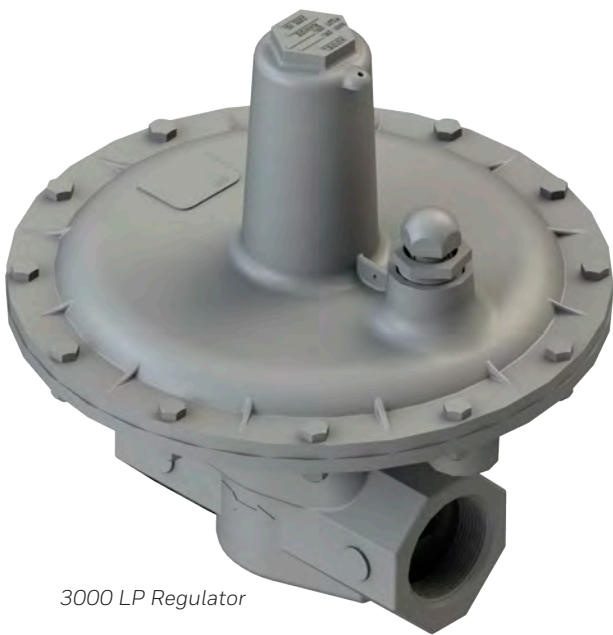


3000 SERIES COMMERCIAL/ INDUSTRIAL REGULATORS

Technical Bulletin

The 3000 Series pressure regulators are designed to control natural gas, air, nitrogen, carbon dioxide, propane vapor, and other non-corrosive gases in light commercial and industrial applications.



3000 LP Regulator



3000 HP Regulator

APPLICATIONS

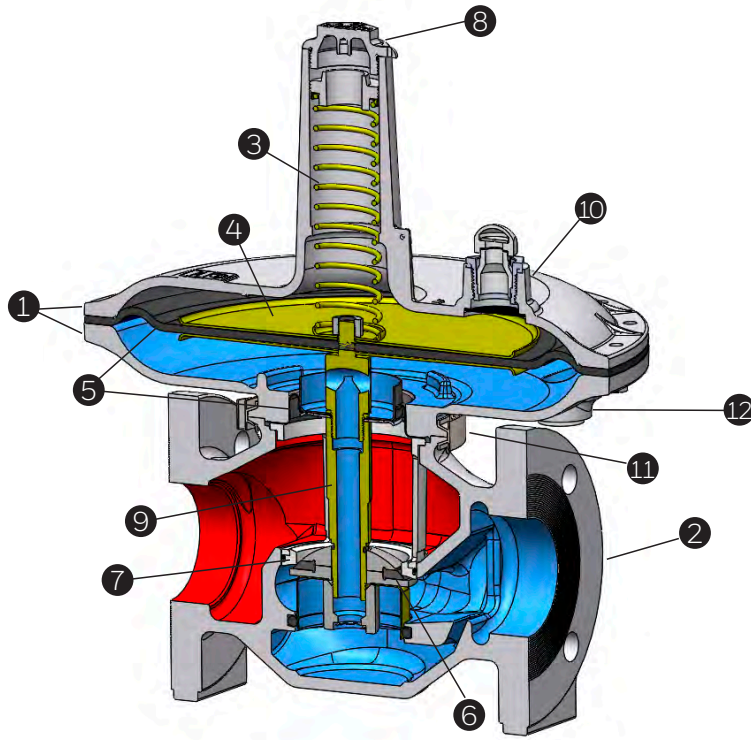
Model Number	Description
3000	Basic regulator, non-relieving, internally sensed
3010	Basic regulator, non-relieving, remotely sensed

General Information

Outlet pressures between 3.5" W.C. and 10 PSIG available. Inlet pressures up to 30 PSIG allowed. Operating temperature range is -20 °F to 150 °F (-30 °C to 65 °C). Maximum flow rate of 65,000 SCFH (1840 m³/h).


FEATURES

- Balanced valve design offers excellent response and high accuracy
- Large primary diaphragm provides superior lockup
- Body clamp allows valve body to remain inline for maintenance
- Internal or external sensing options. Field convertible.
- Wide range of valve body connection sizes: 1 ¼", 1 ½", 2" NPT, 2", 3" and 4" ASME Class 125 Flanged
- DN50, DN80 and DN100 EN 1092-1 PN16 Flanged
- For HP MODEL ONLY, a ¾" 90° vent elbow/ screen assembly (part #78041G002) may be screwed into the vent for added protection from environmental conditions when the regulator is installed in the horizontal position. This item is available separately from the Honeywell Gas Depot.



