



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 (.14 to 24.2 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: | Five body materials & twenty three 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, -31P, -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" (DN8) tapped vent hole. See Table 2 for 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
LCC Steel Body material: SST
Cryogenic Construction: SST.

Gaskets: Standard: Graphite/NBR. **NOT SUITABLE FOR OXYGEN SERVICE.**
Alternate Material: See Opt-45, -46G.

Diaphragms: SST, Neoprene (BC), Fluorocarbon Elastomer (FKM), Phosphor Brz., EPDM, TFE Coated SST, Buna-N. (NBR)

Range Springs: Standard: Epoxy coated steel.
LCC Steel Body material : SST
Cryogenic: SST.

Valve Size	Standard Steel Range Spring		Cryogenic SST Range Spring	
	psig	(Barg)	psig	(Barg)
1/2" (DN15)	2 - 30	(.14 - 2.1)	2 - 30	(.14 - 2.1)
	25 - 50	(1.7 - 3.4)	20 - 60	(1.4 - 4.1)
	40 - 100	(2.8 - 6.9)	50 - 110	(3.4 - 7.6)
	80 - 150	(5.5 - 10.3)	90 - 150	(6.2 - 10.3)
	120 - 215	(8.3 - 14.8)	120 - 245	(8.3 - 16.9)
	150 - 350	(10.3 - 24.1)	220 - 300	(15.2 - 20.7)
3/4"-1" (DN20-25)	2 - 20	(.14 - 1.4)	2 - 25	(.14 - 1.7)
	15 - 40	(1.0 - 2.8)	20 - 45	(1.4 - 3.1)
	30 - 80	(2.1 - 5.5)	35 - 100	(2.4 - 6.9)
	65 - 160	(4.5 - 11.0)	80 - 210	(5.5 - 14.5)
	130 - 205	(9.0 - 14.1)	170 - 300	(11.7 - 20.7)
165 - 350	(11.4 - 24.1)			
1-1/2"-2" (DN40-DN50)	2 - 15	(.14 - 1.0)	2 - 15	(.14 - 1.0)
	10 - 25	(.69 - 1.8)	10 - 30	(.69 - 2.1)
	20 - 55	(1.4 - 3.8)	25 - 55	(1.7 - 3.8)
	45 - 105	(3.1 - 7.2)	45 - 95	(3.1 - 6.6)
	85 - 220	(5.9 - 15.1)	75 - 130	(5.2 - 8.7)
	180 - 350	(12.4 - 24.1)	110 - 300	(7.6 - 20.7)

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 (6.9 Barg) set pressure and a 20% build-up = 120 psig (8.3 Barg) flowing pressure for the capacity listed.

Painting: Standard: All non-corrosion resistant portions to be painted with corrosion resistant epoxy paint per Cashco Spec #S-1606.
Alternate: See Opt-95 or -95OS.

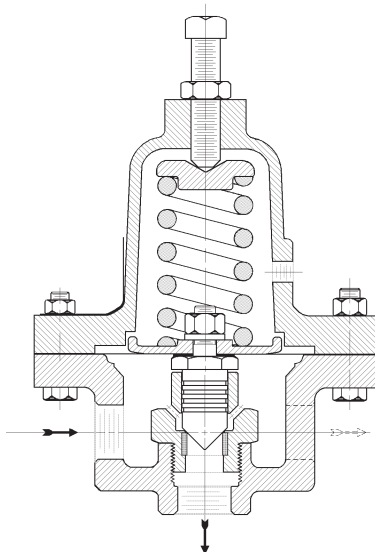


Figure 1: Model 123-33 – Metal Seat Design

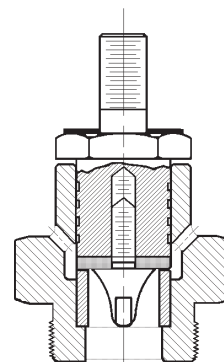


Figure 2: Composition Seat

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. NOT available in body/spring chamber material combinations of BRZ/BRZ, SST/BRZ or SST/SST. Includes closing cap, larger pusher plate, an extra diaphragm gasket (for metal diaphragms), a special grooved adjusting screw, a 1/4" (DN8) NPT female loading pressure connection in spring chamber, and an adjusting screw sealing lock nut. Limited for use on 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 (DN)	Range Spring psid (Bard)
1/2"	2-30, 25-50, 40-100, 80-150
(15)	(.14-2.1, 1.7-3.4, 2.7-6.9, 5.5-10.3)
3/4" & 1"	2-20, 15-40, 30-80, 65-160
(20 & 25)	(.14-1.4, 1.0-2.7, 2.1-5.5, 4.5-11.0)
1-1/2" & 2"	2-15, 10-25, 20-55, 45-105
(40 & 50)	(.14-1.0, .69-1.7, 1.4-3.8, 3.1-7.2)
• Consult factory for sizing and selection of Differential Model 123's. •	

