

#### APPLICATION:

For maintaining a constant pressure drop across meter systems.

#### CERTIFICATIONS:

Canadian Registration Number (CRN):  
 0C16234.24567890NTY (Ductile)  
 0C15604.24567890NTY (Steel)

#### OPERATION:

This regulator is designed to control a set difference between Upstream Pressure (Red) and Downstream Pressure (blue). The differential pressure is set by changing the PILOT SPRING load with the ADJUSTING SCREW.

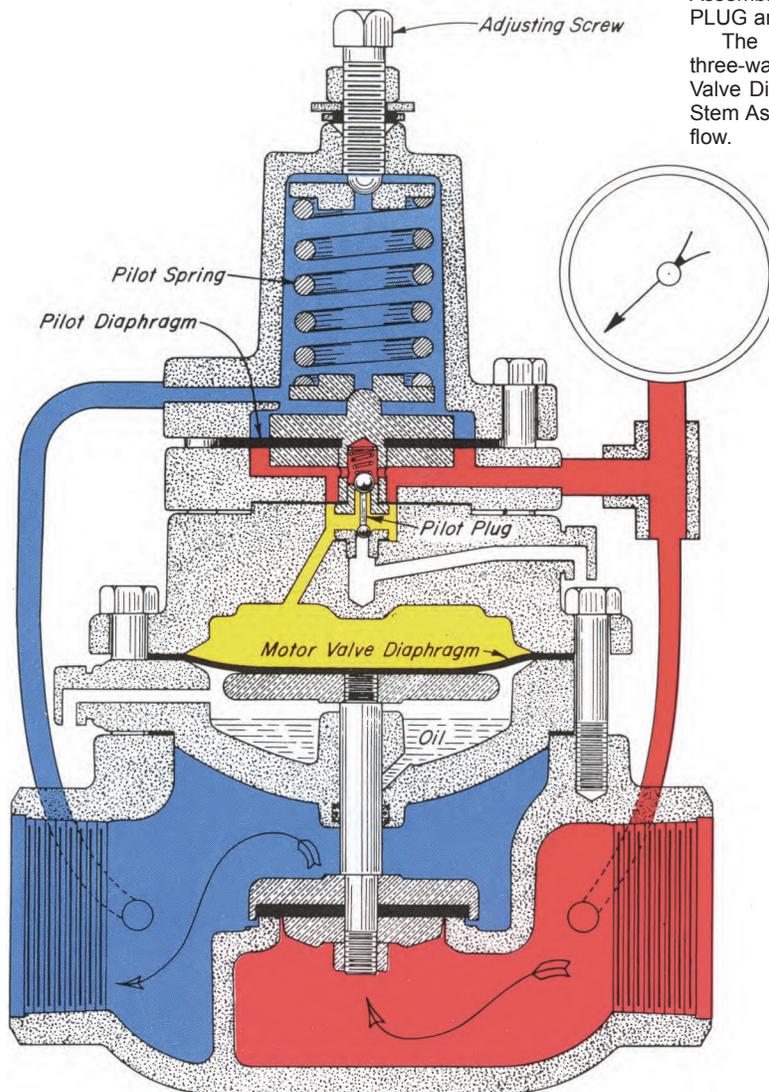
Any change in Downstream Pressure (Blue) will position the Motor Valve Stem Assembly until a like change in Upstream Pressure (Red) has occurred to maintain the set differential pressure.

Assume the load produced by the PILOT SPRING and Downstream Pressure (Blue) acting on the Pilot Assembly has caused it to move downward. This opens the upper seat of the PILOT PLUG (Red to Yellow) and closes the lower seat (Yellow to Atmosphere) admitting full Upstream Pressure (Red) to the MOTOR VALVE DIAPHRAGM, closing the motor valve seat. The area of the MOTOR VALVE DIAPHRAGM is twice the area of the motor valve seat, assuring a Class VI positive shut-off.

As the Upstream Pressure (Red) increases to the set differential pressure, the Pilot Assembly moves upward to first close the upper seat (Red to Yellow) and open the pressure vent (Yellow to Atmosphere). The resulting decrease in Motor Valve Diaphragm Pressure (Yellow) permits the increased Upstream Pressure (Red), acting under the motor valve seat, to open the valve. With the motor valve open, the Upstream Pressure (Red) will decrease until the differential pressure across the PILOT DIAPHRAGM reaches the set point at which time the Pilot Assembly assumes a position in which both seats of the PILOT PLUG are closed.

