

#### APPLICATIONS:







Valve designed to regulate ounces (0.5 oz to 2.5 psig) back pressure on a tank and vent to atmosphere when pressure exceeds set point. A minimum outside supply of 10 psig is required to operate motor valve.

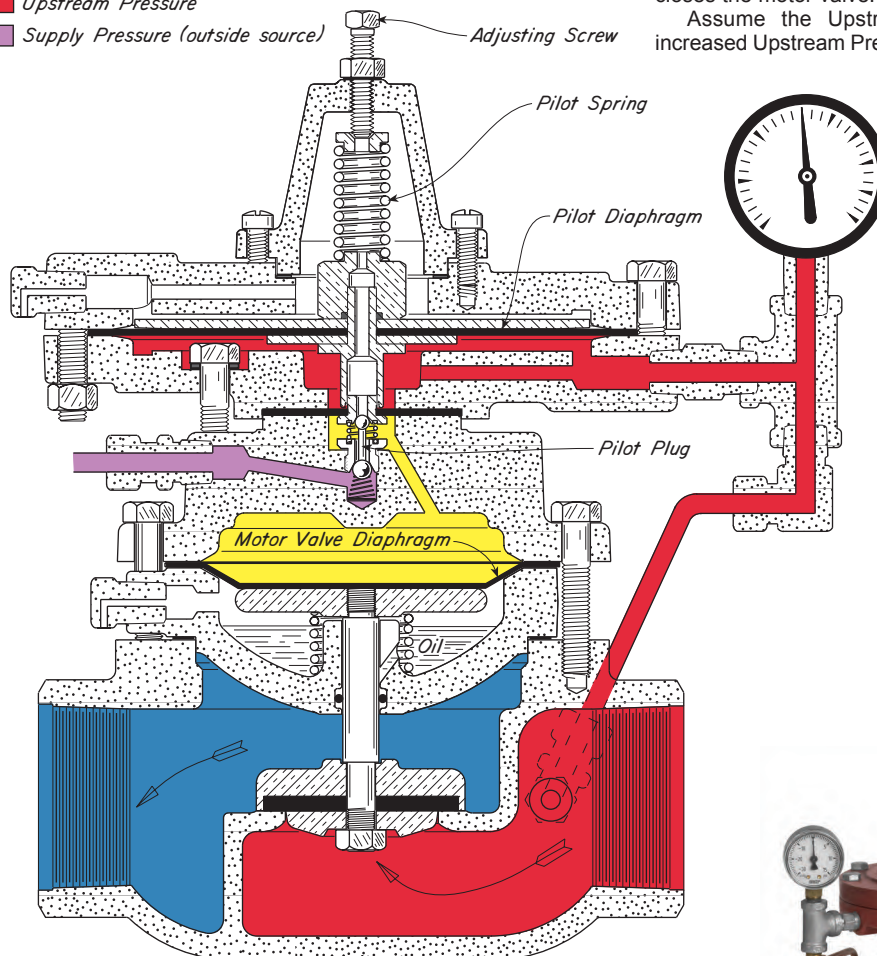
#### CERTIFICATIONS:

Canadian Registration Number (CRN):  
0C16234.24567890NTY (Ductile)

#### 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

-  Motor Valve Assembly
-  Pilot Assembly
-  Motor Valve Diaphragm Pressure
-  Downstream Pressure
-  Upstream Pressure
-  Supply Pressure (outside source)



#### OPERATION:

This Regulator maintains a low pressure back pressure by relieving to a lower pressure or atmosphere. The pressure to operate the valve is an outside pressure source. The Regulator consists of a three-way pilot operating a motor valve. The only moving parts are the Pilot Assembly and the Motor Valve Stem Assembly (Crosshatched). The three-way pilot action is due to the operation of the PILOT PLUG. The PILOT PLUG consists of two stainless balls rigidly connected. The upper PILOT PLUG seat is the Motor Valve Diaphragm Pressure vent (Yellow to Atmosphere). The lower PILOT PLUG seat is the Motor Valve Diaphragm Pressure inlet (Violet to Yellow). The Pilot Assembly actuates the PILOT PLUG. The force of the PILOT SPRING above the PILOT DIAPHRAGM acts against the Upstream Pressure (Red) below the PILOT DIAPHRAGM to determine the motion of the Pilot Assembly.

