

### GAS OUNCES PRESSURE REDUCING TO VACUUM MODEL VR

#### APPLICATION:

Self-contained, pilot-operated regulator used for gas compressor suction regulation. Vapor pressure recovering systems and vacuum distribution systems, and compressor by-pass lines.

#### FEATURES:

- Tight shut-off
- 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

#### CERTIFICATIONS:






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

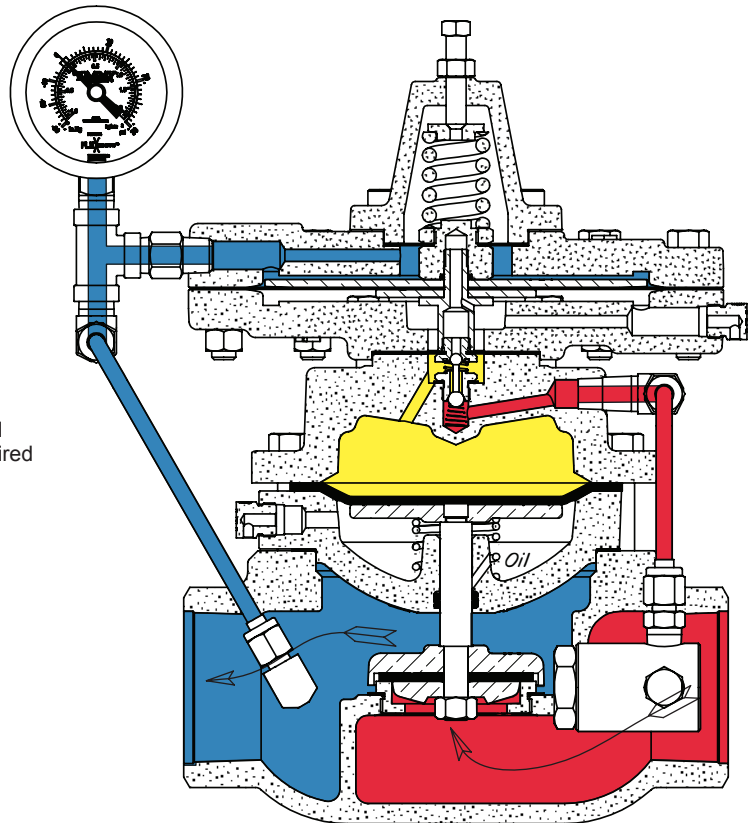
#### CLASSIFICATIONS:

Non-Bleed / Intermittent Vent

#### UPSTREAM PRESSURE RANGE:

- 1 Inch valves:  
Full port 10 psig min. or outside supply source is required  
Reduced port 5 psig min. or outside supply source is required
- 2 thru 6 inch valves:  
5 psig min. or outside supply source is required

-  Pilot Assembly
-  Motor Valve Stem Assembly
-  Upstream Pressure
-  Downstream Pressure
-  Diaphragm Pressure



	Standard Configuration Code †	Order Code	Line Size	Connection Type	Oper. Press. psig	Max. W.P. psig ††	Cv	Cf
Ductile	RVR1SADF2S	APED20	1"	NPT	10-300	300	13.2	0.74
	RVR2SADF2S	APHD20	2"	NPT	0-20	300	47.0	0.84
	RVR2ARDF2S	APID20		150RF	0-20	250		
	RVR3SADF2S	APKD20	3"	NPT	0-20	300	117.0	0.75
	RVR3ARDF2S	APLD20		150RF	0-20	250		
	RVR4SADF2S	APND20	4"	NPT	0-20	300	210.0	0.75
	RVR4ARDF2S	APOD20		150RF	0-20	250		
	RVR4ARDF2S	APRD20	6"	150RF	0-20	250	480.0	0.75

#### NOTES:

For standard & optional seals, metals, Cf Cv values, material specifications & dimensions see technical data on pages 06:1 - 06:1V

