 (337)	10,800 (306)	9,500 (269)	7,400 (209)	4,700 (133)	2,200 (62.3)				
			14,200 (402)	12,300 (348)	11,600 (328)	9,300 (263)	5,600 (159)	2,800 (79.3)	30 (2.0)		15,400 (436)	14,850 (420)	13,300 (377)	12,100 (343)	9,500 (269)	6,000 (170)	2,800 (79.3)				
			15,600 (442)	13,900 (394)	13,700 (388)	10,900 (309)	7,100 (201)	3,400 (96.3)	40 (2.8)				17,000 (481)	15,200 (430)	13,850 (392)	11,600 (328)	7,100 (201)	3,400 (96.3)			
				16,400 (464)	16,000 (453)	14,200 (402)	9,300 (263)	4,700 (133)	60 (4.1)				19,600 (555)	18,200 (515)	17,200 (487)	15,000 (428)	9,800 (277)	4,600 (130)			
						16,000 (453)	11,500 (326)	5,800 (164)	80 (5.5)						20,000 (566)	18,900 (535)	17,700 (501)	11,500 (326)	5,800 (164)		
							13,800 (391)	7,000 (198)	100 (6.9)								13,800 (391)	7,000 (198)			
							8,400 (238)	125 (8.6)									8,400 (238)				

SPRING NO.
71424P021
1 PSIG to 2
PSIG
Set: 2 PSIG
Droop: 0.4
PSIG

(69 to
138mbar
Set: 138mbar
Droop: 27.6
mbar
Max)

	Orifice Size								Inlet PSIG (bar)	Orifice Size										
	1¼"	1"	¾"	¾"	⅝"	½"	⅜"	¼"		1¼"	1"	¾"	¾"	⅝"	½"	⅜"	¼"			
SPRING NO. 71424P022 2 PSIG to 3 PSIG Set: 3 PSIG Droop: 0.6 PSIG (138 to 207mbar Set: 207mbar Droop: 41 mbar Max)	4,100 (116)	3,400 (96.3)	2,900 (82.1)	2,900 (82.1)	2,000 (56.6)	2,000 (56.6)	1,300 (36.8)	750 (21.2)	5 (0.34)											
	7,600 (215)	5,800 (164)	5,000 (142)	5,000 (142)	3,500 (99.1)	3,500 (99.1)	2,200 (62.3)	1,400 (39.6)	10 (0.7)	7,000 (198)	5,600 (158)	4,800 (136)	4,800 (136)	3,700 (105)	3,100 (87.8)	2,200 (62.3)	1,200 (34.0)			
	10,000 (283)	7,900 (224)	6,550 (186)	6,550 (186)	4,800 (136)	4,800 (136)	3,000 (84.9)	1,800 (51.0)	15 (1.0)	9,500 (269)	7,600 (215)	6,200 (176)	6,200 (176)	4,800 (136)	4,200 (119)	3,000 (84.9)	1,850 (52.4)			
	12,000 (340)	9,700 (275)	8,100 (229)	8,100 (229)	5,800 (164)	5,800 (164)	3,600 (102)	2,200 (62.3)	20 (1.4)	11,800 (334)	9,750 (276)	7,600 (215)	7,600 (215)	6,000 (170)	5,300 (150)	3,800 (108)	2,200 (62.3)			
		13,100 (371)	10,800 (306)	10,800 (306)	8,000 (227)	8,000 (227)	4,800 (136)	2,900 (82.1)	30 (2.0)		12,700 (360)	10,500 (297)	10,500 (297)	8,300 (235)	7,200 (204)	5,000 (142)	2,900 (82.1)			
			13,400 (379)	13,400 (379)	9,800 (277)	9,800 (277)	6,000 (170)	3,500 (99.1)	40 (2.8)				13,000 (368)	13,000 (368)	9,400 (266)	8,700 (246)	6,500 (184)	3,500 (99.1)		
			17,000 (481)	17,000 (481)	12,900 (365)	12,900 (365)	8,400 (238)	4,800 (136)	60 (4.1)				17,200 (487)	17,200 (487)	12,700 (359)	12,000 (340)	8,900 (252)	4,900 (139)		
				20,000 (566)	15,500 (439)	15,500 (439)	10,850 (307)	6,200 (176)	80 (5.5)					20,000 (566)	16,000 (453)	15,200 (430)	10,800 (306)	6,200 (176)		
							12,700 (360)	7,500 (212)	100 (6.9)								12,700 (359)	7,500 (212)		
								8,100 (229)	125 (8.6)									8,100 (229)		

SPRING NO.
71424P023
3 PSIG to 5
PSIG
Set: 5 PSIG
Droop: 1
PSIG

(207 to
345mbar
Set: 345mbar
Droop: 69
mbar Max)

	Orifice Size								Inlet PSIG (bar)
	1¼"	1"	¾"	¾"	⅝"	½"	⅜"	¼"	
SPRING NO. 71424P026 1.5 to 2.5 PSIG Set: 2.5 PSIG Droop: 0.4 PSIG (103 to 172mbar Set: 172mbar Droop: 27 mbar Max)	4,050 (115)	3,400 (96.3)	3,400 (96.3)	2,800 (79.3)	2,300 (65.1)	1,800 (51.0)	1,400 (39.6)	800 (22.7)	5 (0.34)
	7,200 (204)	5,800 (164)	5,000 (142)	4,500 (127)	4,700 (133)	2,800 (79.3)	2,200 (62.3)	1,200 (34.0)	10 (0.7)
	8,640 (245)	7,400 (210)	6,300 (178)	5,800 (164)	5,800 (164)	3,500 (99.1)	3,000 (84.9)	1,600 (45.3)	15 (1.0)
	9,090 (257)	8,600 (244)	7,000 (198)	6,800 (193)	6,800 (193)	4,800 (136)	3,500 (99.1)	2,000 (56.6)	20 (1.4)
		10,600 (300)	8,700 (246)	8,800 (249)	8,100 (229)	5,900 (167)	4,800 (136)	2,600 (73.6)	30 (2.0)
			11,200 (317.1)	12,400 (351)	9,700 (275)	6,900 (195)	5,600 (159)	3,100 (87.8)	40 (2.8)
			14,200 (402)	12,800 (362)	12,100 (342)	10,100 (286)	7,400 (210)	4,300 (122)	60 (4.1)
				14,800 (419)	13,700 (388)	12,200 (345)	9,400 (266)	5,400 (153)	80 (5.5)
						10,500 (297)	6,300 (178)	100 (6.9)	
							7,500 (212)	125 (8.6)	

For optimum performance, regulator should be operated above solid line. Enquire for performance figures for 1¼" size.

