Technical Specifications
Rev. C - 07/2022

Dresser™ Regulators

CONTROLS SUPPLY CHAIN
VALVES ACTUATORS INSTRUMENTATIONS

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Dresser Flowgrid

Product Overview

Dresser **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 Dresser 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.

Controls Supply maintains strict quality and safety standards for the manufacturing of Dresser regulators, and has also secured the following verifications; ISO 9001, CRN, PED, along with others testifying to the safety and quality of the Dresser Flowgrid regulator.

General Data & Specifications

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

1. Unless limited by body rating.

Materials of Construction

Body	Steel, Stainless Steel, Ductile Iron
Body & Spring Case	ASTM A 216 GR WCB Carbon Steel
Throttle Plate	17 – 4PH Stainless Steel or A515 Carbon Steel with ENC Coating
Diaphragm	Nitrile/Nylon[1] Optional (Viton/Nylon)
O-Ring & Seals	Nitrile, Optional (Viton)
Bolting	ASTM A 193 GR B-7 or Equal
Spring	301 Stainless Steel

1. Refer to the diaphragm selection chart on page 12.

Specifications Overview

Single Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (barg)	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)
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 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 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)

Dual Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (barg)	Nominal Port Size inches (mm)	Face to Face inches (mm)	Valve Weight lbs (kg)
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)

Flangeless Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (barg)	Nominal Port Size inches (mm)	Face to Face inches (mm)	Valve Weight lbs (kg)
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)

Type-A Flangeless Port Designs

Nominal Size inches (mm)	Stock No.	End Connections	Max Pressure psig (barg)	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 Elster American Meter Axial Flow Valves.

Flow Coefficients & Constants

Single Port Designs

Size inches (mm)	End Connection	Port Size inches (mm)	Percent Capacity (%)	C_v	C_1	C_g	Swage Factor 1.5:1	Swage Factor 2:1
1 (25)	CL 600 NPT CL 600 SWE CL 150-600 FLG	1 (25)	100	13.2	34	450	0.96	0.93
			75	10.6	30	320	0.97	0.95
			50	8.9	27	240	0.98	0.96
			35	5.4	26	140	1.00	0.99
2 x 1 (50 x 25)	CL 150-600 FLG CL 600 NPT CL 600 SWE	1 (25)	100	13.4	37	500	0.96	0.93
			75	10.7	30	320	0.97	0.95
			50	9.1	27	245	0.98	0.96
			35	5.5	26	144	1.00	0.99
2 (50)	CL 150-600 FLG CL 600 NPT CL 600 SWE CL 600 BWE	2 LP (50)	100	40	35	1420	0.97	0.96
			75	34	33	1130	0.98	0.97
			50	27	30	820	0.99	0.98
			35	20	30	610	1.00	1.00
2 (50)	CL 150-600 FLG CL 600 NPT CL 600 SWE	3 (80)	–	–	–	–	–	–
			100	56	35	1970	0.96	0.93
			–	–	–	–	–	–
3 (80)	CL 150-600 FLG CL 150-600 BWE	3 (80)	100	96	36	3450	0.98	0.95
			75	81	34	2730	1.00	1.00
			50	68	32	2150	1.00	1.00
			35	49	31	1530	1.00	1.00
4 (100)	CL 150-600 FLG CL 150-600 BWE	4 (10)	100	172	38	6500	0.97	0.95
			75	142	37	5300	0.98	0.96
			50	100	35	3550	0.99	0.98
			35	76	35	2700	1.00	1.00
6 (150)	CL 150-600 FLG CL 150-600 BWE	6 (150)	100	313	40	12500	0.99	0.97
			75	300	30	9000	0.99	0.97
			50	240	28	6750	1.00	0.98
			35	146	28	4100	1.00	0.98
8 (200)	CL 150-600 FLG	8 (200)	100	530	38	20200	0.97	0.95
			75	515	30	15200	0.98	0.96
			50	350	29	10000	0.99	0.98
			35	250	28	7100	1.00	1.00