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 +150°F (-198° to +66°C). The spring chamber has a 1/4" (DN8) NPT vent connection for purge gas and a 1/8" (3.2mm) diameter drain hole. Mount in horizontal piping with 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-25: TAPPED VENT: 1/8" (DN6) NPT tapped opening in spring chamber for piping vent to remote location, in the event of diaphragm failure.

OPTION-25P: PLASTIC RAIN PROOF BUG VENT. 1/4" NPT(DN8) for spring chamber vent.

OPTION-25S: SST RAIN PROOF BUG VENT. 1/4" NPT(DN8) for spring chamber vent.

OPTION-30: FLANGED END CONNECTIONS. 150# or 300# raised face flanges available on all sizes. Schedule 80 pipe nipples. 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-31P: BSP END CONNECTIONS. British Standard Parallel Pipe threads per ISO 7/1; used as an alternate to NPT ends.

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. Available on all sizes of CS and 316 SST bodies.

OPTION-33: THIRD BODY CONNECTION. 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 with S1 and S36 trim only.
 b. 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 MR0175 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. (Alternate LCC body/spring chamber material with S40B and S40C only trim.) Opt-30 and -32 require post-weld stress relieving by heat treating.

OPTION-40SST: SST NACE CONSTRUCTION. Same as Opt.-40, except uses SST/SST or SST/CS body/spring chamber construction.

OPTION-45: TFE 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 -46G: HIGH TEMPERATURE GASKETS. CS or SST body/spring chamber materials, S1 or S2 Trim only. Standard diaphragm and pusher plate gasket for units with metal diaphragms replaced with carbon graphite gaskets. Operating temperature -20° to +600° F (-29° to +315°C).

OPTION-55: SPECIAL CLEANING: BRZ or SST body materials only. Cleaning per Cashco Spec. #S-1134 for oxygen service. **NOTE:** Design Pressure Rating shall not exceed 375 psig (25.8 Barg) when body material is SST and process medium is oxygen.

OPTION-56: SPECIAL CLEANING: All body materials. Cleaning per Cashco Spec.#S-1542. Not suitable for oxygen service.

OPTION-95: EPOXY PAINT: Special epoxy painting of all non-corrosion resistant external surfaces per Cashco Spec #S-1547. Utilized in harsh atmospheric conditions.

OPTION-95OS: EPOXY PAINT. Special epoxy painting of all non-corrosion resistant external surfaces per Cashco Spec #S-1687 for OFFSHORE installations.

TECHNICAL SPECIFICATIONS

TABLE 1- Applications		
Fluid	Recommended Construction	Trim Designation Number
Air or Inert Gases	Composition Seat and Diaphragm	B2, B3, B4, BB, S3, S3N, SB
	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, SB, 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	BB, B4, B7, S3, S3N, SB
Hydrocarbon Gas or Liquids [‡]	Composition Seat and Diaphragm	BB, B4, B7, S3, S3N, SB
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	BB, B2, B3, S3, S3N, SB
Water and Condensate, High Temperature 180-300°F (83-149°C)	Metal Seat and Diaphragm	B1, S1, S2
	Composition Seat and Diaphragm	B6

[‡] In accordance with ASME B31.3 "process piping", do not use Cast Iron Body for hydrocarbon or flammable fluid service with inlet pressures greater than 150 psig (10.3 Barg) or temperatures greater than 300° F (149° C).