2" Series 1800 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

	Orifice Size			Inlet PSIG (bar)	Orifice Size					
	1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
	2,500 (70.8)	2,000 (56.6)	1,600 (45.3)	1/2 (0.03)	1,500 (42.5)	1,300 (36.8)	1,000 (28.3)	500 (14.2)		
	3,800 (108)	3,200 (90.6)	2,500 (70.8)	1 (0.07)	2,400 (68.0)	1,900 (53.8)	1,600 (45.3)	1,100 (31.1)	900 (25.5)	
	5,600 (158)	5,000 (142)	3,800 (108)	2 (0.14)	3,800 (108)	2,900 (82.1)	2,400 (68.0)	1,650 (46.7)	1,300 (36.8)	
	8,900 (252)	6,300 (178)	5,100 (144)	3 (0.21)	4,800 (136)	3,800 (108)	3,200 (90.6)	2,100 (59.5)	1,600 (45.3)	
SPRING NO. 71424P017	13,200 (374)	10,000 (283)	8,000 (227)	5 (0.34)	7,200 (204)	5,200 (147)	4,000 (113)	2,900 (82.1)	2,000 (56.6)	1,100 (31.1)
3.5" to 6" W.C.		16,500 (467)	13,000 (368)	10 (0.7)	12,300 (348)	8,300 (235)	6,200 (176)	4,800 (136)	3,000 (84.9)	1,650 (46.7)
Set: 6" W.C.		20,000 (566)	16,500 (467)	15 (1.0)	16,000 (453)	10,800 (306)	9,000 (255)	6,600 (187)	4,000 (113)	1,950 (55.2)
Droop: 1" W.C.			20,000 (566)	20 (1.4)	19,000 (538)	15,700 (445)	11,700 (331)	8,000 (227)	4,600 (130)	2,300 (65.1)
Max.				30 (2.0)	20,000 (566)	20,000 (566)	14,300 (405)	10,500 (297)	5,900 (167)	2,850 (80.7)
Compound: 2" W.C.				40 (2.8)		20,000 (566)	18,500 (524)	13,000 (368)	7,200 (204)	3,400 (96.3)
(8.7 to 15mbar Set: 15mbar Droop: 2.5 mbar Max. Compound: 5mbar)				60 (4.1)				17,700 (501)	9,600 (272)	4,500 (127)
				80 (5.5)						5,850 (166)
				100 (6.9)						7,000 (198)
				125 (8.6)						8,400 (238)

	Orifice Size			Inlet PSIG (bar)	Orifice Size					
	1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
	1,900 (53.8)	1,600 (45.3)	1,400 (39.6)	1/2 (0.03)	1,300 (36.8)	1,050 (29.7)	1,000 (28.3)	500 (14.2)		
	3,400 (96.3)	2,700 (76.5)	2,300 (65.1)	1 (0.07)	2,100 (59.5)	1,800 (51.0)	1,600 (45.3)	1,050 (29.7)	750 (21.2)	
	5,600 (159)	4,400 (125)	3,800 (108)	2 (0.14)	3,500 (99.1)	2,700 (76.5)	2,400 (68.0)	1,600 (45.3)	1,250 (35.4)	
	8,500 (241)	6,000 (170)	5,000 (142)	3 (0.21)	4,500 (127)	3,600 (102)	3,200 (90.6)	2,100 (59.5)	1,500 (42.5)	
SPRING NO. 71424P018	13,000 (368)	10,000 (283)	8,000 (267)	5 (0.34)	7,000 (198)	5,000 (142)	4,000 (113)	2,900 (82.1)	2,000 (56.6)	1,000 (28.3)
5.5" to 8" W.C.		15,700 (445)	13,000 (368)	10 (0.7)	11,500 (326)	8,300 (235)	6,200 (176)	4,800 (136)	3,000 (85.0)	1,600 (45.3)
Set: 7" W.C.		17,500 (496)	16,000 (453)	15 (1.0)	15,000 (425)	11,500 (326)	9,000 (255)	6,400 (181)	4,000 (113)	1,900 (53.8)
Droop: 1" W.C.			19,200 (544)	20 (1.4)	19,000 (538)	15,500 (439)	11,000 (311)	7,800 (221)	4,600 (130)	2,200 (62.3)
Max.				30 (2.0)	20,000 (566)	20,000 (566)	14,000 (396)	10,300 (292)	5,900 (167)	2,800 (79.3)
Compound: 2" W.C.				40 (2.8)		20,000 (566)	18,500 (524)	12,500 (354)	7,200 (204)	3,400 (96.3)
(13.7 to 20mbar Set: 17.4mbar Droop: 2.5 mbar Max. Compound: 5mbar)				60 (4.1)				17,400 (493)	9,600 (272)	4,500 (127)
				80 (5.5)						5,800 (164)
				100 (6.9)						7,000 (198)
				125 (8.6)						8,300 (235)

For optimum performance, regulator should be operated above solid line.

2" Series 1800 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

	Orifice Size			Inlet PSIG (bar)	Orifice Size					
	1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
SPRING NO. 71424P019 8.5" to 14" W.C. Set: 11" W.C. Droop: 2" W.C. (21 to 35mbar Set: 27.4mbar Droop: 5 mbar Max.)	3,400 (96.3)	2,700 (76.5)	2,200 (62.3)	1 (0.07)	2,000 (56.6)	1,700 (48.1)	1,600 (45.3)	1,000 (28.3)	750 (21.2)	
	5,100 (144)	4,200 (119)	3,800 (108)	2 (0.14)	3,500 (99.1)	2,700 (76.5)	2,400 (68.0)	1,500 (42.5)	1,200 (34.0)	
	7,200 (204)	5,700 (161)	5,000 (142)	3 (0.21)	4,500 (127)	3,600 (102)	3,000 (84.9)	2,000 (56.6)	1,500 (42.5)	
	11,500 (326)	8,500 (241)	7,100 (201)	5 (0.34)	6,400 (181)	4,800 (136)	4,000 (113)	2,600 (73.6)	2,000 (56.6)	1,000 (28.3)
	20,000 (566)	15,000 (425)	12,300 (348)	10 (0.7)	11,200 (317)	8,100 (229)	6,200 (176)	4,300 (122)	2,900 (82.1)	1,600 (45.3)
		19,000 (538)	16,000 (453)	15 (1.0)	15,000 (425)	10,800 (306)	8,000 (227)	5,800 (164)	3,800 (108)	1,900 (53.8)
			20,000 (566)	20 (1.4)	18,000 (510)	13,300 (377)	10,800 (306)	7,400 (210)	4,300 (122)	2,200 (62.3)
			20,000 (566)	30 (2.0)	20,000 (566)	17,900 (507)	14,000 (396)	10,000 (283)	5,700 (161)	2,800 (79.3)
				40 (2.8)		20,000 (566)	18,000 (510)	12,300 (348)	7,000 (198)	3,300 (93.4)
				60 (4.1)			20,000 (566)	17,300 (490)	9,000 (255)	4,500 (127)
				80 (5.5)				20,000 (566)	11,800 (334)	5,700 (161)
				100 (6.9)						7,000 (198)
				125 (8.6)						8,200 (232)

