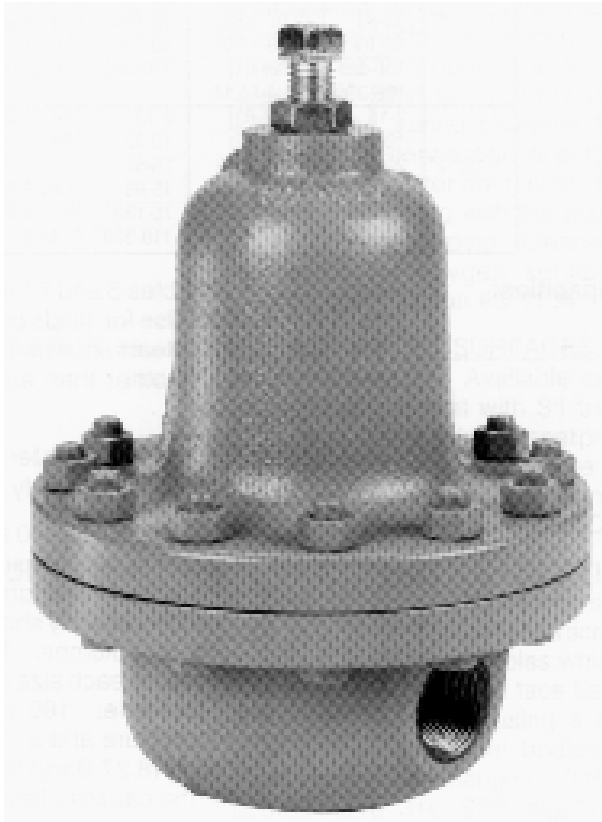




MODEL 123

BACK PRESSURE/RELIEF REGULATOR



MODEL 123

The Model 123 is a relief regulator suitable as a back pressure regulator or bypass valve for controlling inlet pressure between 2 and 350 psig (.13 to 24.1 Barg) (525 psig (36.2 Barg) at 50% build-up). The body has an angle configuration with a side inlet and a bottom outlet. Sizes are 1/2", 3/4", 1", 1-1/2" and 2" (DN15, 20, 25, 40 and 50). Available options include cryogenic construction, NACE construction and a large selection of trim, body and diaphragm materials. It is the most adaptable back pressure/relief regulator Cashco manufactures.

FEATURES

- Versatile:** Four body materials and 19 trim material combinations allow compatibility with most fluids.
- Controlled Compression Composition Seats:** Four composition seat materials are available and all use controlled compression with metal to metal back up for long, trouble free life.
- High Capacity:** A large orifice and diaphragm provide sensitivity with high capacity.

APPLICATIONS

Designed for controlling a wide range of fluids including air, inert gases, cryogenic gas or liquids, sour gas, chemicals, water, fuel oil and steam. *See Table 1 for more information.*



CAUTION

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

STANDARD/GENERAL SPECIFICATIONS

Body Sizes: 1/2", 3/4", 1", 1-1/2" and 2" sizes (DN15,20, 25,40 and 50). Includes one side inlet and a bottom outlet, i.e. angle configuration.

End Connections: Standard: NPT female pipe thread.
Alternate: See Opt-30, -32 or -39 for flanged, extended nipples or socket weld end connections. See Opt -33 for a third body connection.

Body/Spring Chamber Material Combinations: CI/CI, BRZ/CI, BRZ/BRZ, CS/CI, CS/CS, SST/CI, SST/BRZ, SST/CS, SST/SST.

- CI – Cast grey iron
- BRZ – Cast bronze
- CS – Cast carbon steel
- SST – Cast stainless steel

All spring chambers furnished with 1/4" tapped vent hole. See Table 2 for further material specifications.

Operating Temperature: See Tables 2, 3 and 4.

Inlet Pressure: See Tables 2 and 5.

Trim Design: Metal seated or composition seated brass or SST materials. See Figures 1 and 2, and Tables 3 and 4.

Flange Bolting: Standard: Plated Steel
Cryogenic: SST.

Gaskets: Standard: Non-asbestos. NOT SUITABLE FOR OXYGEN SERVICE.
Alternate: See Opt-45.

Diaphragms: SST, Neoprene, Fluorocarbon Elastomer, Phosphor BRZ, EPDM, TFE Coated SST.

Range Springs: Standard: Epoxy coated steel.
Cryogenic: SST.

Valve Size	Standard		Cryogenic	
	Steel Range Spring psig	(Barg)	SST Range Spring psig	(Barg)
1/2"	2-30	(.14-2.07)	2-30	(.14-2.07)
	25-50	(1.72-3.45)	20-60	(1.38-4.14)
	40-100	(2.76-6.90)	50-110	(3.45-7.58)
	80-150	(5.52-10.35)	90-150	(6.21-10.35)
	120-215	(8.28-14.83)	120-245	(8.28-16.90)
	150-350	(10.35-24.14)	220-300	(15.18-20.70)
3/4"-1"	2-20	(.14-1.38)	2-25	(.14-1.72)
	15-40	(1.03-2.76)	20-45	(1.38-3.10)
	30-80	(2.07-5.52)	35-100	(2.41-6.90)
	65-160	(4.48-11.03)	80-210	(5.52-14.48)
	130-205	(9.0-14.1)	170-300	(11.73-20.70)
	165-350	(11.4-24.14)		
1-1/2"-2"	2-15	(.14-1.03)	2-15	(.14-1.03)
	10-25	(.69-1.72)	10-30	(.69-2.07)
	20-55	(1.37-3.79)	25-55	(1.72-3.79)
	45-105	(3.10-7.24)	45-95	(3.10-6.55)
	85-230	(5.86-15.86)	75-130	(5.17-8.97)
	180-350	(12.42-24.14)	110-300	(7.59-20.70)

Capacities: Up to 7 C_v; see Tables 6 and 7 for C_v vs. Set pressure. Use for fluids other than water, air or steam, or when the outlet pressure is other than atmospheric pressure.

See Tables 8, 9 and 10 for water, air or saturated steam, respectively.

Capacities are for 10, 20, 30, 40 and 50% build up over the set pressure. The set pressure is made at approximately 2% of the flow capacity shown in the 20% build up columns. The flow rate is different for each size and set pressure. Example: 100 psig (6.89 Barg) set pressure and a 20% build-up = 120 psig (8.27 Barg) flowing pressure for the capacity listed.

Painting: Standard: CI & CS - Enamel per Cashco Spec. #S-1545. SST or BRZ are non-painted.
Alternate: See Opt-95.



