## MODEL 2171 BACK PRESSURE / RELIEF REGULATOR



The Model 2171 is a stainless steel back pressure/relief regulator designed to handle small to mid-capacity flow rates in general, chemical or cryogenic services. This unit is capable of controlling inlet pressure to setpoint levels between 5 and 500 psig (. 34 and 20.6 Barg).

## FEATURES

High Stability: High mass plug allows dampening of high frequency disturbances from inlet or outlet side of regulator.

Trim Removal: Easily removable trim from valve while in-line by removing screwed-on spring chamber.

Trim Selections: Seven different trim combinations for metallic or composition seated designs.

Flow-thru Angle Two side inlet ports; Bottom outlet Design: port.

Globe Design One side inlet port; one side outlet 1/2" Size: port.

## APPLICATIONS

Designed to control a wide range of fluids including industrial gases, air, oil, steam, water and many chemicals. See Table 1 for more information. Available for cryogenic service and NACE applications.

## 1 CAUTION

This is not a safety device and must not be substituted for a code approved pressure safety relief valve or rupture disc.

## STANDARD/GENERAL SPECIFICATIONS

$\left.\begin{array}{ll}\text { Body Size / End } \\ \text { Connection: }\end{array} \quad \begin{array}{l}\text { 1/4", 3/8", 1/2" (DN8, 10,15) NPT. } \\ \text { Angle Design: with thru-body con- } \\ \text { nections (2 side inlets; bottom outlet). } \\ \text { Globe Design: 1/2" only - side inlet, }\end{array}\right\}$

Inlet Pressure: $\quad$ Standard: Up to 300 psig (20.7 Barg); includes limitation of 100 psi (6.9 Bar) pressure build when set at 200 psig (13.8 Barg) under low flow rate. See Table 2.
Optional: Up to 600 psig (41.3 Barg) (including build) when Option-80 specified.

## Maximum <br> Pressure Drop: Metal Seat: 600 psid (41.3 Bard). CompositionSeat: 400 psid (27.6Bard).

Range Springs \& Standard: Epoxy coated steel. Max. Pressure Cryogenic: SST.
Build:

| Steel <br> Range Spring |  | Maximum Build ${ }^{1}$ |  |  | SST <br> Range Spring |  | Maximum <br> Build <br> $\%$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| psig | (Barg) | $\%$ | psid | (Bard) | psig | (Barg) | $\%$ |
| $5-30$ | $(.34-2.1)$ | 50 | -- | -- | $5-30$ | $(.34-2.1)$ | 20 |
| $20-80$ | $(1.4-5.5)$ | 50 | -- | -- | $20-80$ | $(1.4-5.5)$ | 20 |
| $70-140$ | $(4.8-9.6)$ | 50 | -- | -- | $70-140$ | $(4.8-9.6)$ | 20 |
| $130-200$ | $(9.0-13.8)$ | 50 | 100 | $(6.9)$ | $130-200$ | $(9.0-13.8)$ | 20 |
| Option -80 |  |  |  |  |  |  |  |
| 190-300 | $(13.1-20.7)$ | 50 | 100 | $(6.9)$ |  |  |  |
| $270-400$ | $(18.6-27.6)$ | 39 | 100 | $(6.9)$ |  |  |  |
| $360-500$ | $(24.8-34.5)$ | 29 | 100 | $(6.9)$ |  |  |  |

1 The lesser of the \% or psid (Bard) values must be used as the limit. Build percentage is with respect to setpoint value.

Cv's/Capacities: $\quad$ See Tables 4, 5, 6 and 7.

## OPTION SPECIFICATIONS

Option-2:

Option-20:

Option-22: PANEL MOUNTING. Includes a
mounting nut and a handwheel. Figure 1.
Option-25: VENT TAP. Spring chamber vent tapped 1/8" (DN6) NPT for remote venting.
Option-25S: VENT SCREEN. Cap (For Opt-25). and range spring replaced by bronze dome for external pressure loading up to 100 psig (6.9 Barg); 1/4" (DN8) up to 100 psig (6.9 Barg);
NPT loading connection. Max. capacity $=0.5 \mathrm{Cv}$.
HANDWHEEL. Plastic handwheel on standard unit; aluminum handwheel for Opt. $-2+80$. Utilize for frequent setpoint changes.
-
DOME LOADING. Spring chamber

Option-30: FLANGED END CONNS. Welded-on
Option-30: FLANGED END CONNS. Welded-on 150\# and 300\# raised face flanged for $1 / 2^{\prime \prime}$ (DN15) body size ONLY. Flanges 1/2" (DN15) body size ONLY. Flanges Nipples and Flanges are socket weld design. Two connections only.


Figure 1: Option -22 Panel Mounting (handwheel portion is same for Option -2 Handwheel) Spring Chamber Thread 3/4" - 16 UNF-2A

With 150\# or 300\# flanges, the flange pressure rating is the limiting factor for inlet rating, not the body inlet rating.

With 150 \# flanges, the flange pressure rating is the limiting factor for outlet rating, not the body inlet rating. With 300\# flanges, the body outlet rating is the limiting factor.

Option-34: SPECIAL 14" FACE TO FACE DIMENSION FOR FLANGED END CONNECTIONS. Globe Design - Sizes $1 / 2^{\prime \prime}$ only. See Opt.-30 for standard face to face dimension, angle design.

Option-36: CRYOGENIC SERVICE. Includes SST body and spring chamber. All wetted internal parts are of SST materials suitable for cryogenic service.
The range spring, adjusting screw and locknut are SST; the spring button and pressure plate are brass.
TFE/SST spring loaded seal for diaphragm and pressure plate. Cleaned per Cashco Spec. \#S-1134. Suitable for cryogenic fluids from $-325^{\circ} \mathrm{F}$ to $+100^{\circ} \mathrm{F}\left(-198^{\circ}\right.$ to $\left.+38^{\circ} \mathrm{C}\right)$. The spring chamber has a $1 / 8$ " (DN6) NPT female connection for purge gas plus a $1 / 8$ " ( 3.2 mm ) drilled drain hole. Mount in horizontal piping with the adjusting screw oriented downwards. Suitable for inlet setpoint pressures up to 200 psig (13.8 Barg).