MATERIAL SPECIFICATIONS

- ① Diaphragm Case – Precision cast aluminum with an exclusive 11 step advanced conversion coating, single-coat polyester primer and high solids polyurethane top coat.
- ② Valve Body – Grey cast iron, undercoated, single coat polyester primer and high solids polyurethane top coat. NPT threads meet ANSI/ASME B1.20.1. Flanges to ASME. Available sizes NPT: 1 1/4", 1 1/2", 2" FLANGED: 2", 3" and 4" ASME Class 125, DN50, 80, 100 EN 1092-1, PN16.
*Inlet and outlet 1/8" pressure taps are available on request.
- ③ Pressure Spring – Steel, zinc plated and yellow chromate. Color coded for identification.
- ④ Diaphragm Plate – Steel, zinc plated and yellow chromate.
- ⑤ Diaphragms – Nylon fabric reinforced Buna N.
- ⑥ Seat Disc – Buna N; Replaceable
- ⑦ Orifice – High strength, corrosion resistant aluminum.
- ⑧ Seal Plug – High strength, corrosion resistant aluminum.
- ⑨ Main Stem – Steel, zinc plated with yellow chromate. Hollow stem communicates downstream pressure for internal sensing.
- ⑩ Vent Threaded NPT connection supplied with UV resistant ABS weather- and bug-proof cap. Connection threaded 3/4" or 1" NPT dependent on body size.**
- ⑪ Body Clamp – Steel, zinc plated.
- ⑫ External Sense Port – Threaded 1/2" NPT for remote sensing. Supplied with steel, zinc plated plug for standard internal sensed product. Conversion to external sense requires modification of lower main stem.

 ** A vent line terminating at an external location must be installed for any regulators installed indoors or in enclosures to safely evacuate vented gas. Comply with applicable Federal, State and local codes.

3000 SERIES SPRINGS

SPRING NUMBER	SPRING RANGE	COLOR CODE
1 1/4" & 1 1/2" connections		
70157P033	1" - 3"	Yellow/Purple
70157P034	3" - 7"	Yellow/Brown
70157P035	7" - 14"	Yellow/Red
70157P036	14" - 28"	Light Blue/Purple
70157P037	1-2 PSIG	Blue/Brown
2" Connections		
70157P025	1" - 3"	Purple/Black
70157P027	3" - 7"	Orange/White
70157P006	7" - 14"	Red/Blue
70157P017	14" - 28"	Green/Silver
70157P024	1-2 PSIG	Black/White
71411P021	2-2.5 PSIG	Purple/White*
71411P022	2-5 PSIG	Orange/Black*
71411P044	6-7 PSIG	Yellow*
71411P023	8-10 PSIG	Black*
3" Connections		
70157P028	1" - 3"	No Code
70157P029	3" - 7"	Red/White
70157P030	7" - 14"	Yellow/Blue
70157P031	14" - 28"	Red/Purple
70157P032	1-2 PSIG	Green/Purple
4" Connections		
71411P036	4" - 8"	Blue/Black
71411P034	7" - 14"	Green/White
71411P037	14" - 28"	Red/Green
71411P038	1-2 PSIG	Silver/Black

* Designates 2" HP model
Not interchangeable with low pressure model

3000 Series Regulator Capacity Performance

1¼" 3000 SERIES REGULATOR SCFH (ft³/h) 0.60 specific gravity gas at 60 °F and 14.7PSIA

