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

	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 ºF with Nitrile and Neoprene		-20–150 ºF with Nitrile and Neoprene Elastomers	
	0–300 ºF with Fluoroelastomer		0–300 ºF 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
Closing Cap	N/A	Zinc

F289 1" Part Matrix

F28908		0	0	0	0		0	
								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
								O-ring / Diaphragm Material
						0		Nitrile (NBR)
						1		Fluoroelastomer (FKM)

F289 2" Part Matrix

F28916		0	0	0			2	
								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.

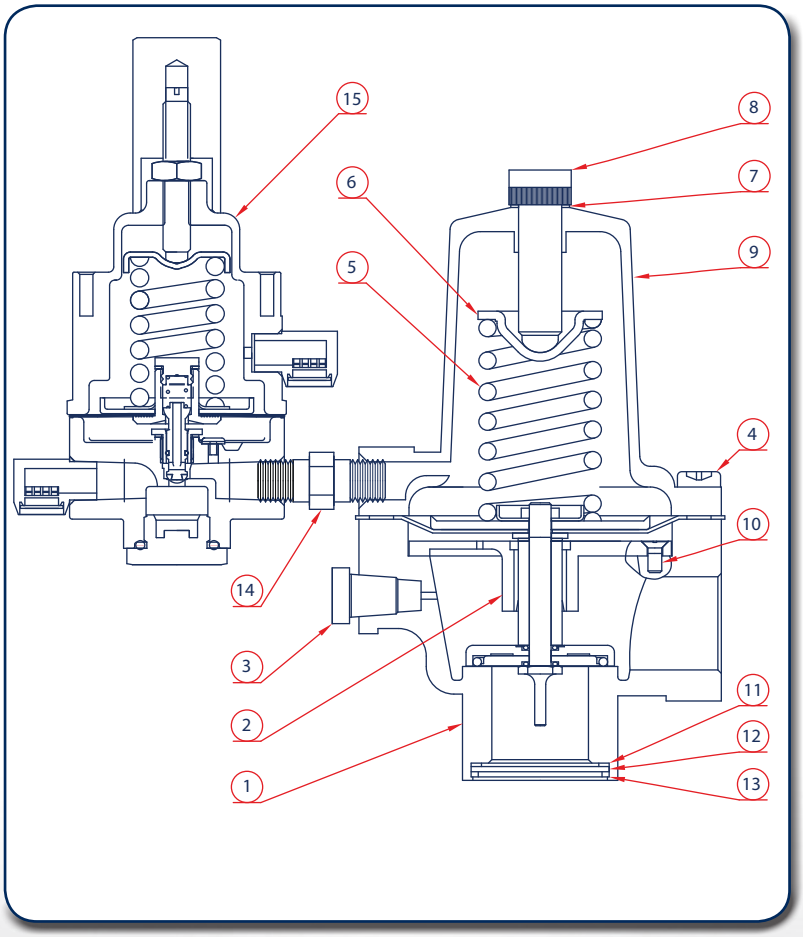
F289 Wide Open Flow Coefficients

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	

1. Wide-open flow coefficients without outlet piping and outlet screen.

F289 1" Parts

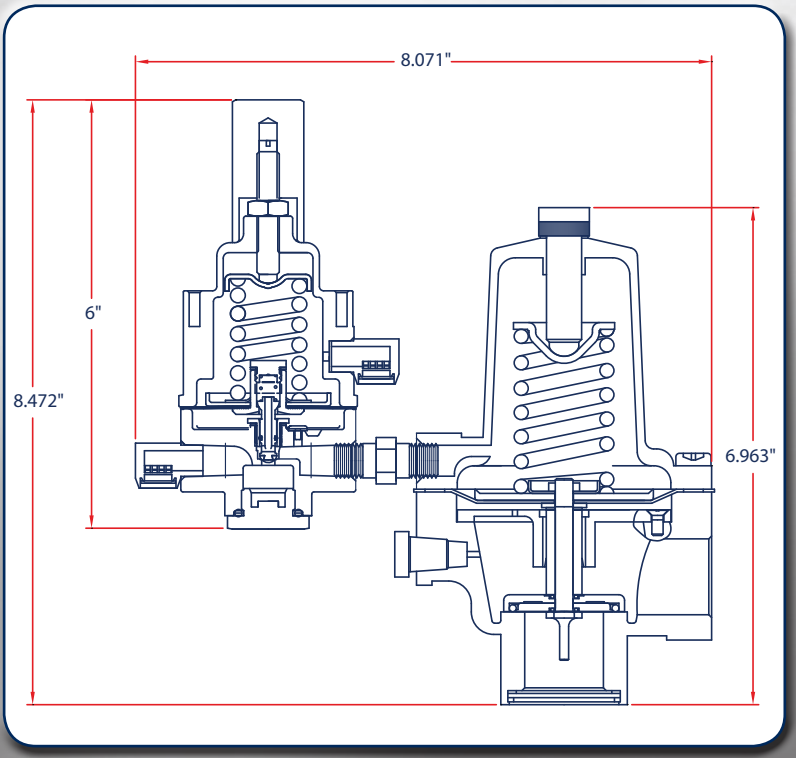
Item	Description		Part Number
1	Body, Aluminum		664-295-000
2	Diaphragm Assembly	Nitrile	804-240-002
		Fluoroelastomer	804-240-003
3	Pipe Plug, Plated Steel		639-099-000
4	Machine Screw (8 required)		648-466-005
5	Range Spring	10 - 30 PSIG, Pink	655-688-000
		30 - 100 PSIG, Red	655-689-000
6	Spring Guide, Plated Steel		626-079-000
7	Copper Gasket		624-090-000
8	Adjustment Screw		648-554-000
9	Bonnet, Aluminum		604-237-000
10	Machine Screw, Stainless Steel (2 required)		648-488-000
11	Gasket, Neoprene		624-063-000
12	Screen, Stainless Steel		647-018-000
13	Retaining Ring, Plated Steel		644-051-000
14	1/4" to 1/4" Pipe Nipple		622-056-000
15	PL82 Pilot Regulators	10-18 PSI, Nitrile	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

