

P289 Back Pressure Regulator

- Throttling Type Relief
- Compact
- Tight Shutoff
- High Flow Rates
- Reliability Due to Simplicity

The Type P289 Back Pressure Regulator functions as a high flow relief valve with an adjustable set point. The P289 can be used in place of a standard relief valve to provide protection against over pressurization in the downstream system. The design of a large diaphragm area and a pitot tube booster allow the valve to respond quickly and relieve the excessive pressure smoothly, especially in low-pressure settings.

Applications

- Fuel Gas Relief
- Gas Gathering Relief

Specifications

Port Size	P289 1" & 3/4" x 1"		P289 2" & L289	
	1 NPT		2 NPT	
Maximum Relief Inlet Pressure	100 PSIG	6.9 BAR	25 PSIG	1.7 BAR
Relief Set Pressure Ranges	1-4.5 PSIG	.07-0.3 BAR	7-18" W.C.	0.017-0.045 BAR
	4-15 PSIG	.28-1.0 BAR	0.5-2.25 PSIG	0.035-0.16 BAR
	10-20 PSIG	0.7-1.4 BAR	1.75-7 PSIG	0.12-0.5 BAR
	15-50 PSIG	1-3.5 BAR	4-10 PSI	0.28-0.7 BAR
Temperature Range	-20-150°F with Nitrile and Neoprene		-20-150°F with Nitrile and Neoprene Elastomers	
	0-300 °F with Fluoroelastomer		0-300°F with Fluoroelastomer	

P289 1" Part Matrix

P289	0	0	0	0	0	0	0
07							Body Size
08							3/4" x 1" NPT
							1" NPT
							Spring Range
							PSIG BAR
004							1 - 4.5 0.07 - 0.3
015							4 - 15 0.3 - 1.0
020							10 - 20 0.69 - 1.4
050							15 - 50 1.0 - 3.4
075							45 - 75 3.1 - 5.2
							O-ring Material
						0	Nitrile
						1	Fluoroelastomer
							Diaphragm Material
						0	Nitrile
						1	Fluoroelastomer

Materials of Construction

	P289 1" & 3/4" x 1"	L289 & P289 2"
Body, Bonnet	Aluminum	L289 - Aluminum Body with Aluminum Bonnet P289 - Cast Iron Body with Aluminum Bonnet
Diaphragm	Nitrile or Fluoroelastomer	Nitrile or Fluoroelastomer
Gaskets	Neoprene	Neoprene/Composite
O-rings	Nitrile or Fluoroelastomer	Nitrile or Fluoroelastomer
O-ring Piston and Spacer	Aluminum	N/A
Seat Washer	N/A	Stainless Steel
Pitot Tube	Aluminum	Brass or Stainless Steel
Main Seat	N/A	Brass or Stainless Steel
Spring	Zinc-plated steel	Zinc-Plated Steel
Diaphragm Piston	Zinc-plated steel	Zinc-Plated Steel
Closing Cap	N/A	Acetal

L289 Part Matrix

L289	0	9	
			Body Size
05			3/4" x 2" NPT
11			1" x 2" NPT
16			2" x 2" NPT
			Spring Range
			W.C. or PSIG mBAR
051			5 - 10" W.C. 12.45 - 24.90
001			7 - 18" W.C. 17.43 - 44.83
003			12 - 40" W.C. 29.89 - 99.63
002			0.5 - 2.25 PSIG 34.47 - 155.03
007			1.75 - 7 PSIG 120.65 - 482.63
010			4 - 10 PSIG 275.79 - 689.47
			Main Seat Material
		0	Brass
		1	Stainless Steel
			O-ring Material
		0	Nitrile
		1	Fluoroelastomer
			Diaphragm Material
		0	Nitrile
		1	Fluoroelastomer
			Pilot Tube Material
		0	Brass
		1	Stainless Steel
			Body Material
		9	Aluminum