	Orifice Size			Inlet PSIG (bar)	Orifice Size					
	1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
SPRING NO. 71424P019 8.5" to 14" W.C. Set: 14" W.C. Droop: 2" W.C. (21 to 35mbar Set: 35mbar Droop: 5 mbar Max.)	2,700 (76.5)	2,200 (62.3)	2,000 (56.6)	1 (0.07)	1,800 (51.0)	1,500 (52.5)	1,500 (52.5)	900 (25.5)	750 (21.2)	
	4,500 (127)	3,800 (108)	3,100 (87.8)	2 (0.14)	3,000 (84.9)	2,300 (65.1)	2,100 (59.5)	1,400 (39.6)	1,100 (31.1)	
	6,000 (170)	5,300 (150)	4,200 (119)	3 (0.21)	3,800 (108)	3,200 (90.6)	2,700 (76.5)	1,800 (51.0)	1,400 (39.6)	
	10,600 (300)	7,600 (215)	6,200 (176)	5 (0.34)	5,600 (158)	4,400 (125)	3,600 (102)	2,500 (70.8)	1,800 (51.0)	1,000 (28.3)
	19,000 (538)	14,100 (399)	11,600 (328)	10 (0.7)	9,800 (278)	7,400 (210)	5,800 (164)	4,000 (113)	2,800 (79.3)	1,600 (45.3)
		19,000 (538)	16,300 (461)	15 (1.0)	14,300 (405)	10,000 (283)	7,900 (224)	5,500 (156)	3,700 (105)	1,900 (53.8)
			20,000 (566)	20 (1.4)	17,700 (501)	12,300 (348)	9,500 (269)	7,200 (204)	4,300 (122)	2,200 (62.3)
				30 (2.0)	20,000 (566)	17,400 (493)	15,000 (425)	9,800 (277)	5,600 (158)	2,800 (79.3)
				40 (2.8)		20,000 (566)	18,000 (510)	12,200 (345)	7,000 (198)	3,300 (93)
				60 (4.1)			20,000 (566)	17,300 (490)	9,000 (255)	4,500 (127)
				80 (5.5)				20,000 (566)	11,800 (334)	5,700 (161)
				100 (6.9)						7,000 (198)
				125 (8.6)						8,100 (229)

For optimum performance, regulator should be operated above solid line.

2" Series 1800 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

Orifice Size			Inlet PSIG (bar)	Orifice Size					
1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
7,000 (198)	5,500 (156)	4,600 (130)	3 (0.21)	4,500 (127)	3,500 (99.1)	3,000 (84.9)	2,000 (56.6)	1,500 (42.5)	
10,000 (283)	7,700 (218)	6,900 (195)	5 (0.34)	6,400 (181)	5,000 (142)	4,100 (116)	2,700 (76.5)	2,000 (56.6)	1,100 (31.1)
18,000 (510)	13,600 (385)	10,900 (309)	10 (0.7)	10,600 (300)	7,900 (224)	6,500 (184)	4,500 (127)	2,800 (79.3)	1,600 (45.3)
	18,000 (510)	15,300 (433)	15 (1.0)	14,000 (396)	10,500 (297)	8,600 (244)	6,100 (173)	3,700 (105)	1,900 (53.8)
	20,000 (566)	20,000 (566)	20 (1.4)	17,200 (487)	13,000 (368)	10,500 (297)	7,600 (215)	4,300 (122)	2,300 (65.1)
		20,000 (566)	30 (2.0)	20,000 (566)	18,000 (510)	14,000 (396)	10,300 (292)	5,600 (159)	2,800 (79.3)
			40 (2.8)	20,000 (566)	20,000 (566)	18,000 (510)	12,600 (357)	6,700 (190)	3,400 (96.3)
			60 (4.1)		20,000 (566)	20,000 (566)	17,400 (493)	9,300 (263)	4,700 (133)
			80 (5.5)				20,000 (566)	11,500 (326)	5,800 (164)
			100 (6.9)					13,800 (391)	7,000 (198)
			125 (8.6)						8,400 (238)

SPRING NO.
71424P020
14.5" to 28" W.C.
Set: 1 PSIG
Droop: 6" W.C.

(36 to 70mbar
Set: 69mbar
Droop: 15 mbar
Max.)

Orifice Size			Inlet PSIG (bar)	Orifice Size					
1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
7,600 (215)	6,000 (170)	5,300 (150)	5 (0.34)	5,200 (147)	4,600 (130)	3,600 (102)	2,600 (73.6)	1,800 (51.0)	1,000 (28.3)
14,100 (399)	10,800 (306)	8,900 (252)	10 (0.7)	8,400 (238)	7,600 (215)	5,900 (167)	4,200 (119)	2,800 (79.3)	1,600 (45.3)
20,000 (566)	15,100 (428)	12,600 (357)	15 (1.0)	11,800 (334)	10,300 (292)	7,600 (215)	5,800 (164)	3,700 (105)	1,900 (53.8)
20,000 (566)	19,100 (541)	15,800 (447)	20 (1.4)	14,500 (411)	12,500 (354)	9,500 (269)	7,200 (204)	4,300 (122)	2,200 (62.3)
	20,000 (566)	20,000 (566)	30 (2.0)	20,000 (566)	16,800 (476)	13,100 (371)	9,800 (278)	5,600 (159)	2,800 (79.3)
		20,000 (566)	40 (2.8)	20,000 (566)	20,000 (566)	17,300 (490)	12,200 (345)	6,700 (190)	3,400 (96.3)
			60 (4.1)	20,000 (566)	20,000 (566)	20,000 (566)	17,200 (487)	9,000 (255)	4,600 (130)
			80 (5.5)		20,000 (566)	20,000 (566)	20,000 (566)	11,500 (326)	5,800 (164)
			100 (6.9)					13,800 (391)	7,000 (198)
			125 (8.6)						8,400 (238)

SPRING NO.
71424P021
1 PSIG to 2 PSIG
Set: 2 PSIG
Droop: 0.4 PSIG

(69 to 138mbar
Set: 138mbar
Droop: 27.6mbar
Max.)

Orifice Size			Inlet PSIG (bar)	Orifice Size					
1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"
5,400 (153)	3,600 (102)	2,900 (82.1)	5 (0.34)	3,200 (90.6)	2,700 (76.5)	2,500 (70.8)	1,600 (45.3)	1,200 (34.0)	800 (22.7)
9,000 (255)	7,400 (210)	6,300 (178)	10 (0.7)	6,500 (184)	5,800 (164)	4,100 (116)	2,900 (82.1)	2,100 (59.5)	1,300 (36.8)
13,100 (371)	10,300 (292)	9,400 (266)	15 (1.0)	9,000 (255)	6,300 (178)	5,800 (164)	4,000 (113)	3,100 (87.8)	1,600 (45.3)
18,500 (524)	12,800 (362)	11,200 (317)	20 (1.4)	11,200 (317)	8,300 (235)	7,000 (198)	5,200 (147)	3,600 (102)	2,000 (56.6)
	19,300 (547)	17,500 (496)	30 (2.0)	15,500 (439)	13,100 (371)	10,400 (294)	7,600 (215)	5,100 (144)	2,600 (73.6)
		22,700 (643)	40 (2.8)	22,700 (643)	17,800 (504)	13,000 (368)	9,200 (261)	6,400 (181)	3,200 (90.6)
			60 (4.1)	22,700 (643)	25,900 (733)	21,600 (612)	14,400 (408)	8,900 (252)	4,400 (125)
			80 (5.5)		18,400 (521)	24,100 (682)	19,100 (541)	11,600 (328)	5,600 (159)
			100 (6.9)					13,400 (379)	6,800 (193)
			125 (8.6)						8,200 (232)

SPRING NO.
71424P026
1.5 PSIG to 2.5
PSIG
Set: 2.5 PSIG
Droop: 0.4 PSIG

(103 to 172mbar
Set: 172mbar
Droop: 27 mbar
Max.)

For optimum performance, regulator should be operated above solid line.

