

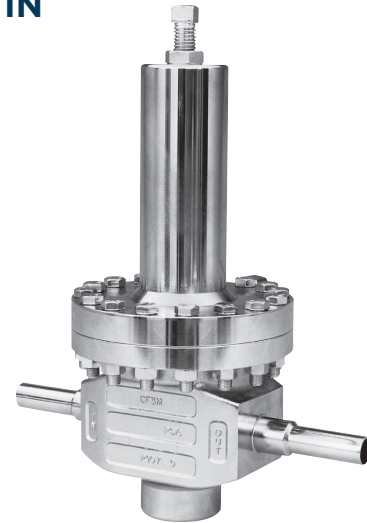


ISO Registered Company



# MODELS CA1 & SA1

## ULTRA HIGH PURITY PRESSURE REDUCING REGULATOR



**MODEL CA1**  
(Investment Casting)

### OVERVIEW

Models CA1 and SA1 are high performance spring-operated, 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 - Internal Surface Only  
Barstock Body - 10 μ-in R<sub>a</sub> average surface finish.
- 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, helium and argon.



### LINE SIZES AVAILABLE

3/4" (DN20), 1" (DN25), 1-1/2" (DN40), 2" (DN50)



### END CONNECTIONS

TUBE-ENDS FOR BUTTWELDING USING ORBITAL WELDER



### COMMON APPLICATIONS

GAS, LIQUID, HIGH PURITY OXYGEN, NITROGEN, HYDROGEN, HELIUM, ARGON



### DESIGN PRESSURE

INLET: UP TO 3000 psig (207 Barg)  
OUTLET: 5-300 psig (0.34-20.7 Barg)

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## TECHNICAL SPECIFICATIONS

### BODY SIZES

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

### 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.)

### OUTLET PRESSURE RANGE

5 – 300 psig (.34 – 20.7 Barg)

In multiple spring ranges. Maximum available controlled pressure a function of body size. See Position 11 of "Product Coder" for available range springs.

### TEMPERATURE RANGE

-20 to +400° F (-29° to +204° C)

Function of elastomeric internal materials. See Table 1.

### FLOW CAPACITY

Function of body form:

Body Size		Max Cv
in	(DN)	
3/4", 1"	(20,25)	3.5
1-1/2"	(40)	11.0
2"	(50)	18.0

### 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.

### HELIUM LEAK TEST

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

## MATERIAL SPECIFICATIONS

### BODY FORM

BS - Barstock; All sizes.

### BODY MATERIALS - SST

BS - ASTM A479, Tp. 316L.

Spring Chamber fabricated from materials of 316L SST.

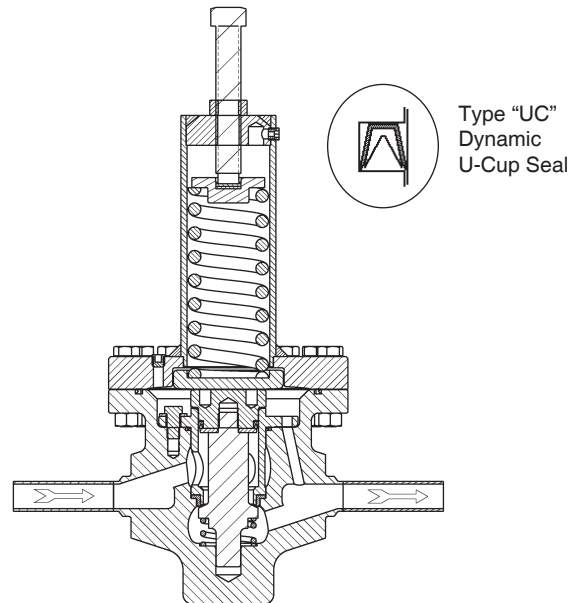
### INTERNAL TRIM & MISC MATERIALS

<u>Trim</u>	- 316L SST
<u>Diaphragm</u>	- 17-7PH SST
<u>Static Seals</u>	- U-CUP: TFE/SST
<u>Dynamic Seal</u>	- Type "UC": TFE/SST or CTFE/SST
<u>Seat</u>	- PolyAll (GN2, He, Ar, H2) V-TFE (All above fluids) CTFE (All above fluids)
<u>Lower Piston Spring</u>	- 17-7PH SST;
<u>Cap Screws</u>	- Ag-plated SST
<u>Flange Bolting</u>	- SST
<u>Adjusting Screw</u>	- Ag-plated SST
<u>Diaphragm Seal</u>	- FFKM-Perfluoroelastomer Elastomer O-ring

### SURFACE FINISH

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

Surface Finish - μ-in.		
Barstock	Metal Trim Parts	10 R <sub>a</sub> Avg



## OPTION SPECIFICATIONS

**OPT-1: CLOSING CAP.** Modification to top of spring chamber to include a 316L SST closing cap to cover adjusting screw and discourage frequent adjusting of the set point.