Spring No.	70157P033	70157P034			70157P035		70157P036			70157P037	
Inlet Pressure	2" wc .5# Droop	4" wc 1# Droop	6" wc 1# Droop	9" wc 1# Droop	12" wc 2# Droop	16" wc 2# Droop	20" wc 2# Droop	24" wc 2.5# Droop	28" wc 3# Droop	42" wc 4# Droop	56" wc 5# Droop
8" WC	2,700	2,300	1,700								
14" WC	3,800	3,500	2,900	1,900	2,000						
21" WC	4,800	4,600	3,900	2,700	3,400	2,200					
1 PSIG	5,600	5,400	4,800	3,800	4,200	3,200	2,400	2,100			
1.5 PSIG	6,800	6,800	6,100	5,300	5,700	4,400	3,300	3,600	3,600		
2 PSIG	8,000	7,900	7,200	6,500	6,600	5,700	4,600	4,700	4,700	2,900	
3 PSIG	8,000	9,000	9,000	8,500	8,400	7,000	6,500	6,000	6,000	4,400	4,300
5 PSIG	10,000	11,000	9,200	9,100	9,000	9,100	8,400	8,400	8,400	7,000	6,500
10 PSIG			9,500	9,300	9,500	9,200	9,200	9,300	9,400	8,800	9,000
15 PSIG			9,600	9,500	10,000	10,000	10,000	10,000	10,100	10,100	10,400
20 PSIG			11,500	11,000	12,000	12,000	12,000	12,500	12,500	13,000	14,000
25 PSIG			11,500	11,000	12,000	12,000	12,000	12,500	12,500	13,000	14,000
30 PSIG			11,500	11,000	12,000	12,000	12,000	12,500	12,500	13,000	14,000

— For optimum performance, use with inlet pressures above line.

1½" 3000 SERIES REGULATOR SCFH (ft³/h) 0.60 specific gravity gas at 60 °F and 14.7PSIA

Spring No.	70157P033	70157P034			70157P035		70157P036			70157P037	
Inlet Pressure	2" wc .5# Droop	4" wc 1# Droop	6" wc 1# Droop	9" wc 1# Droop	12" wc 2# Droop	16" wc 2# Droop	20" wc 2# Droop	24" wc 2.5# Droop	28" wc 3# Droop	42" wc 4# Droop	56" wc 5# Droop
8" WC	2,900	2,600	1,700								
14" WC	3,900	3,700	3,200	1,900	2,000						
21" WC	4,800	4,700	4,000	2,700	3,400	2,300					
1 PSIG	5,300	5,500	4,800	3,200	4,300	3,100	2,400	2,200			
1.5 PSIG	5,500	6,500	6,200	3,700	5,500	3,700	3,500	3,500	3,500		
2 PSIG	7,200	7,300	7,100	5,300	6,000	4,700	4,200	4,200	4,200	3,000	
3 PSIG	8,600	9,000	8,000	8,000	8,000	7,300	6,400	6,400	6,400	4,000	4,500
5 PSIG	10,000	11,000	8,300	8,100	8,100	8,000	8,000	8,000	8,000	6,500	7,000
10 PSIG			8,400	8,200	8,200	8,300	8,300	8,000	8,000	7,500	8,000
15 PSIG			8,500	8,300	9,000	8,900	8,900	8,900	9,000	9,000	9,400
20 PSIG			10,000	9,500	10,000	11,000	10,500	11,000	11,000	11,000	11,000
25 PSIG			9,000	8,500	10,000	10,000	9,500	10,000	11,000	11,000	12,000
30 PSIG			4,500	4,500	4,500	4,500	4,500	4,500	10,000	10,500	11,000

— For optimum performance, use with inlet pressures above line.

2" 3000 SERIES REGULATOR LOW PRESSURE SCFH (ft³/h) 0.60 specific gravity gas at 60 °F and 14.7PSIA

Spring No.	70157P025	70157P027			70157P006		70157P017			70157P024	
Inlet Pressure	2" wc .5# Droop	4" wc 1# Droop	6" wc 1# Droop	9" wc 1# Droop	12" wc 2# Droop	16" wc 2# Droop	20" wc 2# Droop	24" wc 2.5# Droop	28" wc 3# Droop	42" wc 4# Droop	56" wc 5# Droop
8" WC	5,000	4,000	2,300								
14" WC	7,000	6,000	5,000	2,800							
21" WC	8,000	8,000	7,600	4,000	5,800						
1 PSIG	10,000	8,500	9,200	5,000	6,600	4,000					
1.5 PSIG	12,500	11,500	12,500	7,400	10,000	6,500	5,000	5,000			
2 PSIG	15,000	13,500	14,800	10,500	13,000	8,500	6,500	7,000	7,000	5,000	
3 PSIG	18,000	16,500	18,500	16,000	17,500	11,500	9,500	9,500	10,000	8,200	6,100
5 PSIG	18,500	19,000	24,200	24,000	24,000	14,500	13,000	13,500	14,500	13,000	12,000
10 PSIG	19,000	21,000	21,800	20,000	22,000	21,000	20,500	21,000	20,500	20,800	20,500
15 PSIG	19,500	24,000	26,000	27,000	30,000	29,000	25,500	25,000	27,500	21,500	22,000
20 PSIG			17,500	25,000	26,000	26,000	24,000	25,000	26,000	22,000	24,000
25 PSIG			15,500	22,000	25,000	24,000	24,000	24,000	25,000	23,000	25,000
30 PSIG			14,000	20,000	24,000	22,000	22,000	22,000	23,000	23,000	24,500

— For optimum performance, use with inlet pressures above line.

