

174 Series

Masoneilan* Spring Loaded, Direct-Operated
Regulator for Pressure Reducing or
Relief Applications

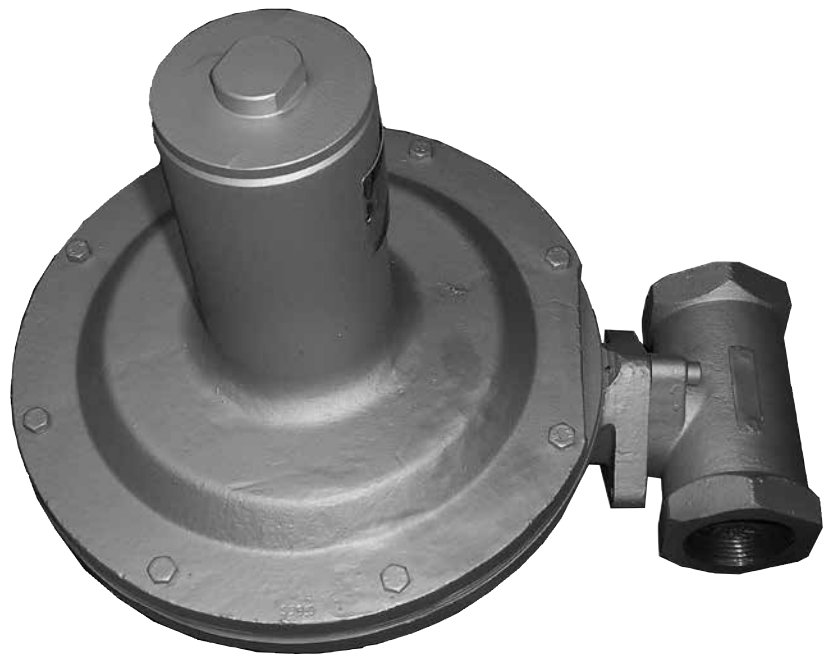
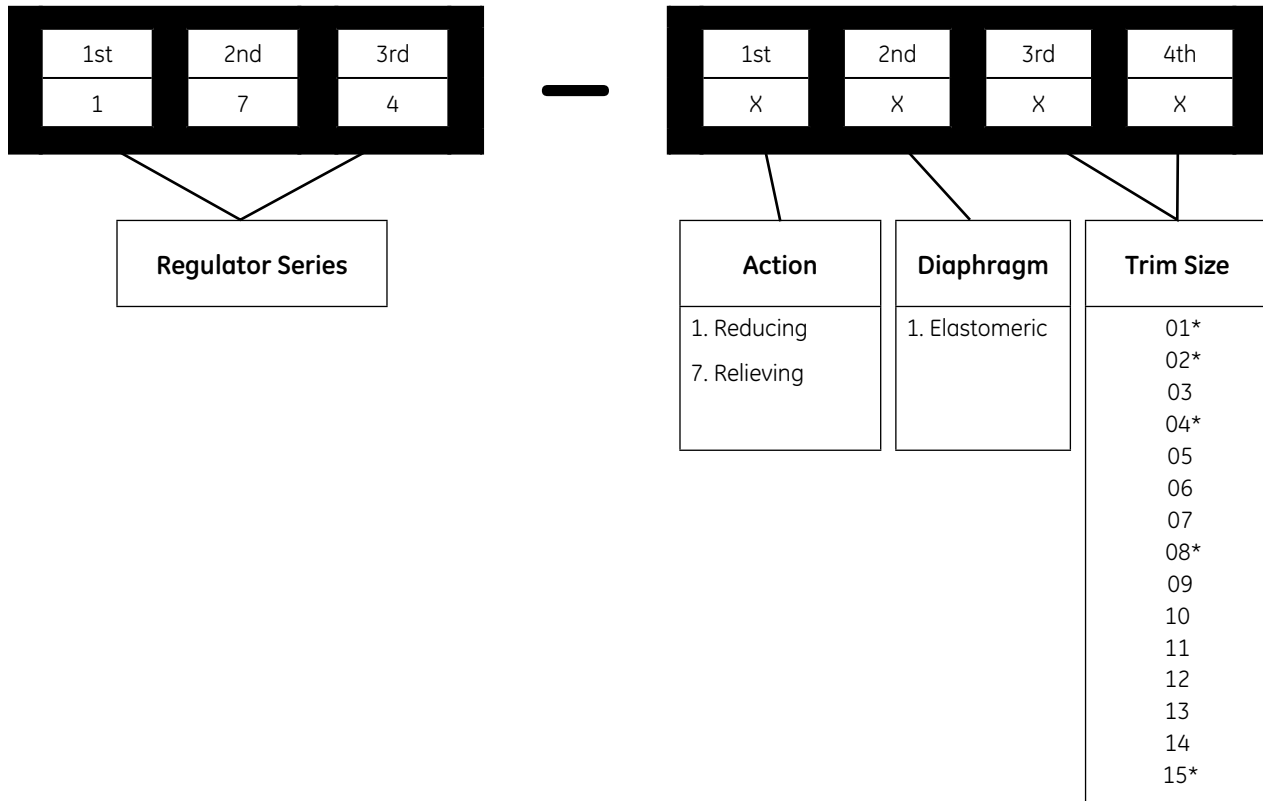


