



# RB4000 Series Regulator

Commercial & Industrial Regulator

The RB4000 regulator is designed for gas supply networks, district station regulation, industrial service regulation, and all applications where accurate pressure control, ease of adjustment, and fast response are required such as for burners, industrial ovens, boilers, etc.

## DESCRIPTION

The RB4000 employs a direct-acting, spring-loaded regulator. The balanced valve design ensures a constant outlet pressure when the upstream pressure varies. A built-in pulsation damper allows stable pressure control even at very low flow rates. An optional built-in shut-off valve offers protection against over-pressure or under-pressure.

## BENEFITS

- » Accurate regulation
- » High flow accuracy
- » Fast response for sharp on-off loads
- » Easy maintenance
- » Compact size
- » Rugged construction for durability
- » Balanced valve design eliminates inlet pressure effect
- » Wide range of outlet pressures
- » Horizontal or Vertical mounting

## FEATURES

- » Interchangeable adjustment spring
- » Balanced valve design
- » Downstream control
- » Direct acting spring loaded design
- » Over pressure shut-off (OPCO) available
- » Under pressure shut-off (UPCO) available

## SHIPPING WEIGHT

1 regulator per box    Box weight: varies by model.

## CONSTRUCTION

Itron takes pride in delivering products with the utmost concern for safety, quality, and customer satisfaction.

### Construction material

Body	Ductile iron quality 500-7 UNI-ISO 1083
Internal parts	Brass and stainless steel
Diaphragm	Synthetic rubber with fabric reinforcement
Seals	Nitrile rubber or Viton (on request)
Diaphragm casing & cover	UNI/EN 10025 pressed steel

## OPERATING TEMPERATURE RANGE

- 4°F to 140°F

## ADDITIONAL SPECIFICATIONS

Available Vent Sizes	1/4" NPT
Downstream Sensing Line Connection	3/8" NPT
Maximum Operating Inlet Pressure	275 PSIG (DI body)
Maximum Emergency Outlet Pressure No Damage	90 PSIG
Maximum Emergency Outlet Pressure Gas Containment	105 PSIG
Available Options	Seal wire to indicate unapproved tampering

## MODEL DESIGNATIONS

4	0	X	X	Valve Body	Options
		1			Low pressure
		2			Medium pressure
		3			High pressure
		4			Without shutoff valve
			0		With over pressure shutoff valve**
			1		With over and under pressure shutoff valve**
			2		
				2" Flange*	
				3" Flange*	

\* Please specify the valve body material on your order (ductile iron or steel).

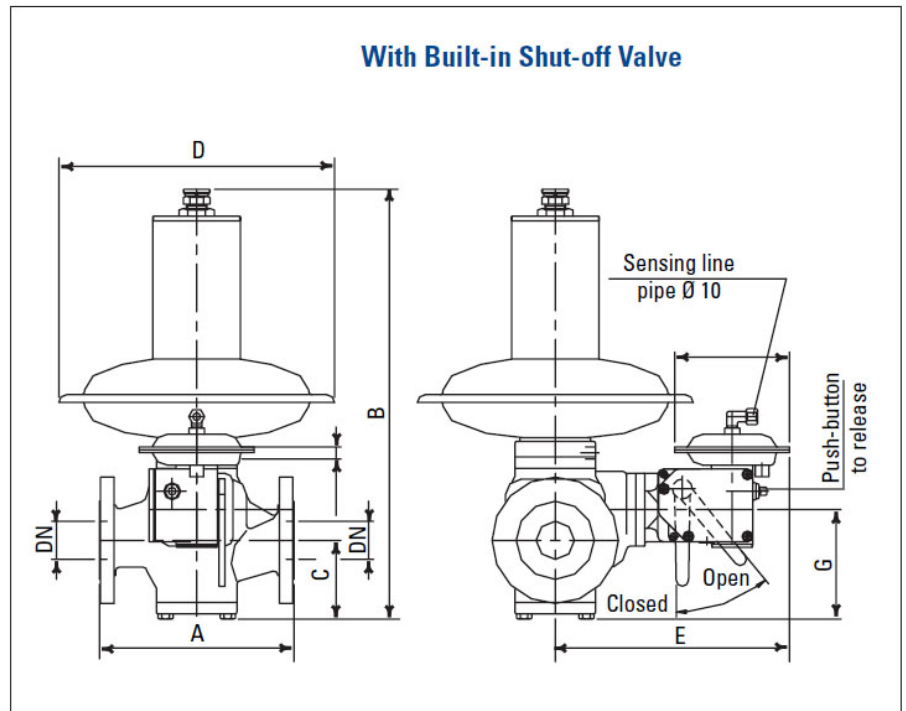
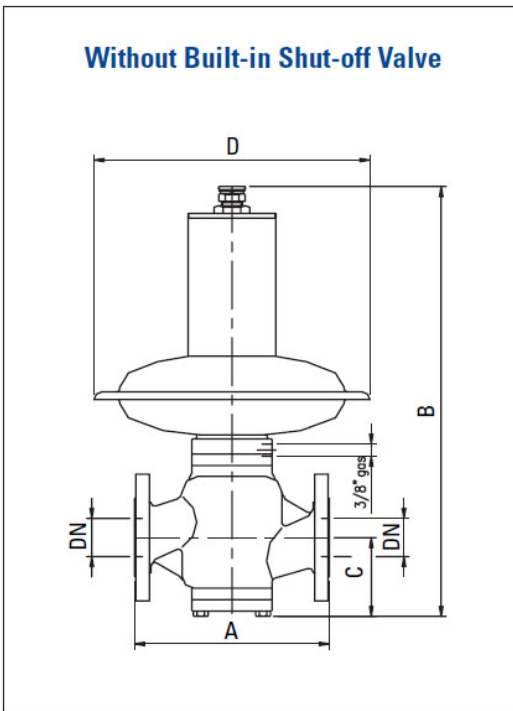
\*\*Multiply capacity data by 0.7 if you are using shutoff valve versions.

## VALVE BODY SIZE (INCHES)

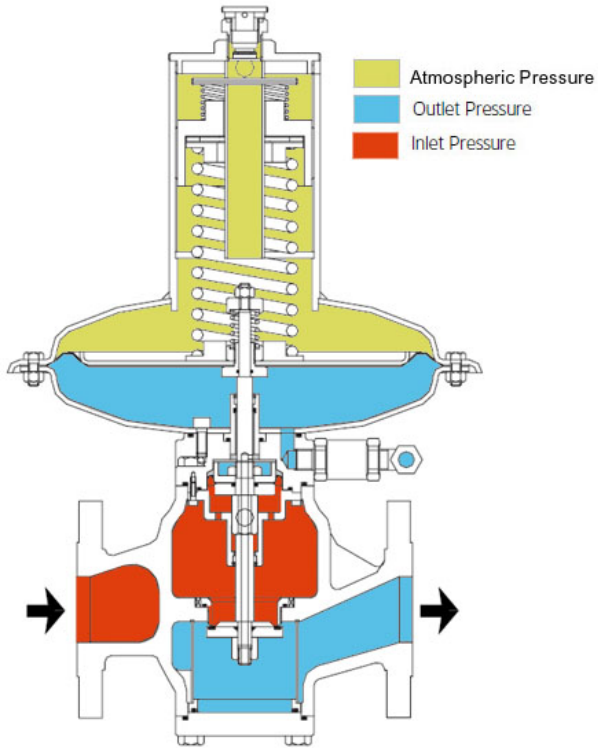
Inlet	Outlet	Flanged	Orifice Diameter	Wide Open Flow Coefficient (K-Factor)
2"	2"	X	2"	4430
3"	3"	X	3"	8540