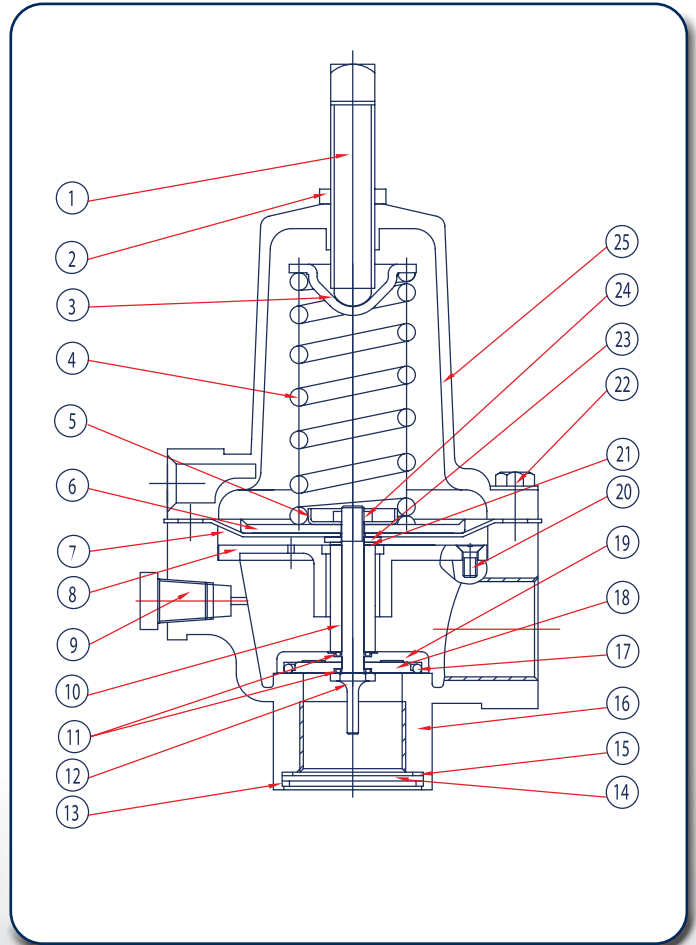
P289 2" Part Matrix

P289	16	0	0	
				Body Size
	16			2" NPT
				Spring Range
				W.C. or PSIG BAR
				7 - 18" W.C. 0.02 - .05
001				0.5 - 2.25 PSIG 0.04 - 0.16
002				1.75 - 7 PSIG 0.12 - 0.48
007				4 - 10 PSIG 0.28 - 0.7
010				
				Main Seat Material
			0	Brass
			1	Stainless Steel
				O-ring Material
			0	Nitrile
			1	Fluoroelastomer
				Diaphragm Material
			0	Nitrile
			1	Fluoroelastomer
				Pilot Tube Material
			0	Brass
			1	Stainless Steel

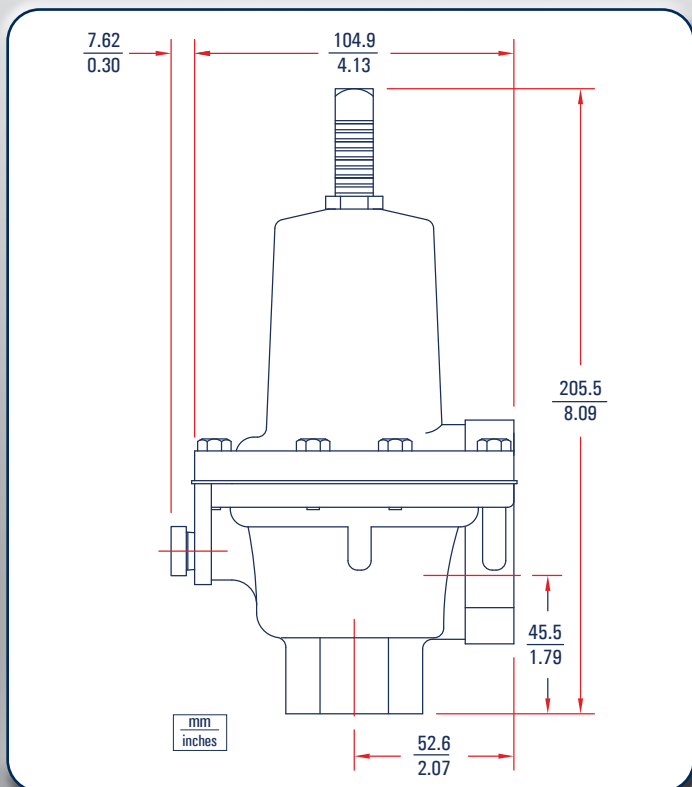


P289 1" Parts

Item	Description	Qty.	Part Number
1	Adjusting Screw, Plated Steel	1	648-487-000
2	Hex Nut, Plated Steel	1	634-154-000
3	Spring Guide, plated steel	1	626-079-000
4	Spring 1-4.5 PSIG (0.1-0.3 BAR), Pink 4-15 PSIG (0.3-1 BAR), Red 10-20 PSIG (0.7-1.4 BAR), Silver 15-50 PSIG (1-3.4 BAR), & 45-75 PSIG (3.1-5.2 BAR), Green	1	655-688-000
			655-689-000
			655-676-000
			655-690-000
5	Piston Retainer, Plated Steel	1	643-191-000
6	Piston, Plated Steel (All Output Pressures other than 45-75 PSIG) Range 45-75 PSIG	1	637-306-000
			637-319-000
7	Dia- phragm P289 1" Nitrile P289 1" Fluoroelastomer	1	600-497-000
			600-497-001
8	Stem Guide Assembly	1	814-014-000
9	Pipe Plug, Plated Steel	1	639-099-000
10	Spacer Tube, Stainless Steel	1	654-178-000
11	O-ring Nitrile Fluoroelastomer	2	649-000-003
			649-000-343
12	Pitot Tube, Aluminum	1	660-051-000
13	Retaining Ring, plated steel	1	644-051-000
14	Screen, Stainless Steel	1	647-018-000
15	Gasket, Neoprene	1	624-063-000
16	Body, Aluminum, 1" NPT Body, Aluminum, 3/4" x 1" NPT	1	664-295-000
			664-386-000
17	O-ring Nitrile Fluoroelastomer	1	649-293-000
			649-293-001
18	O-ring Spacer, Aluminum	1	654-177-000
19	O-ring Piston, Aluminum	1	637-311-000
20	Machine Screw, Stainless Steel	2	648-488-000
21	Gasket, Composite	2	624-062-000
22	Machine Screw	8	648-466-005
23	Washer, Steel	1	662-204-000
24	Hex Nut, Plated Steel	1	634-162-000
25	Bonnet, Aluminum	1	604-221-000



