



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 bronze or stainless steel back pressure regulator used to control inlet pressure level between atmospheric and 400 psig (27.6 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. Use stainless steel only for 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:** ASTM B62 C83600  
 (may substitute with ASTM B16 C36000)  
 ASTM A479 S31600/S31603

**Spring Chamber Material:** ASTM B62 C83600  
 ASTM A479 S31600/S31603

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

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

**Gaskets:** PTFE

**Temperature Range:** See Table 2.

**Maximum Design Pressure:** See Table 1.

**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:** S2 trim limits design pressure rating to 375 psig (26 Barg).

**Option-56:** SPECIAL CLEANING. Cleaned per Cashco Spec. #S-1542. Not suitable for oxygen service.

## TECHNICAL SPECIFICATIONS

**TABLE 1**  
CONTAINMENT PRESSURE VS. TEMPERATURE RATINGS PER ASME B31.3

See Table 2 for trim pressure/temperature limitations

| Materials<br>Body/Spring<br>Chamber | Inlet & Outlet-<br>Pressure |       | Temperature |             |
|-------------------------------------|-----------------------------|-------|-------------|-------------|
|                                     | psi                         | (BAR) | °F          | °C          |
| BRZ/BRZ                             | 525                         | 36.2  | -325 to 100 | -198 to 38  |
|                                     | 490                         | 33.7  | 150         | 66          |
|                                     | 470                         | 32.4  | 200         | 93          |
|                                     | 455                         | 31.3  | 250         | 121         |
|                                     | 435                         | 30.0  | 300         | 149         |
|                                     | 275                         | 18.9  | 400         | 204         |
| SST/SST                             | 525                         | 36.2  | -425 to 600 | -254 to 315 |

**TABLE 3**  
CAPACITY - Cv (F<sub>L</sub> = 0.90)  
1/8" or 1/4" (DN6 or DN8) Sizes

| Setpoint (P <sub>1</sub> )<br>Pressure |        | Metal Diaphragm |     |     |     | Composition Diaphragm |     |     |     | Wide<br>Open |
|----------------------------------------|--------|-----------------|-----|-----|-----|-----------------------|-----|-----|-----|--------------|
|                                        |        | % Build         |     |     |     | % Build               |     |     |     |              |
| psig                                   | (Barg) | 5%              | 10% | 20% | 30% | 5%                    | 10% | 20% | 30% | 0.50         |
| 10                                     | (.69)  | .03             | .07 | .17 | .27 | .04                   | .09 | .22 | .35 |              |
| 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 2**  
TRIM MATERIAL COMBINATIONS

| Part                                   | Trim Designation Number          |                             |                              |                                  |
|----------------------------------------|----------------------------------|-----------------------------|------------------------------|----------------------------------|
|                                        | S2                               | S2B                         | S40G<br>NACE                 | B0                               |
| Diaphragm                              | 302 SST                          | Buna-N                      | Gylon                        | Phos. Bronze                     |
| Gaskets                                | PTFE                             | N/A                         | N/A                          | PTFE                             |
| Plug                                   | 303 SST                          | 303 SST                     | 316 SST                      | Brass B16                        |
| Seat Ring                              | 303 SST                          | 303 SST                     | 316 SST                      | Brass B16                        |
| Pressure Plate<br>Nut & Lock<br>Washer | SST                              | SST                         | SST                          | SST                              |
| Pressure Plate                         | Brass                            | Brass                       | Brass                        | Brass                            |
| Diaphragm Stop                         | Brass                            | Brass                       | Brass                        | Brass                            |
| Spring Button                          | Brass                            | Brass                       | Brass                        | Brass                            |
| Range Spring                           | SST                              | SST                         | SST                          | SST                              |
| Adjusting Screw<br>& Lock Nut          | Plated CS (std)<br>or SST (cryo) | Plated CS                   | Plated CS                    | Plated CS (std)<br>or SST (cryo) |
| Maximum<br>Working<br>Pressure         | 400 psi<br>27.6 BAR              | 400 psi<br>27.6 BAR         | 400 psi<br>27.6 BAR          | 400 psi<br>27.6 BAR              |
| Standard<br>Temperature<br>Range       | -20 to 300°F<br>-29 to 149°C     | -20 to 200°F<br>-29 to 93°C | -20 to 300°F<br>-29 to 149°C | -20 to 300°F<br>-29 to 149°C     |
| Cryogenic<br>Temperature<br>Range      | -325 to 300°F<br>-198 to 149°C   | N/A                         | N/A                          | -325 to 300°F<br>-198 to 149°C   |

**TABLE 4 — AIR CAPACITY – SCFH**  
**S.G. = 1.0 T = 60°F F<sub>L</sub> = 0.90**  
**All Sizes – Composition Diaphragm Only**

| Outlet Pressure<br>(psig) | Setpoint Pressure<br>(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 |
| 25                        | 345                         | 1070                    | HI BUILD | HI BUILD | HI BUILD | 1070                    | HI BUILD | HI BUILD | HI BUILD |
|                           | 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".