Assume a desired Upstream Pressure (Red) greater than the current setting. The ADJUSTING SCREW compresses the PILOT SPRING. The PILOT SPRING forces the Pilot Assembly downward. First, the upper PILOT PLUG seat (Yellow to Atmosphere) closes, then the lower PILOT PLUG seat (Violet to Yellow) opens. Increased Motor Valve Diaphragm Pressure (Yellow) pushes the Motor Valve Stem Assembly downward and closes the motor valve.

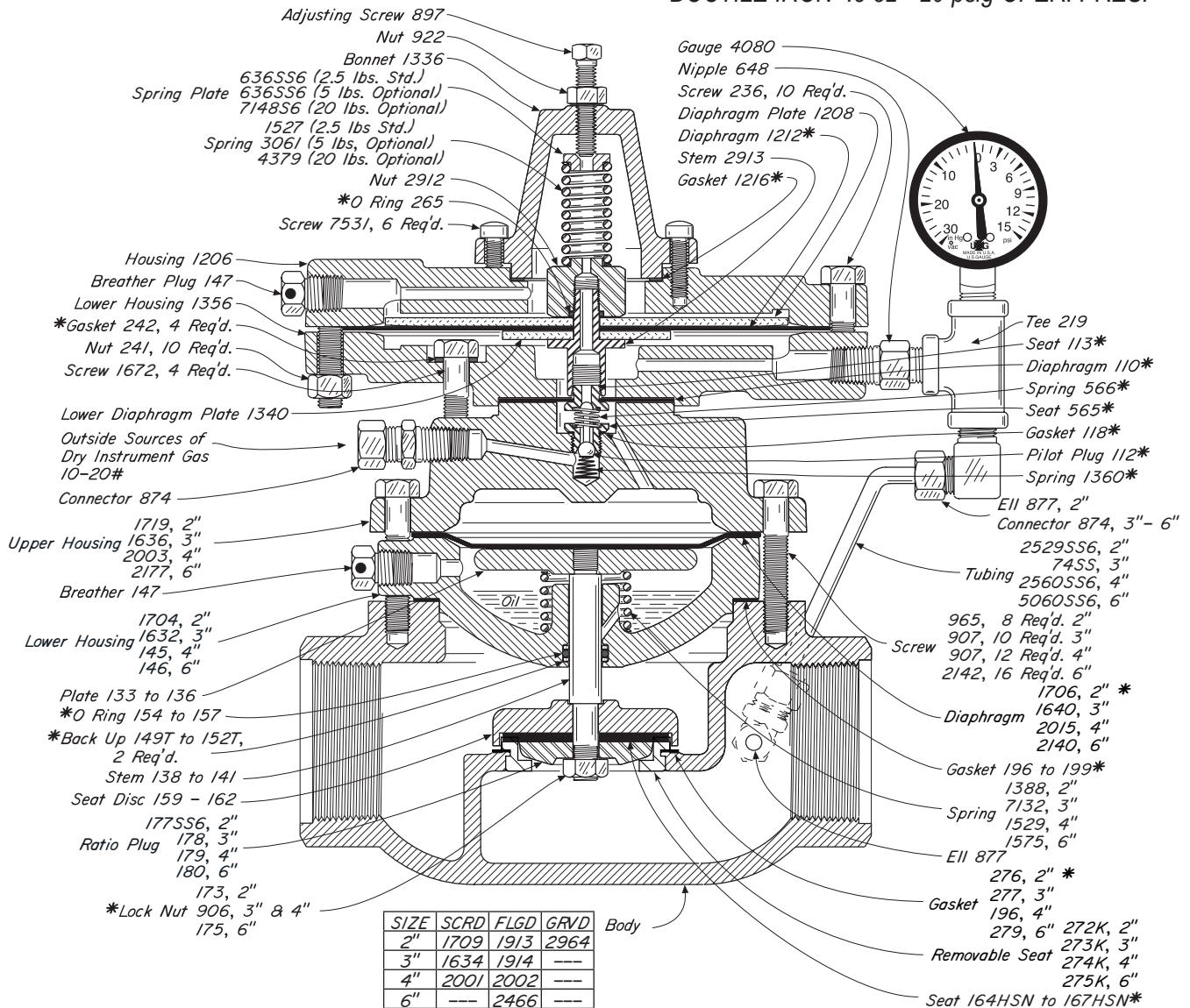
Assume the Upstream Pressure (Red) increases. The increased Upstream Pressure pushes the Pilot Assembly upward against the PILOT SPRING. This first, closes the lower PILOT PLUG seat (Violet to Yellow), then opens the upper PILOT PLUG seat (Yellow to Atmosphere). Motor Valve Diaphragm Pressure (Yellow) decreases, Upstream Pressure (Red) pushes the Motor Valve Diaphragm Assembly upward. The motor valve opens.