Flangeless Single Port Designs

Size inches (mm)	End Connections	Port Size inches (mm)	Percent Capacity (%)	C_v	C_1	C_g	Swage Factor 1.5:1	Swage Factor 2:1
2 (50)	CL 150-600 Flangeless	2 LP (50)	100	40	35	1400	–	–
			75	33	33	1083	–	–
			50	27	30	824	–	–
			35	20	30	590	–	–
4 x 3 (100 x 80)	CL 150-300 Flangeless	3 (80)	100	95	36	3400	0.99	0.98
			75	79	34	2690	1.00	0.99
			50	62	32	1980	1.00	1.00
			35	48	31	1515	1.00	1.00
6 x 4 (150 x 100)	CL 150-300 Flangeless	4 (100)	100	172	37	6400	0.97	0.95
			75	142	32	4500	0.98	0.96
			50	100	30	3000	1.00	0.98
			35	76	30	2250	1.00	1.00
2 Type-A[1] (50)	CL 150-600 Flangeless	2 LP (50)	100	40	35	1400	0.98	0.96
			75	33	33	1083	0.98	0.97
			50	27	30	824	0.99	0.98
			35	20	30	590	1.00	1.00
3 x 3 Type-A (80 x 80)	CL 150-300 Flangeless	3 (80)	100	92	35	3240	0.98	0.96
			75	80	33	2650	0.98	0.97
			50	68	32	2150	0.99	0.98
			35	49	31	1530	1.00	1.00
4 x 4 Type-A (100 x 100)	CL 150-300 Flangeless	4 (100)	100	168	35	5800	0.98	0.96
			75	135	37	5000	0.98	0.97
			50	100	35	3550	0.99	0.98
			35	76	35	2700	1.00	1.00

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

Dual Port Designs

Size inches (mm)	End Connections	Port Size inches (mm)	Percent Capacity (%)	C_v	C_1	C_g	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

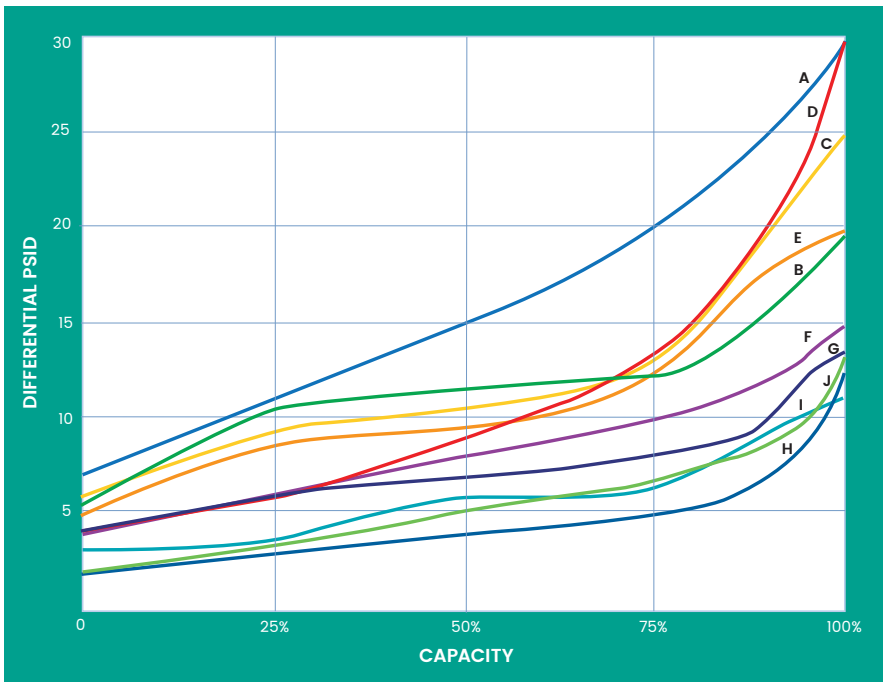
Performance with Series 20L and Series 20 Pilot

Mooney Series 20L Pilot		Pressure Reducing Mode Restrictor Set at 4		
Pilot Spring	**Range**	**Lockup**	**Droop Max Capacity[1]**	**Boost @ Constant Flow[2]**
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 Max Capacity[1]**	**Boost @ Constant Flow[2]**	**Build up Max Capacity**	**Lockup**
Red	3-12 psig	1.0 psig	.30	.70 psig	Note 4	Note 4
Silver	10-40 psig	1.0 psig	.30	.70 psig	+.50 psig	-1.0 psig
Blue	25-90 psig	2.0 psig	.60	.70 psig	+.50 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[3]	-3.0 psig
HP Green	400-900 psig	20.0 psig	8.00	1.50 psig	+12.0 psig[3]	-5.0 psig

1. Inlet pressure (P_1) constant 2. Per 100 psi decrease in inlet pressure (P_1) 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.