Option-40SST: SST NACE CONSTRUCTION. Internal wetted portions meet NACE standard MR0175 when the exterior of the regulator is not directly exposed to a sour gas environment, buried, insulated or otherwise denied direct atmospheric exposure. 316 SST body/ spring chamber material only. S3, S7 and S8 only trim selections available. Not available with Option -20 or -80.

Option-45: TFE GASKETS. Primarily for oxygen service. Limits temperature range to $-20^{\circ}$ to $+400^{\circ} \mathrm{F}\left(-29^{\circ}\right.$ to $\left.+205^{\circ} \mathrm{C}\right)$.

Option-55: SPECIAL CLEANING. Cleaned per Cashco Spec. \#S-1134 for oxygen service. NOTE: Design Pressure Rating shall not exceed 375 psig (25.8 Barg) when process medium is oxygen.

Option-56: SPECIAL CLEANING. Cleaned per Cashco Spec. \#S-1542. Utilize when cleanliness level better than normal is required and unit is NOT FOR OXYGEN SERVICE.

Option-80: HIGH INLET PRESSURE. For controlling inlet pressure above 200 psig (13.8 Barg) setpoint; allows 100 psi (6.9 Bar) maximum pressure build above the setpoint. Available in aluminum bronze and SST spring chamber.

Option-85: INLET GAUGE TAP. 1/4" (DN8) NPT female connection on side of body for inlet pressure, for incorporation of gauge. Gauge not included.

Option-86: INLET PRESSURE GAUGE. Glycerine filled pressure gauge. SST case, bourdon tube, socket, and movement. 2-1/2" ( 65 mm ) dial size. Service application temperature range of 30 to $+160^{\circ} \mathrm{F}$ (-1 to $+71^{\circ} \mathrm{C}$ ) maximum. Rear case $1 / 4^{\prime \prime}$ (DN8) male NPT connection. Dual range scales of psig and Bar. Includes Option-85 body gauge tap when specified. DO NOT SPECIFY WITH OPTIONS -36 OR -55.

| Spring Range |  | Nominal ${ }^{1}$ <br> Gauge Range |  |
| :---: | :---: | :---: | :---: |
| psig | (Barg) | psig | (Barg) |
| $5-30$ | $(.34-2.1)$ | $0-55$ | $(0-4)$ |
| $20-80$ | $(1.4-5.5)$ | $0-140$ | $(0-10)$ |
| $70-140$ | $(4.8-9.6)$ | $0-220$ | $(0-16)$ |
| $130-200$ | $(9.0-13.8)$ | $0-350$ | $(0-25)$ |
| $190-300$ | $(13.1-20.7)$ | $0-550$ | $(0-40)$ |
| $270-400$ | $(18.6-27.6)$ | $0-550$ | $(0-40)$ |
| $360-500$ | $(24.8-34.5)$ | $0-850$ | $(0-60)$ |

${ }^{1}$ Cashco will purchase gauges to the above specs.; ranges may vary from vendor to vendor.

## TECHNICAL SPECIFICATIONS

TABLE 1
APPLICATIONS

| Fluid | Recommended Construction | Trim Designation Number |
| :---: | :---: | :---: |
| $\mathrm{He}, \mathrm{H} 2$ | Metal Seat \& diaphragm | S1,S0 |
|  | Composition Seat \& Metal Diaphragm | S36, S9 |
| Air, Inert or Industrial Gases | Metal Seat \& Diaphragm | S1 |
|  | Metal Seat \& Composition Diaphragm | S8 |
|  | Composition Seat \& Metal Diaphragm | S36 |
|  | Composition Seat \& Diaphragm | S3, S7 |
| Cryogenic Gases or Liquids | Metal Seat \& Diaphragm | S1 |
|  | Composition Seat \& Metal Diaphragm | S36 |
| Hydrocarbons or Chemicals | Metal Seat \& Diaphragm | S1, S0 |
|  | Metal Seat \& Composition Diaphragm | S8 |
|  | Composition Seat \& Metal Diaphragm | S36, S9 |
|  | Composition Seat \& Diaphragm | S3 |
| Sour Gas | Metal Seat and Composition Diaphragm | S8 |
|  | Composition Seat and Diaphragm | S3, S7 |
| Oxygen | Composition Seat \& Diaphragm | S7 |
|  | Composition Seat \& Metal Diaphragm | S9, S36 |
|  | Metal Seat \& Diaphragm | S0, S1 |
| Water and Condensate | Metal Seat \& Diaphragm | S1 |
|  | Metal Seat \& Composition Diaphragm | S8 |
|  | Composition Seat \& Metal Diaphragm | S36 |
|  | Composition Seat \& Diaphragm | S3 |
| Saturated Steam (240 psig (16.5 Barg) \& lower) ${ }^{1}$ | Metal Seat \& Diaphragm | S1 |

Pressure drops above 150 psid (10.3 Bard) may cause accelerated trim and body wear.

TABLE 2
DESIGN PRESSURE vs. TEMPERATURE RATINGS

| Materials of Construction (Body/Spring Chamber) | End <br> Connection | Option | Design Conditions |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Inlet \& Outlet |  |  |
|  |  |  | Pressure |  | Temperature |
|  |  |  | psig (Barg) |  | ${ }^{\circ} \mathrm{F}\left({ }^{\circ} \mathrm{C}\right)$ |
| SST/BRZ or SST/SST | NPT | Std | 400 | (27.6) | -20 to +400 |
| SST/BRZ |  | -80 | 600 | (41.4) | (-29 to +205) |
| $\begin{aligned} & \text { SST/BRZ } \\ & \text { or } \\ & \text { SST/SST } \end{aligned}$ | $\begin{gathered} \text { 150\# Flgd } \\ \text { SST } \end{gathered}$ | $\begin{gathered} -30 \\ \& \\ -34 \end{gathered}$ | 275 | (19.0) | $\begin{aligned} & -20 \text { to }+100 \\ & (-29 \text { to }+38) \end{aligned}$ |
|  |  |  | 235 | (16.2) | 200 (94) |
|  |  |  | 215 | (14.8) | 300 (149) |
|  |  |  | 195 | (13.5) | 400 (205) |
|  | $\begin{gathered} \hline 300 \# \text { Flgd } \\ \text { SST } \end{gathered}$ | $\begin{gathered} -30 \& \\ -34 \end{gathered}$ | 400 | (27.6) | $\begin{aligned} & -20 \text { to }+400 \\ & (-29 \text { to }+205) \end{aligned}$ |
| SST/BRZ | $300 \#$ FlgdSST | $\begin{aligned} & -30+80 \\ & -34+80 \end{aligned}$ | 600 | (41.4) | $\begin{aligned} & -20 \text { to }+200 \\ & (-29 \text { to }+93) \end{aligned}$ |
|  |  |  | 560 | ( 38.6) | $\begin{gathered} -20 \text { to }+300 \\ (-29 \text { to }+149) \\ \hline \end{gathered}$ |
|  |  |  | 515 | (35.5) | $\begin{gathered} -20 \text { to }+400 \\ (-29 \text { to }+205) \\ \hline \end{gathered}$ |
| SST/SST | NPT | -36 | 400 | (27.6) | $\begin{aligned} & -325 \text { to }+100 \\ & (-198 \text { to }+38) \end{aligned}$ |

