ISO Registered Company

# MODELS CA-1 & CA-2

**TECHNICAL BULLETIN**

**CA-TB**
04-18

**MODEL CA-1**

**⚠ CAUTION**

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

## MODEL CA-1

### BACK PRESSURE / RELIEF REGULATOR

The Model CA-1 is a compact, forged Bronze body or SST barstock body back pressure regulator used to control inlet pressure level between atmospheric and 525 psig (36.2 Barg) by relieving excess pressure.

### FEATURES

**Self-Aligning Plug/Seat:** Seat ring floats within mechanically-contained zone.

**Tight Shutoff:** Lapped seat surfaces allow for leakage rates to approach levels of composition seats.

### APPLICATIONS

Widely used in liquid recirculation around a pump. Used as a bypass flow regulator in fuel oil systems. For general air, oil, water, and gas services. May be used in cryogenic gas or liquids or sour gas service. Not recommended for steam service.

### STANDARD/GENERAL SPECIFICATIONS

**Body Size:** 1/8" or 1/4" (DN6 or 8) with NPT female pipe threads. Inlet connection size is equal to outlet connection size.

**Body Orientation:** Three to choose from:
Globe: Side inlet, side outlet.
Angle: Side inlet, bottom outlet.
Flow-Thru: Two side inlets, bottom outlet.

**Body Material:** Forged Bronze - ASTM B283, Alloy 37700.
316/316L SST- Barstock ASTM A479

**Spring Chamber Material:** Bronze or 316/316L SST

**Diaphragm:** Metal – 302 SST. Composition – Buna-N. See Table 2.
Phos. Bronze See Table 2.

**Seat:** Metal – 303 SST. See Table 2.
Brass B16- See Table 2

**Gaskets:** PTFE

**Temperature Range:** SST Diaphragm: -325 to +300°F (-198 to +149°C).
Buna-N Diaphragm: -20 to +200°F (-29 to +94°C).
Gylon Diaphragm: -325 to +300°F (-198 to +149°C).
Phos.Bronze Diaphragm: -325 to +200°F (-198 to +148°C)

**Maximum Design Pressure:** 525 psig (36.2 Barg).

**Range Springs:**

| Spring Ranges | |
|---|---|
| psig | (Barg) |
| 2 - 15 | (.14 - 1.0) |
| 2 - 30 | (.14 - 2.1) |
| 10 - 50 | (.69 - 3.5) |
| 40 - 90 | (2.8 - 6.2) |
| 40-125 | (2.8 - 8.6) |
| 100-175 | (6.9-12.0) |
| 150-400 | (10.3-27.6) |

**Cv's / Capacities:** Up to 0.46 Cv (0.40 kv) (See Table 4.)

## OPTION SPECIFICATIONS

**Option-2:** HANDWHEEL. Plastic handwheel for frequent set point changes.

**Option-5:** CRYOGENIC CONSTRUCTION. Metal diaphragm with B0 or S2 Trim only. SST adjusting screw. Cleaned for oxygen service per Cashco Spec. #S-1134. Applicable temperature range -325° to +300°F (-198° to +149°C). Mount in horizontal piping with adjusting screw oriented downwards.

**Option -36:** SST CRYOGENIC CONSTRUCTION. Same specifications as Option -5, except with SST body/spring chamber material.

**Option-40:** 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. SST body/spring chamber material only. S40G only trim selection available.

**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. Not suitable for oxygen service.

## TECHNICAL SPECIFICATIONS

**TABLE 1**
**BODY AND SPRING CHAMBER**
**MAXIMUM PRESSURE WITH TEMPERATURE RATINGS**

| Materials Body/Sp. Ch./TDN | Inlet Pressure * | | Temperature | |
|---|---|---|---|---|
| | psig | (Barg) | °F | (°C) |
| BRZ/BRZ/S2 or SST.SST/ (S2 or S40G) | 525 | (36.2) | -325 to +100 | (-198 to +38) |
| | 390 | (26.9) | -325 to +150 | (-198 to +66) |
| | 375 | (25.8) | -325 to +200 | (-198 to +93) |
| | 350 | (24.1) | -325 to +250 | (-198 to +121) |
| | 325 | (22.4) | -325 to +300 | (-198 to +149) |
| BRZ/BRZ/S2B or SST/SST/S2B | 525 | (36.2) | -20 to +100 | (-29 to +38) |
| | 390 | (26.9) | -20 to + 150 | (-29 to +66) |
| | 375 | (25.8) | -20 to + 200 | (-29 to +93) |
| * Inlet and outlet at same Pressure vs. Temperature ratings. | | | | |

**TABLE 2**
**TRIM MATERIAL COMBINATIONS**

| Part | Trim Designation Number | | | |
|---|---|---|---|---|
| | S2 * | S2B | S40G NACE | B0 |
| Diaphragm | 302 SST | Buna-N | Gylon | Phos. Bronze |
| Plug | 303 SST | 303 SST | 316 SST | Brass B16 |
| Seat Ring | 303 SST | 303 SST | 316 SST | Brass B16 |
| * For cryogenic applications | | | | |

**TABLE 3**
**MISCELLANEOUS MATERIALS**

| Part | Material |
|---|---|
| Pressure Plate Nut & Lock Washer | SST |
| Pressure Plate | Brass |
| Diaphragm Stop | Brass |
| Spring Button | Brass |
| Range Spring | SST |
| Adjusting Screw & Lock Nut | Std. – Plated CS |