P289 1" Dimensions



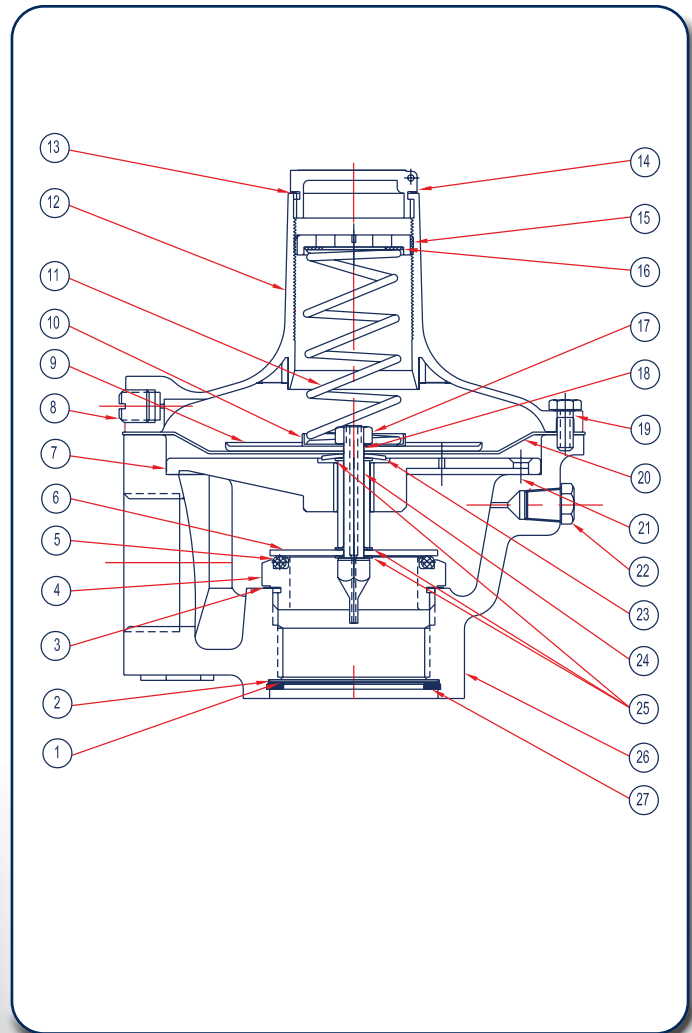
P289 1" & 3/4" x 1" Regulator Rebuild

	Kit Includes	Part Number
P289 1"	Nitrile Diaphragms, Screen & Gasket	971-289-000
P289 1"	Fluorocarbon Diaphragm, Screen & Gasket	971-289-001

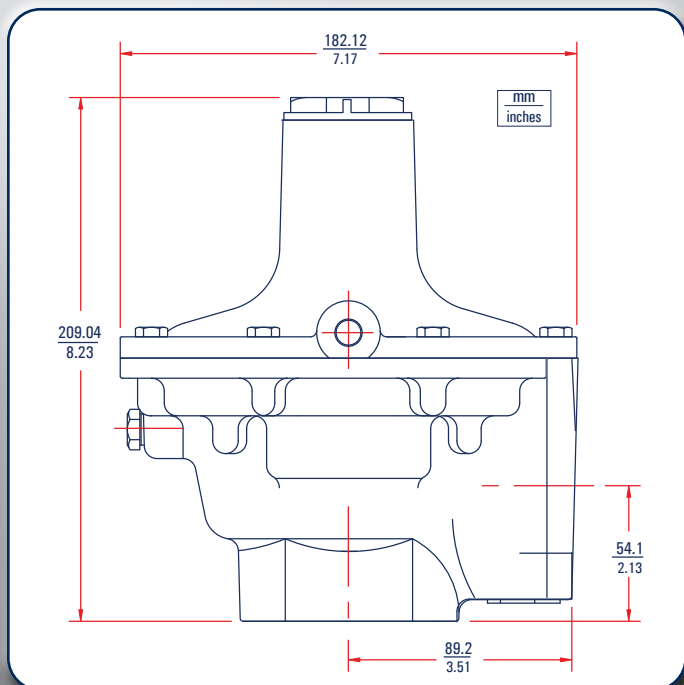


L289 & P289 2" Parts

Item	Description	Qty.	Part Number
1	Gasket, Neoprene	1	624-066-000
2	Screen, Stainless Steel	1	647-020-000
3	Seat Gasket, Neoprene	1	624-071-000
4	Main Seat	1	650-132-000
	Brass		650-133-000
5	O-ring	1	649-302-000
	Nitrile Fluoroelastomer		649-301-000
6	O-ring, Washer, Stainless Steel	1	662-207-000
7	Stem Guide Assembly, Cast Iron & Brass	1	814-015-000
8	Upper Pipe Plug	1	639-102-000
9	Diaphragm Head, Plated Steel	1	637-315-000
10	Lower Spring Retainer, Zinc Plated Steel	1	643-197-000
11	Spring	1	5 to 10" W.C. , Olive
			655-732-001
			7 to 18" W.C. , Dark Blue
			655-691-000
			12 to 40" W.C. , White
655-767-000			
0.5 to 2.25 PSIG (.03 to .15 BAR), Grey			
655-692-000			
1.75 to 7 PSIG (.12 to .48 BAR), Dark Green			
655-693-000			
4 to 10 PSIG (.27 to .69 BAR), Red Stripe			
655-694-000			
12	Bonnet, Aluminum	1	604-558-000
13	Closing Cap Gasket, Neoprene	1	624-069-000
14	Closing Cap, Acetal	1	610-056-000
15	Adjusting Screw, Zinc	1	648-499-000
16	Upper Spring Seat Washer, Aluminum	1	662-206-000
17	Hex Nut, Plated Steel	1	634-173-000
18	Pitot Tube	1	Brass
	Stainless Steel		660-053-000
19	Machine Bolt, Stainless Steel	8	648-466-000
20	Dia-phragm	1	Nitrile
			Fluoroelastomer
21	Machine Screw, Stainless Steel	4	648-500-000
22	Low Pipe Plug, Plated Steel	1	639-099-000
23	Snap Washer, Plated Steel	1	662-208-000
24	Spacer	1	Brass
			Stainless Steel
25	Gasket, Neoprene	3	624-065-000