TABLE 3
SAFETY RELIEF VALVE SETPOINT PRESSURE

| Range Spring (psig) | Diaphragm Material | Emergency ${ }^{1}$ Over-Pressure (psig) |
| :---: | :---: | :---: |
| $\begin{gathered} 5-30,20-80,70-140, \\ 130-200 \end{gathered}$ | ALL | Design Limit from Table 2 or 1.5 x UVRS ${ }^{2}$, whichever is least |
| $\begin{gathered} \hline \text { 190-300, 270-400, } \\ 360-500 \\ \text { (Opt. -80) } \end{gathered}$ | ALL | Design Limit from Table 2 or 1.2 x UVRS ${ }^{2}$, whichever is least |

1 "Emergency Over-Pressure" is defined as the level of pressure, which if exceeded, may cause internal mechanical damage.
2 UVRS - "Upper Value of Range Spring"; i.e. 130-200 psig (9-13.8 Barg) range spring, value would be 200 psig (13.8 Barg).
METRIC CONVERSION FACTOR: psig / 14.5 = Barg

TABLE 4
SAFETY RELIEF VALVE SIZING

| Body Size | Maximum Cv with <br> Valve Plug Wide <br> Open |
| :---: | :---: |
| ALL | $0.9(.78 \mathrm{kv})$ |

TABLE 5
SST TRIM MATERIAL COMBINATIONS

| Part | SST Trim Designation Number |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | S0 | S1 | S3 (NACE) | S7 (NACE) | S8 (NACE) | S9 | S36 |
| Diaphragm | TFE coated 302 SST | 302 SST | Neoprene | Fluorocarbon Elastomer | Neoprene | TFE coated 302 SST | 302 SST |
| Piston | 316L SST | 316L SST | 316L SST | 316L SST | 316L SST | 316L SST | 316L SST |
| Piston O-Ring | TFE | TFE | TFE | TFE | TFE | TFE | TFE |
| Seat ${ }^{1}$ | 316L SST | 316L SST | TFE | TFE | 316L SST | TFE | TFE |
| Seat Screw | --- | --- | 316 SST | 316 SST | - | 316 SST | 316 SST |
| Temperature Range ${ }^{\circ} \mathrm{F}\left({ }^{\circ} \mathrm{C}\right)$ | -20 to +400 | -325 to +400 | -20 to +180 | -20 to +400 | -20 to +180 | -20 to +400 | -325 to +400 |
|  | (-29 to+205) | (-198 to +205) | (-29 to +82) | (-29 to+205) | (-29 to +82) | (-29 to +205) | (-198 to +205) |
| fixed portion of the | s integral to th | body. Indicate | seat is the movin | ing portion, and | attached or | tegral with the | piston. |

NOTE: Cashco, Inc. does not recommend metal seated trim on any service where the flow will be dead ended down stream of the pressure reducing regulator.


Figure 2: Metal Seat Design


Figure 3: Standard Composition Seat Design


Figure 4: Option-80, Composition Seat Design

TABLE 6
CAPACITY - Cv ( $F_{L}=0.95$ ) All Sizes

| Setpoint ( $\mathbf{P}_{1}$ ) <br> Pressure | METAL DIAPHRAGM |  |  |  |  |  | COMPOSITION DIAPHRAGM |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | psig | (Barg) | $10 \%$ | $20 \%$ | $30 \%$ | $40 \%$ | $50 \%$ | $10 \%$ | $20 \%$ | $30 \%$ | $40 \%$ |
| 10 | $(.69)$ | .05 | .10 | .17 | .22 | .28 | .07 | .14 | .21 | .27 | .35 |
| 25 | $(1.7)$ | .09 | .18 | .27 | .35 | .43 | .11 | .22 | .34 | .44 | .54 |
| 50 | $(3.4)$ | .09 | .18 | .27 | .35 | .43 | .11 | .22 | .34 | .44 | .54 |
| 75 | $(5.2)$ | .12 | .25 | .37 | .48 | .57 | .16 | .31 | .46 | .58 | .68 |
| 100 | $(6.9)$ | .08 | .17 | .25 | .33 | .41 | .10 | .20 | .30 | .40 | .50 |
| 125 | $(8.6)$ | .09 | .18 | .27 | .35 | .43 | .11 | .22 | .34 | .44 | .54 |
| 150 | $(10.3)$ | .03 | .07 | .10 | .13 | .17 | .05 | .10 | .14 | .19 | .23 |
| 200 | $(13.8)$ | .07 | .14 | .21 | .28 | .35 | .09 | .17 | .27 | .35 | .43 |
| 250 | $(17.2)$ | .04 | .09 | .12 | .17 | .22 | .06 | .10 | .16 | .22 | .27 |
| 300 | $(20.7)$ | .06 | .11 | .16 | .22 | .28 | .07 | .14 | .20 | .28 | .35 |
| 350 | $(24.1)$ | .13 | .27 | .40 | .52 | .62 | .17 | .32 | .47 | .60 | .70 |
| 450 | $(31.0)$ | .16 | .32 | .47 | .58 | .68 | .20 | .38 | .54 | .67 | .75 |
| 500 | $(34.5)$ | .18 | .35 | .51 | .64 | .73 | .22 | .42 | .59 | .72 | .76 |

Metric Conversion Factor: Cv / 1.16 = kv
TABLE 7
WATER CAPACITY - GPM
S.G. $=1.0 \quad \mathrm{~T}=60^{\circ} \mathrm{F} \quad \mathrm{F}_{\mathrm{L}}=0.95$

