

APPLICATION:

Self-contained, pilot-operated regulator used To maintain ounces of positive pressure on systems flowing into a downstream vacuum, such as vapor recovery systems.

FEATURES:

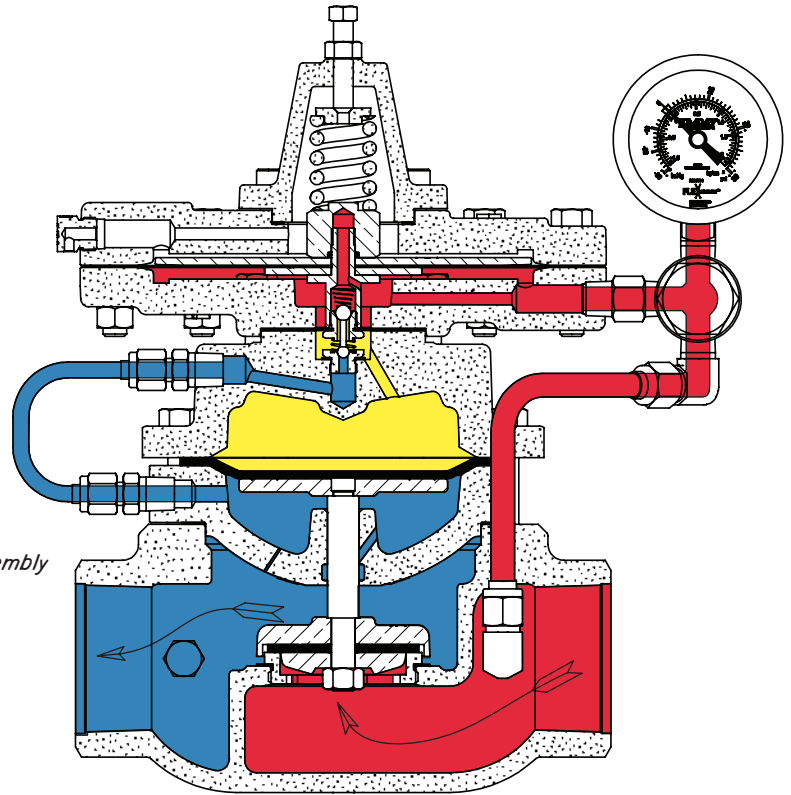
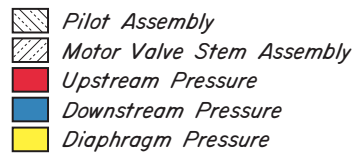
- Tight shut-off - Class VI
- Single soft seat
- Removable valve seat
- Minimum maintenance
- All internal parts can be removed with valve in line
- Single-point adjustment of setpoint
- Utilizes upstream pressure as actuation pressure
- Efficient 3-way plug accurately maintains setpoint
- Minimum upstream pressure required

CERTIFICATIONS:

Canadian Registration Number (CRN):
0C16234.24567890NTY (Ductile)
Kimray is an ISO 9001- certified manufacturer.

CLASSIFICATIONS:

Non-Bleed / Intermittent Vent



	Standard Configuration Code †	Order Code	Line Size	Connection Type	Oper. Press. psig	Max. W.P. psig ††	Cv	Cf
Ductile	RVB2SADF2S	AFED20	2"	NPT	1-20	300	47.0	0.84
	RVB2ARDF2S	AFFD20		150RF	1-20	250		
	RVB3SADF2S	AFHD20	3"	NPT	1-20	300	117	0.75
	RVB3ARDF2S	AFID20		150RF	1-20	250		
	RVB4SADF2S	AFJD20	4"	NPT	1-20	300	210	0.75
	RVB4ARDF2S	AFKD20		150RF	1-20	250		
Steel	RVB4ARDF2S	AFLD20	6"	150RF	1-20	250	480	0.75
	RVB2ARWF2S	AHA20	2"	150RF	1-20	285	47.0	0.84
	RVB3ARWF2S	AHB20	3"	150RF	1-20	285	117	0.75
	RVB4ARWF2S	AHC20	4"	150RF	1-20	285	210	0.75
	RVB6ARWF2S	AHD20	6"	150RF	1-20	285	480	0.75

NOTES:

For standard & optional seals, metals, Cf Cv values, material specifications & dimensions see technical data on pages 06:I - 06:IV

† For Corrosive service remove last "S" & replace with "C"