2" 3000 SERIES REGULATOR - HIGH PRESSURE SCFH (ft³/h) 0.60 specific gravity gas at 60 °F and 14.7PSIA

Spring No.	71411P021		71411P022				71411P044		71411P023		
Inlet Pressure	2 PSIG .2# Droop	2.5 PSIG .25# Droop	2.5 PSIG .25# Droop	3 PSIG .3# Droop	4 PSIG .4# Droop	5 PSIG .5# Droop	6 PSIG .6# Droop	7 PSIG .7# Droop	8 PSIG .8# Droop	9 PSIG .9# Droop	10 PSIG 1# Droop
3	3,900	2,400	1,600								
4	4,900	4,600	3,500	2,600							
5	9,600	8,500	4,800	5,200	4,500						
6	10,300	9,700	5,400	5,600	6,700	4,100					
7	14,200	12,600	6,100	6,400	7,100	7,300	4,600				
8	16,200	16,000	6,700	7,900	9,000	9,200	7,300	6,000			
9	17,900	18,400	7,500	9,300	10,400	11,100	8,300	8,500	5,100		
10	20,600	21,400	8,500	9,700	11,500	12,200	10,600	10,500	4,900	5,000	
15	29,500	39,900	9,200	18,200	18,500	19,000	16,800	17,800	15,400	15,700	15,800
20	25,100	28,600	36,700	47,300	47,200	46,700	28,900	29,800	24,000	24,300	26,500
25	23,700	27,900	33,600	36,600	41,300	51,900	57,900	54,200	41,000	39,300	36,900
30	23,400	27,000	31,100	33,400	38,800	44,500	52,300	66,500	64,400	64,400	61,600

3" 3000 SERIES REGULATOR SCFH (ft³/h) 0.60 specific gravity gas at 60 °F and 14.7PSIA

Spring No.	70157P028	70157P029		70157P030		70157P031			70157P032		
Inlet Pressure	2" wc .5# Droop	4" wc 1# Droop	6" wc 1# Droop	9" wc 1# Droop	12" wc 2# Droop	16" wc 2# Droop	20" wc 2# Droop	24" wc 2.5# Droop	28" wc 3# Droop	42" wc 4# Droop	56" wc 5# Droop
8" WC	8,400	8,750	6,000								
14" WC	12,500	12,800	8,400	6,100							
21" WC	14,100	16,300	10,550	8,050	9,900						
1 PSIG	15,050	18,100	11,900	10,100	11,050	8,300					
1.5 PSIG	17,600	23,000	18,500	13,100	18,000	12,500	11,800	11,800			
2 PSIG	20,400	25,000	20,700	19,400	21,000	16,000	15,200	14,850	14,700	9,150	
3 PSIG	22,500	28,800	24,000	23,500	24,500	22,000	21,000	21,000	20,900	14,600	13,650
5 PSIG	23,400	33,900	29,000	28,750	29,000	27,500	26,300	26,300	26,150	23,950	23,800
10 PSIG		35,100	33,500	32,100	32,300	30,000	30,400	32,000	32,850	32,500	32,500
15 PSIG			33,500	33,100	34,200	32,900	33,300	33,600	33,850	34,400	34,000
20 PSIG			39,000	35,000	37,000	35,000	38,000	40,000	40,000	40,000	40,000
25 PSIG			39,000	35,000	40,000	40,000	40,000	40,000	42,000	45,000	45,000
30 PSIG			45,000	40,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000

4" 3000 SERIES REGULATOR SCFH (ft³/h) 0.60 specific gravity gas at 60 °F and 14.7PSIA