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

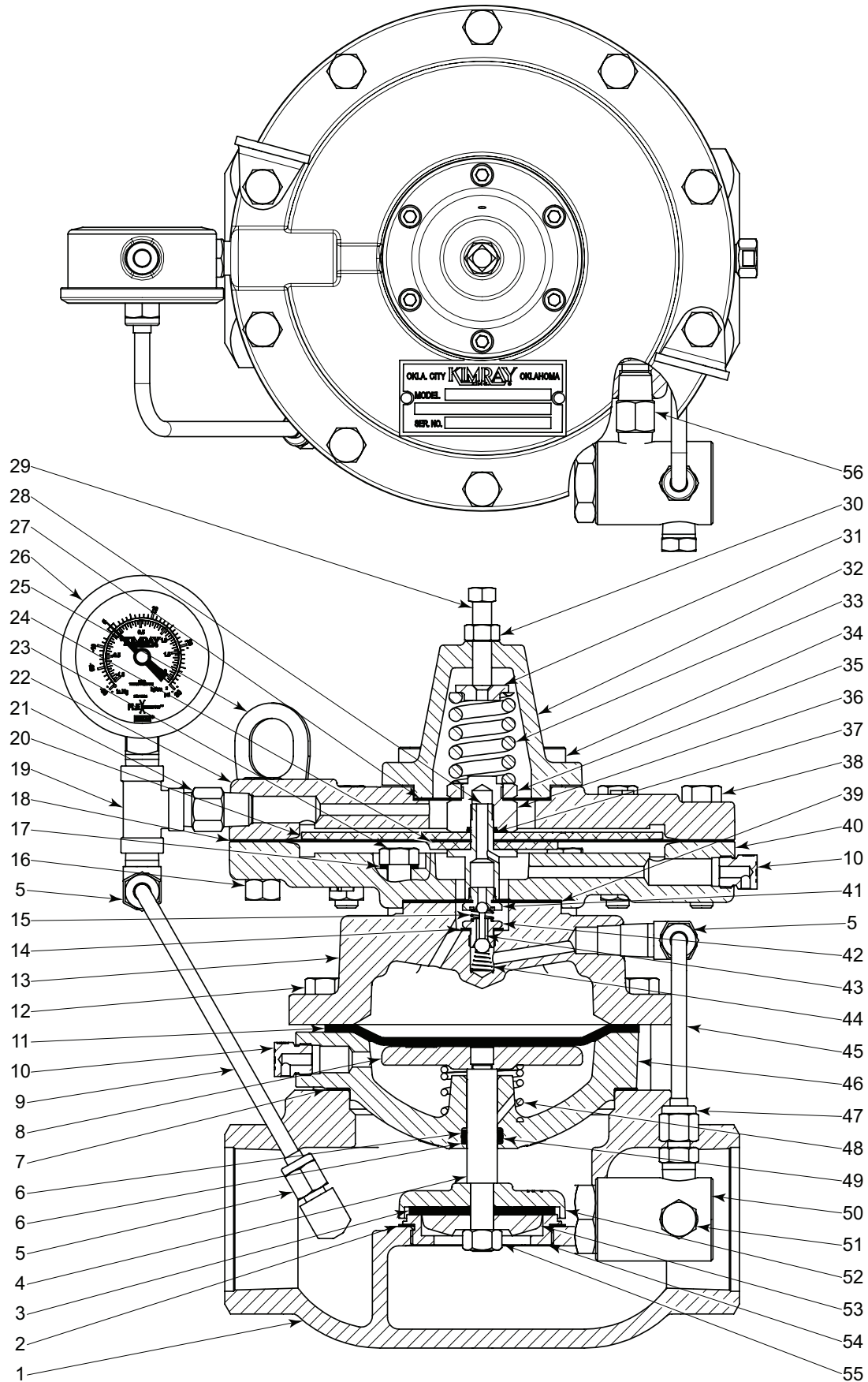
† For code builder see page 06:00.3

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

