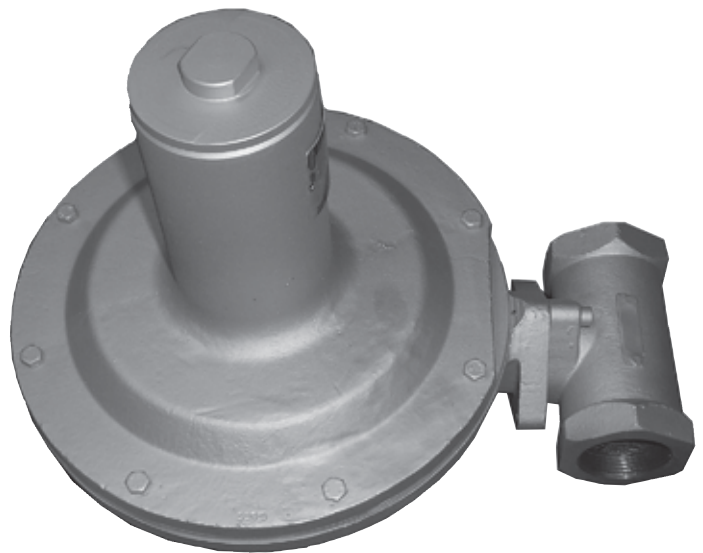


# Masoneilan™ 174 Series

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



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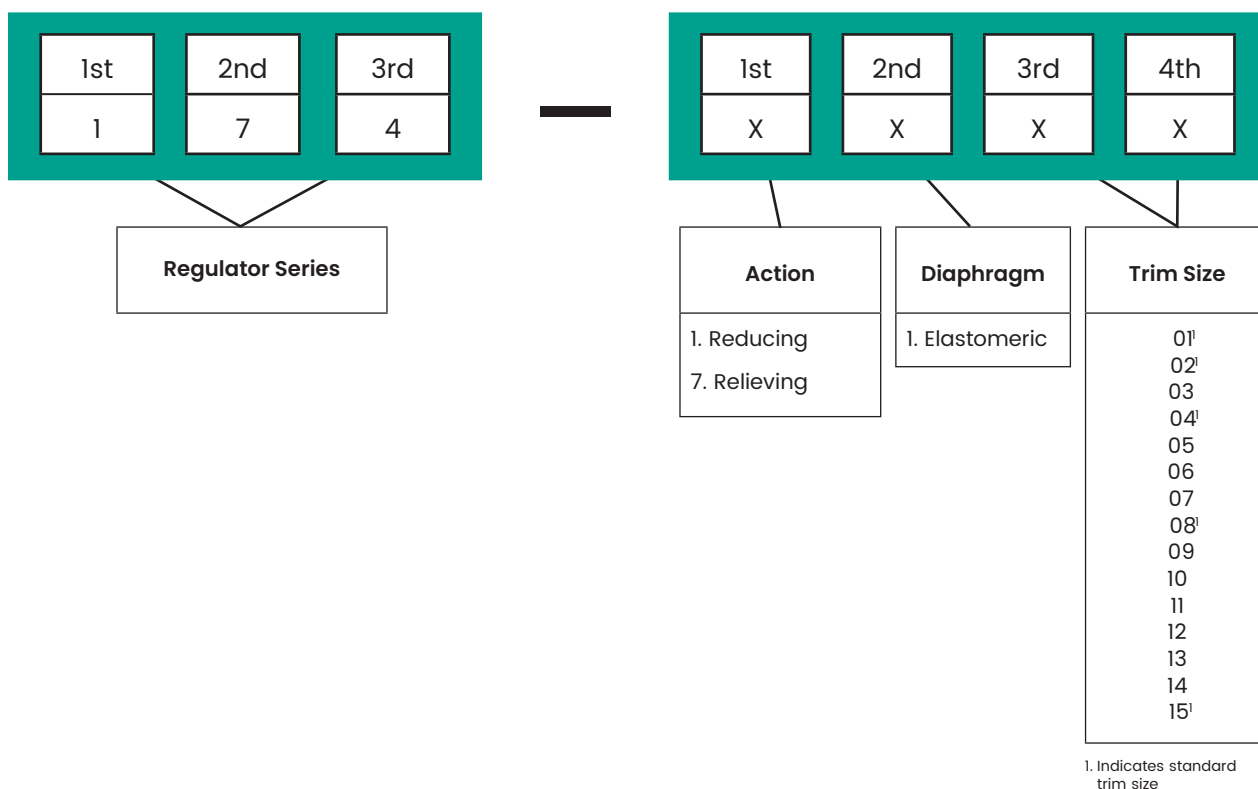
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## Numbering System



