

# Mooney\* Regulators

## Spec Data Catalogue



# Contents

Mooney Flowgrid .....	3
Product Overview .....	3
General Data & Specification .....	3
Materials of Construction .....	3
Specification Overview .....	4
Flow Coefficients & Constants .....	6
Mooney Flowgrid Noise Controller (FG-NC) .....	10
Product Overview .....	10
General Data .....	10
Materials of Construction .....	10
Mooney Flowgrid Slam Shut .....	11
Product Overview .....	11
Diaphragm Selection .....	14
Mooney FlowMax* .....	15
Overpressure Protection .....	15
General Data and Specifications .....	15
Materials of Construction .....	15
Specification Overview .....	16
Flow Coefficients & Constants .....	16
Mooney FlowMax Low Flow Range Extender (LFRX) .....	17
Product Overview .....	17
Capacity Comparison .....	17
Flexflo* Model 900TE .....	18
General Data Overview .....	18
Specification Overview .....	18
Flow Coefficient Data .....	19
Pilots and Accessories .....	20
Sizing .....	23

# Mooney Flowgrid

## Product Overview

GE's Mooney Flowgrid Regulator is an easy-to-maintain valve for self-contained pilot systems that allows users to maintain pressure and flow control of almost any gas or liquid. The Mooney Flowgrid Regulator is well-suited for pressure reducing (PRV), back pressure or relief (BPV) flow control and multi-function control applications where reliable regulation, simplicity and ease-of-maintenance are important. As a self-contained, pilot-operated device, this advanced technology solution can offer substantial energy savings when compared to conventional air-operated or electrically operated control valves.

GE Oil & Gas has secured global PED EN 334 certification for its Mooney Flowgrid regulators, demonstrating our commitment to quality and safety. The certification was awarded by DVGW (the German Technical and Scientific Association for Gas and Water), one of the world's most recognized industry certification bodies and the largest gas and water industry certification agency in Europe. GE Oil & Gas has also secured the following verifications; ISO 9901, ISO 14001, CRN, along with others testifying to the safety and quality of the Mooney Flowgrid regulator.



## General Data & Specification

<b>Sizes</b>	1"-12" (25-300 mm)
<b>Body Styles</b>	Single Port: 1-8 in. (25-200 mm) Dual Port: 10 & 12 in. (250 & 300 mm)
<b>ANSI/ASME Rating</b>	CL 150-600
<b>End Connections</b>	Screwed, Socket Weld, Flanged, Flangeless
<b>Outlet Pressures</b>	5" w.c. - 900 psi (0.01 bar - 62 bar)
<b>Maximum Operating Differential</b>	800 psi (55 bar)
<b>Maximum Emergency Differential*</b>	1000 psi (70 bar)
<b>Cracking Differential</b>	4 ± 1 psid (0.28 ± 0.07 bar)
<b>Working Temperature</b>	-20°F to 150°F (-29°C to 66°C)
<b>Min/Max Temperature</b>	-40°F to 175°F (-40°C to 79°C)
<b>Flow Direction</b>	Bi-Directional

\* Unless limited by body rating

## Materials of Construction

<b>Body</b>	Steel, Stainless Steel, Ductile Iron
<b>Body &amp; Spring Case</b>	ASTM A 216 GR WCB Carbon Steel
<b>Throttle Plate</b>	17 - 4PH Stainless Steel or A515 Carbon Steel with ENC Coating
<b>Diaphragm</b>	Nitrile/Nylon* Optional (Viton/Nylon)
<b>O-Ring &amp; Seals</b>	Nitrile, Optional (Viton)
<b>Bolting</b>	ASTM A 193 GR B-7 or Equal
<b>Spring</b>	301 Stainless Steel

\* Refer to the diaphragm selection chart on page 14.

## Specification Overview

### Single Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (bars)	Nominal Port Size inches (mm)	Face to Face inches (mm)	Valve Weight lbs (kg)
1 (25)	FG11 & 12	NPT/SWE	1480 (102)	1 (25)	7.00 (180)	11 (5)
1 (25)	FG 54**	150 CL FLG	285 (19.6)	1 (25)	7.25 (180)	14 (6)
1 (25)	FG 55 **	300 CL FLG	740 (51)	1 (25)	7.75 (200)	16 (7)
1 (25)	FG 56**	600 CL FLG	1480 (102)	1 (25)	8.25 (210)	18 (8)
1-1/4 (32)	FG 13 & 14	NPT/SWE	1480 (102)	1 (25)	7.00 (180)	11 (5)
1-1/2 (38)	FG 47 & 48	NPT/SWE	1480 (102)	1 (25)	7.00 (180)	11 (5)
1 (25)	FG 24***	NPT	250 (17.2)	1 (25)	7.00 (180)	8 (4)
1-1/4 (32)	FG 25***	NPT	250 (17.2)	1 (25)	7.00 (180)	8 (4)
1-1/2 (38)	FG 26***	NPT	250 (17.2)	1 (25)	7.00 (180)	8 (4)
2 x 1 (50 x 25)	FG 29 & 50	NPT/SWE	1480 (102)	1 (25)	7.00 (180)	14 (6)
2 x 1 (50 x 25)	FG 51	150 CL FLG	285 (19.6)	1 (25)	10.00 (250)	23 (10)
2 x 1 (50 x 25)	FG 52	300 CL FLG	740 (51)	1 (25)	10.50 (270)	26 (11)
2 x 1 (50 x 25)	FG 53	600 CL FLG	1480 (102)	1 (25)	11.25 (290)	30 (14)
2 (50)	FG 1 & 2*	NPT/SWE	1480 (102)	2 Std (50)	8.00 (200)	25 (11)
2 (50)	FG 3*	150 CL FLG	285 (19.6)	2 Std (50)	10.00 (250)	37 (17)
2 (50)	FG 4*	300 CL FLG	740 (51)	2 Std (50)	10.50 (270)	39 (18)
2 (50)	FG 5*	600 CL FLG	1480 (102)	2 Std (50)	11.25 (290)	43 (20)
2 (50)	FG 27 & 28	NPT/SWE	1480 (102)	2 LP (50)	8.00 (200)	25 (11)
2 (50)	FG 29	150 CL FLG	285 (19.6)	2 LP (50)	10.00 (250)	34 (15)
2 (50)	FG 30	300 CL FLG	740 (51)	2 LP (50)	10.50 (270)	37 (17)
2 (50)	FG 31	600 CL FLG	1480 (102)	2 LP (50)	11.25 (290)	40 (18)
2 (50)	FG 82***	NPT	250* (17.2)	2 LP (50)	8.00 (200)	17 (8)
2 (50)	FG 83***	150 CL FLG RF	250* (17.2)	2 LP (50)	10.00 (250)	22 (10)
2 (50)	FG 84***	150 CL FLG FF	250* (17.2)	2 LP (50)	10.00 (250)	22 (10)
2 x 3 (50 x 80)	FG 119	150 CL FLG	285 (19.6)	3 (80)	10.00 (250)	78 (35)
2 x 3 (50 x 80)	FG 120	300 CL FLG	740 (51)	3 (80)	10.50 (270)	82 (37)
2 x 3 (50 x 80)	FG 121	600 CL FLG	1480 (102)	3 (80)	11.25 (290)	88 (41)
2 x 3 (50 x 80)	FG 117	NPT CL 600	1480 (102)	3 (80)	8.00 (200)	68 (31)
2 x 3 (50 x 80)	FG 118	SWE CL 600	1480 (102)	3 (80)	8.00 (200)	68 (31)
3 (80)	FG 16	150 CL FLG	285 (19.6)	3 (80)	11.75 (300)	73 (33)
3 (80)	FG 17	300 CL FLG	740 (51)	3 (80)	12.50 (320)	85 (39)
3 (80)	FG 18	600 CL FLG	1480 (102)	3 (80)	13.25 (340)	94 (43)
4 (100)	FG 39	150 CL FLG	285 (19.6)	4 (100)	13.88 (350)	103 (47)
4 (100)	FG 40	300 CL FLG	740 (51)	4 (100)	14.50 (370)	117 (53)
4 (100)	FG 41	600 CL FLG	1480 (102)	4 (100)	15.50 (400)	143 (65)
6 (150)	FG 44	150 CL FLG	285 (19.6)	6 (150)	17.75 (450)	200 (91)
6 (150)	FG 45	300 CL FLG	740 (51)	6 (150)	18.62 (470)	240 (109)
6 (150)	FG 46	600 CL FLG	1480 (102)	6 (150)	20.00 (510)	330 (150)
8 (200)	FG 72	150 CL FLG	285 (19.6)	8 (200)	21.38 (540)	450 (204)
8 (200)	FG 73	300 CL FLG	740 (51)	8 (200)	22.38 (570)	500 (227)
8 (200)	FG 80	600 CL FLG	1480 (102)	8 (200)	24.00 (610)	650 (295)