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Numbering System



* Indicates standard trim size

174 Series: (97/23/EC - PED, 94/9/EC - ATEX)

The 174 series is a spring loaded, direct-operated regulator for pressure reducing or relief applications in a wide variety of industrial applications. The large diaphragm area provides accurate control at low pressure settings and the lever design provides consistent shut-off tightness. They are available in 1/2 through 1 1/2 inch body sizes. The pressure reducing design can handle inlet pressures up to 145 psig (10 barg).



Features

- In-line maintenance
- Easy maintenance
- Precise control

Specifications

Body

Body Sizes and End Connections

- 1/2" through 1 1/2" (DN15 through DN40)
NPT or GAS

Maximum Inlet Pressure

- 174-1 Reducing: 145 psig (10 barg) - see table 2
- 174-7 Relief: 4.4 psig (0.3 barg)

Maximum Outlet Pressure

- 174-1 Reducing: 8.8 psig (0.61 barg)

Set Pressure Range

- 174-1 Reducing: 1.4 inches w.c. to 8.8 psig
- 174-7 Relief: 1.4 inches w.c. to 4.4 psig

Temperature Range

- -0.4° to 194°F (-18° to 90°C)

Pressure Sensing

- internal

Flow Coefficients

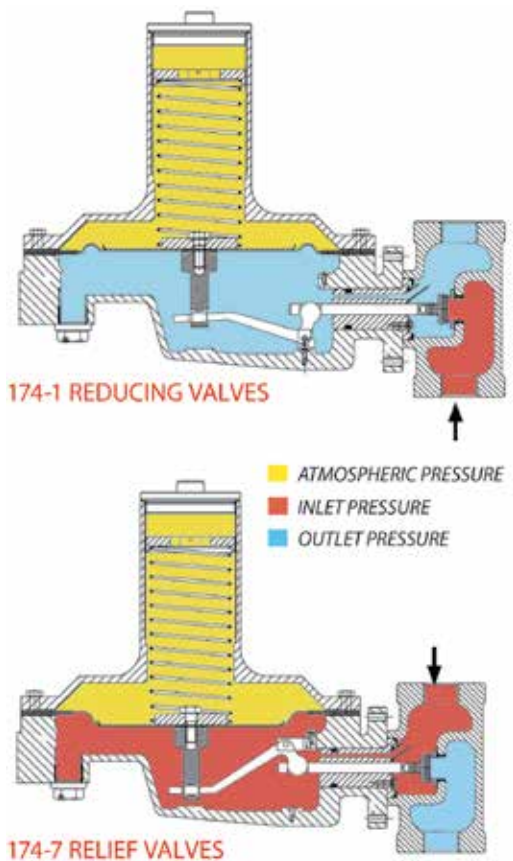
- see tables 6, 7

Capacities

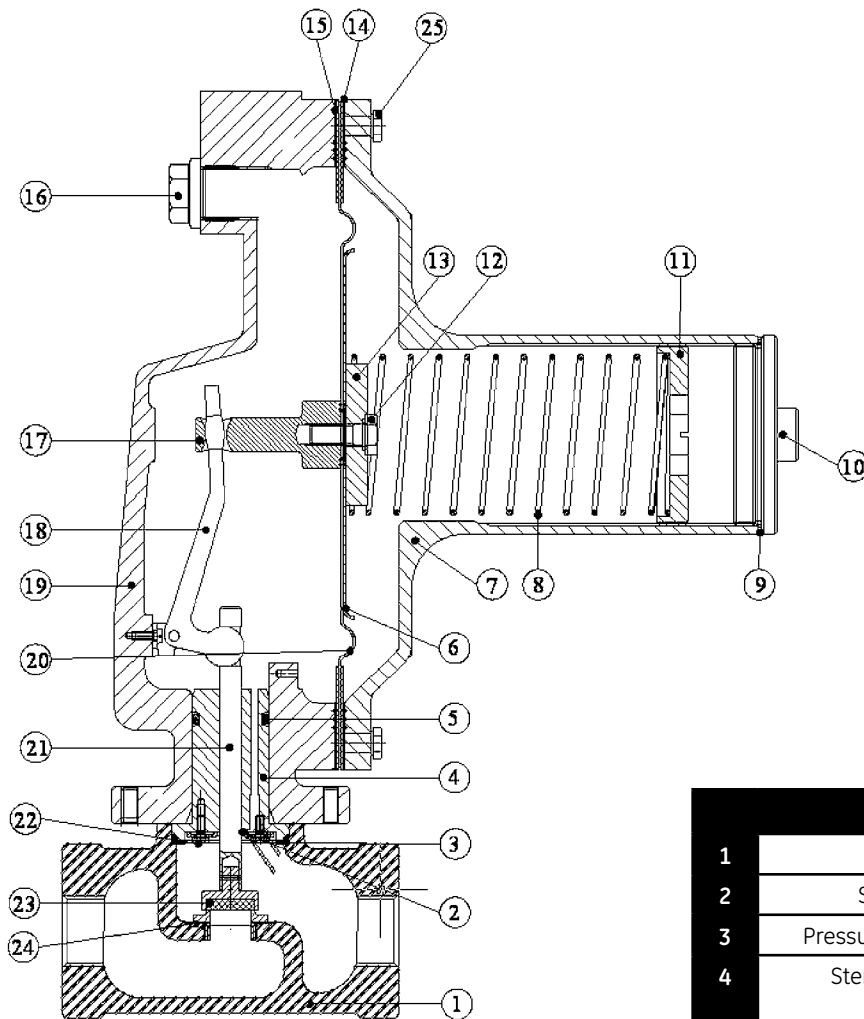
- 174-1 Reducing: see table 8
- 174-7 Relief: see table 9

Weights

- 30 lbs (13.5 kg)



Materials



Materials			
1	Body	14	Gasket
2	Screw	15	Diaphragm Ring
3	Pressure Sensing	16	Screw