Dresser Flowgrid Noise Controller (FG-NC)

Product Overview

The FG-NC is a noise reducing device designed for use with the Dresser 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 Dresser Flowgrid regulator and can either be factory installed or ordered as a retrofit kit.

General Data

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

1. May be limited by body rating.

Materials of Construction

Housing	Steel
Plates	Stainless Steel
Plate Screws	Stainless Steel
Seals	Nitrile
Housing Studs	ANSI B7

Flow Coefficients & Constants

Flowgrid with 100% Throttle Plate and FG-NC		C_v	C_1	C_g
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	12000
12	300	593	36	21340

Dresser Flowgrid Slam Shut

Product Overview

The Dresser 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 shut offs”. Positive shut off is achieved instantly through the snap acting mechanism, and reset can be completed with common tools.

General Data

Sizes	1” and 2” NPT and SWE, 1”- 6” (25-150 mm) RF Flanged
Types	Stand alone or integrated into Flowgrid regulator
Body Styles	Large Port, Single Port
Pressure Protection	Standard: Over Pressure Optional: Over and/or Under
Working Temperature	-20°F to 150°F (-29°C to 66°C)
Maximum Operating Inlet Pressure	1480 psig (102 barg)
Operating Sense Pressure 1-3 inch **2-3 inch** **4-6 inch**	5 to 450 psig (0 .35 to 31 barg) 10 to 900 psig (0 .69 to 62 barg) 10 to 740 psig (0.69 to 51 barg)
Flow Direction	Unidirectional
Taps	Four ¼” – 18 NPT
Response Time	<0 .25 Seconds
Main Shut-off Valve	WCB Carbon Steel
Flapper and Shaft	17-4 Ph Stainless Steel, A515 Carbon Steel w/ ENC Coating
Controller Housing	Aluminum
O-Ring and Seals	Nitrile
Bushings	Bronze

1. May be limited by body rating.

Specifications 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)
1 (25)	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)	-

With Series 50/51 (Single Function), Series 50D/51D (Dual Function), or Series 50DS/51DS (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)
2 (50)	CL 300 NPT	2 LP (50)	SG-27	SA-27	SR-27	8.25 (203)	58 (26)
	CL 300 SWE		SG-28	SA-28	SR-28	8.25 (203)	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 (267)	73 (33)
	CL 600 FLG		SG-31	SA-31	SR-31	11.25 (287)	82 (37)
	CL 300 BWE		SG-77	SA-77	SR-77	11.25 (287)	64 (30)
3 (80)	CL 150 FLG	3 (80)	SG-16	SA-16	SR-16	11.75 (299)	136 (62)
	CL 300 FLG		SG-17	SA-17	SR-17	12.50 (318)	147 (67)
	CL 600 FLG		SG-18	SA-18	SR-18	13.25 (337)	154 (70)
	CL 300 BWE		SG-61	SA-61	SR-61	13.25 (337)	124 (56)
4 (100)	CL 150 FLG	4 (100)	SG-39	SA-39	SR-39	13.88 (353)	197 (90)
	CL 300 FLG		SG-40	SA-40	SR-40	14.50 (368)	210 (95)
	CL 300 BWE		SG-63	SA-63	SR-63	15.50 (394)	190 (86)
6 (150)	CL 150 FLG	6 (150)	SG-44	SA-44	SR-44	17.75 (451)	498 (226)
	CL 300 FLG		SG-45	SA-45	SR-45	18.65 (474)	498 (226)
	CL 300 BWE		SG-65	SA-65	SR-65	20.00 (508)	481 (218)

