ISO Registered Company

TECHNICAL BULLETIN

31-B-TB
02-20

MODEL 31-B

LOW BACK PRESSURE RELIEF REGULATOR

MODEL 31-B

OVERVIEW

The Model 31-B is a compact relief regulator designed expressly for use as a back pressure regulator or bypass valve for controlling inlet pressure between 2 and 16 Inches - W.C. Body is available in cast carbon steel or stainless steel materials only. Interior wetted trims for corrosive applications is standard.

FEATURES

Body Material:	Carbon steel or stainless steel.
Trim Material:	Choice of four combinations of materials, including 316L SST wetted.
Setpoint Pressure Range:	Multiple springs covering 2.0" - 16.0" W.C. (50 - 400mm H_2O).
Accurate Regulation:	Optimum internals design to ensure rapid response to sudden load changes.
Multiple Configurations:	Valve is factory assembled in four standard positions. Actuator section can be rotated 360° around the valve's throat. See Figure 1.
Valve Seat Design:	One-piece, molded, resilient seat self-locks, self-aligns, and is easily field maintained. Design minimizes pressure build above setpoint at lockup (no flow) conditions. Buna-N, fluorocarbon elastomer, silicone or TFE seat material. Loading ring allows field adjustment of "boost effect".

APPLICATIONS

Primarily designed for tank blanketing (padding) with inert gas of fluids that are volatile, corrosive, lethal or combinations of same. Corrosion resistant design negates gas diffusion effects. Unit will also find application in fuel gas service where the gas is corrosive.

LINE SIZES AVAILABLE

1/2" (DN15), 3/4" (DN20) 1" (DN25)
1-1/2" (DN40), 2" (DN50)

END CONNECTIONS

FNPT, RF FLANGED, EXTENDED NIPPLES, 14" FACE TO FACE

COMMON APPLICATIONS

INERT GAS OF FLUIDS THAT ARE VOLATILE, CORROSIVE, LETHAL

DESIGN PRESSURE

MAXIMUM PRESSURE INLET & OUTLET:
50 psig (3.44 Barg)

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 Казахстан +7(7172)727-132 Киргизия +996(312)96-26-47

https://cashco.nt-rt.ru/ || coc@nt-rt.ru

STANDARD / GENERAL SPECIFICATIONS

Body Sizes: 1/2", 3/4", 1", 1-1/2" and 2" (DN15, 20, 25, 40 and 50)
NOTE: Inlet and outlet same size.

End Connections: Standard : NPT female
Option-30: Weld-on 150# RF flanges.
Option-32: Extended plain end nipples. Use for socket welded piping.
Option-34: 14" Face to Face Flange Dimension.

Body/Diaphragm Case/Spring Chamber Material Combinations: CS/SST/CS, SST/SST/CS.
CS = Cast Carbon Steel
SST = Cast Stainless Steel
See Table 1 for materials specifications.

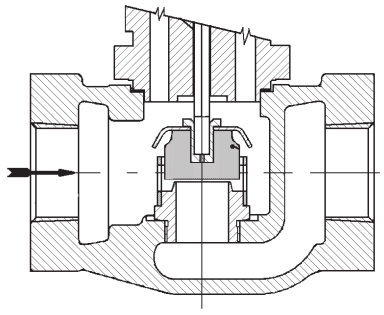
Inlet Pressure Limits: Maximum Design Pressure is 50 psig (3.44 Barg).

Temperature Limits: Maximum Temperature – up to +400°F (204°C) - dependent on loading ring material.
Minimum Temperature – down to -30° F (-34°C) dependent on composition seat material:

See Tables 2a and 2b.

Inlet Setpoint Pressure Ranges: 2.0" to 16" W.C.
(50 to 400mm H_2O).
NOTE: "Setpoint" defined @ 50 SCFH flow with S.G. = 0.97 gas, except for 0.125" orifice which is defined @ 10SCFH.

Trim Design: Composition seat design only.
See Table 2a and 2b for trim designation numbers vs. trim materials.



Cut-away of BODY

Capacities: Cv. vs. Build
Table 4

SCFH vs. Build
Table 5: Natural Gas
Table 6: Nitrogen
Table 7: Propane

Seat Leakage: Dependent on connection size, orifice size and setpoint pressure and level of build.
Meets ANSI/FCI 70/2 (Rev. 1982) Standard — Class VI.