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

Material Specifications (Body / Spring Chamber)		Inlet			
Description (Abbr.)	ASTM No.	Pressure		Temperature	
		psig	(barg)	°F	(°C)
CI/CI	A126, Class B	300 ** 250	(20.7) (17.2)	-20 to +400 -20 to +450	(-29 to +205) (-29 to +232)
BRZ/CI	B62 Alloy C83600/ A126, Class B	300 **	(20.7)	-20 to +350	(-29 to +177)
BRZ/BRZ *	B62, Alloy C83600	400 300 250	(27.6) (20.7) (17.2)	-20 to +200 -20 to +350 -20 to +400	(-29 to +93) (-29 to +177) (-29 to +205)
CS/CI	A216, Gr. WCB/ A126, Class B	300 ** 250	(20.7) (17.2)	-20 to +400 -20 to +450	(-29 to +205) (-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	300 ** 250	(20.7) (17.2)	-20 to +400 -20 to +450	(-29 to +205) (-29 to +232)
SST/BRZ	A351, Gr. CF8M/ B62, Alloy C83600	400 300 250	(27.6) (20.7) (17.2)	-20 to +200 -20 to +350 -20 to +400	(-29 to +93) (-29 to +177) (-29 to +205)
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				

* For operating temperatures between -325 to +150F (-198 to +66°C), specify Opt -5 with trim B5 or Opt-36 with trim S1 or S36.

** For Opt-1+6 with Cast Iron Spring Chamber - Max. Inlet Pressure Rating is de-rated to 250 psig (17.2 Barg).

*** Alternate "CS" material - LCC -Steel - ASTM A352 Gr. LCC - minimum temperature -50 °F (-46 °C) with S1 or S36 Trim.

**TABLE 3
BRASS TRIM MATERIAL COMBINATIONS**

Brass Trim Designations								
Part	Metal Seat	Composition Seat						
	B1	B2	B3	B4	*B5	B6	B7	BB
Diaphragm	302 SST	BC	BC	FKM	Phosphor Brz	EPDM	FKM	NBR
Cylinder	Brass	Brass	Brass	Brass	Brass	Brass	Brass	Brass
Valve Seat	316 SST	Brass	Brass	Brass	Brass	Brass	Brass	Brass
Plug	416 SST	Brass	Brass	Brass	Brass	Brass	Brass	Brass
Seat Disc	None (metal)	NBR	TFE	TFE	TFE	EPR	FKM	NBR
Seat Disc Screw	None	Brass	Brass	Brass	Brass	Brass	Brass	Brass
Temperature °F (°C)	-20 to +400 (-29 to 205)	-20 to +180 (-29 to +83)	-20 to 180 (-29 to +83)	-20 to +300 (-29 to 205)	-20 to +200 (-29 to +93)	-20 to +300 (-29 to +149)	-20 to +300 (-29 to 149)	-20 to +180 (-29 to +83)

* For operating temperatures between -325° and +150°F (-198 and +66°C), specify Opt-5 and trim designation B5.

BC = Neoprene; NBR = Buna-N; FKM = Fluorocarbon elastomer; EPR = Ethylene Propylene; EPDM = Ethylene Propylene Diene; TFE = Polytetrafluoroethylene

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

Stainless Steel Trim Designations - Metal Seat							
Part	S0	*S1	S2	S2N	S5	S40 (NACE)	S40B (NACE)
Diaphragm	TFE Coated 302SST	302SST	302SST	BC	FKM	BC	BC **
Cylinder	316SST	316SST	316SST	316SST	316SST	316SST	316SST
Valve Seat	316SST	316SST	316SST	316SST	316SST	316SST	316SST
Plug	316SST	316SST	416SST	416SST	416SST	316SST	316SST
Seat Disc	None (metal)	None (metal)	None (metal)	None (metal)	None (metal)	None (metal)	None (metal)
Seat Disc Screw	None	None	None	None	None	None	None
Temperature °F (°C)	-20 to +450 (-29 to +232)			-20 to +180 (-29 to +83)	-20 to +300 (-29 to +149)	-20 to +180 (-29 to +83)	-50 to +200 (-46 to +93)

* Available with stellited plug and valve seat (see Opt-15). Includes a screwed in seat cone.
 *For Operating temperatures between -325° and +150°F (-198 and +66°C), specify Opt-36, S1trim.
 ** Special BC Material for Low Temperature.