All Sizes - Composition Diaphragm Only

| Outlet Pressure psig (Barg) | Setpoint <br> Pressure |  | 1/4" (DN8) Body |  |  |  |  | 3/8" (DN10) Body |  |  |  |  | 1/2" (DN15) Body |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | \% Build |  |  |  |  | \% Build |  |  |  |  | \% Build |  |  |  |  |
|  | psig | (Barg) | 10\% | 20\% | 30\% | 40\% | 50\% | 10\% | 20\% | 30\% | 40\% | 50\% | 10\% | 20\% | 30\% | 40\% | 50\% |
| ATM | 10 | (.69) | 0.2 | 0.5 | 0.8 | 1.0 | 1.4 | 0.2 | 0.5 | 0.8 | 1.0 | 1.4 | 0.2 | 0.5 | 0.8 | 1.0 | 1.4 |
|  | 25 | (1.7) | 0.6 | 1.2 | 1.9 | 2.6 | 3.3 | 0.6 | 1.2 | 1.9 | 2.6 | 3.3 | 0.6 | 1.2 | 1.9 | 2.6 | 3.3 |
|  | 50 | (3.4) | 0.8 | 1.7 | 2.7 | 3.7 | 4.7 | 0.8 | 1.7 | 2.7 | 3.7 | 4.7 | 0.8 | 1.7 | 2.7 | 3.7 | 4.7 |
|  | 75 | (5.2) | 1.5 | 2.9 | 4.5 | 5.9 | 7.2 | 1.5 | 2.9 | 4.5 | 5.9 | 7.2 | 1.5 | 2.9 | 4.5 | 5.9 | 7.2 |
|  | 100 | (6.9) | 1.0 | 2.1 | 3.3 | 4.6 | 5.9 | 1.0 | 2.1 | 3.3 | 4.6 | 5.9 | 1.0 | 2.1 | 3.3 | 4.6 | 5.9 |
|  | 125 | (8.6) | 1.3 | 2.6 | 4.2 | 5.6 | 7.2 | 1.3 | 2.6 | 4.2 | 5.6 | 7.2 | 1.3 | 2.6 | 4.2 | 5.6 | 7.2 |
|  | 150 | (10.3) | 0.6 | 1.3 | 1.9 | 2.7 | 3.3 | 0.6 | 1.3 | 1.9 | 2.7 | 3.3 | 0.6 | 1.3 | 1.9 | 2.7 | 3.3 |
|  | 200 | (13.8) | 1.3 | 2.6 | 4.2 | 5.7 | 7.2 | 1.3 | 2.6 | 4.2 | 5.7 | 7.2 | 1.3 | 2.6 | 4.2 | 5.7 | 7.2 |
|  | 250 | (17.2) | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 |
|  | 300 | (20.7) | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 |
| $\begin{gathered} 10 \\ (0.69) \end{gathered}$ | 25 | (1.7) | 0.5 | 1.0 | 1.6 | 2.2 | 2.8 | 0.5 | 1.0 | 1.6 | 2.2 | 2.8 | 0.5 | 1.0 | 1.6 | 2.2 | 2.8 |
|  | 50 | (3.4) | 0.7 | 1.6 | 2.5 | 3.4 | 4.4 | 0.7 | 1.6 | 2.5 | 3.4 | 4.4 | 0.7 | 1.6 | 2.5 | 3.4 | 4.4 |
|  | 75 | (5.2) | 1.4 | 2.8 | 4.3 | 5.7 | 6.9 | 1.4 | 2.8 | 4.3 | 5.7 | 6.9 | 1.4 | 2.8 | 4.3 | 5.7 | 6.9 |
|  | 100 | (6.9) | 1.0 | 2.1 | 3.3 | 4.6 | 5.9 | 1.0 | 2.1 | 3.3 | 4.6 | 5.9 | 1.0 | 2.1 | 3.3 | 4.6 | 5.9 |
|  | 125 | (8.6) | 1.2 | 2.6 | 4.2 | 5.7 | 7.2 | 1.2 | 2.6 | 4.2 | 5.7 | 7.2 | 1.2 | 2.6 | 4.2 | 5.7 | 7.2 |
|  | 150 | (10.3) | 0.6 | 1.3 | 1.9 | 2.7 | 3.3 | 0.6 | 1.3 | 1.9 | 2.7 | 3.3 | 0.6 | 1.3 | 1.9 | 2.7 | 3.3 |
|  | 200 | (13.8) | 1.3 | 2.6 | 4.2 | 5.7 | 7.2 | 1.3 | 2.6 | 4.2 | 5.7 | 7.2 | 1.3 | 2.6 | 4.2 | 5.7 | 7.2 |
|  | 250 | (17.2) | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 |
|  | 300 | (20.7) | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 |
| $\begin{gathered} 25 \\ (1.7) \end{gathered}$ | 50 | (3.4) | 0.6 | 1.3 | 2.2 | 3.0 | 3.8 | 0.6 | 1.3 | 2.2 | 3.0 | 3.8 | 0.6 | 1.3 | 2.2 | 3.0 | 3.8 |
|  | 75 | (5.2) | 1.2 | 2.5 | 3.9 | 5.2 | 6.4 | 1.2 | 2.5 | 3.9 | 5.2 | 6.4 | 1.2 | 2.5 | 3.9 | 5.2 | 6.4 |
|  | 100 | (6.9) | 0.9 | 1.9 | 3.1 | 4.3 | 5.6 | 0.9 | 1.9 | 3.1 | 4.3 | 5.6 | 0.9 | 1.9 | 3.1 | 4.3 | 5.6 |
|  | 125 | (8.6) | 1.2 | 2.5 | 4.0 | 5.4 | 6.9 | 1.2 | 2.5 | 4.0 | 5.4 | 6.9 | 1.2 | 2.5 | 4.0 | 5.4 | 6.9 |
|  | 150 | (10.3) | 0.6 | 1.2 | 1.8 | 2.6 | 3.3 | 0.6 | 1.2 | 1.8 | 2.6 | 3.3 | 0.6 | 1.2 | 1.8 | 2.6 | 3.3 |
|  | 200 | (13.8) | 1.3 | 2.5 | 4.1 | 5.6 | 7.1 | 1.3 | 2.5 | 4.1 | 5.6 | 7.1 | 1.3 | 2.5 | 4.1 | 5.6 | 7.1 |
|  | 250 | (17.2) | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 | 1 | 1.7 | 2.8 | 4.0 | 5.1 | 1.0 | 1.7 | 2.8 | 4.0 | 5.1 |
|  | 300 | (20.7) | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 | 1.2 | 2.6 | 3.8 | 5.6 | 7.2 |

