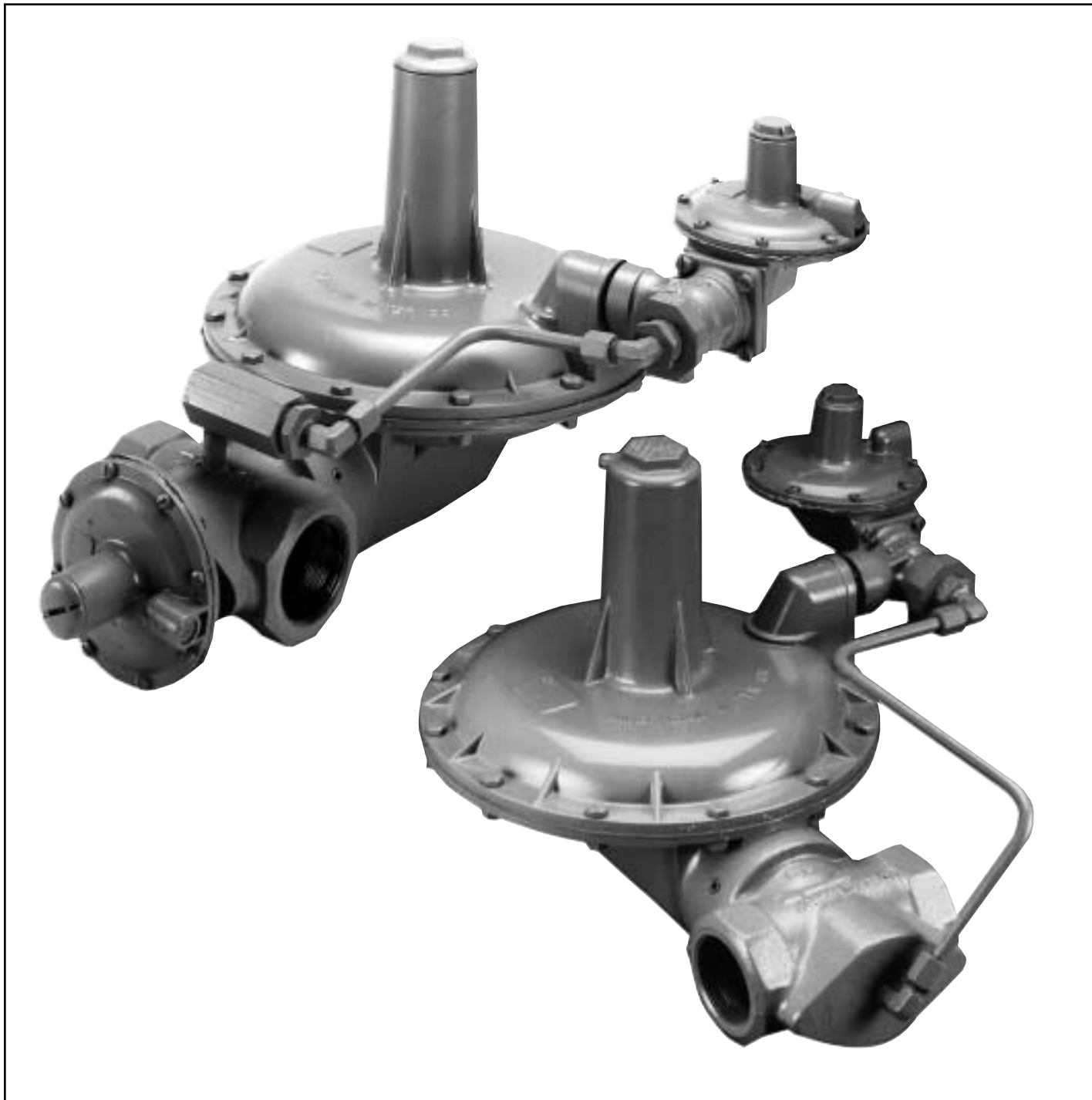


Model 1800 PFM Series Regulators

Instructions and Parts List



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AMERICAN METER COMPANY

Measurement Engineers Since 1836

Instructions: Industrial Regulator Series 1800 PFM

General Information:

