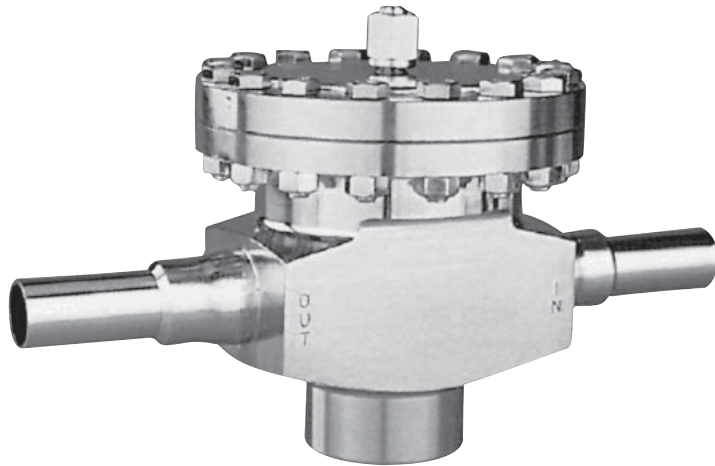




ISO Registered Company

MODELS CA4 and SA4



Model CA4
(Investment Casting)

**ULTRA HIGH PURITY
PRESSURE REDUCING REGULATORS**

**Dome Loaded:
3/4" - 2" (DN20 – DN50)**

Models CA4 and SA4 are high performance dome loaded, flow-to-open pressure reducing regulators with internal pressure balancing piston-cylinder that provides medium flow capacity and high pressure drop capability.

FEATURES

- All SST wetted trim materials.
- Electro-polished.
- Tube-end connections.
- High pressure capability.
- Body Finish -15 μ-in. Ra average surface finish is standard. (Opt.-77 10 μ-in. Ra average surface finish available for Barstock body only).
- In-line maintenance.

APPLICATIONS

For “electronic grade” and other ultra high purity fluids. For either gaseous or liquid service. Most common fluids are high purity oxygen, nitrogen, hydrogen and argon. (A “special” variation including Hastelloy C internal parts is available for anhydrous HCl; consult factory.).

TECHNICAL SPECIFICATIONS

BODY SIZES

3/4", 1", 1-1/2", 2"
(DN20, 25, 40, 50)

OUTLET PRESSURE RANGE

5 – 300 psig (.34 – 20.7 Barg)

MAXIMUM INLET PRESSURE

Up to 3000 psig (207 Barg)
Function of body size and elastomeric internal materials. See Table 1 for Design Pressure vs. Temperature Ratings, and maximum operating pressures. (Internals can withstand a full vacuum.)

TEMPERATURE RANGE

-20 to +400° F (-29° to +204° C)
Function of elastomeric internal materials. See Table 1.

TECHNICAL SPECIFICATIONS (cont.)

FLOW CAPACITY

| Body Size - Form - C _v | | | |
|-----------------------------------|----------|--------|--------------------|
| in | (DN) | Form | Max C _v |
| 3/4" 1" | (20, 25) | IC, BS | 3.5 |
| 1-1/2" | (40) | BS | 11.0 |
| 2" | (50) | BS | 18.0 |

HELIUM LEAK TEST

Inboard leakage less than 1×10^{-9} std cc/sec, actual test.

END CONNECTIONS

Tube-ends for buttwelding using orbital welder. Wall thickness = 0.065 in. (1.65 mm); Nominal Body Size = Tube OD.

AGGREGATE INTERNAL LEAKAGE

Combination of dynamic seal and seat leakage rates:
0.000 1% of rated Cv.

MATERIAL SPECIFICATIONS

BODY FORM

IC - Investment Casting; 3/4" & 1" (DN20 & 25).
BS - Barstock; All sizes.

SURFACE FINISH

Metallic parts are electro-polished, passivated, and ultrasonically cleaned to Cashco cleaning spec. #S-1662.