Metric Conversion Factor: GPM X 3.785 = LPM

TABLE 8
AIR CAPACITY - SCFH
S.G. $=10 \mathrm{~T}=60^{\circ} \mathrm{F} \mathrm{F}_{\mathrm{L}}$

## All Sizes - Composition Diaphragm Only

| Outlet Pressure | SetpointPressurepsig (barg) |  | 1/4" (DN8) Body |  |  |  |  | 3/8" (DN10) Body |  |  |  |  | 1/2" (DN15) Body |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | psig | (barg) | 10\% | 20\% | 30\% | 40\% | 50\% | 10\% | 20\% | 30\% | 40\% | 50\% | 10\% | 20\% | 30\% | 40\% | 50\% |
| ATM | 10 | (.69) | 60 | 130 | 210 | 270 | 370 | 60 | 130 | 210 | 270 | 370 | 60 | 130 | 210 | 270 | 370 |
|  | 25 | (1.7) | 160 | 350 | 570 | 770 | 1000 | 160 | 350 | 570 | 770 | 1000 | 160 | 350 | 570 | 770 | 1000 |
|  | 50 | (3.4) | 270 | 580 | 960 | 1320 | 1710 | 270 | 580 | 960 | 1320 | 1710 | 270 | 580 | 960 | 1320 | 1710 |
|  | 75 | (5.2) | 550 | 1150 | 1830 | 2460 | SONIC | 550 | 1150 | 1830 | 2460 | 3060 | 550 | 1150 | 1830 | 2460 | 3060 |
|  | 100 | (6.9) | 440 | 950 | 1540 | 2190 | SONIC | 440 | 950 | 1540 | 2190 | 2910 | 440 | 950 | 1540 | 2190 | 2910 |
|  | 125 | (8.6) | 590 | 1280 | 2130 | SONIC | SONIC | 590 | 1280 | 2130 | 2960 | 3870 | 590 | 1280 | 2130 | 2960 | 3870 |
|  | 150 | (10.3) | 320 | 690 | 1040 | 1510 | 1950 | 320 | 690 | 1040 | 1510 | 1950 | 320 | 690 | 1040 | 1510 | 1950 |
|  | 200 | (13.8) | 750 | 1530 | 2630 | SONIC | SONIC | 750 | 1530 | 2630 | 3660 | 4800 | 750 | 1530 | 2630 | 3660 | 4800 |
|  | 250 | (17.2) | 620 | 1120 | 1930 | 2850 | HI BUILD | 620 | 1120 | 1930 | 2850 | HI BUILD | 620 | 1120 | 1930 | 2850 | HI BUILD |
|  | 300 | (20.7) | 860 | 1860 | 2870 | HI BUILD | HI BUILD | 860 | 1860 | 2870 | HI BUILD | HI BUILD | 860 | 1860 | 2870 | HI BUILD | HI BUILD |
|  | 350 | (24.1) | 2410 | SONIC | HI BUILD | HI BUILD | HI BUILD | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD |
|  | 450 | (31.0) | SONIC | SONIC | HI BUILD | HI BUILD | HI BUILD | 3620 | SONIC | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD |
| $\begin{gathered} 25 \\ (1.7) \end{gathered}$ | 50 | (3.4) | 260 | 550 | 900 | 1240 | 1610 | 260 | 550 | 900 | 1240 | 1610 | 260 | 550 | 900 | 1240 | 1610 |
|  | 75 | (5.2) | 540 | 1140 | 1810 | 2430 | 3030 | 540 | 1140 | 1810 | 2430 | 3030 | 540 | 1140 | 1810 | 2430 | 3030 |
|  | 100 | (6.9) | 440 | 950 | 1530 | 2190 | 2910 | 440 | 950 | 1530 | 2190 | 2910 | 440 | 950 | 1530 | 2190 | 2910 |
|  | 125 | (8.6) | 590 | 1280 | 2130 | 2960 | 3870 | 590 | 1280 | 2130 | 2960 | 3870 | 590 | 1280 | 2130 | 2960 | 3870 |
|  | 150 | (10.3) | 320 | 690 | 1040 | 1510 | 1950 | 320 | 690 | 1040 | 1510 | 1950 | 320 | 690 | 1040 | 1510 | 1950 |
|  | 200 | (13.8) | 750 | 1530 | 2630 | 3660 | 4800 | 750 | 1530 | 2630 | 3660 | 4800 | 750 | 1530 | 2630 | 3660 | 4800 |
|  | 250 | (17.2) | 620 | 1120 | 1930 | 2850 | HI BUILD | 620 | 1120 | 1930 | 2850 | HI BUILD | 620 | 1120 | 1930 | 2850 | HI BUILD |
|  | 300 | (20.7) | 860 | 1860 | 2870 | HI BUILD | HI BUILD | 860 | 1860 | 2870 | HI BUILD | HI BUILD | 860 | 1860 | 2870 | HI BUILD | HI BUILD |
|  | 350 | (24.1) | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD |
|  | 450 | (31.0) | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD |
| $\begin{gathered} 50 \\ (3.4) \end{gathered}$ | 75 | (5.2) | 460 | 960 | 1530 | 2060 | 2560 | 460 | 960 | 1530 | 2060 | 2560 | 460 | 960 | 1530 | 2060 | 2560 |
|  | 100 | (6.9) | 420 | 900 | 1450 | 2060 | 2740 | 420 | 900 | 1450 | 2060 | 2740 | 420 | 900 | 1450 | 2060 | 2740 |
|  | 150 | (10.3) | 320 | 680 | 1030 | 1500 | 1930 | 320 | 680 | 1030 | 1500 | 1930 | 320 | 680 | 1030 | 1500 | 1930 |
|  | 200 | (13.8) | 750 | 1530 | 2630 | 3650 | 4790 | 750 | 1530 | 2630 | 3650 | 4790 | 750 | 1530 | 2630 | 3650 | 4790 |
|  | 250 | (17.2) | 620 | 1120 | 1930 | 2850 | HI BUILD | 620 | 1120 | 1930 | 2850 | HI BUILD | 620 | 1120 | 1930 | 2850 | HI BUILD |
|  | 300 | (20.7) | 860 | 1860 | 2870 | HI BUILD | HI BUILD | 860 | 1860 | 2870 | HI BUILD | HI BUILD | 860 | 1860 | 2870 | HI BUILD | HI BUILD |
|  | 350 | (24.1) | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD | 2410 | 4940 | HI BUILD | HI BUILD | HI BUILD |
|  | 450 | (31.0) | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD |
| $\begin{aligned} & 100 \\ & (6.9) \end{aligned}$ | 125 | (8.6) | 410 | 890 | 1470 | 2040 | 2670 | 410 | 890 | 1470 | 2040 | 2670 | 410 | 890 | 1470 | 2040 | 2670 |
|  | 150 | (10.3) | 270 | 580 | 870 | 1270 | 1640 | 270 | 580 | 870 | 1270 | 1640 | 270 | 580 | 870 | 1270 | 1640 |
|  | 200 | (13.8) | 700 | 1450 | 2480 | 3440 | 4520 | 700 | 1450 | 2480 | 3440 | 4520 | 700 | 1450 | 2480 | 3440 | 4520 |
|  | 250 | (17.2) | 600 | 1090 | 1880 | 2780 | HI BUILD | 600 | 1090 | 1880 | 2780 | HI BUILD | 600 | 1090 | 1880 | 2780 | HI BUILD |
|  | 300 | (20.7) | 850 | 1840 | 2840 | HI BUILD | HI BUILD | 850 | 1840 | 2840 | HI BUILD | HI BUILD | 850 | 1840 | 2840 | HI BUILD | HI BUILD |
|  | 350 | (24.1) | 2400 | 4920 | HI BUILD | HI BUILD | HI BUILD | 2400 | 4920 | HI BUILD | HI BUILD | HI BUILD | 2400 | 4920 | HI BUILD | HI BUILD | HI BUILD |
|  | 450 | (31.0) | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD | 3620 | 7480 | HI BUILD | HI BUILD | HI BUILD |
| $\begin{gathered} 150 \\ (10.3) \end{gathered}$ | 200 | (13.8) | 570 | 1160 | 1980 | 2760 | 3620 | 570 | 1160 | 1980 | 2760 | 3620 | 570 | 1160 | 1980 | 2760 | 3620 |
|  | 250 | (17.2) | 550 | 990 | 1710 | 2520 | HI BUILD | 550 | 990 | 1710 | 2520 | HI BUILD | 550 | 990 | 1710 | 2520 | HI BUILD |
|  | 300 | (20.7) | 810 | 1750 | 2700 | HI BUILD | HI BUILD | 810 | 1750 | 2700 | HI BUILD | HI BUILD | 810 | 1750 | 2700 | HI BUILD | HI BUILD |
|  | 350 | (24.1) | 2330 | 4780 | HI BUILD | HI BUILD | HI BUILD | 2330 | 4780 | HI BUILD | HI BUILD | HI BUILD | 2330 | 4780 | HI BUILD | HI BUILD | HI BUILD |
|  | 450 | (31.0) | 3580 | 7410 | HI BUILD | HI BUILD | HI BUILD | 3580 | 7410 | HI BUILD | HI BUILD | HI BUILD | 3580 | 7410 | HI BUILD | HI BUILD | HI BUILD |