P289 2" Dimensions

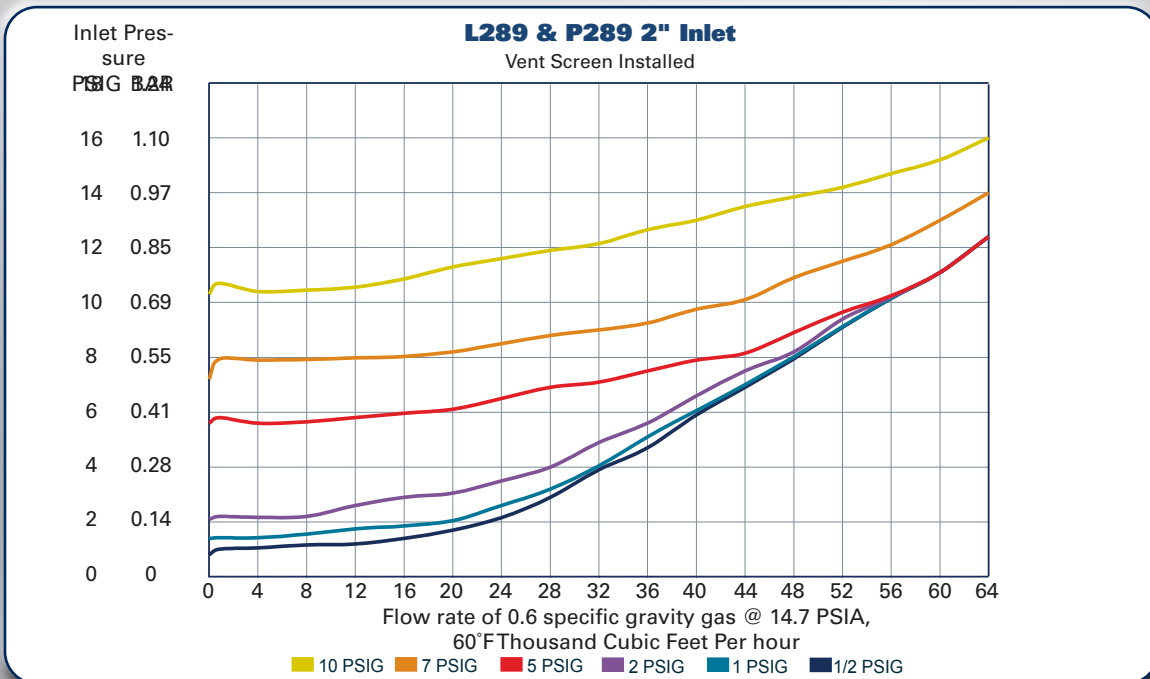
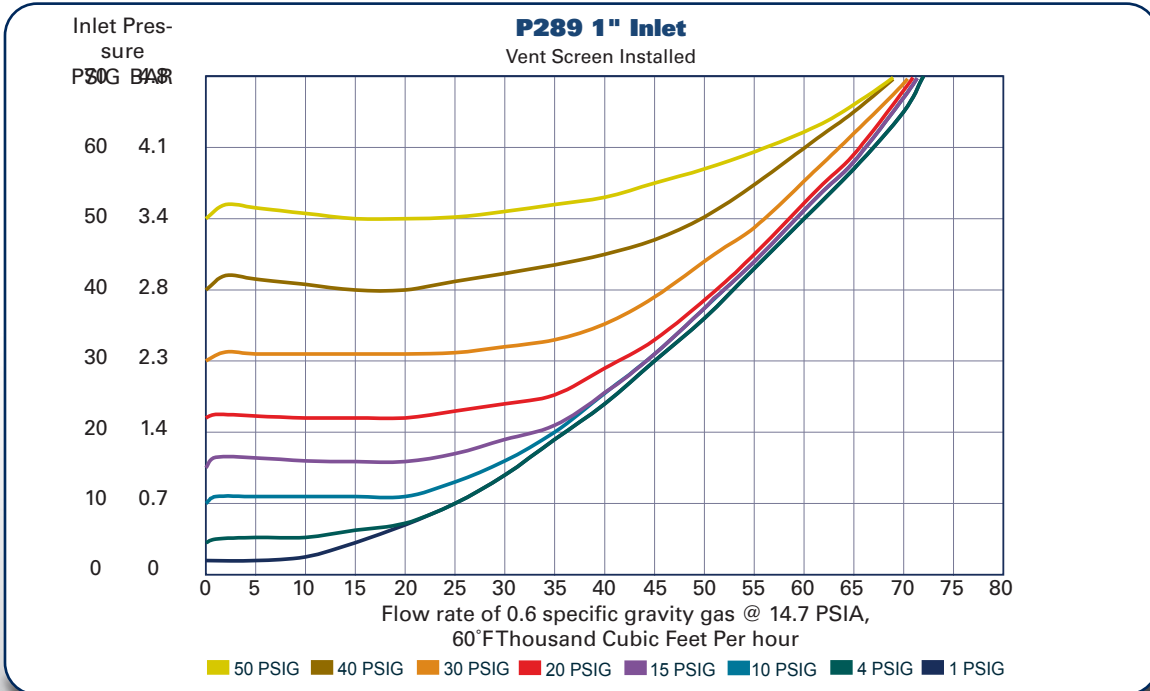
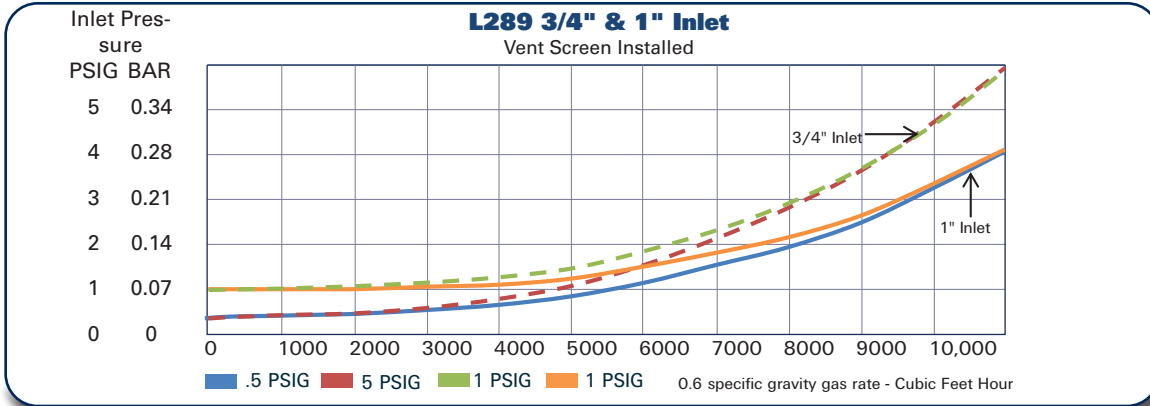