Range Springs: Standard: Heat treated steel. Eight springs. See Table 3 for specific ranges.

Gaskets: Graphite/NBR Body Gasket.

External Bolting: Standard: 316 SST.

Painting: Standard: All non-corrosion resistant portions to be painted with corrosion resistant epoxy paint per Cashco Spec #S1606.

OPTION SPECIFICATIONS

Option -25: TAPPED VENT. 1/4" NPT female tapped opening in spring chamber. Use for piping vent to remote location in event of diaphragm failure.

Option -25S: VENT SCREEN. Cap (For Opt-25),

Option -30: FLANGED END CONNECTIONS. CS or SST body materials. Flange and pipe nipple materials of same general chemistry as body material. Body and flanges socket weld. Available in 150# RF flange only.

NOTES: 1. The body P vs. T ratings of Table 1 are the limiting variables for flanged end connections.
2. No post-weld stress relieving performed.

Option -32: EXTENDED NIPPLES. Use for socket and butt welded pipe systems. CS or SST body materials. Schedule 80 plain end pipe nipples of same general chemistry as body material. Short-threaded nipples seal welded at body.
NOTE: No post-weld stress relieving performed.

Option -34: SPECIAL 14" FACE TO FACE DIMENSION FOR FLANGED END CONNECTIONS. See Opt.-30 for standard face to face dimension.

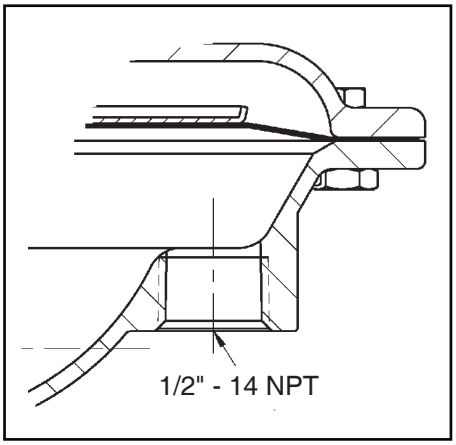
Option -37: ALL SST/CLEAN UNIT. Used primarily for food and pharmaceutical industries. NPT end connections only. Uses SST body and lower casing. Spring chamber and seal cap are unpainted salt nitrided CS. All external bolting of 316 SST. All wetted cast SST parts are electropolished. Unit is cleaned to Cashco Spec. #S-1576. Suitable for operating temperature range of -30 to +100°F (-34 to +38°C).

Option -40: CS NACE CONSTRUCTION. Internal wetted portions meet NACE standard MR0175, when 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 material with S40V, S40V-HT and S50V only trim. Available all sizes. Opt-30, -32 & -34 require post-weld stress relieving by heat treating.

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

Option -56: SPECIAL CLEANING. CS or SST body and lower casing only. Cleaning per Cashco Spec. #S-1542. Higher degree of cleaning than standard commercial cleaning.

Option -ES: EXTERNAL SENSING. 1/2 x 14 NPT threaded port in the lower case for connectng a remote sensing line upstream from the inlet. Requires o-ring seal on plug and stem assembly.



TECHNICAL SPECIFICATIONS

NOTE: Regulators operating at "WC" (mm H_2O) outlet (downstream) pressure levels have the passing gas at near fully expanded conditions; i.e. density is low. This creates high velocities. To prevent downstream pipe frictional effects from causing significant setpoint error, ensure proper downstream pipe sizing. Maximum recommended flow rate for a given pipe size may be calculated from Equation 1.
Increase downstream pipe size until $SCFH_{max}$ is greater than the SCFH flow rate required.

$SCFH_{max}$ = Flow Rate at which pipe friction causes an "h_L" pressure loss in "L" equivalent feet of outlet pipe, with the outlet pipe size and body size equal; ft^3/Hr.

$$SCFH_{max} = 479 \sqrt{\frac{h_L \times d_2^5 \times (P_2 + 407.37)^2}{f \times L \times SG \times T_2^2}}$$

where:

h_L = head/pressure loss in downstream pipe.
d_2 = outlet pipe internal diameter; inch
P_2 = outlet pressure; "W.C.
L = equivalent pipe length; feet
SG = fluid specific gravity; dimensionless
T_2 = outlet temperature; °R
f = friction factor; dimensionless

d_2	f	d_2	f
3/4"	0.031	2"	0.021
1"	0.026	2-1/2"	0.020
1-1/4"	0.024	3"	0.018
1-1/2"	0.023		