2" Series 1800 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

Orifice Size			Inlet PSIG (bar)	Orifice Size						
1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"	
4,100 (116)	3,400 (96.3)	3,200 (90.6)	5 (0.34)	3,000 (84.9)	3,000 (84.9)	2,000 (56.6)	2,000 (56.6)	1,300 (36.8)	750 (21.2)	SPRING NO. 71424P022 2 PSIG to 3 PSIG Set: 3 PSIG Droop: 0.6 PSIG (138 to 207mbar Set: 207mbar Droop: 41.4mbar Max.)
7,600 (215)	5,800 (164)	5,000 (142)	10 (0.7)	5,000 (142)	5,000 (142)	3,500 (99.1)	3,500 (99.1)	2,200 (62.3)	1,400 (39.6)	
10,800 (306)	8,000 (227)	6,600 (187)	15 (1.0)	6,600 (187)	6,600 (187)	4,800 (136)	4,800 (136)	2,000 (56.6)	1,800 (51.0)	
13,800 (391)	10,500 (297)	8,600 (244)	20 (1.4)	8,100 (229)	8,100 (229)	5,800 (164)	5,800 (164)	3,600 (102)	2,200 (62.3)	
	14,200 (402)	12,800 (362)	30 (2.0)	10,800 (306)	10,800 (306)	8,000 (227)	8,000 (227)	4,800 (136)	2,900 (82.1)	
		17,000 (481)	40 (2.8)	14,300 (405)	14,300 (405)	10,000 (283)	10,000 (283)	6,000 (170)	3,500 (99.1)	
			60 (4.1)	20,000 (566)	20,000 (566)	14,500 (411)	14,500 (411)	8,400 (238)	4,800 (136)	
			80 (5.5)		20,000 (566)	19,300 (547)	19,300 (547)	10,900 (309)	6,200 (176)	
			100 (6.9)					13,300 (377)	7,500 (212)	
			125 (8.6)						8,100 (299)	

Orifice Size			Inlet PSIG (bar)	Orifice Size						
1/4"	1"	7/8"		7/8"	3/4"	5/8"	1/2"	3/8"	1/4"	
8,000 (227)	6,300 (178)	5,100 (144)	10 (0.7)	5,100 (144)	5,000 (142)	3,800 (108)	3,100 (87.8)	2,200 (62.3)	1,200 (34.0)	SPRING NO. 71424P023 3 PSIG to 5 PSIG Set: 5 PSIG Droop: 1 PSIG (207 to 345mbar Set: 345mbar Droop: 69mbar Max.)
11,300 (320)	8,600 (244)	7,400 (210)	15 (1.0)	7,000 (198)	7,000 (198)	5,100 (144)	4,300 (122)	3,000 (84.9)	1,800 (51.0)	
14,500 (411)	11,000 (311)	9,200 (261)	20 (1.4)	8,700 (246)	8,700 (246)	6,500 (184)	5,300 (150)	3,800 (108)	2,200 (62.3)	
	15,100 (427)	12,800 (362)	30 (2.0)	12,100 (343)	12,100 (343)	8,800 (249)	7,400 (210)	5,000 (142)	2,900 (82.1)	
		17,000 (481)	40 (2.8)	15,600 (442)	15,600 (442)	11,000 (311)	9,500 (269)	6,500 (184)	3,500 (99.1)	
			60 (4.1)	20,000 (566)	20,000 (566)	15,500 (439)	13,200 (374)	8,900 (252)	4,900 (139)	
			80 (5.5)		20,000 (566)	20,000 (566)	17,000 (481)	11,200 (317)	6,200 (176)	
			100 (6.9)					13,700 (388)	7,500 (212)	
			125 (8.6)						8,100 (229)	

For optimum performance, regulator should be operated above solid line.

1½” Series 2000 Capacity Data

2” Series 2000 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

All capacities in SCFH (SCMH) 0.60 s.g.

	Orifice Size							Inlet PSIG (bar)	Orifice Size								
	1¼”	1”	¾”	¾”	⅝”	½”	⅜”		¼”	1¼”	1”	¾”	¾”	⅝”	½”	⅜”	¼”
SPRING NO. 71411P020 ½ PSIG to 1 PSIG Set: 1 PSIG Droop: 6”W.C. (34.5 to 69mbar Set: 69mbar Droop: 15mbar Max.)	7,000 (198)	5,900 (167)	4,350 (123)	4,350 (123)	4,000 (113)	2,900 (82.1)	1,900 (53.8)	1,000 (28.3)	5 (0.34)	10,700 (303)	7,500 (212)	6,400 (181)	4,700 (133)	4,100 (116)	2,500 (70.8)	1,900 (53.8)	1,000 (28.3)
	11,200 (317)	8,700 (246)	7,300 (207)	6,800 (193)	5,900 (167)	4,500 (127)	2,700 (76.5)	1,500 (42.5)	10 (0.7)	18,100 (513)	12,900 (365)	10,300 (292)	7,400 (210)	6,500 (184)	4,100 (116)	2,800 (79.3)	1,500 (42.5)
	12,200 (345)	10,600 (300)	7,900 (224)	7,900 (224)	7,650 (217)	5,800 (164)	3,700 (105)	1,800 (51.0)	15 (1.0)	20,000 (566)	17,500 (496)	14,200 (402)	9,900 (280)	8,800 (249)	5,500 (156)	3,700 (105)	1,800 (51.0)
		13,200 (374)	11,750 (333)	10,000 (283)	9,500 (269)	7,000 (198)	4,500 (127)	2,200 (62.3)	20 (1.4)		20,000 (566)	18,100 (513)	12,000 (340)	10,800 (306)	6,800 (193)	4,500 (127)	2,200 (62.3)
		15,800 (447)	14,200 (402)	12,300 (348)	10,100 (286)	9,000 (255)	5,700 (161)	2,800 (79.3)	30 (2.0)		20,000 (566)	20,000 (566)	17,000 (481)	15,100 (428)	9,400 (266)	5,700 (161)	2,800 (79.3)
			15,600 (442)	13,900 (394)	12,600 (360)	10,600 (300)	7,100 (201)	3,300 (93.4)	40 (2.8)			20,000 (566)	20,000 (566)	19,200 (544)	11,800 (334)	7,100 (201)	3,400 (96.3)
				16,400 (464)	16,200 (459)	13,500 (382)	9,300 (263)	4,600 (130)	60 (4.1)				20,000 (566)	20,000 (566)	16,800 (476)	9,300 (263)	4,600 (130)
				18,200 (515)	18,000 (510)	15,400 (436)	12,000 (340)	5,900 (167)	80 (5.5)				20,000 (566)	20,000 (566)	20,000 (566)	12,100 (343)	5,900 (167)
							14,000 (396)	7,200 (204)	100 (6.9)							14,900 (422)	7,200 (204)
								8,500 (241)	125 (8.6)								8,500 (241)