**TABLE 4**
**CAPACITY - Cv ($F_L$ = 0.90)**
**1/8" or 1/4" (DN6 or DN8) Sizes**

| Setpoint ($P_1$) Pressure | | Metal Diaphragm % Build | | | | Composition Diaphragm % Build | | | | Wide Open |
|---|---|---|---|---|---|---|---|---|---|---|
| psig | (Barg) | 5% | 10% | 20% | 30% | 5% | 10% | 20% | 30% | |
| 10 | (.69) | .03 | .07 | .17 | .27 | .04 | .09 | .22 | .35 | 0.50 |
| 25 | (1.72) | .03 | .08 | .20 | .30 | .05 | .10 | .24 | .38 | |
| 50 | (3.44) | .08 | .19 | .25 | .36 | .11 | .24 | .32 | .46 | |
| 100 | (6.9) | .07 | .16 | .24 | .34 | .09 | .20 | .30 | .44 | |
| 150 | (10.3) | .07 | .16 | .25 | .36 | .09 | .20 | .32 | .46 | |
| 250 | (17.2) | .08 | .18 | .22 | .30 | .08 | .20 | .24 | .34 | |
| 300 | (20.7) | .06 | .16 | .20 | — | .07 | .18 | .22 | — | |
| 345 | (23.8) | .07 | — | — | — | .08 | — | — | — | |

**METRIC CONVERSION FACTOR: Cv / 1.16 = kv**

**TABLE 5 — AIR CAPACITY – SCFH**
**S.G. = 1.0 T = 60°F $F_L$ = 0.90**
**All Sizes – Composition Diaphragm Only**

| Outlet Pressure (psig) | Setpoint Pressure (psig) | 1/8" (DN6) Body % Build | | | | 1/4" (DN8) Body % Build | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 5% | 10% | 20% | 30% | 5% | 10% | 20% | 30% |
| ATM | 10 | 40 | 80 | 210 | 340 | 40 | 80 | 210 | 340 |
| | 25 | 70 | 150 | 380 | 630 | 70 | 150 | 380 | 630 |
| | 50 | 260 | 590 | 850 | 1300 | 260 | 590 | 850 | 1300 |
| | 100 | 380 | 880 | 1430 | SONIC | 380 | 880 | 1430 | 2250 |
| | 150 | 550 | 1270 | SONIC | SONIC | 550 | 1270 | 2210 | 2250 |
| | 250 | 790 | SONIC | SONIC | SONIC | 790 | 2050 | 2680 | 2250 |
| | 300 | 820 | SONIC | SONIC | HI BUILD | 820 | 2200 | SONIC | HI BUILD |
| | 345 | 1070 | HI BUILD | HI BUILD | HI BUILD | 1070 | HI BUILD | HI BUILD | HI BUILD |
| 25 | 50 | 250 | 560 | 800 | 1220 | 250 | 560 | 800 | 1220 |
| | 100 | 380 | 880 | 1430 | 2250 | 380 | 880 | 1430 | 2250 |
| | 150 | 550 | 1270 | 2210 | 3420 | 550 | 1270 | 2210 | 3420 |
| | 250 | 790 | 2050 | 2680 | 4100 | 790 | 2050 | 2680 | 4100 |
| | 300 | 820 | 2200 | 2920 | HI BUILD | 820 | 2200 | 2920 | HI BUILD |
| | 345 | 1070 | HI BUILD | HI BUILD | HI BUILD | 1070 | HI BUILD | HI BUILD | HI BUILD |
| 50 | 100 | 360 | 830 | 1350 | 2120 | 360 | 830 | 1350 | 2120 |
| | 150 | 540 | 1260 | 2190 | 3380 | 540 | 1260 | 2190 | 3380 |
| | 250 | 790 | 2050 | 2680 | 4100 | 790 | 2050 | 2680 | 4100 |
| | 300 | 820 | 2200 | 2920 | HI BUILD | 820 | 2200 | 2920 | HI BUILD |
| | 345 | 1070 | HI BUILD | HI BUILD | HI BUILD | 1070 | HI BUILD | HI BUILD | HI BUILD |
| 100 | 150 | 460 | 1070 | 1850 | 2860 | 460 | 1070 | 1850 | 2860 |
| | 250 | 770 | 2010 | 2610 | 4000 | 770 | 2010 | 2610 | 4000 |
| | 300 | 810 | 2180 | 2900 | HI BUILD | 810 | 2180 | 2900 | HI BUILD |
| | 345 | 1070 | HI BUILD | HI BUILD | HI BUILD | 1070 | HI BUILD | HI BUILD | HI BUILD |
| 150 | 250 | 700 | 1820 | 2380 | 3630 | 700 | 1820 | 2380 | 3630 |
| | 300 | 770 | 2070 | 2750 | HI BUILD | 770 | 2070 | 2750 | HI BUILD |
| | 345 | 1030 | HI BUILD | HI BUILD | HI BUILD | 1030 | HI BUILD | HI BUILD | HI BUILD |

**NOTE:** 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. Max. flow will be approximately the last indicated value in the column above "SONIC".