\* Discontinued

\*\* Special welded assembly

\*\*\*Ductile Iron & Aluminum

## Dual Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (bar)	Nominal Port Size inches (mm)	Face to Face inches (mm)	Valve Weight lbs (kg)
2 (50)	FG 8*	150 CL FLG	285 (20)	2 Std (50)	10.00 (250)	52 (24)
2 (50)	FG 9*	300 CL FLG	740 (51)	2 Std (50)	10.50 (267)	55 (25)
2 (50)	FG 10*	600 CL FLG	1480 (102)	2 Std (50)	11.25 (286)	59 (27)
2 (50)	FG 32*	150 CL FLG	285 (20)	2 LP (50)	10.00 (250)	50 (23)
2 (50)	FG 33*	300 CL FLG	740 (51)	2 LP (50)	10.50 (267)	52 (24)
2 (50)	FG 34*	600 CL FLG	1480 (102)	2 LP (50)	11.25 (286)	54 (25)
4 (100)	FG 21*	150 CL FLG	285 (20)	3 (80)	13.88 (352)	145 (66)
4 (100)	FG 22*	300 CL FLG	740 (51)	3 (80)	14.50 (368)	160 (73)
4 (100)	FG 23*	600 CL FLG	1480 (102)	3 (80)	15.50 (394)	194 (88)
10 (250)	FG 57	150 CL FLG	285 (20)	6 (150)	26.50 (673)	590 (268)
10 (250)	FG 58	300 CL FLG	740 (51)	6 (150)	27.88 (708)	670 (304)
10 (250)	FG 59	600 CL FLG	1480 (102)	6 (150)	29.60 (752)	900 (408)
12 (300)	FG 74	150 CL FLG	285 (20)	8 (200)	29.00 (737)	1097 (498)
12 (300)	FG 75	300 CL FLG	740 (51)	8 (200)	30.50 (775)	1195 (542)
12 (300)	FG 81	600 CL FLG	1480 (102)	8 (200)	32.25 (819)	1383 (627)

\*Discontinued

## Flangeless Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (bar)	Nominal Port Size inches (mm)	Face to Face inches (mm)	Valve Weight lbs (kg)
2 (50)	FG 15*	150 CL FLG	285 (20)	2 Std (50)	4.187 (105)	27 (12)
2 (50)	FG 15*	300 CL FLG	740 (51)	2 Std (50)	4.187 (105)	27 (12)
2 (50)	FG 15*	600 CL FLG	1480 (102)	2 Std (50)	4.187 (105)	27 (12)
2 (50)	FG 35	150 CL FLG	285 (20)	2 LP (50)	4.187 (105)	27 (12)
2 (50)	FG 35	300 CL FLG	740 (51)	2 LP (50)	4.187 (105)	27 (12)
2 (50)	FG 35	600 CL FLG	1480 (102)	2 LP (50)	4.187 (105)	27 (12)
4 x 3 (100 x 80)	FG 19	150 CL FLG	285 (20)	3 (80)	5.81 (148)	92 (42)
4 x 3 (100 x 80)	FG 20	300 CL FLG	740 (51)	3 (80)	5.81 (148)	92 (42)
6 x 4 (150 x 100)	FG 42	150 CL FLG	285 (20)	4 (100)	8.00 (200)	115 (52)
6 x 4 (150 x 100)	FG 43	300 CL FLG	740 (51)	4 (100)	8.00 (200)	115 (52)

\*Discontinued

## Type-A Flangeless Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (bar)	Nominal Port Size inches (mm)	Face to Face Inches (mm)	Valve Weight lbs (kg)
2 (50)	FG 100	150 CL FLG	285 (20)	2 LP (50)	3.03 (80)	29 (13)
2 (50)	FG 101	300 CL FLG	740 (51)	2 LP (50)	3.03 (80)	29 (13)
2 (50)	FG 102	600 CL FLG	1480 (102)	2 LP (50)	3.41 (90)	29 (13)
3 (80)	FG 103	150 CL FLG	285 (20)	3 (80)	3.72 (95)	60 (27)
3 (80)	FG 104	300 CL FLG	740 (51)	3 (80)	3.72 (95)	60 (27)
4 (100)	FG 106	150 CL FLG	285 (20)	4 (100)	4.50 (115)	85 (39)
4 (100)	FG 107	300 CL FLG	740 (51)	4 (100)	4.50 (115)	85 (39)

Note: Same face-to-face dimensions as American Meter Axial® Flow Valves.