Figure 1: Model 123-33 – Metal Seat Design

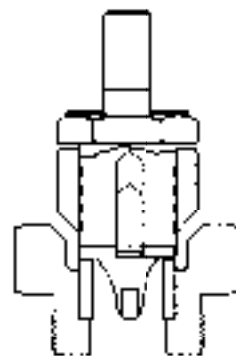


Figure 2: Composition Seat

OPTION SPECIFICATIONS

OPTION-1: CLOSING CAP. Covers the adjusting screw to discourage tampering with the spring setting or for remote venting of the spring chamber. Includes a cast iron or steel spring chamber, a ductile iron closing cap, a gasket for sealing the closing cap to the spring chamber, a sealing lock nut on the adjusting screw and an NPT vent connection in the spring chamber.

OPTION-1+6: DIFFERENTIAL CONSTRUCTION: For differential pressure service. Available in CS/CS or SST/CS materials only. Internal construction includes closing cap, larger pusher plate, an extra diaphragm gasket (for metal diaphragms), a special grooved adjusting screw, a 1/4" NPT female loading pressure connection in spring chamber, and an adjusting screw sealing lock nut. Limited to the use of the lower range springs indicated below and maximum pressure containment levels indicated in Table 2. (See Model 123-1+6+S Technical Bulletin for alternate design.)

Body Size inches (mm)	Range Spring psid (Bard)
1/2" (DN15)	2-30, 25-50, 40-100, 80-150 (0.14-2.1, 1.7-3.4, 2.7-6.9, 5.5-10.3)
3/4" & 1" (DN20 & 25)	2-20, 15-40, 30-80, 65-160 (0.14-1.4, 1.0-2.7, 2.1-5.5, 4.5-11.0)
1-1/2" & 2" (DN40 & 50)	2-15, 10-25, 20-55, 45-105 (0.14-1.0, 0.7-1.7, 1.4-3.8, 3.1-7.2)

• Consult factory for sizing and selection of Differential Model 123's. •

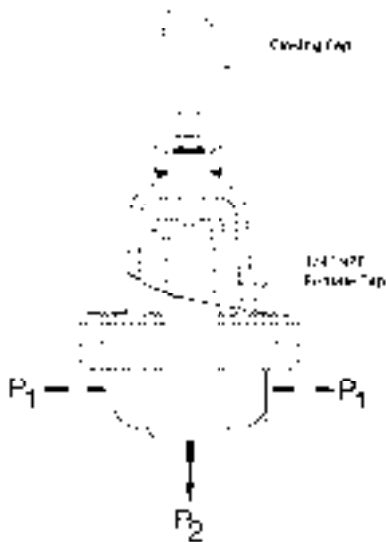


Figure 3: Model 123-1+6
Differential Construction w/Closing Cap

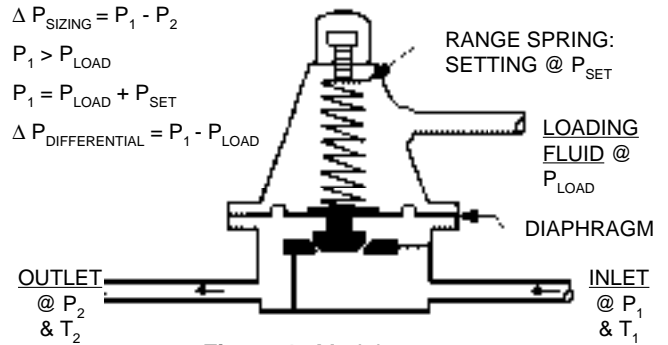


Figure 4: Model 123-1+6
Differential Schematic

OPTION-5: CRYOGENIC CONSTRUCTION. For cryogenic service. Available in 1/2", 3/4", 1", 1-1/2" and 2" (DN15, 20, 25, 40, and 50) sizes with NPT end connections. Trim B5 is standard with this construction. All other wetted parts are brass. Non-wetted metal parts are of brass or SST to operate at temperatures from -325° to +100°F (-198° to +38°C). The spring chamber has a 1/4" NPT vent connection for purge gas and a 1/8" diameter drain hole. Mount in horizontal piping with the adjusting screw below the piping. Cleaned and packaged for oxygen service per Cashco specification #S-1134.

OPTION-15: STELLITED SEAT SURFACES. Stellite faced seating. Available only on 316 SST metal seat with S1 trim. Includes a stellite faced valve seat pressed into the cylinder plus a stellite faced seat cone screwed into the piston. NOT SUITABLE FOR NACE SERVICE.

OPTION-30: FLANGED END CONNECTIONS. 150# or 300# raised face flanges available on all sizes. The body has screwed-in Schedule 80 pipe nipples which are seal welded. The raised face flange is welded to the nipple using a socket weld connection. Steel bodies have steel nipples and flanges. 316 SST bodies have 316 SST nipples and flanges. See Tables 2, 3, and 4 for maximum operating temperatures and pressures. With 150# flanges, the flange pressure rating is the pressure limiting factor. For 300# flanges, the body rating is the pressure limiting factor. Standard is two flanges; with Opt-30+33, a third flange is available.