	Orifice Size							Inlet PSIG (bar)	Orifice Size									
	1¼”	1”	¾”	¾”	⅝”	½”	⅜”		¼”	1¼”	1”	¾”	¾”	⅝”	½”	⅜”	¼”	
SPRING NO. 71411P021 1 PSIG to 2½ PSIG Set: 2½ PSIG Droop: ½ PSIG (69 to 172mbar Set: 172mbar Droop: 34mbar Max.)	6,300 (178)	5,000 (142)	4,400 (125)	3,800 (108)	3,250 (92.0)	2,400 (68.0)	1,700 (48.1)	900 (25.5)	5 (0.34)	7,500 (213)	5,800 (165)	4,900 (139)	3,800 (108)	3,300 (93.4)	2,200 (62.3)	1,700 (48.1)	900 (25.5)	
	10,500 (297)	8,400 (238)	7,150 (202)	6,500 (184)	5,350 (151)	4,100 (116)	2,700 (76.5)	1,400 (39.6)	10 (0.7)	13,800 (391)	10,200 (289)	8,300 (235)	6,800 (193)	5,400 (153)	3,800 (108)	2,700 (76.5)	1,400 (39.6)	
	13,300 (377)	10,600 (300)	9,400 (266)	8,400 (238)	7,250 (206)	5,500 (157)	3,600 (102)	1,800 (51.2)	15 (1.0)	19,100 (541)	13,700 (388)	11,700 (331)	9,000 (255)	7,500 (212)	5,200 (147)	3,600 (102)	1,800 (51.0)	
	15,200 (433)	13,500 (384)	11,200 (319)	10,000 (285)	8,900 (253)	6,800 (194)	4,350 (124)	2,200 (62.6)	20 (1.4)	20,000 (566)	17,400 (493)	14,300 (405)	10,800 (306)	9,500 (269)	6,400 (181)	4,350 (123)	2,200 (62.3)	
		16,500 (470)	14,600 (416)	13,000 (370)	11,250 (320)	9,000 (256)	5,700 (162)	2,800 (79.7)	30 (2.0)		20,000 (566)	20,000 (566)	15,200 (430)	13,100 (371)	8,900 (252)	5,700 (161)	2,800 (79.3)	
			17,700 (504)	15,000 (427)	14,000 (398)	10,900 (310)	7,100 (202)	3,400 (97)	40 (2.8)			20,000 (566)	20,000 (566)	19,300 (547)	16,700 (473)	11,100 (314)	7,100 (201)	3,400 (96.3)
				18,300 (521)	17,500 (498)	13,700 (390)	9,600 (273)	4,600 (131)	60 (4.1)				20,000 (566)	20,000 (566)	16,000 (453)	9,600 (272)	4,600 (130)	
				20,000 (566)	20,000 (566)	16,800 (478)	12,100 (344)	5,900 (168)	80 (5.5)				20,000 (566)	20,000 (566)	20,000 (566)	12,100 (343)	5,900 (167)	
							14,200 (404)	7,200 (205)	100 (6.9)							14,300 (405)	7,200 (204)	
								8,500 (242)	125 (8.6)								8,500 (241)	

	Orifice Size							Inlet PSIG (bar)	Orifice Size									
	1¼”	1”	¾”	¾”	⅝”	½”	⅜”		¼”	1¼”	1”	¾”	¾”	⅝”	½”	⅜”	¼”	
SPRING NO. 71411P022 2½ PSIG to 5 PSIG Set: 5 PSIG Droop: 1 PSIG (172 to 345mbar Set: 345mbar Droop: 69mbar Max.)	10,400 (294)	8,000 (227)	6,600 (187)	6,200 (176)	4,800 (136)	4,000 (113)	2,400 (68.0)	1,300 (36.8)	10 (0.7)	11,700 (331)	9,200 (261)	7,500 (212)	6,200 (176)	4,800 (136)	3,600 (102)	2,400 (68.0)	1,300 (36.8)	
	13,800 (391)	11,100 (314)	9,000 (255)	8,800 (249)	6,700 (190)	5,500 (156)	3,200 (90.6)	1,800 (51.0)	15 (1.0)	16,800 (476)	13,000 (368)	10,800 (306)	8,800 (249)	6,700 (190)	5,000 (142)	3,200 (90.6)	1,800 (51.0)	
	16,300 (462)	14,200 (402)	11,200 (317)	10,700 (303)	8,300 (235)	7,000 (198)	4,000 (113)	2,200 (62.3)	20 (1.4)	20,000 (566)	16,700 (473)	13,600 (385)	11,200 (317)	8,700 (246)	6,400 (181)	4,000 (113)	2,200 (62.3)	
		18,300 (518)	15,000 (425)	14,300 (405)	11,300 (320)	9,500 (269)	5,500 (156)	2,800 (79.3)	30 (2.0)		20,000 (566)	20,000 (566)	18,900 (535)	15,500 (439)	12,000 (340)	9,000 (255)	5,500 (156)	2,800 (79.3)
			19,500 (552)	17,200 (487)	14,900 (422)	11,800 (334)	6,700 (190)	3,400 (96.3)	40 (2.8)			20,000 (566)	20,000 (566)	19,600 (555)	15,700 (445)	11,400 (323)	6,700 (190)	3,400 (96.3)
			20,000 (566)	20,000 (566)	19,000 (538)	15,800 (447)	9,200 (261)	4,600 (130)	60 (4.1)			20,000 (566)	20,000 (566)	20,000 (566)	16,000 (453)	9,200 (261)	4,600 (130)	
				20,000 (566)	20,000 (566)	19,000 (538)	12,000 (340)	5,900 (167)	80 (5.5)				20,000 (566)	20,000 (566)	20,000 (566)	12,000 (340)	5,900 (167)	
							14,200 (402)	7,200 (204)	100 (6.9)							14,700 (416)	7,200 (204)	
								8,500 (241)	125 (8.6)								8,500 (241)	

For optimum performance, regulator should be operated above solid line.

1½” Series 2000 Capacity Data

2” Series 2000 Capacity Data

All capacities in SCFH (SCMH) 0.60 s.g.

All capacities in SCFH (SCMH) 0.60 s.g.

	Orifice Size								Inlet PSIG (bar)	Orifice Size							
	1¼"	1"	¾"	¾"	5/8"	½"	3/8"	¼"		1¼"	1"	¾"	¾"	5/8"	½"	3/8"	¼"
	10,000 (283)	8,250 (234)	7,000 (198)	6,300 (178)	5,000 (142)	4,000 (113)	2,800 (79.3)	1,500 (42.5)	15 (1.0)	10,700 (303)	8,700 (246)	7,400 (210)	6,200 (176)	5,000 (142)	3,700 (105)	2,800 (79.3)	1,500 (42.5)
SPRING NO. 71411P023	13,000 (368)	11,500 (326)	9,400 (266)	8,400 (238)	6,600 (187)	5,400 (153)	3,500 (99.1)	2,100 (59.5)	20 (1.4)	13,800 (391)	12,000 (340)	10,100 (286)	8,400 (238)	6,700 (190)	5,000 (142)	3,500 (99.1)	2,100 (59.5)
5 PSIG to 10 PSIG		16,100 (456)	13,350 (378)	12,000 (340)	9,700 (275)	7,700 (218)	5,200 (147)	2,800 (79.3)	30 (2.0)		17,700 (501)	15,000 (425)	12,300 (348)	9,800 (278)	7,300 (207)	5,200 (147)	2,800 (79.3)
Set: 10 PSIG Droop: 2 PSIG			17,600 (498)	15,000 (425)	12,000 (340)	10,000 (283)	6,600 (187)	3,400 (96.3)	40 (2.8)			19,400 (549)	15,700 (445)	12,000 (340)	9,500 (269)	6,600 (187)	3,400 (96.3)
(345 to 689mbar Set: 689mbar Droop: 138mbar Max.)			20,000 (566)	20,000 (566)	17,800 (504)	13,800 (391)	9,100 (258)	4,600 (130)	60 (4.1)			20,000 (566)	20,000 (566)	18,300 (518)	13,400 (379)	9,100 (258)	4,600 (130)
				20,000 (566)	20,000 (566)	17,300 (490)	11,700 (331)	5,900 (167)	80 (5.5)				20,000 (566)	20,000 (566)	17,400 (493)	11,700 (331)	5,900 (167)
							14,200 (402)	7,200 (204)	100 (6.9)							14,400 (408)	7,200 (204)
								8,500 (241)	125 (8.6)								8,500 (241)