- Available Models – Standard Regulator, Standard Monitor Regulator, Internal Relief Valve, Overpressure Shutoff. See Table 1 and identification tag on regulator.
- Available Sizes: 1-1/2 and 2-inch screwed; 2-inch ANSI - 125 Flange.
- Maximum inlet pressure, normal service (P1): Up to 125 PSIG, depending on orifice size – reference Capacity Tables found in Sales Bulletin SB 8551.
- Maximum outlet pressure, normal service (P2): Depending on model and spring range selection, 30 PSI. Reference Capacity Tables found in Sales Bulletin SB 8551.

Table 1 – Available Regulator Models

Model Number	Description
1803 PFM	Standard regulator
1803M PFM	Standard monitor regulator
1883 PFM	Overpressure shutoff
1883M PFM	Overpressure shutoff with monitor

Preparation

1. Install, operate, inspect and maintain the regulator as outlined in American Meter's instructions and in accordance with your company's policies and applicable federal, state and local codes and laws. Installation and service must be done by qualified personnel only.

Failure to follow these instructions may result in damage to the regulator.
2. Check installation location for suitability. It is possible that physical changes have been made to the building site since the regulator and location were originally selected.
3. Examine regulator for shipping damage.

WARNING: Do not connect the inlet of the regulator to a pressure source higher than that recommended by the manufacturer. Never connect the regulator outlet to the source of pressure. Observe the flow direction on the valve head casting.

If inlet pressure can exceed the maximum regulator outlet pressure rating, some form of overpressure protection is required to prevent possible damage to the regulator and personal injury.

4. Check regulator and piping for dirt or other foreign matter which may have accumulated during shipment or handling.
5. Check data plate to determine if regulator is suitable for intended service.
6. Suitable stop valve(s) should be installed and should be conveniently located.
7. Filters are available from the manufacturer for applications where pipeline contaminants are suspected to be present.
8. Regulators may be used at temperatures between -20°F and +150°F (-30°C and 65°C).

Installation

1. Remove all shipping plugs.
2. Use good piping practice. Be sure piping and regulator are free of dirt, pipe dope and other debris. Apply pipe dope to male threads only.
3. Install regulator. Make certain it is piped up correctly with inlet pipe connection to the inlet connection and flow is in the direction as indicated by arrow located on valve head. The regulator may be mounted in any position. The vent should be positioned to prevent entry of water and debris. American Meter recommends that the vent face downward. By loosening three setscrews, the regulator body may be rotated 360° in relation to the valve head. Tighten the setscrews.

Inside Installations – A regulator installed within a building should be located as near as practical to the point of service line entrance.

4. Turn gas on very slowly. If an outlet stop valve is used, it should be opened first. Do not overload the diaphragm with a sudden surge of inlet pressure.
5. Assure that there are no leaks and all connections are tight.

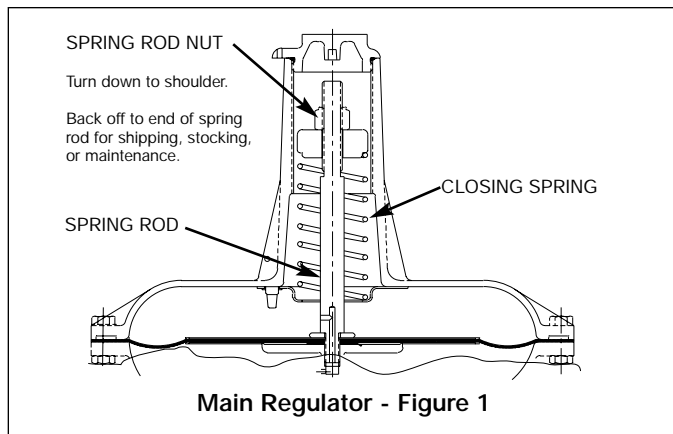
WARNING: *INSIDE INSTALLATION* requires a vent line of sufficient diameter to carry gas vented by the pilot relief valve to a safe outside location, away from any opening in the building. Vent piping thread size is 1/4-inch NPT. In accordance with the American National Standard for pipe threads ANSI B2.1. Keep vent lines as short and direct as possible.