## Flow Coefficients & Constants

### Single Port Designs

Size inches (mm)	End Connection	Port Size inches (mm)	Percent Capacity (%)	Cv	C1	Cg	Swage Factor 1.5:1	Swage Factor 2:1
<b>1</b> <b>(25)</b>	CL 600 NPT CL 600 SWE CL 150-600 FLG	1 (25)	<b>100</b>	13.2	34	450	0.96	0.93
			<b>75</b>	10.6	30	320	0.97	0.95
			<b>50</b>	8.9	27	240	0.98	0.96
			<b>35</b>	5.4	26	140	1.00	0.99
<b>2 x 1</b> <b>(50 x 25)</b>	CL 150-600 FLG CL 600 NPT CL 600 SWE	1 (25)	<b>100</b>	13.4	37	500	0.96	0.93
			<b>75</b>	10.7	30	320	0.97	0.95
			<b>50</b>	9.1	27	245	0.98	0.96
			<b>35</b>	5.5	26	144	1.00	0.99
<b>2</b> <b>(50)</b>	CL 150-600 FLG CL 600 NPT CL 600 SWE CL 600 BWE	2 STD* (50)	<b>100</b>	32	35	1130	0.98	0.97
			<b>75</b>	28	30	850	0.99	0.98
			<b>50</b>	25	27	680	1.00	0.98
			<b>35</b>	15	26	380	1.00	1.00
<b>2</b> <b>(50)</b>	CL 150-600 FLG CL 600 NPT CL 600 SWE CL 600 BWE	2 LP (50)	<b>100</b>	40	35	1420	0.97	0.96
			<b>75</b>	34	33	1130	0.98	0.97
			<b>50</b>	27	30	820	0.99	0.98
			<b>35</b>	20	30	610	1.00	1.00
<b>2</b> <b>(50)</b>	CL 150-600 FLG CL 600 NPT CL 600 SWE	3 (80)						
			<b>100</b>	56	35	1970	0.96	0.93
<b>3</b> <b>(80)</b>	CL 150-600 FLG CL 150-600 BWE	3 (80)	<b>100</b>	96	36	3450	0.98	0.95
			<b>75</b>	81	34	2730	1.00	1.00
			<b>50</b>	68	32	2150	1.00	1.00
			<b>35</b>	49	31	1530	1.00	1.00
<b>4</b> <b>(100)</b>	CL 150-600 FLG CL 150-600 BWE	4 (10)	<b>100</b>	172	38	6500	0.97	0.95
			<b>75</b>	142	37	5300	0.98	0.96
			<b>50</b>	100	35	3550	0.99	0.98
			<b>35</b>	76	35	2700	1.00	1.00
<b>6</b> <b>(150)</b>	CL 150-600 FLG CL 150-600 BWE	6 (150)	<b>100</b>	313	40	12500	0.99	0.97
			<b>50</b>	240	28	6750	1.00	0.98
<b>8</b> <b>(200)</b>	CL 150-600 FLG	8 (200)	<b>100</b>	530	38	20200	0.97	0.95
			<b>75</b>	515	30	15200	0.98	0.96
			<b>50</b>	350	29	10000	0.99	0.98
			<b>35</b>	250	28	7100	1.00	1.00

\*Discontinued

## Flangeless Single Port Designs

Size inches (mm)	End Connections	Port Size inches (mm)	Percent Capacity (%)	Cv	C1	Cg	Swage Factor 1.5:1	Swage Factor 2:1
<b>2 (50)</b>	CL 150-600 Flangeless	2 STD** (50)	<b>100</b>	32	35	1120	0.98	0.97
			<b>75</b>	27	30	827	0.99	0.98
			<b>50</b>	23	27	620	1.00	0.98
			<b>35</b>	13	26	338	1.00	1.00
<b>2 (50)</b>	CL 150-600 Flangeless	2 LP (50)	<b>100</b>	40	35	1400		
			<b>75</b>	33	33	1083		
			<b>50</b>	27	30	824		
			<b>35</b>	20	30	590		
<b>4 x 3 (100 x 80)</b>	CL 150-300 Flangeless	3 (80)	<b>100</b>	95	36	3400	0.99	0.98
			<b>75</b>	79	34	2690	1.00	0.99
			<b>50</b>	62	32	1980	1.00	1.00
			<b>35</b>	48	31	1515	1.00	1.00
<b>6 x 4 (150 x 100)</b>	CL 150-300 Flangeless	4 (100)	<b>100</b>	172	37	6400	0.97	0.95
			<b>75</b>	142	32	4500	0.98	0.96
			<b>50</b>	100	30	3000	1.00	0.98
			<b>35</b>	76	30	2250	1.00	1.00
<b>2 Type-A* (50)</b>	CL 150-600 Flangeless	2 LP (50)	<b>100</b>	40	35	1400	0.98	0.96
			<b>75</b>	33	33	1083	0.98	0.97
			<b>50</b>	27	30	824	0.99	0.98
			<b>35</b>	20	30	590	1.00	1.00
<b>3 x 3 Type-A (80 x 80)</b>	CL 150-300 Flangeless	3 (80)	<b>100</b>	92	35	3240	0.98	0.96
			<b>75</b>	80	33	2650	0.98	0.97
			<b>50</b>	68	32	2150	0.99	0.98
			<b>35</b>	49	31	1530	1.00	1.00
<b>4 x 4 Type-A (100 x 100)</b>	CL 150-300 Flangeless	4 (100)	<b>100</b>	168	35	5800	0.98	0.96
			<b>75</b>	135	37	5000	0.98	0.97
			<b>50</b>	100	35	3550	0.99	0.98
			<b>35</b>	76	35	2700	1.00	1.00

\* All Flangeless valves except FG-15 & FG-35 include Line Bolt Kits.

\*\*Discontinued

## Flowgrid 250 Valves

Size inches (mm)	End Connections	Port Size	Percent Capacity (%)	Cv	C1	Cg	Swage Factor 1.5:1	Swage Factor 2:1
2 (50)	NPT CL 150 FLG*	2 LP (50)	100	46	35	1600	0.97	0.96
			75	37	33	1230	0.98	0.97
			50	27	30	820	0.99	0.98
			35	19	30	560	1.00	1.00

\*Raised Face and Flat Face available

## Dual Port Designs

Size inches (mm)	End Connections	Port Size inches (metric)	Percent Capacity (%)	Cv	C1	Cg	Swage Factor 1.5:1	Swage Factor 2:1
10 (250)	CL 150-600 FLG	6 (150)	100	650	33	22000	1.00	0.99
			75	550	30	16500	1.00	0.99
			50	472	28	13200	1.00	0.99
			35	290	27	7830	1.00	1.00
12 (300)	CL 150-600 FLG	8 (200)	100	1060	38	40400	0.97	0.95
			75	1030	30	30400	0.98	0.96
			50	700	29	20000	0.99	0.98
			35	500	28	14200	1.00	1.00



## Valve Performance

### Performance with Series 20L™ and Series 20™ Pilot

Mooney® Series 20L Pilot		Pressure Reducing Mode Restrictor Set at 4		
Pilot Spring	Range	Lockup	Droop Max Capacity <sup>1</sup>	Boost @ Constant Flow <sup>2</sup>
White	5 i.w.c. - 15 i.w.c.	1.0 i.w.c.	0.5 i.w.c.	0.7 i.w.c.
Brown	10 i.w.c. - 40 i.w.c.	1.0 i.w.c.	2 i.w.c.	0.7 i.w.c.
Yellow	1-3 psig	0.2 psig	0.15 psig	0.25 psig
Orange	2-5 psig	0.35 psig	0.25 psig	0.25 psig
Gray	4-8 psig	.5 psig	0.30 psig	0.25 psig

