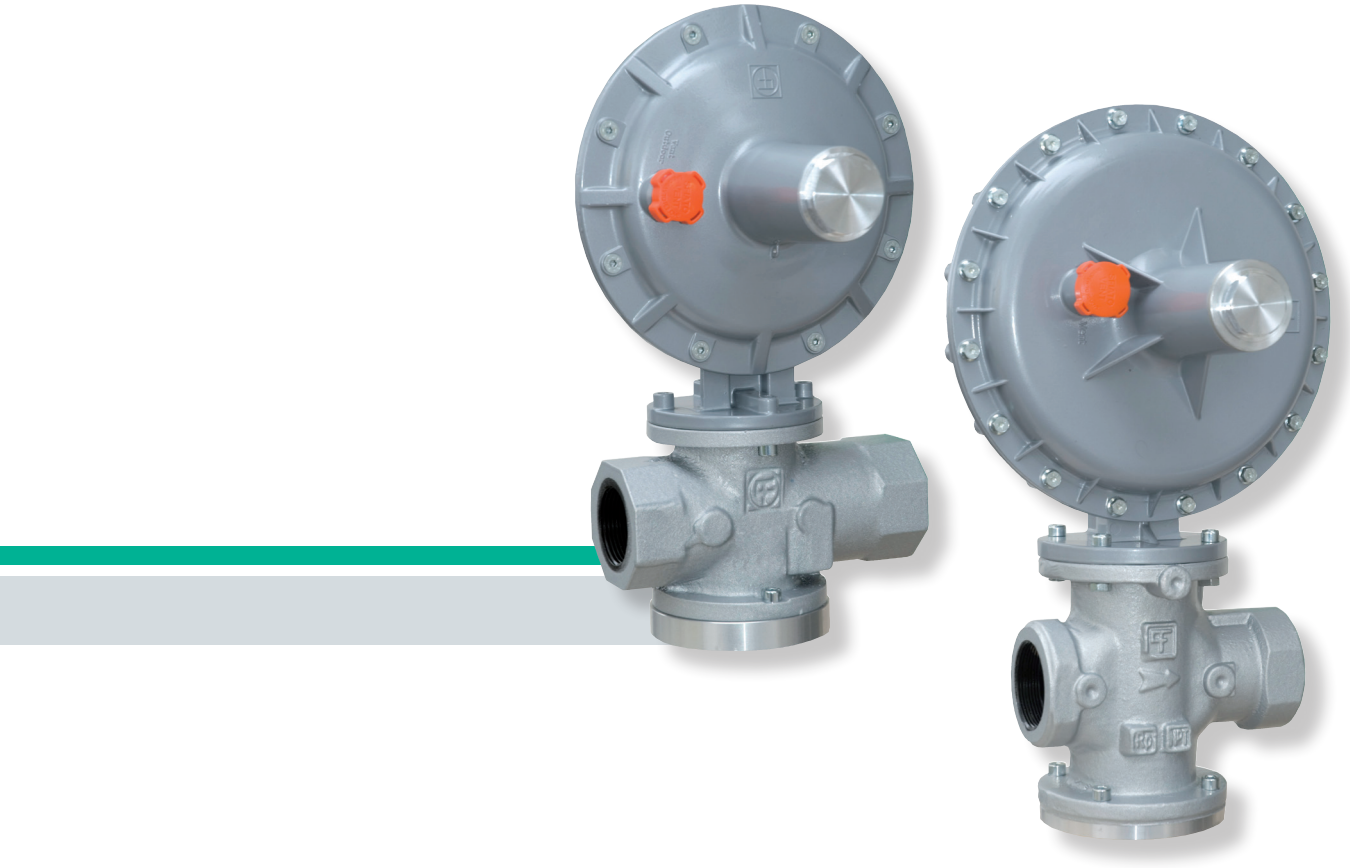
Pietro Fiorentini



PF80 - PF120

Commercial & Industrial Pressure Regulators

PF80 - PF120

OVERVIEW

The **PF80 & PF120** spring loaded direct-acting natural gas pressure regulators are suited for commercial and industrial applications requiring low and medium delivery pressures. The modular design allows for easy adaptation of multiple optional overpressure protection devices to fit almost any application requirement.