***OUTSIDE INSTALLATION* requires that care be taken to prevent pilot vent opening from freezing closed or becoming blocked or permitting water to enter from any cause. Particular consideration should be given to sites where flooding, snow or freezing rain may be experienced. The vent or vent line port should point vertically downward, and overhead protection should be used where necessary.**

Periodically check vent to be certain it is not obstructed.

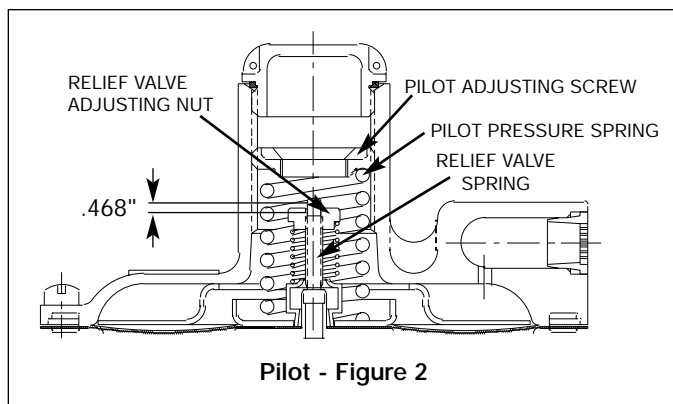
6. Unless otherwise specified, the 1800 PFM Series Regulator is preset at the factory with the diaphragm horizontal and the springhorn vertical. Outlet pressure may vary with the diaphragm oriented in another position. See page 3 for regulator outlet pressure adjustments.

Instructions: Industrial Regulator Series 1800 PFM



NOTE:

Adjustment of the regulator is accomplished by means of the pilot spring adjustment screw (Figure 2). Other adjustments of the regulator should not be necessary, **except for setting the closing spring which is normally backed off to the end of the spring rod for shipping, stocking, or maintenance.** BEFORE PLACING REGULATOR IN SERVICE, ADJUST CLOSING SPRING TO ITS MAXIMUM VALUE. (Figure 1) Pilots with relief are preset at the factory and do not require adjustment.



Regulator Pilot Adjustment - Pilot Screw

The following table gives the specific inlet set pressures for various anticipated maximum pressures. The inlet set pressure is to be maintained while setting the outlet pressure. A flow rate of 200 cfh should be established while the outlet pressure is being set. The values of inlet set pressures shown in the table have been found to give optimum performance for the range of inlet pressures established by the maximum anticipated pressure. Set regulator outlet pressures by adjusting pilot adjusting screw.

Recommended Inlet Set Pressure with 200 cfh flow through Regulator

Max. Inlet Pressure PSI	Inlet Set Pressure PSI
10	10
15	15
20	15
25	20
30	25
35	30
40	30
45	35

Max. Inlet Pressure PSI	Inlet Set Pressure PSI
50	40
55	40
60	40
65	50
70	50
75	55
80	60
85	60

Max. Inlet Pressure PSI	Inlet Set Pressure PSI
90	60
95	60
100	60
105	70
110	70
115	75
120	75
125	80

Capacities shown in the tables in Bulletin SB 8551 were achieved using the maximum recommended inlet pressure for each orifice size as a basis for selection of the inlet set pressure according to the table above.

OPSO Instructions: Industrial Regulator Series 1800 PFM

Resetting The Overpressure Shutoff (OPSO)

Figure 3: Models 1883 PFM, 1883M PFM

Operation: When the line pressure increases to the specified overpressure shutoff setting, the pressure under the shutoff diaphragm forces the diaphragm stem outward releasing the plunger. The shutoff spring forces the shutoff disc against the orifice.

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

Resetting: To reset the OPSO, shut off pressure, unscrew the seal cap which opens the regulator orifice, permitting gas to flow. Pull the seal cap straight out until the overpressure shutoff device latches completely. Then retighten the seal cap. (Do not trip the shutoff valve unless the seal cap is installed.)