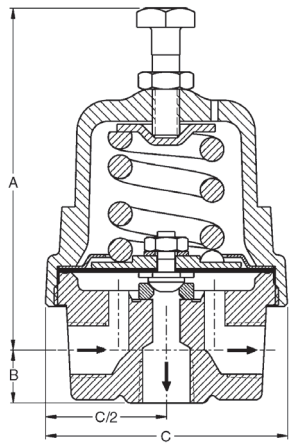
**METRIC CONVERSION FACTORS: psig / 14.5 = Barg; SCFH / 35.31 = $Sm^3/Hr$; SCFH / 37.32 = $Nm^3/Hr$**

**TABLE 6 — WATER CAPACITY – GPM**
**S.G. = 1.0 T = 60°F $F_L$ = 0.90**
**All Sizes – Composition Diaphragm Only**

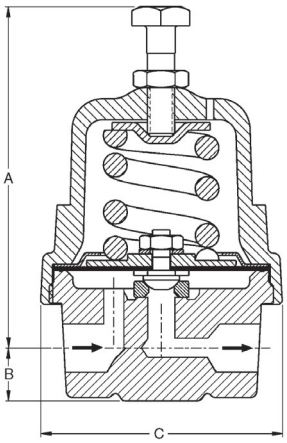
| Outlet Pressure (psig) | Setpoint Pressure (psig) | 1/8" (DN6) Body % Build | | | | 1/4" (DN8) Body % Build | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 5% | 10% | 20% | 30% | 5% | 10% | 20% | 30% |
| 0 | 10 | 0.1 | 0.3 | 0.8 | 1.3 | 0.1 | 0.3 | 0.8 | 1.3 |
| | 25 | 0.3 | 0.5 | 1.4 | 1.9 | 0.3 | 0.5 | 1.4 | 1.9 |
| | 50 | 0.7 | 1.6 | 2.2 | 3.3 | 0.7 | 1.6 | 2.2 | 3.3 |
| | 100 | 0.8 | 1.9 | 3.2 | 4.5 | 0.8 | 1.9 | 3.2 | 4.5 |
| | 150 | 1.0 | 2.3 | 3.9 | 5.8 | 1.0 | 2.3 | 3.9 | 5.8 |
| | 250 | 1.2 | 3.0 | 3.7 | 5.5 | 1.2 | 3.0 | 3.7 | 5.5 |
| | 300 | 1.1 | 2.9 | 3.8 | HI BUILD | 1.1 | 2.9 | 3.8 | HI BUILD |
| | 345 | 1.4 | HI BUILD | HI BUILD | HI BUILD | 1.4 | HI BUILD | HI BUILD | HI BUILD |
| 5 | 10 | 0.1 | 0.2 | 0.6 | 1.0 | 0.1 | 0.2 | 0.6 | 1.0 |
| | 25 | 0.2 | 0.5 | 1.3 | 2.0 | 0.2 | 0.5 | 1.3 | 2.0 |
| | 50 | 0.8 | 1.7 | 2.2 | 3.3 | 0.8 | 1.7 | 2.2 | 3.3 |
| | 100 | 0.8 | 1.9 | 3.2 | 4.5 | 0.8 | 1.9 | 3.2 | 4.5 |
| | 150 | 1.0 | 2.3 | 3.9 | 5.8 | 1.0 | 2.3 | 3.9 | 5.8 |
| | 250 | 1.2 | 3.0 | 3.7 | 5.5 | 1.2 | 3.0 | 3.7 | 5.5 |
| | 300 | 1.1 | 2.9 | 3.8 | HI BUILD | 1.1 | 2.9 | 3.8 | HI BUILD |
| | 345 | 1.4 | HI BUILD | HI BUILD | HI BUILD | 1.4 | HI BUILD | HI BUILD | HI BUILD |
| 10 | 25 | 0.2 | 0.4 | 1.1 | 1.8 | 0.2 | 0.4 | 1.1 | 1.8 |
| | 50 | 0.7 | 1.6 | 2.3 | 3.3 | 0.7 | 1.6 | 2.3 | 3.3 |
| | 100 | 0.8 | 1.9 | 3.2 | 4.5 | 0.8 | 1.9 | 3.2 | 4.5 |
| | 150 | 1.0 | 2.3 | 3.9 | 5.8 | 1.0 | 2.3 | 3.9 | 5.8 |
| | 250 | 1.2 | 3.0 | 3.7 | 5.5 | 1.2 | 3.0 | 3.7 | 5.5 |
| | 300 | 1.1 | 2.9 | 3.8 | HI BUILD | 1.1 | 2.9 | 3.8 | HI BUILD |
| | 345 | 1.4 | HI BUILD | HI BUILD | HI BUILD | 1.4 | HI BUILD | HI BUILD | HI BUILD |
| 15 | 25 | 0.2 | 0.4 | 1.0 | 1.6 | 0.2 | 0.4 | 1.0 | 1.6 |
| | 50 | 0.7 | 1.5 | 2.1 | 3.3 | 0.7 | 1.5 | 2.1 | 3.3 |
| | 100 | 0.9 | 1.9 | 3.2 | 4.5 | 0.9 | 1.9 | 3.2 | 4.5 |
| | 150 | 1.0 | 2.3 | 3.9 | 5.8 | 1.0 | 2.3 | 3.9 | 5.8 |
| | 250 | 1.2 | 3.0 | 3.7 | 5.5 | 1.2 | 3.0 | 3.7 | 5.5 |
| | 300 | 1.1 | 2.9 | 3.8 | HI BUILD | 1.1 | 2.9 | 3.8 | HI BUILD |
| | 345 | 1.4 | HI BUILD | HI BUILD | HI BUILD | 1.4 | HI BUILD | HI BUILD | HI BUILD |
| 25 | 50 | 0.6 | 1.3 | 1.9 | 2.9 | 0.6 | 1.3 | 1.9 | 2.9 |
| | 100 | 0.8 | 1.8 | 3.2 | 4.5 | 0.8 | 1.8 | 3.2 | 4.5 |
| | 150 | 1.0 | 2.3 | 3.9 | 5.8 | 1.0 | 2.3 | 3.9 | 5.8 |
| | 250 | 1.2 | 3.0 | 3.7 | 5.5 | 1.2 | 3.0 | 3.7 | 5.5 |
| | 300 | 1.1 | 2.9 | 3.8 | HI BUILD | 1.1 | 2.9 | 3.8 | HI BUILD |
| | 345 | 1.4 | HI BUILD | HI BUILD | HI BUILD | 1.4 | HI BUILD | HI BUILD | HI BUILD |

