



ISO Registered Company

6987-TB

02-20

MODEL 6987

HIGH PRESSURE BACK PRESSURE RELIEF REGULATOR



MODEL 6987

OVERVIEW

The Model 6987 is a heavy duty, high pressure, self-contained back pressure/relief regulator for controlling fluid pressure between 50 and 1050 psig (3.4 and 72.35 Barg) setpoint levels. Pressure builds up to 20% above setpoint pressure are possible. The body design is an angle configuration with a side inlet and bottom outlet. Available options include flanged end connections, stellite seating surfaces and NACE construction.

FEATURES

- High Pressure:** High inlet and outlet pressures; high pressure drops.
- Adjustment Ease:** Ball bearing reduces frictional forces and assures proper transmission of forces.
- Wide Setpoint Range:** Six range springs from which to select.
- Third Body Connection:** Optional. Allows in-line, flow-thru installation.

APPLICATIONS

Designed for controlling a wide range of fluids including air, inert gases, water, fuel oil and chemicals. Model 6987 is not normally utilized in steam service.



LINE SIZES AVAILABLE

1/2" (DN15), 3/4" (DN20)



END CONNECTIONS

NPT, RF FLANGED, EXTENDED NIPPLES



COMMON APPLICATIONS

AIR, INERT GASES, WATER, FUEL OIL, CHEMICALS



DESIGN PRESSURE

MAXIMUM INLET PRESSURE:
1500 psig (103.4 Barg)

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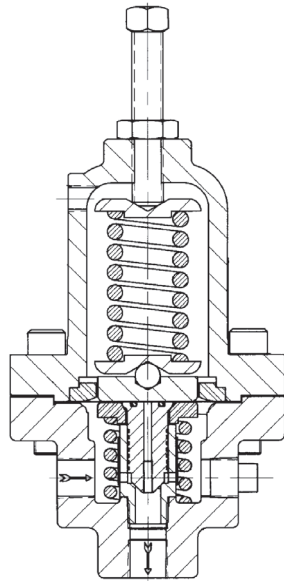
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STANDARD / GENERAL SPECIFICATIONS

Body Size:	1/2" and 3/4" (DN15, 20).	Diaphragm Bolting:	<u>Standard:</u> Alloy steel socket head screws.
End Connections:	<u>Standard:</u> NPT female. <u>Opt-30:</u> 300# or 600# RF flanges <u>Opt-32:</u> Extended Nipples <u>Opt-33:</u> Third Body Connection	Orifice Size:	<u>Standard:</u> 0.50 inch (13 mm) <u>Optional:</u> Opt-12+15; 0.25 inch (6 mm)
Body Material:	CS - Cast Steel; WCB. SST - Cast 316SST; CF8M	Gaskets:	<u>Standard:</u> Aramid/SBR.
Spring Chamber:	CS - Cast Steel	Range Springs:	Plated steel.
Trim:	S1 & S40M Trim: See Table 3		



Standard Model 6987

Range Springs	
psig	(Barg)
50 - 100	(3.4 - 6.9)
75 - 200	(5.2 - 13.8)
150 - 300	(10.3 - 20.7)
200 - 450	(13.8 - 31.0)
400 - 600	(27.6 - 41.4)
500 - 1050	(34.5 - 72.35)

Max. Inlet Pressure:	1500 psig (103.4 Barg)
Operating Temperature:	-20° to +450°F (-29° to +232°C)
Capacity - Cv:	Full Orifice - Up to 2.2 Cv Reduced Orifice - Up to 1.1 Cv
Painting:	<u>Standard:</u> All non-corrosion resistant portions to be painted with corrosion resistant epoxy paint per Cashco Spec #S-1606.