4	Stem Guide	17	Stem Diaphragm Connection
5	O-Ring	18	Lever
6	Diaphragm Plate	19	Diaphragm Case
7	Spring Case	20	Diaphragm
8	Spring	21	Stem
9	Gasket	22	Gasket
10	Spring Case Cap	23	Plug
11	Adjusting Screw Ring	24	Seat
12	Screw	25	Screw
13	Spring Button (lower)		

Specifications

Table 1 - Standard Material Combinations

Body	
	Carbon Steel*
	-18°C < T < 90°C (-0.4°F < T < 194°F)
Body	Carbon Steel
Studs	8.8
Nuts	8
Trim	
Seat	316 SS
Disc	NBR
Stem	316 SS
Guide Bushing	PTFE
Actuator	
Spring Case	Carbon Steel
Diaphragm Case	Carbon Steel
Spring	CrV Steel
Diaphragm	Nitrile Rubber (NBR)

* Stainless steel construction available on request

Table 2 - Maximum Operating Inlet Pressures

Orifice Size mm	Maximum Operating Inlet Pressure, PSIG (barg)				
	With 1.4 to 2.2 inches w.c. (3.4 to 5.5 mbarg)	With 2.2 to 3.7 inches w.c. (5.5 to 9.3 mbarg)	With 3.7 to 8.8 inches w.c. (9.3 to 22.0 mbarg)	With 8.8 to 13.6 inches w.c. (22.0 to 34.0 mbarg)	With 13.6 to 25 inches w.c. (34.0 to 62.0 mbarg)
	Outlet Pressure Setting	Outlet Pressure Setting	Outlet Pressure Setting	Outlet Pressure Setting	Outlet Pressure Setting
1	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)
2	81.2 (5.60)	94.3 (6.50)	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)
4	18.9 (1.30)	23.2 (1.60)	37.7 (2.60)	46.4 (3.20)	53.7 (3.70)
8	4.4 (0.30)	5.8 (0.40)	8.7 (0.60)	11.6 (0.80)	13.1 (0.90)
14	1.6 (0.11)	1.9 (0.13)	3.1 (0.21)	3.6 (0.25)	4.4 (0.30)

Table 2 - Maximum Operating Inlet Pressures (cont.)