Mooney® Series 20 Pilot		Pressure Reducing Mode Restrictor Set at 4			Back Pressure Mode Restrictor Set at 4	
Pilot Spring	Range	Lockup	Droop <sup>1</sup> Max Capacity	Boost @ <sup>2</sup> Constant Flow	Build up Max Capacity	Lockup
Red	3-12 psig	1.0 psig	.30	.70 psig	Note <sup>4</sup>	Note <sup>4</sup>
Silver	10-40 psig	1.0 psig	.30	.70 psig	+5.0 psig	-1.0 psig
Blue	25-90 psig	2.0 psig	.60	.70 psig	+5.0 psig	-1.0 psig
Purple	60-200 psig	2.0 psig	1.30	.70 psig	+1.0 psig	-1.0 psig
Black	100-260 psig	5.0 psig	2.00	.70 psig	+3.0 psig	-1.5 psig
Green	200-450 psig	10.0 psig	4.00	.70 psig	+5.0 psig	-2.0 psig
HP Black	200-520 psig	10.0 psig	4.00	1.50 psig	+5.0 psig <sup>3</sup>	-3.0 psig
HP Green	400-900 psig	20.0 psig	8.00	1.50 psig	+12.0 psig <sup>3</sup>	-5.0 psig

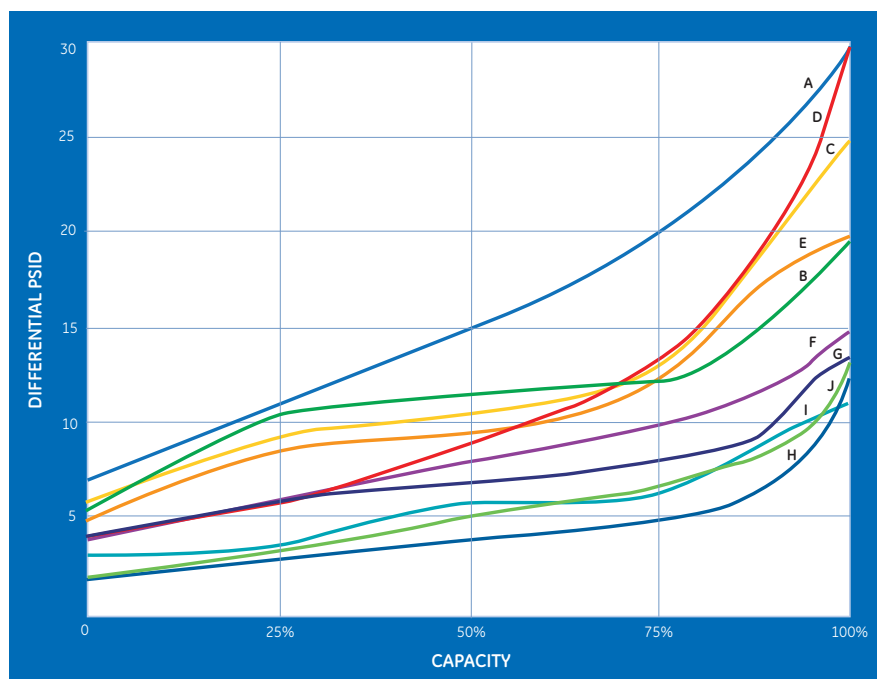
1 Inlet pressure (P1) constant

2 Per 100 psi decrease in inlet pressure (P1)

3 SST/Delrin trim required

4 Minimum set point for the Flowgrid Valve and Pilot when used as a relief valve is 15 psig or the minimum differential, whichever is greater.

### Minimum Pressure Differential Versus Capacity



- A 1" 75 Duro, STD Spring
- B 1" 60 Duro, Low Spring
- C 2" LP 75 Duro, STD Spring
- D 3" 75 Duro, STD Spring
- E 2" STD 75 Duro, STD Spring
- F 4", 6" 75 Duro, STD Spring
- G 2" STD 60 Duro, Low Spring
- H 4", 6" 60 Duro, Low Spring
- I 2" LP 60 Duro, Low Spring
- J 3" 60 Duro, Low Spring

Use the chart at left to determine the amount of available capacity through a Flowgrid® valve when the differential pressure across the regulator falls below 30 psid.

For example: At 15 psid a 1" single port valve with a standard main spring and 75 duro diaphragm (A) can flow 50% of total calculated capacity in this condition. With a low differential main spring and 60 durometer diaphragm installed (B) the valve can flow approximately 90% of its calculated capacity.

# Mooney Flowgrid Noise Controller (FG-NC)

## Product Overview

The FG-NC is a noise reducing device designed for use with the Mooney Flowgrid regulator. The FG-NC acts as an energy absorber that when used properly can reduce noise levels up to 25 dBA.

When gas flow exits the standard Flowgrid throttle plate, it passes through a series of flow channels created by the Noise Plate Assembly of the FG-NC. As the gas passes through these channels, the noise energy is dissipated, causing an overall reduction in noise.

The FG-NC is integrated into the top entry design of the Mooney Flowgrid regulator and can either be factory installed or ordered as a retrofit kit.



## General Data

<b>Sizes (in)</b>	1, 2, 2 (AC), 3, 4, 6, 8, 10, 12
<b>Sizes (mm)</b>	25, 50, 50 (AC), 80, 100, 150, 200, 250, 300
<b>ANSI/ASME Rating</b>	CL 150-600
<b>Working Temperature</b>	-20°F to 150°F (-29°C to 66°C)
<b>Min/Max Temperature</b>	-40°F to 175°F (-40°C to 79°C)
<b>Maximum Operating Differential</b>	800 psi (55 bar)*
<b>Maximum Emergency Differential</b>	1000 psi (69 bar)*
<b>Maximum Inlet Pressure</b>	1480 psig (102 bar)*
<b>Flow Direction</b>	Unidirectional

\*May be limited by body rating

## Materials of Construction

<b>Housing</b>	Steel
<b>Plates</b>	Stainless Steel
<b>Plate Screws</b>	Stainless Steel
<b>Seals</b>	Nitrile
<b>Housing Studs</b>	ANSI B7

## Flow Coefficients and Constants

Flowgrid with 100% Throttle Plate and FG-NC		Cv	C1	Cg
inches	mm			
1	25	7	35	250
2	50	24	35	840
2 AC	50	44	35	1540
3	80	53	35	1860
4	100	89	35	3130
6	150	180	33	6000
8	200	295	36	10670
10	250	364	33	1200
12	300	593	36	21340

# Mooney Flowgrid Slam Shut

## Product Overview

The Mooney Flowgrid Slam Shut is a combination of a regulator and an automatic shut-off device. In addition to pressure regulation, this pneumatically actuated device provides automatic downstream pressure protection. By separating the pneumatic controller and mechanical latching mechanism, shut off occurs only when designated set points are reached. The patent pending design prevents disruptive and costly "accidental shutoffs". Positive shutoff is achieved instantly through the snap acting mechanism, and reset can be completed with common tools.