**RB4000 DIMENSIONS (INCHES)**

Valve Body Size	Dimensions (inches)	Without Built-in Shut-off Valve			With Built-in Shut-off Valve		
		RB4010	RB4020	RB4030-40	RB4011-12	RB4021-22	RB4031-32
2"	A	10	10	10	10	10	10
	B	22.2	21.3	21.3	22.2	21.3	21.3
	C	3.9	3.9	3.9	3.9	3.9	3.9
	D	18.9	14.2	14.2	18.9	14.2	14.2
	E	---	---	---	12.0	12.0	10.9
	F	---	---	---	5.9/3.5	5.9/3.5	5.9/3.5
	G	---	---	---	5.7	5.7	5.7
	<b>Weight (lbs.)</b>		90.4	63.9	72.8	105.8	77.2
3"	A	11.7	11.7	11.7	11.7	11.7	11.7
	B	28.0	25.8	24.6	28.0	25.8	24.6
	C	5.1	5.1	5.1	5.1	5.1	5.1
	D	23.6	18.9	14.2	23.6	18.9	14.2
	E	---	---	---	14.3	14.3	13.1
	F	---	---	---	5.9/3.5	5.9/3.5	5.9/3.5
	G	---	---	---	7.3	7.3	7.3
	<b>Weight (lbs.)</b>		154.3	123.5	108.0	178.6	147.7



## OPERATIONAL SCHEMATIC



## SPRING COLOR OUTLET PRESSURE RANGES: 2" VALVE BODY

Spring Color	RB4010		RB4020		RB4030	
	Spring Range (inches w.c./PSIG)		Spring Range (inches w.c./PSIG)		Spring Range (inches w.c./PSIG)	
Orange/silver	4.0	5.6	-	-	-	-
Brown/silver	5.6	7.6	-	-	-	-
Dark green/silver	7.6	10.7	-	-	-	-
Light green/silver	10.0	14.5	-	-	-	-
Light blue/silver	14.1	19.3	1.0	1.5	-	-
Purple/silver	0.8	1.2	1.6	2.6	-	-
Yellow	1.2	1.9	2.6	4.1	-	-
Blue/silver	1.6	2.1	4.1	5.4	-	-
Blue	-	-	3.9	6.5	-	-
Silver	-	-	6.9	9.5	10.0	14.6
Purple	-	-	9.3	11.8	14.2	17.2
Yellow/silver	-	-	11.5	14.3	16.9	22.2
Red/silver	-	-	14.2	18.6	21.5	28.7

**SPRING COLOR OUTLET PRESSURE RANGES: 3" VALVE BODY**

Spring Color	RB4020		RB4030		RB4040	
	Spring Range (inches w.c./PSIG)		Spring Range (inches w.c./PSIG)		Spring Range (inches w.c./PSIG)	
Orange/silver	-	-	-	-	-	-
Brown/silver	-	-	-	-	-	-
Dark green/silver	-	-	-	-	-	-
Light green/silver	-	-	-	-	-	-
Light blue/silver	-	-	-	-	-	-
Black/silver	-	-	-	-	-	-
Purple/silver	-	-	-	-	-	-
Yellow	1.2	1.9	-	-	-	-
Blue/silver	1.6	2.0	-	-	-	-
Blue	1.7	3.4	4.3	7.2	-	-
Silver	2.6	4.2	6.9	9.5	10.0	14.6
Purple	3.4	5.3	9.4	11.8	14.2	17.2
Yellow/silver	4.3	6.7	11.5	14.3	16.9	22.2
Red/silver	5.4	7.2	14.2	18.6	21.5	28.7

**OVERPRESSURE SHUT-OFF VALVE SPRING RANGES**

Spring Color	Shut-off Models 8611 and 8612		Shut-off Models 8621 and 8622		Shut-off Models 8631 and 8632		Shut-off Models 8641 and 8642	
	6" Diaphragm (inches w.c.)		6" Diaphragm (PSIG)		3.5" Diaphragm (PSIG)		3.5" Diaphragm (PSIG)	
Yellow	11	26	1.74	3.19	2.90	5.51	4.64	8.41
Red	18	40	2.32	5.08	4.06	8.70	7.25	13.05
White	32	64	3.19	7.40	5.80	11.60	10.15	17.40
Blue	40	100	5.08	10.88	8.70	16.68	14.50	26.83
Orange	76	181	7.98	18.13	13.78	29.73	21.75	45.68
Brown	141	281	14.50	29.73	21.75	45.68	33.35	73.95
Green	181	350	21.75	36.25	29.00	55.10	44.95	84.10
Black	241	422	24.65	40.60	36.25	69.60	55.10	98.60
Gray	382	563	38.43	62.35	56.55	91.35	82.65	134.85
Yellow	-	-	-	-	72.50	116.00	130.50	188.50
Red	-	-	-	-	111.65	156.60	184.15	217.50

**UNDER PRESSURE SHUT-OFF VALVE SPRING RANGES**

Spring Color	Shut-off Model 8612		Shut-off Model 8622		Shut-off Model 8632		Shut-off Model 8642	
	6" Diaphragm (in. w.c.)		6" Diaphragm (PSIG)		3.5" Diaphragm (PSIG)		3.5" Diaphragm (PSIG)	
White	2	7	-	-	-	-	-	-
Blue	4	22	-	-	-	-	-	-
Orange	12	30	1.60	4.21	3.34	7.11	4.64	9.14
Brown	24	60	2.32	7.11	3.77	10.59	6.09	15.95
Green	84	297	4.64	14.50	7.54	14.50	7.54	22.48

## CORRECTION FACTORS FOR NON-NATURAL GAS APPLICATIONS

The RB4000 may be used to control gases other than natural gas. To determine the capacity for gases other than natural gas, multiply the values within the capacity tables by a correction factor. The table below lists the correction factors for some of the more common gases:

Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide (Dry)	1.52	0.63
Carbon Monoxide (Dry)	0.97	0.79
Natural Gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air-Mix	1.20	0.71

To calculate the correction factor for gases not listed in the table above, use the gases' specific gravity and insert it in the formula listed below:

$$\text{Correction Factor (CF)} = \sqrt{\frac{SG_1}{SG_2}}$$

Where:

SG<sub>1</sub> = Specific gravity of the gas in which the capacity is published.

SG<sub>2</sub> = Specific gravity of the gas to be controlled.