OPSO Shutoff Springs

Spring Range PSI	Part Number	Color Code
14" to 28" w.c.	70017P075	Red - Purple
1 to 2 PSI	70017P076	Red - Brown
2 to 3 PSI	70017P077	Red - Black
3 to 5 PSI	70017P078	Orange - Yellow
5 to 8 PSI	70017P079	Orange - Green
8 to 14 PSI (requires reducing ring)	70017P078	Orange - Yellow
14 to 20 PSI (requires reducing ring)	70017P079	Orange - Green
Reducing Ring	72646P001	

Changing And Adjusting The OPSO Pressure Spring – Figure 3:

Unscrew the cap seal until it is loosely held on the shutoff shaft. Tilt and disengage the cap seal and spring clip from the end of the shutoff shaft. (The spring clip should remain on the cap seal.) This exposes the pressure spring adjustment screw.

Remove the pressure spring adjustment screw and the pressure spring. Install a new pressure spring (see note below). Screw in the pressure spring adjustment screw until it is approximately 3/4" below the top of the spring housing.

To adjust the shutoff pressure, close the inlet to the main regulator body and slowly pressurize the outlet of the regulator, up to the desired shutoff pressure. If the OPSO mechanism trips before the desired shutoff pressure is reached, turn the adjustment screw further in, reset the OPSO and retest. If the OPSO does not trip when the desired pressure is reached, turn the adjustment screw out slowly until it does. Then reset the OPSO and check it again. Replace and retighten the cap seal making certain the spring clip on the cap seal engages the shutoff shaft.

NOTE: Series 1883 PFM Regulators using OPSO shutoff springs with ranges of 8 to 14 PSI or 14 to 20 PSI require the use of the reducing ring shown in Figure 3. To install the reducing ring, remove the OPSO cover as described in the paragraph below. Position the reducing ring as shown and reassemble the cover.

Rotating The OPSO Cover Vent – Figure 3:

If it is necessary to rotate the OPSO vent, first remove the seal cap. Note the position of the adjustment screw and put a pencil line on the outside of the spring housing corresponding to the top of the adjustment screw. Back out the adjustment screw until it is flush with the top of the spring housing. (This releases the tension on the OPSO pressure spring.)

Remove the eight screws on the OPSO cover and carefully lift the OPSO cover so that the diaphragm remains on the bottom casting. Rotate the vent to the desired position, and align the screw holes in the top, the diaphragm and the bottom casting. Reinstall the eight screws loosely and check that the diaphragm is flat (and not crimped) between the screw holes. Tighten the eight screws, and screw in the adjustment screw to its original position. Check and adjust the shutoff pressure as described in the previous paragraphs. Replace and tighten the cap seal.

