F289 Pilot Operated Back Pressure Regulator

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

The 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

	F289 1"		F289 2"	
Port Size	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

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 1" Part Matrix

F289			0	0	0	0		0	
									Body
	07								3/4" x 1" NPT
	08								1" x1" 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	

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	Nm³/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	Nm³/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

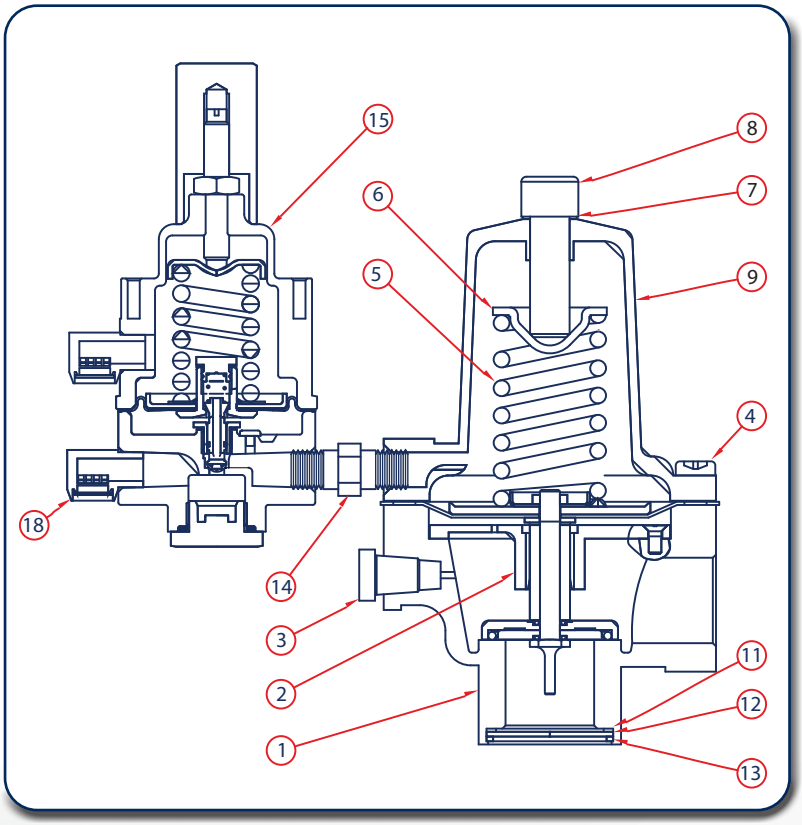
1. Set pressure is defined as the pressure at which the pilot exhaust starts to bubble (discharge).
2. Inlet pressure buildup over the set pressure to achieve wide-open capacity.
3. Capacities with inlet piping equal to body size and without outlet piping.