Flow Coefficients & Constants – Flowgrid with Slam Shut

Size inches (mm)	End Connection	Port Size inches (mm)	Percent Capacity (%)	C_v	C_1	C_g	Swage Factor 1.5:1	Swage Factor 2:1
1 (25)	CL 300 NPT & SWE CL 150 FLG CL300 FLG CL 600 FLG	1 (25)	100	10.8	38	410	0.96	0.93
			75	8.0	35	280	0.97	0.95
			50	6.7	30	200	0.98	0.96
			35	3 .3	30	100	1.00	0.99
2 (50)	CL 300 NPT & SWE CL 150 FLG CL300 FLG CL 600 FLG	2 LP (50)	100	40	35	1420	0.97	0.96
			75	34	33	1130	0.98	0.97
			50	27	30	820	0.99	0.98
			35	20	30	610	1.00	1.00
3 (80)	CL 150 FLG CL 300 FLG CL 600 FLG CL 150 & 300 BWE	3 (80)	100	96	36	3450	0.98	0.95
			75	81	34	2730	1.00	1.00
			50	68	32	2150	1.00	1.00
4 (100)	CL 150 FLG CL 300 FLG CL 150 & 300 BWE	4 (100)	100	172	38	6500	0.97	0.95
			75	142	37	5300	0.98	0.96
			50	100	35	3550	0.99	0.98
			35	76	35	2700	1.00	1 .00
6 (150)	CL 150 FLG CL 300 FLG CL 150 & 300 BWE	6 (150)	100	313	40	12500	0.99	0.97
			75	300	30	9000	0.99	0.97
			50	240	28	6750	1.00	0.98
			35	146	28	4100	1.00	0.98

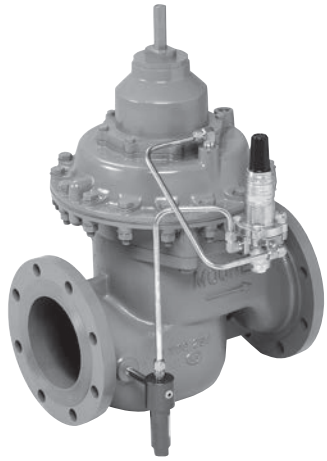
Diaphragm Selection

Compound	Temp. Range (°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.

Dresser FlowMax



The Dresser **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 Dresser 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 & Specifications

Sizes	2" – 6" (50–150 mm)
Body Style	Single Port
End Connections	NPT, RF Flanged, FF Flanged
Working Temperature	-20°F – 150°F (-29°C – 66°C)
Min/Max Temperature	-40°F – 175°F (-40°C – 79°C)
Max. Operating Differential	250 psi (17 bar)
Max. Casting Pressure	250 psi (17 bar)
Min. Differential	3–4 psid (0.21 bard)
Max. Inlet Pressure	250 psig (17 barg)
Outlet Pressure Range	
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)
Pilot Supply Body Tap	One ¼" – 18 NPT
Sense Line Tap	One ½" – 14 NPT

1. Limited by pilot or flange rating.

Materials of Construction

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

Specifications Overview

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

Flow Coefficients & Constants

Size inches (mm)	End Connections	Percent Capacity (%)	C_v	C_1	C_g
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

Dresser 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 Dresser 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 (LRFX) 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 C_g	Standard Min C_g
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[1] P/N	LFRX Max C_g	LFRX Min C_g
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

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

Dresser FlowMax HP

The Dresser FlowMax HP regulator is a high-pressure reducing regulator that offers a full Class 600 pressure rating, bubble tight shut-off at all pressure differentials and full capacity at differential pressures as low as 12 psi (0.83 bar). This innovative design complements the Dresser Flowgrid regulator and FlowMax regulators. The FlowMax HP regulator maximizes capacity, speed of response, providing accuracy up to 1%[1] and incorporating many of the same original maintenance and performance features for which the Flowgrid regulator is renowned.

Noise Control Options

Where a regulator application is controlling a high-pressure differential or high mass flow rate, noise may be a concern. In some cases, resulting noise generated may be high enough to require control. The Dresser FlowMax HP has a Lo-dB noise reduction option that can be specified to provide noise attenuation of up to 20 dBA. The noise-reduction trim can fit into the standard FlowMax HP without other modifications to allow field retrofit where required.

Overpressure Protection

The Dresser FlowMax HP regulator has a full rating of 1480 psig (102 barg), for the CL600 version, on both the inlet and outlet connections as well as the actuator housing assembly. Overpressure protection is only required if the pressure can exceed the flange or body rating. Anytime the FlowMax HP regulator or pilot system is exposed to pressures in excess of its rating, it should be inspected for damage.