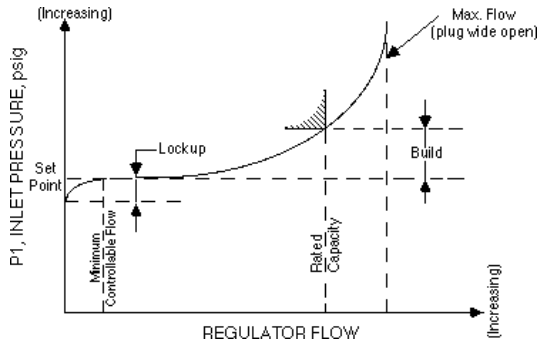
- OPTION-32:** EXTENDED P.E. NIPPLES. Schedule 80 plain end pipe nipples used for field butt or socket welding into pipeline. Pipe nipples of same general chemistry as body material. Short threaded pipe nipples seal welded to body. Use for socket weld pipe systems.
- OPTION-33:** THIRDBODYCONNECTION. This option eliminates a pipe tee when the Model 123 is installed in the pump outlet piping. The bottom connection handles the discharge fluid. NPT and Opt -30, -32 and -39 can be furnished on the third body connection.
- OPTION-36:** SST CRYOGENIC CONSTRUCTION. Same specifications as Opt.-5 except:
- a. For SST/SST body/spring chamber materials.
 - b. S1 and S36 only available trim selections.
 - c. Opt-30 flanged ends available.
- OPTION-39:** SOCKET WELD END CONNECTIONS. Available on all sizes of CS and 316 SST bodies.
- OPTION-40:** NACE CONSTRUCTION: Internal wetted portions meet NACE standard MRO-175 for application in sour gas service. Exterior of the unit not to be directly exposed to a sour gas environment, buried, insulated or otherwise denied direct atmospheric exposure. CS/CS body/spring chamber materials ONLY. Acceptable ONLY with S40, S40T and S40V trim. Diaphragm flange bolting of heat treated steel per ASTM 449 and per NACE Class III. NPT connections ONLY. Not available with Opt-15.
- OPTION-40SST:** SST NACE CONSTRUCTION. Same as Opt.-40, except uses SST/SST or SST/CS body/spring chamber construction.
- OPTION-45:** ALTERNATE NON-ASBESTOS GASKETS. Primarily for oxygen service. Utilizes TFE/Silicate diaphragm gaskets and closing cap (Opt-1) gaskets. Limits temperature range to -20° to +400°F (-29° to +205°C). Not required when using a composition diaphragm.
- OPTION-55:** SPECIAL CLEANING: BRZ or SST body materials only. Cleaning per Cashco Spec. #S-1134. Acceptable cleaning level for oxygen service.
- OPTION-56:** SPECIAL CLEANING: All body materials. Cleaning per Cashco Spec. #S-1542. Not suitable for oxygen service.
- OPTION-95:** EPOXY PAINT: Two-part epoxy coating for severe ambient conditions to minimize external corrosion. Applied to all exposed external parts except those of SST. Per Cashco Spec #S-1547.

APPLICATION AND SELECTION

The following procedure will help determine a suitable selection for an application.

- STEP 1.** FIVE KNOWNNS. The following minimal parameters / information must be available before a selection procedure can begin:
- a. Service Fluid-What is it: Liquid or gas? SG (std. cond.)
 - b. Inlet pressure- P_1 (upstream pressure). How much can P_1 vary as flow varies?
 - c. Outlet pressure- P_2 (downstream pressure).
 - d. Desired capacity - C_V , GPM, SCFH; minimum and maximum.
 - e. Fluid temperature - T_1 , SG (actual)
- STEP 2.** INLET PRESSURE. Assure that the actual design inlet pressure and temperature limits do not exceed the limits established in Table 2. Both body and spring chamber must comply. Consider level of pressure build to be added (see Step 3).
- STEP 3.** PRESSURE BUILD. Once setpoint is reached and valve opens, all self-contained back pressure/relief regulators “build” from a setpoint pressure level as the flow rate increases.
- This deviation in setpoint is described as “% Build”. Build is expressed on increasing flow, starting from a minimum flow level.
- The “% build” must be known to enter the capacity tables. The acceptable level of setpoint deviation should be known for the min-to max flow variation.

A regulator may have a setpoint 10% below the lower stated range spring level. (Nameplates will show the standard ranges.) A setpoint above the higher range spring level is not recommended. Setpoint at the upper limit of a range spring is acceptable. If final setpoint is questionable and ex-



pected near the upper limit, the next higher range spring should be utilized. Best performance will be obtained when the lowest range spring is utilized.

STEP 4.

DIAPHRAGM MATERIAL. Select the diaphragm first considering its temperature limits. See Tables 3 and 4. Composition diaphragms will give approximately an extra 25% in capacity over a metal diaphragm at equal levels of build.

STEP 5.

Systems subject to pulsating inlet pressures should be provided with metal diaphragms.

GASKET MATERIAL. Considering the fluid, determine the compatibility of the gasket material from the two choices offered. (**NOTE: Composition diaphragms do not require gasket selection.**)

STEP 6.

CAPACITY. The five knowns of Step 1 allow proper sizing of the regulator. (Specific Gravity tables are required.) With P₁, P₂, % build, flow rate (C_v, GPM, SCFH or #/HR), and diaphragm type per Step 4, enter the capacity tables and confirm Model 123 capability.

Refer to Tables 6 through 10 for capacities.

STEP 7.

TRIM MATERIAL. Combining diaphragm material choice of Step 4 and the use of Tables 3 and 4 allows proper selection of "Trim Designation Numbers" for materials and temperatures. See Table 1 for type of service.

A composition seat will initially provide bubble-tight shut-off in clean service and without downstream overpressurization. See Figure 2. Minute leakage should be expected with metal seated design.

TECHNICAL SPECIFICATIONS

**TABLE 1
APPLICATIONS**

Fluid	Recommended Construction	Trim Designation Number
Air or Inert Gases	Composition Seat and Diaphragm	B2, B3, B4, S3, S3N
	Metal Seat and Composition Diaphragm	S2N
Chemicals	Metal Seat and Diaphragm	S0, S1, S2
	Metal Seat and Composition Diaphragm	S2N, S5, S40
	Composition Seat and Diaphragm	S3, S3N, S40T, S40V
	Composition Seat and Metal Diaphragm	S9, S36
Sour Gas	Metal Seat and Composition Diaphragm	S40
	Composition Seat and Diaphragm	S40T, S40V
Cryogenic Gas or Liquids	Metal Seat and Diaphragm	S1
	Composition Seat and Metal Diaphragm	B5 or S36
Fuel Oil	Composition Seat and Diaphragm	B2, B3, B4, B7, S3, S3N
Hydrocarbon Gas or Liquids	Composition Seat and Diaphragm	B2, B3, B4, B7, S3, S3N
Saturated Steam, Low Pressures-up to 50 psig (3.4 Barg)	Metal Seat and Diaphragm	B1, S1, S2
	Composition Seat and Diaphragm	B6
	Composition Seat and Metal Diaphragm	B5, S36
Saturated Steam, Pressures up to 100 psig (6.8 Barg), 50 psid	Metal Seat and Diaphragm	B1, S1, S2
	Composition Seat and Metal Diaphragm	B5, S36
Steam Pressures above 100 psig (6.9 Barg) Saturated or Superheated	Metal Seat and Diaphragm	S1 or S2
Water and Condensate, Low Temperature 32-180°F (0-83°C)	Metal Seat and Composition Diaphragm	S2N
	Composition Seat and Diaphragm	B2, B3, S3, S3N
Water and Condensate, High Temperature 180-300°F (83-149°C)	Metal Seat and Diaphragm	B1, S1, S2
	Composition Seat and Diaphragm	B6