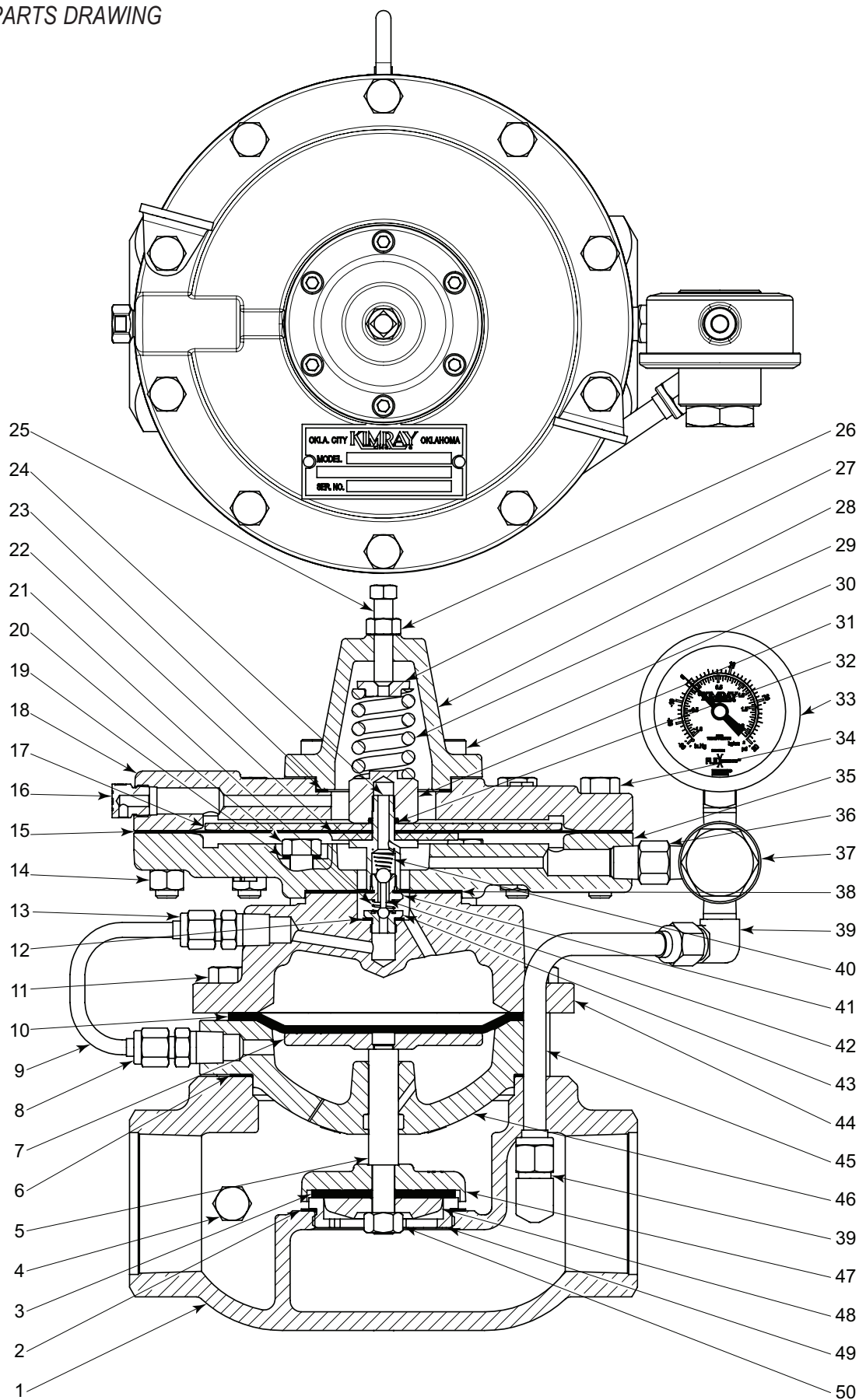
† For code builder see page 06:00.3

†† Max W.P. values based on -20°F to 100°F.