BODY MATERIALS - SST

IC - ASTM A351, Gr. CF3M.
BS - ASTM A479, Tp. 316L.

Surface Finish - μ-in.

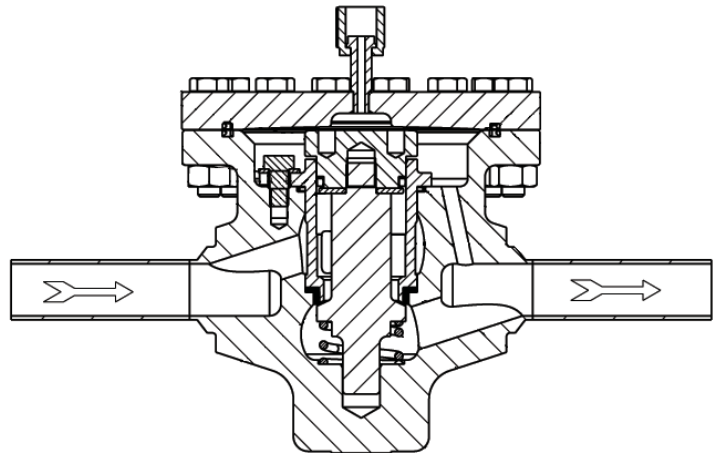
| | |
|------------------|-----------|
| Metal Trim Parts | 15 Ra Avg |
|------------------|-----------|

Alternate: See Opt-77.

Loading Chamber fabricated from materials of 316L SST.

INTERNAL TRIM & MISC MATERIALS

Trim - 316L SST
Diaphragm - 17-7PH SST
Static Seals - FKM - Fluorocarbon
 Elastomer O-ring;
 TFE/SST U-cup
Dynamic Seal - Type "CP": TFE+FKM;
 Type "UC": TFE/SST
Seat - PolyAll (GN2, Ar, H2)
 V-TFE (GOX)
 CTFE (All above fluids)
Lower Piston Spring - 17-7PH SST;
 316 SST
Cap Screws - Ag-plated SST
Flange Bolting - SST
Diaphragm Seal - Ag-jacketed C-ring



OPTION SPECIFICATIONS

OPT-77: 10 μ-in Ra AVG. SURFACE FINISH. For Barstock body only. Body and trim electro-polished to 10 μ-in Ra average surface finish.

**TABLE 1
MAXIMUM DESIGN PRESSURE vs. TEMPERATURE:
MAXIMUM OPERATING PRESSURES, TEMPERATURES,
PRESSURE DROPS AND Cv FLOW CAPACITY**

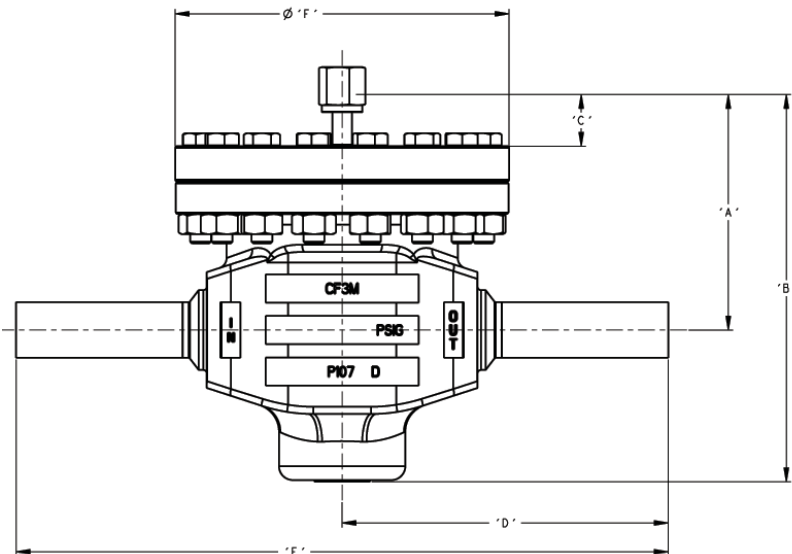
**NOTE: The below ratings may be further "derated" by limitations thru the
Pressure Equipment Directive (97/23/EC-May '97')**