**TABLE 2
BODY AND SPRING CHAMBER
MAXIMUM PRESSURE WITH TEMPERATURE RATINGS**

Material Specifications (Body / Spring Chamber)		Inlet			
Description (Abbr.)	ASTM No.	Pressure psig (Barg)		Temperature °F (°C)	
CI/CI	A126, Class B	400	(27.5)	-20 to +275	(-29 to +135)
		295	(20.4)	-20 to +400	(-29 to +204)
		250	(17.2)	-20 to +450	(-29 to +232)
BRZ/CI	B62 Alloy C83600/ A126, Class B	400	(27.5)	-20 to +150	(-29 to +66)
		300	(20.6)	-20 to +350	(-29 to +177)
BRZ/BRZ	B62, Alloy C83600	250	(17.2)	-20 to +400	(-29 to +204)
CS/CI	A216, Gr. WCB/ A126, Class B	400	(27.5)	-20 to +275	(-29 to +135)
		295	(20.4)	-20 to +400	(-29 to +204)
		250	(17.2)	-20 to +450	(-29 to +232)
CS/CS	A216, Gr. WCB/ A216, Gr. WCB	525	(36.1)	-20 to +450	(-29 to +232)
SST/CI	A351, Gr. CF8M/ A126, Class B	400	(27.5)	-20 to +275	(-29 to +135)
		295	(20.4)	-20 to +400	(-29 to +204)
		250	(17.2)	-20 to +450	(-29 to +232)
SST/BRZ	A351, Gr. CF8M/ B62, Alloy C83600	400	(27.5)	-20 to +150	(-29 to +66)
		300	(20.6)	-20 to +350	(-29 to +177)
		250	(17.2)	-20 to +400	(-29 to +204)
SST/CS	A351, Gr. CF8M/ A216, Gr. WCB	525	(36.1)	-20 to +450	(-29 to +232)
SST/SST	A351, Gr. CF8M/ A351, Gr. CF8M				

NOTE: For operating temperatures between -325 to +100F (-198 to +38°C), specify Opt -5 with trim B5 or Opt-36 with trim S1 or S36.

**TABLE 3
BRASS TRIM MATERIAL COMBINATIONS**

Brass Trim Designations							
Part	Metal Seat	Composition Seat					
	B1	B2	B3	B4	*B5	B6	B7
Diaphragm	302SST	Neoprene	Neoprene	Fluorocarbon Elastomer	Phosphor BRZ	EPDM	Fluorocarbon Elastomer
Cylinder	Brass	Brass	Brass	Brass	Brass	Brass	Brass
Valve Seat	316SST	Brass	Brass	Brass	Brass	Brass	Brass
Plug	416SST	Brass	Brass	Brass	Brass	Brass	Brass
Seat Disc	None (metal)	Buna-N	TFE	TFE	TFE	EPR	Fluorocarbon Elastomer
Seat Disc Screw	None	Brass	Brass	Brass	Brass	Brass	Brass
Temperature °F (°C)	-20 to +400 (-29 to +204)	-20 to +180 (-29 to +82)	-20 to +180 (-29 to +82)	-20 to +400 (-29 to +204)	-20 to +400 (-29 to +204)	-20 to +300 (-29 to +149)	-20 to +400 (-29 to +204)

* For operating temperatures between -325° and +100°F (-198 and +38°C), specify Opt-5 and trim designation B5.

TABLE 4 (a)
STAINLESS STEEL TRIM MATERIAL COMBINATIONS – METAL SEAT

Stainless Steel Trim Designations — Metal Seat						
Part	S0	*S1	S2	S2N	S5	**S40
Diaphragm	TFE coated 302SST	302SST	302SST	Neoprene	Fluorocarbon Elastomer	Neoprene
Cylinder	316SST	316SST	316SST	316SST	316SST	316SST
Valve Seat	316SST	316SST	316SST	316SST	316SST	316SST
Plug	316SST	316SST	416SST	416SST	416SST	316SST
Seat Disc	None (metal)	None (metal)	None (metal)	None (metal)	None (metal)	None (metal)
Seat Disc Screw	None	None	None	None	None	None
Temperature °F (°C)	-20 to +450 (-29 to +232)	-20 to +450 (-29 to +232)	-20 to +450 (-29 to +232)	-20 to +180 (-29 to +82)	-20 to +400 (-29 to +204)	-20 to +180 (-29 to +83)

* Available with stellited plug and valve seat (see Opt-15). Includes a screwed in seat cone.

* For operating temperatures between -325° and +100°F (-198 and +38°C), specify Opt-36, S1 trim.

** Trim Options for NACE service.

TABLE 4 (b)
STAINLESS STEEL TRIM MATERIAL COMBINATIONS – COMPOSITION SEAT

Stainless Steel Trim Designations — Composition Seat						
Part	S3	S3N	S9	*S36	**S40T	**S40V
Diaphragm	Neoprene	Neoprene	TFE coated 302SST	302SST	Fluorocarbon Elastomer	Fluorocarbon Elastomer
Cylinder	316SST	316SST	316SST	316SST	316SST	316SST
Valve Seat	316SST	316SST	316SST	316SST	316SST	316SST
Plug	316SST	316SST	316SST	316SST	316SST	316SST
Seat Disc	TFE	Buna-N	TFE	TFE	TFE	Fluorocarbon Elastomer
Seat Disc Screw	316SST	316SST	316SST	316SST	316SST	316SST
Temperature °F (°C)	-20 to +180 (-29 to +82)	-20 to +180 (-29 to +82)	-20 to +400 (-29 to +204)	-20 to +400 (-29 to +204)	-20 to +400 (-29 to +204)	-20 to +400 (-29 to +204)

* For operating temperatures between -325° and +100°F (-198 and +38°C), specify Opt-36, S36 trim.

** Trim Options for NACE service.

TABLE 5
MAXIMUM ALLOWABLE PRESSURE DROPS

Fluid	Pressure Drop ¹		Seat Material	Trim Material	Trim Designation No.
	psid	(Bard)			
Liquid	350	(24.14)	Stellite	SST	S1
	350	(24.14)	Comp	SST	S9 or S36
	350	(24.14)	Comp	SST - Comp	S3, S3N, S40T or S40V
	250	(17.25)	Metal	BR	B1
	250	(17.25)	Comp	BR - Comp	B2, B3, B4, B6 or B7
Gases	350	(24.14)	Metal	BR or SST	B1, S0, S1 or S2
			Metal	SST - Comp	S2N, S5 or S40
			Comp	SST	S9 or S36
			Comp	SST - Comp	S3, S3N, S40T or S40V
			Comp	BR - Comp	B2, B3, B4, B6 or B7
Steam	350	(24.14)	Stellite	SST	S1
	300	(20.7)	Metal	SST	S1 or S2
	200	(13.8)	Metal	BR	B1
	50	(3.45)	Comp	Br - Comp	B6

¹ Maximum pressure drops are with the plug on the seat; i.e. no flow.