### Wide Open Flow Calculations

For wide-open orifice flow calculations use the following equations:

$$\text{For } \frac{P_1}{P_2} < 1.89 \text{ use: } Q = K\sqrt{P_2(P_1 - P_2)}$$

$$\text{For } \frac{P_1}{P_2} > 1.89 \text{ use: } Q = \frac{KP_1}{2}$$

Where: P<sub>1</sub> = Absolute Inlet Pressure (PSIA)

P<sub>2</sub> = Absolute Outlet Pressure (PSIA)

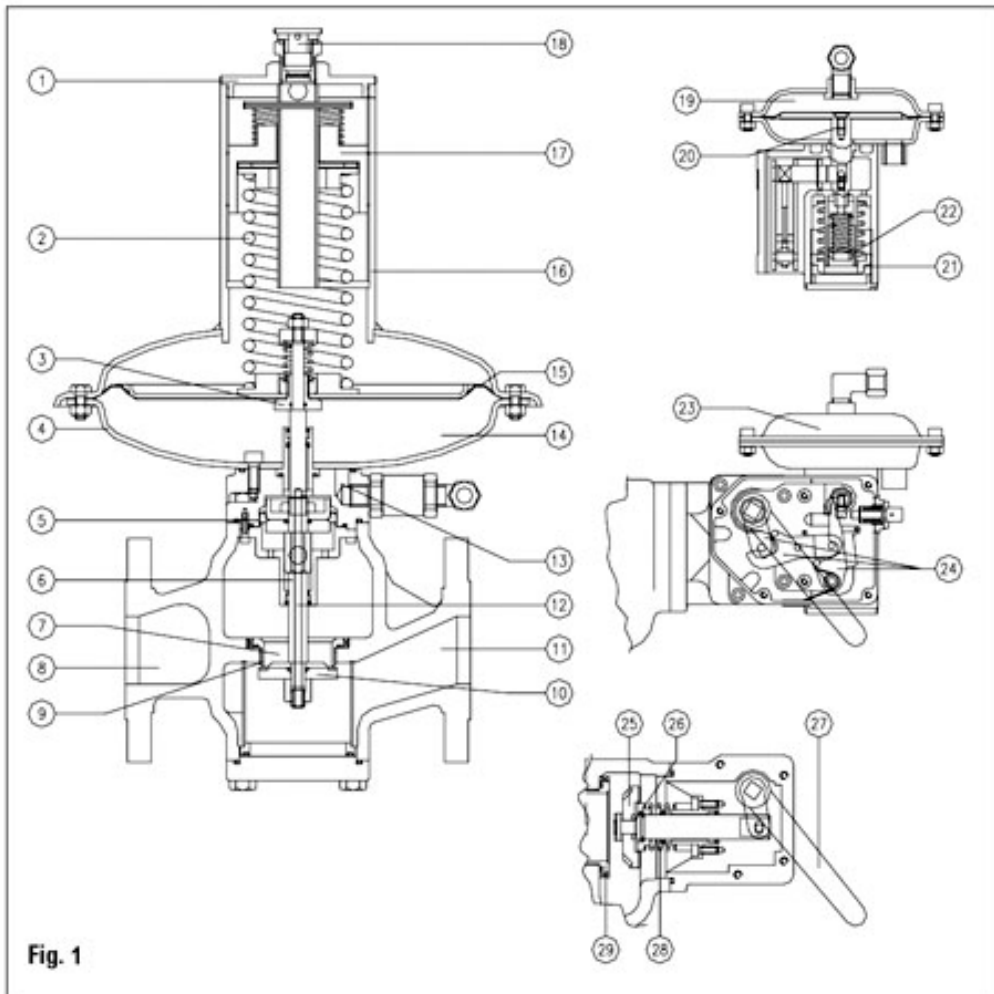
Q = Flow Rate (SCFH)

K = Orifice Coefficient (SCFH/PSI)

## OPERATION SCHEMATIC

### Key

- | No. | Description                      |
|-----|----------------------------------|
| 1   | Spring chamber cover             |
| 2   | Calibration spring               |
| 3   | Diaphragm nut                    |
| 4   | Diaphragm chamber bottom case    |
| 5   | Balancing diaphragm              |
| 6   | Stem                             |
| 7   | Valve orifice                    |
| 8   | Inlet chamber                    |
| 9   | Valve seat                       |
| 10  | Valve plug                       |
| 11  | Outlet chamber                   |
| 12  | Balancing tube                   |
| 13  | Control line intake              |
| 14  | Regulation control chamber       |
| 15  | Diaphragm                        |
| 16  | Spring housing cover             |
| 17  | Spring adjustment lock nut       |
| 18  | Vent plug                        |
| 19  | Shutoff valve diaphragm chamber  |
| 20  | Diaphragm assembly               |
| 21  | Over pressure adjustment spring  |
| 22  | Under pressure adjustment spring |
| 23  | Shutoff valve outlet chamber     |
| 24  | Control levers                   |
| 25  | Shutoff valve plug               |
| 26  | By-pass                          |
| 27  | Reset lever                      |
| 28  | Shutoff valve spring             |
| 29  | Shutoff valve seat               |



**RB4010 CAPACITY TABLE 2" VALVE BODY**

Capacities in 1,000 SCFH of 0.6

S.G. gas; base conditions of 14.7 PSIA and 60° F.


Typical Capacity Info.	
Manufacturer	Itron
Type and model	RB4010

Inlet Pressure (PSIG)	Outlet Pressure Setting					
	7" w.c.	14" w.c.	1 PSIG		2 PSIG	
	1" w.c. droop	2" w.c. droop	1% absolute droop	2% absolute droop	1% absolute droop	2% absolute droop
1	14.2					
2	18.0	17.5	16.0	17.0		
3	23.5	25.0	22.5	25.7	10.3	17.8
5	38.0	34.3	32.5	38.3	16.3	28.6
8	43.9	38.9	33.5	43.9	22.7	39.9
10	47.9	55.8	56.3	64.3	26.2	47.5
15	57.4	75.6	56.1	64.1	32.6	57.5
20	67.0	94.8	65.5	74.8	40.7	67.0
30	86.2	96.2	84.4	96.4	45.5	79.0
40	105.4	99.6	103.3	118.0	52.8	98.2
50	124.6	117.9	122.2	139.6	58.5	120.6
60	143.8	136.1	141.0	161.1	77.3	139.3
70	162.9	154.3	159.9	182.7	87.7	158.0
80	182.1	172.5	178.8	204.2	98.1	176.7
90	201.3	190.7	197.7	225.8	108.5	195.4
100	220.5	208.9	216.6	247.4	118.9	214.2
120	261.2	245.4	254.3	290.5	139.7	251.6
150	316.4	566.4	311.0	355.2	170.8	307.8
175	364.3	652.4	358.2	409.2	196.8	354.6
200	412.3	738.4	405.4	463.1	222.8	401.4
225	460.2	824.4	452.6	517.0	248.8	448.1

Lock up Pressure	1" w.c.	1.5" w.c.	0.1 PSIG	0.2 PSIG
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Notes:

\*Individual regulator performance may vary from data shown.

 Inlet pressure is too low to deliver set point.



**RB4020 CAPACITY TABLE 2" VALVE BODY**

Capacities in 1,000 SCFH of 0.6

S.G. gas; base conditions of 14.7 PSIA and 60° F.

Typical Capacity Info.	
Manufacturer	Itron
Type and model	RB4020

Inlet Pressure (PSIG)	Outlet Pressure Setting							
	1 PSIG	2 PSIG		5 PSIG		10 PSIG		
	1% absolute droop	1% absolute droop	2% absolute droop	1% absolute droop	2% absolute droop	1% absolute droop	10% gauge droop	2% gauge droop
1								
2	15.2							
3	19.7	10.3	17.8					
5	27.2	16.3	28.6					
8	34.8	22.7	39.9	16.0	23.6			
10	38.2	26.2	47.5	20.8	28.9			
15	46.2	32.6	57.5	30.8	46.4	17.8	34.8	50.8
20	52.4	40.7	67.0	36.6	49.4	24.9	47.6	69.1
30	68.1	45.5	79.0	43.5	62.8	35.9	68.0	98.2
40	87.2	52.8	98.2	53.8	76.4	44.4	85.2	121.0
50	100.3	58.5	120.6	63.6	90.4	50.0	92.6	133.3
60	115.9	77.3	139.3	70.5	97.4	65.4	117.3	166.6
70	131.5	87.7	158.0	83.4	118.5	65.5	121.3	174.6
80	147.1	98.1	176.7	93.3	132.5	73.2	135.7	195.3
90	162.6	108.5	195.4	94.4	134.0	89.9	157.6	225.3
100	178.2	118.9	214.2	113.0	160.6	88.8	164.4	236.7
120	211.4	141.0	251.6	121.0	188.7	105.4	193.2	278.1
150	256.1	170.8	307.8	126.8	191.0	131.4	213.0	315.3
175	295.1	196.8	354.6	139.6	203.0	146.9	232.3	349.9
200	334.0	222.8	401.4	211.9	301.0	166.3	308.2	443.6
225	372.9	248.8	448.1	236.6	336.1	185.7	344.1	495.3

Lock up Pressure (PSIG)	0.2	0.3	0.3	0.5
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Notes:

\*Individual regulator performance may vary from data shown.