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

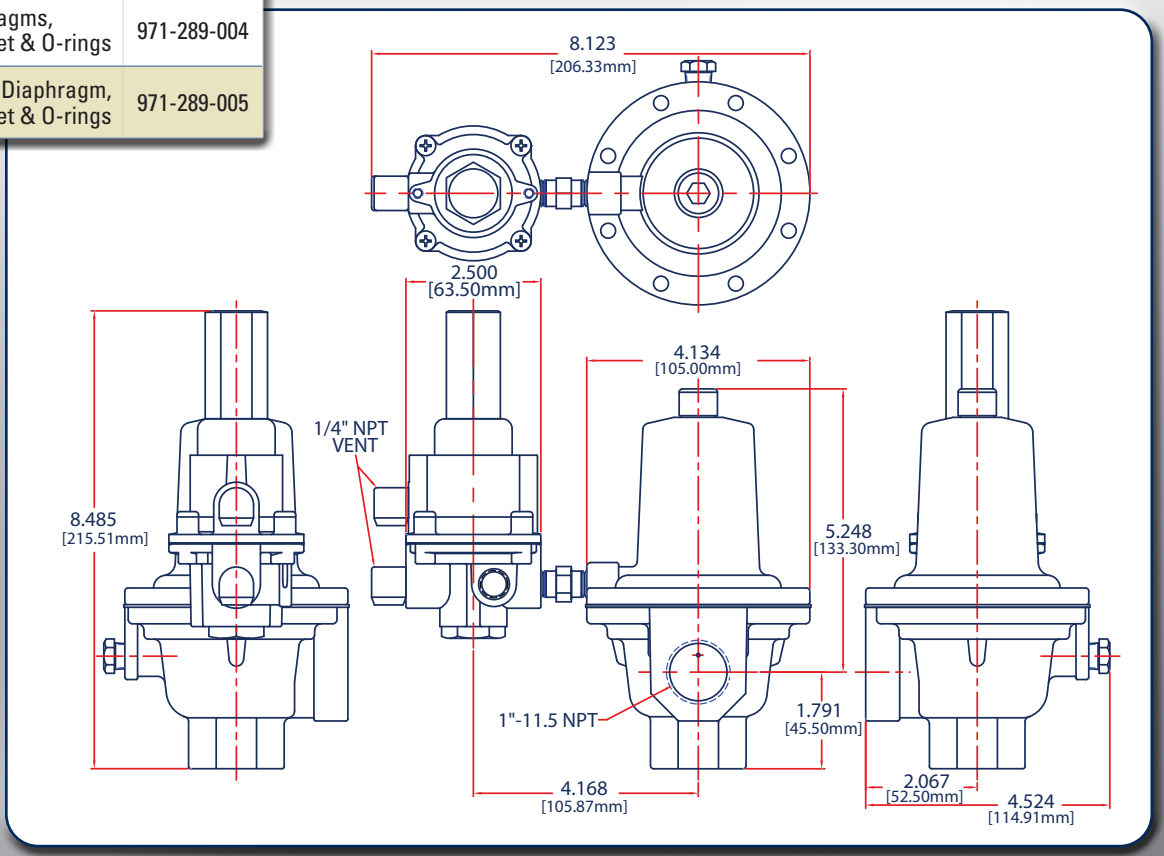
Item	Description		Qty.	Part Number
1	Body	1" Aluminum	1	664-295-000
		3/4" x 1" Aluminum		664-386-000
2	Dia-phragm Assembly	Nitrile	1	804-240-002
		Fluoroelastomer		804-240-003
3	Pipe Plug, Plated Steel		1	639-099-000
4	Machine Screw		8	648-466-005
5	Range Spring	10 - 30 PSIG, Pink	1	655-688-000
		30 - 100 PSIG, Red		655-689-000
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	10-18 PSI, Nitrile	1	832-833-018
		10-18 PSI, Fluoroelastomer		832-833-021
		18-30 PSI, Nitrile		832-833-033
		18-30 PSI, Fluoroelastomer		832-833-035
		30-100 PSI, Nitrile		832-833-020
		30-100 PSI, Fluoroelastomer		832-833-023



F289 1" Regulator Rebuild Kits

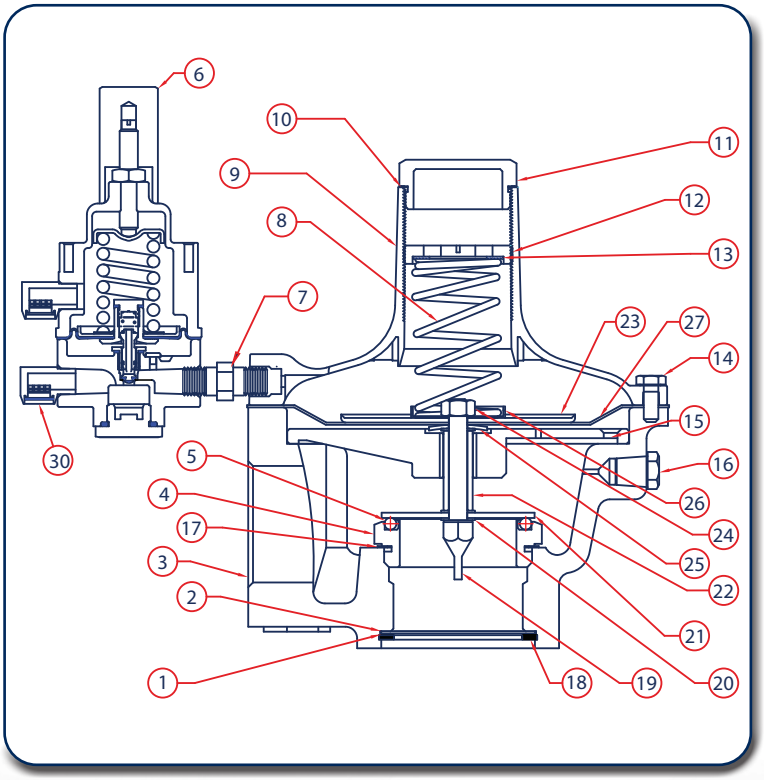
	Kit Includes	Part Number
F289 1"	Nitrile Diaphragms, Screen, Gasket & O-rings	971-289-004
F289 1"	Fluorocarbon Diaphragm, Screen, Gasket & O-rings	971-289-005