TABLE 6
CAPACITY TABLES - Cv — METAL DIAPHRAGM

Set Point (inlet) Pressure, P ₁ (psig)	1/2" Body					3/4" Body					1" Body					1-1/2" Body					2" Body				
	% Build					% Build					% Build					% Build					% Build				
	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%
5	0.22	0.44	0.67	0.89	1.11	0.50	1.00	1.44	1.77	2.05	0.50	1.00	1.44	1.77	2.05	1.50	2.89	3.57	3.92	4.28	1.74	3.32	4.11	4.59	4.90
10	0.37	0.76	1.14	1.52	1.90	0.72	1.45	2.05	2.56	3.07	0.72	1.45	2.05	2.56	3.07	1.55	2.94	3.84	4.38	4.40	1.78	3.36	4.47	5.10	5.15
15	0.41	0.84	1.26	1.67	2.09	0.80	1.64	2.38	2.95	3.54	0.80	1.64	2.38	2.95	3.54	1.60	3.02	4.00	4.40	4.40	1.81	3.44	4.66	5.15	5.15
25	0.49	0.98	1.50	2.00	2.14	0.77	1.57	2.31	2.84	3.34	0.77	1.57	2.31	2.84	3.34	1.71	3.18	4.21	4.40	4.40	1.94	3.62	4.90	5.15	5.15
35	0.54	1.09	1.63	2.14	2.14	0.80	1.79	2.61	3.18	3.78	0.80	1.79	2.61	3.18	3.78	0.93	1.78	2.70	3.48	4.20	1.04	2.10	2.85	4.10	4.93
50	0.67	1.32	1.98	2.14	2.14	0.72	1.43	2.15	2.84	3.38	0.72	1.43	2.15	2.84	3.38	1.15	2.25	3.36	4.28	4.40	1.33	2.62	3.95	5.00	5.15
75	0.59	1.19	1.78	2.14	2.14	1.07	2.15	3.04	3.38	3.38	1.07	2.15	3.04	3.38	3.38	1.28	2.44	3.56	4.40	4.40	1.42	2.80	4.17	5.15	5.15
100	0.74	1.45	2.14	2.14	2.14	0.69	1.25	1.88	2.52	3.38	0.69	1.25	1.88	2.52	3.38	1.40	2.65	3.83	4.40	4.40	1.56	3.05	4.47	5.15	5.15
150	0.59	1.19	1.78	2.14	2.14	0.88	1.76	2.66	3.38	3.10	0.88	1.76	2.66	3.38	3.10	1.28	2.52	3.64	4.40	4.40	1.48	2.90	4.14	5.15	5.15
200	0.74	1.45	2.14	2.14	2.14	0.98	1.90	2.81	3.38	3.38	0.98	1.90	2.81	3.38	3.38	1.69	3.26	4.40	4.40	4.40	1.95	3.72	5.15	5.15	5.15
300	0.81	1.62	2.14	2.14	2.14	1.11	2.15	3.33	3.38	3.38	1.11	2.15	3.33	3.38	3.38	1.62	3.14	4.40	4.40	4.40	1.77	3.61	5.15	5.15	5.15
350	0.85	1.70	2.14	2.14	2.14	1.27	2.55	3.38	3.38	3.38	1.27	2.55	3.38	3.38	3.38	1.80	3.50	4.40	4.40	4.40	2.08	4.00	5.15	5.15	5.15

TABLE 7
CAPACITY TABLES - Cv — COMPOSITION DIAPHRAGM

Set Point (inlet) Pressure, P ₁ (psig)	1/2" Body					3/4" Body					1" Body					1-1/2" Body					2" Body				
	% Build					% Build					% Build					% Build					% Build				
	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%
5	0.37	0.73	1.12	1.48	1.85	0.83	1.67	2.40	2.95	3.42	0.83	1.67	2.40	2.95	3.42	2.50	4.82	5.95	6.53	6.70	2.90	5.53	6.85	7.00	7.00
10	0.62	1.27	1.90	2.53	3.04	1.20	2.42	3.42	4.27	5.10	1.20	2.42	3.42	4.27	5.10	2.58	4.90	6.40	6.70	6.70	2.97	5.60	7.00	7.00	7.00
15	0.68	1.40	2.10	2.78	3.04	1.33	2.73	3.97	4.92	5.10	1.33	2.73	3.97	4.92	5.10	2.67	5.00	6.67	6.70	6.70	3.02	5.73	7.00	7.00	7.00
25	0.82	1.63	2.50	3.04	3.04	1.28	2.62	3.85	4.73	5.10	1.28	2.62	3.85	4.73	5.10	2.85	5.30	6.70	6.70	6.70	3.23	6.03	7.00	7.00	7.00
35	0.90	1.82	2.72	3.04	3.04	1.33	2.98	4.35	5.10	5.10	1.33	2.98	4.35	5.10	5.10	1.55	2.97	4.50	5.80	6.70	1.73	3.50	4.75	7.00	7.00
50	1.12	2.20	3.04	3.04	3.04	1.20	2.38	3.58	4.73	5.10	1.20	2.38	3.58	4.73	5.10	1.92	3.75	5.60	6.70	6.70	2.22	4.37	6.58	7.00	7.00
75	0.98	1.98	2.97	3.04	3.04	1.78	3.58	5.07	5.10	5.10	1.78	3.58	5.07	5.10	5.10	2.13	4.07	5.93	6.70	6.70	2.37	4.67	6.95	7.00	7.00
100	1.23	2.42	3.04	3.04	3.04	0.99	1.79	2.69	3.60	4.43	0.99	1.79	2.69	3.60	4.43	2.00	3.79	5.47	6.70	6.70	2.23	4.36	6.39	7.00	7.00
150	0.84	1.70	2.54	3.04	3.04	1.26	2.51	3.80	4.96	5.10	1.26	2.51	3.80	4.96	5.10	1.83	3.60	5.20	6.53	6.70	2.11	4.14	5.91	7.00	7.00
200	1.06	2.07	3.04	3.04	3.04	1.40	2.71	4.01	5.10	5.10	1.40	2.71	4.01	5.10	5.10	2.41	4.66	6.47	6.70	6.70	2.79	5.31	7.00	7.00	7.00
300	1.16	2.31	3.04	3.04	3.04	1.59	3.07	4.75	5.10	5.10	1.59	3.07	4.75	5.10	5.10	2.31	4.49	6.36	6.70	6.70	2.53	5.16	7.00	7.00	7.00
350	1.21	2.43	3.04	3.04	3.04	1.81	3.64	5.10	5.10	5.10	1.81	3.64	5.10	5.10	5.10	2.57	5.00	6.70	6.70	6.70	2.97	5.71	7.00	7.00	7.00