Inlet pressure is too low to deliver set point.

**RB4030 CAPACITY TABLE 2" VALVE BODY**

Capacities in 1,000 SCFH of 0.6 S.G. gas; base conditions of 14.7 PSIA and 60° F.

**Typical Capacity Info.**

<b>Manufacturer</b>	Itron
<b>Type and model</b>	RB4030

Inlet Pressure (PSIG)	Outlet Pressure Setting							
	10 PSIG		15 PSIG		20 PSIG		30 PSIG	
	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop
15	29.0	49.5						
20	36.0	70.0	34.9	57.8				
30	59.2	89.0	58.9	88.2	49.8	87.5		
40	70.6	115.5	73.0	114.0	69.6	120.0	49.3	85.5
50	78.0	123.3	77.0	121.6	84.7	136.8	59.8	110.8
60	90.4	144.2	89.4	141.2	98.3	158.8	69.4	128.6
70	102.9	162.9	97.3	146.2	115.9	181.7	80.4	151.1
80	113.1	180.2	114.2	180.3	125.5	202.8	88.6	164.2
90	121.6	199.3	126.6	199.9	139.1	224.8	98.2	182.0
100	133.2	214.5	138.0	221.6	163.2	250.2	107.9	199.8
120	159.5	250.1	160.4	255.3	186.7	292.8	127.1	235.5
150	184.4	303.0	189.1	314.0	223.2	352.0	155.9	302.9
175	214.1	357.1	231.9	366.1	254.8	411.8	180.0	333.4
200	260.3	419.9	262.9	415.0	288.8	466.8	204.0	378.0
225	291.0	469.4	293.8	463.9	322.8	521.7	228.0	422.5

Lock up Pressure (PSIG)	0.5	0.8	0.9	1.3
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Notes:

\*Individual regulator performance may vary from data shown.

Inlet pressure is too low to deliver set point.

**RB4020 CAPACITY TABLE 3" VALVE BODY**

Capacities in 1,000 SCFH of 0.6 S.G. gas; base conditions of 14.7 PSIA and 60° F.


Typical Capacity Info.	
Manufacturer	Itron
Type and model	RB4020

Inlet Pressure (PSIG)	Outlet Pressure Setting					
	1 PSIG		3 PSIG		5 PSIG	
	1% absolute droop	2% absolute droop	1% absolute droop	2% absolute droop	1% absolute droop	2% absolute droop
3	44.3	50.6				
5	64.0	75.4	32.1	46.2		
8	66.0	86.5	44.7	64.4	31.5	46.5
10	110.9	126.7	51.6	74.3	41.0	56.9
15	110.5	126.2	64.2	92.5	60.6	91.3
20	129.1	147.4	80.2	115.5	72.1	97.3
30	166.3	189.9	89.6	129.1	85.7	123.7
40	203.4	232.4	104.0	149.8	105.9	150.5
50	240.6	274.9	115.2	166.0	125.4	178.1
60	277.8	317.4	152.3	219.3	138.9	191.9
70	315.0	359.9	172.8	248.8	164.3	233.5
80	352.2	402.4	193.2	278.3	183.8	261.1
90	389.4	444.9	213.7	307.8	186.0	264.0
100	426.6	487.4	234.2	337.2	222.7	316.4
120	501.0	572.4	275.1	396.2	238.4	371.8
150	612.6	699.8	336.5	484.6	249.8	376.3
175	705.6	806.1	387.7	558.3	275.0	399.9
200	798.5	912.3	438.9	632.0	417.4	539.0
225	891.5	1018.5	490.1	705.7	466.0	662.2

Lock up Pressure (PSIG)	0.1	0.2	0.35
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Notes:

\*Individual regulator performance may vary from data shown.

 Inlet pressure is too low to deliver set point.

**RB4030 CAPACITY TABLE 3" VALVE BODY**

Capacities in 1,000 SCFH of 0.6 S.G. gas; base conditions of 14.7 PSIA and 60° F.


<b>Typical Capacity Info.</b>	
<b>Manufacturer</b>	Itron
<b>Type and model</b>	RB4030

Inlet Pressure (PSIG)	Outlet Pressure Setting			
	10 PSIG		15 PSIG	
	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop
15	57.1	97.5		
20	70.9	137.9	68.8	113.9
30	116.6	175.3	116.0	173.8
40	139.1	227.5	143.8	224.6
50	153.7	242.9	151.8	239.6
60	178.1	284.1	176.2	278.2
70	202.7	320.9	191.7	288.0
80	222.8	355.0	225.0	355.2
90	239.6	392.6	249.4	393.7
100	262.4	422.6	271.9	436.6
120	314.2	492.7	316.0	502.9
150	363.3	596.9	372.5	618.6
175	421.8	703.5	456.8	721.2
200	512.8	827.2	517.8	817.5
225	573.3	924.7	578.8	913.9

Lock up Pressure (PSIG)	0.5	0.8
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Notes:

\*Individual regulator performance may vary from data shown.

 Inlet pressure is too low to deliver 2" w.c.

**RB4040 CAPACITY TABLE 3" VALVE BODY**

Capacities in 1,000 SCFH of 0.6 S.G. gas; base conditions of 14.7 PSIA and 60° F.

<b>Typical Capacity Info.</b>	
Manufacturer	Itron
Type and model	RB4040

Inlet Pressure (PSIG)	Outlet Pressure Setting							
	10 PSIG		15 PSIG		20 PSIG		30 PSIG	
	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop	10% gauge droop	20% gauge droop
15	52.0	88.7						
20	67.4	131.0	63.3	104.8				
30	106.1	159.6	109.1	163.3	98.1	172.4		
40	132.1	216.2	132.3	206.6	137.1	236.4	97.1	168.4
50	139.8	221.0	142.7	225.3	166.8	269.5	117.8	218.3
60	169.2	269.9	162.1	255.9	193.6	312.9	136.7	253.3
70	184.5	292.0	180.2	270.7	228.3	357.9	158.4	297.7
80	211.7	337.2	207.0	326.8	247.2	399.5	174.6	323.5
90	218.0	357.3	234.4	370.1	274.0	442.9	193.5	358.6
100	249.3	401.4	250.1	401.6	321.5	492.9	212.5	393.7
120	285.9	448.4	297.0	472.8	367.8	576.8	250.3	463.9
150	345.1	567.1	342.7	569.1	439.7	693.4	307.2	596.7
175	383.8	640.2	429.4	677.9	501.9	811.2	354.5	656.9
200	487.2	785.8	476.4	752.1	569.0	919.5	401.8	744.6
225	521.7	841.4	544.1	859.0	636.0	1027.8	449.2	832.3