1. Accuracy is rated in accordance with EN 334 requirements.

General Data & Specifications

Body Size	2" (DN 50)	3" (DN 80)	4" (DN 100)	6" (DN 150)
End Connection	CL 300 RF CL 600 RF	CL 300 RF CL 600 RF	CL 300 RF CL 600 RF	CL 300 RF CL 600 RF
Body Material	Steel	Steel	Steel	Steel
Maximum Inlet Pressure[1]				
CL 300 RF[1] CL 600 RF[1]	740 psig (51 barg) 1480 psig (102 barg)	740 psig (51 barg) 1480 psig (102 barg)	740 psig (51 barg) 1480 psig (102 barg)	740 psig (51 barg) 1480 psig (102 barg)
Maximum Outlet Pressure[1,2]				
Maximum Outlet Pressure[1,2] Maximum Operating Differential[1] Minimum Differential (fully open)	1480 psi (102 bar) 1480 psi (102 bar) 12 psi (0.83 bar)	1480 psi (102 bar) 1480 psi (102 bar) 12 psi (0.83 bar)	1480 psi (102 bar) 1480 psi (102 bar) 12 psi (0.83 bar)	1480 psi (102 bar) 1480 psi (102 bar) 12 psi (0.83 bar)
Maximum Casing Pressure				
CL 300 RF[1] CL 600 RF[1]	740 psig (51 barg) 1480 psig (102 barg)	740 psig (51 barg) 1480 psig (102 barg)	740 psig (51 barg) 1480 psig (102 barg)	740 psig (51 barg) 1480 psig (102 barg)
Outlet Pressure Range				
Series 22 Pilot	3-900 psig (0.21-62 barg)	3-900 psig (0.21-62 barg)	3-900 psig (0.21-62 barg)	3-900 psig (0.21-62 barg)
Maximum Operating Differential Pressure				
Main Valve Series 22 Pilot	1480 psid (102 bard) 1000 psid (69 bard) between loading pressure in pilot and sense pressure			
Temperature				
Operating Temperature Emergency Temperature	-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) -40°F to 175°F (-40°C to 79°C)	-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) -40°F to 175°F (-40°C to 79°C)

1. Do not exceed the pressure and temperature limits for the pressure class and body material as defined in ASME B16.34.

Materials of Construction

Part Name	Material
Body	ASTM A216 GR WCC/WCB
Seat Ring	ASTM A479, Type 316
Cage	ASTM A487 GR CA6NM, Chrome Plated
Plug	ASTM A564, Type 630, Condition H1075 (17-4PH)
Seat Insert, Soft Seat	Nitrile
Plug Skirt	ASTM A479, Type 316
Stem	ASTM A564, Type 630, Condition H1075 (17-4PH)
Housing Adapter	ASTM A216 GR WCC/WCB or ASTM A105
Lower Diaphragm Housing	ASTM A216 GR WCC/WCB or ASTM A105
Upper Diaphragm Housing,	ASTM A216 GR WCC/WCB or ASTM A105
Stem Seal Housing	ASTM A479, Type 316
Lower Diaphragm Support Plate	Anodized Aluminum ASTM B211 Alloy 6061-T6
Upper Diaphragm Support Plate	Anodized Aluminum ASTM B211 Alloy 6061-T6
Diaphragm	Nitrile with Nylon Fabric
Spring	ASTM A228, EN 10270-1-SH
Plug Seal	Nitrile Seal with Filled PTFE Backing Rings
Stem Seal	Nitrile Seal with Filled PTFE Backing Rings
Stem Glydring	Filled PTFE
Seal Housing Cover	ASTM A479, Type 316
Diaphragm Washer	ASTM A564, Type 630, Condition H1075 (17-4PH)
Spring Guide	ASTM A564, Type 630, Condition H1075 (17-4PH)
Body & Housing Bolts	ASTM A193 GR B7 Zinc Plated
Seal Housing Bolts	18-8 SST
Stem Nut	18-8 SST
Seat & Body Gasket	316L SST Spiral Wound Gasket with Graphite Filler
O-rings	Nitrile
X-ring	Nitrile

Specifications Overview

Size inches (mm)	End Connections	Orifice Size inches (mm)	Stock No.	Stock No. w/Indicator	Max Pressure psig (barg)	Min Differential psig (barg)	Face to Face inches (mm)	Valve Weight lbs. (kg)
2 (50)	CL 300 RFF	2 (50)	FM-14	FM-14T	740 (51)	12 (.83)	10.50 (267)	160 (73)
	CL 600 RFF		FM-18	FM-18T	1480 (102)	12 (.83)	11.25 (286)	163 (74)
3 (80)	CL 300 RFF	3 (80)	FM-15	FM-15T	740 (51)	12 (.83)	12.50 (317)	302 (136)
	CL 600 RFF		FM-19	FM-19T	1480 (102)	12 (.83)	13.25 (337)	308 (140)
4 (100)	CL 300 RFF	4 (100)	FM-16	FM-16T	740 (51)	12 (.83)	14.50 (368)	448 (203)
	CL 600 RFF		FM-20	FM-20T	1480 (102)	12 (.83)	15.50 (394)	469 (213)
6 (150)	CL 300 RFF	6 (150)	FM-17	FM-17T	740 (51)	12 (.83)	18.62 (473)	654 (297)
	CL 600 RFF		FM-21	FM-21T	1480 (102)	12 (.83)	20.00 (508)	705 (320)