# PRESSURE REGULATORS



GAS OUNCES PRESSURE REDUCING TO VACUUM  
MODEL VR PARTS DRAWING



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



**PRESSURE REGULATORS**

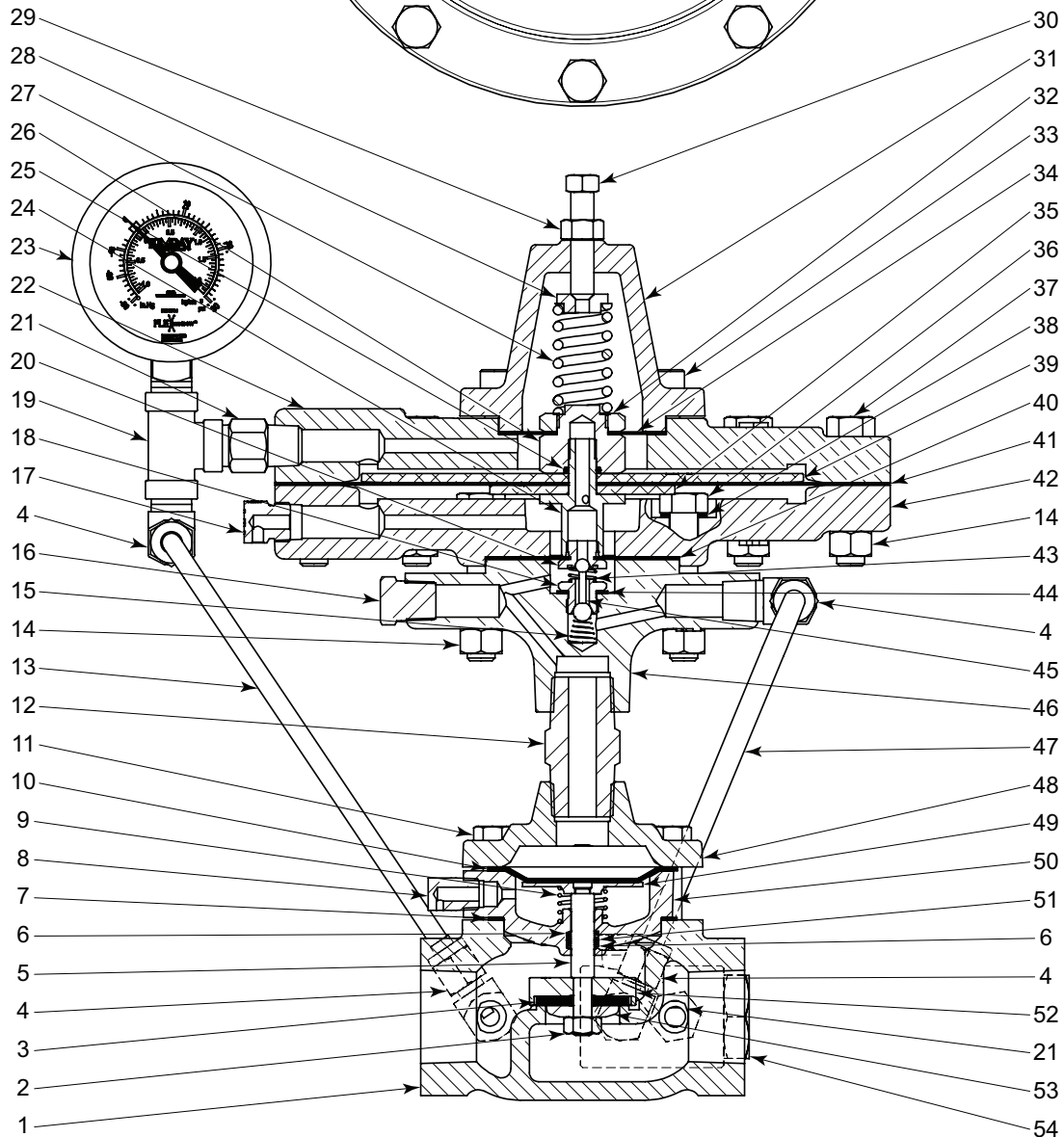
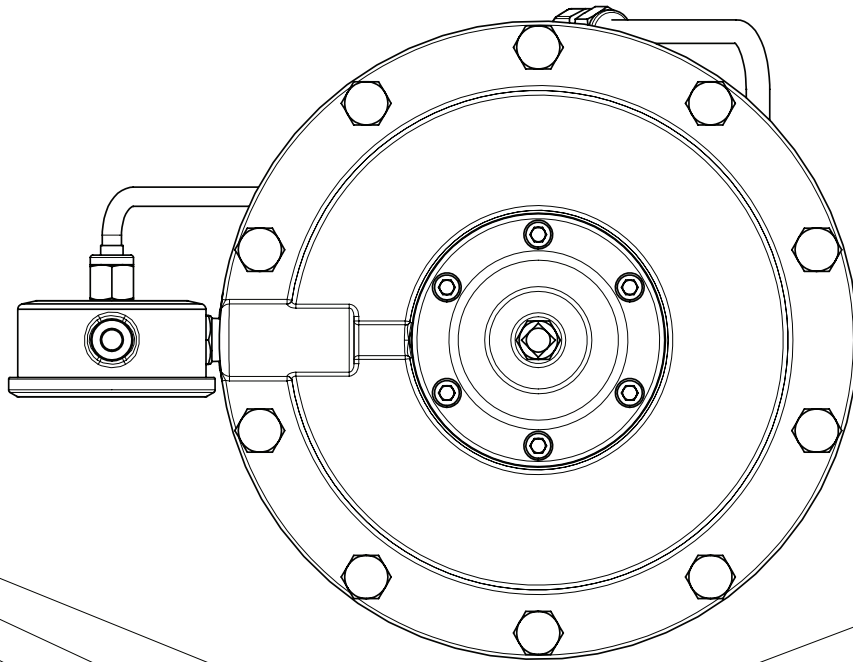
**GAS OUNCES PRESSURE REDUCING TO VACUUM  
MODEL VR PARTS LIST**