NOTES: Where "SONIC" is indicated within the above capacity tables, outlet velocity with Schedule 40 pipe has reached sonic velocity of 1118 fps. Additional flow cannot be obtained and pipeline velocity is in excess of customary pipe velocity design limits. Maximum flow will be approximately the last indicated value in the column above "SONIC".
Where "HI BUILD" is indicated, the pressure build exceeds established limits in Technical Bulletin.
Metric Conversion Factor: SCFH / 35.31 = Sm ${ }^{3} / \mathrm{Hr}$; SCFH / 37.32 $=\mathbf{N m}{ }^{3} / \mathrm{Hr}$

TABLE 9
STEAM CAPACITY - LBS/HR

## S.G. $=$ Actual $T=$ Saturated $F_{L}=0.95$ <br> All Sizes - Metal Diaphragm Only

| Outlet Pressure psig (Barg) | Setpoint Pressure |  | 1/4" Body |  |  |  |  | 3/8" Body |  |  |  |  | 1/2" Body |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | \% Build |  |  |  |  | \% Build |  |  |  |  | \% Build |  |  |  |  |
|  | psig | (Barg) | 10\% | 20\% | 30\% | 40\% | 50\% | 10\% | 20\% | 30\% | 40\% | 50\% | 10\% | 20\% | 30\% | 40\% | 50\% |
| ATM | 10 | (.69) | 2 | 4 | 7 | 10 | 13 | 2 | 4 | 7 | 10 | 13 | 2 | 4 | 7 | 10 | 13 |
|  | 25 | (1.7) | 7 | 13 | 21 | 28 | 35 | 7 | 13 | 21 | 28 | 35 | 7 | 13 | 21 | 28 | 35 |
|  | 50 | (3.4) | 11 | 23 | 35 | 47 | 59 | 11 | 23 | 35 | 47 | 59 | 11 | 23 | 35 | 47 | 59 |
|  | 75 | (5.2) | 20 | 43 | 66 | 89 | 109 | 20 | 43 | 66 | 89 | 109 | 20 | 43 | 66 | 89 | 109 |
|  | 100 | (6.9) | 17 | 38 | 57 | 78 | 100 | 17 | 38 | 57 | 78 | 100 | 17 | 38 | 57 | 78 | 100 |
|  | 125 | (8.6) | 23 | 48 | 75 | 101 | 128 | 23 | 48 | 75 | 101 | 128 | 23 | 48 | 75 | 101 | 128 |
|  | 150 | (10.3) | 9 | 22 | 33 | 44 | 60 | 9 | 22 | 33 | 44 | 60 | 9 | 22 | 33 | 44 | 60 |
|  | 200 | (13.8) | 28 | 57 | 89 | 124 | 160 | 28 | 57 | 89 | 124 | 160 | 28 | 57 | 89 | 124 | 160 |
|  | 240 | (16.6) | 19 | 44 | 61 | 89 | 119 | 19 | 44 | 61 | 89 | 119 | 19 | 44 | 61 | 89 | 119 |
| 10 (.69) | 25 | (1.7) | 6 | 12 | 19 | 25 | 32 | 6 | 12 | 19 | 25 | 32 | 6 | 12 | 19 | 25 | 32 |
|  | 50 | (3.4) | 11 | 22 | 34 | 45 | 57 | 11 | 22 | 34 | 45 | 57 | 11 | 22 | 34 | 45 | 57 |
|  | 75 | (5.2) | 20 | 42 | 65 | 87 | 106 | 20 | 42 | 65 | 87 | 106 | 20 | 42 | 65 | 87 | 106 |
|  | 100 | (6.9) | 17 | 38 | 57 | 78 | 100 | 17 | 38 | 57 | 78 | 100 | 17 | 38 | 57 | 78 | 100 |
|  | 125 | (8.6) | 23 | 48 | 75 | 101 | 128 | 23 | 48 | 75 | 101 | 128 | 23 | 48 | 75 | 101 | 128 |
|  | 150 | (10.3) | 9 | 22 | 33 | 44 | 60 | 9 | 22 | 33 | 44 | 60 | 9 | 22 | 33 | 44 | 60 |
|  | 200 | (13.8) | 28 | 57 | 89 | 124 | 160 | 28 | 57 | 89 | 124 | 160 | 28 | 57 | 89 | 124 | 160 |
|  | 240 | (16.6) | 19 | 44 | 61 | 89 | 119 | 19 | 44 | 61 | 89 | 119 | 19 | 44 | 61 | 89 | 119 |
| 25 (1.7) | 50 | (3.4) | 10 | 20 | 31 | 42 | 53 | 10 | 20 | 31 | 42 | 53 | 10 | 20 | 31 | 42 | 53 |
|  | 75 | (5.2) | 19 | 41 | 64 | 85 | 104 | 19 | 41 | 64 | 85 | 104 | 19 | 41 | 64 | 85 | 104 |