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

Stainless Steel Trim Designations - Composition Seat								
Part	S3	S3N	S9	*S36	S40T (NACE)	S40V (NACE)	S40C (NACE)	SB
Diaphragm	BC	BC	TFE Coated 302SST	302SST	FKM	FKM	BC **	NBR
Cylinder	316SST	316SST	316SST	316SST	316SST	316SST	316SST	316SST
Valve Seat	316SST	316SST	316SST	316SST	316SST	316SST	316SST	316SST
Plug	316SST	316SST	316SST	316SST	316SST	316SST	316SST	316SST
Seat Disc	TFE	NBR	TFE	TFE	TFE	FKM	TFE	NBR
Seat Disc Screw	316SST	316SST	316SST	316SST	316SST	316SST	316SST	316SST
Temperature °F (°C)	-20 to +180 (-29 to +83)		-20 to +400 (-29 to +205)		-20 to +300 (-29 to +149)		-50 to +200 (-46 to +93)	-20 to +180 (-29 to +83)

* For operating temperatures between -325° and +150°F (-198 and +66°C), specify Opt-36, S36 trim.
 ** Special BC Material for Low Temperature.

BC = Neoprene; NBR = Buna-N; FKM = Fluorocarbon elastomer; EPDM = Ethylene Propylene-Diene; EPR = Ethylene Propylene; TFE = Polytetrafluoroethylene

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, SB, S40T,V or C
	250	(17.25)	Metal	BR	B1
	250	(17.25)	Comp	BR - Comp	B2, B3, B4, B6, B7 or BB
Gases	350	(24.14)	Metal	BR or SST	B1, S0, S1 or S2
			Metal	SST - Comp	S2N, S5 or S40 or S40B
			Comp	SST	S9 or S36
			Comp	SST -Comp	S3, S3N, SB,S40T,V or C
			Comp	BR - Comp	B2, B3, B4, B6, B7 or BB
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		1/2" (DN15) Body					3/4" (DN20) Body					1" (DN25) Body					1-1/2" (DN40) Body					2" (DN50) Body				
		% Build					% Build					% Build					% Build					% Build				
psig	(Barg)	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	(.34)	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	(.69)	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	(1.0)	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	(1.7)	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	(2.4)	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	(3.4)	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	(5.2)	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	(6.9)	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	(10.3)	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	(13.8)	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	3.2	5.15	5.15	5.15
300	(20.7)	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	(24.1)	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

Metric Conversion Factor: Cv / 1.16 = kv

**TABLE 7
CAPACITY TABLES - Cv — COMPOSITION DIAPHRAGM**

Set Point (Inlet) Pressure P ₁		1/2" (DN15) Body					3/4" (DN20) Body					1" (DN25) Body					1-1/2" (DN40) Body					2" (DN50) Body				
		% Build					% Build					% Build					% Build					% Build				
psig	(Barg)	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	(.34)	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	(.69)	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	(1.0)	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	(1.7)	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	(2.4)	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	(3.4)	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	(5.2)	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	(6.9)	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	(10.3)	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	5.63	6.70	2.11	4.14	5.91	7.00	7.00
200	(13.8)	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	(20.7)	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	(24.1)	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