Orifice Size mm	Maximum Operating Inlet Pressure, PSIG (barg)			
	With 25 to 39 inches w.c. (62.0 to 98.0 mbarg)	With 1.4 to 2.8 psig (0.098 to 0.190 barg)	With 2.8 to 4.4 psig (0.190 to 0.300 barg)	With 4.4 to 8.8 psig (0.300 to 0.610 barg)
	Outlet Pressure Setting	Outlet Pressure Setting	Outlet Pressure Setting	Outlet Pressure Setting
1	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)
2	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)
4	91.4 (6.30)	145.0 (10.00)	145.0 (10.00)	145.0 (10.00)
8	21.8 (1.50)	36.3 (2.50)	39.2 (2.70)	72.5 (5.00)
14	7.3 (0.50)	11.6 (0.80)	11.6 (0.80)	23.2 (1.60)

Table 3 - Set Pressure Ranges (Control Pressure)

Type Number	Spring	Set Pressure Range With Spring Case Above Diaphragm
174	UBB02	1.4 to 2.2 inches w.c. (3.4 to 5.5 mbarg)
	UBB03	2.2 to 3.7 inches w.c. (5.5 to 9.3 mbarg)
	UBB05	3.7 to 8.8 inches w.c. (9.3 to 22 mbarg)
	UBB06	8.8 to 13.6 inches w.c. (22 to 34 mbarg)
	UBB07	13.6 to 25 inches w.c. (34 to 62 mbarg)
	UBB08	25 to 39 inches w.c. (62 to 98 mbarg)
	UBB09	1.4 to 2.8 psig (0.098 to 0.190 barg)
	UBB10	2.8 to 4.4 psig (0.190 to 0.300 barg)
	UBB12	4.4 to 8.8 psig (0.300 to 0.610 barg)

Table 4 - Temperature Ranges for Disc Elastomer

Nitrile Rubber (NBR)*	-0.4 to 194°F (-18 to 90°C)
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Table 5 - Temperature Ranges for Diaphragms

Nitrile Rubber (NBR)*	-0.4 to 194°F (-18 to 90°C)
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Specifications

Table 6 - Flow Coefficient C_v - Model 174-7 Relief Version				
Nozzle	1/2" (DN 15)	3/4" (DN 20)	1" (DN 25)	1 1/2" (DN 40)
1	0.04	0.04	0.04	0.04
2	0.17	0.17	0.17	0.17
3*	0.38	0.38	0.38	0.38
4	0.75	0.75	0.75	0.75
5*	0.95	0.95	0.95	0.95
6*	1.39	1.39	1.39	1.39
7*	1.88	1.88	1.88	1.88
8	2.50	2.50	2.50	2.50
9*	1.96	2.96	2.96	2.96
10*	3.40	3.40	3.40	3.40
11*	3.75	3.75	3.75	3.75
12*	3.95	3.95	3.95	3.95
13*		4.15	4.15	4.15
14		4.40	4.40	4.40
15*		4.86	4.90	4.90

Table 7 - Flow Coefficient C_v - Model 174-1 Reducing Version				
Nozzle	1/2" (DN 15)	3/4" (DN 20)	1" (DN 25)	1 1/2" (DN 40)
1	0.04	0.04	0.04	0.04
2	0.10	0.10	0.10	0.10
3*	0.34	0.34	0.34	0.34
4	0.75	0.75	0.75	0.75
5*	0.94	0.94	0.94	0.94
6*	1.38	1.38	1.38	1.38
7*	1.90	1.90	1.90	1.90
8	2.45	2.45	2.45	2.45
9*	2.80	2.80	2.80	2.80
10*	3.14	3.14	3.14	3.14
11*	3.55	3.55	3.55	3.55
12*	3.82	3.82	3.82	3.82
13*		4.00	4.00	4.00
14		4.50	4.50	4.50
15*		4.95	4.90	4.90