This rapid but stable interaction of the Pilot Assembly and Motor Valve Diaphragm Assembly produce a true throttling action.



Kimray is an ISO 9001- certified manufacturer.

GAS OUNCES BACK PRESSURE TO ATMOSPHERE W/OUTSIDE SUPPLY  
DUCTILE IRON .5 oz - 20 psig OPER. PRES.



### THRU VALVES AVAILABLE:

PART NO.	BODY <sup>†</sup> CONNECTION	MODEL NO.	OPER. PRES.	MAX <sup>††</sup> W.P.	REP. KIT
AAID2.5	2" NPT	2.2 SGT OBPAD	.5 oz - 2.5 psig	300	RUID
AAID5	2" NPT	2.5 SGT OBPAD	1 oz - 5 psig	300	RUID
AAID20	2" NPT	202 SGT OBPAD	1 psig - 20 psig	300	RUID
AAJD2.5	2" 150RF	2.2 FGT OBPAD	.5 oz - 2.5 psig	250	RUID
AAJD5	2" 150RF	2.5 FGT OBPAD	1 oz - 5 psig	250	RUID
AAJD20	2" 150RF	202 FGT OBPAD	1 psig - 20 psig	250	RUID
AAKD2.5	2" GRVD.	2.2 GGT OBPAD	.5 oz - 2.5 psig	300	RUID
AAKD5	2" GRVD.	2.5 GGT OBPAD	1 oz - 5 psig	300	RUID
AAKD20	2" GRVD.	202 GGT OBPAD	1 psig - 20 psig	300	RUID
AALD2.5	3" NPT	3.2 SGT OBPAD	.5 oz - 2.5 psig	300	RUJD
AALD5	3" NPT	3.5 SGT OBPAD	1 oz - 5 psig	300	RUJD
AALD20	3" NPT	302 SGT OBPAD	1 psig - 20 psig	300	RUJD
AAMD2.5	3" 150RF	3.2 FGT OBPAD	.5 oz - 2.5 psig	250	RUJD
AAMD5	3" 150RF	3.5 FGT OBPAD	1 oz - 5 psig	250	RUJD
AAMD20	3" 150RF	302 FGT OBPAD	1 psig - 20 psig	250	RUJD
AAND2.5	4" NPT	4.2 SGT OBPAD	.5 oz - 2.5 psig	300	RUKD
AAND5	4" NPT	4.5 SGT OBPAD	1 oz - 5 psig	300	RUKD
AAND20	4" NPT	402 SGT OBPAD	1 psig - 20 psig	300	RUKD
AAOD2.5	4" 150RF	4.2 FGT OBPAD	.5 oz - 2.5 psig	250	RUKD
AAOD5	4" 150RF	4.5 FGT OBPAD	1 oz - 5 psig	250	RUKD

### THRU VALVES AVAILABLE:

PART NO.	BODY <sup>†</sup> CONNECTION	MODEL NO.	OPER. PRES.	MAX <sup>††</sup> W.P.	REP. KIT
AAOD20	4" 150RF	402 FGT OBPAD	1 psig - 20 psig	250	RUKD
AAPD2.5	6" 150RF	6.2 FGT OBPAD	.5 oz - 2.5 psig	250	RTYD
AAPD5	6" 150RF	6.5 FGT OBPAD	1 oz - 5 psig	250	RTYD
AAPD20	6" 150RF	602 FGT OBPAD	1 psig - 20 psig	250	RTYD

### NOTES:

\*These parts are recommended spare parts and are stocked as repair kits.

The numbers of a series assigned to a part indicate different line sizes. For example: Stem 137-1", 138-2", 139-3", 140-4", 141-6".