Metric Conversion Factor: Cv / 1.16 = kv

TABLE 8
WATER CAPACITY - GPM S.G. = 1.0 T = 60°F F_L = 0.945
All Sizes - COMPOSITION DIAPHRAGM ONLY

Outlet Pressure (psig)	Set Point Pressure (psig)	17" (DN15) Body					34" (DN20) Body					1" (DN25) Body					1-1/2" (DN40) Body					2" (DN50) Body					
		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	0.9	1.8	2.9	3.9	5.1	1.9	4.1	6.1	7.8	9.4	5.9	11.8	15.2	17.3	18.3	6.8	13.5	17.5	18.5	19.2						
	10	2.1	4.4	6.9	9.5	11.8	4.0	8.4	12.3	16.0	19.8	8.6	17.0	23.1	25.1	25.9	9.9	19.4	25.2	26.2	27.1						
	15	2.8	5.9	9.3	12.7	14.4	5.4	11.6	17.5	22.5	24.2	10.8	21.2	29.5	30.7	31.8	24.3	24.3	30.9	32.1	33.2						
	20	3.4	8.9	14.3	17.8	17.8	6.7	14.4	21.9	27.8	29.9	14.9	29.9	39.3	39.3	39.3	16.9	22.0	31.2	32.1	33.2						
	25	4.0	11.8	17.9	20.0	20.0	8.3	19.3	28.6	33.5	33.5	8.3	19.3	28.6	33.5	33.5	10.7	22.7	31.2	32.1	33.2						
	30	4.6	16.5	22.8	22.8	22.8	8.9	17.9	26.9	35.5	38.3	8.9	17.9	26.9	35.5	38.3	14.2	28.1	42.0	43.0	44.1						
	35	5.2	21.6	26.3	26.9	26.9	15.7	15.7	44.8	45.1	45.1	15.7	44.8	51.1	51.1	51.1	21.0	31.2	45.1	46.1	47.1						
	40	5.8	26.3	30.4	30.4	30.4	15.1	30.1	45.6	59.5	61.1	15.1	30.1	45.6	59.5	61.1	23.2	33.3	47.2	48.2	49.2						
	45	6.4	31.1	34.4	34.4	34.4	15.1	34.4	50.9	78.8	84.6	15.1	34.4	50.9	78.8	84.6	25.8	36.0	50.9	51.9	52.9						
	50	7.0	36.0	38.3	38.3	38.3	15.1	38.3	55.4	84.6	91.0	15.1	38.3	55.4	84.6	91.0	28.7	38.3	52.9	53.9	54.9						
	55	7.6	41.4	43.7	43.7	43.7	15.1	43.7	60.8	84.6	91.0	15.1	43.7	60.8	84.6	91.0	31.6	40.8	54.9	55.9	56.9						
	60	8.2	47.2	49.5	49.5	49.5	15.1	49.5	66.2	84.6	91.0	15.1	49.5	66.2	84.6	91.0	34.5	43.7	57.9	58.9	59.9						
	65	8.8	53.4	55.7	55.7	55.7	15.1	55.7	71.6	84.6	91.0	15.1	55.7	71.6	84.6	91.0	37.4	46.6	60.9	61.9	62.9						
	70	9.4	60.1	62.4	62.4	62.4	15.1	62.4	77.0	84.6	91.0	15.1	62.4	77.0	84.6	91.0	40.3	49.5	63.9	64.9	65.9						
	75	10.0	67.3	69.6	69.6	69.6	15.1	69.6	82.4	84.6	91.0	15.1	69.6	82.4	84.6	91.0	43.2	52.4	66.9	67.9	68.9						
	80	10.6	75.0	77.3	77.3	77.3	15.1	77.3	87.8	84.6	91.0	15.1	77.3	87.8	84.6	91.0	46.1	55.3	69.9	70.9	71.9						
	85	11.2	83.2	85.5	85.5	85.5	15.1	85.5	93.2	84.6	91.0	15.1	85.5	93.2	84.6	91.0	49.0	58.2	72.9	73.9	74.9						
	90	11.8	91.9	94.2	94.2	94.2	15.1	94.2	98.6	84.6	91.0	15.1	94.2	98.6	84.6	91.0	51.9	61.1	74.9	75.9	76.9						
	95	12.4	100.1	102.4	102.4	102.4	15.1	102.4	104.0	84.6	91.0	15.1	102.4	104.0	84.6	91.0	54.8	64.0	77.9	78.9	79.9						
	100	13.0	109.0	111.3	111.3	111.3	15.1	111.3	112.2	84.6	91.0	15.1	111.3	112.2	84.6	91.0	57.7	67.1	80.9	81.9	82.9						

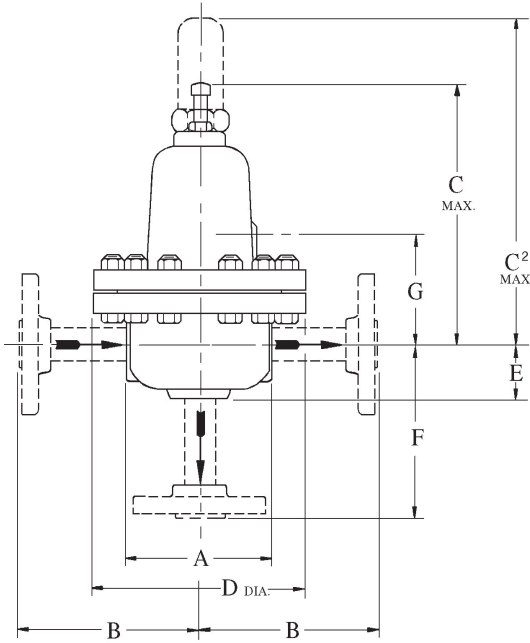
Metric Conversion Factors: psig/14.5 = Barg; (GPM x 3.785 = LPM).