* Special nozzle sizes available on request

Specifications

Table 8 - 174-1 Pressure Reducing Capacities									
Outlet Pressure Range Spring Code	Offset From Setpoint	Outlet Pressure Setting	Maximum Inlet Pressure PSIG (barg)	Capacities in SCFH (Nm ³ /h)					
				Orifice Size (mm)					
				1	2	4	8	14	
1.4 to 2.2 inches w.c. (3.4 to 5.5 mbar), 43 12 UBB02	0.4 inches w.c. (1 mbar)	1.4 inches w.c. (3.4 mbar)	0.11 (1.6)	9.89 (0.265)	26.85 (0.719)	213.15 (5.711)	696.30 (18.655)	1278.92 (34.264)	
			0.30 (4.35)	18.96 (0.508)	47.92 (1.284)	359.43 (9.630)	1174.15 (31.457)		
			1.30 (18.85)	43.77 (1.173)	109.42 (2.931)	820.63 (21.986)			
			5.60 (81.22)	140.20 (3.756)	350.50 (9.390)				
		10.00 (145)	242.60 (6.500)						
		2.2 inches w.c. (5.5 mbar)	0.11 (1.6)	9.78 (0.262)	26.55 (0.711)	211.24 (5.659)	690.051 (18.487)	1267.44 (33.957)	
			0.30 (4.35)	18.89 (0.506)	47.80 (1.281)	358.46 (9.604)	1170.98 (31.372)		
			1.30 (18.85)	43.76 (1.172)	109.42 (2.931)	820.44 (21.981)			
	5.60 (81.22)		140.18 (3.755)	350.44 (9.389)					
	10.00 (145)	242.58 (6.499)							
	2.2 to 3.7 inches w.c. (5.5 to 9.3 mbar), 43 12 UBB03	0.8 inches w.c. (2 mbar)	2.2 inches w.c. (5.5 mbar)	0.13 (1.88)	10.91 (0.292)	29.56 (0.792)	230.78 (6.183)	753.89 (20.198)	1384.69 (37.098)
				0.40 (5.80)	22.29 (0.597)	55.71 (1.493)	417.86 (11.195)	1365.00 (36.570)	
1.60 (23.2)				49.94 (1.338)	124.85 (3.345)	936.53 (25.091)			
6.50 (94.27)				161.09 (4.316)	402.72 (10.790)				
10.00 (145)			242.58 (6.499)						
3.7 inches w.c. (9.3 mbar)			0.13 (1.88)	10.72 (0.287)	29.06 (0.779)	227.61 (6.098)	743.53 (19.920)	1365.66 (36.588)	
			0.40 (5.80)	22.21 (0.595)	55.53 (1.488)	416.45 (11.157)	1360.41 (36.447)		
			1.60 (23.2)	49.94 (1.338)	124.85 (3.345)	936.33 (25.086)			
		6.50 (94.27)	161.04 (4.315)	402.60 (10.786)					
10.00 (145)		242.53 (6.498)							
3.7 to 8.8 inches w.c. (9.3 to 22 mbar) 43 12 UBB05		2 inches w.c. (5 mbar)	3.7 inches w.c. (9.3 mbar)	0.21 (3.05)	14.77 (0.396)	39.30 (1.053)	294.73 (7.896)	962.77 (25.794)	1768.36 (47.377)
				0.60 (8.70)	27.75 (0.744)	69.38 (1.859)	520.35 (13.941)	1699.81 (45.540)	
	2.60 (37.71)			70.35 (1.885)	175.87 (4.712)	1319.02 (35.338)			
	10.00 (145)			242.53 (6.498)	606.33 (16.244)				
	8.8 inches w.c. (22 mbar)		0.21 (3.05)	14.26 (0.382)	38.24 (1.024)	286.78 (7.683)	936.80 (25.098)	1720.66 (46.099)	
			0.60 (8.70)	27.58 (0.739)	68.94 (1.847)	517.06 (13.853)	1689.05 (45.252)		
			2.60 (37.71)	70.18 (1.880)	175.44 (4.700)	1315.78 (35.252)			
			10.00 (145)	242.38 (6.494)	605.94 (16.234)				
	8.8 to 13.6 inches w.c. (22 to 34 mbar) 43 12 UBB06	13.15 inches w.c. (8 mbar)	8.8 inches w.c. (22 mbar)	0.25 (3.63)	16.13 (0.432)	42.20 (1.131)	316.54 (8.480)	1034.02 (27.703)	1899.21 (50.883)
				0.80 (11.60)	32.55 (0.872)	81.38 (2.180)	610.33 (16.352)	1993.73 (53.415)	
				3.20 (46.41)	84.17 (2.255)	210.43 (5.638)	1578.26 (42.284)		
				10.00 (145)	242.38 (6.494)	605.94 (16.234)			
13.6 inches w.c. (34 mbar)			0.25 (3.63)	15.68 (0.420)	41.28 (1.106)	309.62 (8.295)	1011.41 (27.097)	1857.69 (49.770)	
			0.80 (11.60)	32.43 (0.869)	81.07 (2.172)	608.00 (16.289)	1986.11 (53.211)		
			3.20 (46.41)	84.01 (2.251)	210.04 (5.627)	1575.28 (42.204)			
			10.00 (145)	242.23 (6.490)	605.58 (16.224)				
13.6 to 25 inches w.c. (34 to 62 mbar) 43 12 UBB07		6.8 inches w.c. (17 mbar)	13.6 inches w.c. (34 mbar)	0.30 (4.35)	17.93 (0.480)	45.95 (1.231)	344.61 (9.233)	1125.74 (30.160)	2067.68 (55.396)
				0.90 (13.05)	34.78 (0.932)	89.96 (2.330)	652.21 (17.474)	2130.54 (57.080)	
				3.70 (53.66)	95.66 (2.563)	239.14 (6.407)	1793.56 (48.052)		
				10.00 (145)	242.23 (6.490)	605.58 (16.224)			
	25 inches w.c. (62 mbar)		0.30 (4.35)	16.92 (0.453)	43.95 (1.177)	329.63 (8.831)	1076.78 (28.849)	1977.77 (52.987)	
			0.90 (13.05)	34.52 (0.925)	86.30 (2.312)	647.26 (17.341)	2114.38 (56.647)		
			3.70 (53.66)	95.29 (2.553)	238.23 (6.382)	1786.69 (47.868)			
			10.00 (145)	241.89 (6.481)	604.73 (16.202)				