Lock up Pressure (PSIG)	0.6	1.0	1.1	1.5
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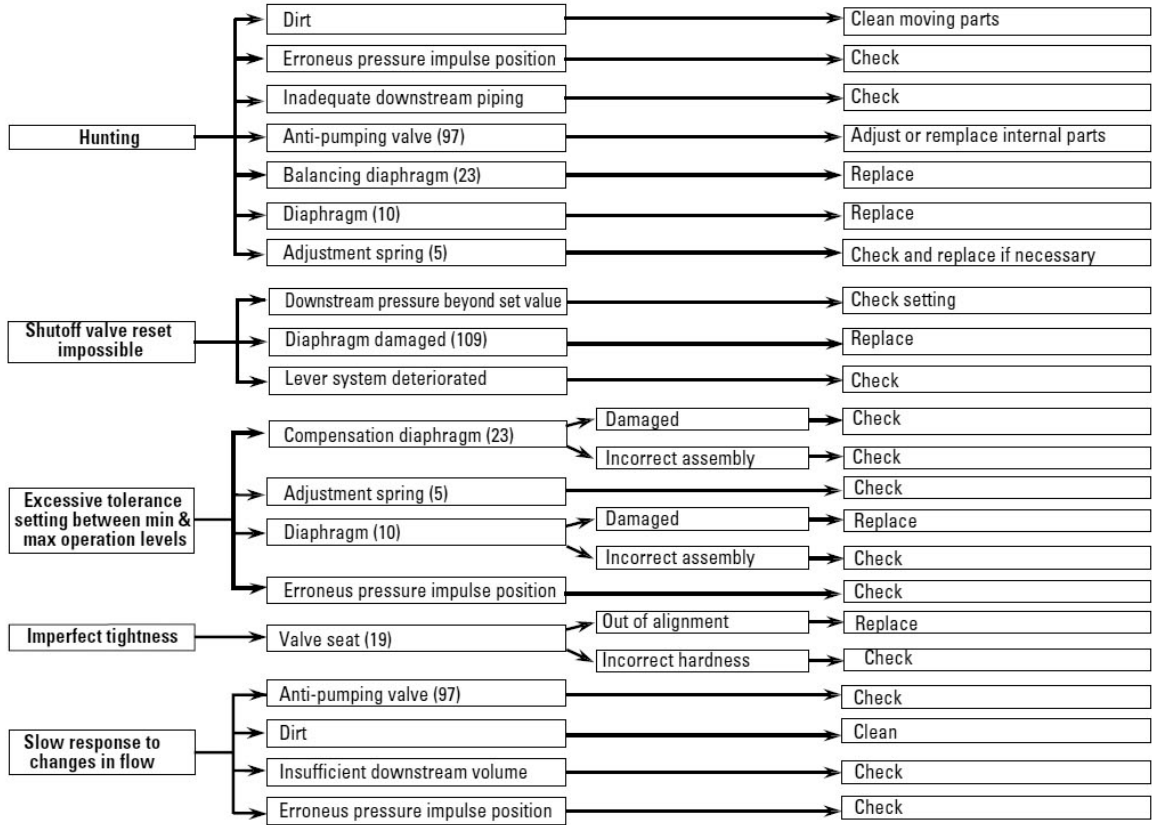
Notes:

\*Individual regulator performance may vary from data shown.

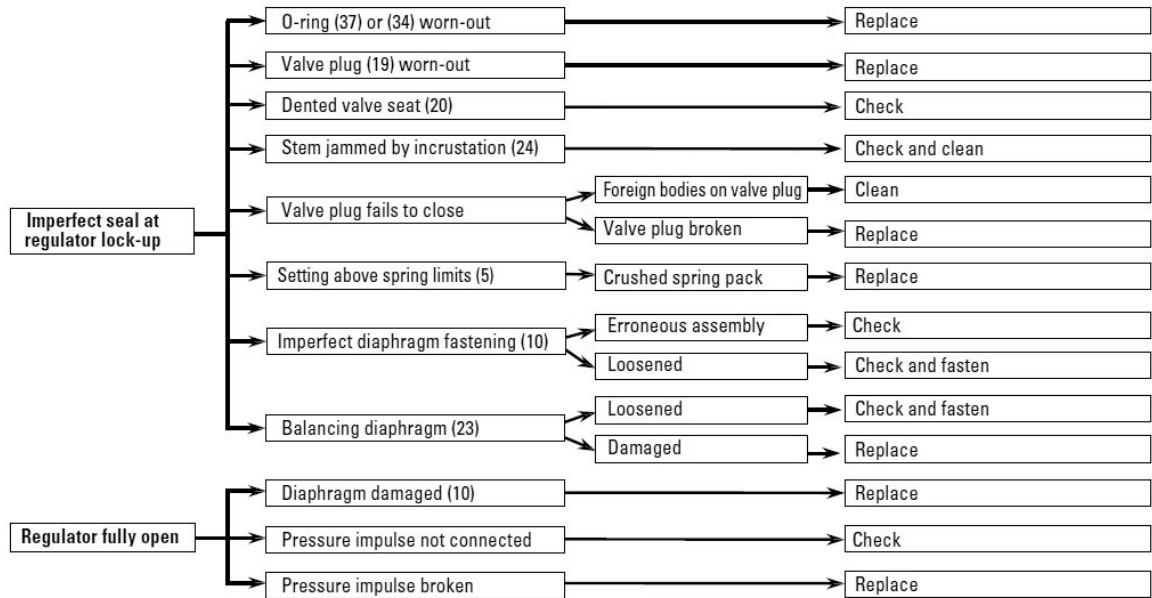
Inlet pressure is too low to deliver set point.