OPTION SPECIFICATIONS

OPTION -1:	<u>CLOSING CAP.</u> A removable ductile iron cap which discourages tampering with spring setting. Includes a 1/4" NPT female vent connection.	pipng vent to remote location in event of diaphragm failure.
OPTION -1+6:	<u>DIFFERENTIAL CONSTRUCTION.</u> Model 6987 is <u>not available as a differential valve.</u> A special variation Model 123-1+6+S is applicable within the same pressure/temperature ranges and sizes. Consult the factory with application details.	
OPTION -12+15:	<u>REDUCED & STELLITED SEATS.</u> Includes a 0.25" reduced orifice, stellite insert in the cylinder, and a stellited seating surface for the piston.	
OPTION -25	<u>TAPPED VENT.</u> 1/4" NPT (DN8) tapped opening in spring chamber for	
OPTION -25S:	<u>VENT SCREEN:</u> Cap.	
OPTION -30:	<u>FLANGE END CONNECTIONS.</u> 300# or 600# raised face flanges. 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. Stainless steel bodies have 316SST nipples and flanges.	
		With either of the above flange pressure classes, the flange pressure ratings are the pressure limiting factors, not the body inlet rating. (Refer to ASME B16.5 for allowable working pressure vs. temperature tables.)

OPTION-32: EXTENDED NIPPLES. Schedule 80 plain end nipples are welded to the body to facilitate field welding into the piping. The nipples are screwed into the body and seal welded. Available in steel or SST materials; nipple material match body material.

OPTION-33: THIRD BODY CONNECTION. Normally plugged side inlet connection is removed providing a third body connection. May be used with Opt-30 and -32. Third connection is at same pressure level as inlet and is in-line with inlet connection, allowing in-line, flow-thru installation.

OPTION-40: CS NACE CONSTRUCTION. Internal wetted portions meet NACE standard MRO 175 when the exterior of the regulator is not directly exposed to a sour gas environment, buried, insulated or otherwise denied direct atmospheric exposure. CS/CS body/spring chamber materials only. Use only S40M trim. Opt-30 and -32 require post-weld stress relieving by heat treating.

OPTION-40SST: SST NACE CONSTRUCTION. Same as Option-40, except uses SST body.

OPTION-56: SPECIAL CLEANED. Cleaned per Cashco Spec. #S-1542. Utilize when better than normal cleanliness level is required and unit is not for oxygen service.

TECHNICAL SPECIFICATIONS

**TABLE 1
DESIGN PRESSURE –TEMPERATURE
MATERIAL SPECIFICATIONS**

Temperature °F	Working Pressure Classes										Temperature °C
	Carbon Steel Body- ASTM A216 Gr. WCB					Stainless Steel Body-ASTM A351 Gr. CF8M					
	NPT & Opt-32	300# Flanges		600# Flanges		NPT & Opt-32	300# Flanges		600# Flanges		
-20 to +100	1500 psig (103.4 Barg)	psig	(Barg)	psig	(Barg)	1500 psig (103.4 Barg)	psig	(Barg)	psig	(Barg)	(-29 to +38)
200		740	(51.0)	1480	(102.0)		720	(49.6)	1440	(99.3)	(93)
300		680	(46.9)	1360	(93.8)		620	(42.8)	1240	(85.5)	(149)
400		655	(45.2)	1310	(90.3)		560	(38.6)	1120	(77.2)	(205)
450		635	(43.8)	1265	(87.2)		515	(35.5)	1025	(70.7)	(232)
		615	(42.4)	1235	(85.2)		495	(34.1)	990	(68.3)	(232)

**TABLE 2
MAXIMUM ALLOWABLE PRESSURE DROPS**

Fluid	Maximum Recommended Operating Pressure Drop				Seat Design	Trim Designation Number
	Clean Fluid Industrial Quality		Unclean Fluid Pipeline Quality			
	psid	(Bard)	psid	(Bard)		
Liquid	600	(41.4)	400	(27.6)	Standard	S1, S40M
	960 ¹	(49.7)	600 ¹	(41.4) ¹	Opt-12+15 Stellite	S1
Gas	960	(66.2)	600	(41.3)	Standard	S1, S40M
	960	(66.2)	960	(66.2)	Opt-12+15 Stellite	S1

¹Non-cavitating.