	Orifice Size								Inlet PSIG (bar)	Orifice Size							
	1¼"	1"	¾"	¾"	5/8"	½"	3/8"	¼"		1¼"	1"	¾"	¾"	5/8"	½"	3/8"	¼"
	12,900 (365)	10,200 (289)	8,500 (241)	7,800 (221)	5,900 (167)	5,000 (142)	3,100 (87.8)	1,800 (51.0)	20 (1.4)	13,900 (0)	11,000 (311)	8,900 (252)	7,500 (212)	6,000 (170)	4,500 (127)	3,100 (87.8)	1,800 (51.0)
SPRING NO. 71411P024		15,800 (447)	12,900 (365)	12,300 (348)	9,250 (262)	7,800 (221)	4,900 (139)	2,800 (79.3)	30 (2.0)		17,600 (498)	14,600 (413)	12,000 (340)	9,700 (275)	7,100 (201)	4,900 (139)	2,800 (79.3)
10 PSIG to 15 PSIG			17,900 (507)	15,800 (447)	13,000 (368)	10,000 (283)	6,300 (178)	3,400 (96.3)	40 (2.8)			19,200 (544)	15,500 (439)	13,000 (268)	9,500 (269)	6,300 (178)	3,400 (96.3)
Set: 15 PSIG Droop: 3 PSIG			20,000 (566)	20,000 (566)	18,300 (518)	14,800 (419)	9,100 (258)	4,600 (130)	60 (4.1)			20,000 (566)	20,000 (566)	18,400 (521)	13,500 (382)	9,100 (258)	4,600 (130)
(689 to 1034mbar Set: 1034mbar Droop: 207mbar Max.)				20,000 (566)	20,000 (566)	19,500 (552)	11,700 (331)	5,900 (167)	80 (5.5)				20,000 (566)	20,000 (566)	17,600 (498)	11,700 (331)	5,900 (167)
							14,500 (411)	7,200 (204)	100 (6.9)							14,500 (411)	7,200 (204)
								8,500 (241)	125 (8.6)								8,500 (241)

For optimum performance, regulator should be operated above solid line.

Regulator Springs and Orifices

1800 SERIES REGULATOR PRESSURE SPRINGS

Outlet Pressure Range		Part Number	Color Code
3.5" to 6" W.C.	8.7 to 15mbar	71424P017	Red
5.5" to 8" W.C.	13.7 to 20mbar	71424P018	Orange
8.5" to 14" W.C.	21 to 35mbar	71424P019	Yellow
14.5" to 28" W.C.	36 to 70mbar	71424P020	Green
1 to 2 PSIG	69 to 138mbar	71424P021	Blue
1.5 to 2.5 PSIG	103 to 172mbar	71424P026	Brown and Blue
2 to 3 PSIG	138 to 207mbar	71424P022	Brown and Green
3 to 5 PSIG	207 to 345mbar	71424P023	Black and Green
5 to 7 PSIG	345 to 483mbar	71424P027	Red and Green

2000 SERIES REGULATOR PRESSURE SPRINGS

Outlet Pressure Range		Part Number	Color Code
0.5 to 1 PSIG	34.5 to 69mbar	71411P020	Brown and White
1 to 2.5 PSIG	69 to 172mbar	71411P021	Purple and White
2.5 to 5 PSIG	172 to 345mbar	71411P022	Orange and Black
5 to 10 PSIG	345 to 689mbar	71411P023	Black
10 to 15 PSIG	689 to 1034mbar	71411P024	Yellow and Green

1800/2000 SERIES REGULATOR ORIFICE SIZES

Valve Head Size	Orifice Size	Part Number
1/4", 1/2" and 2"	1/4"	72983P010
1/4", 1/2" and 2"	3/8"	72983P011
1/4", 1/2" and 2"	1/2"	72983P012
1/4", 1/2" and 2"	5/8"	72983P013
1/4", 1/2" and 2"	3/4"	72983P014
1/4", 1/2" and 2"	7/8"	72983P015
1/4", 1/2" and 2"	1"	72983P016
1/4", 1/2" and 2"	1 1/4"	72983P017

OPSO SHUTOFF SPRINGS

Shut Off Pressure Range		Part Number	Color Code
14" to 28" W.C.	35 to 70mbar	70017P075	Red and Purple
1 to 2 PSIG	69 to 138mbar	70017P076	Red and Brown
2 to 3 PSIG	138 to 207mbar	70017P077	Purple
3 to 5 PSIG	207 to 345mbar	70017P078	Orange & Yellow
5 to 8 PSIG	345 to 552mbar	70017P079	Orange & Green
8 to 14 PSIG*	552 – 965mbar*	70017P078	Orange & Yellow
14 to 20 PSIG*	965– 1379mbar*	70017P079	Orange & Green

*To achieve these ranges, reducing ring 72646P001 must be used.

USSA SLAM SHUT - OVER PRESSURE SPRINGS

Shut Off Pressure Range		Part Number	Color Code
7.5 to 24 "W.C.	18 to 60mbar	70017P123	Black
20 to 32 "W.C.	50 to 80mbar	70017P124	Orange
24 to 44 "W.C.	60 to 110mbar	70017P125	Red
40 to 84 "W.C.	100 to 210mbar	70017P126	Dark Green
3 to 5 PSIG	200 to 350mbar	70017P127	Yellow
4 to 7 PSIG	280 to 500mbar	70017P128	White

USSA SLAM SHUT - UNDER PRESSURE SPRINGS

Shut Off Pressure Range		Part Number	Color Code
3 to 6 "W.C.	8 to 16mbar	70017P133	Light Blue
6 to 24 "W.C.	16 to 60mbar	70017P134	Brown
24 to 60 "W.C.	60 to 150mbar	70017P135	Purple

OTHER GAS CAPACITIES

To determine the capacity of these regulators for gases other than natural gas, multiply the values within the capacity tables by a Specific Gravity Conversion Factor (F_g). The table below lists this factor for some of the more common gases.

GAS TYPE	SPECIFIC GRAVITY	CONVERSION FACTOR (F_g)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide	1.52	0.63
Nitrogen	0.97	0.79
Propane	1.53	0.63

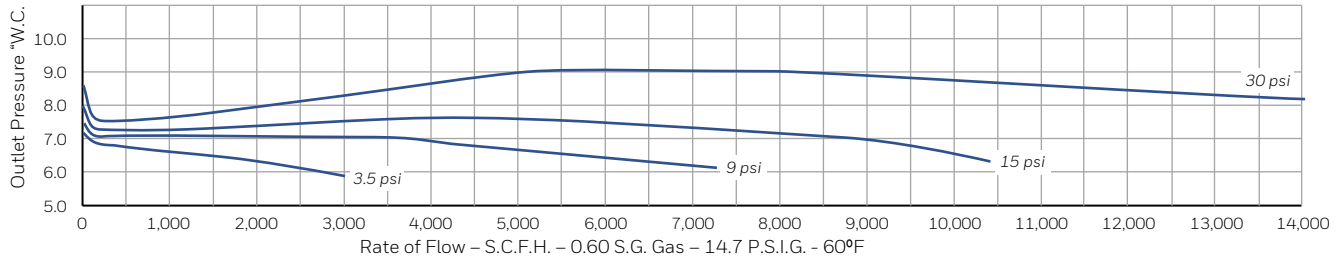
To calculate the Conversion Factor for other gases:

$$\sqrt{\frac{\text{Specific gravity of natural gas (0.6)}}{\text{Specific gravity of gas being used}}}$$