# 174 Series (PED 2014/68/EU, ATEX 2014/34/EU)

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 inch through 1 1/2 inch (DN 15 through DN 40)  
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°F to 194°F (-18°C to 90°C)

Pressure Sensing

- internal

Flow Coefficients

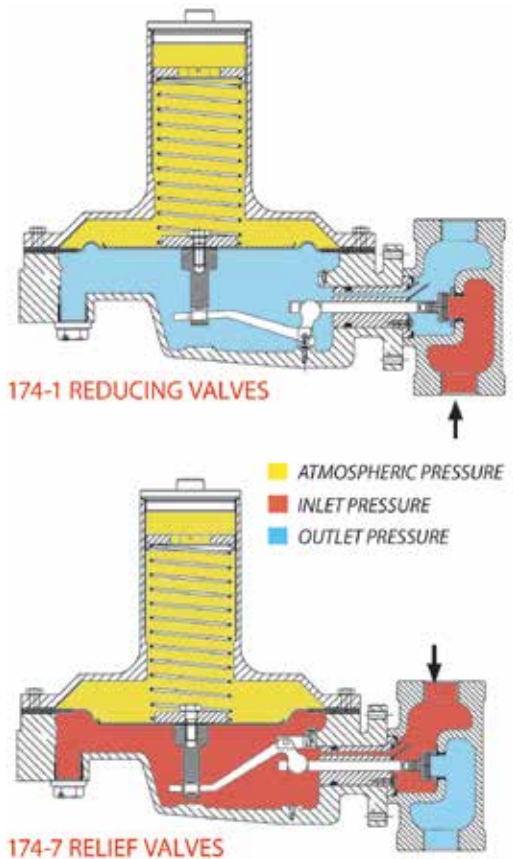
- see tables 6, 7

Capacities

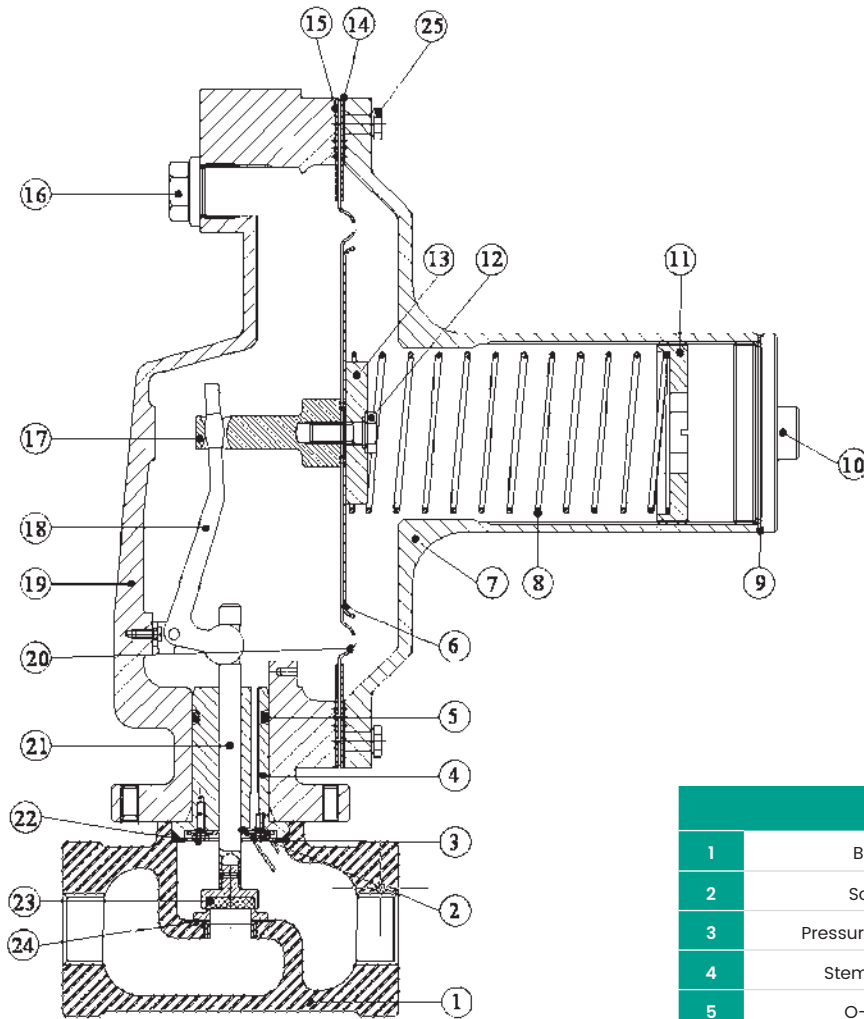
- 174-1 Reducing: see table 8
- 174-7 Relief: see table 9