ITEM	QTY.	DESCRIPTION	PART 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	Valve Stem	Standard	138	139	140	141	138SS6	139SS6	140SS6	141SS6	
			Reduced	138	1222SS6	1223SS6	1224SS6	138SS6	1222SS6	1223SS6	1224SS6	
5	3	Elbow			875							
6	2	Back Up *	149T	150T	151T	152T	149T	150T	151T	152T		
7	1	Gasket *	196	197	198	199	196	197	198	199		
8	1	Diaphragm Plate	133	134	135	136	133	134	135	136		
9	1	Tubing	2505SS6	213SS6	2505SS6	5061SS6	2505SS6	213SS6	2505SS6	5061SS6		
10	2	Vent Plug			147							
11	1	Diaphragm *	1706	1640	2015	2140	1706	1640	2015	2140		
12	(QTY)	Bolt	965 (8)	907(10)	907 (12)	2142 (16)	965 (8)	907(10)	907 (12)	2142 (16)		
13	1	Upper Housing	1719	1636	2003	2177	1719 ‡	1636 ‡	2003 ‡	2177 ‡		
14	1	Gasket *			118				118			
15	1	Spring *			566				566HAC			
16	10	Nut			241				241			
17	4	Gasket *			242				242			
18	1	Diaphragm *			1212				1212			
19	1	Tee			219				219SS6			
20	1	Upper Diaphragm Plate			1208				1208SS6			
21	1	Nipple			648				648SS6			
22	1	Upper Pilot Housing			1206				1206 ‡			
23	4	Screw			1672				1672SS6			
24	1	Lower Diaphragm Plate			1340				1340SS6			
25	2	Lifting Ring		7559		----			7559		----	
26	1	Pressure Gauge			7704				7704			
27	1	Diaphragm *			5027				5027			
28	1	Stem			1339				1339S6			
29	1	Adjusting Screw			897				897			
30	1	Nut			922				922SS6			
31	1	Spring Guide		7148S6 (Std.)	636SS6 (Opt. 2.5 & 5 lbs.)				7148S6 (Std.)	636SS6 (Opt. 2.5 & 5 lbs.)		
32	1	Bonnet			5043				5043 ‡			
33	1	Spring		4379 (Std.)	1527 (Opt. 2.5 lbs.) & 3061 (Opt. 5 lbs.)				4379 (Std.)	1527 (Opt. 2.5 lbs.) & 3061 (Opt. 5 lbs.)		
34	6	Screw			7531				7531			
35	1	Diaphragm Nut			5026				5026SS6			
36	1	Diaphragm Stem			5028				5028SS6			
37	1	O-Ring *			265				265			
38	10	Screw			236				236			
39	1	Diaphragm *			110				110			
40	1	Lower Pilot Housing			1356				1356 ‡			
41	1	Pilot Seat *			113				113SS6			
42	1	Pilot Seat *			565				565SS6			
43	1	Pilot Plug *			112				112			
44	1	Spring *			1360				1360			
45	1	Tubing	214SS6	217SS6	2552SS6	5061SS6	214SS6	217SS6	2552SS6	5061SS6		
46	1	Lower Housing	1704	1632	145	146	1704 ‡	1632 ‡	145 ‡	146 ‡		
47	1	Connector			874				874SS6			
48	1	Spring	1388	1528	1529	1575	1388	1528	1529	1575		
49	1	O-Ring *	154	155	156	157	154	155	156	157		
50	1	1/4 F30 Filter			YAS				YASSS6			
51	1	Plug			699				699SS6			
52	1	Seat Disc	Standard	159	160	161	162	2493SS6	2494SS6	2495SS6	2961SS6	
			Reduced	159	1229	159	160	2493SS6	2585SS6	2493SS6	2494SS6	
53	1	Ratio Plug	Standard	177SS6	178	179	180	177SS6	3076SS6	3078SS6	3079SS6	
			Reduced	4933	1228SS6	177SS6	178	4933SS6	1228SS6	177SS6	3076SS6	
54	1	Removable Seat	Standard	272K	273K	274K	275K	2496SS6K	2497SS6K	2498SS6K	3075SS6K	
			Reduced	4934K	1219DK	1220DK	1221K	4934SS6K	1219SS6K	1220SSK	1221SS6K	
55	1	Nut	Standard *	173	906		175	173SS6		174SS6	175SS6	
			Reduced *		173		906		173SS6		174SS6	
56	1	Nipple	262		648				262	648SS6		
Repair Kits			RYI	RYM	RYQ	RYT	‡ Coated Parts available with "K" service type RYS6 RYMS6 RYQS6 RYTS6					
* These parts are recommended spare parts and are stocked as repair kits.												