The rapid but stable repositioning, intermittent vent pilot, three-way valve action of the PILOT PLUG adjust the Motor Valve Diaphragm Pressure (Yellow) to position the Motor Valve Stem Assembly and provide true throttling action for any rate of flow.

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

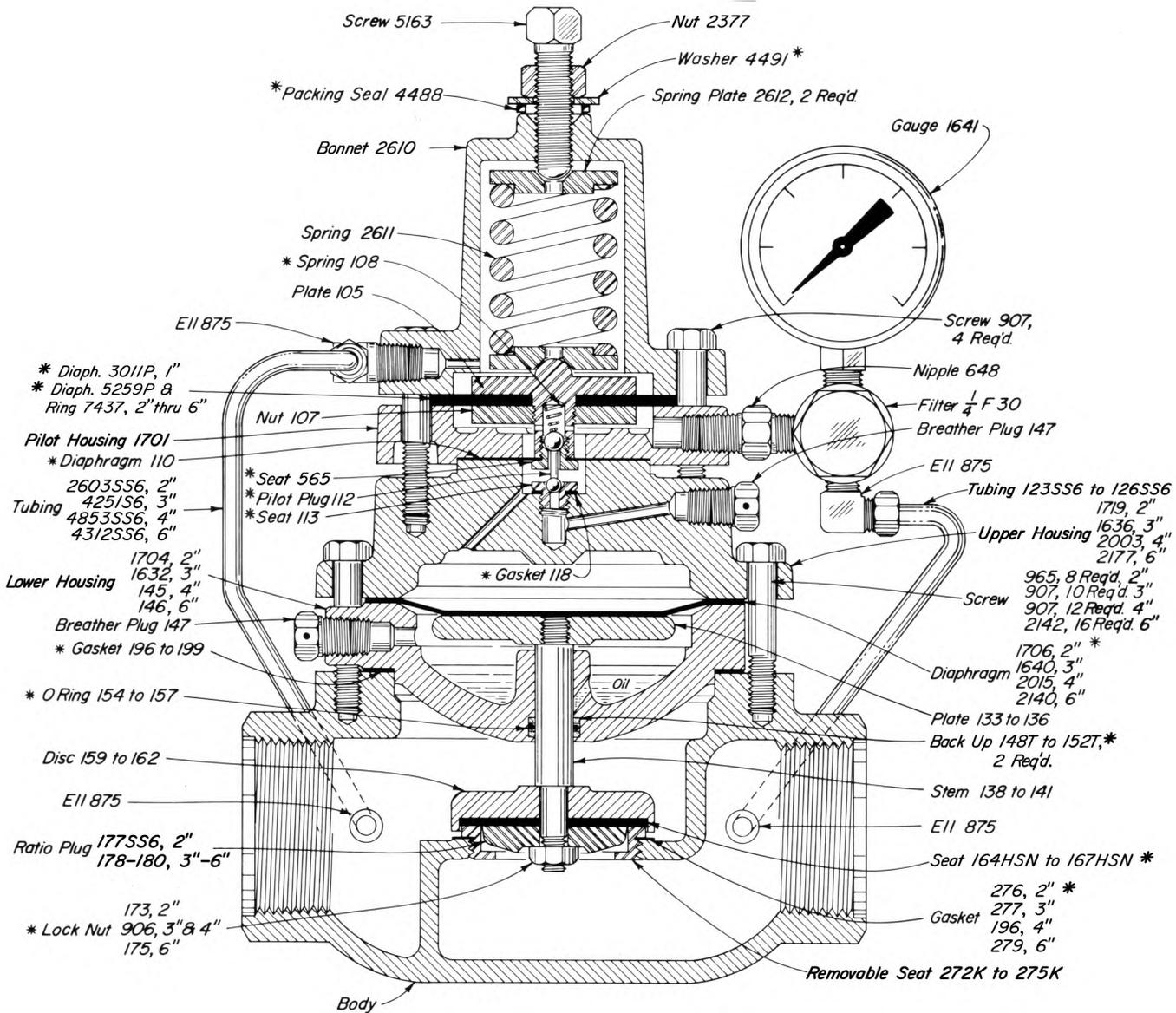


Kimray is an ISO 9001- certified manufacturer.