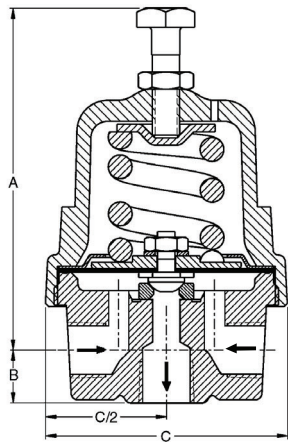
**METRIC CONVERSION FACTORS:** psig / 14.5 = Barg; SCFH / 35.31 = Sm<sup>3</sup>/Hr; SCFH / 37.32 = Nm<sup>3</sup>/Hr

**TABLE 5 — WATER CAPACITY – GPM**  
**S.G. = 1.0 T = 60°F F<sub>L</sub> = 0.90**  
**All Sizes – Composition Diaphragm Only**

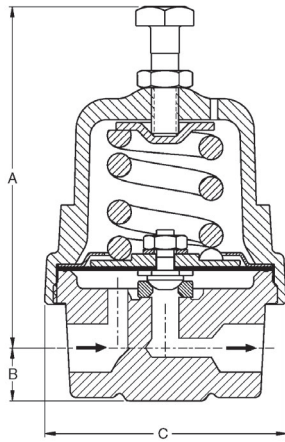
| Outlet Pressure<br>(psig) | Setpoint Pressure<br>(psig) | 1/8" (DN6) Body % Build |          |          |          | 1/4" (DN8) Body % Build |          |          |          |
|---------------------------|-----------------------------|-------------------------|----------|----------|----------|-------------------------|----------|----------|----------|
|                           |                             | 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

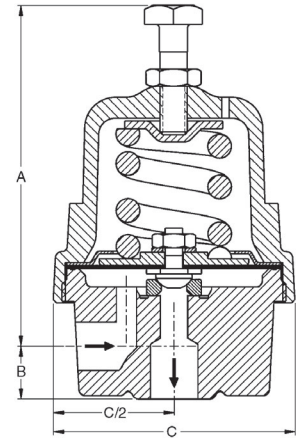
# DIMENSIONS & WEIGHT



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. |                |    |     |              |

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# MODEL CA-1 PRODUCT CODER 08/26/21

**A****1** POS 3 — POS 5 POS 6 & 7 **7** — **1** POS 11 **0** 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             | <b>1</b> |
| 1/4"              | (8)  |                                            | <b>2</b> |
| 1/8"              | (6)  | Angle — side inlet, bottom outlet          | <b>B</b> |
| 1/4"              | (8)  |                                            | <b>C</b> |
| 1/8"              | (6)  | Flow-Thru — two side inlets, bottom outlet | <b>F</b> |
| 1/4"              | (8)  |                                            | <b>G</b> |

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

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

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

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

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

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



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.

## MODEL CA-2

### BACK PRESSURE / RELIEF REGULATOR

The Model CA-2 is a compact bronze or stainless steel back pressure regulator used to control inlet pressure level between atmospheric and 610 psig (42.0 Barg) by relieving excess pressure.

### FEATURES

|                                 |                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------|
| <b>Self-Aligning Plug/Seat:</b> | Seat ring floats within mechanically-contained zone.                                  |
| <b>Tight Shutoff:</b>           | 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:** ASTM B62 C83600  
 ASTM A479 S31600/S31603

**Spring Chamber Material:** ASTM B62 C83600  
 ASTM A479 S31600/S31603

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

**Seat:** Metal - 303 SST, Monel® R-405  
 See Table 2.

**Gaskets:** PTFE

**Temperature Range:** See Table 2.

**Maximum Design Pressure:** See Table 1.

**Range Springs:**

| Spring Ranges |             |
|---------------|-------------|
| psig          | (Barg)      |
| 3 - 30        | (.21- 2.1)  |
| 30 - 50       | (2.1 - 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 limited to 375 psig (26 Barg) when used with S2, S2B, and S40G trim.