EQUATION 1

TABLE 1
DESIGN PRESSURE –TEMPERATURE
MATERIAL SPECIFICATIONS

STANDARD, OPT -30 & OPT -32 CONSTRUCTIONS								
Material Specifications (Body/Lower Casing/Sp. Ch.)		End Connections	Inlet & Outlet					
			Pressure	Trim Designation Nos.				
				S40N, S50N, S40T	WS40N, WS50N	S40V, [S50V]	S40N-HT, WS40N-HT	S40V-HT
Description (Abbr.)	ASTM No.		psig (Barg)	Temperature				
				°F(°C)	°F(°C)	°F(°C)	°F(°C)	°F(°C)
CS/SST/CS	A216, Gr. WCB/ A351, Gr. CF3M/ A216, Gr. WCB	NPT–Std or Opt.–32 P. E. Pipe Nipples or Opt.–37	50 (3.44)	-30 to +220 (-34 to +104)	-30 to +220 (-34 to +104)	-15 to +220 (-26 to +104) [-15 to +400 (-26 to +204)]	-30 to +250 (-34 to +121)	-15 to +400 (26 to +204)
SST/SST/CS	A351, Gr. CF3M/ A351, Gr. CF3M/ A216 Gr. WCB							
CS/SST/CS	A216, Gr. WCB/ A351, Gr. CF3M/ A216, Gr. WCB	Opt.-30 or Opt-34: 150# Flgd.						
SST/SST/CS	A351, Gr. CF3M/ A351, Gr. CF3M/ A216 Gr. WCB	Opt.-30 or Opt-34: 150# Flgd.						

Pipe Materials	Nipples	Flanges
CS	ASTM A106 Gr. B; or equal	ASTM A105 Forged, or equal
SST	ASTM A240, Tp. 316L	ASTM A182 Forged, Gr. F316L

TABLE 2a
TRIM MATERIALS
For Sizes 1/2" - 1" (DN15 - DN25)

Part Description	Trim Designation Nos.						
	S40N	**WS40N**	**S40T**	**S40V (NACE)**	**S40N-HT**	**WS40N-HT**	**S40V-HT (NACE)**
Seat	NBR	Silicone	TFE	FKM	NBR	Silicone	FKM
Loading Ring	Glass-filled Nylon	Glass-filled Nylon	Graph / PTFE	Glass-filled Nylon	Graph / PTFE	Graph / PTFE	Graph / PTFE
Orifice	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST
Stem	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST
Linkage Lever	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST
Link. Lever Screw	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST
Linkage Pin	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST
Diaphragm	NBR w/ Reinforcing Cores	NBR w/ Reinforcing Cores	NBR w/ Cotton Insert &TFE cover	FKM w/ Reinforcing Cores	NBR w/ Reinforcing Cores	NBR w/ Reinforcing Cores	FKM w/ Reinforcing cores
Lower Diaph. Plate	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST	316L SST
Temperature Range	-30 to +220°F	-30 to +220°F	-30 to +220°F	-15 to +220°F	-30 to +250°F	-30 to +250°F	-15 to +400°F
	(-34 to +104°C)	(-34 to +104°C)	(-34 to +104°C)	(-26 to +104°C)	(-34 to +121°C)	(-34 to +121°C)	(-26 to +204°C)
(NBR = Buna-N; FKM = Fluorocarbon elastomer)							

TABLE 2b
TRIM MATERIALS
For Sizes 1-1/2" & 2" (DN40 & DN50)

Part Description	Trim Designation Nos.		
	S50N	**WS50N**	**S50V (NACE)**
Seat	NBR	Silicone	FKM
Loading Ring	316L SST *	316L SST *	316L SST *
Orifice	316L SST	316L SST	316L SST
Stem	316L SST	316L SST	316L SST
Linkage Lever	316L SST	316L SST	316L SST
Link. Lever Screw	316L SST	316L SST	316L SST
Linkage Pin	316L SST	316L SST	316L SST
Diaphragm	NBR w/ Reinforcing Cores	NBR w/ Reinforcing Cores	FKM w/ Reinforcing Cores
Lower Diaph. Plate	316L SST	316L SST	316L SST
Temperature Range	-30 to +220°F	-30 to +220°F	-15 to +400°F
	(-34 to + 104°C)	(-34 to +104°C)	(-26 to +204°C)
* Steel body uses steel loading ring. (NBR = Buna-N; FKM = Fluorocarbon elastomer)			