# PRESSURE REGULATORS



GAS PRESSURE DIFFERENTIAL  
DUCTILE IRON 10-300 psig OPER. PRES.



| LINE SIZE | THRU    |         |
|-----------|---------|---------|
|           | SCREWED | FLANGED |
| 2"        | 1709    | 1913    |
| 3"        | 1634    | 1914    |
| 4"        | 2001    | 2002    |
| 6"        | -----   | 2466    |

## THRU VALVES AVAILABLE:

| PART NO. | BODY <sup>†</sup> CONNECTION | MODEL NO.    | OPER. PRES. | MAX <sup>††</sup> W.P. | REP. KIT |
|----------|------------------------------|--------------|-------------|------------------------|----------|
| ACU      | 2" NPT                       | 230 SGT PD-D | 10-300      | 300                    | RPK      |
| ACW      | 2" 150RF                     | 218 FGT PD-D | 10-250      | 250                    | RPK      |
| ACX      | 3" NPT                       | 330 SGT PD-D | 10-300      | 300                    | RPL      |
| ACY      | 3" 150RF                     | 318 FGT PD-D | 10-250      | 250                    | RPL      |
| ADA      | 4" NPT                       | 430 SGT PD-D | 10-300      | 300                    | RPM      |
| ADB      | 4" 150RF                     | 418 FGT PD-D | 10-250      | 250                    | RPM      |
| ADC      | 6" 150RF                     | 618 FGT PD-D | 10-250      | 250                    | RPN      |

## 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:1 - A:V

<sup>†</sup> Standard Trim size is same as connection size. For Reduced trim sizes, see A:1

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

Kimray is an ISO 9001- certified manufacturer.

| Table 1 - Flow Coefficient(Cv) at % stem travel for Pilot Operated Regulators |      |                          |      |      |       |       |       |       |       |       |       |
|---|------|--------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|
| 1" Pressure Regulator   |      |                          |      |      |       |       |       |       |       |       |       |
| Trim Size<br>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<br>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<br>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<br>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<br>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

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

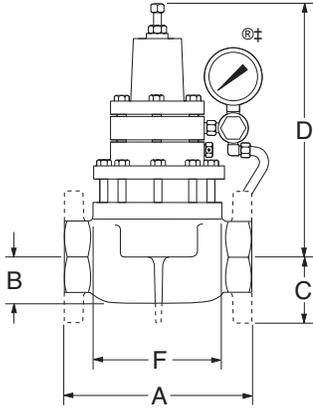
# PRESSURE REGULATORS



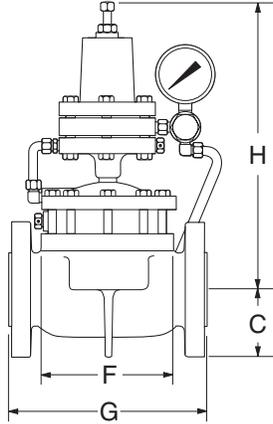
## DIMENSIONS

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

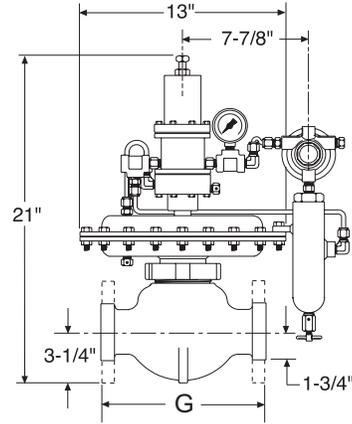
PRESSURE DIFFERENTIAL  
PRESSURE REDUCING  
BACK PRESSURE VACUUM  
LIQUID BACK PRESSURE