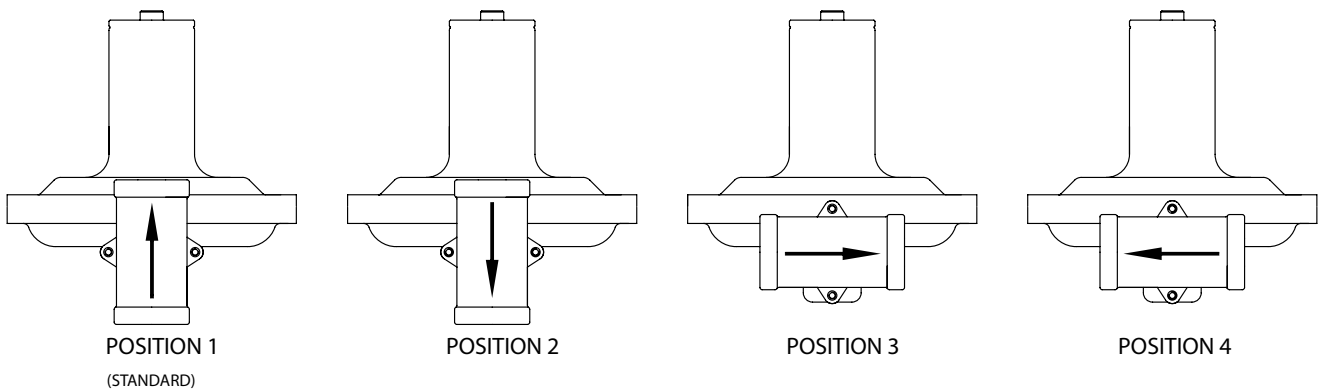
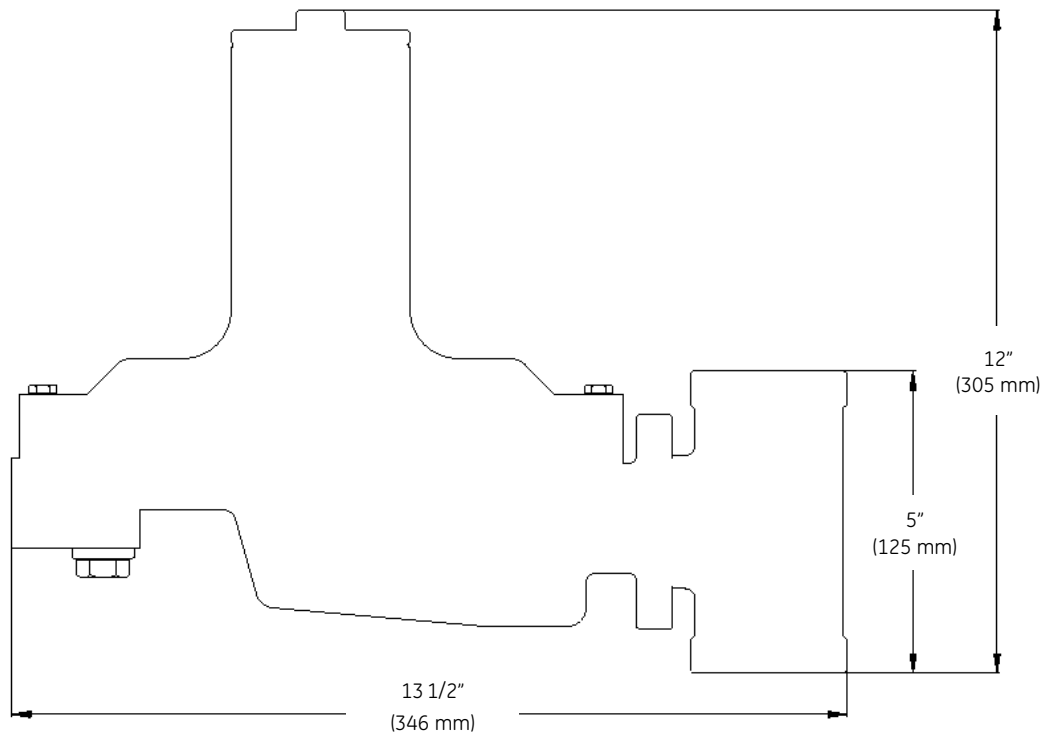
Specifications