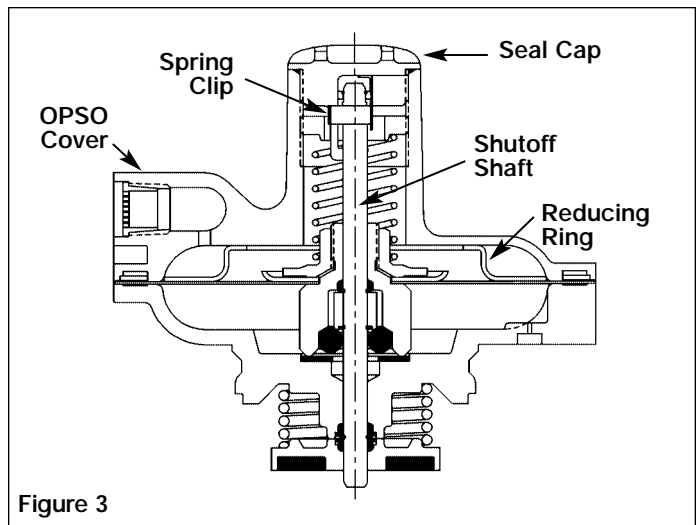
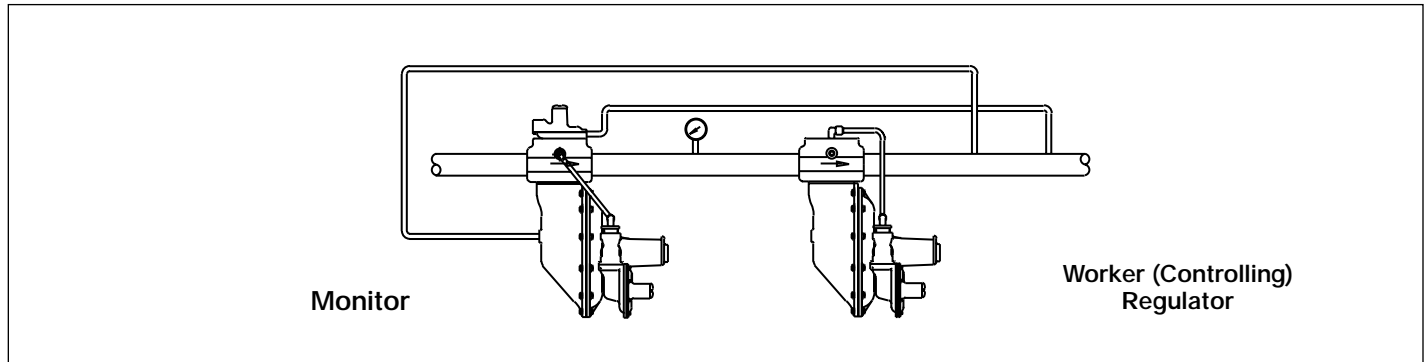


Figure 3

Worker/Monitor Instructions: Industrial Regulator Series 1800 PFM

Worker/Monitor Application



A worker/monitor regulator installation consists of a regulator with an external static connection and a regulator with an internal static connection. The regulator selected to be the monitor is set at 1/2 PSI above the controlling regulators, with set points, under 2 PSI and 1-2 PSI above the controlling regulators, with set points, above 2 PSI. Upstream monitoring, as shown in the sketch above, is more commonly used. The external static connection should be connected at a point free of turbulence and preferably a minimum of five pipe diameters downstream. A worker-to-monitor conversion kit is available.

1800 PFM Series Monitor Conversion Instructions For 73909K012 - Monitor Conversion Kit

1. Referring to Figures 4 and 5, remove the main regulator assembly from the valve head (25) by loosening set-screws (6).

**Check date code stamped on main seal plug (11).
If regulator was manufactured later than May 1998,
steps 2 through 12 are not required.**

2. Remove seal cap (11), lock nut (5), spring follower (9), and main spring (14).
3. Disconnect pilot pressure tube.
4. Remove the twelve 5/16" bolts (21) holding the regulator top to the lower diaphragm chamber.
5. Remove the regulator top and the diaphragm assembly where it engages with the lever (2). Caution should be used not to damage the diaphragm assembly during disassembly.
6. Remove the lever (2) and plunger (1).
7. Degrease plunger and install plunger O-Ring (31).
8. Lubricate plunger (1) and O-Ring assembly using O-Ring grease or all-purpose silicon grease and reinstall plunger and lever.
9. Install diaphragm assembly by engaging the lever into the diaphragm stem.

10. Position regulator top over the main diaphragm and line up three of the bolts holding the top, the main diaphragm, and lower diaphragm chamber; insert three bolts. Line up and install the remaining nine. Install the twelve nuts and torque to 120 inch pounds.
11. Install the main spring (14), spring follower (9), and lock nut (5); replace the seal cap.
12. Reattach pilot pressure tube.
13. Remove the seat disc assembly (13) from the plunger (1).
14. Assemble the two remaining O-Rings (29) and (30) and the isolation plate (28) and lubricate using O-Ring grease or all-purpose silicon grease.
15. Install the isolation plate (28) around the plunger guide (Figure 5).
16. Reinstall the seat disc assembly (13).
17. Lubricate the inside bore of the valve head as well as the outside O-Ring with O-Ring grease or all-purpose silicon grease. Attach the regulator to the valve head and torque the three retaining setscrews (6) to 75 inch pounds.