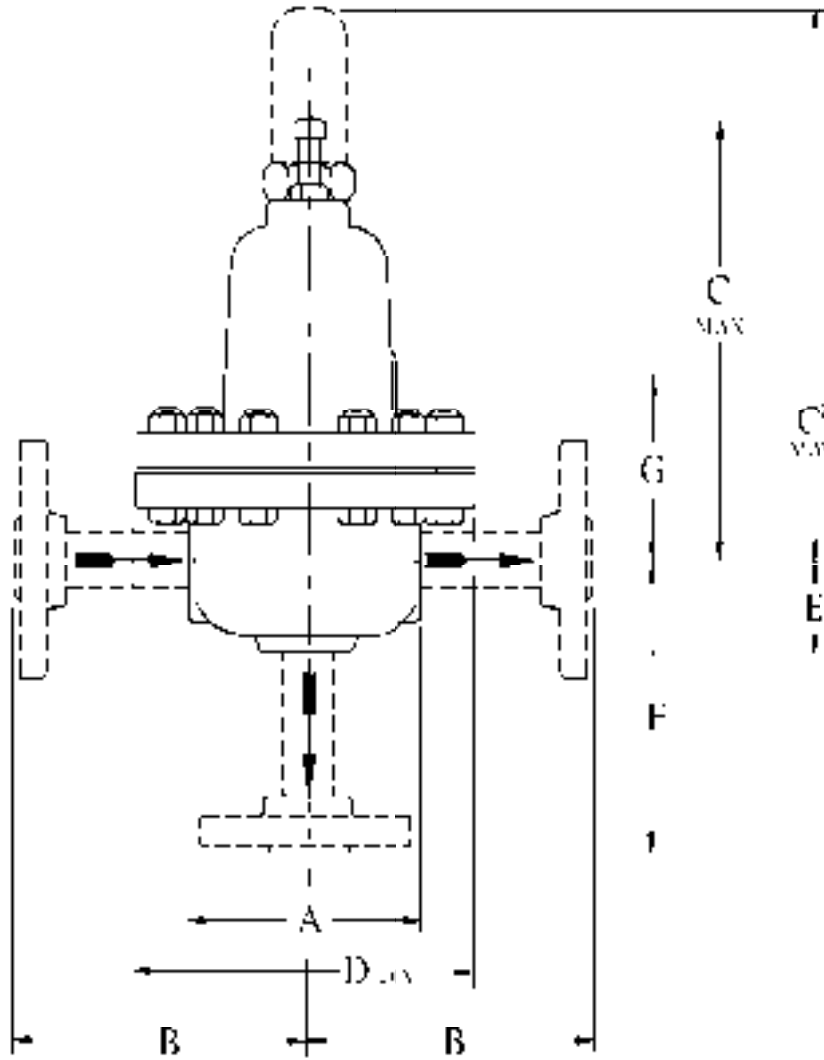
TABLE 9
AIR CAPACITY - SCFH S.G. = 1.0 T = 60°F F_L = 0.945
All Sizes - COMPOSITION DIAPHRAGM ONLY