Flow Coefficients & Constants

100% Capacity	2 (50)	3 (80)	4 (100)	6 (150)
C_g	2380	4970	7880	13720
C_1	34	36	36	36
C_v	70	138	219	381

Flexflo Model 900TE

The **Flexflo™ Model 900TE Regulator**is a self-contained, pilot-operated pressure regulator that may be used in both gas and liquid applications. The Model 900TE 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 Model 900TE Flexflo 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

Sizes	2" - 6" (50 - 150 mm)
End Connections	150, 300, 600 CL RF Flanged
Working Temperature	-20°F - 150°F (-29°C - 66°C)
Min/Max Temperature	-40°F - 175°F (-40°C - 79°C)
Maximum Differential	1200 psid[1]
Maximum Inlet Pressure	1480 psig[1]
Outlet Pressure Range	1480 psig[2]

1. Limited by Flexflo tube selection.
2. Limited by Flexflo pilot selection.

Specifications 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 C_v (100% Core)	Q_{max} H_2O (gpm)
2 (50)	58	300
3 (80)	94	660
4 (100)	128.5	1175
6 (150)	304	2644

Standard Flexflo Tube Materials

Material (Code number)	814 (C)	846 (E)	878 (A)	893 (D)	888 (B)	725 (F)	744 (L) 740 (K)	644 (R)
Base Polymer	Nitrile	Nitrile	ECH	ECH	EPDM	ECH	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	-40/120	10/212	-40/150
Temp. Range min/max °C	-12/65	-12/65	-29/65	-40/65	-29/48	-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 H_2S 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-Hydro-carbon Service, Water	Gen-Hydro-carbon Service, Water	Gen-Hydro-Carbon Service	Gen-Hydro-carbon Service	Std. Water Ammonia, CO_2 Service	Low ΔP Apps Only	White Petrol Products, Unleaded Gas w/ Alcohols (MTBE) Crude Oil	Gen-Hydro-carbon Service, Water

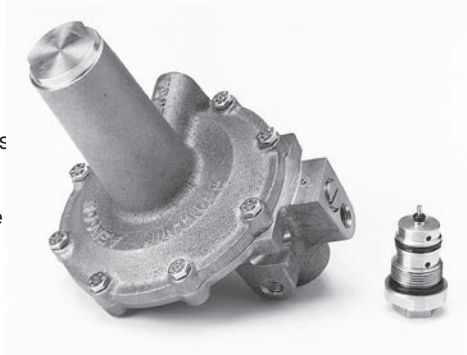
Notes:
- OK indicates material is compatible with corresponding fluid
- NR indicates material Not Recommended for specific Flexflo regulator model
- Nitrile and HNBR are standard
- *Suggestion only. Customer must choose best tube for the application*

Pilots and Accessories

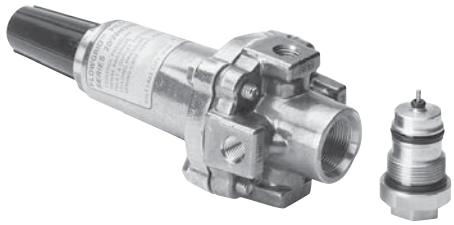
Dresser Series 20, 20H, 20L

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
	White	20L	5-15 i.w.c. (12 - 37 mbar)
	Brown	20L	10-40 i.w.c. (25 - 100 mbar)
	Yellow	20L	1-3 psig (0.07 - 0.21 barg)
	Orange	20L	2-5 psig (0.14 - 0.34 barg)
	Gray	20L	4-8 psig (0.28 - 0.55 barg)
	Red	20	3-12 psig (0.21 - 0.83 barg)
	Silver	20	10-40 psig (0.69 - 2.8 barg)
	Blue	20	25-90 psig (1.7 - 6.2 barg)
	Purple	20	60-200 psig (4.1 - 13.8 barg)
	Black	20	100-260 psig (6.9 - 18 barg)
	White/Green	20	200-450 psig (13.8 - 31 barg)
	Black	20HP	200-520 psig (13.8 - 37 barg)
	White/Green	20HP	400-900 psig (28 - 62 barg)