## General Data

<b>Sizes</b>	1" NPT and SWE, 1.25" NPT and SWE, 2", 3", 4" (25, 32, 50, 80, 100) mm
<b>Types</b>	Stand alone or integrated into Flowgrid regulator
<b>Body Styles</b>	Flowgrid 250, Large Port, Single Port
<b>Pressure Protection</b>	Standard: Over Pressure Optional: Over and/or Under Pressure
<b>Working Temperature</b>	-20°F to 150°F (-29°C to 66°C)
<b>Maximum Operating Inlet Pressure</b>	740 psig (50 bar)
<b>Operating Sense Pressure 1-inch / 2-4 inch</b>	5 to 450 psig (0.35 bar to 31 bar) 10 to 450 psig (0.69 bar to 31 bar)
<b>Flow Direction</b>	Unidirectional
<b>Taps</b>	Four ¼" – 18 NPT
<b>Response Time</b>	<0.25 Seconds

## Materials of Construction

<b>Main Shut-off Valve</b>	WCB Carbon Steel
<b>Flapper and Shaft</b>	17-4 Ph Stainless Steel, A515 Carbon Steel w/ ENC Coating
<b>Controller Housing</b>	Aluminum
<b>O-Ring and Seals</b>	Nitrile
<b>Bushings</b>	Acetal

## Specification Overview

With Series 41 (Single Function) or series 41D (Dual Function) Controller\*

Size inches (mm)	End Connections	Port Size inches (mm)	Stock No. (Flowgrid w/Slam shut)	Stock No. (Slam Shut Only)	Stock No. (Retrofit kit)	Face to Face inches (mm)	Weight FG w/ S.S. lbs (kg)
<b>1 (25)</b>	CL 300 NPT	1 (25)	SG-123	SA-123	SR-123	8.25 (210)	21 (10)
	CL 300 SWE		SG-125	SA-125	SR-125	8.25 (210)	21 (10)
	CL 150 FLG		SG-127	SA-127	SR-127	10.00 (250)	
	CL 300 FLG		SG-128	SA-128	SR-128	10.00 (250)	
<b>1 ¼ x 1 (32 x 25)</b>	NPT	1 (25)	SG-124	SA-124	SR-124		
	SWE		SG-126	SA-126	SR-126		

With Series 50 (Single Function), Series 50D (Dual Function), or Series 50DS (Dual Function Dual Sense) Controller\*

Size inches (mm)	End Connections	Port Size inches (mm)	Stock No. (Flowgrid w/Slam shut)	Stock No. (Slam Shut Only)	Stock No. (Retrofit kit)	Face to Face inches (mm)	Weight FG w/ S.S. lbs (kg)
<b>2 (50)</b>	CL 300 NPT	2 STD* (50)	SG-1	SA-1	SR-1	8.00 (200)	61 (28)
	CL 300 SWE		SG-2	SA-2	SR-2	8.00 (200)	60 (28)
	CL 150 FLG		SG-3	SA-3	SR-3	10.00 (250)	71 (32)
	CL 300 FLG		SG-4	SA-4	SR-4	10.50 (250)	74 (35)
	CL 300 BWE		SG-76	SA-76	SR-76	11.25 (285)	66 (30)
<b>2 (50)</b>	CL 300 NPT	2 LP (50)	SG-27	SA-27	SR-27	8.00 (200)	58 (26)
	CL 300 SWE		SG-28	SA-28	SR-28	8.00 (200)	58 (26)
	CL 150 FLG		SG-29	SA-29	SR-29	10.00 (250)	69 (31)
	CL 300 FLG		SG-30	SA-30	SR-30	10.50 (270)	73 (33)
	CL 300 BWE		SG-77	SA-77	SR-77	11.25 (285)	64 (30)
<b>3 (80)</b>	CL 150 FLG	3 (80)	SG-16	SA-16	SR-16	11.75 (300)	136 (62)
	CL 300 FLG		SG-17	SA-17	SR-17	12.50 (320)	147 (67)
	CL 150 & 300 BWE		SG-61	SA-61	SR-61	13.25 (340)	124 (56)
<b>4 (100)</b>	CL 150 FLG	4 (100)	SG-39	SA-39	SR-39	13.88 (350)	163 (74)
	CL 300 FLG		SG-40	SA-40	SR-40	14.50 (370)	178 (81)
	CL 150 & 300 BWE		SG-63	SA-63	SR-63	15.50 (370)	146 (66)

Ductile body with Series 50 (Single Function), Series 50D (Dual Function), or Series 50DS (Dual Function Dual Sense) Controller\*

Size inches (mm)	End Connections	Port Size	Stock No. (Flowgrid w/Slam shut)	Stock No. (Slam Shut Only)	Stock No. (Retrofit kit)	Face to Face inches (mm)	Weight FG w/ S.S. lbs (kg)
<b>2 (50)</b>	NPT	Flowgrid 250	SG-82	SA-82	SR-82	8.00 (200)	55 (25)
	CL 150 RF		SG-83	SA-83	SR-83	10.00 (250)	65 (30)
	CL 150 FF		SG-84	SA-84	SR-84	10.00 (250)	65 (30)

\*Discontinued

## Flow Coefficients and Constants – Flowgrid with Slamshut

Size inches (mm)	End Connections	Port Size inches (mm)	Percent Capacity (%)	Cv	C1	Cg	Swage Factor 1.5:1	Swage Factor 2:1
<b>1 (25)</b>	CL 300 NPT	1 (25)	100	108	38	410	0.96	0.93
	CL 300 SWE		75	80	35	280	0.97	0.95
	CL 150 FLG		50	67	30	200	0.98	0.96
	CL 300 FLG		35	3.3	30	100	1.00	0.99
<b>1 ¼ x 1 (32 x 25)</b>	NPT SWE	1 (25)	100	108	38	410	0.96	0.93
			75	80	35	280	0.97	0.95
			50	67	30	200	0.98	0.96
			35	3.3	30	100	1.00	0.99
<b>2 (50)</b>	CL 300 NPT & SWE	2 STD* (50)	100	28	40	1130	0.98	0.97
	CL 150 & 300 FLG		75	24	35	850	0.99	0.98
	CL 300 BWE		50	21	52	680	1.00	0.98
<b>2 (50)</b>	CL 300 NPT & SWE	2 LP (50)	100	36	40	1420	0.97	0.96
	CL 150 & 300 FLG		75	30	38	1130	0.98	0.97
	CL 300 BWE		50	23	35	820	0.99	0.98
			35	17	35	610	1.00	1.00
<b>3 (80)</b>	CL 150 & 300 FLG	3 (80)	100	84	41	3450	0.98	0.95
	CL 150 & 300 BWE		75	71	39	2750	1.00	1.00
			50	58	37	2150	1.00	1.00
<b>4 (100)</b>	CL 150 & 300 FLG	4 (100)	100	172	38	6500	0.97	0.95
	CL 150 & 300 BWE		75	142	37	5300	0.98	0.96
			50	100	35	3550	0.99	0.98
			35	76	35	2700	1.00	1.00