NOTE: To use an external static connection, remove plug (27).

Model 1800 PFM Industrial Regulator Repair Parts

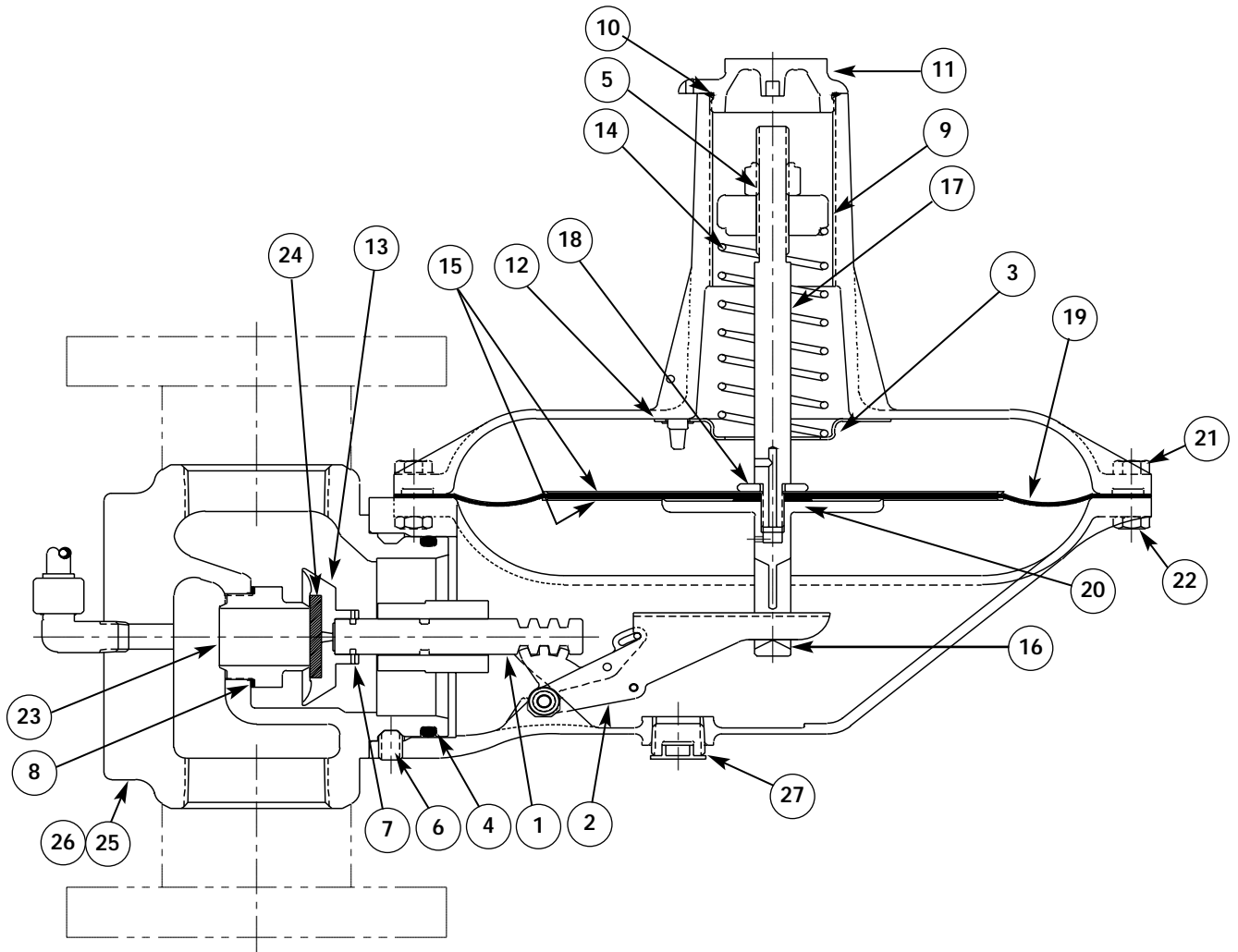


Figure 4
Standard Model

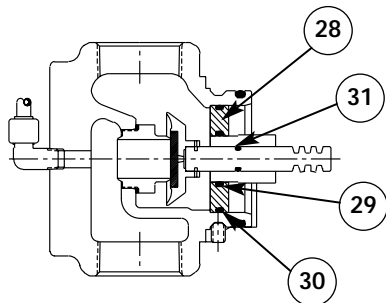


Figure 5
Monitor Model

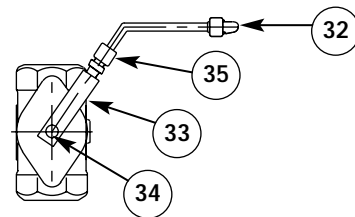
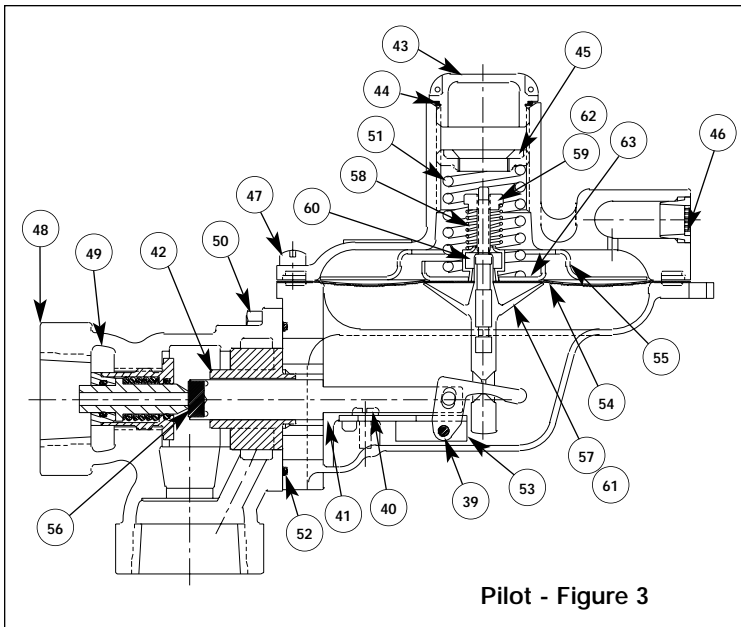


Figure 6
Pilot Filter (Optional)

Model 1800 PFM Industrial Regulator

Item No.	Part No.	Description	Qty.	Item No.	Part No.	Description	Qty.
1	72627P001	Valve Plunger	1	23	72983P010	Valve - 1/4"	1
2	72626G001	Lever Assembly	1		72983P018	Valve - 3/8"	1
3	73094P001	Spring Plate	1		72983P013	Valve - 5/8"	1
4	42710P161	O-Ring	1		72983P015	Valve - 7/8"	1
5	55606P016	Lock Nut	1		72983P016	Valve - 1"	1
6	78014P006	Socket Head Set Screw	3		72983P017	Valve - 1-1/4"	1
7	72858P001	Retainer Clip	1	24	70041P072	Valve Seat Disc, 70 Durometer, Buna-N	1
8	70019P094	Gasket	1		70041P073	Valve Seat Disc, 80 Durometer, Buna-N (Standard)	1
9	73093P002	Spring Follower	1		70041P133	Valve Seat Disc, 70 Durometer, Viton	1
10	42710P107	O-Ring	1		70041P135	Valve Seat Disc, 80 Durometer, Viton	1