# PRESSURE REGULATORS



1 INCH GAS OUNCES PRESSURE REDUCING TO VACUUM  
MODEL VR PARTS DRAWING



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

ITEM	QTY.	DESCRIPTION	PART NUMBER	
			STANDARD	CORROSIVE
1	1	Body	2033	2033 ‡
2	1	Nut *	172	172SS6
3	1	Seat *	163	163HSN
4	4	Elbow	875	875SS6
5	1	Valve Stem	137X	138SS6X
6	2	Back Up *	148T	148T
7	1	Gasket *	195	195
8	1	Vent Plug	1357	1357SS6
9	1	Spring	7323	7323
10	1	Diaphragm *	127	127
11	6	Bolt	2007	2007
12	1	Nipple	2516	2516SS6
13	1	Tubing	4251S6	4251S6
14	14	Nut	241	241
15	1	Spring *	1360	1360HAC
16	1	Plug	699	699SS6
17	1	Vent Plug	147	147SS6
18	1	Pilot Seat *	565	565SS6
19	1	Tee	219	219SS6
20	1	Pilot Seat *	113	113SS6
21	2	Nipple	648	648SS6
22	1	Upper Pilot Housing	1206	1206 ‡
23	1	Pressure Gauge	7704	7704
25	1	O-Ring *	265	265
24	1	Stem	1339	1339S6
26	1	Diaphragm Stem	5028	5028S6
27	1	Spring	4379 (Std.) 1527 (Opt. 2.5 lbs.) & 3061 (Opt. 5 lbs.)	4379 (Std.) 1527 (Opt. 2.5 lbs.) & 3061 (Opt. 5 lbs.)
28	1	Spring Guide	7148S6 (Std.) 636SS6 (Opt. 2.5 & 5 lbs.)	7148S6 (Std.) 636SS6 (Opt. 2.5 & 5 lbs.)
29	1	Nut	922	922
30	1	Adjusting Screw	897	897
31	1	Bonnet	4477	4477 ‡
32	1	Diaphragm Nut	5026	5026S6
33	6	Screw	7531	7531
34	1	Diaphragm *	5027	5027
35	1	Lower Diaphragm Plate	1340	1340SS6
36	4	Screw	191	191
37	10	Screw	236	236
38	4	Gasket *	242	242
39	1	Upper Diaphragm Plate	1208	1208SS6
40	1	Diaphragm *	110	110
41	1	Diaphragm *	1212	1212
42	1	Lower Pilot Housing	1356	1356 ‡
43	1	Spring *	566	566HAC
44	1	Gasket *	118	118
45	1	Pilot Plug *	112	112
46	1	Base	4995	4995 ‡
47	1	Tubing	217SS6	217SS6
48	1	Bonnet	1336	1336 ‡
49	1	Diaphragm Plate	132SS6	132SS6
50	1	Lower Housing	142	142 ‡
51	1	O-Ring *	153	153
52	1	Seat Disc	158	158SS6
53	1	Ratio Plug	176SS6	176SS6
54	1	1/4 F30 Filter	YAS	YASS6
‡ Coated Parts available with "E" shell material				
Repair Kits			RYF	RYFS6
* These parts are recommended spare parts and are stocked as repair kits.				

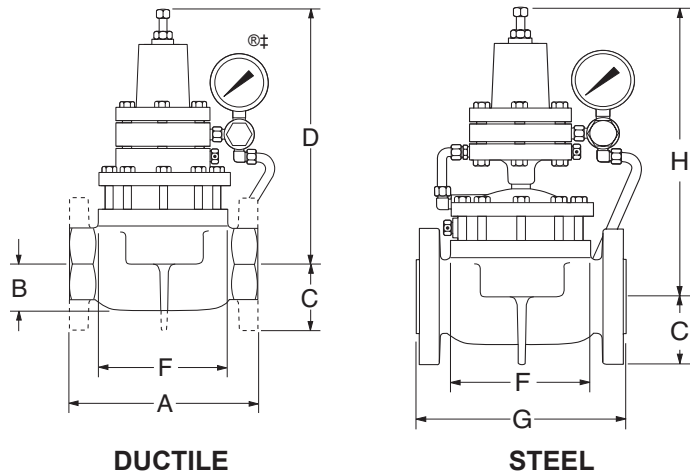
<b>Table 1 - Flow Coefficient(Cv) at % stem travel for Pilot-operated Regulators</b>											
<b>1" Pressure Regulator</b>											
Trim Size in.(mm)	Cf	Valve Opening Percentage									
		10	20	30	40	50	60	70	80	90	100
<b>1/2 in (12mm) Reduced</b>	<b>0.75</b>	0.4	0.7	0.9	1.3	1.8	2.5	3.2	3.9	4.5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