PRESSURE REGULATORS

GAS LOW PRESSURE BACK PRESSURE TO VACUUM
MODEL VB PARTS DRAWING

KIMRAY[®]



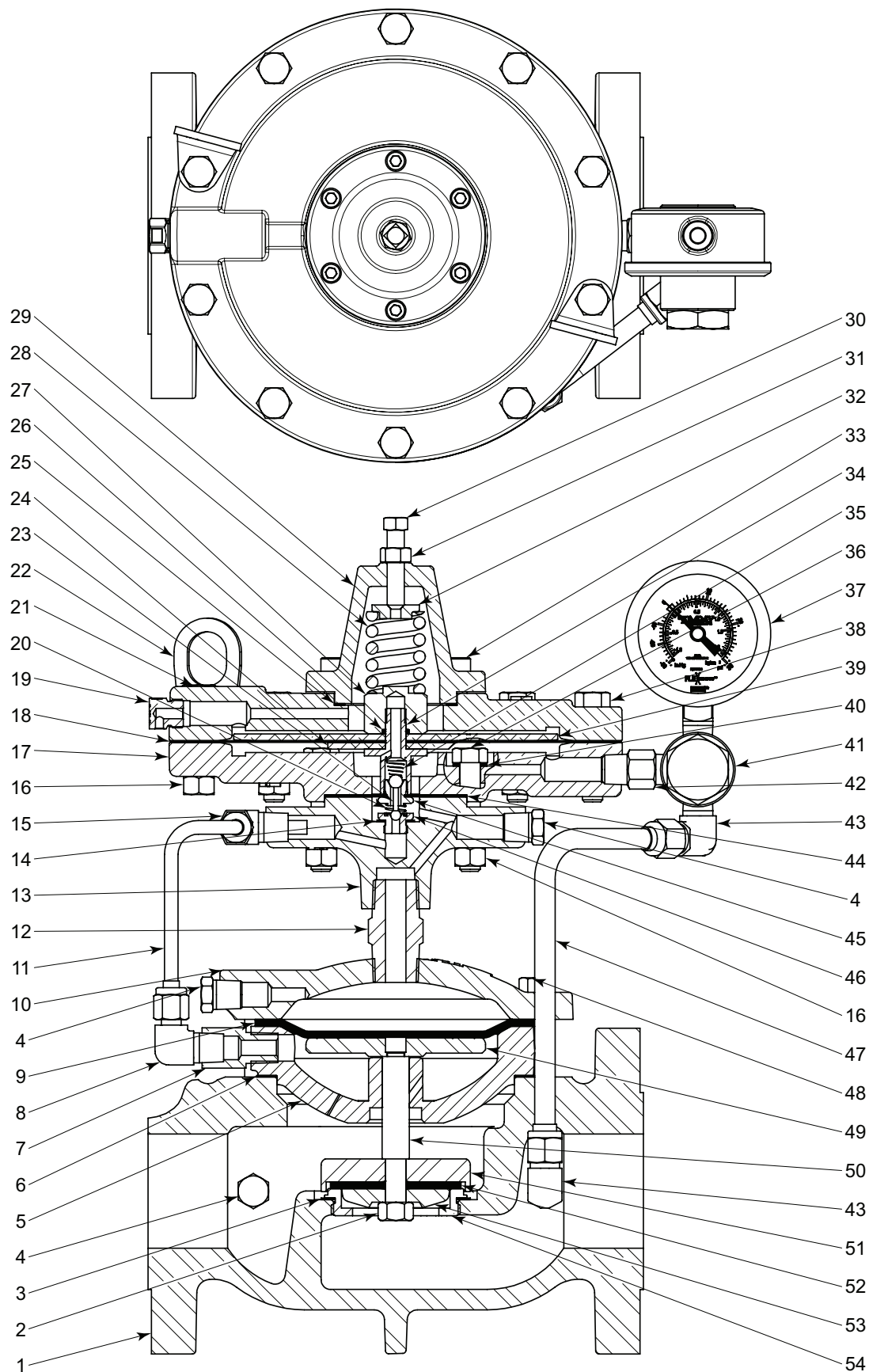
All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.