Features

- Balanced valve design
  - Stable outlet pressure independent of inlet pressure variation
  - High turndown ratio easily serves varying loads
  - Single orifice simplifies sizing without impacting inlet pressure limitation
- Internal strainer protects the orifice and seat from foreign debris
- Multiple body sizes to fit design requirements
- Outlet pressure ranges from 6” w.c. to 10 PSIG
- Environmentally-friendly overpressure protection options that minimize or eliminate large volumes of gas from being emitted to the atmosphere in the event of an abnormal condition

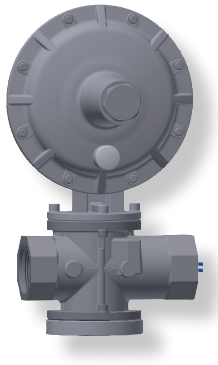


Fig. 1 **PF80** - (Basic version)

Fig. 2 **IMD** - (Independent Monitoring Device)

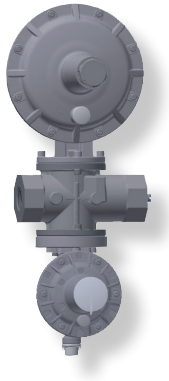


Fig. 3 **SSV** - (Slam-Shut Valve)

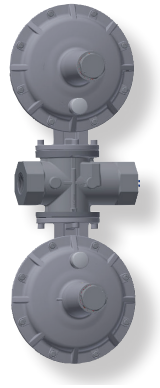


Fig. 4 **IFM** - (Independent Full Monitor - IFM)

PRODUCT SPECIFICATIONS

Specifications

Maximum Inlet Pressure:	125 PSIG
Outlet Pressure Range:	7” w.c. to 10 PSIG
Ambient Temperature Range:	-20°F +150°F
Flowing Gas Temperature Range:	-4°F +140°F
Body Size:	PF80 1¼” NPT; 1½” NPT; 2” NPT PF120 1½” NPT (Pending); 2” NPT 2” Flanged
Spring Case Vent Connection:	½” NPT
Orifice Size	PF80 3/4” PF120 1½”
CG Values	PF80: 245 PF120: 818

Materials:

Body:	Ductile Iron
Diaphragm Case:	Aluminium
Diaphragm:	Nitrile Rubber
Orifice:	Brass
O-rings:	Nitrile

Industry standards:

- **ANSI B109.4**
- **ANSI Z21.80**

BALANCED VALVE DESIGN (Fig.5 Item #1)

PF80 and **PF120** regulators are spring loaded self-operated regulators that incorporate a balanced valve design. The balancing valve allows an opposite force equal to the inlet pressure to be applied on the back side of the orifice's seat disk. This feature improves the consistency of the outlet pressure setting as inlet pressure fluctuates, and provides high turndown ratio across a wide flow range.

INTEGRAL STRAINER (Fig.5 Item #2)

All PF80 and **PF120** models are equipped with a removable internal 300 micron strainer to prevent foreign particles, such as weld slag or PE shavings, from entering the orifice and seat disk chamber and preventing lockup. The strainer also provides protection to all optional integral overpressure protection devices as well as downstream customer assets. The strainer can easily be accessed without removing the regulator body from the piping, cleaned and replaced, if necessary.

TOKEN RELIEF VALVE (Fig.5 Item #3)

All PF80 and **PF120** regulator models have an optional token relief valve that discharges a small volume of gas to the atmosphere when the regulator exceeds the outlet pressure set point. During no-flow conditions, thermal expansion of the gas can cause downstream static pressure to build up. The token relief valve will prevent downstream pressure from rising, and if equipped, prevent nuisance tripping of the SSV.

OUTLET PRESSURE SENSING (Fig.5 Item #4)

All PF80 and **PF120** regulators can sense downstream pressure internally (4a), externally (4b), or by using both. Internal sense versions have a sense line built into the outlet of the regulator body. Externally sensed versions require the internal sense line to be plugged, and use a secondary external sense line connected to the lower diaphragm case. When using the external sense configuration without plugging the internal sense line, the higher pressure of the two will provide the control pressure to the lower diaphragm. This can be used to improve response in applications where the load changes quickly.