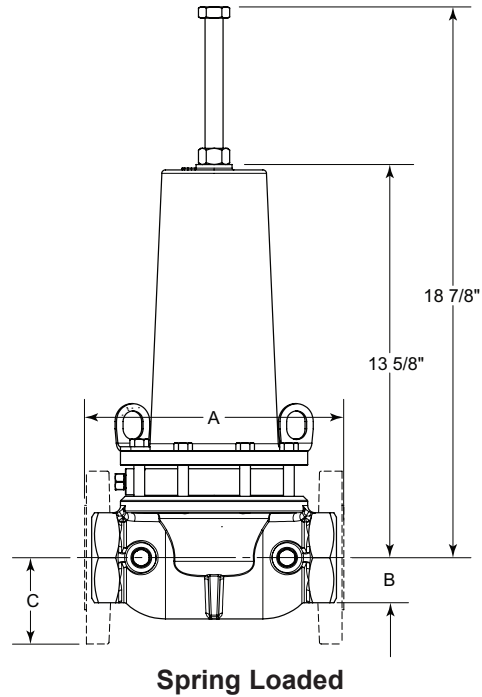
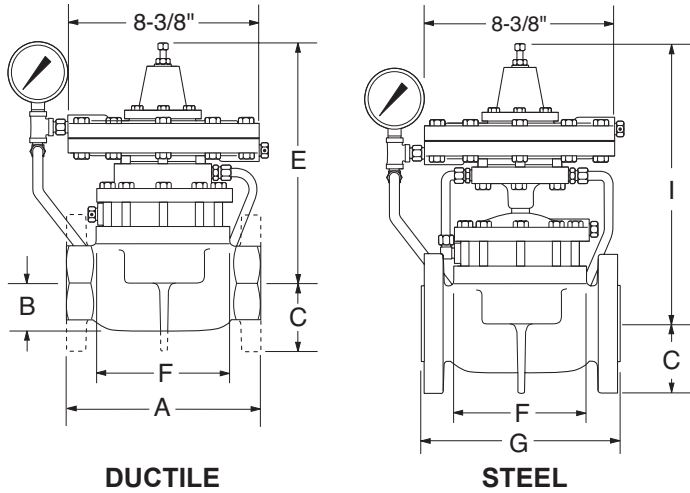


## DIMENSIONS



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

- Low Pressure Back Pressure
- Ounces Back Pressure To Vacuum
- Ounces Pressure Reducing
- Ounces Pressure Reducing Vacuum
- Vacuum Back Pressure To Vacuum



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](http://www.kimray.com)