11	70103P001	Seal Plug	1	25	72619P075	Valve Head, 1-1/2 x 1-1/2 NPT	1
12	52745P001	Push Nut	3		72619P077	Valve Head, 2 x 2 NPT	1
13	72624P003	Seat Disc Holder (1803 PFM – all sizes)	1		72992P019	Valve Head, 2" Class 125 Flanged (10.50" long)	1
	72624P003	(2" 1883 PFM, 1/4" thru 7/8" valve/orifice sizes)			72992P022	Valve Head, 2" Class 125 Flanged (10.00" long)	1
	72624P001	(2" 1883 PFM, 1" thru 1-1/4" valve/orifice sizes)		26	11970P033	Plug (1/4" NPT)	1
	72624P001	(1-1/2" 1883 PFM – all sizes)		27	11970P031	Plug (1/2" NPT)	1
14	71424P025	Closing Spring	1	28	73010P002	Isolation Plate (monitor)	1
	71424P018	Closing Spring (for 1/2 PSI set)	1	29	42710P078	O-Ring (monitor)	1
15	70012P029	Diaphragm Plate	2	30	42710P157	O-Ring (monitor)	1
16	72629P008	Stem	1	31	42710P149	O-Ring (monitor)	1
17	73097P002	Spring Rod	1	32	78061P020	Elbow	2
18	70859P001	Diaphragm Plate	1	33	73407G001	Pilot Filter Assembly	1
19	70014P175	Diaphragm	1	34	78044P040	Nipple (use w/filter only)	1
20	13981P076	Flat Washer	1	35	78109P031	Tube Connector (use w/filter only)	1
21	78001P032	Hex Head Cap Screw	12				
22	78020P003	Hex Nut	12				