# TROUBLESHOOTING

## Malfunction



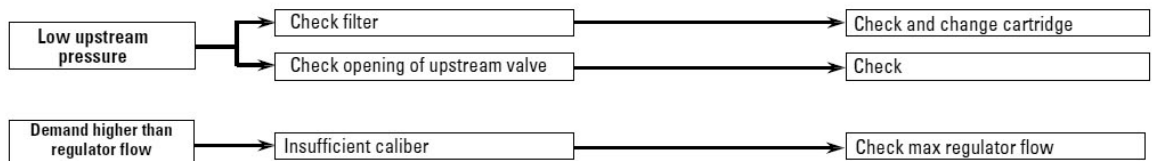
## Pressure Beyond Regulator Setting



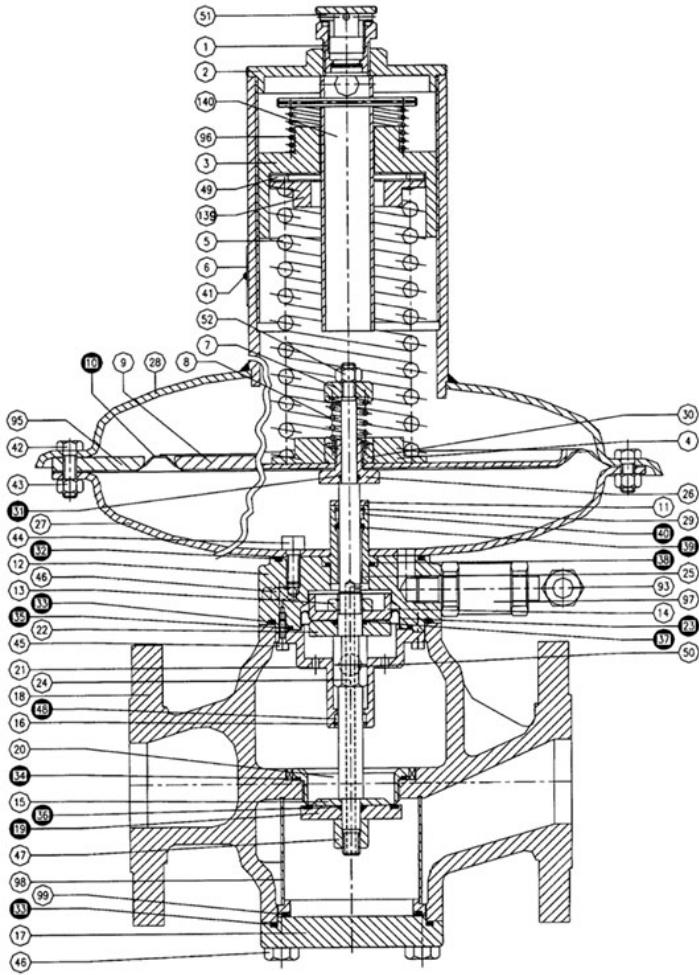
## No Flow



## Low Downstream Pressure and Flow



**RB4000 PARTS LIST**



**Spare Parts Kit RB4000**

Part Number	Description
39926101	Spare parts kit RB 4010 2" Body
39926201	Spare parts kit RB 4020 2" Body
39926301	Spare parts kit RB 4030 2" Body
39927200	Spare parts kit RB 4020 3" Body
39927300	Spare parts kit RB 4030 3" Body
39927400	Spare parts kit RB 4040 3" Body
39927120	Spare parts kit list RB 4011-4012 3" Body
39927310	Spare parts kit list RB 4031-4032 3" Body
39927410	Spare parts kit list RB 4041-4042 3" Body

**Spare Parts Kit RB 4010 2" Body**

Item Number	Part Number	Quantity	Description
10	20550290	1	Diaphragm RB 4010 2" body rev.0
19	20600260	1	Valve plug SHA 55 RB 4010 2" body rev.C
23	20556290	1	Balancing diaphragm RB 4000 2" body II series rev.0
31	45000108	1	O-ring or 108
32	45004312	1	O-ring or 4312
33	45004325	2	O-ring or 4325
34	45003231	1	O-ring or 3231
35	45003262	1	O-ring or 3262
36	45000112	1	O-ring or 112

**Spare Parts Kit RB 4010 2" Body**

Item Number	Part Number	Quantity	Description
37	45003056	1	O-ring or 3056
38	45003087	1	O-ring or 3087
39	20030715	1	O-ring 12 SHA 65 St.3007 rev.A
40	20080170	1	Nylon bushing D.12 rev. 0
48	20080270	1	Nylon bushing D.14 rev.0

**Spare Parts Kit RB 4020 2" Body**

10	20552390	1	Diaphragm RB 4020 2" body rev. 0
19	20604260	1	Valve plug SHA 75 RB 4020 2" body rev. C
23	20556290	1	Balancing diaphragm RB 4000 2" body II series rev. 0
31	45000108	1	O-ring or 108
32	45004312	1	O-ring or 4312
33	45004325	2	O-ring or 4325
34	45003231	1	O-ring or 3231
35	45003262	1	O-ring or 3262
36	45000112	1	O-ring or 112
37	45003056	1	O-ring or 3056
38	45003087	1	O-ring or 3087
39	20030715	1	O-ring 12 SHA 65 ST.3007 rev. A
40	20080170	1	Nylon bushing D.12 rev. 0
48	20080270	1	Nylon bushing D.14 Rev.0

**Spare Parts Kit RB 4030 2" Body**

10	20552390	1	Diaphragm RB 4020 2" body rev.0
19	20604260	1	Valve Plug SHA 75 RB 4020 2" body rev. C
23	20556290	1	Balancing diaphragm RB 4000 2" body II series rev. 0
31	45000108	1	O-ring or 108
32	45004312	1	O-ring or 4312
33	45004325	2	O-ring or 4325
34	45003231	1	O-ring or 3231
35	45003262	1	O-ring or 3262
36	45000112	1	O-ring or 112
37	45003056	1	O-ring or 3056
38	45003087	1	O-ring or 3087
39	20030715	1	O-ring 12 SHA 65 ST.3007 rev. A
40	20080170	1	Nylon bushing D.12 rev. 0
48	20080270	1	Nylon bushing D.14 rev. 0

**Spare Parts Kit RB 4020 3" Body**

10	20552190	1	Diaphragm RB 4020 3" body rev. 0
19	20601100	1	Valve plug SHA75 RB 4020 3" body rev. 0
23	20555390	1	Balancing diaphragm RB 4000 3" body rev. 0
31	45000108	1	O-ring or 108
32	45004450	1	O-ring or 4450
33	45004475	2	O-ring or 4475
34	45004362	1	O-ring or 4362
35	45004387	1	O-ring or 4387
36	45000115	1	O-ring or 115



**Spare Parts Kit RB 4010 2" Body**

Item Number	Part Number	Quantity	Description
37	45000121	1	O-ring or 121
38	45000132	1	O-ring or 132
39	20030815	1	O-ring 14 SHA 65 ST.3008 rev. A
40	20080270	1	Nylon bushing D.14 rev. 0
48	20080370	1	Nylon bushing D.18 rev. 0

**Spare Parts Kit RB 4030 3" Body**

10	20552190	1	Diaphragm RB 4020 2" body rev. 0
19	20601100	1	Valve plug SHA75 RB 4020 3" body rev. 0
23	20555390	1	Balancing diaphragm RB 4000 3" body rev. 0
31	45000108	1	O-ring or 108
32	45004450	1	O-ring or 4450
33	45004475	2	O-ring or 4475
34	45004362	1	O-ring or 4362
35	45004387	1	O-ring or 4387
36	45000115	1	O-ring or 115
37	45000121	1	O-ring or 121
38	45000132	1	O-ring or 132
39	20030815	1	O-ring 14 SHA 65 ST.3008 rev. A
40	20080270	1	Nylon bushing D.14 rev. 0
48	20080370	1	Nylon bushing D.18 rev. 0

**Spare Parts Kit RB 4040 3" Body**

10	20552390	1	Diaphragm RB 4020 2" body rev. 0
19	20604260	1	Valve plug SHA 75 RB 4020 2" body rev. C
23	20556290	1	Balancing diaphragm RB 4000 2" body II series rev. 0
31	45000108	1	O-ring or 108
32	45004312	1	O-ring or 4312
33	45004325	2	O-ring or 4325
34	45003231	1	O-ring or 3231
35	45003262	1	O-ring or 3262
36	45000112	1	O-ring or 112
37	45003056	1	O-ring or 3056
38	45003087	1	O-ring or 3087
39	20030715	1	O-ring 12 SHA 65 ST.3007 rev. A
40	20080170	1	Nylon bushing D.12 rev. 0
48	20080270	1	Nylon bushing D.14 rev. 0

**Spare Parts Kit RB 4011-4012 3" Body**

10	20555290	1	Diaphragm RB 4010 3" body rev. A
19	20600100	1	Valve plug SHA 55 RB 4010 3" body rev.0
23	20555390	1	Balancing diaphragm RB 4000 3" body rev. 0
31	45000115	2	O-ring or 115
32	45004450	1	O-ring or 4450
33	45004475	2	O-ring or 4475
34	45004362	2	O-ring or 4362
35	45004387	1	O-ring or 4387
37	45000121	1	O-ring or 121
38	45000132	1	O-ring or 132