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 <sup>1</sup>
	-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)

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) Outlet Pressure Setting	With 2.2 to 3.7 inches w.c. (5.5 to 9.3 mbarg) Outlet Pressure Setting	With 3.7 to 8.8 inches w.c. (9.3 to 22.0 mbarg) Outlet Pressure Setting	With 8.8 to 13.6 inches w.c. (22.0 to 34.0 mbarg) Outlet Pressure Setting	With 13.6 to 25 inches w.c. (34.0 to 62.0 mbarg) 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) Outlet Pressure Setting	With 1.4 to 2.8 psig (0.098 to 0.0190 barg) Outlet Pressure Setting	With 2.8 to 4.4 psig (0.190 to 0.300 barg) Outlet Pressure Setting	With 4.4 to 8.8 psig (0.300 to 0.610 barg) 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°F to 194°F (-18°C to 90°C)

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

1. Stainless steel construction available on request

# 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 <sup>1</sup>	0.38	0.38	0.38	0.38
4	0.75	0.75	0.75	0.75
5 <sup>1</sup>	0.95	0.95	0.95	0.95
6 <sup>1</sup>	1.39	1.39	1.39	1.39
7 <sup>1</sup>	1.88	1.88	1.88	1.88
8	2.50	2.50	2.50	2.50
9 <sup>1</sup>	1.96	2.96	2.96	2.96
10 <sup>1</sup>	3.40	3.40	3.40	3.40
11 <sup>1</sup>	3.75	3.75	3.75	3.75
12 <sup>1</sup>	3.95	3.95	3.95	3.95
13 <sup>1</sup>	-	4.15	4.15	4.15
14	-	4.40	4.40	4.40
15 <sup>1</sup>	-	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 <sup>1</sup>	0.34	0.34	0.34	0.34
4	0.75	0.75	0.75	0.75
5 <sup>1</sup>	0.94	0.94	0.94	0.94
6 <sup>1</sup>	1.38	1.38	1.38	1.38
7 <sup>1</sup>	1.90	1.90	1.90	1.90
8	2.45	2.45	2.45	2.45
9 <sup>1</sup>	2.80	2.80	2.80	2.80
10 <sup>1</sup>	3.14	3.14	3.14	3.14
11 <sup>1</sup>	3.55	3.55	3.55	3.55
12 <sup>1</sup>	3.82	3.82	3.82	3.82
13 <sup>1</sup>	-	4.00	4.00	4.00
14	-	4.50	4.50	4.50
15 <sup>1</sup>	-	4.95	4.90	4.90

1. 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 <sup>3</sup> /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)	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)	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 <sup>3</sup> /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)	-	-	-
			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)	-	-