P289 2" Regulator Rebuild Kits

	Kit Includes	Part Number
P289 2"	Nitrile Diaphragms, Screen, Screen Gasket (Neoprene), Composite Gas-gaskets (Qty.3)	971-289-002
P289 2"	Fluorocarbon Diaphragm, Screen, Screen Gasket (Neoprene), Composite Gas-gaskets (Qty. 3)	971-289-003



L289 & P289 Flow Rates



F289 Pilot Operated Back Pressure Regulator

- Throttling Type Relief
- Compact
- Tight Shutoff
- High Flow Rates
- Reliability Due to Simplicity

The Type F289 is a Pilot Operated Back Pressure Regulator that functions as a high flow relief valve with an adjustable set point. The F289 can be used in place of a standard relief valve to provide protection against over pressurization in the downstream system. The pilot regulator allows for accurate back pressure control with minimal buildup over the set pressure for full opening of the main valve.

Applications

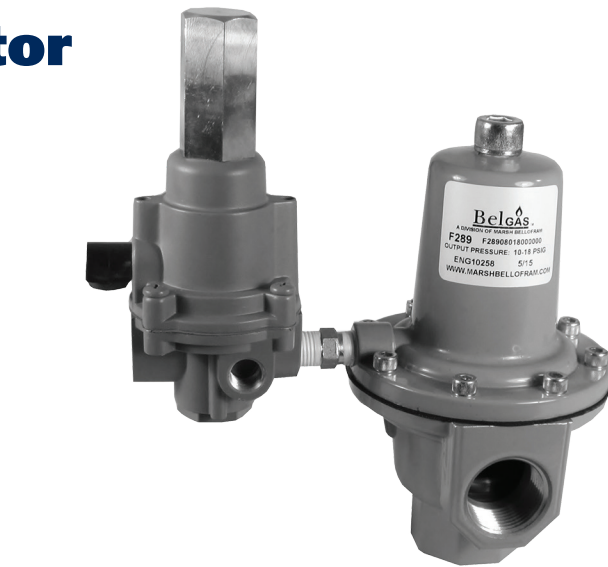
- Fuel Gas Relief
- Gas Gathering Relief

Specifications

Port Size	F289 1"		F289 2"	
	1 NPT		2 NPT	
Maximum Relief Inlet Pressure	50 PSIG above max output or 110 PSIG Max.	7.6 BAR	15 PSIG	1.0 BAR
Relief Set Pressure Ranges	10 - 18 PSIG	.7-1.2 BAR	14" - 2 PSIG	.04 - .14
	18 - 30 PSIG	1.2-2.1 BAR	2 - 10 PSIG	.14 - .7
	30 - 100 PSIG	2.1-6.9 BAR		
Temperature Range	-20-150 °F with Nitrile and Neoprene		-20-150 °F with Nitrile and Neoprene Elastomers	
	0-300 °F with Fluoroelastomer		0-300 °F with Fluoroelastomer	
Approximate Weight	2.5 lbs.	1.133 kg	15.5 lbs.	7.030 kg

F289 1" Part Matrix

F289		0	0	0	0	0	
07							Body 3/4" x 1" NPT
08							1" x 1" NPT
							Output Ranges
							PSIG BAR
018							10 - 18 0.7 - 1.3
030							18 - 30 1.3 - 2.1
100							30 - 100 2.1 - 7.0
	0	0	0	0			O-ring / Diaphragm Material
					0		Nitrile (NBR)
					1		Fluoroelastomer (FKM)
					0		Trim Material
						0	Brass
						1	Stainless Steel