For standard & optional Seals, Metals, Cv values, Material specifications & Dimensions see Technical Data on pages A:I - A:V

<sup>†</sup> Standard Trim size is same as connection size. For Reduced trim sizes, see A:I

<sup>††</sup> Max W.P. valves based on -20°F to 100°F. See page A:V for temps above 100°F

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<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

\* Use "2 inch Removable Full Port" values for regulators with operating pressure ranges of 10-250psig, 10-285psig & 10-300psig

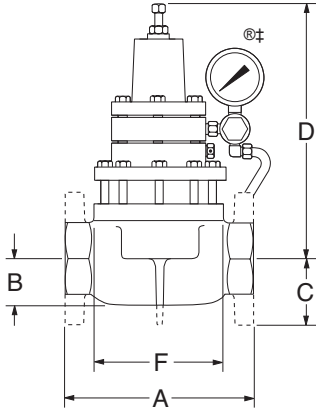
# PRESSURE REGULATORS



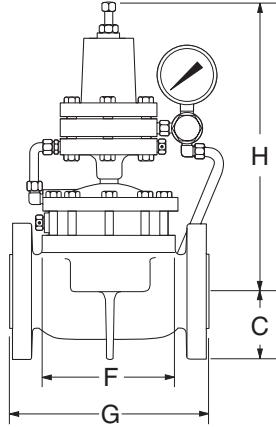
## DIMENSIONS

**FOR:** BACK PRESSURE  
UPSTREAM DIFFERENTIAL PRESSURE  
PRESSURE REDUCING-BALANCED  
PRESSURE REDUCING VACUUM

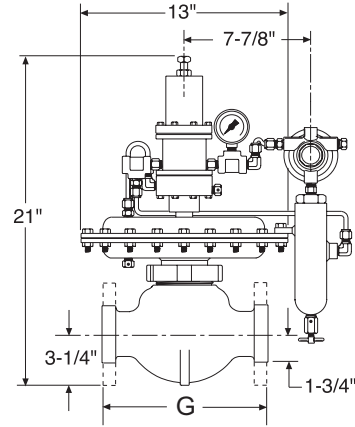
PRESSURE DIFFERENTIAL  
PRESSURE REDUCING  
BACK PRESSURE VACUUM  
LIQUID BACK PRESSURE



**DUCTILE**

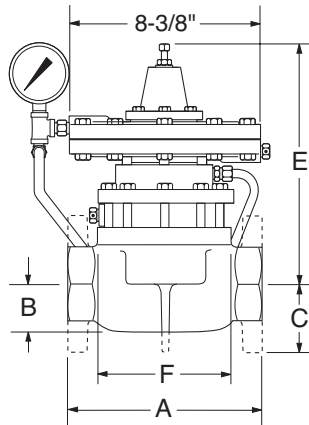


**STEEL**

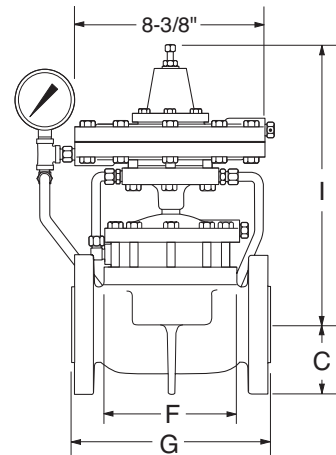


**250 S/FGT-BP-S**

**FOR:** LOW PRESSURE BACK PRESSURE  
OUNCES BACK PRESSURE TO VACUUM  
OUNCES PRESSURE REDUCING  
OUNCES PRESSURE REDUCING VACUUM  
VACUUM BACK PRESSURE TO VACUUM



**DUCTILE**

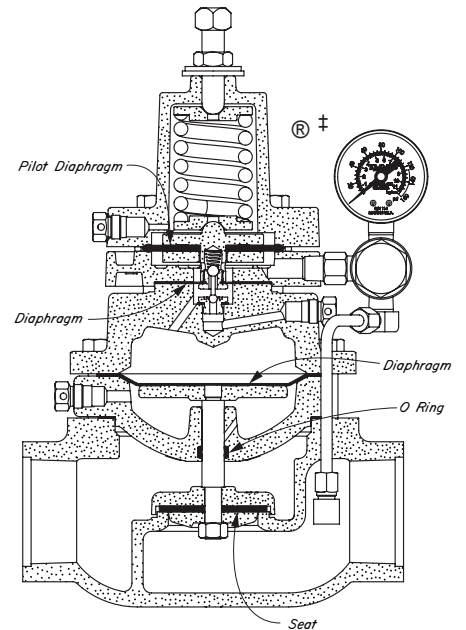


**STEEL**

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"			
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.