| Size in (DN) | Form | Design Pressure * | | Temperature Range °F | Seat | Maximum Operating Pressures | | | | | |
|--------------------|----------------|-------------------|----------------|----------------------------|---------|-----------------------------|----------------|------------|---------------|----------------|------------|
| | | Inlet psig | Outlet psig | | | GAS | | | LIQUID ** | | |
| | | | | | | Inlet psig | Outlet psig | ΔP psid | Inlet psig | Outlet psig | ΔP psid |
| 3/4" (20) | IC or BS | 3000 | 600 | -20 to +225 | PolAll | 1050 | 300 | 750 | 900 | 300 | 600 |
| | | 3000 | 600 | -20 to +300 | V-TFE | 900 | 300 | 600 | 600 | 300 | 300 |
| | | 2895 | 600 | 400 | | 3000 | 300 | 2950 | 900 | 300 | 600 |
| | | 3000 | 600 | -20 to +300 | CTFE | 2945 | 300 | 2895 | | | |
| | | 2945 | 600 | 350 | | 2315 | 300 | 2265 | 900 | 300 | 600 |
| 1" (25) | IC or BS | 2400 | 600 | -20 to +225 | PolyAll | 1050 | 300 | 750 | 900 | 300 | 600 |
| | | 2400 | 600 | -20 to +300 | V-TFE | 900 | 300 | 600 | 600 | 300 | 300 |
| | | 2230 | 600 | 400 | | 2400 | 300 | 2350 | 900 | 300 | 600 |
| | | 2400 | 600 | -20 to +300 | CTFE | 2315 | 300 | 2265 | | | |
| | | 2315 | 600 | 350 | | 1540 | 300 | 1490 | 900 | 300 | 600 |
| 1-1/2" (40) | BS | 1600 | 600 | -20 to +225 | PolyAll | 1050 | 300 | 750 | 900 | 300 | 600 |
| | | 1600 | 600 | -20 to +300 | V-TFE | 900 | 300 | 600 | 600 | 300 | 300 |
| | | 1485 | 600 | 400 | | 1600 | 300 | 1550 | 900 | 300 | 600 |
| | | 1600 | 600 | -20 to +300 | CTFE | 1540 | 300 | 1490 | | | |
| | | 1540 | 600 | 350 | | 1115 | 600 | 400 | 1200 | 300 | 1150 |
| 2" (50) | BS | 1200 | 600 | -20 to +225 | PolyAll | 1050 | 300 | 750 | 900 | 300 | 600 |
| | | 1200 | 600 | -20 to +300 | V-TFE | 900 | 300 | 600 | 600 | 300 | 300 |
| | | 1115 | 600 | 400 | | 1200 | 300 | 1150 | 900 | 300 | 600 |
| | | 1200 | 600 | -20 to +300 | CTFE | 1155 | 300 | 1105 | | | |
| | | 1155 | 600 | 350 | | | | | | | |

* For fluid containment only. - Exceeding these levels of pressure will damage internals and may render unit inoperable.

** Non-Cavitating Liquid.

DIMENSIONS & WEIGHTS



| English Units (in) | | | | | | | | Wt lbs. |
|--------------------|------|------|------|------|------|-------|--------|------------|
| Size | Form | A | B | C | D | E | F dia. | |
| 3/4" | IC | 4.50 | 7.25 | 1.00 | 5.37 | 10.75 | 6.00 | 25 |
| 1" | BS | 4.50 | 7.25 | 1.00 | 5.87 | 11.75 | 6.00 | |
| 1-1/2" | BS | 5.25 | 8.44 | 1.00 | 6.75 | 13.50 | 8.00 | 50 |
| 2" | | 5.81 | 9.69 | 1.00 | 8.37 | 16.75 | 9.97 | 80 |

