

Application

The Zurn Wilkins Model ZW209FP Pilot Operated Pressure Reducing Valve is designed specifically for Fire Suppression Systems to reduce high inlet pressures to a safe and stable outlet pressure. The pilot assembly reacts to changes in downstream pressure allowing the main valve to modulate between the closed and open position ensuring a constant downstream set pressure. Once the downstream pressure reaches the pilot setting, the main valve will seal shut preventing damage downstream. Pressure regulation is not dependent upon flow rate, resulting in minimal pressure loss through the valve. In addition the Model ZW209FP comes standard with red epoxy coating internally and externally for corrosion protection, as well as isolation valves and pressure gauges for quick and easy maintenance or repair. The Zurn Wilkins Model ZW209FP is available in both globe and angle pattern bodies.

Approvals

- UL and C-UL Listed (1-1/4" thru 10")



Materials

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	Ductile Iron ASTM A536
Disc Guide	Stainless Steel
Seat	Stainless Steel
Disc	Buna-N Rubber
Diaphragm	Nylon Reinforced Buna-N
Stem	Stainless Steel
Spring	Stainless Steel

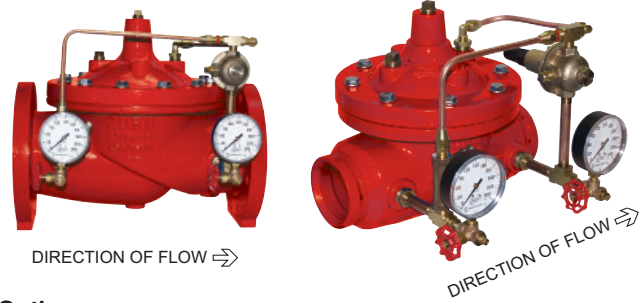
Standard Features

- "Wye" Type Strainer
- Inlet and Outlet Pressure Gauges (UL/FM)
- 3-Way Gauge Isolation Valves
- Red Epoxy Coated, FDA Approved
- Copper Tubing and Brass Fittings

Sizes

Globe and Angle Style Body:	
Flanged ends	<input type="checkbox"/> 1 1/2" thru 10"
Grooved ends	<input type="checkbox"/> 1 1/2" thru 10"
Threaded ends	<input type="checkbox"/> 1 1/4" thru 3"
Temperature Rating:	<input type="checkbox"/> Water 33°F to 140°F
Pilot Spring Range:	<input type="checkbox"/> 50-165 psi Residual Pressure (155 psi Max 10")

Refer to www.zurn.com for updated information.



Options

(Add suffix letters to ZW209FP)

Function

- C - 40XL Hydraulic Check

Body

- A - Angle Style Body

Connections

- G - Grooved Ends (inlet rating 300 psi)
- TH - NPT threaded (inlet rating 300 psi)
- Y - ANSI Class 300 Flanged (inlet rating 300 psi)
- X - ANSI Class 150 Flanged (inlet rating 250 psi)

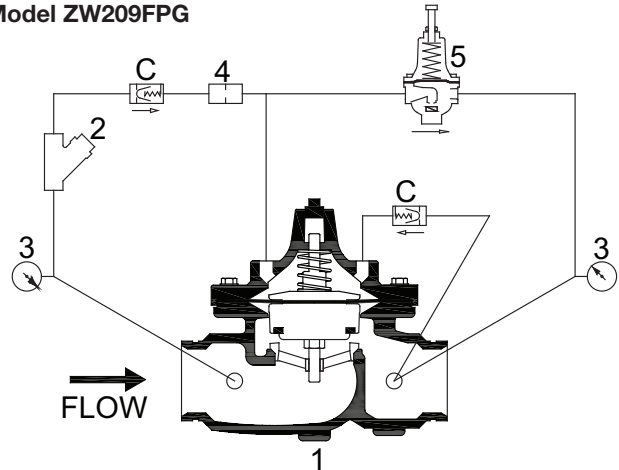
Pilot System

- RV - Pilot on Reverse Side

Schematic Diagram

Item	Description of Standard Features
1	Main Valve
2	SXL "Wye" Type Strainer
3	Pressure Gauge
4	Restriction Fitting
5	PV-PRD Pressure Reducing Control
C	40XL Hydraulic Check