TABLE 3
RANGE SPRINGS - ALL SIZES

Setpoint Pressure Range	
Inch W.C.	**(mm H_2O)**
2.0 to 3.0 *	(50 - 76)
3.0 to 4.5	(76 - 114)
4.5 to 5.5	(114 - 140)
5.0 to 7.0	(127 - 178)
5.5 to 8.0	(140 - 203)
7.0 to 11.0	(178 - 279)
8.0 to 12.0	(203 - 305)
11.0 to 16.0	(279 - 406)
* Spring case must be oriented down.	

TABLE 4
CAPACITY – C_v

Set Point (Inlet) Pressure P_1		Body Size 1/2" - 1" (DN15 -DN25)														
		No.2 Orifice (0.125")			No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
		% Build														
in wc	(mm H20)	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	0.35	0.36	0.36	0.56	0.81	0.81	0.70	1.35	1.43	0.99	1.55	1.65	1.41	2.43	2.66
3.75	(95)	0.31	0.35	0.36	0.69	0.83	0.85	0.84	1.32	1.38	1.06	1.77	1.91	1.61	2.21	2.65
5"	(127)	0.28	0.39	0.41	0.66	0.68	0.74	1.11	1.35	1.41	1.15	1.83	1.98	1.43	2.35	2.71
6"	(152)	0.23	0.37	0.39	0.60	0.76	0.77	1.10	1.29	1.37	1.42	1.98	2.10	1.38	2.22	2.56
7"	(178)	0.27	0.40	0.41	0.56	0.68	0.70	1.11	1.32	1.38	1.36	1.90	1.97	1.61	2.27	2.52
9"	(228)	0.29	0.38	0.40	0.74	0.76	0.78	0.98	1.30	1.39	1.21	1.73	1.88	1.37	2.08	2.49
10"	(254)	0.29	0.37	0.40	0.73	0.75	0.76	0.96	1.27	1.38	1.21	1.72	1.84	1.25	1.92	2.37
13.5"	(343)	0.29	0.36	0.38	0.60	0.74	0.75	0.92	1.19	1.36	1.04	1.60	1.85	1.17	1.90	2.39

Set Point (Inlet) Pressure P_1		Body Size 1-1/2 - 2" (DN40 -DN50)														
		No.2 Orifice (0.125")			No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
		% Build														
in wc	(mm H20)	NA	10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	NA	0.78	0.86	0.88	1.10	1.28	1.36	1.06	1.58	2.04	1.20	2.43	2.92			
3.75	(95)		0.75	0.88	0.90	0.98	1.25	1.38	1.23	1.88	2.12	1.79	2.65	2.97			
5"	(127)		0.75	0.80	0.81	0.85	1.25	1.48	1.21	1.86	2.12	1.62	2.50	3.02			
6"	(152)		0.73	0.78	0.80	1.11	1.42	1.57	1.29	1.86	2.09	1.62	2.57	2.95			
7"	(178)		0.76	0.81	0.85	1.15	1.49	1.57	1.37	1.98	2.12	1.58	2.68	2.95			
9"	(228)		0.74	0.82	0.85	1.09	1.37	1.53	1.21	1.79	2.12	1.43	2.35	2.81			
10"	(254)		0.70	0.81	0.84	0.96	1.34	1.51	1.14	1.75	2.06	1.43	2.48	2.83			
13.5"	(343)		0.71	0.78	0.83	0.95	1.34	1.51	0.99	1.68	2.00	1.38	2.28	2.76			

TABLE 5
NATURAL GAS CAPACITY — SCFH
SG = 0.60 T = 60°F F_L = 0.90

Setpoint Pressure		SCFH @ 1/2" - 1" (DN15 - 25) - Body Size														
		No. 2 Orifice (0.125")			No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
in wc	(mm H20)	% Build														
		10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	30	32	34	48	73	76	60	121	134	85	140	152	121	219	249
3.75	(95)	32	39	41	73	91	97	88	146	158	112	195	219	170	243	304
5	(127)	34	49	54	80	88	97	134	171	183	139	232	256	177	295	350
6	(152)	30	51	56	80	106	112	140	177	195	171	250	280	183	305	366
7	(178)	37	58	63	91	116	124	158	195	213	195	280	305	230	335	390
9	(228)	46	63	71	122	130	139	158	219	249	195	293	329	222	351	435
10	(254)	49	66	73	127	134	144	165	225	256	207	305	341	213	341	439
13.5	(343)	58	75	83	124	156	166	183	244	293	207	329	396	232	390	512