Materials of Construction

	F289 1"	F289 2"
Body, Bonnet	Aluminum	Cast Iron Body with Aluminum Bonnet
Diaphragm	Nitrile or Fluoroelastomer	Nitrile or Fluoroelastomer
Gaskets	Neoprene	Neoprene/Composite
O-rings	Nitrile or Fluoroelastomer	Nitrile or Fluoroelastomer
O-ring Piston and spacer	Aluminum	N/A
Seat Washer	N/A	Stainless Steel
Pitot Tube	Aluminum	Brass or Stainless Steel
Main Seat	N/A	Brass or Stainless Steel
Spring	Zinc-plated steel	Zinc-Plated Steel
Diaphragm Piston	Zinc-plated steel	Zinc-Plated Steel

F289 2" Part Matrix

F28916		0	0	0	0	
						Output Ranges
						W.C. or PSIG BAR
002						14" W.C. - 2 PSIG 0.04 - 0.14
010						2 - 10 PSIG 0.14 - 0.7
						O-ring / Diaphragm Material
					0	Nitrile (NBR)
					1	Fluoroelastomer (FKM)
						Trim Material
					0	Brass
					1	Stainless Steel



F289 1 NPT Main Valve Capacities and PL82 Pilot

Main Valve Spring Part Number, and Color	Set Pressure Range		Set Pressure ¹		Build-up Over Set Pressure to Begin Opening Main Valve ²		Build-up Over Set Pressure to Fully Open Main Valve ³		Pressure Drop Below Set Pressure to Reseat Pilot		Capacities of 0.6 Specific Gravity Natural Gas ⁴	
	PSIG	BAR	PSIG	BAR	PSIG	BAR	PSIG	BAR	PSIG	BAR	SCFH	Nm ³ /h
For set pressures up to 30 psig / 2.1 bar	10 to 18	0.69 to 1.2	10	0.69	0.8	0.055	1.0	0.07	1.0	0.07	23,000	616
			15	1.0							29,000	777
			18	1.2							32,000	858
	18 to 30	1.2 to 2.1	18	1.2	0.9	0.062	1.2	0.08	1.0	0.07	32,000	858
			25	1.7							39,000	1,045
			30	2.1							44,000	1,179
For set pressures over 30 psig / 2.1 bar	30 to 100	2.1 to 7.0	30	2.1	1.4	0.10	1.9	0.13	1.0	0.07	44,000	1,179
			40	2.8							54,000	1,447
			50	3.4							64,000	1,715
			60	4.1							73,000	1,956
			70	4.8	1.6	0.11	2.1	0.14	1.0	0.07	83,000	2,224
			80	5.5							92,000	2,466
			90	6.2							102,000	2,734
			100	7.0							111,000	2,975

1. Set pressure is defined as the pressure at which the pilot exhaust starts to bubble (discharge).
2. Crack pressure is the inlet pressure at which the main valve starts audible flow.
3. Inlet pressure buildup over the set pressure to achieve wide-open capacity.
4. Capacities with inlet piping equal to body size and without outlet piping.

F289 2 NPT Main Valve Capacities and PL83 & PL82 Pilot

Relief Set Pressure Range, Spring Part Number, and Color	Set Pressure ¹		Buildup Over Set Pressure to Fully Open Main Valve ²		Pressure Drop Below Set Pressure to Reseat Pilot		Capacities of 0.6 Specific Gravity Natural Gas ³	
	PSIG	BAR	PSIG	mBAR	PSIG	mBAR	SCFH	Nm ³ /h
14-inches w.c. to 2 PSIG (35 mbar to 0.14 BAR) PL83	0.5	0.03	0.25	17	0.25	17	18,700	501
	1.0	0.07					24,000	643
	1.5	0.10					28,400	761
	2.0	0.14					32,100	860
2 to 10 PSIG (0.14 to 0.69 BAR) PL82	2.0	0.14	0.30	21	0.30	21	32,500	871
	4.0	0.28					44,300	1,187
	6.0	0.41					53,700	1,439
	8.0	0.55					62,000	1,662
	10.0	0.69					69,500	1,863

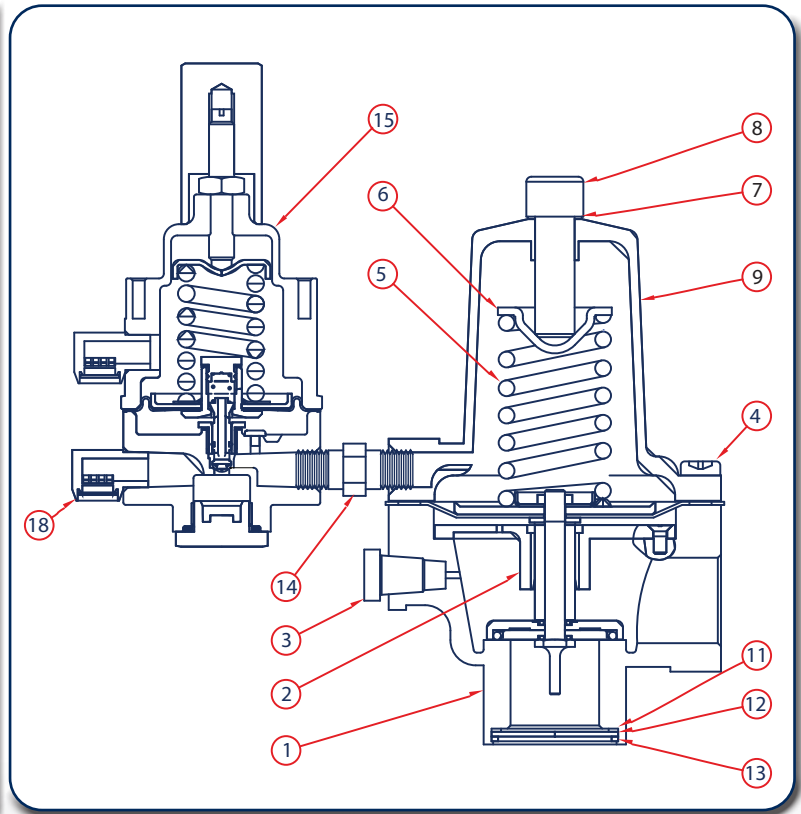
1. Set pressure is defined as the pressure at which the pilot exhaust starts to bubble (discharge).
2. Inlet pressure buildup over the set pressure to achieve wide-open capacity.
3. Capacities with inlet piping equal to body size and without outlet piping.