\*Discontinued

## Diaphragm Selection

Compound	Temp. Range (Degrees °F)	Maximum Differential	Characteristics	Recommended Applications
75 Duro	-20 to 150	1000 psid	Best all-around material	60 psid to max. differential
60 Duro	-25 to 150	300 psid*	Best shutoff at low differential pressure	Low differential (100 psid or less) or low temperature
80 Duro High ACN	-5 to 175	1000 psid	Higher abrasion and swelling resistance	High differential (400 psid or higher) or abrasive conditions with Distillates
80 Duro Low ACN	-20 to 150	1000 psid	Higher abrasion resistance and low temperature flexibility	High differential (400 psid or higher) or abrasive conditions at low temperatures

**Note:** Minimum temperature is defined as the lowest temperature for normal valve operation. Valves will operate below this temperature, but response times may increase and bubble-tight shutoff may be impaired. At extreme low temperatures (below -40°F), flexure of the diaphragm may result in cracking of the material. This will require replacement of the diaphragm.

Maximum differentials listed are recommended for best diaphragm life.

\*The 60 durometer diaphragm is standard on the Flowgrid 250 Valve which is a ductile iron and aluminum construction with a maximum inlet and differential rating of 250 psi.

# Mooney FlowMax\*

The Mooney FlowMax regulator is a pressure reducing regulator that offers bubble tight shut-off at all pressure differentials and full capacity at very low differential pressures. It is an equally innovative design that compliments the Flowgrid regulator. The FlowMax regulator maximizes capacity, speed of response, and accuracy while incorporating many of the same original maintenance and performance features for which the Flowgrid regulator is renowned.

## Overpressure Protection

The Mooney FlowMax regulator has a full rating of 250 psi (17 bar) on the inlet and outlet connections as well as the actuator housing assembly. Overpressure protection is required only if the pressure can exceed the flange or body rating. Anytime the FlowMax regulator or pilot system is exposed to pressures in excess of its rating it should be inspected for damage.



## General Data and Specifications

<b>Sizes</b>	2" – 6" (50–150 mm)
<b>Body Style</b>	Single Port
<b>End Connections</b>	NPT, RF Flanged, FF Flanged
<b>Working Temperature</b>	-20°F – 150°F (-29°C – 66°C)
<b>Min/Max Temperature</b>	-40°F – 175°F (-40°C – 79°C)
<b>Max. Operating Differential</b>	250 psi (17 bar)
<b>Max. Casting Pressure</b>	250 psi (17 bar)
<b>Min. Differential</b>	3–4 psid (0.21 bar)
<b>Max. Inlet Pressure</b>	250 psig* (17 bar)
<b>Outlet Pressure Range</b>	
Series 20L	5" w.c. to 8 psi (0.01 bar to 0.55 bar)
Series 20	3 psi to 248 psi (0.21 bar to 17 bar)
<b>Pilot Supply Body Tap</b>	One ¼" – 18 NPT
<b>Sense Line Tap</b>	One ½" – 14 NPT

\*Limited by pilot or flange rating

## Materials of Construction

<b>Body</b>	ASTM A 395 Ductile Iron
<b>Actuator Housing</b>	A 356-T6 Cast Aluminum
<b>Spring Case</b>	A 356-T6 Cast Aluminum
<b>Plug</b>	Nitrile
<b>Diaphragm</b>	Nitrile/Nylon
<b>O-Ring &amp; Seals</b>	Nitrile
<b>Bolting</b>	ASTM B8 or equal
<b>Spring</b>	Music wire

## Specification Overview

Size inches (mm)	End Connections	Orifice Size inches (mm)	Stock No.	Stock No. w/Indicator	Max Pressure psig (bar)	Min Differential psig (bar)	*Face to Face inches (mm)	Valve Weight lbs. (kg)
2 (50)	CL 150 RF FLG	2 (50)	FM-1	FM-1-T	250 (17)	3 (.21)	10.00 (254)	36 (16)
	NPT		FM-2	FM-2-T			8.00 (203)	31 (14)
	CL 150 FF FLG		FM-3	FM-3-T			10.00 (254)	36 (16)
3 (80)	CL 150 RF FLG	3 (80)	FM-4	FM-4-T	250 (17)	4 (.28)	11.75 (298)	59 (27)
	CL 150 FF FLG		FM-5	FM-5-T				
4 (100)	CL 150 RF FLG	4 (100)	FM-6	FM-6-T	250 (17)	4 (.28)	13.88 (352)	103 (47)
	CL 150 FF FLG		FM-7	FM-7-T				
6 (150)	CL 150 RF FLG	6 (150)	FM-8	FM-8-T	250 (17)	4 (.28)	17.75 (451)	190 (86)
	CL 150 FF FLG		FM-9	FM-9-T				

## Flow Coefficients & Constants

Size inches (mm)	End Connections	Percent Capacity (%)	Cv	C1	Cg
2 (50)	CL 150 RF FLG, FF FLG, NPT	100	64	35	2250
		75	47*	34	1650
		50	34*	32	1200
		25	17*	28	600
3 (80)		100	114	37	4200
		50	66	32	2100
4 (100)		100	212	35	7500
		50	123	31	3800
6 (150)		100	393	37	14500
		50	231	31	7200

\*Calculated



# Mooney FlowMax Low Flow Range Extender (LFRX)

## Product Overview

Seasonal low flow demands on regulators in distribution networks can cause noisy vibrations and can send numerous high pressure waves downstream causing unstable flow conditions. The Mooney FlowMax regulator delivers high flow capacity with minimal pressure differential (2 psid - 4 psid) by design with a single top entry actuator. Our proprietary Flow Max Low Flow Range Extender (LFRX) improves the performance range of this regulator and allows it to deliver a smooth and accurate set point even when operating down to 1% of its top capacity.

## Capacity Comparison

Flowmax Regulator Size inches (mm)	Standard P/N	Standard Max Cg	Standard Min Cg
2 (50)	132-055-01	2250	225
3 (80)	133-043-01	4200	420
4 (100)	134-043-01	7500	750
6 (150)	136-043-01	14500	1450

Flowmax Regulator Size inches (mm)	LFRX Kit* P/N	LFRX Max Cg	LFRX Min Cg
2 (50)	132-053-01	1901	57
3 (80)	133-053-01	4074	122
4 (100)	134-053-01	6900	207
6 (150)	136-053-01	13630	408

\*LFRX is a full version kit that consists of a range extender, seat, O-rings, gasket and plug seal

# Flexflo\* Model 900TE

The Model 900TE (Top Entry) Flexflo Regulator is a self-contained, pilot-operated pressure regulator that may be used in both gas and liquid applications. The 900TE Flexflo Regulator features a simple, top-entry design for easy inline maintenance and incorporates a cast steel body with integral flanged end connections. Multiple trim configurations are available to match a variety of applications. The 900TE Flexflo Regulator typically is used with a Pilot for pressure control applications. The environmentally friendly design of the Flexflo Regulator eliminates all atmospheric emissions by maintaining all gas/liquids within the piping system.