**Option-56:** SPECIAL CLEANING. Cleaned per Cashco Spec. #S-1542. Not suitable for oxygen service.

## TECHNICAL SPECIFICATIONS

**TABLE 1**

CONTAINMENT PRESSURE VS. TEMPERATURE RATINGS PER ASME B31.3

See Table 2 for trim pressure/temperature limitations

| Materials<br>Body/Spring<br>Chamber | Inlet & Outlet-<br>Pressure |       | Temperature |             |
|-------------------------------------|-----------------------------|-------|-------------|-------------|
|                                     | psi                         | (BAR) | °F          | °C          |
| BRZ/BRZ                             | 610                         | 42.0  | -325 to 100 | -198 to 38  |
|                                     | 605                         | 41.7  | 150         | 66          |
|                                     | 600                         | 41.3  | 200         | 93          |
|                                     | 560                         | 38.6  | 250         | 121         |
|                                     | 530                         | 36.5  | 300         | 149         |
|                                     | 485                         | 33.4  | 400         | 204         |
| SST/SST                             | 610                         | 42.0  | -425 to 600 | -254 to 315 |

**TABLE 3**

**CAPACITY - Cv (F<sub>L</sub> = 0.90)  
1/8" or 1/4" (DN6 or DN8) Sizes**

| Setpoint (P.)<br>Pressure |        | Metal Diaphragm |     |     |     | Composition Diaphragm |     |     |      | Wide<br>Open |
|---------------------------|--------|-----------------|-----|-----|-----|-----------------------|-----|-----|------|--------------|
|                           |        | % Build         |     |     |     | % Build               |     |     |      |              |
| psig                      | (Barg) | 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 2**

TRIM MATERIAL COMBINATIONS

| Part                                   | Trim Designation Number             |                             |                              |                                     |
|----------------------------------------|-------------------------------------|-----------------------------|------------------------------|-------------------------------------|
|                                        | S2                                  | S2B                         | S40G<br>NACE                 | M7                                  |
| Diaphragm                              | 302 SST                             | Buna-N                      | Gylon                        | Phos. Brz.                          |
| Gaskets                                | PTFE                                | N/A                         | N/A                          | PTFE                                |
| Plug                                   | 303 SST                             | 303 SST                     | 316 SST                      | Monel® R-405                        |
| Seat Ring                              | 303 SST                             | 303 SST                     | 316 SST                      | Monel® R-405                        |
| Pressure Plate<br>Nut & Lock<br>Washer | SST                                 | SST                         | SST                          | SST                                 |
| Pressure Plate                         | Brass                               | Brass                       | Brass                        | Brass                               |
| Diaphragm Stop                         | Brass                               | Brass                       | Brass                        | Brass                               |
| Spring Button                          | Brass                               | Brass                       | Brass                        | Brass                               |
| Range Spring                           | SST                                 | SST                         | SST                          | SST                                 |
| Adjusting Screw<br>& Lock Nut          | Plated CS (std)<br>or<br>SST (cryo) | Plated CS                   | Plated CS                    | Plated CS (std)<br>or<br>SST (cryo) |
| Maximum<br>Working<br>Pressure         | 610 psi<br>42.0 BAR                 | 610 psi<br>42.0 BAR         | 610 psi<br>42.0 BAR          | 610 psi<br>42.0 BAR                 |
| Standard<br>Temperature<br>Range       | -20 to 300°F<br>-29 to 149°C        | -20 to 200°F<br>-29 to 93°C | -20 to 300°F<br>-29 to 149°C | -20 to 300°F<br>-29 to 149°C        |
| Cryogenic<br>Temperature<br>Range      | -325 to 300°F<br>-198 to 149°C      | N/A                         | N/A                          | -325 to 300°F<br>-198 to 149°C      |

**TABLE 4 — AIR CAPACITY – SCFH**  
**S.G. = 1.0 T = 60°F F<sub>L</sub> = 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 |
| 25                     | 400                      | 3400                               | SONIC | SONIC | SONIC | 3400                  | 7430 | SONIC | SONIC |
|                        | 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 |
|                        | 150                      | 820                                | 1870  | 3350  | 4850  | 820                   | 1870 | 3350  | 4850  |
|                        | 250                      | 1340                               | 2910  | 5770  | 8000  | 1340                  | 2910 | 5770  | 8000  |
| 100                    | 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 |
|                        | 250                      | 1220                               | 2640  | 5250  | 7270  | 1220                  | 2640 | 5250  | 7270  |
| 150                    | 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".