Spring No.	71411P036		71411P034		71411P037				71411P038	
Inlet Pressure	4" wc 1# Droop	6" wc 1# Droop	9" wc 2# Droop	12" wc 2# Droop	16" wc 4# Droop	20" wc 4# Droop	24" wc 4# Droop	28" wc 4# Droop	42" wc 8# Droop	56" wc 8# Droop
8" WC	12,500	8,500								
14" WC	18,000	13,000	14,000							
21" WC	23,500	20,000	21,000	18,000						
1 PSIG	24,000	22,000	28,000	23,000	21,000					
1.5 PSIG	29,000	25,000	34,000	28,000	26,000	24,000	18,000			
2 PSIG	32,000	28,000	44,000	37,100	37,500	37,000	26,000	16,000	26,000	
3 PSIG	40,000	50,000	55,000	56,000	56,000	55,000	44,000	30,000	43,000	38,000
5 PSIG	45,000	50,000	55,000	60,000	70,000	72,000	62,000	56,000	60,000	55,000
10 PSIG	45,000	50,000	55,000	60,000	70,000	75,000	75,000	75,000	90,000	90,000
15 PSIG	45,000	50,000	55,000	60,000	70,000	75,000	75,000	75,000	90,000	90,000
20 PSIG		50,000	55,000	55,000	65,000	65,000	65,000	60,000	80,000	75,000
25 PSIG		55,000	57,000	55,000	65,000	65,000	65,000	60,000	80,000	75,000
30 PSIG		55,000	58,000	55,000	65,000	65,000	65,000	60,000	80,000	75,000

3000 Series Regulators

Other Technical Data

FULL-OPEN REGULATOR RELIEF CAPACITY

For sizing downstream relief valves, use the following formulas to determine the regulator full-open capacity:

<p>For critical flow rates:</p> $Q = \frac{(59.64 * C)}{2} * \frac{P_1}{\sqrt{G}}$	<p>For sub-critical flows:</p> $Q = 59.64 * C * h \frac{\sqrt{P_2}}{\sqrt{G}}$
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- Q** Maximum capacity of regulator
- C** Orifice constant (see table)
- P₁** Inlet absolute pressure (PSIA)
- P₂** Outlet absolute pressure (PSIA)
- h** Differential pressure (P₁ - P₂)
- G** Specific gravity of gas

ORIFICE CONSTANTS

Size	C
1 1/4"	20
1 1/2"	20
2"	43
3"	86
4"	141

Critical flow occurs when the absolute outlet pressure is less than about 1/2 of the absolute inlet pressure.

OTHER GAS CAPACITIES

To determine the capacity of these regulators for gases other than natural gas, multiply the values within the capacity tables by a Specific Gravity Conversion Factor (Fg). The table below lists this factor for some of the more common gases.

GAS TYPE	SPECIFIC GRAVITY	CONVERSION FACTOR (Fg)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide	1.52	0.63
Nitrogen	0.97	0.79
Propane	1.53	0.63

To calculate the Conversion Factor for other gases:

$$(Fg) = \sqrt{\frac{\text{Specific gravity of gas on which the capacity table is based}}{\text{Specific gravity of gas being used}}}$$

Example: If using propane and only having tables based on natural gas, the Specific Gravity Conversion Factor is:

$$(Fg) = \sqrt{\frac{\text{Specific gravity of natural gas (0.6)}}{\text{Specific gravity of propane (1.53)}}}$$