|  | 100 | (6.9) | 17 | 37 | 56 | 76 | 97 | 17 | 37 | 56 | 76 | 97 | 17 | 37 | 56 | 76 | 97 |
|  | 125 | (8.6) | 23 | 47 | 73 | 98 | 125 | 23 | 47 | 73 | 98 | 125 | 23 | 47 | 73 | 98 | 125 |
|  | 150 | (10.3) | 9 | 22 | 33 | 44 | 59 | 9 | 22 | 33 | 44 | 59 | 9 | 22 | 33 | 44 | 59 |
|  | 200 | (13.8) | 28 | 57 | 89 | 124 | 160 | 28 | 57 | 89 | 124 | 160 | 28 | 57 | 89 | 124 | 160 |
|  | 240 | (16.6) | 19 | 44 | 61 | 89 | 119 | 19 | 44 | 61 | 89 | 119 | 19 | 44 | 61 | 89 | 119 |
| 50 (3.4) | 75 | (5.2) | 17 | 36 | 55 | 74 | 90 | 17 | 36 | 55 | 74 | 90 | 17 | 36 | 55 | 74 | 90 |
|  | 100 | (6.9) | 16 | 35 | 53 | 72 | 92 | 16 | 35 | 53 | 72 | 92 | 16 | 35 | 53 | 72 | 92 |
|  | 125 | (8.6) | 22 | 46 | 72 | 96 | 122 | 22 | 46 | 72 | 96 | 122 | 22 | 46 | 72 | 96 | 122 |
|  | 150 | (10.3) | 9 | 21 | 32 | 43 | 57 | 9 | 21 | 32 | 43 | 57 | 9 | 21 | 32 | 43 | 57 |
|  | 200 | (13.8) | 27 | 56 | 87 | 120 | 155 | 27 | 56 | 87 | 120 | 155 | 27 | 56 | 87 | 120 | 155 |
|  | 240 | (16.6) | 18 | 43 | 60 | 88 | 117 | 18 | 43 | 60 | 88 | 117 | 18 | 43 | 60 | 88 | 117 |
| 100 (6.9) | 125 | (8.6) | 17 | 36 | 56 | 75 | 95 | 17 | 36 | 56 | 75 | 95 | 17 | 36 | 56 | 75 | 95 |
|  | 150 | (10.3) | 8 | 19 | 28 | 38 | 51 | 8 | 19 | 28 | 38 | 51 | 8 | 19 | 28 | 38 | 51 |
|  | 200 | (13.8) | 26 | 54 | 83 | 115 | 149 | 26 | 54 | 83 | 115 | 149 | 26 | 54 | 83 | 115 | 149 |
|  | 240 | (16.6) | 18 | 42 | 58 | 85 | 114 | 18 | 42 | 58 | 85 | 114 | 18 | 42 | 58 | 85 | 114 |

Metric Conversion Factor: LBS/HR X $0.4536=K G / H R$

DIMENSIONS AND WEIGHTS

| ENGLISH UNITS (Inches) |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Body Size | A | B | C | D | E | F | G | H | Ship Weight |
| Angle 1/4",3/8",1/2" | - | - | - | 4.94 | - | - | 2.50 *** | 1.06 |  |
| Globe 1/2" | - | - | - | 5.25 | - | - | 3.00 | . 75 |  |
| -2 (Handwheel) | - | - | - | 5.44 ** | - | - | - | - | 3 lbs . |
| -20( Dome Load) | - | - | - | 2.25 ** | - | - | - | - |  |
| -22 (Panel Mount) | - | - | - | 5.44 ** | 2.38 | 2.31 | - | - |  |
| -30 (Angle) * | - | 4.00 | 4.00 | - | - | - | - | - | 8 lbs. |
| -34 (Globe) * | 14.00 | 7.00 | - | - | - | - | - | - | 10 lbs. |
| -80 (High Outlet Pressure) | - | - | - | 7.25 ** | - | - | - | - |  |
| $-2+80$ | - | - | - | 9.75** | - | - | - | - | 4 lbs. |
| METRIC UNITS (mm) |  |  |  |  |  |  |  |  |  |
| Body Size | A | B | C | D | E | F | G | H | Ship Weight |
| Angle (DN8,DN10,DN15) | - | - | - | 125 | - | - | 64 *** | 27 |  |
| Globe (DN15) | - | - | - | 134 | - | - | 76 | 19 |  |
| -2 (Handwheel) | - | - | - | 138 ** | - | - | - | - | 1.36 kgs. |
| -20 (Dome Load) | - | - | - | 57 ** | - | - | - | - |  |
| -22 (Panel Mount) | - | - | - | 138 ** | 61 | 59 | - | - |  |
| -30 (Angle) * | - | 101 | 101 | - | - | - | - | - | 3.63 kgs . |
| -34 (Globe) * | 356 | 178 | - | - | - | - | - | - | 4.54 kgs . |
| -80 (High Outlet Pressure) | - | - | - | 184 ** | - | - | - | - | 1.81 kgs . |
| -2+80 | - | - | - | 248 ** | - | - | - | - |  |