Model ZW209FPG

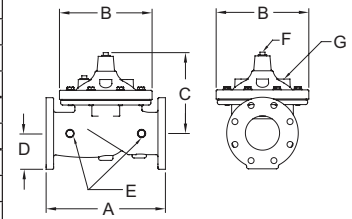


Standards And Pressure Ratings

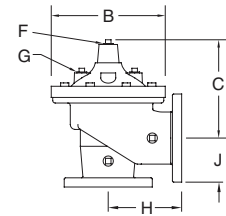
	Standards Compliance	UL Pressure Ratings
Main Body	ANSI/AWWA C530	
Flanged	CLASS 150 - ANSI B16.42	250 psi
	CLASS 300 - ANSI B16.42	300 psi
Grooved	IPS - AWWA C606	300 psi
Threaded	NPT - ANSI B1.20.1	300 psi

Globe and Angle Main Valve Dimensions

DIM	FULL PORT	VALVE SIZE INCHES (mm)								
		1 1/4 (32)	1 1/2 (38)	2 (50)	2 1/2 (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)
A	Threaded	7 1/4	7 1/4	9 7/16						
	Class 150 Flange		8 1/2	9 3/8	11	12	15	20	25 3/8	29 3/4
	Class 300 Flange		9	10	11 5/8	13 1/4	15 5/8	21	26 7/16	31 1/8
	Grooved		8 1/2	9	11	12 1/2	15	20	25 3/8	29 3/4
B	Diameter	5 5/8	5 5/8	6 3/4	8	9 3/16	11 11/16	15 3/4	20 1/8	23 11/16
C	Max.	5 3/4	5 3/4	6 3/16	7 3/8	8	10 3/16	12 5/16	15 9/16	17 5/8
D	Threaded/Grooved	1 3/8	1 3/8	1 3/4	2 1/8	2 9/16	3 7/16	5	5	5 13/16
	Class 150 Flange		2 1/2	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4	8
	Class 300 Flange		3	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2	8 3/4
E	NPT Body Tap	3/8	3/8	3/8	1/2	1/2	3/4	3/4	1	1
F	NPT Cvr. Plug Tap	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1	1
G	NPT Cover Tap	3/8	3/8	3/8	1/2	1/2	3/4	3/4	1	1
H	Threaded	3 1/4	3 1/4	4 3/4	5 1/2	6 1/4				
	Class 150 Flange		4	4 3/4	5 1/2	6	7 1/2	10	12 3/4	15
	Class 300 Flange		4 1/4	5	6	6 7/16	8	10 1/2	13 1/4	15 9/16
	Grooved		4 7/16	4 3/4	5 1/2	6	7 1/2	10	12 3/4	15
J	Threaded	2	2	3 1/4	4	4 1/2				
	Class 150 Flange		4	3 1/4	4	4	5	6	8	8 5/8
	Class 300 Flange		4 1/4	3 1/2	4 5/16	4 7/16	5 1/3	6 1/2	8 1/2	9 5/16
	Grooved		3 3/16	3 1/4	4	4 1/4	5	6	8	8 5/8
Valve Stem Internal Thread		10-32	10-32	10-32	10-32	1/4-20	1/4-20	1/4-20	3/8-16	3/8-16
Stem Travel (in)		7/16	7/16	3/4	7/8	1	1 3/16	1 3/4	2 3/8	2 13/16
Approx. Wt. (lbs)		22	26	36	55	70	130	240	440	720



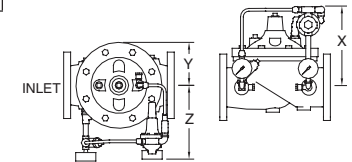
Globe Style Body



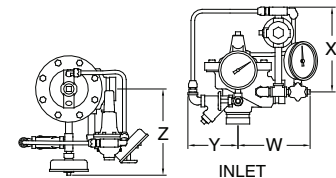
Angle Style Body

Pilot System Dimensions

PILOT SYSTEM DIMENSIONS			VALVE SIZE INCHES (mm)								
	DIM		1-1/4 (32)	1-1/2 (40)	2" (50)	2-1/2" (65)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)
Full Port Body	X Max. (inches)		8 1/2	8 1/2	8 1/2	8 1/2	9 1/2	12	13	14	15 3/4
	Y Max. (inches)		4	4	3 1/2	4	4 1/2	6	8	10	12
	Z Max. (inches)		8 1/2	8 1/2	9	9	9 1/2	10	11 1/2	13	14 1/2
Angle Body	W Max. (inches)		7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10	13	15
	X Max. (inches)		8 1/2	8 1/2	8 1/2	8 1/2	9 1/2	12	13	14	17 1/2
	Y Max. (inches)		5	5	5	5	5	5 13/16	7 7/8	10	12
	Z Max. (inches)		9	9	9 1/2	9 1/2	10	10 1/2	12	13 1/2	15