F289 1" Pilot Dimensions



F289 2" Parts

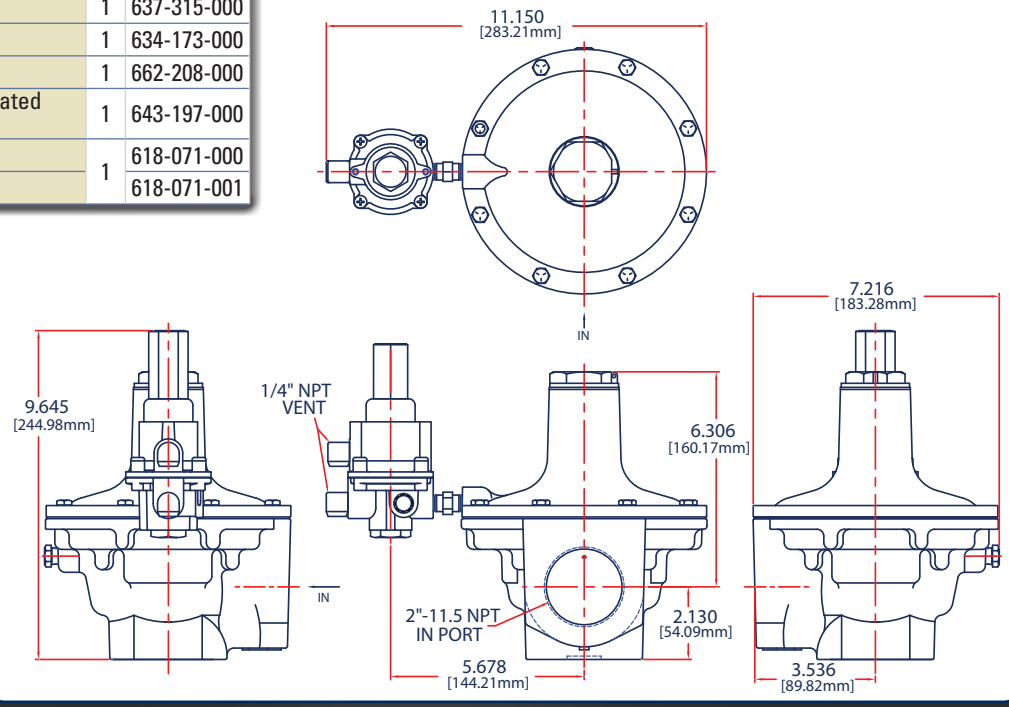
Item	Description		Qty.	Part Number
1	Gasket, Neoprene		1	624-066-000
2	Screen, Stainless Steel		1	647-020-000
3	Body	3/4" x 2" Aluminum	1	664-303-000
		1" x 2" Aluminum		664-303-001
		2" x 2" Aluminum		664-303-002
		2" x 2" Iron		664-302-000
4	Main Seat	Brass	1	650-132-000
		Stainless Steel		650-133-000
5	O-Ring	Nitrile	1	649-302-000
		Fluoroelastomer		649-301-000
6	PL82/ PL83 Pilot	PL82 2-10 PSI, Nitrile	1	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	14" W.C. - 2 PSIG White	1	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	Brass	1	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	Brass	1	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	Nitrile	1	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



BelGAS

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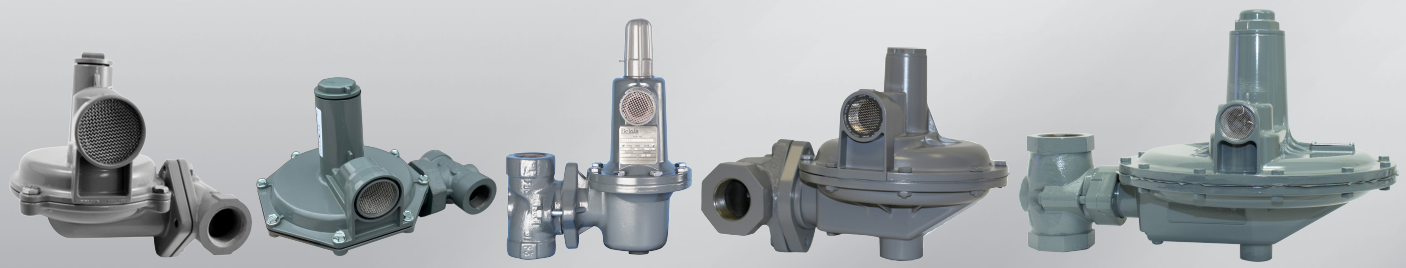

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