* Only $1 / 2^{\prime \prime}$ (DN15) body size is available with Opt-30 and Opt-34 anged end connections.
** When specified with Globe Design $1 / 2 "$ size add $0.31 "(8 \mathrm{~mm})$.
***Angle Design 1/2" (DN15) body size - dimension = 3.00"



## NOTES

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| POSITION 2 - GASKET * \& SERVICE |  |  |  |
| :--- | :---: | :---: | :---: |
| Service |  | Options | CODE |
| Basic <br> (Above $-20^{\circ} \mathrm{F}\left(-29^{\circ} \mathrm{C}\right)$ ) | Std. Non-Oxygen <br> Primarily for <br> Oxygen | - | B |
| Cryogenic <br> -325 to $+100^{\circ} \mathrm{F}$ <br> $\left(-198\right.$ to $\left.38^{\circ} \mathrm{C}\right)$ | All | -36 ** | C |
| * Refer to Tech Bulletin for temperature limits. <br> ** Cryo Const. includes Special Cleaning \#S-1134 (Opt.-55). |  |  |  |


| POSITION 6 \& 7 TRIM |  | POSITION 10 - END CONNECTIONS |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Opt. | Type | CODE |
| Desig. No | CODE | Angle \& Globe | NPT | 1 |
| S0 | S0 | 30 | 150\# Flgs. | A |
| S1* | S1 | Angle Design Select Code "4" | 300\# Flgs. | B |
| S3 ** | SF | from Position 3. | DIN (PN40) | D |
| S7 ** | SG | -34 | 150\# Flgs. | V |
| S8 ** | S8 | Globe Design Select Code | 300\# Flgs. | W |
| S9 | SH | "5","6" or "7" from | DIN (PN40) | 7 |
| S36* | SJ | Position 3. | DIN (PN40) | 2 |
| * Suitable for Opt-36. <br> ** Suitable for NACE. |  | *1/2" (DN15) Body Size, 2 connections ONLY. |  |  |


| POSITION 11 - RANGE SPRINGS |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Spring Chamber Option | Range Spring |  | STD | $\begin{gathered} \text { Opt } \\ -36 \ddagger \end{gathered}$ |
|  | Psig | (Barg) | CODE | CODE |
| Std. | 5-30 | (.34-2.1) | 1 | A |
|  | 20-80 | (1.4-5.5) | 2 | B |
|  | 70-140 | (4.8-9.7) | 3 | C |
|  | 130-200 | (9.0-13.8) | 4 | D |
| Opt-80 * | 190-300 | (13.1-20.7) | 5 |  |
|  | 270-400 | (18.6-27.6) | 6 |  |
|  | 360-500 | (24.8-34.5) | 7 |  |
| Opt-20 | No Spring Dome Loaded |  | Y |  |
| * Opt-80 for High Outlet Pressure construction. Non- NACE. <br> $\ddagger$ SST spring. |  |  |  |  |

## * For information on ATEX see pages 9 \& 10 on the IOM.

| POSITION 3 - SIZES |  |  |
| :---: | :---: | :---: |
| In | (DN) | CODE |
| Angle Design (Two side inlets with <br> bottom outlet) |  |  |
| $1 / 4^{\prime \prime}$ | $(8)$ | 2 |
| $3 / 8^{\prime \prime}$ | $(10)$ | 3 |
| $1 / 2^{\prime \prime}$ | $(15)$ | 4 |
| Globe Design (Side inlet- Side |  |  |
| outlet) |  |  |$|$| $1 / 2^{\prime \prime}$ |  | $(15)$ |
| :---: | :---: | :---: |
| $3 / 4^{\prime \prime} *$ | $(20)$ | 5 |
| $1^{\prime \prime} *$ | $(25)$ | 6 |


| POSITION 5 - BODY <br> \& SPRING <br> CHAMBER <br> MATERIALS |  |
| :---: | :---: |
| Body/Sp. Ch. | CODE |
| SST / BRZ | $\mathbf{8}$ |
| SST / SST * | A |
| * Required for Opt-36. |  |

* $1 / 2^{\prime \prime}$ size body w/Reducing Flanges.

3/4" \& 1" Size not available in NPT.

| POSITION 12 - TRIM VARIATIONS |  |  |
| :---: | :---: | :---: |
| Description | Option | CODE |
| No Option | -- | $\mathbf{0}$ |
| For Special Construction <br> Contact Cashco for Special Product Code. | SPQ | $\mathbf{X}$ |


| POSITION 13 - FEATURE OPTIONS |  |  |
| :---: | :---: | :---: |
| Description | Option | CODE |
| No Option | - | 0 |
| Handwheel * | -2 | 2 |
| Panel Mounting - Handwheel included * | -22 | C |
| * Not available with Cryogenic Construction |  |  |


| POSITION 14 - SPRING CHAMBER OPTIONS |  |  |
| :---: | :---: | :---: |
| Description | Option | CODE |
| No Option | - | $\mathbf{0}$ |
| Vent Tap. | -25 | D |
| Vent Screen (includes Opt-25). | $-25 S$ | H |


| POSITION 15 - BODY OPTIONS |  |  |
| :---: | :---: | :---: |
| Description | Option | CODE |
| No Option | - | 0 |
| Inlet Gauge Tap - 1/4" NPT (No Gauge). | -85 | V |
| Inlet Pressure Gauge (Includes Opt-85) *. | -86 | Y |
| * NOT available with Opt-36 or Opt-55. |  |  |


| POSITION 16 - CERTIFICATE OPTIONS |  |  |
| :---: | :---: | :---: |
| Description | Option | CODE |
| No Option | - | $\mathbf{0}$ |
| NACE Const. SST/SST/XX <br> Per MR0175, S3, S7, S8 Trims. | -40 SST | K |
| Special Cleaning: Per Cashco Spec \#S-1134. <br> Suitable for oxygen service. | -55 | M |
| Special Cleaning: Per Cashco Spec \#S-1542. | -56 | N |