**METRIC CONVERSION FACTORS: psig / 14.5 = Barg; GPM x 3.785 = LPM**

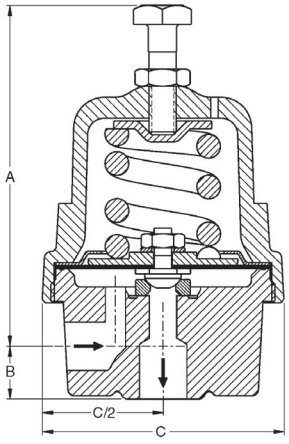
# DIMENSIONS & WEIGHT




FLOW-THRU BODY DESIGN




GLOBE BODY DESIGN




ANGLE BODY DESIGN

**ENGLISH UNITS – inches & lbs.**

| Option No. | DIMENSION - Inch | | | Weight - lbs. |
|---|---|---|---|---|
| | A | B | C * | |
| Std. | 3.38 | 0.50 | 2.25 | 1.1 |
| -2 | 3.69 | | | |
| * Face to Face is 1.79". | | | | |

**METRIC UNITS – mm & kg**

| Option No. | DIMENSION - mm | | | Weight - kg. |
|---|---|---|---|---|
| | A | B | C * | |
| Std. | 89 | 13 | 57 | 0.5 |
| -2 | 94 | | | |
| * Face to Face is 45 mm. | | | | |

# MODEL CA-1 PRODUCT CODER 04/23/18

An “X” in POS 12 followed by a 5-digit control number overrides remaining selections.

| A1 | POS 3 | — | POS 5 | POS 6 & 7 | 7 | — | 1 | POS 11 | POS 12 | POS 13 | 0 | 0 | POS 16 | 0 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| POSITION 3 - SIZE | | | |
|---|---|---|---|
| Size | | Connection Orientation | CODE |
| in | (DN) | | |
| 1/8" | (6) | Globe — side inlet side outlet | 1 |
| 1/4" | (8) | | 2 |
| 1/8" | (6) | Angle — side inlet, bottom outlet | B |
| 1/4" | (8) | | C |
| 1/8" | (6) | Flow-Thru — two side inlets, bottom outlet | F |
| 1/4" | (8) | | G |

| POSITION 5 - BODY / SPRING CHAMBER MATERIAL | |
|---|---|
| Material | CODE |
| Brass | 3 |
| SST * | A |
| * Select for NACE | |

| POSITION 6 & 7 - TRIM DESIGNATION NO. | |
|---|---|
| SST Trim | |
| Desig. | CODE |
| S2 * | S2 |
| S2B | SB |
| S40G NACE | SG |
| B0 | B0 |
| * Select For Cryogenic Service | |

| POSITION 11 - RANGE SPRING | | |
|---|---|---|
| psig | (Barg) | CODE |
| 2 - 15 | (.14 - 1.0) | A |
| 2 - 30 | (.14 - 2.1) | B |
| 10 - 50 | (.69 - 3.4) | C |
| 40 - 90 | (2.8 - 6.2) | D |
| 40 -125 | (2.8 - 8.6) | E |
| 100 -175 | (6.9-12.1) | F |
| 150 -400 | (10.3 -27.6) | G |

| POSITION 12 - TRIM OPTIONS | | |
|---|---|---|
| Description | Option | CODE |
| No Option | — | 0 |
| For Special Construction Contact Cashco for Special Product Code. | SPQ | X |

| POSITION 13 - FEATURE OPTIONS | | |
|---|---|---|
| Description | Option | CODE |
| No Option | - | 0 |
| Handwheel * | -2 | 2 |
| * Not available with Cryogenic Construction. | | |

| POSITION 16 - CERTIFICATE OPTIONS | | |
|---|---|---|
| Description | Option | CODE |
| No Option | — | 0 |
| Brass Cryogenic Constr. Includes Opt-55 - Special Cleaning. Must select trim No. B0 or S2. | -5 | 5 |
| SST Cryogenic Constr. Includes Opt-55 - Special Cleaning. Must select trim No. S2. | -36 | 6 |
| NACE Construction: SST/SST/SG Trim Per MR0175. | -40 | K |
| Special Cleaning: Per Cashco Spec #S-1134. Suitable for oxygen service. | -55 | M |
| Special Cleaning: Per Cashco Spec #S-1542. | -56 | N |

# MODEL CA-2

## BACK PRESSURE / RELIEF REGULATOR

**MODEL CA-2**

**⚠ CAUTION**

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

The Model CA-2 is a compact, forged Bronze body or SST barstock body back pressure regulator used to control inlet pressure level between atmospheric and 610 psig (42.0 Barg) by relieving excess pressure.