ITEM	QTY.	DESCRIPTION		PART NUMBER				NUMBER			
				STANDARD				CORROSIVE			
				2 INCH	3 INCH	4 INCH	6 INCH	2 INCH	3 INCH	4 INCH	6 INCH
1	1	Body									
		NPT Thru		1709	1634	2001	----	1709 ‡	1634 ‡	2001 ‡	----
		150RF Thru		1913	1914	2002	2466	1913 ‡	1914 ‡	2002 ‡	2466 ‡
		Grooved Thru		2964	-----	-----	-----	2964 ‡	-----	-----	-----
2	1	Gasket	* 276	277	196	279	276	277	196	279	
3	1	Seat	Standard * 164HSN	165HSN	166HSN	167HSN	164HSN	165HSN	166HSN	167HSN	
			Reduced * 164HSN	1230HSN	164HSN	165HSN	164HSN	1230HSN	164HSN	165HSN	
4	1	Plug		699				699SS6			
5	1	Valve Stem	Standard	138	139	140	141	138SS6	139SS6	140SS6	141SS6
			Reduced	138	1222SS6	1223SS6	1224SS6	138SS6	1222SS6	1223SS6	1224SS6
6	1	Gasket		196	197	198	199	196	197	198	199
7	1	Diaphragm Plate		133	134	135	136	133	134	135	136
8	1	Connector		875				875SS6			
9	1	Tubing		4008SS6	213SS6	2505SS6	215SS6	1826SS6	213SS6	2505SS6	215SS6
10	1	Diaphragm *		1706	1640	2015	2140	1706	1640	2015	2140
11	(QTY)	Bolt		965 (8)	907(10)	907 (12)	2142 (12)	965SS6 (8)	907SS6(10)	907SS6 (12)	2142SS6 (12)
12	1	Gasket *		118				118			
13	1	Connector		874				874SS6			
14	10	Nut		241				241			
15	1	Diaphragm *		1212				1212			
16	1	Vent Plug		147				147SS6			
17	1	Upper Diaphragm Plate		1208				1208SS6			
18	1	Upper Pilot Housing		1206				1206 ‡			
19	4	Gasket *		242				242			
20	4	Screw		1672				1672SS6			
21	1	Spring *		566				566HAC			
22	1	Lower Diaphragm Plate		1340				1340SS6			
23	1	Gasket *		1216				1216			
24	1	Stem		1339				1339S6			
25	1	Adjusting Screw		897				897			
26	1	Nut		922				922SS6			
27	1	Spring Guide		7148S6 (Std. 20 lbs.) 636SS6 (Optional 2.5 & 5 lbs.)				7148S6 (Std. 20 lbs.) 636SS6 (Optional 2.5 & 5 lbs.)			
28	1	Bonnet		1336				1336 ‡			
29	1	Spring		4379 (Std 20 lbs.) 1527 (Opt 2.5 lbs.) 3061 (Opt 5 lbs.)				4379 (Std 20 lbs.) 1527 (Opt 2.5 lbs.) 3061 (Opt 5 lbs.)			
30	6	Screw		7531				7531			
31	1	Nut		1337				1337S6			
32	1	O-Ring *		265				265			
33	1	Pressure Gauge		7704				7704			
34	10	Screw		236				236SS6			
35	1	Lower Pilot Housing		1356				1356 ‡			
36	1	Nipple		648				648SS6			
37	1	1/4 F30 Filter		YAS				YASSS6			
38	1	Diaphragm *		110				110			
39	2	Elbow / Conn.		877				877SS6			
40	1	Spring *		1360				1360HAC			
41	1	Pilot Seat *		565				565SS6			
42	1	Pilot Plug *		112				112			
43	1	Pilot Seat *		113				113SS6			
44	1	Upper Housing		1719	1636	2003	2177	1719 ‡	1636 ‡	2003 ‡	2177 ‡
45	1	Tubing		4127				4127SS6			
46	1	Lower Housing		1373	1632	1375	146	1373 ‡	1632 ‡	1375 ‡	146 ‡
47	1	Seat Disc	Standard	159	160	161	162	2493SS6	2494SS6	2495SS6	2961SS6
			Reduced	159	1229	159	160	2493SS6	2585SS6	2493SS6	2494SS6
48	1	Ratio Plug	Standard	177SS6	178	179	180	177SS6	3076SS6	3078SS6	3079SS6
			Reduced	4933	1228SS6	177SS6	178	4933SS6	1228SS6	177SS6	3076SS6
49	1	Removable Seat	Standard	272K	273K	274K	275K	2496SS6K	2497SS6K	2498SS6K	3075SS6K
			Reduced	4934K	1219DK	1220DK	1221K	4934SS6K	1219SS6K	1220SSK	1221SS6K
50	1	Nut	Standard * 173	906		175	173SS6	174SS6		175SS6	
			Reduced * 173	173		906	173SS6		174SS6		
	2	Lifting Ring (not shown)		7559				7559			
								‡ Coated Parts available with "E" shell material			
Repair Kits				RYI	RYM	RYQ	RYT	RYIS6	RYMS6	RYQS6	RYTS6
				* These parts are recommended spare parts and are stocked as repair kits.							

PRESSURE REGULATORS

STEEL GAS LOW PRESSURE BACK PRESSURE TO VACUUM
MODEL VB PARTS DRAWING

KIMRAY
INC.®



All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.