Setpoint Pressure		SCFH @ 1-1/2" and 2" (DN40 & 50) - Body Size											
		No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
in wc	(mm H20)	% Build											
		10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	67	78	82	95	115	128	91	142	191	103	219	274
3.75	(95)	79	97	103	103	137	158	130	207	243	188	292	341
5	(127)	91	104	110	102	158	191	146	235	274	195	317	390
6	(152)	97	110	116	146	195	224	171	256	299	213	353	421
7	(178)	110	122	134	165	219	244	195	293	329	225	396	457
9	(228)	122	140	151	177	232	268	196	301	371	232	396	491
10	(254)	124	146	158	163	238	280	199	310	380	244	439	524
13.5	(343)	146	165	183	188	275	323	200	341	427	274	469	591

TABLE 6
NITROGEN GAS CAPACITY — SCFH
SG = 0.987 T = 60°F F_L = 0.90

Setpoint Pressure		SCFH @ 1/2" - 1" (DN15 & 25) - Body Size														
		No. 2 Orifice (0.125")			No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
in wc	(mm H20)	% Build														
		10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	25	27	28	40	61	64	50	101	111	71	116	127	101	183	208
3.75	(95)	27	32	34	61	76	81	74	122	132	93	162	183	142	203	254
5	(127)	28	41	45	67	73	81	112	142	152	116	193	214	147	248	292
6	(152)	25	43	47	67	88	94	117	147	163	142	208	234	152	254	305
7	(178)	30	49	53	76	97	104	132	163	178	163	234	254	192	280	325
9	(228)	39	53	59	101	109	116	132	183	203	163	244	275	185	293	363
10	(254)	41	55	61	106	112	120	137	188	214	173	254	285	178	285	366
13.5	(343)	49	63	69	104	130	138	152	203	244	173	275	330	193	325	427

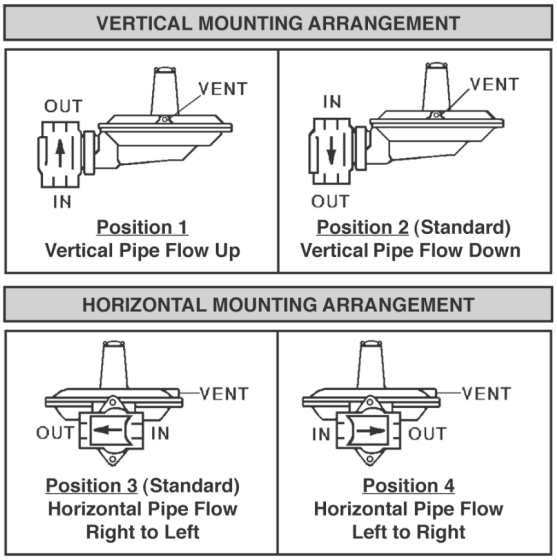
Setpoint Pressure		SCFH @ 1-1/2" and 2" (DN40 & 50) - Body Size											
		No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
in wc	(mm H20)	% Build											
		10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	56	65	69	79	96	106	76	118	159	86	183	228
3.75	(95)	66	81	86	86	114	132	108	172	203	157	244	284
5	(127)	76	85	91	85	132	160	122	196	229	163	264	325
6	(152)	81	91	97	122	163	187	142	214	249	178	295	351
7	(178)	91	102	112	137	183	203	163	244	275	188	330	381
9	(228)	102	117	126	147	193	224	164	251	309	193	330	410
10	(254)	104	122	132	136	198	234	166	258	317	203	366	437
13.5	(343)	122	137	152	157	230	269	169	285	356	229	391	493