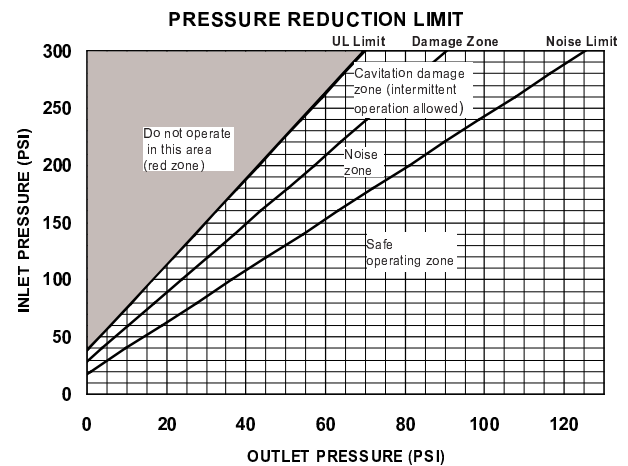
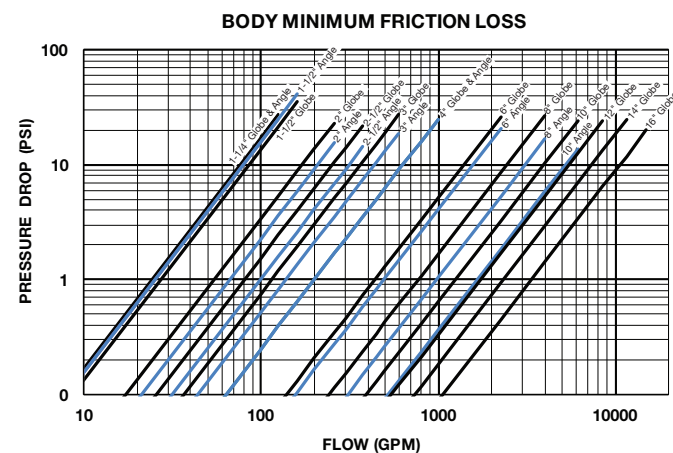


Globe Pilot System Dimensions



Angle Pilot System Dimensions

Flow Characteristics



See Instruction Sheet at www.zurn.com for more setting information.

* Notes for Body Minimum Friction Loss Chart:

Minimum inlet pressure is 10 psi higher than set point or the additional body friction loss at intended flow, whichever is higher. (friction loss may be important at flows above 20 ft/s)

Example: A 6" valve intended to flow 2000 GPM at 150 psi has a friction loss of 20 psi at 2000 GPM. The minimum inlet pressure would be 150 + 20 = 170 psi. When inlet pressure is below set point, the outlet pressure will be the pressure at the inlet minus the friction loss.

Valve Size	NPS (inches)	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
	DN (mm)	32	38	50	65	80	100	150	200	250
Min Flow Rate to set Valve (GPM)		15	15	100	35	60	100	220	400	600
Max Flow Rate (GPM)		125	160	250	375	600	1000	2250	4000	6000

Flow calculations are based on flow through schedule 40 Pipe. Maximum continuous flow is approximately 20 ft./sec (6.1 meters/sec). Maximum intermittent flow is 25 ft./sec (7.6 meters/sec). Minimum continuous flow is approximately 1.25 ft./sec (0.4 meters/sec).

Operation

The Model ZW209FP utilizes a pressure reducing pilot valve that installs on the discharge side of the control circuitry. The pilot is a direct acting, normally open, spring loaded, diaphragm actuated valve. The operation of the ZW209FP begins with accurately sizing the valve, then fine tuning the control circuit by adjusting the pilot spring to the desired downstream pressure. Inlet pressure is piped to the inlet port of the pressure reducing pilot. A sensing line runs internally from the discharge side of the pilot to its lower control chamber under the diaphragm. Thus, downstream pressure exceeding the preset acts to close the pilot while the adjustable spring seeks to keep it open. The result is a modulating action in the pilot that is transmitted to the cover of the main valve. This creates a mirror modulation of the diaphragm assembly in the main valve. Downstream pressure is maintained within narrow limits regardless of changing flow rates or varying inlet pressures.