## FEATURES

**Self-Aligning Plug/Seat:** Seat ring floats within mechanically-contained zone.

**Tight Shutoff:** Lapped seat surfaces allow for leakage rates to approach levels of composition seats.

## APPLICATIONS

Widely used in liquid recirculation around a pump. Used as a bypass flow regulator in fuel oil systems. For general air, oil, water, and gas services. May be used in cryogenic gas or liquids or sour gas service. Not recommended for steam service.

## STANDARD/GENERAL SPECIFICATIONS

**Body Size:** 1/4", 3/8" or 1/2" (DN8, 10 or 15) with NPT female pipe threads. Inlet connection size is equal to outlet connection size.

**Body Orientation:** Three to choose from:
Globe: Side inlet, side outlet.
Angle: Side inlet, bottom outlet.
Flow-Thru: Two side inlets, bottom outlet.

**Body Material:** Forged Bronze - ASTM B283, Alloy 37700.
316/316L SST- Barstock ASTM A479

**Spring Chamber Material:** Bronze or 316/316L SST

**Diaphragm:** Metal – 302 SST. Composition – Buna-N. See Table 2.

**Seat:** Metal - 303 SST. See Table 2.

**Gaskets:** PTFE

**Temperature Range:** SST Diaphragm: -325 to +300°F (-198 to +149°C).
Buna-N Diaphragm: -20 to +200°F (-29 to +94°C).
Gylon Diaphragm: -325 to +300°F (-198 to +149°C).

**Maximum Design Pressure:** 600 psig (41.3 Barg).

**Range Springs:**

| Spring Ranges | |
|---|---|
| psig | (Barg) |
| 3 - 30 | (.21- 2.8) |
| 30 - 50 | (2.8 - 3.4) |
| 50 - 80 | (3.4 - 5.5) |
| 80-150 | (5.5-10.3) |
| 150-250 | (10.3-17.2) |
| 250-400 | (17.2-27.6) |
| 300-610 | (20.7-42.0) |

**Cv's / Capacities** Up to 0.97 Cv (0.84 kv) (See Table 4.)

## OPTION SPECIFICATIONS

**Option-1:** CLOSING CAP. Removable cap discourages tampering with range spring setting.

**Option-2:** HANDWHEEL. Plastic handwheel for frequent set point changes.

**Option-5:** CRYOGENIC CONSTRUCTION. Metal diaphragm S2 Trim only. SST adjusting screw. Cleaned for oxygen service per Cashco Spec. #S-1134. Applicable temperature range -325° to +300°F (-198° to +149°C). Mount in horizontal piping with adjusting screw oriented downwards.

**Option-22:** PANEL MOUNTING. Includes a locknut and a handwheel.

**Option -36:** SST CRYOGENIC CONSTRUCTION. Same specifications as Option -5, except with SST body/spring chamber material.

**Option-40:** 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. SST body/spring chamber material only. S40G only trim selection available.

**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. Not suitable for oxygen service.

## TECHNICAL SPECIFICATIONS

**TABLE 1**
**BODY AND SPRING CHAMBER**
**MAXIMUM PRESSURE WITH TEMPERATURE RATINGS**

| Materials | Inlet Pressure* | | Temperature | |
|---|---|---|---|---|
| Body/Sp. Ch./TDN | psig | (Barg) | °F | (°C) |
| BRZ/BRZ/S2 or SST/SST/ (S2 or S40G) | 600 | (41.4) | -325 to +100 | (-198 to +38) |
| | 490 | (33.8) | -325 to +150 | (-198 to +66) |
| | 470 | (32.4) | -325 to +200 | (-198 to +93) |
| | 440 | (30.3) | -325 to +250 | (-198 to +121) |
| | 410 | (28.3) | -325 to +300 | (-198 to +149) |
| BRZ/BRZ/S2B or SST/SST/S2B | 600 | (41.4) | -20 to +100 | (-29 to +38) |
| | 490 | (33.8) | -20 to +150 | (-29 to +66) |
| | 470 | (32.4) | -20 to +200 | (-29 to +93) |
| * Inlet and outlet at same Pressure vs. Temperature ratings. | | | | |

**TABLE 2**
**TRIM MATERIAL COMBINATIONS**

| Part | Trim Designation Number | | |
|---|---|---|---|
| | S2 * | S2B | S40G NACE |
| Diaphragm | 302 SST | Buna-N | Gylon |
| Plug | 303 SST | 303 SST | 316 SST |
| Seat Ring | 303 SST | 303 SST | 316 SST |
| * For cryogenic applications | | | |

**TABLE 3**
**MISCELLANEOUS MATERIALS**

| Part | Material |
|---|---|
| Pressure Plate Nut & Lock Washer | SST |
| Pressure Plate | Brass |
| Diaphragm Stop | Brass |
| Spring Button | Brass |
| Range Spring | SST |
| Adjusting Screw & Lock Nut | Std. – Plated CS |