## General Data Overview

<b>Sizes</b>	2" - 6" (50 - 150 mm)
<b>End Connections</b>	150, 300, 600 CL RF Flanged
<b>Working Temperature</b>	-20°F - 150°F (-29°C - 66°C)
<b>Min/Max Temperature</b>	-40°F - 175°F (-40°C - 79°C)
<b>Maximum Differential</b>	1200 psid*
<b>Maximum Inlet Pressure</b>	1480 psig*
<b>Outlet Pressure Range</b>	1480 psig*

\* Limited by Flexflo tube selection

\*\* Limited by Flexflo pilot selection

## Specification Overview

Size inches (mm)	End Connections	Face to Face inches (mm)	Valve Weight lbs. (kg)
2 (50)	150 CL RF FLG	10 (250)	40 (18)
	300 CL RF FLG	10.5 (267)	45 (20)
	600 CL RF FLG	11.25 (286)	49 (22)
3 (80)	150 CL RF FLG	11.75 (298)	96 (44)
	300 CL RF FLG	12.5 (318)	103 (47)
	600 CL RF FLG	13.25 (337)	119 (54)
4 (100)	150 CL RF FLG	13.98 (352)	124 (56)
	300 CL RF FLG	14.5 (368)	144 (65)
	600 CL RF FLG	15.5 (394)	164 (74)
6 (150)	150 CL RF FLG	17.75 (451)	294 (133)
	300 CL RF FLG	18.63 (473)	338 (153)
	600 CL RF FLG	20 (500)	373 (169)

## Flow Coefficient Data

Size inches (mm)	Max Cv (100% Core)	Qmax H2O (gpm)
2 (50)	58	300
3 (80)	94	660
4 (100)	128.5	1175
6 (150)	304	2644

## Standard Flexflo Tube Materials

REDQ Material (Code number)	814 (C)	846 (E)	878 (A)	893 (D)	888 (B)	725 (F)	745 (M) 744 (L) 740 (K)	644 (R)
Base Polymer	Nitrile	Nitrile	Hydrin	Hydrin	EPDM	Hydrin	HNBR	Nitrile
Nominal Durometer	65	75	65	55	70	40	65, 75, 85	75
Max. Differential (psid)	740	1200	740	285	740	60	745, 744, 740, 285, 740, 1200	1200
Temp. Range min/max °F	10/150	10/150	-20/150	-20/150	-40/120	-40/48	10-212	-40/150
Temp. Range min/max °C	-12/65	-12/65	-29/65	-40/65	-29/79	-40/48	-12/100	-40/65
Hydrocarbon								
Gaseous	OK	OK	OK	OK	NR	OK	OK	OK
Liquid	OK	OK	OK	OK	NY	OK	OK	OK
% Aromatic content Max	20	15	30	15	NR	20	40	NR
Max sulfur % wt	0.5	0.5	5	0.5	NR	5	5	NR
Fluid Compatibility								
Water	OK	OK	NR	NR	OK	NR	OK	OK
Nitrogen	OK	OK	OK	OK	OK	OK	OK	OK
Air	OK	OK	OK	120 °F max	OK	OK	OK	OK
Synthetic Lubes (Phosphate Esters)	NR	NR	NR	OK	NR	NR	OK	OK
Peroxides (Sour Gasoline)	NR	NR	NR	NR	NR	NR	OK	OK
Ketones/Amines	NR	NR	NR	NR	NR	NR	NR	NR
Max H2S in water % wt	0.5	0.5	NR	NR	Unlimited	NR	1.5	NR
Methyl. Ethyl Alcohols	NR	NR	NR	NR	OK	NR		NR
	Gen-Hydrocarbon Service, Water	Gen-Hydrocarbon Service, Water	Gen-Hydrocarbon Service	Gen-Hydrocarbon Service	Std. Water Ammonia, CO2 Service	Low ΔP Apps Only	White Petrol Products, Unleaded Gas w/Alcohols (MTBE) Crude Oil	Gen-Hydrocarbon Service, Water

### NOTES:

OK Indicates Material is Compatible with Corresponding Fluid.

NR Indicates Material Not Recommended for Specific Flexflo® Regulator Model.

Nitrile, Hydrin and HNBR are standard.

*Suggestion only: Customer must choose best tube for the application.*

# Pilots and Accessories

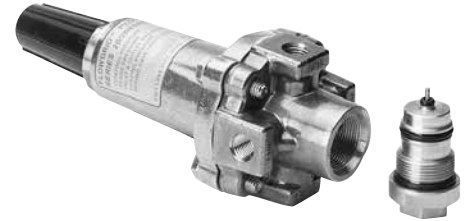
## Mooney Series 20\*, 20H, 20L

The Series 20\* Flowgrid\* pilot is a reversible pressure-control regulator designed primarily for use as a control pilot for pressure-reducing (PRV), backpressure (BPV or Relief), and differential-pressure (DPV) applications. The Series 20 pilot is designed for both gas and liquid applications.
















- Series 20 Brass construction with 3 to 450 psig control pressure range
- Series 20H High pressure brass construction with a 200 to 900 psig control pressure range
- Series 20S Stainless steel construction with a 3 to 450 psig control pressure range
- Series 20HS High pressure, stainless steel construction with a 200 to 900 psig control pressure range.
- Series 20L-B Bronze construction with 5 i.w.c. to 8 psig control pressure range
- Series 20L-A Aluminum construction with 5 i.w.c. to 8 psig control pressure range



Series 20L Pilot



Series 20 Pilot

	Spring Color	Series 20 Pilot	Outlet Pressure Range
		20L	5-15 i.w.c. (12 - 37 mbar)
		20L	10-40 i.w.c. (25 - 100 mbar)
		20L	1-3 psig (0.07 - 0.21 bar)
		20L	2-5 psig (0.14 - 0.34 bar)
		20L	4-8 psig (0.28 - 0.55 bar)
		20	3-12 psig (0.21 - 0.83 bar)
		20	10-40 psig (0.69 - 2.8 bar)
		20	25-90 psig (1.7 - 6.2 bar)
		20	60-200 psig (4.1 - 13.8 bar)
		20	100-260 psig (6.9 - 18 bar)
		20	200-450 psig (13.8 - 31 bar)
		20HP	200-520 psig (13.8 - 37 bar)
		20HP	400-900 psig (28 - 62 bar)

Pilot available in:  
 20L Aluminum & Bronze,  
 20 Brass and SST, 20H  
 Brass and SST