STEEL GAS LOW PRESSURE BACK PRESSURE TO VACUUM MODEL VB PARTS LIST

ITEM	QTY.	DESCRIPTION		PART NUMBER				CORROSIVE			
				STANDARD							
				2 INCH	3 INCH	4 INCH	6 INCH	2 INCH	3 INCH	4 INCH	6 INCH
1	1	Body		2468	2469	2470	2959	2468 ‡	2469 ‡	2470 ‡	2959 ‡
2	1	Nut	Standard *	173	906		175	173SS6	174SS6		175SS6
			Reduced *	173			906	173SS6			174SS6
3	1	Gasket	*	276	277	196	279	276	277	196	279
4	3	Plug		699				699SS6			
5	1	Lower Housing		4211	4212	4213	4214	4211 ‡	4212 ‡	4213 ‡	4214 ‡
6	1	Gasket	*	196	197	198	199	196	197	198	199
7	1	Adapter		7244				7244S6			
8	1	Elbow		875				875SS6			
9	1	Diaphragm	*	1706	1640	2015	2140	1706	1640	2015	2140
10	1	Bonnet		2487	2488	2489	2956	2487 ‡	2488 ‡	2489 ‡	2956 ‡
11	1	Tubing		4050SS6	2505SS6		4312SS6	4050SS6	2505SS6		4312SS6
12	1	Nipple		2516				2516SS6			
13	1	Base		4995				4995 ‡			
14	1	Gasket	*	118				118			
15	1	Elbow / Connector		875		874	875	875SS6		874SS6	875SS6
16	14	Nut		241				241			
17	1	Lower Pilot Housing		1356				1356 ‡			
18	1	Diaphragm	*	1212				1212			
19	1	Vent Plug		147				147SS6			
20	1	Spring	*	566				566HAC			
21	2	Lifting Ring (not shown)		7559			----	7559			----
22	1	Upper Pilot Housing		1206				1206 ‡			
23	1	Pilot Plug	*	112				112			
24	1	Lower Diaphragm Plate		1340				1340SS6			
25	1	Gasket	*	1216				1216			
26	1	O-Ring	*	265				265			
27	1	Nut		1337				1337S6			
28	1	Spring		4379 (Std 20 lbs.) 1527 (Opt 2.5 lbs.) 3061 (Opt 5 lbs.)				4379 (Std 20 lbs.) 1527 (Opt 2.5 lbs.) 3061 (Opt 5 lbs.)			
29	1	Bonnet		1336				1336 ‡			
30	1	Adjusting Screw		897				897			
31	1	Nut		922				922			
32	1	Spring Guide		7148S6 (Std. 20 lbs.) 636SS6 (Optional 2.5 & 5 lbs.)				7148S6 (Std. 20 lbs.) 636SS6 (Optional 2.5 & 5 lbs.)			
33	6	Screw		7531				7531			
34	1	Stem		1339				1339S6			
35	1	Spring	*	1360				1360HAC			
36	4	Screw		191				191			
37	1	Pressure Gauge		7704				7704			
38	10	Screw		236				236			
39	1	Upper Diaphragm Plate		1208				1208SS6			
40	4	Gasket	*	242				242			
41	1	Nipple		648				648SS6			
42	1	1/4 F30 Filter		YAS				YASSS6			
43	2	Elbow		877			875	877SS6			875SS6
44	1	Diaphragm	*	110				110			
45	1	Pilot Seat	*	565				565SS6			
46	1	Pilot Seat	*	113				113SS6			
47	1	Tubing		4127	4129S6		2529SS6	4127SS6	4129S6		2529SS6
48	(QTY)	Bolt		965 (8)	907(10)	907 (12)	2142 (16)	965 (8)	907(10)	907 (12)	2142 (16)
49	1	Diaphragm Plate		2490	2491	2492	2958	2490SS6	2491SS6	2492SS6	2958SS6
50	1	Valve Stem	Standard	138	139	140	141	138SS6	139SS6	140SS6	141SS6
			Reduced	138	1222SS6	1223SS6	1224SS6	138SS6	1222SS6	1223SS6	1224SS6
51	1	Seat Disc	Standard	2493SS6	2494SS6	2495SS6	2961SS6	2493SS6	2494SS6	2495SS6	2961SS6
			Reduced	2493SS6	2585SS6	2493SS6	2494SS6	2493SS6	2585SS6	2493SS6	2494SS6
52	1	Seat	Standard *	164HSN	165HSN	166HSN	167HSN	164HSN	165HSN	166HSN	167HSN
			Reduced *	164HSN	1230HSN	164HSN	165HSN	164HSN	1230HSN	164HSN	165HSN
53	1	Ratio Plug	Standard	177SS6	178	179	3079SS6	177SS6	3076SS6	3078SS6	3079SS6
			Reduced	4933	1228SS6	177SS6	178	4933SS6	1228SS6	177SS6	3076SS6
54	1	Removable Seat	Standard	2496SS6K	2497SS6K	2498SS6K	3075SS6K	2496SS6K	2497SS6K	2498SS6K	3075SS6K
			Reduced	4934SS6K	1219SS6K	1220SSK	1221SS6K	4934SS6K	1219SS6K	1220SSK	1221SS6K
Repair Kits				RYI	RYM	RYQ	RYT	RYIS6	RYMS6	RYQS6	RYTS6
				* These parts are recommended spare parts and are stocked as repair kits.							