**TABLE 4**
**CAPACITY - Cv ($F_L$ = 0.90)**
**1/4", 3/8" or 1/2" (DN8, DN10 or DN15) Sizes**

| Setpoint ($P_1$) Pressure psig | (Barg) | Metal Diaphragm % Build | | | | Composition Diaphragm % Build | | | | Wide Open |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 5% | 10% | 20% | 30% | 5% | 10% | 20% | 30% | |
| 10 | (.69) | .13 | .29 | .51 | .69 | .19 | .40 | .70 | .95 | 1.0 |
| 25 | (1.72) | .14 | .32 | .55 | .71 | .20 | .54 | .75 | .97 | |
| 50 | (3.44) | .11 | .26 | .45 | .68 | .17 | .36 | .62 | .90 | |
| 100 | (6.9) | .11 | .26 | .45 | .68 | .15 | .32 | .55 | .72 | |
| 150 | (10.3) | .12 | .27 | .45 | .65 | .16 | .35 | .58 | .78 | |
| 250 | (17.2) | .12 | .24 | .38 | .56 | .14 | .29 | .53 | .68 | |
| 300 | (20.7) | .14 | .29 | .46 | .67 | .17 | .35 | .64 | .82 | |
| 350 | (24.1) | .17 | .34 | .53 | .78 | .20 | .41 | .74 | .95 | |
| 400 | (27.6) | .19 | .38 | .61 | .90 | .22 | .46 | .85 | 1.00 | |

**METRIC CONVERSION FACTOR: Cv / 1.16 = kv**

## TABLE 5 — AIR CAPACITY – SCFH
### S.G. = 1.0 T = 60°F $F_L$ = 0.90
### All Sizes – Composition Diaphragm Only

| Outlet Pressure (psig) | Setpoint Pressure (psig) | 1/4" & 3/8" (DN8 & DN10) Body Size | | | | 1/2" (DN15) Body Size | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | % Build | | | | % Build | | | |
| | | 5% | 10% | 20% | 30% | 5% | 10% | 20% | 30% |
| 0 | 10 | 170 | 360 | 660 | 930 | 170 | 360 | 660 | 930 |
| | 25 | 290 | 810 | 1190 | 1620 | 290 | 810 | 1190 | 1620 |
| | 50 | 400 | 890 | 1640 | 2540 | 400 | 890 | 1640 | 2540 |
| | 100 | 640 | 1410 | 2620 | 3690 | 640 | 1410 | 2620 | 3690 |
| | 150 | 980 | 2230 | 4000 | SONIC | 980 | 2230 | 4000 | 5790 |
| | 250 | 1380 | 2980 | SONIC | SONIC | 1380 | 2980 | 5920 | 8190 |
| | 300 | 1990 | 4280 | SONIC | SONIC | 1990 | 4280 | SONIC | SONIC |
| | 350 | 2710 | SONIC | SONIC | SONIC | 2710 | 5820 | SONIC | SONIC |
| | 400 | 3400 | SONIC | SONIC | SONIC | 3400 | 7430 | SONIC | SONIC |
| 25 | 50 | 380 | 840 | 1540 | 2390 | 380 | 840 | 1540 | 2390 |
| | 100 | 630 | 1410 | 2620 | 3680 | 630 | 1410 | 2620 | 3680 |
| | 150 | 980 | 2230 | 4000 | 5790 | 980 | 2230 | 4000 | 5790 |
| | 250 | 1380 | 2980 | 5920 | 8190 | 1380 | 2980 | 5920 | 8190 |
| | 300 | 1990 | 4280 | 8510 | 11770 | 1990 | 4280 | 8510 | 11770 |
| | 350 | 2710 | 5820 | 11420 | SONIC | 2710 | 5820 | 11420 | 15840 |
| | 400 | 3400 | 7430 | SONIC | SONIC | 3400 | 7430 | 14930 | 18990 |
| 50 | 100 | 600 | 1330 | 2470 | 3470 | 600 | 1330 | 2470 | 3470 |
| | 150 | 970 | 2210 | 3960 | 5740 | 970 | 2210 | 3960 | 5740 |
| | 250 | 1380 | 2980 | 5920 | 8190 | 1380 | 2980 | 5920 | 8190 |
| | 300 | 1990 | 4280 | 8510 | 11770 | 1990 | 4280 | 8510 | 11770 |
| | 350 | 2710 | 5820 | 11420 | 15840 | 2710 | 5820 | 11420 | 15840 |
| | 400 | 3400 | 7430 | 14930 | 18990 | 3400 | 7430 | 14930 | 18990 |
| 100 | 150 | 820 | 1870 | 3350 | 4850 | 820 | 1870 | 3350 | 4850 |
| | 250 | 1340 | 2910 | 5770 | 8000 | 1340 | 2910 | 5770 | 8000 |
| | 300 | 1970 | 4240 | 8430 | 11660 | 1970 | 4240 | 8430 | 11660 |
| | 350 | 2700 | 5800 | 11380 | 15780 | 2700 | 5800 | 11380 | 15780 |
| | 400 | 3390 | 7420 | 14920 | 18970 | 3390 | 7420 | 14920 | 18970 |
| 150 | 250 | 1220 | 2640 | 5250 | 7270 | 1220 | 2640 | 5250 | 7270 |
| | 300 | 1870 | 4030 | 8010 | 11090 | 1870 | 4030 | 8010 | 11090 |
| | 350 | 2630 | 5630 | 11060 | 15340 | 2630 | 5630 | 11060 | 15340 |
| | 400 | 3340 | 7300 | 14670 | 18660 | 3340 | 7300 | 14670 | 18660 |

**NOTE:** 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. Max. flow will be approximately the last indicated value in the column above "SONIC".