**Spare Parts Kit RB 4011-4012 3" Body**

Item Number	Part Number	Quantity	Description
39	20030815	1	O-ring 14 SHA 65 ST.3008 rev. A
40	20080270	1	Nylon bushing D.14 rev. 0
48	20080370	3	Nylon bushing D.18 rev. 0
54	20500270	1	Cap gasket for VDB 8600 rev. 0
56	48000804	1	Elastic Pin 3x20 UNI 6873
57	20600200	1	Valve Plug RB 4011 3" Body Rev. B
60	45000128	2	O-ring or 128
65	45003037	2	O-ring or 3037
109	20558290	1	Diaphragm VDB 8600 L.P. rev. 0
117	45004437	1	O-ring or 4437

**Spare Parts Kit RB 4031-4032 3" Body**

10	20552390	1	Diaphragm RB 4020 2" body rev. 0
19	20601100	1	Valve plug ShA75 RB 4020 3" body rev. 0
23	20555390	1	Balancing diaphragm RB 4000 3" body rev.0
31	45000108	1	O-ring or 108
32	45004450	1	O-ring or 4450
33	45004475	2	O-ring or 4475
34	45004362	2	O-ring or 4362
35	45004387	1	O-ring or 4387
36	45000115	1	O-ring or 115
37	45000121	1	O-ring or 121
38	45000132	1	O-ring or 132
39	20030815	1	O-ring 14 SHA 65 ST.3008 rev. A
40	20080270	1	Nylon bushing D.14 rev. 0
48	20080370	1	Nylon bushing D.18 Rev. 0
67	20551690	1	Shut-off valve diaphragm RB 4021 rev.0
72	20600200	1	Valve plug RB 4011 3" body rev. B
75	45000112	1	O-ring or 112
76	45003237	1	O-ring or 3237
77	45003087	1	O-ring or 3087
78	20030415	1	O-ring 10 SHA 65 ST.3001 rev. B
85	48000804	1	Elastic pin 3x20 UNI 6873
86	45004437	1	O-ring or 4437

**Spare Parts Kit RB 4041-4042 3" Body**

Item Number	Part Number	Quantity	Description
10	20552990	1	Diaphragm RB 4030 rev. 0
19	20601100	1	Valve plug SHA75 RB 4020 3" body rev. 0
23	20555390	1	Balancing diaphragm RB 4000 3" body rev. 0
31	45000108	1	O-ring or 108
32	45004450	1	O-ring or 4450
33	45004475	2	O-ring or 4475
34	45004362	1	O-ring or 4362
35	45004387	1	O-ring or 4387
36	45000115	1	O-ring or 115
37	45000121	1	O-ring or 121
38	45000132	1	O-ring or 132

**Spare Parts Kit RB 4041-4042 3" Body**

<b>Item Number</b>	<b>Part Number</b>	<b>Quantity</b>	<b>Description</b>
39	20030815	1	O-ring 14 SHA 65 St.3008 rev. A
40	20080270	1	Nylon bushing D.14 rev. 0
48	20080370	1	Nylon bushing D.18 rev. 0
67	20555090	1	Shut-off valve diaphragm RB 4031 Rev. 0
72	20600200	1	Valve plug RB 4011 3" body rev. B
75	45000112	1	O-ring or 112
76	45003237	1	O-ring or 3237
77	45003087	1	O-ring or 3087
78	20030415	1	O-ring 10 SHA 65 ST.3001 rev. B
85	48000804	1	Elastic Pin 3 x 20 UNI 6873
86	45004437	1	O-ring or 4437

<b>Item Number</b>	<b>Part Number</b>	<b>Spring Color</b>
5	20568085	Orange/silver
5	20568086	Brown/silver
5	20568087	Dark green/silver
5	20568088	Light green/silver
5	20568089	Light blue/silver
5	20568090	Black/silver
5	20568081	Purple/silver
5	20568082	Yellow
5	20568083	Blue/silver
5	20568183	Blue
5	20568182	Silver
5	20568181	Purple
5	20568186	Yellow/silver
5	20568184	Red/silver
5	20568185	White/silver
5	20569590	Orange
5	20569591	Brown
5	20569592	Dark green
5	20569593	Light green
5	20569594	Black
5	20569690	Red
5	20569691	Light blue
5	20569585	White
5	20569586	Pink

**Special Tools**

<b>Part Number</b>	<b>Description</b>
39926000	Orifice wrench 2" valve body
39927000	Orifice wrench 3" valve body
799056	Spring adjustment wrench

## VENT LINES FOR REGULATORS

When constructing vent lines to be attached to regulators installed indoors, follow a few basic rules:

- Never use pipe sizes smaller than the vent size; smaller pipe sizes restrict the gas flow. If a long gas run must be used, Itron advises increasing the pipe one nominal size every ten feet to keep the flow restriction as low as possible.
- Keep the vent line length as short as possible to minimize the restriction and reduce the vent's tendency to cause regulator pulsation.
- Support the vent pipe to eliminate strain on the regulator diaphragm case.
- Always point outdoor vent pipes in the downward position to reduce the possibility of rain, snow, sleet, and other moisture entering the pipe. Install a bug screen in the end of the pipe.
- Do not locate the vent line terminus near windows, fans, or other ventilation equipment. See the installation instructions furnished with the regulator.
- Adhere to all applicable codes and regulations.
- If your vent pipe causes regulator pulsation, consult your sales representative or manufacturer.
- Itron strongly recommends running a separate vent line for each regulator. Headers with various installed devices can cause regulator malfunction.

**Caution** Ensure the end of the vent line is away from ANY potential ignition sources. It is the installer's responsibility to ensure the vent line is exhausting to a safe environment.

## INSTALLATION

**Warning** Itron does not endorse or warrant the completeness or accuracy of any third party regulator installation procedures or practices, unless otherwise provided in writing by Itron. Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those given in this document when installing regulators.

### Key

No. Description

- Upstream valve
- Differential pressure gauge
- Strainer/Filter
- Upstream pressure gauge
- Regulator/Monitor
- Shutoff valve
- Pressure gauge
- Monitor Regulator
- Shutoff valve impulse
- Regulator impulse
- Monitor regulator impulse
- Downstream pressure gauge
- Discharge vent pipe
- Downstream valve
- Upstream isolating connection
- Discharge vent pipe
- Regulator vent
- Meter
- Peak shaving valve
- Downstream electrical insulating connection

Fig. 1

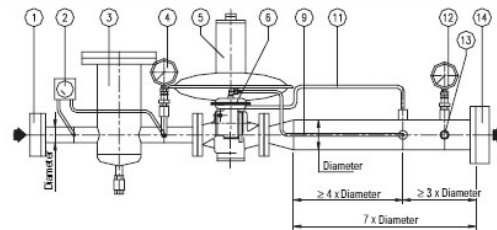


Fig. 2

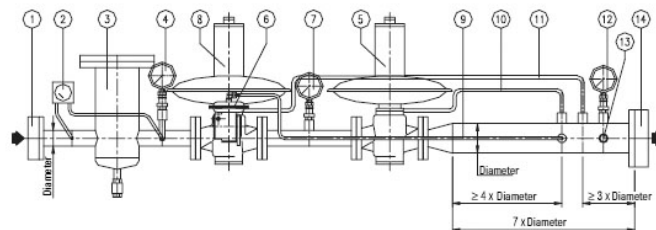


Fig. 3

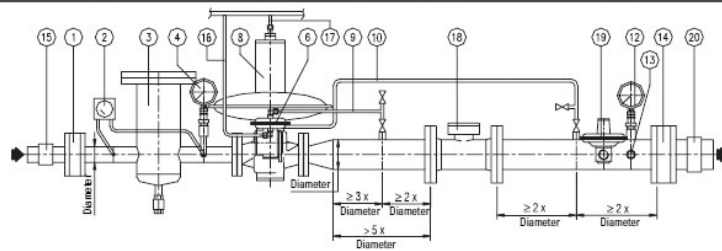
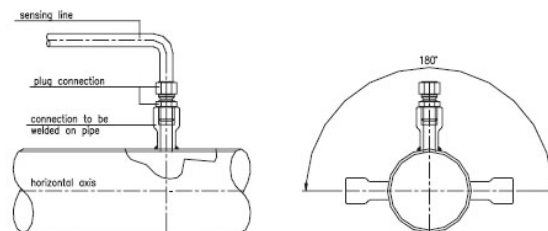