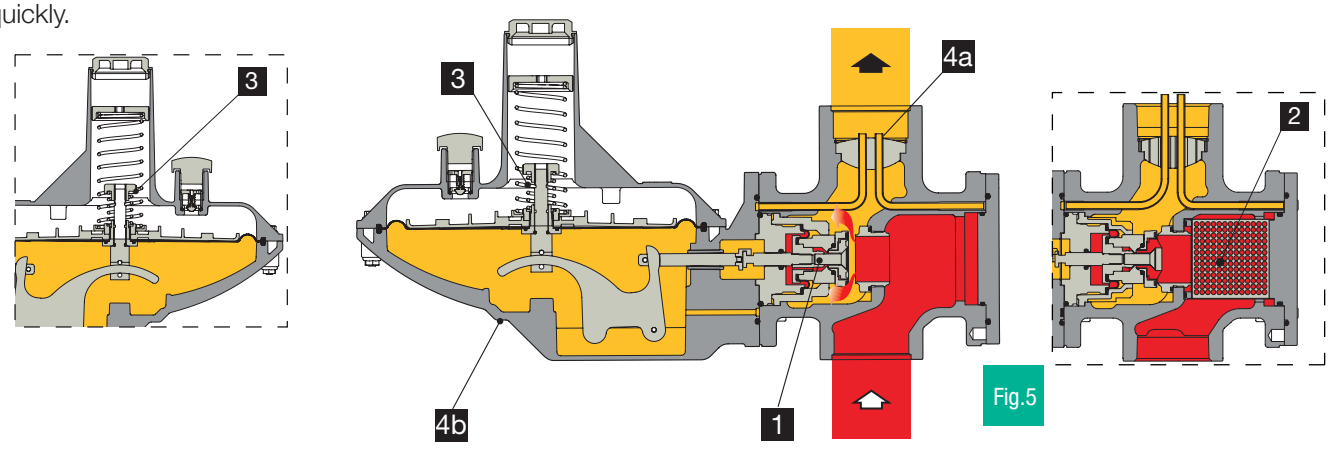


Fig.5

SPRING RANGE TABLES

Features of the springs for PF120		
Color	**Head**	**Pressure Range**
BLACK US64470382NE	BP	7” – 11” w.c.
YELLOW US6447031GI	BP	12”– 16” w.c.
VIOLET US64470302VI	BP	0.6 – 1.2 PSIG
ORANGE US64470262AR	MP	1.3 – 2.4 PSIG
LIGHT BLUE US64470398AZ	MP	2.5 – 4.2 PSIG
RED US64470408RO	MP	4.3 – 7.3 PSIG
RED US64470408RO	TR	7.3-10.2 PSIG

Tab.1

Features of the springs for PF80		
Color	**Head**	**Pressure Range**
YELLOW US64470068GI	BP	6.8” – 9.6” w.c.
BLACK US64470139NE	BP	10” – 14.1” w.c.
GREY US64470071GR	BP	0.9 – 1.4 PSIG
GREEN US64470141VE	MP	1.5 – 2.4 PSIG
BLUE US64470338BL	MP	2.5 – 5.3 PSIG
VIOLET US64470144VI	TR	5.4 – 10.2 PSIG

Tab.2

INDEPENDENT MONITORING DEVICE - IMD

The IMD is an effective **overpressure protection safety device (OPP)** designed to limit downstream pressure buildup in case of regulator catastrophic failure such as a seat cut diaphragm, or lever disconnect. When a failure occurs, the IMD operates on the inlet side or the orifice to limit downstream pressure.
Since the IMD is a separate and independent monitor from the main regulator, it will function in the event of a catastrophic failure on the main regulator.
When the IMD is functioning or in lock-up, a small amount of gas will bleed continuously to the atmosphere through a small port in the IMD (less than 15 CFH). This serve as an alert that the regulator is functioning under an abnormal condition.
It is recommended you do not use the token relief valve option when using the IMD.

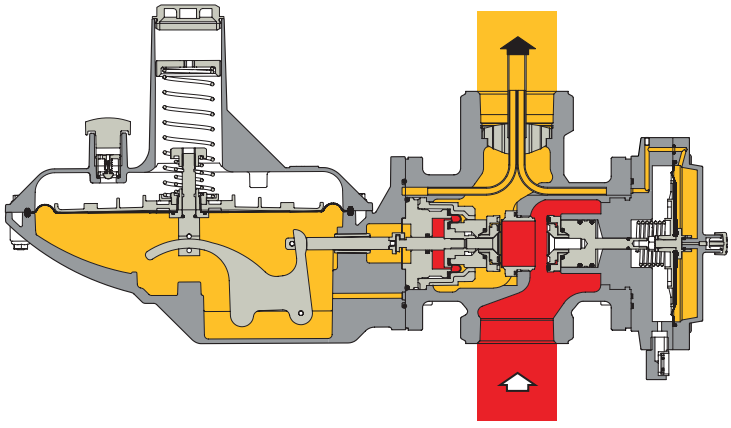


Fig.6 **IMD** - (Independent monitoring Device)

IMD Performance

Regulator Set Range	IMD version	Maximum IMD peak Activation Pressure	IMD Pressure Control Range *	IMD Lock-up pressure	IMD Activated Vent Flow Rate	
					Standard version	Vent limited version
7” w.c.	IMD-1	0.9 PSIG	0.5 - 0.7 PSIG	0.9 PSIG	<15 CFH	<1 CFH
7”w.c. – 1PSIG	IMD-2	1.8 PSIG	1.2 - 1.7 PSIG	1.8 PSIG	<15 CFH	< 1 CFH
7”w.c. – 2 PSIG	IMD-5	3.9 PSIG	2.4 - 3.7 PSIG	3.9 PSIG	<15 CFH	< 2.5 CFH
7”w.c. – 5 PSIG	IMD-7	6.9 PSIG	5.5 - 6.5 PSIG	6.9 PSIG	<15 CFH	< 2.5 CFH

Tab.3

* Depending on flow rate and inlet pressure.