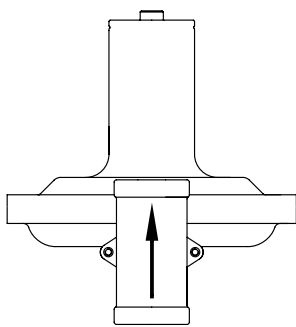
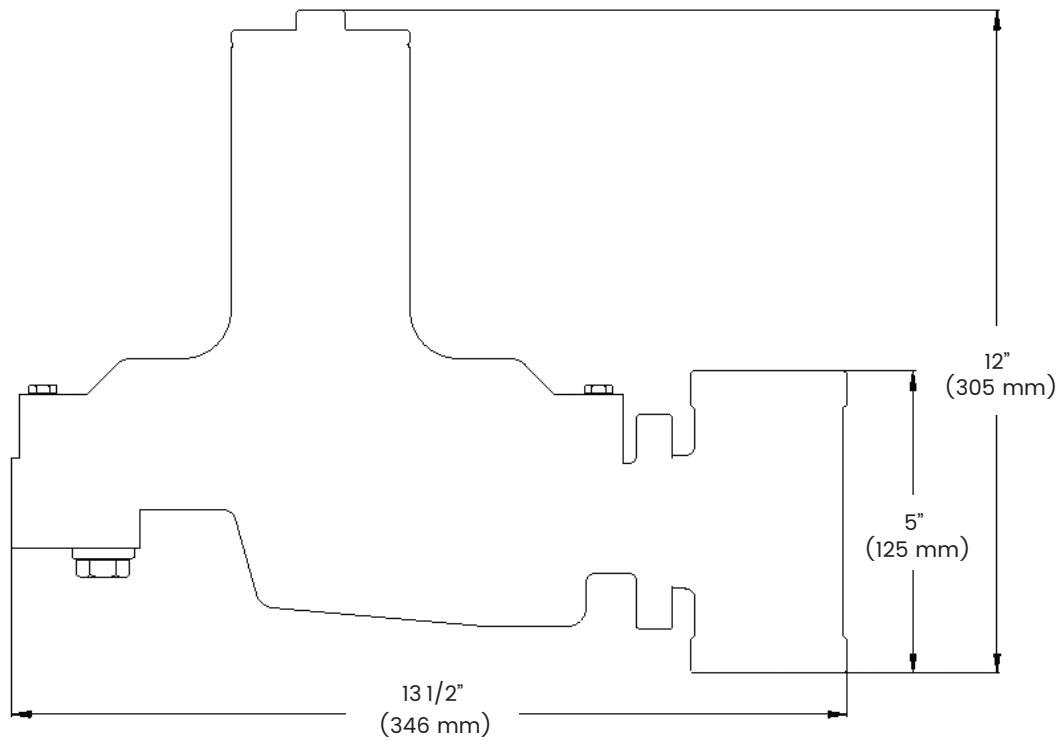


# Specifications

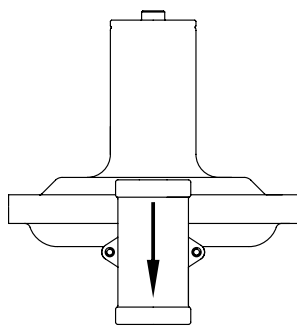
Table 9 - 174-7 Pressure Relief Capacities

Outlet Pressure Range Spring Code	Offset From Setpoint	Outlet Pressure Setting	Maximum Inlet Pressure PSIG (barg)	Capacities in SCFH (Nm <sup>3</sup> /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)

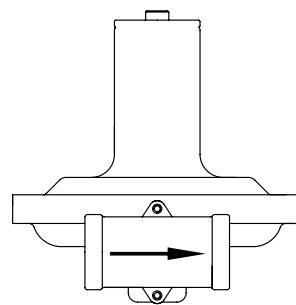
# Dimensions



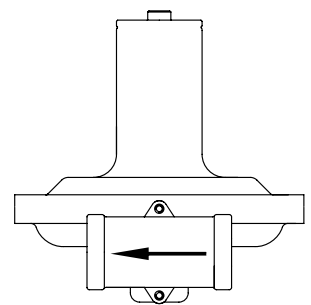
POSITION 1  
(STANDARD)



POSITION 2



POSITION 3



POSITION 4

Body - Spring Case Orientation



CONTROLS SUPPLY CHAIN

VALVES ACTUATORS INSTRUMENTATIONS