F289 Wide Open Flow Coefficients

1 NPT Main Valve				2 NPT Main Valve			
Inlet Piping Size	C _g	C _v	C ₁	Inlet Piping Size	C _g	C _v	C ₁
Line Size Equals Body Size [1-inch (25 mm) Inlet Piping]	740	23.1	32	Line Size Equals Body Size [2-inch (51 mm) Inlet Piping]	2,290	73.4	31.2
2:1 Line Size to Body Size Piping [2-inch (51 mm) Inlet Piping]	560	17.5		2:1 Line Size to Body Size Piping [4-inch (102 mm) Inlet Piping]	2,050	65.7	

F289 1" Parts

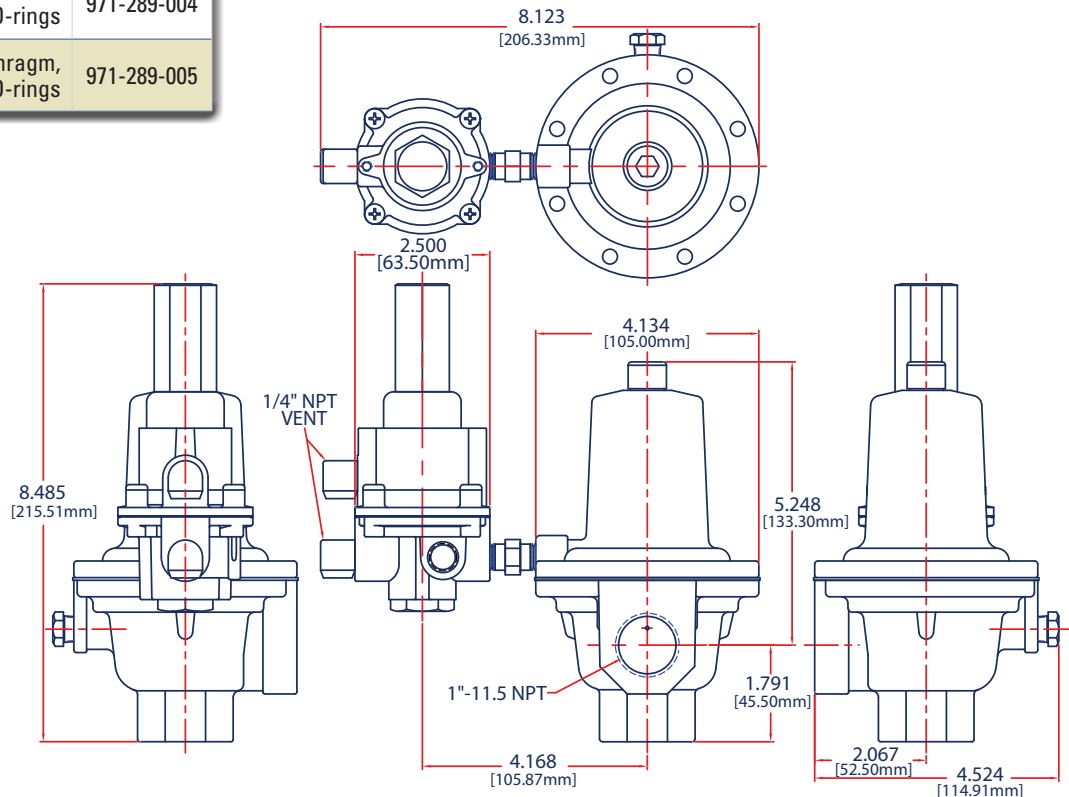
Item	Description	Qty.	Part Number
1	Body	1	1" Aluminum
			3/4" x 1" Aluminum
2	Dia-phragm Assembly	1	Nitrile
			Fluoroelastomer
3	Pipe Plug, Plated Steel	1	639-099-000
4	Machine Screw	8	648-466-005
5	Range Spring	1	10 - 30 PSIG, Pink
			30 - 100 PSIG, Red
6	Spring Guide, Steel	1	626-079-000
7	Gasket, Copper	1	624-090-000
8	Adjustment Screw, Plated Steel	1	648-554-000
9	Bonnet, Aluminum	1	604-237-000
10	Machine Screw, Stainless Steel	2	648-488-000
11	Gasket, Neoprene	1	624-063-000
12	Screen, Stainless Steel	1	647-018-000
13	Retaining Ring, Steel	1	644-051-000
14	1/4" to 1/4" Pipe Nipple	1	622-056-000
15	PL82 Pilot	1	10-18 PSI, Nitrile
			10-18 PSI, Fluoroelastomer
			18-30 PSI, Nitrile
			18-30 PSI, Fluoroelastomer
			30-100 PSI, Nitrile
			30-100 PSI, Fluoroelastomer