SLAM SHUT VALVE - SSV

The **SSV** is an overpressure protection safety device designed to shut off the gas flow under abnormal downstream pressure conditions. The SSV can be configured to operate when any of three conditions are met: overpressure, underpressure, or both over/under pressure.
To help ensure that the abnormal condition has been properly corrected, the SSV must be manually reset.
The internal bypass valve simplifies resetting by equalizing internal pressure, thus eliminating the need for any other tools or piping. SSV set-points are field adjustable.
It is highly recommended to use the optional token relief valve wen using the SSV.

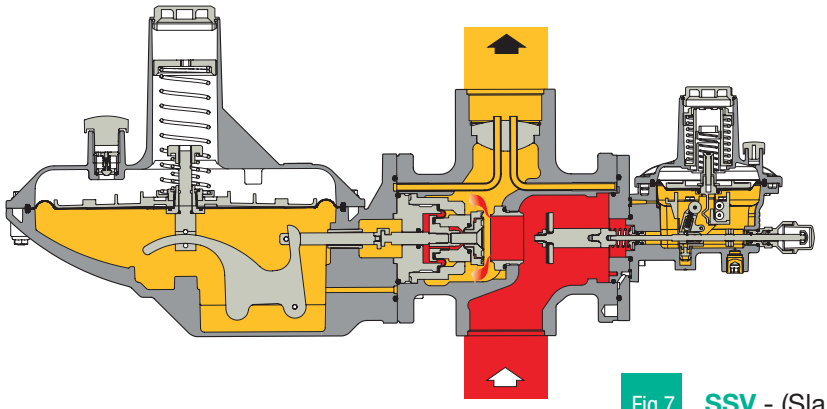


Fig.7 **SSV** - (Slam-Shut Valve)

Shut-Off Device Model SSV Performance	
Worker Set Point	**MINIMUM SUGGESTED SET-POINT**
7” w.c.	15” w.c.
2 PSIG	3 PSIG
5 PSIG	7 PSIG
10 PSIG (Pending)	12 PSIG

Tab.4

Features of the springs for SSV PF80 – PF120		
Color	**SSV Head**	**Pressure Range**
RED US64470112RO	BP	14” – 20” w.c.
GREY US64470115GR	BP	0.7 – 2.5 PSIG
YELLOW US64470116GI	MP	2.6 – 3.9 PSIG
WHITE US64470051BI	MP	4 – 6.9 PSIG
BLUE US64470057BL	MP	7 – 17 PSIG

Tab.5

INDEPENDENT FULL MONITOR - IFM

The **IFM** is an overpressure protection safety device that will precisely take over outlet pressure control when an abnormal event occurs in main worker regulator. In this configuration, the gas flows through the monitor first, and then through the worker (or operator) regulator. The monitor regulator outlet pressure set-point must be set higher than the worker which will allow full flow through to the worker regulator under normal operation. In the event of an abnormal condition in the worker regulator, the monitor will resume accurate pressure control at a slightly higher outlet pressure set-point.
Since the two control actuators are externally tied together, regulator operation does not require an external sense line, although the control actuators can be tied to a common external sense connection.
If an external sensing line is used then it is recommended to plug the internal sense line.

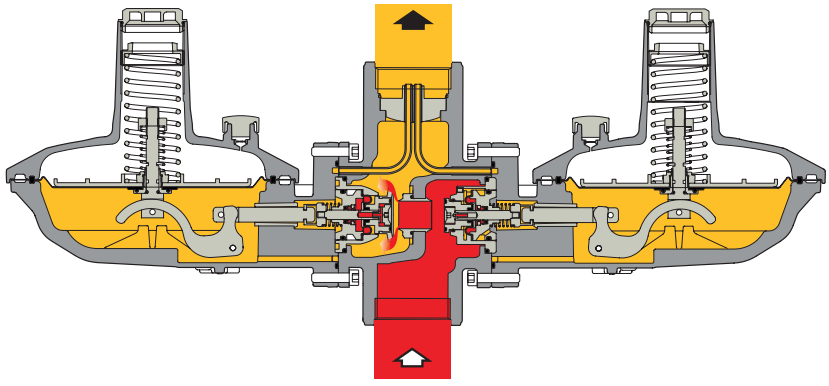


Fig.8 IFM (Independent Full Monitor)

MONITOR

A monitor is an emergency pressure regulator that is usually upstream from the worker regulator. In an abnormal event when the worker regulator is unable to maintain downstream pressure from exceeding the set point, the monitor will perform the function of the worker regulator at a set point slightly higher than the worker regulator.
An external sensing line is required in upstream monitor configurations, and the internal sense line must be plugged.