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" (DN15) Body					3/4" (DN20) Body					1" (DN25) Body					1-1/2" (DN40) Body					2" (DN50) Body					
		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	6	13	20	26	33	14	29	42	52	61	14	29	42	52	61	43	83	104	115	128	49	96	120	135	146	158
	10	15	32	49	67	85	30	61	89	112	137	30	61	89	112	137	64	125	166	192	217	74	142	193	224	230	257
	15	22	45	70	94	120	42	89	131	166	204	42	89	131	166	204	84	163	221	248	253	95	186	257	291	297	330
2.5	25	36	73	116	158	173	56	118	178	225	271	56	118	178	225	271	125	238	324	348	357	141	271	378	407	417	466
	35	50	103	159	215	221	73	170	255	319	390	73	170	255	319	390	185	369	503	549	553	199	378	512	568	578	630
	50	80	163	252	314	389	101	175	266	336	401	101	175	266	336	401	210	415	549	601	601	233	446	601	661	705	745
5	100	154	314	481	497	513	144	271	422	585	810	144	271	422	585	810	292	574	861	1022	1055	325	661	1004	1196	1235	1355
	150	175	368	572	712	735	166	322	485	651	855	166	322	485	651	855	381	780	1169	1463	1511	440	898	1330	1713	1769	1905
	200	286	583	894	926	956	214	409	583	768	1042	214	409	583	768	1042	511	1011	1463	1903	1966	553	1093	1583	2027	2302	2421
7.5	300	463	966	1327	1375	1422	329	623	829	1033	1375	329	623	829	1033	1375	829	1619	2326	3026	3113	829	1619	2326	3026	3113	3309
	350	555	1157	1514	1569	1623	391	735	939	1144	1514	391	735	939	1144	1514	939	1838	2591	3336	3336	939	1838	2591	3336	3421	3605
	400	647	1327	1773	1836	1898	441	829	1079	1375	1836	441	829	1079	1375	1836	1079	2158	2963	3798	3891	1079	2158	2963	3798	3891	4095
10	450	741	1514	2000	2071	2141	500	939	1235	1583	2000	500	939	1235	1583	2000	1235	2470	3336	4291	1235	2470	3336	4291	4495	4789	
	500	833	1705	2244	2325	2405	550	1033	1375	1773	2244	550	1033	1375	1773	2244	1375	2754	3643	4633	4633	1375	2754	3643	4633	4837	5131
	550	925	1898	2470	2551	2631	600	1128	1514	2000	2470	600	1128	1514	2000	2470	1514	3026	3963	4963	4963	1514	3026	3963	4963	5167	5461
Metric Conversion Factors: psig/14.5 = Barg; LBS/HR X 0.4536 = KG/HR.	600	1017	2071	2714	2805	2895	650	1235	1623	2141	2895	650	1235	1623	2141	2895	1623	3246	4291	5291	1623	3246	4291	5291	5495	5789	
	650	1109	2244	2925	3016	3106	700	1329	1773	2326	2925	700	1329	1773	2326	2925	1773	3541	4633	5633	1773	3541	4633	5633	5837	6131	
	700	1201	2417	3100	3191	3281	750	1423	1867	2470	3191	750	1423	1867	2470	3191	1867	3754	4845	5845	1867	3754	4845	5845	6049	6343	

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such product at any time without notice. Cashco, Inc. does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Cashco, Inc. product remains solely with the purchaser.

DIMENSIONS AND WEIGHTS



Regulator Size (inch)	ENGLISH (in)										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	9.87	10.78	8.50	2.19	5.94	8.19	3.88	38
2	6.00	7.19	9.00	9.75	10.85	8.50	2.19	6.38	8.19	4.31	48

Regulator Size DN	METRIC (mm)										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	250	273	216	56	151	208	98	17.2
50	152	183	229	247	275	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.

Cryogenic OPT-5 or -36 BRZ or SST Body Mat'l OR For LCC Body Mat'l to -50°F(-46°C)

An "X" in POS 12 followed by a 5-digit control number overrides remaining selections.



POSITION 3 - SIZE		
Size	(DN)	CODE
1/2"	(15)	4
3/4"	(20)	5
1"	(25)	6
1-1/2"	(40)	8
2"	(50)	9

POSITION 5 - BODY & SPRING CHAMBER MATERIALS		
Body/Sp.Ch.	Option	CODE
BRZ/BRZ	-5 *	3
SST/SST	-36 *	A
CS/CS (LCC)	**	D

* Cleaned per Spec #S-1134 (Opt. -55).
 ** Minimum temperature -50 °F (-46 °C).