TABLE 7
PROPANE GAS CAPACITY — SCFH
SG = 1.52 T = 60°F F_L = 0.90

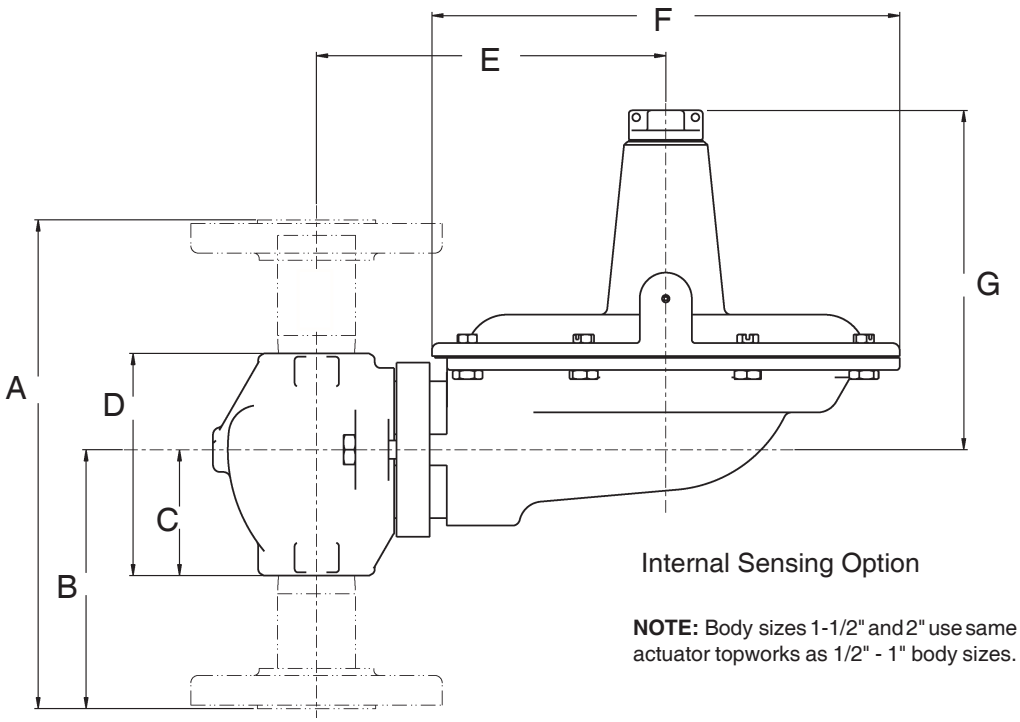
Setpoint Pressure		SCFH @ 1/2" - 1" (DN15 - 25) - Body Size														
		No. 2 Orifice (0.125")			No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
in wc	(mm H20)	% Build														
		10	20	30	10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	20	21	22	32	48	51	40	81	89	56	93	101	81	145	166
3.75	(95)	21	25	27	48	60	64	59	97	105	74	129	145	113	162	202
5	(127)	23	32	36	53	58	65	89	113	122	92	154	107	118	198	233
6	(152)	20	34	37	53	70	75	93	118	130	113	166	186	122	203	243
7	(178)	24	39	42	61	77	83	105	130	142	130	186	203	153	223	259
9	(228)	31	42	47	81	87	92	103	146	162	130	195	219	148	233	289
10	(254)	32	44	49	84	89	96	109	150	170	138	203	227	142	227	292
13.5	(343)	39	50	55	83	104	110	122	162	195	138	219	263	154	259	340

Setpoint Pressure		SCFH @ 1-1/2" and 2" (DN40 & 50) - Body Size											
		No. 3 Orifice (0.1875")			No. 4 Orifice (0.250")			No. 5 Orifice (0.312")			No. 6 Orifice (0.375")		
in wc	(mm H20)	% Build											
		10	20	30	10	20	30	10	20	30	10	20	30
2.5	(63)	44	51	55	63	77	85	60	94	127	68	145	182
3.75	(95)	52	64	68	68	91	105	86	137	162	125	194	227
5	(127)	61	69	73	68	105	127	97	156	182	130	211	259
6	(152)	65	73	77	97	130	149	113	170	199	142	235	280
7	(178)	73	81	89	109	146	162	130	195	219	150	263	304
9	(228)	81	93	100	118	154	178	131	200	246	154	263	327
10	(254)	83	97	105	109	158	186	132	206	253	162	292	349
13.5	(343)	97	109	122	125	183	215	133	227	284	182	312	393

FIGURE 1
MOUNTING ARRANGMENT



DIMENSIONS AND WEIGHTS



Internal Sensing Option

NOTE: Body sizes 1-1/2" and 2" use same actuator topworks as 1/2" - 1" body sizes.