Note:

Pilots are available in

- 20L: Alumninium & Bronze
- 20 & 20H: Brass & Stainless Steel

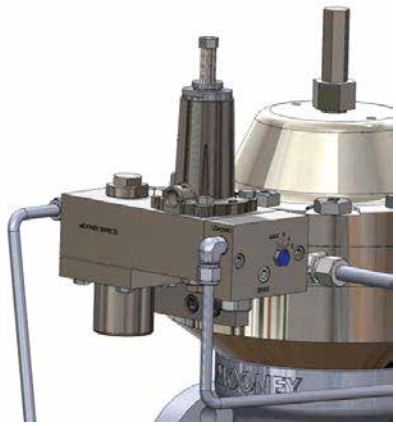
Specifications

Series 20 & 20H Pilot		
Max Inlet Pressure	1500 psig (103 barg)	
Max Loading Connection Pressure	1500 psig (103 barg)	
Max Outlet Pressure	1500 psig (103 barg)	
Set Pressure Range		
Standard Pilot	3 – 450 psig (.21-31 barg)	
HP Pilot	200 – 900 psig (13.79 – 62 barg)	
Max Emergency Sensing Pressure	1000 psig (69 barg)	
Max Spring Housing Pressure	1000 psig (69 barg)	
Port Size		
Standard	0.15 in. (3.8 mm)	
Large	0.17 in. (4.3 mm)	
Working Temperature	-20°F to 150°F (-29°C to 66°C)	
Min/Max Temperature	-40°F to 175°F (-40°C to 79°C)	
Capacity	**0.170 Orifice**	**0.150 Orifice**
C_g max	11.2	9.6
C_v max	0.29	0.25
C_1	38	38

Dresser Series 22, 22H

The Dresser Series 22 Pilot is a stainless steel, modular design which provides multiple regulating systems; pressure relieving, back pressure, standby monitor, and working monitor mode for the Flowmax HP. The Series 22 Pilot must be paired with the Type 27 variable restrictor which provides adjustable system gain, stability, and response. The Type 27 variable restrictor features a built-in check valve to prevent damage to diaphragm if the regulator sees high back pressure.

	Spring Color	Series 22 pilot	Outlet Pressure Range
	Red	22	3-12 psig (0.21 - 0 .83 barg)
	Silver	22	10-40 psig (0.69 - 2 .8 barg)
	Blue	22	25-90 psig (1 .7 - 6 .2 barg)
	Purple	22	60-200 psig (4.1 - 13 .8 barg)
	Black	22	100-260 psig (6.9 - 18 barg)
	White/Green	22	200-450 psig (13.8 - 31 barg)
	Black	22H	200-520 psig (13.8 - 37 barg)
	White/Green	22H	400-900 psig (28 - 62 barg)



Specifications

Series 22 & 22H Pilot	
Max Inlet Pressure	1480 psig (102 barg)
Max Loading Connection Pressure	1480 psig (102 barg)
Max Outlet Pressure	1480 psig (102 barg)
Set Pressure Range	
Standard Pilot	3 – 450 psig (.21 - 31 barg)
HP Pilot	200 - 900 psig (13 .79 - 62 barg)
Max Sensing Pressure	1000 psig (69 barg)
Max Spring Housing Pressure	1000 psig (69 barg)
Port Size	
Standard	0.15 in. (3.8 mm)
Large	0.17 in. (4.3 mm)
Working Temperature	-20°F to 150°F (-29°C to 66°C)
Min/Max Temperature	-40°F to 175°F (-40°C to 79°C)

Series 22 Pilot Stock Numbers

Series 22 Pilot	Pressure Reducing		
	Orifice Size		
Spring Range (psig/barg) & Color	0.150	0.170	.150 Delrin
3-12 (0.2-0.8) Red	FP-248	FP-264	FP-280
10-40 (0.7-2.7) Plated	FP-249	FP-265	FP-281
25-90 (1.7-4.1) Blue	FP-250	FP-266	FP-282
60-200 (4.1-13.8) Purple	FP-251	FP-267	FP-283
100-260 (6.9-17.9) Black	FP-252	FP-268	FP-284
200-450 (13.8-31.0) White/Green	FP-253	FP-269	FP-285

Note: The letter "V" may be appended to any figure number to designate FKM soft goods (e.g. FP-248V).