Capacity Data

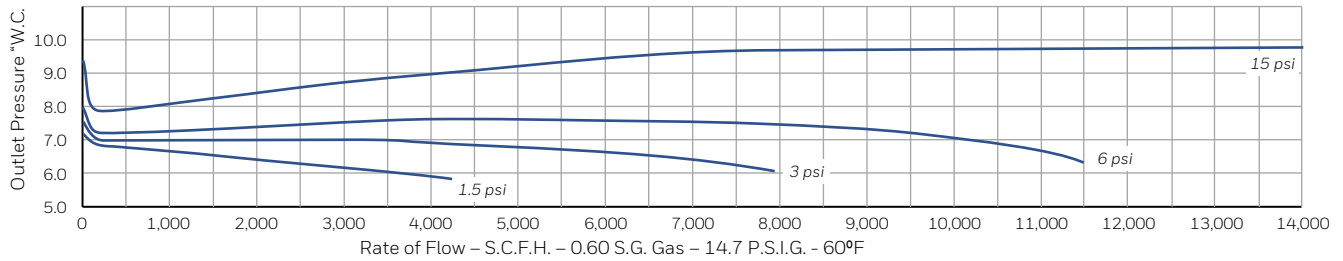
5/8" Orifice – Set pressure 7.0" W.C. at 200 SCFH

Spring Range: 5.5" to 8.0"



1" Orifice – Set pressure 7.0" W.C. at 200 SCFH

Spring Range: 5.5" to 8.0"

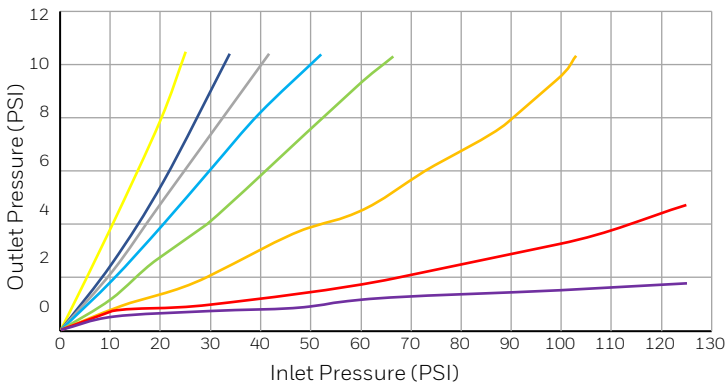


Model 1813B Regulator (1-1/2" and 2" sizes)

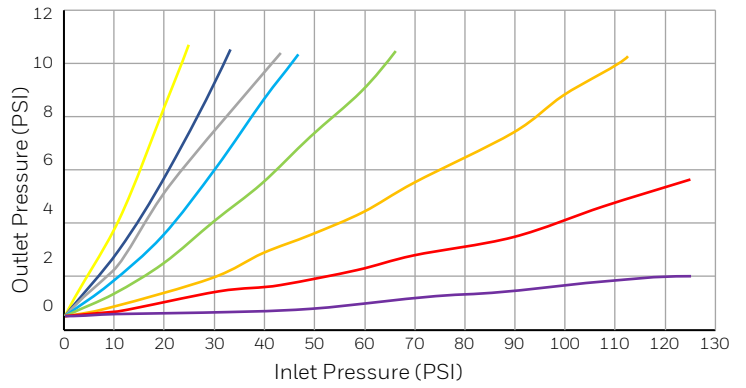
Full Relief Valve Characteristics

Test performed with orifice valve blocked in wide open position.
2" screened vent-no vent pipe. Numbers in each circle indicate orifice size

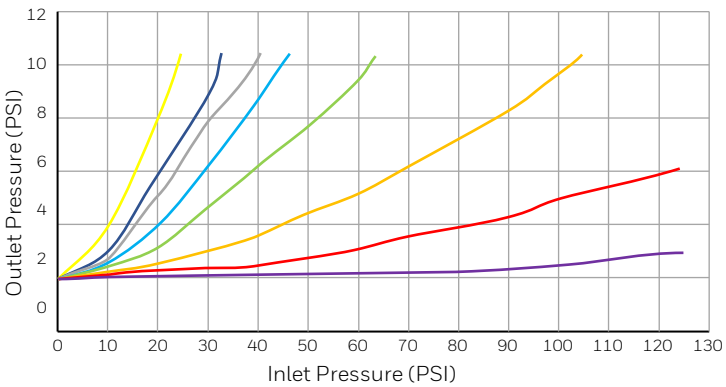
7" W.C. - Set pressure



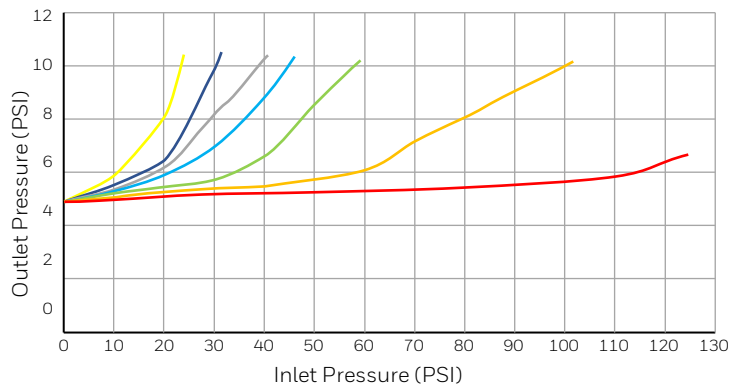
14" W.C. - Set pressure



2 PSIG - Set pressure



5 PSIG - Set pressure



- 1/4"
- 3/8"
- 1/2"
- 5/8"
- 3/4"
- 7/8"
- 1"
- 1 1/4"

Series 1800 & 2000 Dimensions

Low Pressure

Model Number	Description	Dimensions				
		A	B	C	D	E*

Low Pressure

1803	Standard Regulator	12.75" (324mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
1803M	Standard Monitor Regulator	12.75" (324mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
1813	Partial Internal Relief Regulator	12.75" (324mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
1813B	Full Capacity Internal Relief Regulator	12.75" (324mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)

Low Pressure with OPSS

1843	OPSO with Partial Internal Relief	12.75" (324mm)	6" (512mm)	5.62" (143mm)	19.87" (505mm)	10.5" (267mm)
1843B	OPSO with Full Capacity Internal Relief	12.75" (324mm)	6" (512mm)	5.62" (143mm)	19.87" (505mm)	10.5" (267mm)
1853	OPSO with Partial Internal Relief	12.75" (324mm)	6" (512mm)	5.62" (143mm)	19.87" (505mm)	10.5" (267mm)
1883	OPSO	12.75" (324mm)	6" (512mm)	5.62" (143mm)	19.87" (505mm)	10.5" (267mm)
1883M	OPSO with Monitor	12.75" (324mm)	6" (512mm)	5.62" (143mm)	19.87" (505mm)	10.5" (267mm)

Low Pressure with USSA

1823	Underpressure Shutoff (USSA)	12.75" (324mm)	6" (512mm)	1.75" (45mm)	21" (533mm)	10.5" (267mm)
1833	UPSO with Partial Internal Relief (USSA)	12.75" (324mm)	6" (512mm)	1.75" (45mm)	21" (533mm)	10.5" (267mm)
1833B	UPSO with Full Internal Relief (USSA)	12.75" (324mm)	6" (512mm)	1.75" (45mm)	21" (533mm)	10.5" (267mm)
1853B	OPSO & UPSO with Full Capacity Internal Relief (USSA)	12.75" (324mm)	6" (512mm)	1.75" (45mm)	21" (533mm)	10.5" (267mm)
1893	OPSO and UPSO (USSA)	12.75" (324mm)	6" (512mm)	1.75" (45mm)	21" (533mm)	10.5" (267mm)