**DUCTILE**

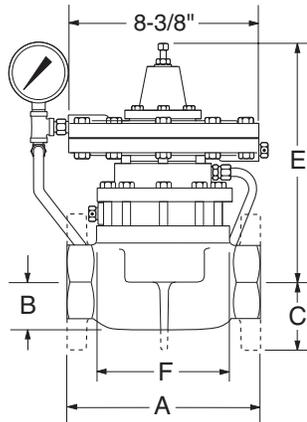


**STEEL**

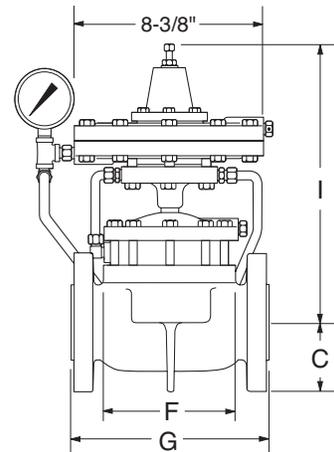


**250 S/FGT-BP-S**

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



**DUCTILE**

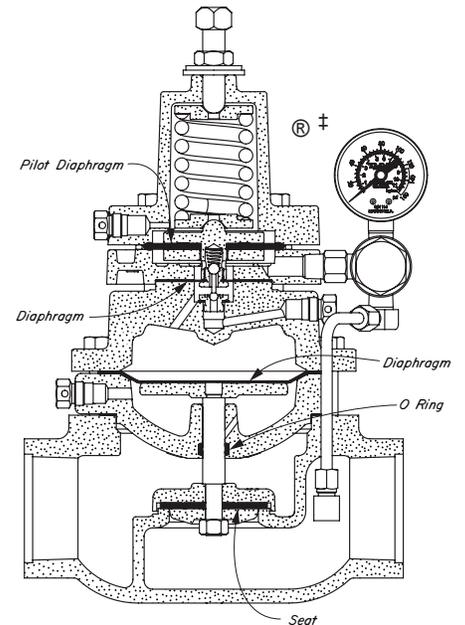


**STEEL**

| 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<br>Except Pilot Diaphragm | Nitrile           | FKM, HSN, AFLAS®, Gylon® |
| Pilot Diaphragm                          | Polyurethane      | FKM, HSN, AFLAS®, Gylon® |

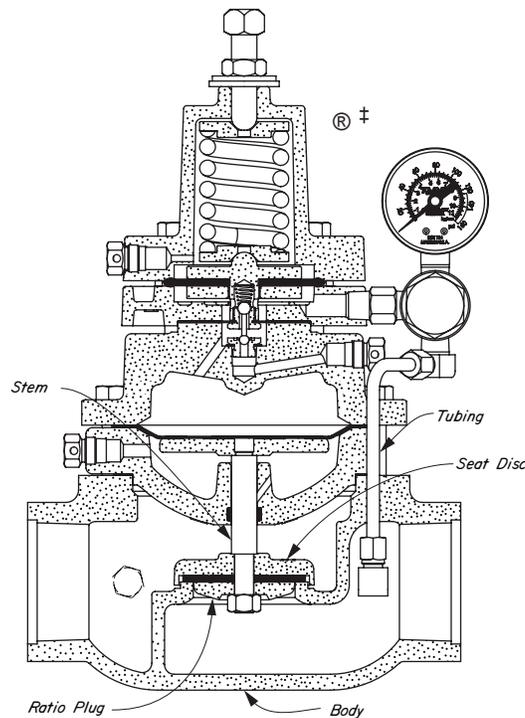


|                   |                         | NITRILE        | HIGHLY SATURATED NITRILE | FKM            | AFLAS®         | POLY-URETHANE  | GYLON           |
|-------------------|-------------------------|----------------|--------------------------|----------------|----------------|----------------|-----------------|
|                   | <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

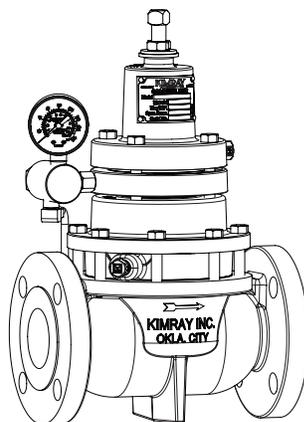
**Table 4 - Materials of Construction**

| 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                             |

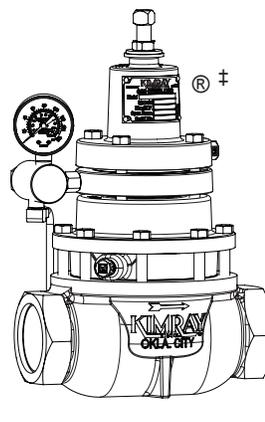


**Table 6 - Temperature vs. Pressure Rating**

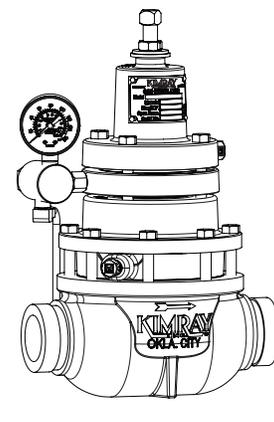
| ASTM Class<br>Temperature<br>°F (°C)        | Flange Class                |
|---|-----------------------------|
|   | 150 RF                      |
|   | Static Test Pressure (psig) |
|   | 450 (31 bar)                |
| Maximum Allowable Non-Shock Pressure (psig) |                             |
| 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.