Table 1 - Flow Coefficient(Cv) at % stem travel for Pilot-operated Regulators											
1" Pressure Regulator											
Trim Size in.(mm)	Cf	Valve Opening Percentage									
		10	20	30	40	50	60	70	80	90	100
1/2 in (12mm) Reduced	0.75	0.4	0.7	0.9	1.3	1.8	2.5	3.2	3.9	4.5	5
1 in (25mm) Full Port	0.74	1.1	1.8	2.4	3.4	4.8	6.6	8.5	10.2	11.9	13.2
2" Pressure Regulator											
Trim Size in. (mm)	Cf	Valve Opening Percentage									
		10	20	30	40	50	60	70	80	90	100
1 1/4 in (31 mm) Reduced	0.75	1.8	2.8	3.9	5.4	7.7	10.5	13.6	16.2	19.0	21.0
2 in Removable Full Port *	0.84	4.0	6.2	8.6	12.1	17.2	23.5	30.4	36.3	42.5	47.0
2 in (50 mm) Full Port *	0.75	4.4	6.9	9.5	13.4	19.1	26.0	33.6	40.2	47.0	52.0
3" Pressure Regulator											
Trim Size in. (mm)	Cf	Valve Opening Percentage									
		10	20	30	40	50	60	70	80	90	100
1 5/8 in (66 mm) Reduced	0.82	2.9	4.5	6.2	8.8	12.5	17.0	22.0	26.3	30.7	34.0
3 in (76 mm) Full Port	0.75	9.9	15.6	21.5	30.2	42.9	58.6	75.7	90.4	105.7	117.0
4" Pressure Regulator											
Trim Size in. (mm)	Cf	Valve Opening Percentage									
		10	20	30	40	50	60	70	80	90	100
2 in (50 mm) Reduced	0.80	4.7	7.3	10.1	14.2	20.2	27.5	35.6	42.5	49.7	55.0
4 in (100 mm) Full Port	0.75	17.8	27.9	38.6	54.2	77.0	105.2	135.9	162.2	189.8	210.0
6" Pressure Regulator											
Trim Size in. (mm)	Cf	Valve Opening Percentage									
		10	20	30	40	50	60	70	80	90	100
3 in (76 mm) Reduced	0.80	10.2	16.0	22.0	30.9	44.0	60.1	77.7	92.7	108.4	120.0
6 in (152 mm) Full Port	0.75	40.6	63.8	88.1	123.8	176.0	240.4	310.6	370.7	433.7	480.0

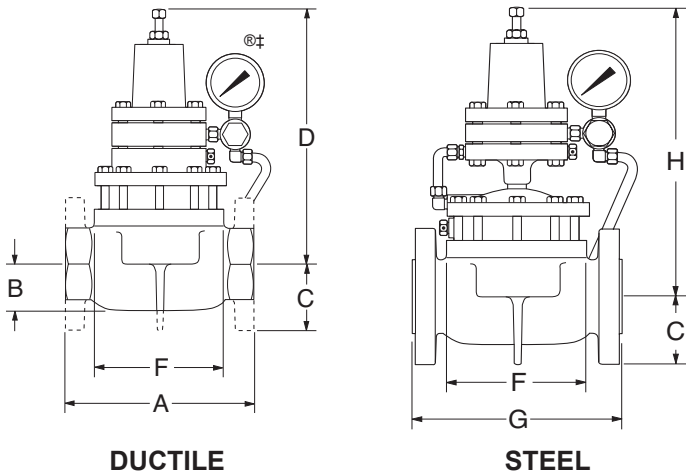
Kimray flow equations conform to ANSI/ISA - 75.01.01-2002