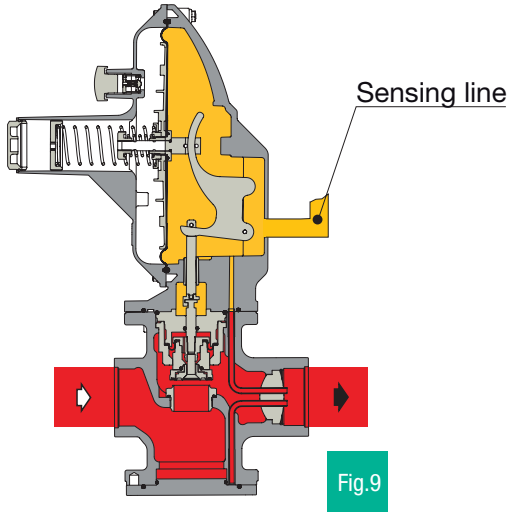


Fig.9

Typical remote sense connection for independent applications

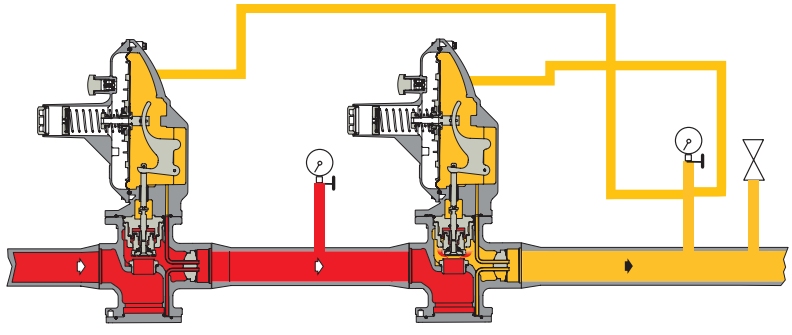


Fig. 10

SIZING THE PRESSURE REGULATOR

The following charts are provided in order to simplify the sizing of the regulators. Select your inlet pressure, required outlet pressure and then select the given flow in the tables.

NOTE: The flow value in the following tables are actual maximum reccommended flows for the regulator with all the option devices and no safety factor is necessary when sizing the regulator.

Capacity Tables

Outlet pressure (psig) 7"WC (+2"WC/-1"WC)

Inlet pressure (psig)	PF80*			PF120*
	1 ¼"	1 ½"	2"	2"
2	2,100	2,400	2,500	7,000
5	2,500	2,800	3,000	8,500
7	2,800	3,500	3,700	9,500
10	3,500	4,200	4,600	12,500
15	5,500	6,500	6,500	15,000
25	7,000	8,500	9,000	17,000
40	8,500	8,500	9,000	19,000
60	7,000	7,000	8,000	25,000
72,5	7,000	7,000	8,000	25,000
100	7,000	7,000	8,000	25,000
125	7,000	7,000	8,000	25,000
* Flow Rate (SCFH)				Tab.6

Outlet pressure (psig) 14"WC (+/-2"WC)

Inlet pressure (psig)	PF80*			PF120*
	1 ¼"	1 ½"	2"	2"
2	2,100	2,400	2,500	7,000
5	2,500	2,800	3,000	9,000
7	2,800	3,500	3,850	10,000
10	3,500	4,200	5,000	13,000
15	5,500	6,500	6,500	15,500
25	7,000	8,500	10,000	19,500
40	8,500	8,500	10,000	23,000
60	7,000	7,000	8,800	23,000
72,5	7,000	7,000	8,800	23,000
100	7,000	7,000	8,800	23,000
125	7,000	7,000	8,800	23,000
* Flow Rate (SCFH)				Tab.7

Outlet pressure (psig) 1 PSIG (+/-1% ABS; +/- 0.155 PSIG)

Inlet pressure (psig)	PF80*			PF120*
	1 ¼"	1 ½"	2"	2"
5	2,500	2,800	3,000	9,000
7	3,500	3,700	3,850	10,500
10	4,300	4,500	5,000	13,000
15	6,000	6,500	6,500	17,000
25	8,250	9,500	10,500	21,500
40	10,500	12,000	13,000	27,250
60	10,500	12,000	13,000	27,250
72,5	10,500	12,000	13,000	27,250
100	10,500	12,000	13,000	27,250
125	10,500	12,000	13,000	27,250
* Flow Rate (SCFH)				Tab.8

Outlet pressure (psig) 2 PSIG (+/-1% ABS; +/- 0.165 PSIG)

Inlet pressure (psig)	PF80*			PF120*
	1 ¼"	1 ½"	2"	2"
5	2,650	3,100	3,000	7,000
7	3,700	4,000	4,000	9,000
10	4,500	4,700	5,000	11,000
15	6,250	6,750	7,000	14,000
25	8,500	10,000	11,300	19,000
40	10,500	12,000	13,000	27,250
60	10,500	12,000	12,000	27,250
72,5	10,500	12,000	12,000	27,250
100	10,500	12,000	12,000	27,250
125	10,500	12,000	12,000	27,250
* Flow Rate (SCFH)				Tab.9