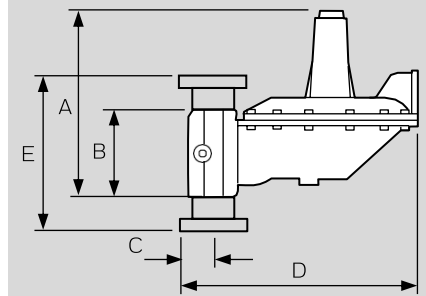
High Pressure

2003	Standard Regulator	18.19" (462mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
2003M	Standard Monitor Regulator	18.19" (462mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
2023	UPSO	18.19" (462mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
2083	OPSO	18.19" (462mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
2083M	OPSO with Monitor	18.19" (462mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)
2093	OPSO and UPSO	18.19" (462mm)	6" (512mm)	1.75" (45mm)	16" (407mm)	10.5" (267mm)

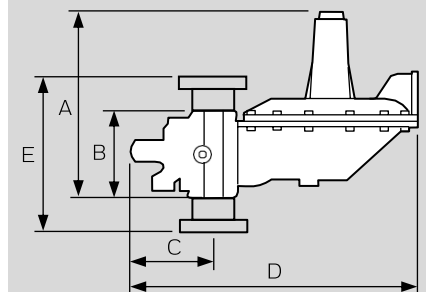
REGULATOR REPAIR KITS

Kit Part No.	Description	Used On.
73909K013.	O-Rings, Diaphragm Assy, Seat Disk Assy, Fasteners	Models 2003, 2003M, 2023, 2083, 2083M, & 2093 Made - after 4/1/1994
73909K012	Monitor Conversion Kit	All Models
73909K007	O-Rings, Diaphragm Assy, Seat Disk Assy, Fasteners	Models 1813B, 1833B, 1843B, & 1853B (All Full Relief) - Made before 4/1/1994
73909K015	O-Rings, Diaphragm Assy, Seat Disk Assy, Fasteners	Models 1813B, 1833B, 1843B, & 1853B - Made after 4/1/1994
73909K006	O-Rings, Diaphragm Assy, Seat Disk Assy, Fasteners	Models 1813, 1823, 1833, 1843, 1843M, 1853, & 1853M (All Partial Relief) - Made after 4/1/1994
73909K014	Seal plug and body O-Rings & Seat Disk Assy	All Models

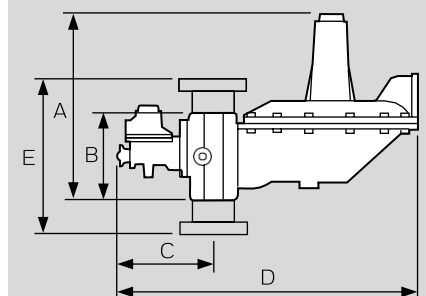
Low Pressure



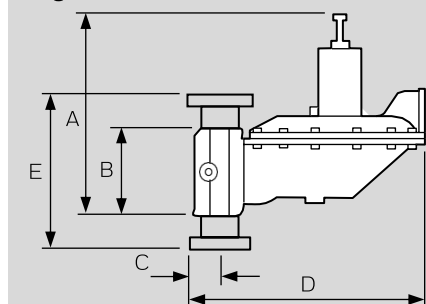
Low Pressure with OPSS



Low Pressure with USSA

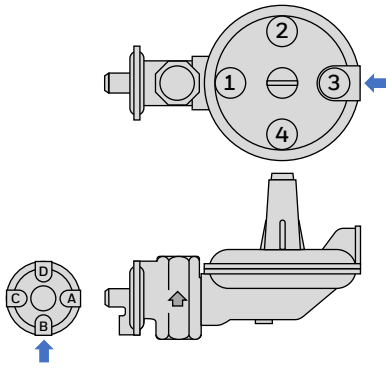


High Pressure



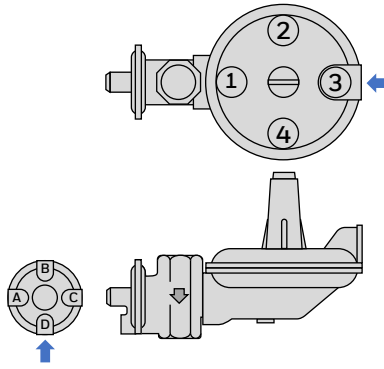
Series 1800 & 2000 Assembly Positions

Valve Head Position A

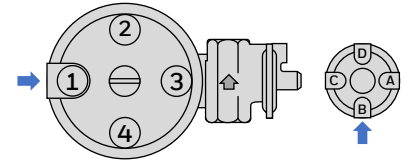


↑ = Standard Vent Position

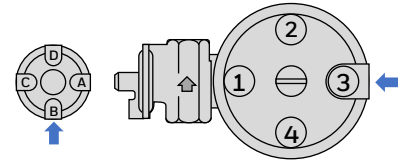
Valve Head Position B



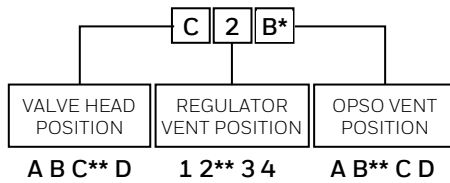
Valve Head Position C



Valve Head Position D



Regulator Assembly Number



* FOR MODELS USING OPSO ONLY.
 ** UNLESS OTHERWISE SPECIFIED,
 VALVE HEAD POSITION "C" WILL BE SUPPLIED

Full-Open Regulator Capacity

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

For critical flow rates –

$$Q = 0.5 C \times \frac{P_1}{\sqrt{G}}$$

sub-critical flows –

$$Q = C \times \sqrt{\frac{P_2 h}{G}}$$

Shipping Weights

Description	(Lbs.)
1½" x 1½" Screwed 1800*	19 ¾
1½" x 1½" Screwed 1883	21 ¾
1½" x 1½" Screwed 2000*	25 ½
1½" x 1½" Screwed 2083	27 ½
2" x 2" Screwed† 1800*	19 ½
2" x 2" Screwed† 1883	21 ½
2" x 2" Screwed† 2000*	25 ¼
2" x 2" Screwed† 2083	27 ¼

* All Models except OPSO
 † for Flanged Models add 13 ½ lbs.
 Please enquire for weights of 1¼" size.

Ordering Information

1. Model number.
2. Size of connection: screwed or flanged.
3. Inlet and outlet pressures.
4. Volume in scfh.
5. Kind of gas and specific gravity.
6. Assembly position.
7. Orifice size.
8. OPSO spring part numbers, if required.

For more information

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Key
Q = Maximum capacity of regulator
C = Orifice constant, see table
P1 = Inlet absolute pressure (psia)
P2 = Outlet absolute pressure (psia)
h = Differential pressure (P1 - P2)
G = Specific gravity of gas

Orifice	C
¼"	110
⅜"	226
½"	400
⅝"	600
¾"	840
7⁄8"	1,100
1"	1,425
1¼"	2,150

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 18002000US | 03 | 06/23
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