Kimray inherent flow characteristics conform to ANSI/ISA 75.11.01 -1985

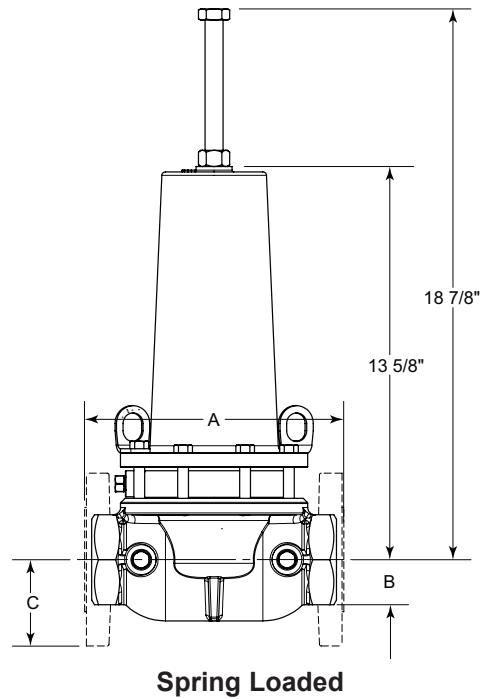
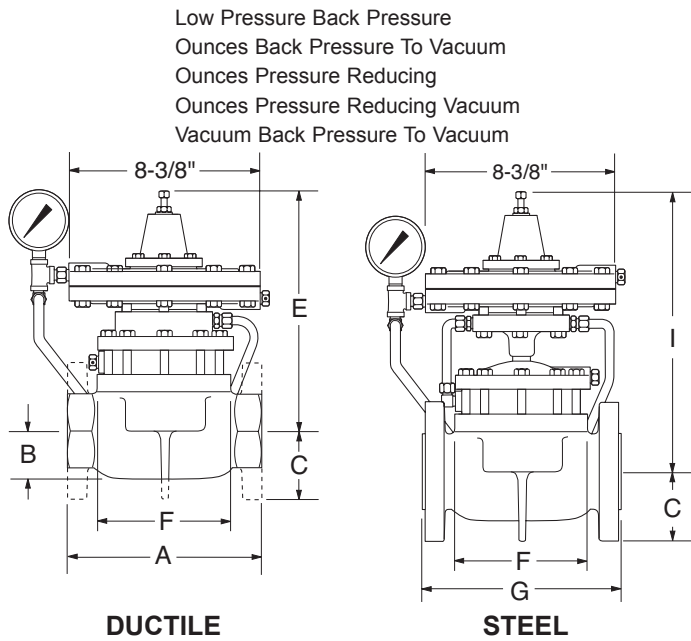
PRESSURE REGULATORS

DIMENSIONS

KIMRAY[®]



Back Pressure
Back Pressure Vacuum
Liquid Back Pressure
Pressure Reducing
Pressure Reducing Vacuum
Pressure Reducing-Balanced
Pressure Differential



LINE SIZE	BODY SIZE	A	B	C	D *	E	F	G	H *	I
1"	NPT	4 3/8"	1 1/8"		7 1/2"	11 5/8"	3 1/4"			
	FLANGED	7 1/4"	1 1/8"	2 1/8"	7 1/2"	11 5/8"	3 1/4"			
2"	NPT	8 1/2"	2 1/8"		11 1/2"	10 1/2"	6 1/2"			
	FLANGED	9"		3"	11 1/2"	10 1/2"	6 1/2"	9 1/8"	14 1/2"	14"
	GROOVED	8 3/4"	2 1/8"		11 1/2"	10 1/2"	6 1/2"			
250 S/FGT	NPT							10 1/2"		
	FLANGED							10 3/8"		
3"	NPT	12 1/16"	3 1/16"		13"	12"	8 1/2"			
	FLANGED	12 3/16"		3 3/4"	13"	12"	8 1/2"	12 3/8"	16 1/2"	15 1/2"
4"	NPT	15" 1/16	4"		14 1/2"	13 3/16"	10 1/2"			
	FLANGED	15 1/16"		4 1/2"	14 1/2"	13 3/16"	10 1/2"	15 1/16"	18 1/2"	16 11/16"
6"	FLANGED	22"		5 1/2"	17"	17 7/8"	16"	21 15/16"	20 1/2"	18 3/8"

FLANGE DIMENSIONS ARE ANSI 125/150 STANDARD. *Add 7/8" to Pressure Reducing Balanced and Up Stream Differential Pressure Regulators for this dimension.