## Specifications

20 & 20H Pilot		
<b>Max Inlet Pressure</b>	1,500 psig (103 bar)	
<b>Max Loading Connection Pressure</b>	1,500 psig (103 bar)	
<b>Max Outlet Pressure</b>	1,500 psig (103 bar)	
<b>Set Pressure Range</b>		
Standard Pilot	3 – 450 psig (.21-31 bar)	
HP Pilot	200 -900 psig (13.79-62 bar)	
<b>Max Emergency Sensing Pressure</b>	1,000 psig (69 bar)	
<b>Max Spring Housing Pressure</b>	1,000 psig (69 bar)	
<b>Port Size</b>		
Standard	0.15 in. (3.8 mm)	
Large	0.17 in. (4.3 mm)	
<b>Working Temperature</b>	-20°F to 150°F (-29°C to 66°C)	
<b>Min/Max Temperature</b>	-40°F to 175°F (-40°C to 79°C)	
<b>Capacity</b>	<b>0.170 Orifice</b>	<b>0.150 Orifice</b>
Cg max	11.2	9.6
Cv max	0.29	0.25
C1	38	38

## Mooney Filters

### Type 30A and 30S

The Type 20A and 30S Mooney Filters are designed to limit dirt and other debris particulates from entering the pilot supply which could affect the function of the restrictor or variable orifice in the pilot. Both Filters can be used in a variety of gas and liquid applications.



## Mooney Restrictor

### Type 24\*, 24S and 25

The Mooney Restrictor is an integral part of the Mooney Regulator Pilot System. It is usually located in the pilot supply and affects the response rate, stability, and sensitivity of the regulator. The Restrictor is available in both steel and stainless steel construction with a stainless steel rotor. The Type 24, 24S and 25 Restrictors can be used in many liquid and gas applications.



## Mooney Inspirator

### Type 26\*

Use of the Type 26 Inspirator in place of a Mooney Restrictor maximizes flow through the regulator at times when the pressure differential across the valve falls below the published valve minimum differential pressure for full capacity.

The Type 26 Inspirator incorporates a special nozzle design that reduces the loading (spring case) pressure to a value below the outlet pressure, allowing the valve to fully open even when the pressure differential is very small. The Inspirator acts like a differential amplifier with a gain of approximately 3.



## Specifications

	Type 24 & 24S Restrictor		Type 30A and 30S Filter	Type 26 Inspirator
<b>Pressure Rating</b>	1,500 psig (103.4 bar)		1,500 psig (103.4 bar)	1,500 psig (103.4 bar)
<b>Working Temperature</b>	-20°F to 150°F (-29°C to 66°C)		-40°F to 175°F (-40°C to 79°C)	-20°F to 150°F (-29°C to 66°C)
<b>Flow Coefficient</b>	<b>Large</b>	<b>Std.</b>		
Cg min	1.60	.75		4.0
Cg max	7.3	5.8		
Cg			19	
C1			35	
Cv	0.18		.54	
<b>Filter Element</b>			10 Micron	
<b>Material</b>	Steel & Stainless Steel		Aluminum, Steel* & Stainless Steel	Steel

\*Discontinued

# Sizing

## Universal Gas Sizing Equation

$$Q = \sqrt{\frac{520}{G \cdot T}} \cdot C_g \cdot P_1 \cdot \text{SIN} \left[ \frac{3417}{C_1} \sqrt{\frac{\Delta P}{P_1}} \right] \text{ deg.}$$

$$C_g = \frac{Q}{P_1 \sqrt{\frac{520}{G \cdot T}} \cdot \text{SIN} \left[ \frac{3417}{C_1} \sqrt{\frac{\Delta - P_2}{P_1}} \right] \text{ deg.}}$$

↓ **Simplifies 1.29**      **Simplifies 1.00**  
 Natural Gas at 60° F & 0.6 Sg      Critical Flow

<b>Q</b>	Flow Rate (SCFH)
<b>Cg</b>	Gas Sizing Coefficient
<b>P<sub>1</sub></b>	Inlet Pressure (psia)
<b>ΔP</b>	Pressure Drop Across Valve ( ΔP = P <sub>1</sub> - P <sub>2</sub> ) (psid)
<b>P<sub>2</sub></b>	Outlet Pressure (psia)
<b>C1</b>	Valve Recovery Coefficient (C <sub>1</sub> = Cg/C <sub>v</sub> )
<b>Cv</b>	Liquid Sizing Coefficient
<b>G</b>	Specific Gravity (0.6 for Natural Gas) (1.0 for Air)
<b>T</b>	Gas Temperature (°Rankine) (T = 460 + °F)

## Simplified Gas Sizing Equation

If the following term  $(P_1 - P_2) / P_1$  equals .64 or greater, then sonic velocity is present in the valve and the simplified version of the gas-sizing equation may be used.

**Air:**  $Q = P_1 C_g$       **Natural Gas:**  $Q = P_1 C_g 1.29$

**NOTE:** Valve sizing and selection software is available for download at: [ge.com/energy](http://ge.com/energy)

## Liquid Sizing

$$Q = C_v F_p \sqrt{\frac{\Delta P_A}{G}}$$

<b>ΔP<sub>A</sub> or ΔP</b>	Allowable
<b>ΔP<sub>A</sub></b>	$P_1 - P_2$ or $.8 (P_1 - P_v)$ } whichever is less
<b>Q</b>	Flow gpm (gallons per minute)
<b>Cv</b>	Liquid Specific Gravity

<b>G</b>	Liquid Specific Gravity
<b>P<sub>1</sub></b>	Inlet Pressure (psia)
<b>P<sub>2</sub></b>	Outlet Pressure (psia)
<b>Pv</b>	Vapor Pressure (psia)
<b>F<sub>p</sub></b>	Piping Swage Factor

Use the minimum inlet and maximum flow conditions for a given application and solve the equation for Cg. For optimum performance, select a regulator to operate in the 10-80% range. A GE representative can help you select and size a Flowgrid regulator.

## Gas Velocity

To avoid generating additional noise in the outlet piping, it is recommended that the body outlet velocity be limited to approximately 0.5 of Mach. This equates to approximately 500 ft/sec for air and 700 ft/sec for natural gas. Swages (reducers) should be used to further reduce the outlet piping velocity to approximately 200 ft/sec or less to minimize pressure loss. The formulas for velocity and pipe size are as follows:

$$V = \frac{748 Q}{d^2 P_2}$$

<b>V</b>	Velocity in ft/sec
<b>d</b>	Internal pipe diameter in inches
<b>Q</b>	Flow in MSCFH
<b>P<sub>2</sub></b>	Outlet Pressure (psia)

**NOTE:** To avoid the possibility of excessive noise, vibration, and damage to the regulator and piping, the outlet velocity should not exceed 70% of sonic velocity.

**Air:** 770 ft/sec      **Natural Gas:** 1000 ft/sec



\*Denotes a trademark of the General Electric Company.

Other company names and product names used in this document are the registered trademarks or trademarks of their respective owners.

©2015 General Electric Company. All rights reserved.

GEA31375 (03/2015)