Capacity Tables

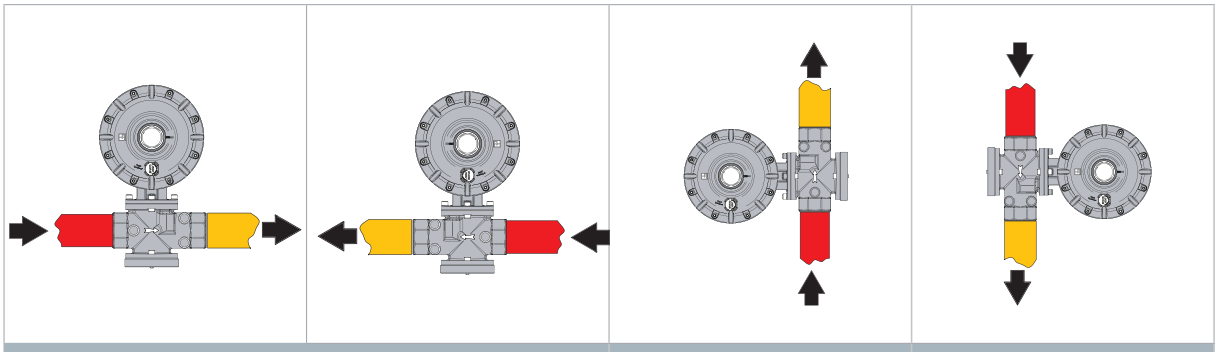
Outlet pressure (psig) 5 PSIG (+/-1% ABS; +/- 0.197 PSIG)				
Inlet pressure (psig)	PF80			PF120
	1 ¼"	1 ½"	2"	2"
10	2,150	2,450	2,450	10,600
15	2,825	3,350	3,700	14,850
25	3,850	4,600	5,750	22,250
40	6,850	8,850	9,500	23,500
60	9,500	11,500	12,000	27,250
72,5	12,250	14,000	16,000	27,250
100	12,250	14,000	16,000	27,250
125	12,250	14,000	16,000	27,250
* Flow Rate (SCFH)				Tab.10

Outlet pressure (psig) 5 PSIG (+/-10% Gauge; +/- 0.5 PSIG)				
Inlet pressure (psig	PF80			PF120
	1 ¼"	1 ½"	2"	2"
10	4,950	5,100	5,300	17,500
15	6,500	7,000	7,250	25,000
25	10,000	11,000	11,500	30,000
40	13,500	15,000	16,500	30,000
60	13,500	15,000	16,500	30,000
72,5	13,500	15,000	16,500	30,000
100	13,500	15,000	16,500	30,000
125	13,500	15,000	16,500	30,000
* Flow Rate (SCFH)				Tab. 11

Outlet pressure (psig) 10 PSIG (+/-10% Gauge; +/- 0.1 PSIG)				
Inlet pressure (psig	PF80			PF120
	1 ¼"	1 ½"	2"	2"
25	6,500	7,000	7,200	30,000
40	10,500	11,000	11,500	33,000
60	13,500	15,000	15,500	35,000
72,5	15,000	17,000	17,500	42,000
100	15,000	17,000	17,500	42,000
125	15,000	17,000	17,500	42,000
* Flow Rate (SCFH)				Tab. 12

TYPICAL CONNECTION DIAGRAMS

The following examples are provided as a recommendation to get the best performance from the PF80 & PF120 regulators. Additional control head orientation are available on request.



Flow Horizontal Left-Right | Flow Horizontal Right-Left | Flow Vertical Bottom Up | Flow Vertical Top-Down

Available Configurations:

PF80	PF120	MODEL	
■		**8**	PF80
	■	**2**	PF120
PF80	**PF120**	**BODY CONNECTIONS**	
■		**A**	1-1/4” NPT
■		**B**	1-1/2" NPT
■	■	**C**	2" NPT
	■	**D**	2"-125# FF Flange
PF80	**PF120**	**CONFIGURATION**	
■	■	**01**	STD/A: Basic Regulator, Internal Sense, Token Relief
■	■	**02**	STD/A: Basic Regulator, Internal Sense, No Token Relief
■	■	**03**	STD/M: Basic Regulator, External Sense Only, Token Relief
■	■	**04**	STD/M: Basic Regulator, External Sense Only, No Token Relief
■	■	**05**	IMD: STD/A with Independent Monitoring Device, No Token Relief
■	■	**06**	IMD/VL: STD/A with Vent-Limiting Independent Monitoring Device, No Token Relief
■	■	**07**	IFM: STD/A (No Token Relief) x STD/M (Token Relief) Independent Full Monitor
■	■	**08**	SSV/A: STD/A with Slam Shut Valve, Token Relief
■	■	**09**	SSV/M: STD/M with Slam Shut Valve, Token Relief
■	■	**10**	SSV/A: STD/A with Slam Shut Valve, no Token Relief
■	■	**11**	SSV/M: STD/M with Slam Shut Valve, no Token Relief
PF80	**PF120**	**INTERNAL STRAINER**	
■	■	**A**	Strainer
■	■	**B**	No Strainer
PF80	**PF120**	**SPRING RANGE**	
■		**11**	BP/80/Yellow: 6.8" - 9.6" WC
■		**12**	BP/80/Black: 10" - 14.1" WC
■		**13**	BP/80/Grey: 0.9 - 1.4 PSIG
■		**14**	MP/80/Green: 1.5 - 2.4 PSIG
■		**15**	MP/80/Blue: 2.5 - 5.3 PSIG
■		**16**	TR/80/Violet: 5.4 - 10.2 PSIG
	■	**21**	BP/120/Black: 7" - 11" WC
	■	**22**	BP/120/Yellow: 12" - 16" WC
	■	**23**	BP/120/Violet: 0.6 - 1.2 PSIG
	■	**24**	MP/120/Orange: 1.3 - 2.4 PSIG
	■	**25**	MP/120/Light Blue: 2.5 - 4.2 PSIG
	■	**26**	MP/120/Red: 4.3 - 7.3 PSIG
■	■	**27**	TR/120/Red: 7.3 - 10.2 PSIG