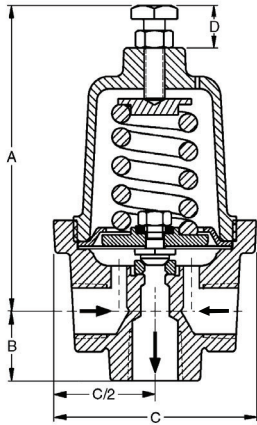
**METRIC CONVERSION FACTORS:** psig / 14.5 = Barg; SCFH / 35.31 = Sm<sup>3</sup>/Hr; SCFH / 37.32 = Nm<sup>3</sup>/Hr

**TABLE 5 — WATER CAPACITY – GPM**  
**S.G. = 1.0 T = 60°F F<sub>L</sub> = 0.90**  
**All Sizes – Composition Diaphragm Only**

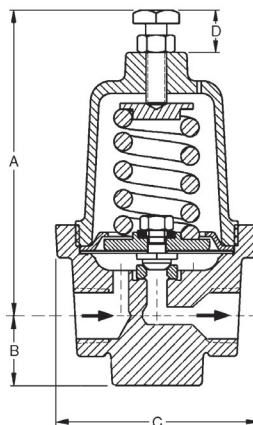
| Outlet Pressure (psig) | Setpoint Pressure (psig) | 1/4" & 3/8" (DN8 & DN10) Body Size |      |      |      | 1/2" (DN15) Body Size |      |      |      |
|------------------------|--------------------------|------------------------------------|------|------|------|-----------------------|------|------|------|
|                        |                          | % 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 |
| 5                      | 400                      | 4.1                                | 8.7  | 16.8 | 20.5 | 4.1                   | 8.7  | 16.8 | 20.5 |
|                        | 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 |
| 10                     | 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                       | 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 |
| 25                     | 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 |
|                        | 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

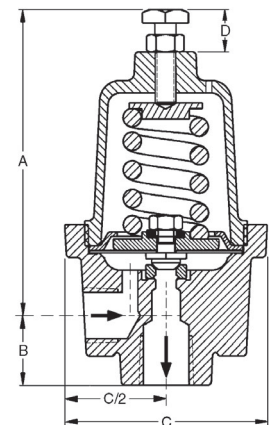
## DIMENSIONS AND WEIGHTS



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 2.46". |                  |      |      |      |              |

### 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. |                |    |     |    |             |

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# MODEL CA-2 PRODUCT CODER 08/26/21

**A** **2** POS 3 — POS 5 POS 6 & 7 **7** — **1** POS 11 **0** POS 13 **0** **0** POS 16 POS 17 **A**

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

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

| POSITION 6 & 7 - TRIM DESIGNATION NO. |           |
|---------------------------------------|-----------|
| Desig.                                | CODE      |
| S2 *                                  | <b>S2</b> |
| S2B                                   | <b>SB</b> |
| S40G NACE                             | <b>SG</b> |
| M7 *                                  | <b>M7</b> |
| * Select For Cryogenic Service        |           |

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

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

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

| POSITION 16 - CERTIFICATE OPTIONS                                                                      |        |          |
|--------------------------------------------------------------------------------------------------------|--------|----------|
| Description                                                                                            | Option | CODE     |
| No Option                                                                                              | —      | <b>0</b> |
| <u>Brass Cryogenic Constr.</u><br>Includes special cleaning #S-1134.<br>Must select trim No. S2 or M7. | -5     | <b>5</b> |
| <u>SST Cryogenic Constr.</u><br>Includes special cleaning #S-1134.<br>Must select trim No. S2 or M7.   | -36    | <b>6</b> |
| NACE Construction: SST/SST/SG Trim Per MR0175.                                                         | -40    | <b>K</b> |

| POSITION 17 - CERTIFICATE OPTIONS                                          |        |          |
|----------------------------------------------------------------------------|--------|----------|
| Description                                                                | Option | CODE     |
| No Option                                                                  | —      | <b>0</b> |
| Special Cleaning: Per Cashco Spec #S-1134.<br>Suitable for oxygen service. | -55    | <b>M</b> |
| Special Cleaning: Per Cashco Spec #S-1542.                                 | -56    | <b>N</b> |

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