Table 8 - 174-1 Pressure Reducing Capacities (cont.)								
Outlet Pressure Range Spring Code	Offset From Setpoint	Outlet Pressure Setting	Maximum Inlet Pressure PSIG (barg)	Capacities in SCFH (Nm ³ /h)				
				Orifice Size (mm)				
				1	2	4	8	14
25 to 39 inches w.c. (62 to 98 mbar), 43 12 UBB08	10.24 inches w.c. (26 mbar)	25 inches w.c. (62 mbar)	0.50 (7.25)	24.16 (0.647)	60.41 (1.618)	453.08 (12.139)	1480.04(39.652)	2718.45(72.831)
			1.50 (21.76)	47.69 (1.278)	119.23 (3.194)	894.23 (23.958)	2921.16(78.262)	
			6.30 (91.37)	155.74 (4.172)	389.34 (10.431)	2920.07(78.233)		
			10.00 (145)	241.89 (6.481)	604.73 (16.202)			
		39 inches w.c. (98 mbar)	0.50 (7.25)	23.45 (0.628)	58.63 (1.571)	439.75 (11.782)	1436.51(38.486)	2638.49(70.689)
			1.50 (21.76)	47.53 (1.273)	118.83 (3.184)	891.21 (23.877)	2911.29(77.998)	
			6.30 (91.37)	155.29 (4.160)	388.22 (10.401)	2911.63(78.006)		
			10.00 (145)	241.45 (6.469)	603.63 (16.172)			
1.4 to 2.8 psig (0.098 to 0.19 barg) 43 12 UBB09	0.73 psig (0.050 barg)	1.4 psig (0.098 barg)	0.80 (11.60)	31.69 (0.849)	79.23 (2.123)	594.26 (15.921)	1941.23(52.008)	3565.52(95.525)
			2.50 (36.26)	67.68 (1.813)	169.19 (4.533)	1268.91(33.996)	4145.11(111.053)	
			10.00 (145)	241.45 (6.469)	603.63 (16.172)	4527.24(121.291)		
		2.8 psig (0.19 barg)	0.80 (11.60)	30.42 (0.815)	76.04 (2.037)	570.32 (15.280)	1863.02(49.913)	3421.88(91.677)
			2.50 (36.26)	67.59 (1.811)	168.96 (4.527)	1267.23(33.951)	4139.62(110.906)	
			10.00 (145)	240.33 (6.439)	600.82 (16.097)	4506.16(120.726)		
2.8 to 4.4 psig (0.19 to 0.30 barg) 43 12 UBB10	1.12 psig (0.077 barg)	2.8 psig (0.19 barg)	0.80 (11.60)	30.42 (0.815)	76.04 (2.037)	570.32 (15.280)	1863.02(49.913)	3421.88(91.677)
			2.70 (39.16)	71.53 (1.916)	178.82 (4.791)	1341.15(35.931)	4381.08(117.375)	
			10.00 (145)	240.33 (6.439)	600.82 (16.097)	4506.16(120.726)		
		4.4 psig (0.30 barg)	0.80 (11.60)	28.48 (0.763)	71.21 (1.908)	534.05 (14.308)	1744.57(46.740)	3204.32(85.848)
			2.70 (39.16)	71.39 (1.913)	178.47 (4.781)	1338.53(35.861)	4372.53(117.146)	
			10.00 (145)	238.98 (6.403)	597.44 (16.006)	4480.81(120.047)		
4.4 to 8.8 psig (0.30 to 0.61 barg) 43 12 UBB12	2.7 psig (0.180 barg)	4.4 psig (0.30 barg)	1.60 (23.2)	48.50 (1.300)	121.24 (3.248)	909.32 (24.362)	2970.43(79.582)	5455.90 (146.171)
			5.00 (72.52)	122.46 (3.281)	306.15 (8.202)	2296.1 (61.516)	7500.59 (200.951)	
			10.00 (145)	238.98 (6.403)	597.44 (16.006)	4480.81(120.047)		
		8.8 psig (0.61 barg)	1.60 (23.2)	45.44 (1.217)	113.60 (3.044)	852.02 (22.827)	2783.26 (74.567)	5112.10 (136.96)
			5.00 (72.52)	118.35 (3.171)	295.88 (7.927)	2219.09 (59.452)	7249.02 (194.211)	
			10.00 (145)	235.13 (6.300)	587.82 (15.748)	4408.62(118.113)		