F289 1" Regulator Rebuild Kits

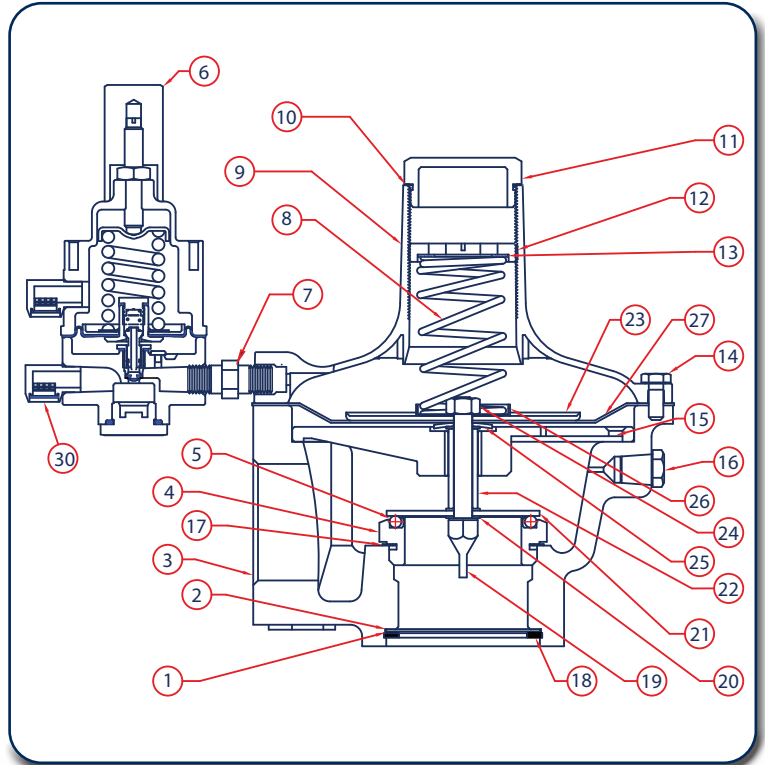
	Kit Includes	Part Number
F289 1"	Nitrile Diaphragms, Screen, Gasket & O-rings	971-289-004
F289 1"	Fluorocarbon Diaphragm, Screen, Gasket & O-rings	971-289-005

F289 1" Pilot Dimensions



F289 2" Parts

Item	Description	Qty.	Part Number
1	Gasket, Neoprene	1	624-066-000
2	Screen, Stainless Steel	1	647-020-000
3	Body	1	3/4" x 2" Aluminum 664-303-000
	1" x 2" Aluminum 664-303-001		
	2" x 2" Aluminum 664-303-002		
	2" x 2" Iron 664-302-000		
4	Main Seat	1	Brass 650-132-000
	Stainless Steel 650-133-000		
5	O-Ring	1	Nitrile 649-302-000
	Fluoroelastomer 649-301-000		
6	PL82/ PL83 Pilot	1	PL82 2-10 PSI, Nitrile 832-833-032
			PL82 2-10 PSI, Fluoroelastomer 832-833-034
			PL83 14"-2 PSI, Nitrile 833-032-000
			PL83 14"-2 PSI, Fluoroelastomer 833-032-001
7	1/4" to 1/4" Pipe Nipple	1	622-056-000
8	Spring	1	14" W.C. - 2 PSIG White 655-751-000
			2 - 10 PSIG Blue 655-691-000
9	Bonnet, Aluminum	1	604-268-000
10	Closing Cap Gasket, Neoprene	1	624-069-000
11	Closing Cap	1	610-071-000
12	Adjusting Screw, Zinc	1	648-499-000
13	Upper Spring Seat Washer, Aluminum	1	662-206-000
14	Machine Bolt, Stainless Steel	8	648-466-000
15	Machine Screw, Stainless Steel	4	648-500-000
16	Low Pipe Plug, Steel	1	639-099-000
17	Seat Gasket, Neoprene	1	624-071-000
18	Retaining Ring, Steel	1	644-054-000
19	Pitot Tube	1	Brass 660-053-000
			Stainless Steel 660-054-001
20	Gasket, Neoprene	3	624-065-000
21	O-Ring, Washer, Stainless Steel	1	662-207-000
22	Spacer	1	Brass 654-181-000
			Stainless Steel 654-182-000
23	Diaphragm Head, Steel	1	637-315-000
24	Hex Nut, Steel	1	634-173-000
25	Snap Washer, Steel	1	662-208-000
26	Lower Spring Retainer, Zinc Plated Steel	1	643-197-000
27	Dia- phragm	1	Nitrile 618-071-000
			Fluoroelastomer 618-071-001



F289 2" Regulator Rebuild Kits

	Kit Includes	Part Number
F289 2"	Nitrile Diaphragms, Screen, Screen Gasket (Neoprene), Composite Gaskets	971-289-006
F289 2"	Fluorocarbon Diaphragm, Screen, Screen Gasket (Neoprene), Composite Gaskets	971-289-007

F289 2" Dimensions