$$(Fg) = \sqrt{\frac{0.60}{1.53}}$$

$$(Fg) = 0.626$$

REGULATOR PRESSURE RATING

30 PSIG (8.6 bar) = Maximum recommended inlet pressure for normal service.

60 PSIG (12 bar) = Maximum inlet pressure for abnormal or emergency service, without causing damage to regulator case.

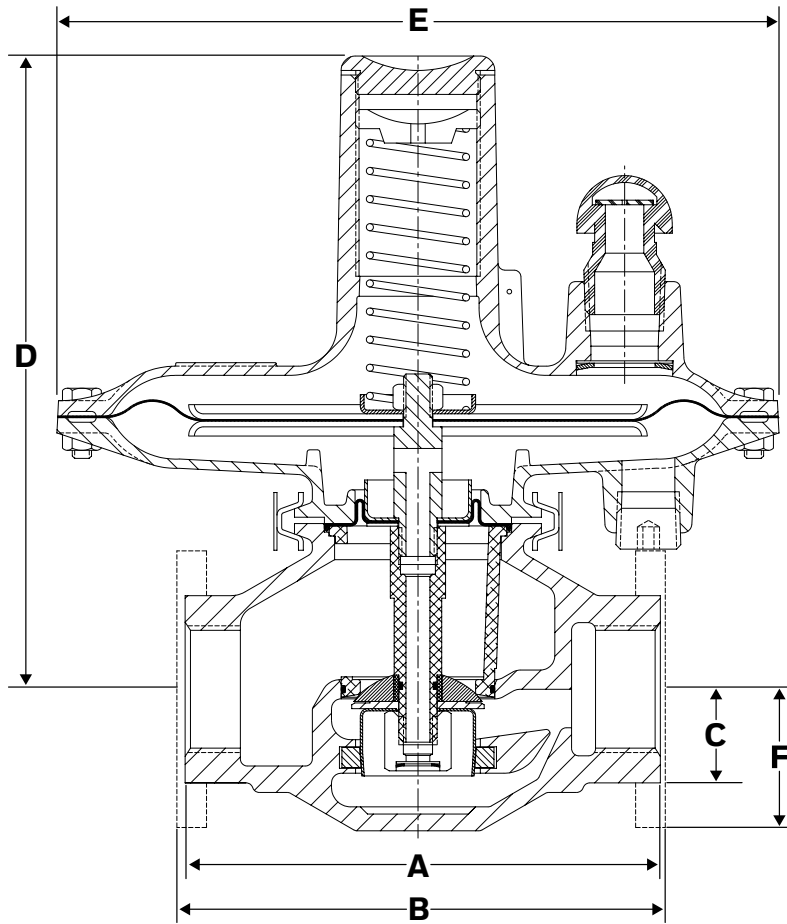
2 PSIG (138 mbar) = Maximum outlet pressure for normal service

- 1 1/4", 1 1/2", 2" LOW PRESSURE, 3", 4" MODELS

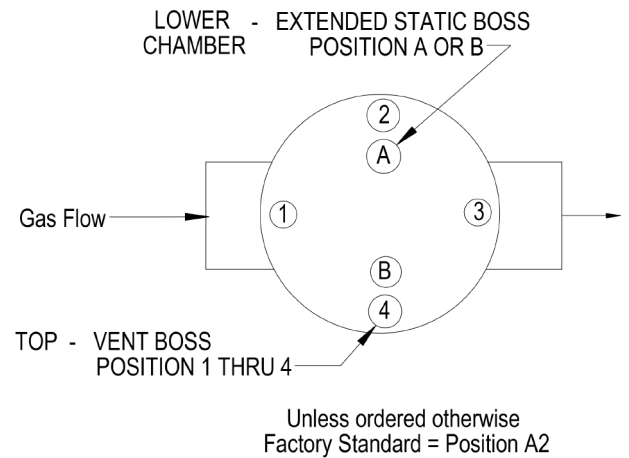
10 PSIG (138 mbar) = Maximum outlet pressure for normal service

- 2" High Pressure model ONLY

3000 Series Regulator Dimensions



Regulator Assembly Positions



SIZE	DIMENSIONS inches (mm)						SHIPPING WEIGHT lbs (kg)
	A	B	C	D	E	F	
1 1/4" NPT	6.25 (158.8)		1.16 (29.46)	8.25 (209.6)	9.38 (238.3)		9.5 (4.3)
1 1/2" NPT	6.25 (158.8)		1.16 (29.46)	8.25 (209.6)	9.38 (238.3)		9.25 (4.2)
2" NPT	7.81 (197.4)		1.81 (46.0)	Low Pressure 10.41 (264.4)	12.13 (308.1)		22 (10.0)
				High Pressure 17.25 (438.2)			33 (15)
2" ANSI 125 Flanged		8.75 (222.3)		Low Pressure 10.41 (264.4)	12.13 (308.1)	3 (76.2)	30 (13.6)
				High Pressure 17.25 (438.2)			43 (19.5)
3" ANSI 125 Flanged		10.25 (260.4)		12.88 (327.2)	15 (381)	3.75 (95.3)	47 (21.3)
4" ANSI 125 Flanged		12.38 (314.5)		19.56 (495.6)	17.25 (438.2)	4.5 (114.3)	77 (34.9)

For more information

www.elster-americanmeter.com

Honeywell | Smart Energy

2221 Industrial Road
Nebraska City, NE 68410
T +1 402-873-8200
F +1 402-873-7616
www.honeywellsmartenergy.com

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