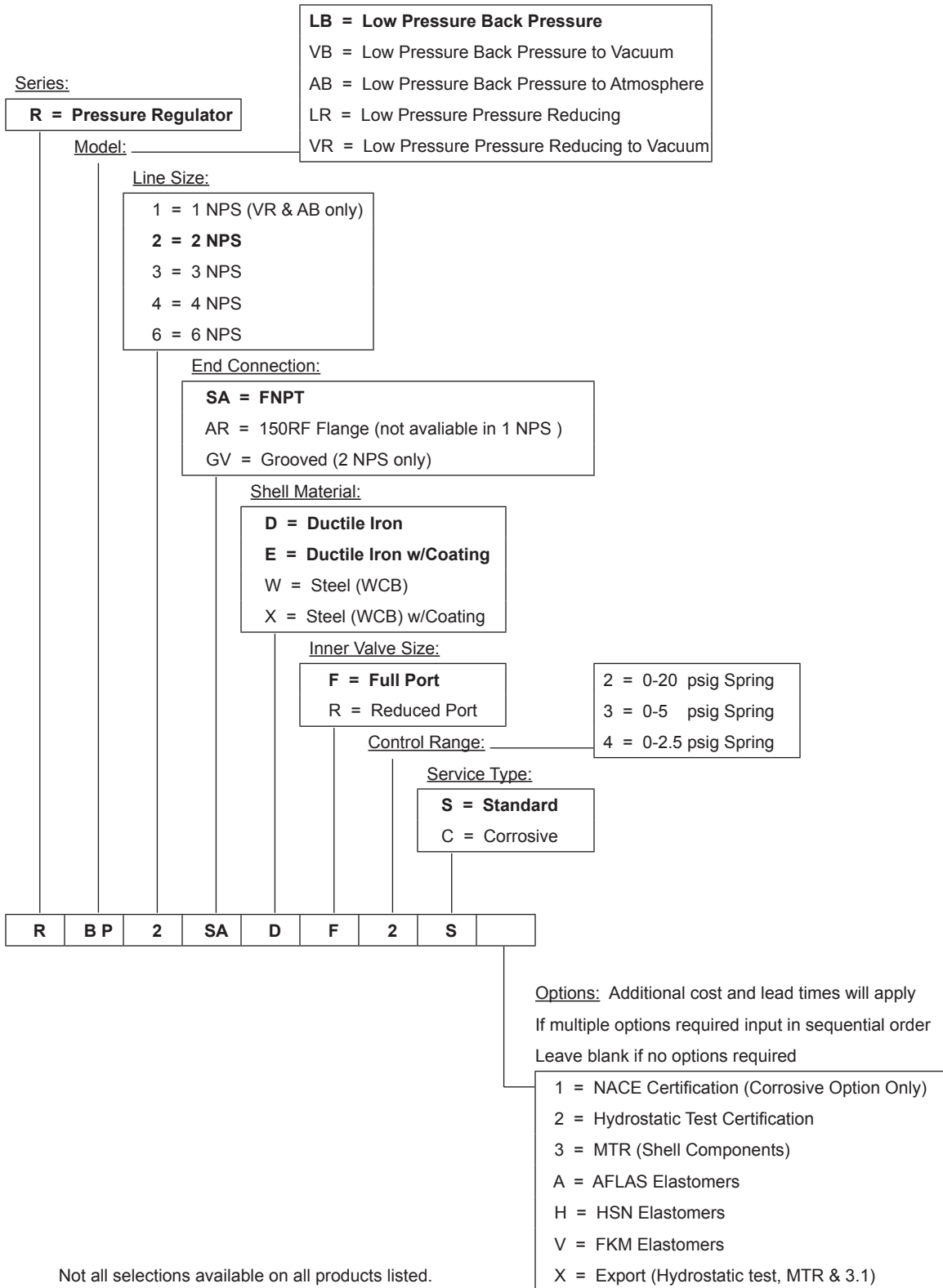
Table 2 - Seal Options		
Part	Standard Material	Optional Material
Seat	HSN	FKM, AFLAS®
O-rings	Nitrile	HSN, FKM, AFLAS®
All Diaphragms	Nitrile	HSN, FKM, AFLAS®

Table 3 - Seal Specifications				
	NITRILE	HIGHLY SATURATED NITRILE	FKM	AFLAS®
Kimray Suffix	-	HSN	V	AF
Resistance	Abrasion	G	G-E	G
	Acid	F	G-E	E
	Chemical	F	F	E
	Cold	G	G	P
	Flame	P	P	E
	Heat	G	E	E
	Oil	G-E	E	E
	Ozone	P	G	G-E
	Set	G	G	G-E
	Tear	F	F	F
	Water/Steam	F	E	P
	Weather	F	G	E
	CO2	F-G	G	G
	H2S	P	F	P
	Methanol	F	E	P
Properties	Dynamic	G	G	G
	Electrical	F	F	G-E
	Impermeability	G	G	G
	Tensile Strength	G	G-E	G
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)	



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