Part	Standard Material	Optional Material
Seat	Nitrile	FKM, HSN, AFLAS®, Gylon®
O-rings	Nitrile	FKM, HSN, AFLAS®, Gylon®
All Diaphragms Except Pilot Diaphragm	Nitrile	FKM, HSN, AFLAS®, Gylon®
Pilot Diaphragm	Polyurethane	FKM, HSN, AFLAS®, Gylon®

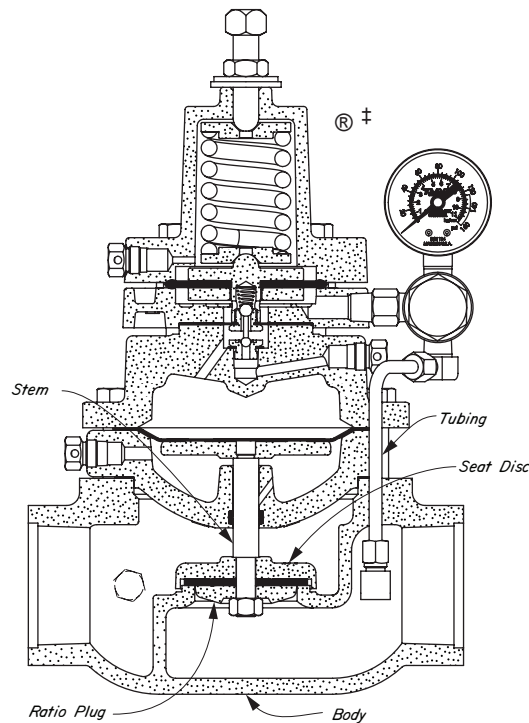


		NITRILE	HIGHLY SATURATED NITRILE	FKM	AFLAS®	POLY-URETHANE	GYLON
	<b>Kimray Suffix</b>	-	HSN	V	AF	P	GY
<b>Resistance</b>	<b>Abrasion</b>	G	G-E	G	G	E	E
	<b>Acid</b>	F	G-E	G-E	E	P	E
	<b>Chemical</b>	F	F	E	E	F	E
	<b>Cold</b>	G	G	P	P	G	E
	<b>Flame</b>	P	P	E	E	P	P
	<b>Heat</b>	G	E	E	E	F	E
	<b>Oil</b>	G-E	E	E	E	G	E
	<b>Ozone</b>	P	G	G-E	E	E	E
	<b>Set</b>	G	G	G-E	P	F	P
	<b>Tear</b>	F	F	F	P	G-E	E
	<b>Water/Steam</b>	F	E	P	G	P	E
	<b>Weather</b>	F	G	E	E	E	E
	<b>CO2</b>	F-G	G	G	G	G	E
	<b>H2S</b>	P	F	P	E	G	E
<b>Methanol</b>	F	E	P	P	P	E	
<b>Properties</b>	<b>Dynamic</b>	G	G	G	G	E	P
	<b>Electrical</b>	F	F	F	G-E	F	E
	<b>Impermeability</b>	G	G	G	G	G	E
	<b>Tensile Strength</b>	G	G-E	G	F	G-E	E
	<b>Temp. Range (°F)</b>	-20° to +225°F	-20° to +250°F	-15° to +400°F	+15° to +450°F	-40° to +180°F	-450° to +500°F
	<b>Temp. Range (°C)</b>	-29° to +107°C	-29° to +121°C	-26° to +204°C	-9° to +232°C	-40° to +82°C	-268° to +260°C
	<b>Form</b>	O,S,D	O,S,D	O,S,D	O,S,D	S,D	S,D