POSITION 6 & 7 - TRIM DESIGNATION NO.			
Brass Trim (For Brass Body)		Stainless Steel Trim (For SST & LCC Body)	
Desig.	CODE	Desig.	CODE
B5	B5	S1	S1
		S36	36
		S40B *	4B
		S40C *	4C

* NACE Trim use w/ CS Body down to -50° F (-46° C).

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
	ATEX	A

* For products to be placed in service in Europe - Ref to Directive 2014/68/EU. Forward Completed "EU" Application Recorder prior to quotation. (Without Recorder- Processing of Purchase Order will be delayed). Contact Cashco for Assistance.

POSITION 10 - END CONNECTIONS	
Description	CODE
NPT Screwed	1
OPT-30 - 150 LB RF Flg * (2)	6
OPT-30 - 300 LB RF Flg * (2)	7

* SST or LCC Body Material ONLY. (Nipples & Flanges same Material as Body)

POSITION 11 - RANGE SPRING			
SST Range Spring			
Size	Range		CODE
	psig	(Barg)	
1/2" (DN15)	2-30	(.14-2.1)	3
	20-60	(1.4-4.1)	6
	50-110	(3.4-7.6)	A
	90-150	(6.2-10.3)	C
	120-245	(8.3-16.9)	E
	220-300	(15.2-20.7)	H
3/4" & 1" (DN20) (DN25)	2-25	(.14-1.7)	2
	20-45	(1.4-3.1)	5
	35-100	(2.4-6.9)	9
	80-210	(5.5-14.5)	D
	170-300	(11.7-20.7)	G
1 1/2" & 2" (DN40) (DN50)	2-15	(.14-1.0)	1
	10-30	(.69-2.1)	4
	25-55	(1.7-3.8)	7
	45-95	(3.1-6.6)	8
	75-130	(5.2-9.0)	B
	110-300	(7.6-20.6)	F

POSITION 12 - TRIM OPTIONS		
Description	Option	CODE
No Option	—	0
For Special Construction Contact Cashco for Special Product Code.	SPQ	X

POSITION 16 - CERTIFICATE OPTIONS		
Description	Option	CODE
No Option	—	0
NACE Const: CS/CS/XX Per MR0175, S40B, S40C *	-40	J

* Not Available for OPT-5 or -36.

MODEL 123 Basic & Differential PRODUCT CODER 02/19/16

An "X" in POS 12 followed by a 5-digit control number overrides remaining selections.



POSITION 1 - MODEL	
CODE	Description
8	MODEL "123" BACK PRESSURE RELIEF
9	MODEL "123-1+6" Differential BACK PRESS. W/ CLOSING CAP

POSITION 2 - GASKETS * & SERVICE		
Gasket - Service	Options	CODE
Standard: Graphite/NBR - Non-Oxygen	--	B
TFE - Primarily for Oxygen	-45 **	D
Carbon graphite - High Temperature	-46G ***	G

* Refer to Tech bulletin for temperature limits.
 ** Not available with Option -1+6. Comp. Diaphragm does not require gaskets.
 *** Only Available with CS(WCB) or SST Body & Sprng Chamber, S1 or S2 Trim.

POSITION 3 - SIZES		
Size		CODE
inch	(DN)	
1/2"	(15)	4
3/4"	(20)	5
1"	(25)	6
1-1/2"	(40)	8
2"	(50)	9

POSITION 5 - BODY & SPRING CHAMBER MATERIALS	
Body/Sp. Ch.	CODE
CI/CI	1
BRZ/CI	2
BRZ/BRZ *	3
CS/CI	4
CS/CS (WCB)	5
SST/CI	7
SST/BRZ *	8
SST/CS	9
SST/SST *	A

* Not available w/ 1+6 variation.

POSITION 6 & 7 - TRIM DESIGNATION NUMBERS				
Brass Trim			Stainless Steel Trim	
Desig.	Body Material		Desig.	Body Mat'l
	CI OR BRZ CODE	CS 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
BB	BB	BB	S9	S9
			S36	36
			S40	40
			S40T	4T
			S40V	4V
			SB	SB

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 2014/68/EU. Forward Completed "EU" Application Recorder prior to quotation. (Without Recorder- Processing of Purchase Order will be delayed). Contact Cashco for Assistance.