Series 22H Pilot Stock Numbers

Series 22H Pilot	Pressure Reducing		
	Orifice Size		
Spring Range (psig/barg) & Color	0.150	0.170	.150 Delrin
200-520 (13.8-35.8) Black	FP-254	FP-270	FP-286
400-900 (27.6-62.0) White/Green	FP-255	FP-271	FP-287

Note: The letter "V" may be appended to any figure number to designate FKM soft goods (e.g. FP-254V).

Series 22 Monitor Stock Numbers

Series 22 Monitor	Pressure Reducing		
	Orifice Size		
Spring Range (psig/barg) & Color	0.150	0.170	.150 Delrin
3-12 (0.2-0.8) Red	FP-348	FP-364	FP-380
10-40 (0.7-2.7) Plated	FP-349	FP-365	FP-381
25-90 (1.7-6.2) Blue	FP-350	FP-366	FP-382
60-200 (4.1-13.8) Purple	FP-351	FP-367	FP-383
100-260 (6.9-17.9) Black	FP-352	FP-368	FP-384
200-450 (13.8-31.0) White/Green	FP-353	FP-369	FP-385

Note: The letter "V" may be appended to any figure number to designate FKM soft goods (e.g. FP-348V).

Series 22H Monitor Stock Numbers

Series 22H Monitor	Pressure Reducing		
	Orifice Size		
Spring Range (psig/barg) & Color	0.150	0.170	.150 Delrin
200-520 (13.8-35.8) Black	FP-354	FP-370	FP-386
400-900 (27.6-62.0) White/Green	FP-355	FP-371	FP-387

Note: The letter "V" may be appended to any figure number to designate FKM soft goods (e.g. FP-354V).

Dresser Filters

Type 30A and 30S

The Type 30A and 30S Dresser 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.

Dresser Restrictor

Type 24, 24S and 27

The Dresser Restrictor is an integral part of the Dresser 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 27 Restrictors can be used in many liquid and gas applications.

Dresser Inspirator

Type 26

Use of the Type 26 Inspirator in place of a Dresser 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
Pressure Rating	1,500 psig (103.4 barg)		1,500 psig (103.4 barg)	1,500 psig (103.4 barg)
Working Temperature	-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)
Flow Coefficient	**Large**	**Std.**		
C_g min	1.60	.75		4.0
C_g max	7.3	5.8		
C_g			19	
C_1			35	
C_v	.18		.54	
Filter Element			10 Micron	
Material	Steel & Stainless Steel		Aluminum, Stainless Steel	Steel

Sizing

Universal Gas Sizing Equation

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

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

Simplifies 1.29

Natural Gas at 60° F & 0.6 Sg

Simplifies 1.00

Critical Flow

Q	Flow Rate (SCFH)
C_g	Gas Sizing Coefficient
P_1	Inlet Pressure (psia)
ΔP	Pressure Drop Across Valve ($\Delta P = P_1 - P_2$) (psid)
P_2	Outlet Pressure (psia)
C_1	Valve Recovery Coefficient ($C_1 = C_g/C_v$)
C_v	Liquid Sizing Coefficient
G	Specific Gravity (0.6 for Natural Gas) (1.0 for Air)
T	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:** $Q = P_1 C_g 1.29$

Liquid Sizing

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

ΔP_A or ΔP	Allowable or Actual pressure differential, whichever is less.
ΔP_A	$P_1 - P_2$ or $.8 (P_1 - P_v)$ whichever is less
Q	Flow gpm (gallons per minute)
C_v	Liquid Specific Gravity

G	Liquid Specific Gravity
P_1	Inlet Pressure (psia)
P_2	Outlet Pressure (psia)
P_v	Vapor Pressure (psia)
F_P	Piping Swage Factor

Use the minimum inlet and maximum flow conditions for a given application and solve the equation for C_g. For optimum performance, select a regulator to operate in the 10-80% range. A Controls Supply 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:

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

V	Velocity in ft/sec
d	Internal pipe diameter in inches
Q	Flow in MSCFH
P_2	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

Notes:

Notes:

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