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

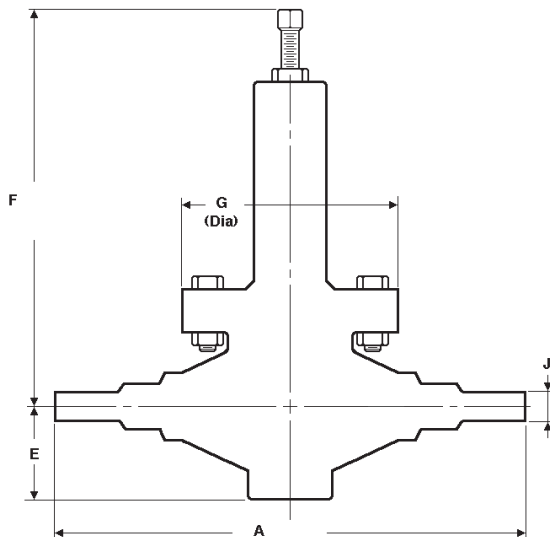
**NOTE: The below ratings may be further "derated" by limitations through the Pressure Equipment Directive (2014/68/EU)**

Size in (DN)	Design Pressure *		Temperature Range °F	Seat	Maximum Operating Pressures						Max Flow Capacity			
	Inlet psig	Outlet psig			GAS			LIQUID **			Form			
					Inlet psig	Outlet psig	ΔP psid	Inlet psig	Outlet psig	ΔP psid	Wideopen		20% Droop Cv	
											IC	BS	IC	BS
3/4' (20)	3000	600	-20 to +225	PolAll	1050	300	750	900	300	600	3.5	3.5	3.0	3.0
	3000	600	-20 to +300	V-TFE	900	300	600	600	300	300				
	2895	600	400											
	3000	600	-20 to +300	CTFE	3000	300	2950	900	300	600				
	2945	600	350		2945	300	2895							
1" (25)	2400	600	-20 to +225	PolyAll	1050	300	750	900	300	600	3.5	3.5	3.0	3.0
	2400	600	-20 to +300	V-TFE	900	300	600	600	300	300				
	2230	600	400											
	2400	600	-20 to +300	CTFE	2400	300	2350	900	300	600				
	2315	600	350		2315	300	2265							
1-1/2" (40)	1600	600	-20 to +225	PolyAll	1050	300	750	900	300	600	-	11.0	-	9.8
	1600	600	-20 to +300	V-TFE	900	300	600	600	300	300				
	1485	600	400											
	1600	600	-20 to +300	CTFE	1600	300	1550	900	300	600				
	1540	600	350		1540	300	1490							
2" (50)	1200	600	-20 to +225	PolyAll	1050	300	750	900	300	600	-	18.0	-	16.0
	1200	600	-20 to +300	V-TFE	900	300	600	600	300	300				
	1115	600	400											
	1200	600	-20 to +300	CTFE	1200	300	1150	900	300	600				
	1155	600	350		1155	300	1105							

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

\*\* Non-Cavitating Liquid.

## DIMENSIONS & WEIGHTS



Size in	ENGLISH UNITS						Weight (lbs.)
	Dimension (inches)						
	A	E	F	F- Opt-1	G	J	
3/4"	10.75	2.75	11.75	12.92	6.00	.75	30
1"	11.75	2.75	11.75	12.92	6.00	1.00	
1-1/2"	13.50	3.19	14.00	15.81	8.00	1.50	55
2"	16.75	3.88	18.00	18.75	10.00	2.00	85

Size (DN)	METRIC UNITS						Weight (kg)
	Dimension (mm)						
	A	E	F	F- Opt-1	G	J	
(20)	273	70	298	328	152	19.1	14
(25)	298	70	298	328	152	25.4	
(40)	343	81	356	402	203	38.1	25
(50)	425	99	457	476	254	50.8	39

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# MODELS CA1 & SA1 PRODUCT CODER

08/09/21

**B**1 POS 3 — **S** **L** POS 7 **7** — **T** POS 11 **3** **0** POS 14 **0** **0** **0** **D**

POSITION 3 - SIZE & STYLE		
Size		CODE
in.	(DN)	
3/4"	(20)	B
1"	(25)	C
1-1/2"	(40)	E
2"	(50)	F

POSITION 7 - TRIM MATERIALS							
Inlet Pressure	Service	Diaphragm	Seat	Seals			CODE
				Static	Dynamic	Diaphragm Seal	
P <sub>1</sub> ≤ 375 <sup>1</sup> PSIG	GOX	17-7 PH SST	V-TFE	U-CUP SST/TFE	FFKM		C
	ALL <sup>2</sup>		V-TFE				N
ALL <sup>2</sup>			POLLYALL				E
P <sub>1</sub> ≤ 750 PSIG	ALL <sup>2</sup>		CTFE				R
	ALL <sup>2</sup>	CTFE	Z				

<sup>1</sup>: PER CGA-4.4  
<sup>2</sup>: GN2, Ar, H2, and He

POSITION 11 - RANGE SPRING							
Body Size	Pressure Range		CODE	Body Size	Pressure Range		CODE
	psig	(barg)			psig	(barg)	
3/4" & 1" (DN20 & DN25)	5-20	(.34-1.4)	A	2" (DN50)	5-15	(.34-1.0)	M
	10-35	(.69-2.4)	B		10-30	(.69-2.1)	N
	20-80	(1.4-5.5)	C		15-50	(1.0-3.4)	P
	30-150	(2.1-10.3)	D		30-90	(2.1-6.2)	Q
	70-200	(4.8-13.8)	E		50-150	(3.4-10.3)	R
	100-300	(6.9-20.7)	F				
1-1/2" (DN40)	5-20	(.34-1.4)	A				
	15-45	(1.0-3.1)	H				
	10-70	(.69-4.8)	J				
	40-125	(2.8-8.6)	K				
	70-200	(4.8-13.8)	E				

POSITION 14 - SPRING CHAMBER OPTION OPTIONS		
Description	Option	CODE
None	-	0
Closing Cap.	-1	Y

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