Fig. 4



## START-UP PROCEDURE

After the pressure regulator has been installed, verify that:

- The upstream and downstream on/off valves and the discharge vent pipe are all closed
- The pressure of the inlet gas is not higher than the established design value.

After these checks are completed, proceed as follows :

- Partially open the upstream on/off valve slowly, just enough to verify that a very small amount of gas passes.
- Reset the shutoff valve whenever it was set for minimum pressure intervention; it will be closed in the absence of pressure (see Shutoff Device Reset).
- Verify that the pressure rises slowly on the upstream and downstream pressure gauges. The downstream pressure must stabilize around the pre-set set value or a value slightly higher. If the pressure continues to rise, interrupt the starting procedure by closing the upstream on/off valve and consult the trouble-shooting diagram to identify the cause of the malfunction.
- After the upstream pressure value stabilizes, open the upstream on/off valve completely.
- Slowly open the downstream on/off valve until the piping is completely filled.
- At this point, the pressure regulator is operative. You must use the same procedure when installing monitor-equipped pressure regulators connected on line with the active pressure regulator (see Figure 2).

---

**Note** The pressure gauge installed in the section between the two regulators must indicate the same pressure value as the upstream gauge.

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### Pressure Regulator Setting

(See the Principle of Operation Schematic)

The pressure regulator is typically shipped set to the specifications indicated in the order. If you must modify the set pressure, the new setting value must be within the installed spring's setting range.

Begin by reviewing the installed spring specifications to verify the spring is capable of the desired setting value.

After verification, proceed as follows:

- To increase the value of the set pressure, rotate the spring adjustment ferrule (lock) nut clockwise using the adjustment wrench until the desired value is reached (monitor the reading on the gauge downstream).
- To decrease the value of the set pressure, proceed as above, rotating the spring adjustment ferrule counter-clockwise.

Pressure regulator settings can be changed regardless of whether the pressure regulator is delivering flow or the downstream on/off cock is closed. Be sure to (in the latter case) open the discharge plug (control line intake), downstream of the regulator. Close this valve after the desired set pressure is obtained.

### Shutoff Device Setting

**Important** If you are Changing the shutoff valve setting, the diaphragm chamber must always be under pressure (see the Principal of Operation schematic).

Begin by reviewing the installed spring specifications to verify the spring is capable of the desired setting value. After verification, check the setting of the shutoff unit.

- To reach the maximum downstream pressure, close the ON/OFF valve downstream (see Figure 1) and slowly increase the pressure downstream until you reach the desired maximum intervention pressure.
- To correct the maximum intervention value, rotate the overpressure adjustment spring nut (see the Principal of Operation Schematic) clockwise to increase the set pressure and counter-clockwise to decrease the value.
- To reach the minimum downstream pressure, close the upstream ON/OFF valve (see Figure 1), and slowly discharge the downstream pressure until the desired minimum intervention pressure is reached.
- To correct the minimum downstream pressure, rotate the under pressure adjustment spring nut (see the Principle of Operation Schematic) clockwise to increase the setting value, and counter-clockwise to decrease the value.

### Shutoff Device Reset

(Fig.1, 2 & 3)

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**Important** Identify the cause of the device shutoff prior to resetting the shutoff.

---

To restore normal operating conditions, perform the following operations:

- Close the ON/OFF valve downstream
- Open the valve for the upstream and downstream pressure gauges
  - Downstream pressure = 0 (discharge any residual pressure by opening the discharge vent pipe).
  - Relief valve and discharge valve closed

Check the unit's valve seat seal by opening the discharge valve (test the unit using the bubble system).

- Slowly rotate the reset lever (see the Principal of Operation schematic) clockwise until the internal bypass is opened. Slowly rotating the reset lever permits the outlet chamber, the downstream piping, and the shutoff valve diaphragm chamber to fill. Verify the outlet chamber, the downstream piping, and the shutoff valve filled on the gauge positioned downstream.
- After the pressure on the gauge stabilizes, continue using the reset lever until it can be connected to the control levers. At this point, the reset lever will remain stable in its open position.

After these operations are completed, the shutoff valve is ready for service and the downstream valve can be slowly reopened.

When you are restoring normal operating conditions, the shutoff valve must always be reset whenever the valve is equipped with the minimum downstream pressure intervention function.

## **SAFETY WARNING**

This product, as of the date of manufacture, is designed and tested to conform to all governmental and industry safety standards as they may apply to the manufacturer. The purchaser/user of this product must comply with all fire control, building codes, and other safety regulations governing the application, installation, operation, and general use of this regulator to avoid leaking gas hazards resulting from improper installation, startup or use of this product.

Itron strongly recommends installation by a qualified professional and periodic inspection of pressure regulators (inspections may be required by local applicable codes or regulations).

Inspections should include checking for gas quality, cycle numbers, external environmental changes, and operating conditions that impact wear on the regulator's moving parts. To ensure safe and efficient operation of this product, replace worn or damaged parts found during inspection.

## LIMITED WARRANTY

Itron, Inc. 2111 North Molter Road Liberty Lake, WA 99019, warrants this gas product against defects in materials and workmanship for the earlier of one (1) year from the date the product is shipped by Itron or a period of one year from the date the product is installed by Itron at the original purchaser's site. During such one-year period, provided that the original purchaser continues to own the product, Itron will, at its sole option, repair any defects, replace the product or repay the purchase price.

» This warranty will be void if the purchaser fails to observe the procedures for installation, operation or service of the product as set forth in the Operating Manual and Specifications for the product or if the defect is caused by tampering, physical abuse or misuse of the product.

- » Itron specifically disclaims all implied warranties including those of merchantability or of fitness for particular purpose. Under no circumstances will Itron be liable for incidental or consequential damages of any kind whatsoever.
- » Itron's liability for any claim of any kind, including negligence and breach of warranty for the sale and use of any product covered by or furnished, shall in no case exceed the price allocable to the product or part thereof which gives rise to the claim.
- » In the event of a malfunction of the product, consult your Itron Service Representative or Itron Inc., 2111 North Molter Road Liberty Lake, WA 99019. See Itron Terms and Conditions of Sale for the full and complete terms of the Limited Warranty.

## ORDERING INFORMATION

Specify:

1. Inlet and Outlet Connection Size and Type
2. Model Number
3. Outlet pressure desired
4. Pilot needed
5. Inlet pressure range
6. Type of gas and maximum capacity required
7. Assembly position number (see chart below)
8. Special requirements such as tagging, 1/8" pipe plug tap, seal wire, etc.



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