**TABLE 3
TRIM MATERIAL**

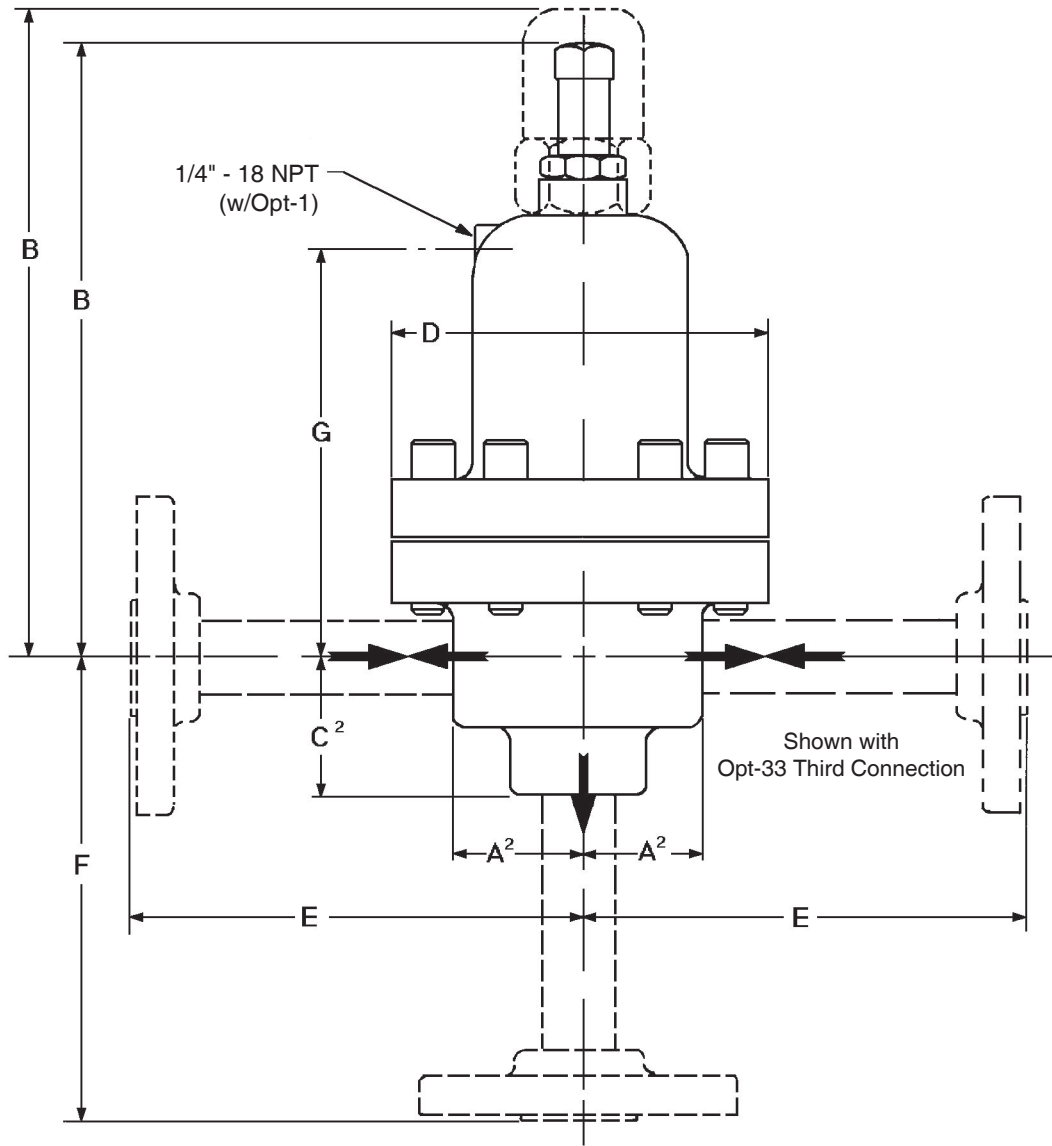
Trim Designation No.	Dia-phragm	1Cylinder	Piston	O-ring	Spring Button	Piston Spring	Temperature	
							°F	(°C)
S1	302 SST	316 SST	316 SST	TFE	STEEL	302 SST	-20 to +450	(-29 to +232)
S40M	ELGILOY	316 SST	316 SST	TFE	STEEL	INCONELL X-750		