Outlet Pressure (psig)	Set Point Pressure (psig)	1/2" Body										3/4" Body										1" Body										1-1/2" Body										2" Body									
		% Build					% Build					% Build					% Build					% Build					% Build					% Build					% Build					% Build									
		10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%										
0	5	270	540	850	1140	1460	600	1230	1810	2280	2710	1100	2300	3370	4360	5390	1800	3780	5460	7140	8820	2500	5000	7500	10000	12500	3200	6400	9600	12800	16000	4000	8000	12000	16000	20000	5000	10000	15000	20000	25000	6000	12000	18000	24000	30000	7000	14000	21000	28000	35000
	10	570	1210	1880	2590	3220	1100	2300	3380	4370	5400	1600	3200	4800	6400	8000	2200	4400	6600	8800	11000	2800	5600	8400	11200	14000	3600	7200	10800	14400	18000	4500	9000	13500	18000	22500	5500	11000	16500	22000	27500	6500	13000	19500	26000	32500					
	15	760	1630	2560	3540	4030	1480	3180	4840	6260	6760	2180	4360	6540	8720	10900	2880	5760	8640	11520	14400	3780	7560	11340	15120	18900	4880	9760	14640	19520	24400	6080	12160	18240	24320	30400	7280	14560	21840	29120	36400										
	25	1230	2600	4210	5380	5660	1930	4170	6480	8380	9490	2830	5660	8490	11320	14150	3730	7460	11190	14920	18650	4830	9660	14490	19320	24150	6130	12260	18190	24120	30050	7530	15060	22590	30120	37650	9130	18260	27390	36420	45450										
	35	1710	3680	5840	7280	7820	2520	5220	7830	10180	11580	3620	7240	10860	14480	18100	4720	9440	14160	18880	23600	5920	11840	17760	23680	29600	7420	14840	22260	29680	37100	9120	18240	27360	36480	45600	11020	22040	33060	44080	55100										
	50	2780	5860	9300	12100	13700	4000	8000	12000	16000	18200	5600	11200	16800	22400	28000	7200	14400	21600	28800	36000	9400	18800	28200	37600	47000	12200	24400	36600	48800	61000	15000	30000	45000	60000	75000	19000	38000	57000	76000	95000										
	75	3400	7390	11800	15600	17900	5600	11200	16800	22400	25600	7600	15200	22800	30400	37000	10000	20000	30000	40000	50000	13200	26400	39600	52800	66000	17200	34400	51600	68800	86000	22400	44800	67200	89600	112000	28000	56000	84000	112000	140000										
	100	5470	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000	40000	80000	120000	160000	200000										
	150	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000	40000	80000	120000	160000	200000										
	200	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000	40000	80000	120000	160000	200000										
300	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000	40000	80000	120000	160000	200000											
350	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000	40000	80000	120000	160000	200000											
2.5	5	250	510	790	1070	1370	2740	4110	5480	6850	8220	16440	24660	32880	41100	5060	10120	15180	20240	25300	30360	60720	91080	121440	151800	182160	364320	546480	728640	910800	1103400	2206800	3310200	4413600	5517000	6620400	13240800	19861200	26481600	33102000											
	10	570	1210	1870	2580	3210	1100	2300	3370	4360	5390	1800	3780	5460	7140	8820	2200	4400	6540	8720	10900	2880	5760	8640	11520	14400	3780	7560	11340	15120	18900	4880	9760	14640	19520	24400	6080	12160	18240	24320	30400										
	15	760	1630	2560	3540	4030	1480	3180	4840	6260	6760	2180	4360	6540	8720	10900	2880	5760	8640	11520	14400	3780	7560	11340	15120	18900	4880	9760	14640	19520	24400	6080	12160	18240	24320	30400															
	25	1230	2600	4210	5380	5660	1930	4170	6480	8380	9490	2830	5660	8490	11320	14150	3730	7460	11190	14920	18650	4830	9660	14490	19320	24150	6130	12260	18190	24120	30050	7530	15060	22590	30120	37650															
	35	1710	3680	5840	7280	7820	2520	5220	7830	10180	11580	3620	7240	10860	14480	18100	4720	9440	14160	18880	23600	5920	11840	17760	23680	29600	7420	14840	22260	29680	37100	9120	18240	27360	36480	45600															
	50	2780	5860	9300	12100	13700	4000	8000	12000	16000	18200	5600	11200	16800	22400	28000	7200	14400	21600	28800	36000	9400	18800	28200	37600	47000	12200	24400	36600	48800	61000	15000	30000	45000	60000	75000															
	75	3400	7390	11800	15600	17900	5600	11200	16800	22400	25600	7600	15200	22800	30400	37000	10000	20000	30000	40000	50000	13200	26400	39600	52800	66000	17200	34400	51600	68800	86000	22400	44800	67200	89600	112000															
	100	5470	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000															
	150	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000															
	200	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000															
300	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000																
350	5390	11800	18200	24600	28200	8600	17200	25800	34400	39800	11600	23200	34800	46400	57000	15200	30400	45600	60800	76000	19600	39200	58800	78400	98000	25600	51200	76800	102400	128000	32000	64000	96000	128000	160000																
5	10	530	1130	1760	2430	3020	6040	9060	12080	15100	18120	36240	54360	72480	90600	110760	221520	332280	443040	553800	664560	1329120	1993680	2658240	3322800	4034400	8068800	12103200	16137600	20172000	26220000	52440000	78660000	104880000	131100000																
	15	750	1610	2530	3500	3980	1460	3140	4780	6190	6680	2140	4280	6420	8560	10700	2520	5040	7560	10080	12600	3120	6240	9360	12480	15600	3960	7920	11880	15840	19800	4920	9840	14760	19680	24600															
	25	1230	2600	4210	5380	5660	1930	4170	6480	8380	9490	2830	5660	8490	11320	14150	3730	7460	11190	14920	18650	4830	9660	14490	19320	24150	6130	12260	18190	24120	30050	7530	15060	22590	30120	37650															
	35	1710	3680	5840	7280	7820	2520	5220	7830	10180	11580	3620	7240	10860	14480	18100	4720	9440	14160	18880	23600	5920	11840	17760	23680	29600	7420	14840	22260	29680	37100	9120	18240	27360	36480	45600															
	50	2780	5860	9300	12100	13700	4000	8000	12000	16000	18200	5600	11200	16800	22400	28000	7200	14400	21600	28800	36000	9400	18800	28200	37600	47000	12200	24400	36600	48800	61000	15000	30000	45000	60000	75000															
	75	3400	7390	11800	15600	17900	5600	11200	16800	22400	25600	7600	15200	22800	30400	37000	10000	20000	30000	40000	50000	13200	26400	39600	52800	66000																									

TABLE 10
STEAM CAPACITY - LBS/HR
S.G. = Actual T = Saturated $F_L = 0.945$
All Sizes - METAL DIAPHRAGM

Outlet Pressure (psig)	Set Point Pressure (psig)	1/2" Body % Build										3/4" Body % Build										1" Body % Build										1-1/2" Body % Build										2" Body % Build																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		10%		20%		30%		40%		50%		10%		20%		30%		40%		50%		10%		20%		30%		40%		50%		10%		20%		30%		40%		50%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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DIMENSIONS AND WEIGHTS



Valve Size (Inches)	ENGLISH (inches)										Shipping Weight lbs. ⁴
	A	B	B ¹	C	C ²	D	E	F	F ³	G	
1/2	4.32	5.16	8.16	9.00	9.59	6.00	1.88	4.88	7.88	2.50	20
3/4	5.00	6.19	8.50	9.75	10.28	7.38	1.75	5.56	7.75	3.50	30
1	5.00	6.19	8.50	9.75	10.28	7.38	1.75	5.56	7.75	3.50	30
1-1/2	6.24	6.88	9.12	9.62	10.53	8.50	2.19	5.94	8.19	3.88	38
2	6.00	7.19	9.00	9.50	10.60	8.50	2.19	6.38	8.19	4.31	48

¹ CL of body to extended P.E. nipple (not shown), Opt-32

² CL of body to top of Closing Cap, Opt-1

³ CL of body to end of extended P.E. nipple (not shown), Opt-32

⁴ Weights do not include flanges.

Valve Size (DN)	METRIC (mm & kg)										Shipping Weight kgs ⁴
	A	B	B ¹	C	C ²	D	E	F	F ³	G	
15	110	131	207	229	243	152	48	124	200	63	9.1
20	128	157	216	248	261	187	44	141	197	89	13.6
25	128	157	216	248	261	187	44	141	197	89	13.6
40	158	175	232	244	268	216	56	151	208	98	17.2
50	152	183	229	241	269	216	56	162	208	109	21.2

¹ CL of body to extended P.E. nipple (not shown), Opt-32

² CL of body to top of Closing Cap, Opt-1

³ CL of body to end of extended P.E. nipple (not shown), Opt-32

⁴ Weights do not include flanges.

NOTES

NOTES

PRODUCT CODE 2-15-01

TABLE 4

BRASS TRIM (OPTION-5)		STAINLESS STEEL TRIM (OPTION-36)	
DESIG.	CODE	DESIG.	CODE
B5	B5	S1	S1
		S36	36

TABLE 3

BODY/SP.CH.	OPTION	CODE
BRZ/BRZ	-5	3
SST/SST	-36	A

TABLE 2

SIZE	CODE
1/2"	4
3/4"	5
1"	6
1-1/2"	8
2"	9

TABLE 1

SERVICE*	GASKETS	OPTIONS	CODE
Cryogenic (Below -20°F)	Std: Non-Asbestos TFE	-5 or -36**	C

* Refer to Tech Bulletin for complete temperature range.
 **Cryo. Const. includes Special Cleaning #S-1134 (Opt-55).