Pilot Regulator Repair Parts



Pilot Diaphragm Case Assembly Kits			
52744K009	... 1/2-1 PSI (Relief)	52744K010	... 1/2-1 PSI (Non-Relief)
52744K007	... 1-2 PSI (Relief)	52744K008	... 1-2 PSI (Non-Relief)
52744K001	... 2-6 PSI (Relief)	52744K004	... 2-6 PSI (Non-Relief)
52744K002	... 7-15 PSI (Relief)	52744K005	... 7-15 PSI (Non-Relief)
52744K003	... 16-30 PSI (Relief)	52744K006	... 16-30 PSI (Non-Relief)

Pilot Springs		
Spring Range PSI	Part Number	Color Code
1/2-1 PSI	70017P076	Red - Brown
1-2 PSI	70017P078	Orange - Yellow
2-30 PSI	70017P079	Orange - Green

Item No.	Part No.	Description	Qty.
39	70016P001	Pin	1
40	78008P005	Pan Head Screw	2
41	70025G005	Plunger & Lever Assembly	1
42	73322P001	Plunger Guide	1
43	73942F003	Seal Plug	1
44	70019P108	Gasket	1
45	71824P005	Adjustment Screw	1
46	70034P001	Vent Screen	1
47	78008P006	Fillister Head Screw #10-24x.50 long	8
48	73484P003	Valve Head	1
49	73161G007	E.C. Orifice Assembly	1
50	78008P014	Hex Head Screw	4
51	70017P079	Pressure Adjusting Spring	1
	70017P078	Pressure Adjusting Spring (1-2 PSI)	1
	70017P076	Pressure Adjusting Spring (1/2-1 PSI)	1
52	78152P001	O-Ring	1
53	14264P005	Lever Adapter	1
54	74079G007	Diaphragm & Plate Assembly (1/2-6 PSI)	1
	74079G008	Diaphragm & Plate Assembly (7-15 PSI)	1
	74079G009	Diaphragm & Plate Assembly (16-30 PSI)	1
55	72646P001	Reducing Ring (7-15 PSI)	1
	72646P002	Reducing Ring (16-30 PSI)	1
56	70009P002	Pilot Seat Disc - Buna-N (70) STD	1
	70009P003	Pilot Seat Disc - Buna-N (80)	1
	70041P087	Pilot Seat Disc - Viton (70)	1
	70041P088	Pilot Seat Disc - Viton (80)	1
57	73525P001	Relief Valve Stem (Relief)	1
58	71403P014	Relief Spring (Relief)	1
59	70711P001	Relief Valve Nut (Relief)	1
60	73092P001	Relief Valve Guide (Relief)	1
61	70011P002	Diaphragm Stem (Non-Relief)	1
62	78020P001	Hex Nut (Non-Relief)	1
63	70012P001	Diaphragm (Guide) Plate (Non-Relief)	1



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