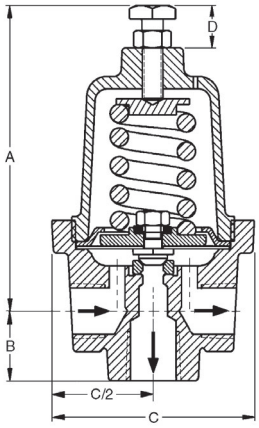
**METRIC CONVERSION FACTORS: psig / 14.5 = Barg; SCFH / 35.31 = $Sm^3/Hr$; SCFH / 37.32 = $Nm^3/Hr$**

## TABLE 6 — WATER CAPACITY – GPM
### S.G. = 1.0 T = 60°F $F_L$ = 0.90
### All Sizes – Composition Diaphragm Only

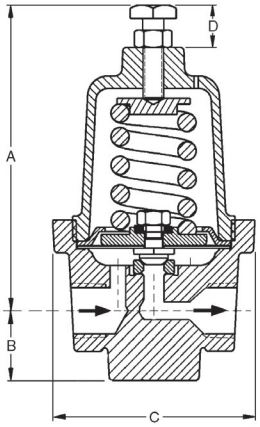
| Outlet Pressure (psig) | Setpoint Pressure (psig) | 1/4" & 3/8" (DN8 & DN10) Body Size | | | | 1/2" (DN15) Body Size | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | % Build | | | | % Build | | | |
| | | 5% | 10% | 20% | 30% | 5% | 10% | 20% | 30% |
| 0 | 10 | 0.6 | 1.3 | 2.4 | 3.4 | 0.6 | 1.3 | 2.4 | 3.4 |
| | 25 | 1.3 | 2.8 | 4.1 | 5.0 | 1.3 | 2.8 | 4.1 | 5.0 |
| | 50 | 1.1 | 2.4 | 4.3 | 6.5 | 1.1 | 2.4 | 4.3 | 6.5 |
| | 100 | 1.4 | 3.0 | 5.4 | 7.4 | 1.4 | 3.0 | 5.4 | 7.4 |
| | 150 | 1.8 | 4.0 | 7.0 | 9.8 | 1.8 | 4.0 | 7.0 | 9.8 |
| | 250 | 2.0 | 4.3 | 8.3 | 11.0 | 2.0 | 4.3 | 8.3 | 11.0 |
| | 300 | 2.7 | 5.7 | 10.9 | 14.6 | 2.7 | 5.7 | 10.9 | 14.6 |
| | 350 | 3.4 | 7.2 | 13.6 | 18.2 | 3.4 | 7.2 | 13.6 | 18.2 |
| | 400 | 4.1 | 8.7 | 16.8 | 20.5 | 4.1 | 8.7 | 16.8 | 20.5 |
| 5 | 10 | 0.4 | 1.0 | 1.9 | 2.7 | 0.4 | 1.0 | 1.9 | 2.7 |
| | 25 | 1.2 | 2.6 | 3.8 | 5.1 | 1.2 | 2.6 | 3.8 | 5.1 |
| | 50 | 1.2 | 2.5 | 4.3 | 6.5 | 1.2 | 2.5 | 4.3 | 6.5 |
| | 100 | 1.4 | 3.0 | 5.4 | 7.4 | 1.4 | 3.0 | 5.4 | 7.4 |
| | 150 | 1.8 | 4.0 | 7.0 | 9.8 | 1.8 | 4.0 | 7.0 | 9.8 |
| | 250 | 2.0 | 4.3 | 8.3 | 11.0 | 2.0 | 4.3 | 8.3 | 11.0 |
| | 300 | 2.7 | 5.7 | 10.9 | 14.6 | 2.7 | 5.7 | 10.9 | 14.6 |
| | 350 | 3.4 | 7.2 | 13.6 | 18.2 | 3.4 | 7.2 | 13.6 | 18.2 |
| | 400 | 4.1 | 8.7 | 16.8 | 20.5 | 4.1 | 8.7 | 16.8 | 20.5 |
| 10 | 25 | 1.0 | 2.3 | 3.4 | 4.6 | 1.0 | 2.3 | 3.4 | 4.6 |
| | 50 | 1.1 | 2.4 | 4.4 | 6.5 | 1.1 | 2.4 | 4.4 | 6.5 |
| | 100 | 1.4 | 3.0 | 5.4 | 7.4 | 1.4 | 3.0 | 5.4 | 7.4 |
| | 150 | 1.8 | 4.0 | 7.0 | 9.8 | 1.8 | 4.0 | 7.0 | 9.8 |
| | 250 | 2.0 | 4.3 | 8.3 | 11.0 | 2.0 | 4.3 | 8.3 | 11.0 |
| | 300 | 2.7 | 5.7 | 10.9 | 14.6 | 2.7 | 5.7 | 10.9 | 14.6 |
| | 350 | 3.4 | 7.2 | 13.6 | 18.2 | 3.4 | 7.2 | 13.6 | 18.2 |
| | 400 | 4.1 | 8.7 | 16.8 | 20.5 | 4.1 | 8.7 | 16.8 | 20.5 |
| 25 | 50 | 0.9 | 2.0 | 3.7 | 5.7 | 0.9 | 2.0 | 3.7 | 5.7 |
| | 100 | 1.3 | 3.0 | 5.4 | 7.4 | 1.3 | 3.0 | 5.4 | 7.4 |
| | 150 | 1.8 | 4.0 | 7.0 | 9.8 | 1.8 | 4.0 | 7.0 | 9.8 |
| | 250 | 2.0 | 4.3 | 8.3 | 11.0 | 2.0 | 4.3 | 8.3 | 11.0 |
| | 300 | 2.7 | 5.7 | 10.9 | 14.6 | 2.7 | 5.7 | 10.9 | 14.6 |
| | 350 | 3.4 | 7.2 | 13.6 | 18.2 | 3.4 | 7.2 | 13.6 | 18.2 |
| | 400 | 4.1 | 8.7 | 16.8 | 20.5 | 4.1 | 8.7 | 16.8 | 20.5 |