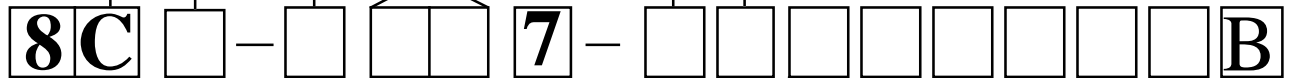
TABLE 5

DESCRIPTION	CODE
NPT SCREWED	1
OPT-30 - 150 LB RF FLANGES * SS Bodies ONLY	6
OPT-30 - 300 LB RF FLANGES * SS Bodies ONLY	7

*Nipples & Flanges of same material as body.

TABLE 6

SST RANGE SPRING		
SIZE	RANGE (psig)	CODE
1/2"	2-30	3
	20-60	6
	50-110	A
	90-150	C
	120-245	E
3/4" & 1"	220-300	H
	2-25	2
	20-45	5
	35-100	9
	80-210	D
1 1/2" & 2"	170-300	G
	2-15	1
	10-30	4
	25-55	7
	45-95	8
	75-130	B
	110-300	F



MODEL "123" BACK PRESSURE RELIEF REGULATOR, CRYOGENIC SERVICE

TABLE 7

DESCRIPTION	OPTION	CODE
SPECIAL CONSTRUCTION	-	X

- ASSIGNMENT OF "OPTION" CODES
1. When ordering a valve per one of Cashco's special drawings, the code "X" and the 5-digit number following override all other options. Otherwise, proceed with the following.
 2. NUMERIC digits assigned first in "ascending" order.
 3. ALPHA designations are assigned second (excluding the "X" in "alphabetical order").
 4. Left justify.
 5. Add "0" to all unused squares.
 6. If insufficient quantity of squares, consult factory for proper code.

PRODUCT CODE 08-01-01

TABLE 5

BRASS TRIM			STAINLESS STEEL TRIM	
DESIG.	BODY MATERIAL		DESIG.	BODY MATL
	CI or BRZ CODE	CS CODE		CI, CS & SST CODE
B1	B1	B1	S0	S0
B2	B2	B2	S1	S1
B3	B3	—	S2	S2
B4	B4	—	S2N	SN
B5	B5	—	S3	S3
B6	B6	—	S3N	SC
B7	B7	—	S5	S5
			S9	S9
			S36	36
			S40	40
			S40T	4T
			S40V	4V

TABLE 4

BODY/SP.CH.	SIZES	CODE
CI/CI*	ALL	1
BRZ/CI*	ALL	2
BRZ/BRZ*	ALL	3
CS/CI*	ALL	4
CS/CS	ALL	5
SST/CI*	ALL	7
SST/BRZ*	ALL	8
SST/CS	ALL	9
SST/SST*	ALL	A

* Not available w/ 1+6 variation.

TABLE 3

SIZE	CODE
1/2"	4
3/4"	5
1"	6
1-1/2"	8
2"	9

TABLE 2

√ GASKETS / SERVICE	OPTIONS	CODE
Standard : Non-Asbestos/Non-Oxygen	—	B
* Non-Asbestos TFE / Oxygen	-45	D

√ Refer to Tech Bulletin for suitable gasket temp. range.
* Not available w/1+6 variation

TABLE 7

RANGE SPRING - STD & "1+6" VARIATION		
SIZE	SPRING (psig)	CODE
1/2"	2-30*	3
	25-50*	6
	40-100*	9
	80-150*	C
	120-215	F
3/4" & 1"	150-350	G
	2-20*	2
	15-40*	5
	30-80*	8
	65-160*	B
1-1/2" & 2"	130-205	E
	165-350	H
	2-15*	1
	10-25*	4
	20-55*	7
	45-105*	A
	85-230	D
180-350	J	

* Range springs for use with Opt.-1+6.

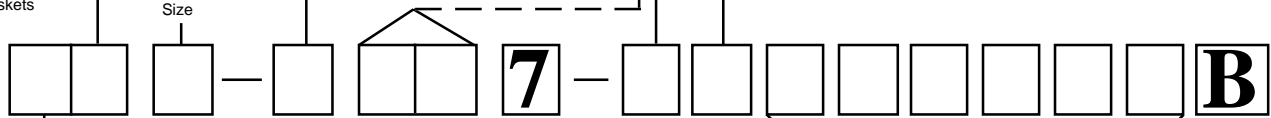


TABLE 1

CODE	DESCRIPTION
8	MODEL "123" BACK PRESSURE RELIEF REGULATOR
9	MODEL "123-1+6" BACK PRESS. RELIEF REGULATOR- DIFFERENTIAL CONSTRUCTION, W/CLOSING CAP

MODELS "123" & "123-1+6" BACK PRESSURE RELIEF REGULATORS

ASSIGNMENT OF "OPTION" CODES

- When ordering a valve per one of Cashco's special drawings, the code "X" and the 5-digit number following override all other options. Otherwise, proceed with the following.
- NUMERIC digits assigned first in "ascending" order.
- ALPHA designations are assigned second (excluding the "X" in "alphabetical order").
- Left justify.
- Add "0" to all unused squares.
- If insufficient quantity of squares, consult factory for proper code.

TABLE 8

DESCRIPTION	OPTION	CODE
SPECIAL CONSTRUCTION	—	X
DI CLOSING CAP		
CI OR CS Spring Chamber (Included with "1+6" Variation)	-1	1
STELLITED SEAT SURFACES S1 Trim Only	-15	A
NACE CONSTRUCTION: CS/CS/XX Per MR0175, NPT Body S40,S40M,S40T or S40V Trims (NOT Available with "1+6" Variation)	-40	J
NACE CONSTRUCTION: SS/SS/XX OR SS/CS/XX Per MR0175, NPT Body S40,S40M,S40T or S40V Trims (NOT Available with "1+6" Variation)	-40SST	K
SPECIAL CLEANING: Per Cashco Spec #S-1134. BRZ or SST body/sp.ch. mat'ls only. (NOT Available w/"1+6" Variation)	-55	M
SPECIAL CLEANING. Per Cashco Spec #S-1542. SST,CS & CI body/spring chamber materials only. Not suitable for oxygen service	-56	N
EPOXY PAINTED	-95	W

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