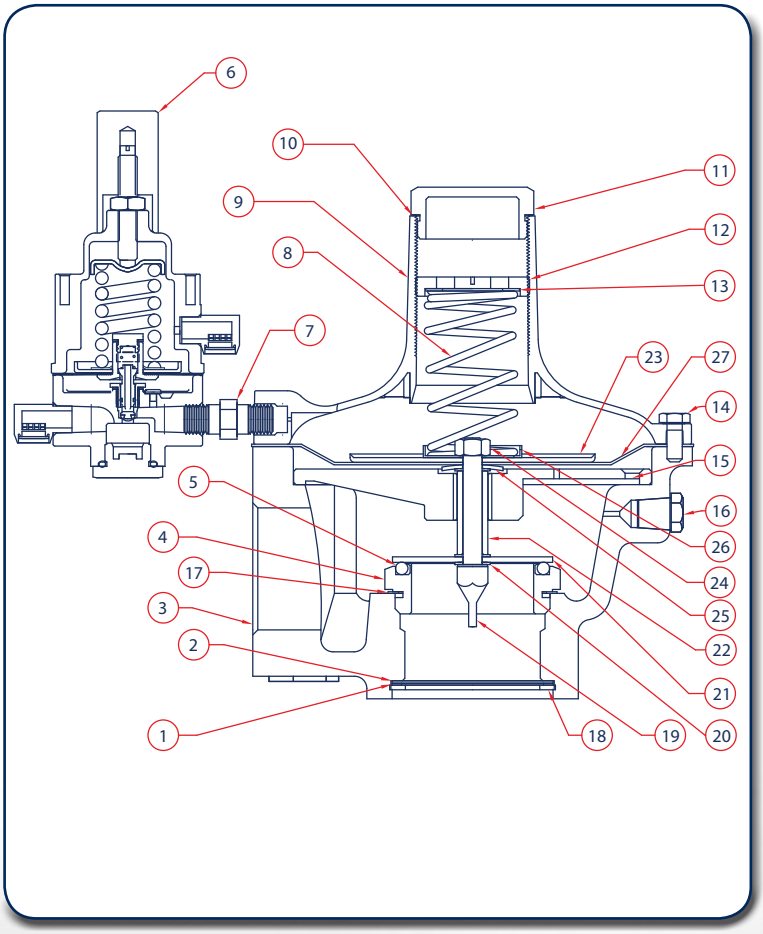
	Kit Includes	Part Number
F289 1"	Nitrile Diaphragms, Screen & Gasket	971F28900
F289 1"	Fluorocarbon Diaphragm, Screen & Gasket	971F28901

F289 1" Pilot Dimensions



F289 2" Parts

Item	Description		Part Number
1	Gasket, Neoprene		624-066-000
2	Screen, Stainless Steel		647-020-000
3	Body, Cast Iron		664-302-000
4	Main Seat	Brass	650-132-000
		Stainless Steel	650-133-000
5	O-Ring	Nitrile	649-302-000
		Fluoroelastomer	649-301-000
6	PL82/PL83 Pilot Reg.	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		622-056-000
8	Spring	14" W.C. - 2 PSIG White	655-751-000
		2 - 10 PSIG Blue	655-691-000
9	Bonnet, Aluminum		604-558-000
10	Closing Cap Gasket, Neoprene		624-069-000
11	Closing Cap		610-071-000
12	Adjusting Screw, Zinc		648-499-000
13	Upper Spring Seat Washer		662-206-000
14	Machine Bolt (8 required)		648-466-000
15	Machine Screw, Stainless Steel (4 required)		648-500-000
16	Low Pipe Plug, Plated Steel		639-099-000
17	Seat Gasket, Neoprene		624-071-000
18	Retaining Ring		644-054-000
19	Plugged Pitot Tube	Brass	660-088-000
		Stainless Steel	660-088-001
20	Gasket, Neoprene (3 required)		624-065-000
21	O-Ring, Washer, Stainless Steel		662-207-000
22	Spacer	Brass	654-181-000
		Stainless Steel	654-182-000
23	Diaphragm Head, Plated Steel		637-315-000
24	Hex Nut, Plated Steel		634-173-000
25	Snap Washer, Plated Steel		662-208-000
26	Lower Spring Retainer, Zinc Plated Steel		643-197-000
27	Diaphragm	Nitrile	618-071-000
		Fluoroelastomer	618-071-001
28	1/4" to 1/4" Pipe Nipple		622-056-000



F289 2" Regulator Rebuild Kits

	Kit Includes	Part Number
F289 2"	Nitrile Diaphragms, Screen, Screen Gasket (Neoprene), Composite Gaskets (Qty.3)	971 F28 902
F289 2"	Fluorocarbon Diaphragm, Screen, Screen Gasket (Neoprene), Composite Gaskets (Qty. 3)	971 F28 903

F289 2" Dimensions