¹A stellite #6 insert is press fit into the cylinder when an Opt-12+15 is specified - S1 Trim only

**TABLE 4
Capacity - C_v
F_L = 0.95**

Set Pressure		Full Orifice		Stellited Seats & Reduced Orifice Opt-12+15	
		% Build		% Build	
psig	(Barg)	10%	20%	10%	20%
50	(3.4)	.42	.78	.25	.46
75	(5.2)	.50	.95	.31	.57
100	(6.9)	.65	1.20	.35	.69
150	(10.3)	.68	1.30	.40	.73
250	(17.2)	.82	1.52	.17	.37
350	(24.1)	.35	.66	.21	.35
450	(31.0)	.40	.75	.23	.43
550	(38.0)	.47	.85	.25	.45
650	(44.8)	.48	.88	.26	.46
1050	(72.35)	.50	1.00	.30	.57

DIMENSIONS AND WEIGHTS



ENGLISH UNITS (Inches & lbs)									
Body Size	A ²	B	B	C ²	D	E ¹	F ¹	G	Shipping Weight
1/2" & 3/4"	1.82	9.44	10.00	2.00	5.50	5.25	5.25	5.59	34 lbs
METRIC UNITS (mm & kg)									
Body Size	A ²	B	B	C ²	D	E ¹	F ¹	G	Shipping Weight
DN 15 & DN 20	46	240	254	51	140	133	133	142	15.4 kgs.
¹ Applies to Model 6987 -30+33 or Model 6987-32+33. ² Applies to NPT (screwed) bodies. NOTE: Dimensions "E" and "F" apply to Opt-30 Flanged end connections or Opt-32 Plain End Pipe Nipples.									

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MODEL 6987 PRODUCT CODER 02/07/20

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



POSITION 3 - SIZE		
Size		CODE
in	(DN)	
1/2"	(15)	4
3/4"	(20)	5

POSITION 5 - BODY & SP. CHAMBER MATERIAL	
Body/Spring Chamber	CODE
CS/CS	5
SST/CS	9

POSITION 6 & 7 - TRIM DESIGNATION NUMBERS	
Stainless Steel Trim	
Desig.	CODE
S1	S1
S40M	4M

POSITION 10 - END CONNECTIONS		
Description	2-End Conn.	3-End Conn. (Opt-33)
	CODE	CODE
NPT Screwed	1	4
Opt-30 - 300 LB RF Flanges *	7	D
Opt-30 - 600 LB RF Flanges *	8	H
Opt-32 - SCH 80 PE EXT Nipples *	E	F

*Nipples & Flanges same material as body.

POSITION 11 - RANGE SPRING		
Range		CODE
psig	(Barg)	
50 - 100	(3.4-6.9)	1
75 - 200	(5.2-1.8)	2
150 - 300	(10.3-20.7)	3
200 - 450	(13.8-31.0)	A
400 - 600	(27.6-41.4)	B
500 - 1050	(34.5-72.35)	C

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

POSITION 14 - SPRING CHAMBER OPTIONS			
Description	Option	CODE	
No Option	—	0	
1/4" NPT Vent Tap	-25	E	
SST Rain-proof Bug Vent. (includes Opt-25)	-25S	H	

POSITION 13 - FEATURE OPTIONS			
Description	Option	CODE	
No Option	—	0	
Closing Cap	-1	1	

POSITION 16 - CERTIFICATE OPTIONS			
Description	Option	CODE	
No Option	—	0	
NACE Construction: CS/CS/S40M Per MR0175.	-40	J	
NACE Construction: SS/CS/S40M Per MR0175.	-40SST	K	
Special Cleaning: Per Cashco Spec #S-1542.	-56	N	

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