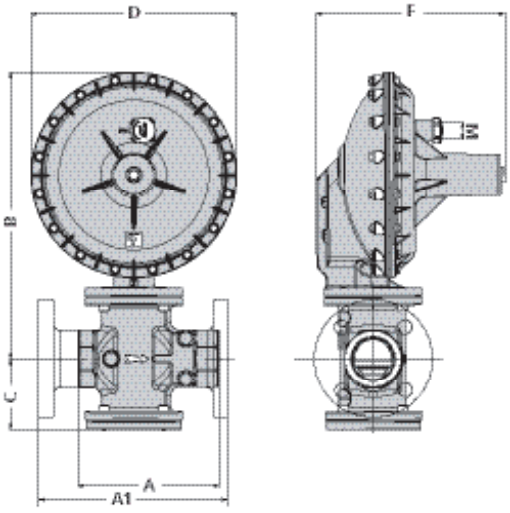
Tab.13

Available Configurations:

PF80	PF120	OPP RANGE	
■		**11**	IFM BP/80/Yellow: 6.8" - 9.6" WC
■		**12**	IFM BP/80/Black: 10" - 14.1" WC
■		**13**	IFM BP/80/Grey: 0.9 - 1.4 PSIG
■		**14**	IFM MP/80/Green: 1.5 - 2.4 PSIG
■		**15**	IFM MP/80/Blue: 2.5 - 5.3 PSIG
■		**16**	IFM TR/80/Violet: 5.4 - 12.0 PSIG
	■	**21**	IFM BP/120/Black: 7" - 11" WC
	■	**22**	IFM BP/120/Yellow: 12" - 16" WC
	■	**23**	IFM BP/120/Violet: 0.6 - 1.2 PSIG
	■	**24**	IFM MP/120/Orange: 1.3 - 2.4 PSIG
	■	**25**	IFM MP/120/Light Blue: 2.5 - 4.2 PSIG
	■	**26**	IFM MP/120/Red: 4.3 - 7.3 PSIG
	■	**27**	IFM TR/120/Red: 7.3 - 12.0 PSIG
■	■	**31**	SSV - BP/Red: 14" - 20" WC
■	■	**32**	SSV - BP/Grey: 0.7 - 2.5 PSIG
■	■	**33**	SSV - MP/Yellow: 2.6 - 3.9 PSIG
■	■	**34**	SSV - MP/White: 4 - 6.9 PSIG
■	■	**35**	SSV - MP/Blue: 7 - 17 PSIG
■	■	**41**	IMD - 1
■	■	**42**	IMD - 2
■	■	**43**	IMD - 5
■	■	**44**	IMD - 7
■	■	**99**	No OPP
PF80	**PF120**	**POSITION**	
■	■	**A**	VBU: Vertical, Bottom-Up
■	■	**B**	VTD: Vertical, Top-Down
■	■	**C**	HLR: Horizontal, Left-Right
■	■	**D**	HRL: Horizontal, Right-Left
PF80	**PF120**	**TEMPERATURE**	
■	■	**A**	Ambient Temperature -20°F to +150°F