**METRIC CONVERSION FACTORS: psig / 14.5 = Barg; GPM x 3.785 = LPM**

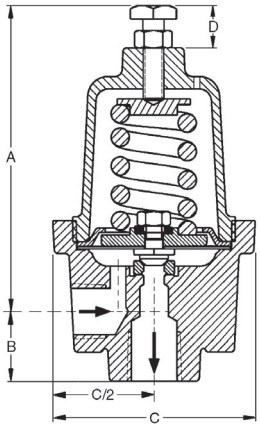
# DIMENSIONS AND WEIGHTS




FLOW-THRU BODY DESIGN




GLOBE BODY DESIGN




ANGLE BODY DESIGN

**ENGLISH UNITS – inches & lbs.**

| Option No. | DIMENSION - Inch | | | | Weight – lbs |
|---|---|---|---|---|---|
| | A | B | C * | D | |
| Std. | 5.38 | 1.06 | 3.12 | – | 3.6 |
| -1 | 5.75 | 1.06 | 3.12 | – | |
| -2 | 5.69 | 1.06 | 3.12 | – | |
| -22 | 5.69 | 1.06 | 3.12 | 1.88 | |
| * Face to Face is 2.53". | | | | | |

**METRIC UNITS – mm & kg**

| Option No. | DIMENSION - mm | | | | Weight – kg |
|---|---|---|---|---|---|
| | A | B | C * | D | |
| Std. | 137 | 27 | 79 | – | 1.6 |
| -1 | 146 | 27 | 79 | – | |
| -2 | 145 | 27 | 79 | – | |
| -22 | 145 | 27 | 79 | 48 | |
| * Face to Face is 64 mm. | | | | | |

# MODEL CA-2 PRODUCT CODER 04/23/18

An "X" in POS 12 followed by a 5-digit control number overrides remaining selections.

| A2 | POS 3 | — | POS 5 | POS 6 & 7 | 7 | — | 1 | POS 11 | POS 12 | POS 13 | 0 | 0 | POS 16 | 0 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| POSITION 3 - SIZE | | | |
|---|---|---|---|
| Size | | Connection Orientation | CODE |
| in | (DN) | | |
| 1/4" | (8) | Globe — side inlet side outlet | 2 |
| 3/8" | (10) | | 3 |
| 1/2" | (15) | | 4 |
| 1/4" | (8) | Angle — side inlet, bottom outlet | C |
| 3/8" | (10) | | D |
| 1/2" | (15) | | E |
| 1/4" | (8) | Flow-Thru — two side inlets, bottom outlet | G |
| 3/8" | (10) | | H |
| 1/2" | (15) | | J |

| POSITION 5 - BODY / SPRING CHAMBER MATERIAL | |
|---|---|
| Material | CODE |
| Brass | 3 |
| SST * | A |
| * Select for NACE | |

| POSITION 6 & 7 - TRIM DESIGNATION NO. | |
|---|---|
| SST Trim | |
| Desig. | CODE |
| S2 * | S2 |
| S2B | SB |
| S40G NACE | SG |
| * Select For Cryogenic Service | |

| POSITION 11 - RANGE SPRING | | |
|---|---|---|
| psig | (Barg) | CODE |
| 3 - 30 | (.21-2.1) | K |
| 30 - 50 | (2.1 - 3.4) | L |
| 50 - 80 | (3.4 - 5.5) | M |
| 80-150 | (5.5 -10.3) | N |
| 150-250 | (10.3-17.2) | P |
| 250-400 | (17.2-27.6) | S |
| 300-610 | (20.7-42.0) | T |

| POSITION 12 - TRIM OPTIONS | | |
|---|---|---|
| Description | Option | CODE |
| No Option | — | 0 |
| For Special Construction Contact Cashco for Special Product Code. | SPQ | X |

| POSITION 13 - FEATURE OPTIONS | | |
|---|---|---|
| Description | Option | CODE |
| No Option | - | 0 |
| Closing Cap. | -1 | 1 |
| Handwheel * | -2 | 2 |
| Panel Mounting - Includes Opt-2 * | -22 | C |
| * Not available with Cryogenic Construction. | | |

| POSITION 16 - CERTIFICATE OPTIONS | | |
|---|---|---|
| Description | Option | CODE |
| No Option | — | 0 |
| Brass Cryogenic Constr. Includes Opt-55 - Special Cleaning. Must select trim No. S2. | -5 | 5 |
| SST Cryogenic Constr. Includes Opt-55 - Special Cleaning. Must select trim No. S2. | -36 | 6 |
| NACE Construction: SST/SST/SG Trim Per MR0175. | -40 | K |
| Special Cleaning: Per Cashco Spec #S-1134. Suitable for oxygen service. | -55 | M |
| Special Cleaning: Per Cashco Spec #S-1542. | -56 | N |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