| Metric Units (mm) | | | | | | | | Wt kgs. |
|-------------------|------|-----|-----|-----|-----|-----|--------|------------|
| DN | Form | A | B | C | D | E | F dia. | |
| 20 | IC | 114 | 184 | 254 | 136 | 273 | 152 | 12 |
| 25 | BS | 114 | 184 | 254 | 149 | 298 | 152 | |
| 40 | BS | 133 | 214 | 254 | 171 | 343 | 203 | 23 |
| 50 | | 148 | 246 | 254 | 212 | 425 | 253 | 37 |

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MODELS CA4 & SA4 PRODUCT CODER

03/11/16



| POSITIONS 1 & 2 - MODEL | |
|--------------------------|------|
| Body | CODE |
| SA4 - Barstock | B4 |
| CA4 - Investment Casting | C4 |
| See Positions 3 & 5 | |

| POSITION 3 - SIZE & STYLE | | | | |
|---------------------------|------|----------|--------------------|------|
| Size | | Barstock | Investment Casting | CODE |
| in. | (DN) | | | |
| 3/4" | (20) | Yes | Yes | B |
| 1" | (25) | | | C |
| 1-1/2" | (40) | | No | E |
| 2" | (50) | | | F |

| POSITION 5 - BODY/LOADING CHAMBER | |
|--|------|
| Materials | CODE |
| CF3M/316L SST Inv. Casting 3/4" and 1" Size ONLY (Select "C4" in Position 1 & 2) | C |
| 316L SST/316L SST Barstock Body (Select "B4" in Position 1 & 2) | S |

| POSITION 7 - TRIM MATERIALS | | | | | | |
|--|----------------|-------------|---------|-------------------|-----------------------|------|
| Inlet Pressure | Service | Diaphragm | Seat | Seals | | CODE |
| | | | | Static | Dynamic | |
| P ₁ ≤ 750 psig (51.7 Barg) | GOX | 17-7 PH SST | V-TFE | FKM | Type "CP"; TFE+FKM | S |
| | GN2, Ar, H2 | 17-7 PH SST | PolyAll | FKM | Type "CP"; TFE+FKM | P |
| | | 17-7 PH SST | PolyAll | U-Cup; TFE/SST | Type "UC"; TFE/SST | U |
| | * ALL | 17-7 PH SST | V-TFE | U-Cup; TFE/SST | Type "UC"; TFE/SST | W |
| P ₁ ≤ 3000 psig (207 Barg) | * ALL | 17-7 PH SST | CTFE | U-Cup; TFE/SST | Type "UC"; TFE/SST | H |

* ALL = GOX, GN2, Ar, H2 and He.

| POSITION 8 - Product Classification Under European "Pressure Equipment Directive" | | |
|---|----------------------------------|------|
| PRODUCT DESTINATION | HAZARD CATEGORY | CODE |
| Anywhere except Europe | N/A | 7 |
| European Countries * (CE Mark does not apply to DN25 and below) | Sound Engineering Practice (SEP) | S |
| | CE Marked Hazard Cat I or II | E |

* For products to be placed in service in Europe - Ref to Directive 97/23/EC. Forward Completed "EU" Application Recorder prior to quotation. (Without Recorder- Processing of Purchase Order will be delayed). Contact Cashco for Assistance.

| POSITION 16 - SURFACE FINISH | | | |
|-------------------------------|----------|--|------|
| Body | Option | Description | CODE |
| Barstock & Investment Casting | Standard | Ultra High Purity Electro-Polish to 15 Ra Average Finish. Cleaned to Spec #S-1662. | 0 |
| Barstock ONLY | -77 | Ultra High Purity Electro-Polish to 10 Ra Average Finish. Cleaned to Spec #S-1662. | 4 |

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