All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.
‡ Configuration of Back Pressure Control Valve is a trademark of Kimray, Inc.

www.kimray.com

Table 2 - Seal Options

Part	Standard Material	Optional Material
Seat	HSN	FKM, AFLAS®
O-rings	Nitrile	HSN, FKM, AFLAS®
All Diaphragms	Nitrile	HSN, FKM, AFLAS®

Table 3 - Seal Specifications

Table 3 - Seal Specifications					
		NITRILE	HIGHLY SATURATED NITRILE	FKM	AFLAS®
Resistance	Kimray Suffix	-	HSN	V	AF
	Abrasion	G	G-E	G	G
	Acid	F	G-E	G-E	E
	Chemical	F	F	E	E
	Cold	G	G	P	P
	Flame	P	P	E	E
	Heat	G	E	E	E
	Oil	G-E	E	E	E
	Ozone	P	G	G-E	E
	Set	G	G	G-E	P
	Tear	F	F	F	P
	Water/Steam	F	E	P	G
	Weather	F	G	E	E
	CO2	F-G	G	G	G
	H2S	P	F	P	E
	Methanol	F	E	P	P
	Properties	Dynamic	G	G	G
Electrical		F	F	F	G-E
Impermeability		G	G	G	G
Tensile Strength		G	G-E	G	F
Temp. Range	-20° to +250°F	-20° to +300°F	-15° to +400°F	+15° to +450°F	
	-29° to +121°C	-29° to +149°C	-26° to +204°C	-9° to +232°C	
RATINGS: P-POOR, F-FAIR, G-GOOD, E-EXCELLENT					

Table 4 - Material Options

Part Description	Valve Size	Standard Material	Corrosive Material
Ratio Plug	1" & 2"	316 Powdered Metal SS-316NI-25	
	1" & 2" Reduced Trim	Alloy Steel (ASTM A108)	316SS (ASTM A479)
	3"	Powdered Metal F-008	316SS (ASTM A479)
	4" & 6"	Ductile (ASTM A395)	316SS (ASTM A479)
Seat Disc	1"	Powdered Metal F-008	316SS (ASTM A479)
	2", 3" & 4"	Ductile (ASTM A395)	316SS (ASTM A351 CF8M)
	6"	Ductile (ASTM A395)	316SS (ASTM A 240)
Stem	1" thru 6"	303SS (ASTM A582)	316SS (ASTM A479)
Body	1" thru 6"	Ductile (ASTM A395)	Ductile (ASTM A395) + Kimcoat
	2" thru 6"	WCB (ASTM A216)	WCB (ASTM A216) + Kimcoat
Tubing	1" thru 6"	304SS (ASTM A249)	316SS (ASTM A213)
Removable Seat	2" thru 6" Ductile Body	Ductile (ASTM A395)	316SS (ASTM A351 CF8M)
	2" thru 6" Steel Body	316SS (ASTM A351 CF8M)	

Series:
R = Pressure Regulator

Model:

Line Size:
1 = 1 NPS (VR & AB only)
2 = 2 NPS
3 = 3 NPS
4 = 4 NPS
6 = 6 NPS

End Connection:
SA = FNPT
AR = 150RF Flange (not available in 1 NPS)
GV = Grooved (2 NPS only)

Shell Material:
D = Ductile Iron
E = Ductile Iron w/Coating
W = Steel (WCB)
X = Steel (WCB) w/Coating

Inner Valve Size:
F = Full Port
R = Reduced Port

Control Range:
2 = 0-20 psig Spring
3 = 0-5 psig Spring
4 = 0-2.5 psig Spring

Service Type:
S = Standard
C = Corrosive

R	BP	2	SA	D	F	2	S	
---	----	---	----	---	---	---	---	--

Options: Additional cost and lead times will apply
If multiple options required input in sequential order
Leave blank if no options required

1 = NACE Certification (Corrosive Option Only)
2 = Hydrostatic Test Certification
3 = MTR (Shell Components)
A = AFLAS Elastomers
H = HSN Elastomers
V = FKM Elastomers
X = Export (Hydrostatic test, MTR & 3.1)

Not all selections available on all products listed.
See the following product pages for available options
06:10.9 - 06:10.11, 06:30.5 - 06:30.9,
06:50.9 - 06:50.13, 06:90.1 - 06:90.13