Size (Inches)	DIMENSIONS - ENGLISH (INCHES)									Shipping Weight (NPT) lbs.	Shipping Weight (Flg.) lbs.
	A[1]	A[2]	B[1]	B[2]	C	D	E	F	G		
1/2' - 1"	8.25	11.75	4.38	6.12	2.12	3.75	5.91	7.91	5.73	12	17
1-1/2" & 2"	11.75	13.75	5.88	6.88	2.88	5.75	6.06	7.91	5.73	17	25

Size (DN)	DIMENSIONS - METRIC (mm)									Shipping Weight (NPT) Kgs.	Shipping Weight (Flg.) Kgs.
	A[1]	A[2]	B[1]	B[2]	C	D	E	F	G		
15 - 25	210	298	111	156	54	95	150	201	146	5.45	7.72
40 & 50	298	349	149	175	73	146	154	201	146	7.72	11.34

[1] Flanged connections. - A[1] also available with Opt-34, special 14" (356mm) face to face dimension, (with B[1] = 7.25" (185 mm) for sizes 1/2" - 1". For 1-1/2" & 2" sizes B[1] = 7.00" (178 mm).

[2] Extended Nipples (Opt-32) connections.

MODEL 31-B PRODUCT CODER 02/07/20

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

LR	POS 3	—	POS 5	POS 6 & 7	7	—	POS 10	POS 11	POS 12	0	POS 14	0	POS 16	0A

POSITION 3 - BODY / ORIFICE SIZES

Orifice		Body Size CODE				
No.	Size	1/2" (DN15)	3/4" (DN20)	1" (DN25)	1-1/2" (DN40)	2" (DN50)
2	0.125"	2	A	B	--	--
3	0.1875"	3	E	F	G	H
4	0.250"	4	J	K	L	M
5	0.312"	5	N	P	R	T
6	0.375"	6	V	W	Y	Z

POSITION 5 - BODY/LOWER CASING/ SPRING CHAMBER MATERIALS

Body/Lower Case/Spring Chamber	Arrangement/Position 1	2	3	4
	CODE			
CS/SST/CS	1	2	3	4
SST/SST /CS	5	6	7	8

NOTE: See TB Table 1 for material limitations of Design Pressure Ratings.

POSITION 6 & 7 - TRIM DESIGNATION NUMBERS

Stainless Steel Trim

Body Size 1/2" - 1" (DN20 & DN25)		Body Size 1-1/2" & 2" (DN40 & DN50)	
Desig.	CODE	Desig.	BR. CODE
S40N	4N	S50N	5N
WS40N	WN	WS50N	W5
S40V *	4V	S50V *	5V
S40T	4T		
S40N-HT	6N		
WS40N-HT	6W		
S40V-HT*	6V		

* Only Trim Suitable For NACE.

POSITION 10 - END CONNECTIONS

Description	CODE
NPT - Screwed	1
-30 Opt. - 150 LB RF Flanges *	6
-30 Opt. - PN40 RF Flanged *	D
-32 Opt. - SCH. 80 PE Ext. Nipples *	E
-34 Opt. - 150 LB RF Flgs. 14" F to F Dim. *	V

*Nipples & flanges of same material as body.

POSITION 11 - RANGE SPRINGS

Steel Range Spring Inch H_2O	CODE
2.0-3.0 *	L
3.0-4.5	M
4.5-5.5	N
5.0-7.0	R
5.5-8.0	S
7.0-11.0	T
8.0-12.0	V
11.0-16.0	W

* Spring case must be oriented down.

POSITION 12 - TRIM OPTIONS

Description	Option	CODE
No Option	—	0
External Sensing.	-ES	E
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 Spring Chamber Vent Tap.	-25	D
SST Rain-proof Bug Vent (Includes Opt-25).	-25S	P

POSITION 16 - CERTIFICATE OPTIONS

Description	Option	CODE
No Option	—	0
NACE Construction: CS/CS/XX Per MR0175, S40V, S40V-HT, S50V,Trims	-40	J
NACE Construction: SS/SS/XX Per MR0175, S40V, S40V-HT, S50V Trims.	-40SST	K
SST Body & wetted parts / Clean Unit (Used primarily for food & pharmaceutical applications.) NPT end connections only.	-37	R
Special Cleaning: Per Cashco Spec #S-1542.	-56	N

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 Казахстан +7(7172)727-132 Киргизия +996(312)96-26-47

https://cashco.nt-rt.ru/ || coc@nt-rt.ru