RATINGS: P-POOR, F-FAIR, G-GOOD, E-EXCELLENT

**Table 4 - Materials of Construction**

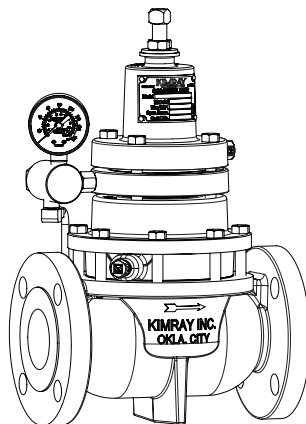
Part Description	Valve Size	Standard Material	Optional Material(s)
Ratio Plug	1" & 2"	316 Powdered Metal SS-316NI-25	N/A
	1" & 2" Reduced Trim	Steel, ASTM A-108	316 Stainless Steel ASTM A-479
	3"	Powdered Metal F-008	316 Stainless Steel ASTM A-479
	4" & 6"	Ductile, ASTM A-395	316 Stainless Steel ASTM A-479
Seat Disc	1"	Powdered Metal F-0008-30	316 Stainless Steel ASTM A-479
	2", 3" & 4"	Ductile, ASTM A-395	Stainless Steel ASTM A-351 CF8M
	6"	Ductile, ASTM A-395	Stainless Steel ASTM A-240
Stem	1" thru 6"	303 Stainless Steel, ASTM A-582	316 Stainless Steel ASTM A-479
Body	1" thru 6"	Ductile, ASTM A-395	N/A
Body	2" thru 6"	Steel, ASTM A-216 WCB	Stainless Steel ASTM A-351 CF8M
Tubing	175 W.P. or Less	Copper Tubing ASTM B-380 UNS C-12200	316 Stainless Steel ASTM A-213
		Copper Tubing ASTM B-280 UNS C-12200	316 Stainless Steel ASTM A-213
	Greater Than 175 W.P.	304 Stainless Steel ASTM A-249	316 Stainless Steel ASTM A-213
Removable Seat	2" thru 6" Ductile Body	Ductile, ASTM A-395	Stainless Steel ASTM A-351 CF8M
	2" thru 6" Steel Body	Stainless Steel ASTM A-351 CF8M	N/A



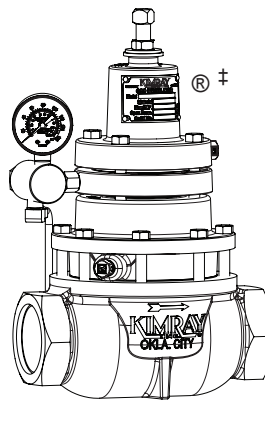


**Table 6 - Temperature vs. Pressure Rating**

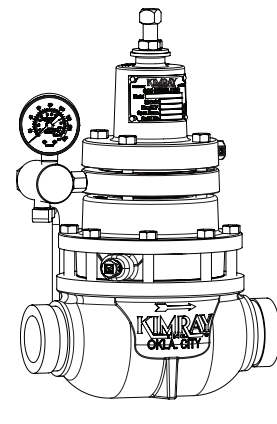
ASTM Class Temperature °F (°C)	Flange Class
	150 RF
	Static Test Pressure (psig)
	450 (31 bar)
Maximum Allowable Non-Shock Pressure (psig)	
CAST DUCTILE ASTM A-395	
	Flange Class
	150 RF
-20 to 100 (-28 to 37)	250 (17.2 bar)
200 (93)	235 (16.2 bar)
300 (148)	215 (14.8 bar)
400 (204)	200 (13.7 bar)
500 (260)	170 (11.7 bar)
600 (315)	140 (9.6 bar)
650 (343)	125 (8.6 bar)
700 (371)	
CAST STEEL ASTM A-216 - WCB	
	Flange Class
	150 RF
-20 to 100 (-28 to 37)	285 (20.0 bar)
200 (93)	260 (17.9 bar)
300 (148)	230 (15.9 bar)
400 (204)	200 (13.8 bar)
500 (260)	170 (11.7 bar)
600 (315)	140 (9.7 bar)
650 (343)	125 (8.6 bar)
700 (371)	110 (7.6 bar)



FLANGED (150RF)



SCREWED (NPT)



GROOVED

Kimray valves conform to ASME B16.34-2009 for working pressure vs working temperature & ASME B16.5-1996 for flanges and flanged fittings.