POSITION 10 - END CONNECTIONS	
Description	CODE
NPT Screwed	1
OPT-30 - 150 LB RF Flgs (2) *	6
OPT-30 - 300 LB RF Flgs (2) *	7
OPT-31P - BSPP Screwed Parallel Pipe Thread	P
OPT-32 - SCH. 80 PE EXT. Nipples (2) *	E
OPT-33 - Third Body CONN (NPT)	4
OPT-39 - Socket Weld (2 CONN)	2
OPT-30 +33 - 150 LB RF Flgs (3 CONN) *	C
OPT-30 +33 - 300 LB RF Flgs (3 CONN) *	D
OPT-32 +33 - SCH. 80 PE EXT. Nipples(3 CONN) *	F
OPT-39 +33 - Socket Weld (3 CONN)	G

* Nipples & Flanges of same material as body. Flanges not available with CI body.

POSITION 11 - RANGE SPRINGS			
Range Spring - STD & "1+6" Option			
SIZE	Range		CODE
	psig	(Bar)	
1/2" (DN15)	2-30 *	(.14-2.1)	3
	25-50 *	(1.7-3.4)	6
	40-100 *	(2.8-6.9)	9
	80-150 *	(5.5-10.3)	C
	120-215	(8.3-14.8)	F
3/4" & 1" (DN20) (DN25)	150-350 **	(10.3-24.1)	G
	2-20 *	(.14-1.4)	2
	15-40 *	(1.0-2.8)	5
	30-80 *	(2.1-5.5)	8
	65-160 *	(4.5-11.0)	B
1-1/2" & 2" (DN40) (DN50)	130-205	(9.0-14.1)	E
	165-350 **	(11.4-24.1)	H
	2-15 *	(.14-1.0)	1
	10-25 *	(.69-1.7)	4
	20-55 *	(1.4-3.8)	7
	45-105 *	(3.1-7.2)	A
	85-220	(5.9-15.1)	D
	180-350 **	(12.4-24.1)	J

* Range springs for use with Opt-1+6.
 ** Not available for any body-spring chamber material combinations with CI. Must select BRZ, CS or SST spring chamber material from Position 5.

POSITION 12 - TRIM OPTIONS		
Description	Option	CODE
No Option	--	0
Stellited Seat Surface - S1 Trim Only.	-15	A
For Special Construction Contact Cashco for Special Product Code.	SPQ	X

POSITION 13 - FEATURE OPTIONS		
Description	Option	CODE
No Option	--	0
DI Closing Cap CI or CS Spring Chamber. (Included with "1+6" Variation).	-1	1

POSITION 14 - SPRING CHAMBER OPTIONS		
Description	Option	CODE
No Option	--	0
1/8" (DN6) NPT Vent Tap for CI, CS, SST Mat'l's.	-25	D
Plastic Rain-proof Bug Vent.	-25P	P
SST Rain-proof Bug Vent.	-25S	H

POSITION 16 - CERTIFICATE OPTIONS		
Description	Option	CODE
No Option	--	0
NACE Construction: CS/CS/XX Per MR0175, S40, S40T, or S40V Trims (NOT Available with "1+6" Variation).	-40	J
NACE Construction: SS/SS/XX OR CS/CS/XX Per MR0175, S40, 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'l's only. Suitable for oxygen service. (Not Available w/ "1+6" Variation).	-55	M
Special Cleaning: Per Cashco Spec #S-1542.	-56	N

POSITION 17 - PAINT OPTIONS		
Description	Option	CODE
No Option	--	0
Epoxy Painted Per Cashco Spec #S-1547.	-95	W
Epoxy Painted Per Cashco Spec #S-1687 OFFSHORE Applic.	-95OS	Y

Cashco, Inc.
 P.O. Box 6
 Ellsworth, KS 67439-0006
 PH (785) 472-4461
 Fax. # (785) 472-3539
 www.cashco.com
 email: sales@cashco.com
 Printed in U.S.A. 123-TB

Cashco GmbH
 Handwerkerstrasse 15
 15366 Hoppegarten, Germany
 PH +49 3342 30968 0
 Fax. No. +49 3342 30968 29
 www.cashco.com
 email: germany@cashco.com

Cashco do Brasil, Ltda.
 Al.Venus, 340
 Indaiatuba - Sao Paulo, Brazil
 PH +55 11 99677 7177
 Fax. No.
 www.cashco.com
 email: brazil@cashco.com