Materials of Construction

Table 9 - 174-7 Pressure Relief Capacities								
Outlet Pressure Range Spring Code	Offset From Setpoint	Outlet Pressure Setting	Maximum Inlet Pressure PSIG (barg)	Capacities in SCFH (Nm ³ /h)				
				Orifice Size (mm)				
				1	2	4	8	14
1.4 to 2.2 inches w.c. (3.4 to 5.5 mbar), 43 12 UBB02	0.4 inches w.c. (1 mbar)	1.4 inches w.c. (3.4 mbar)	0.00	1.14 (0.031)	6.01 (0.161)	31.48 (0.843)	116.59 (3.124)	213.41 (5.718)
		2.2 inches w.c. (5.5 mbar)	0.00	1.56 (0.042)	8.06 (0.216)	41.66 (1.116)	153.02 (4.100)	279.17 (7.479)
2.2 to 3.7 inches w.c. (5.5 to 9.3 mbar), 43 12 UBB03	0.8 inches w.c. (2 mbar)	2.2 inches w.c. (5.5 mbar)	0.00	1.56 (0.042)	8.06 (0.216)	41.66 (1.116)	153.02 (4.100)	279.17 (7.479)
		3.7 inches w.c. (9.3 mbar)	0.00	2.18 (0.058)	11.07 (0.297)	56.48 (1.513)	205.77 (5.513)	367.45 (9.844)
3.7 to 8.8 inches w.c. (9.3 to 22 mbar), 43 12 UBB05	2 inches w.c. (5 mbar)	3.7 inches w.c. (9.3 mbar)	0.00	2.18 (0.058)	11.07 (0.297)	56.48 (1.513)	205.77 (5.513)	367.45 (9.844)
		8.8 inches w.c. (22 mbar)	0.00	3.73 (0.100)	18.53 (0.496)	92.83 (2.487)	321.22 (8.606)	565.35 (15.147)
8.8 to 13.6 inches w.c. (22 to 34 mbar), 43 12 UBB06	3.15 inches w.c. (8 mbar)	8.8 inches w.c. (22 mbar)	0.00	3.73 (0.100)	18.53 (0.496)	92.83 (2.487)	321.22 (8.606)	565.35 (15.147)
		13.6 inches w.c. (34 mbar)	0.00	4.88 (0.131)	24.01 (0.643)	119.33 (3.197)	399.48 (10.703)	703.09 (18.837)
13.6 to 25 inches w.c. (34 to 62 mbar), 43 12 UBB07	6.8 inches w.c. (17 mbar)	13.6 inches w.c. (34 mbar)	0.00	4.88 (0.131)	24.01 (0.643)	119.33 (3.197)	399.48 (10.703)	703.09 (18.837)
		25 inches w.c. (62 mbar)	0.00	7.06 (0.189)	34.34 (0.920)	161.99 (4.340)	539.97 (14.467)	950.35 (25.461)
25 to 39 inches w.c. (62 to 98 mbar), 43 12 UBB08	10.24 inches w.c. (26 mbar)	25 inches w.c. (62 mbar)	0.00	7.06 (0.189)	34.34 (0.920)	161.99 (4.340)	539.97 (14.467)	950.35 (25.461)
		39 inches w.c. (98 mbar)	0.00	9.37 (0.251)	45.21 (1.211)	203.96 (5.464)	679.86 (18.214)	1196.55 (32.057)
1.4 to 2.8 psig (0.098 to 0.19 barg), 43 12 UBB09	0.73 psig (50 mbar)	1.4 psig (0.098 barg)	0.00	9.37 (0.251)	45.21 (1.211)	203.96 (5.464)	679.86 (18.214)	1196.55 (32.057)
		2.8 psig (0.190 barg)	0.00	14.19 (0.380)	64.67 (1.733)	285.31 (7.644)	951.03 (25.479)	1673.81 (44.844)
2.8 to 4.4 psig (0.19 to 0.30 barg), 43 12 UBB10	1.12 psig (77 mbar)	2.8 psig (0.19 barg)	0.00	14.19 (0.380)	64.67 (1.733)	285.31 (7.644)	951.03 (25.479)	1673.81 (44.844)
		4.4 psig (0.30 barg)	0.00	19.07 (0.511)	81.82 (2.192)	360.99 (9.671)	32.238 (1203.30)	2117.81 (56.739)

Dimensions



Body - Spring Case Orientation

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