Tab.14

BASIC VERSION - OVERALL DIMENSIONS

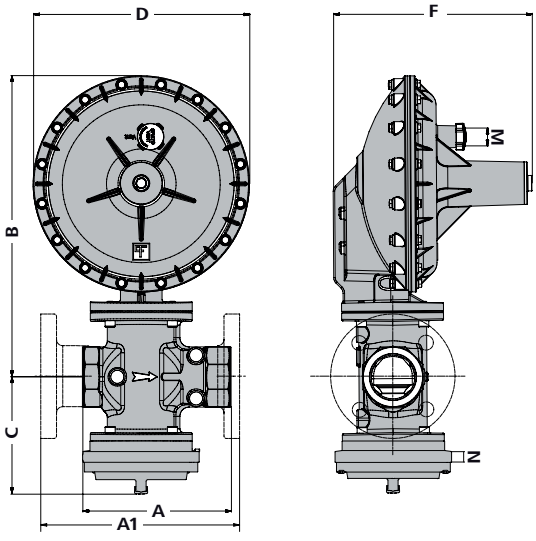


Overall dimensions in inches		
	PF 80	PF 120
A	6.6”	7.6”
A1	/	10.0
B	10.2”	15.4”
C	2.6”	3.9”
D	17.3”	11.0”
F	7.0”	10.1”
M	1/4” NPT	1/2” NPT
Inlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT
Outlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT

Tab.15

Disassembling requires 3” more than overall dimensions on PF120 and 2” on PF 80

IMD - OVERALL DIMENSIONS

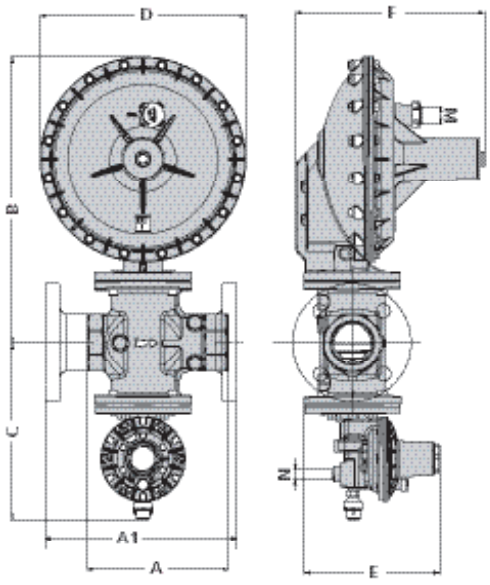


Overall dimensions in inches		
	PF 80 IMD	PF 120 IMD
A	6.6”	7.6”
A1	/	10.0
B	10.2”	15.4”
C	4.25”	6.10”
D	7.3”	11.0”
F	7.0”	10.1”
M	1/4” NPT	1/2” NPT
N	1/4” NPT	1/4” NPT
Inlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT
Outlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT

Tab.16

Disassembling requires 3” more than overall dimensions on PF120 and 2” on PF 80

SVV OVERALL DIMENSIONS

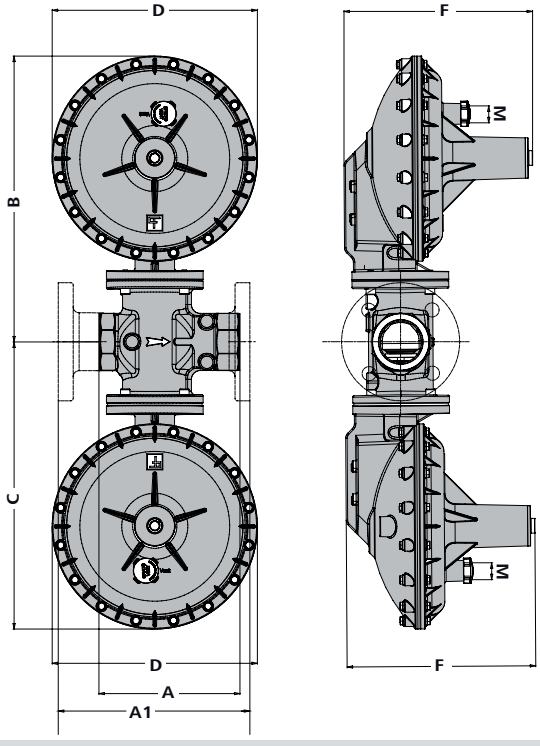


Overall dimensions in inches		
	PF 80 SSV	PF 120 SSV
A	6.6”	7-6”
A1	/	10.0
B	10.2”	15.4”
C	8.2”	9.5”
D	7.3”	11.0”
E	6.5”	7.3”
F	7.0”	10.1”
M	1/4” NPT	1/2” NPT
N	1/4” NPT	1/4” NPT
Inlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT
Outlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT

Tab.17

Disassembling requires 3” more than overall dimensions on PF120 and 2” on PF 80

IFM OVERALL DIMENSIONS



Overall dimensions in inches		
	PF 80 IFM	PF 120 IFM
A	6.6”	7.6”
A1	/	10.0
B	10.2”	15.4”
C	10.3”	15.5”
D	7.3”	11.0”
F	7.0”	10.1”
M	1/4” NPT	1/2” NPT
Inlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT
Outlet	1-1/4”; 1-1/2”; 2”NPT	2” NPT

Tab.18

Disassembling requires 3” more than overall dimensions on PF120 and 2” on PF 80

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The data are not binding. We reserve the right to make changes without prior notice.

CT-s 647-US February 19-b