MODEL CA-2

BACK PRESSURE / RELIEF REGULATOR



MODEL CA-2

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.

⚠ CAUTION

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

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- 2.1)
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 or Spec. #S-1542. 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).

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 5%	10%	20%	30%	Composition Diaphragm % Build 5%	10%	20%	30%	Wide Open
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".

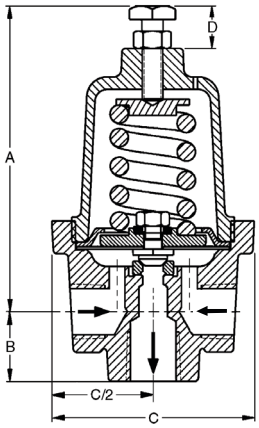
METRIC CONVERSION FACTORS: psig / 14.5 = Barg; SCFH / 35.31 = Sm^3/Hr; SCFH / 37.32 = Nm^3/Hr

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

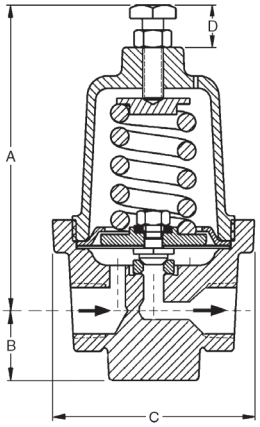
Outlet Pressure (psig)	Setpoint Pressure (psig)	1/4" & 3/8" (DN8 & DN10) Body Size				1/2" (DN15) Body Size			
		% Build				% Build			
		5%	10%	20%	30%	5%	10%	20%	30%
0	10	0.6	1.3	2.4	3.4	0.6	1.3	2.4	3.4
	25	1.3	2.8	4.1	5.0	1.3	2.8	4.1	5.0
	50	1.1	2.4	4.3	6.5	1.1	2.4	4.3	6.5
	100	1.4	3.0	5.4	7.4	1.4	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

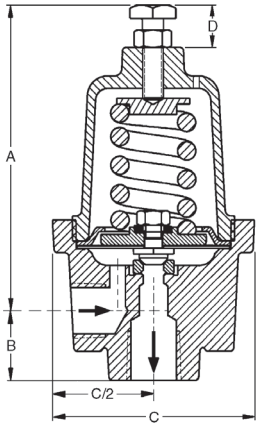
DIMENSIONS AND WEIGHTS



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 2.46".					

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 02/07/20

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	POS 17	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. Must select special cleaning #S-1134 or #S-1542. Must select trim No. S2.	-5	5
SST Cryogenic Constr. Must select special cleaning #S-1134 or #S-1542.. Must select trim No. S2.	-36	6
NACE Construction: SST/SST/SG Trim Per MR0175.	-40	K

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

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

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