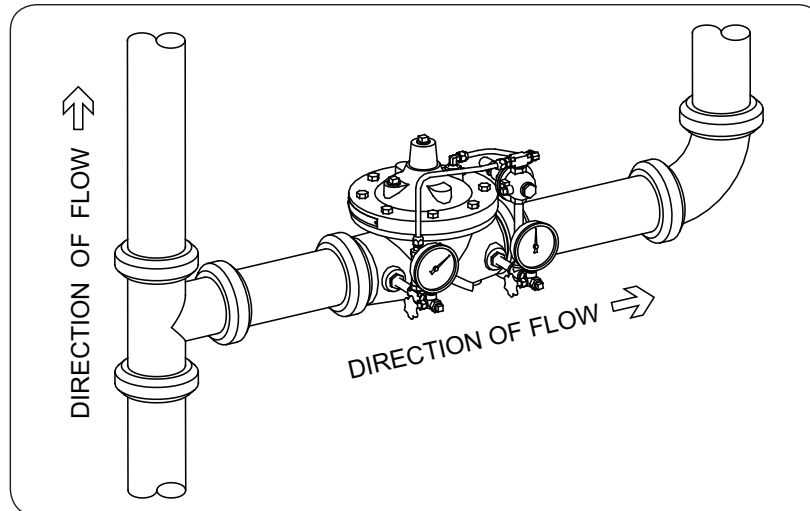
Typical Installation

The upstream and downstream pressure gauges are required by Underwriters Laboratories® (UL). Also a relief valve of not less than 1/2" in size MUST be installed on the downstream side of the pressure control valve. Adequate drainage for the relief valve discharge must be provided.

UI Installation Specification Requirements

UL installation specifications require the valve to be installed in accordance with the standard for installation of sprinkler systems, NFPA 13, or the standard for installation of standpipes and hose systems, NFPA 14. The valve is to be inspected, tested and maintained in accordance with the standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

Typical Installation



Specifications

The Pressure Reducing Valve shall be a diaphragm actuated, pilot controlled. The main valve body shall be Ductile Iron ASTM A 536. The stem of the basic valve shall be guided top and bottom. The diaphragm shall not be used as a seating surface. All internal and external ferrous surfaces shall be coated with a high quality, fusion epoxy coating. The pilot control shall consist of a two-way, normally open, direct acting, adjustable spring loaded, diaphragm actuated pressure reducing pilot. The pilot control shall be field adjustable from 50 psi to 165 psi. The Pressure Reducing Valve shall be a ZURN WILKINS Model ZW209FP.

Job Name _____ **Contractor** _____

Job Location _____ **Engineer** _____

Models 106-PR-10159 UL / 106-PR-8702A ULC

Pressure Reducing Valve

KEY FEATURES

- UL and ULC approved for fire extinguishing systems
- Reliable diaphragm actuated
- Hydraulically operated design
- Stainless steel fasteners
- Class 150 and 300 flanges (grooved, threaded - UL only)
- Heat-fused red epoxy coating
- Available in globe and angle style

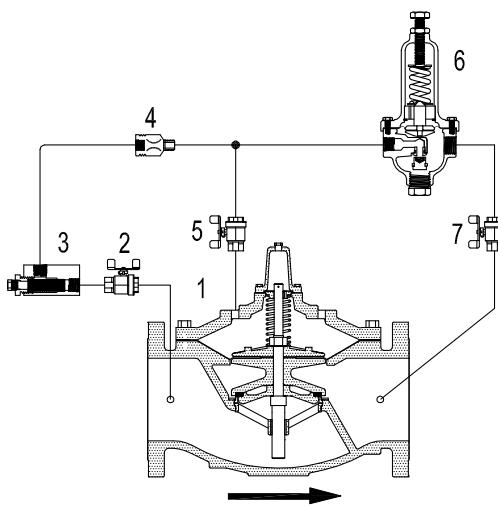


PRODUCT OVERVIEW

The 106-PR, which is UL and ULC labelled and listed, is ideal for automatically reducing a higher inlet pressure to a steady lower discharge pressure, regardless of fluctuations in flow or inlet pressure.

The valves are based on the 106-PG or A106PG control valves and are available in a complete range of sizes from 2 in / 50 mm to 8 in / 200 mm (sizes depend on UL classification). In typical pressure reducing applications, the globe style 106-PR is often the preferred valve style.

SCHEMATIC DRAWING



Schematic A-10159B UL

1. Main Valve - Model 106-PG, SPG or GE, Globe or Angle, 2 in / 50 mm - 8 in / 200 mm UL (2 in / 50 mm, 8 in / 200 mm ULC) Grooved - 2 in / 50 mm to 8 in / 200 mm, Globe style only
2. Lockable Isolation Valve J0044A_SS - optional
3. Strainer J0098A - standard 4 in / 100 mm and larger
4. Fixed Restriction
5. Lockable Isolation Valve J0044A_SS - optional
6. Pressure Reducing Pilot Model 161PR (UL), 160PR (ULC)
 - Range: 30 to 165 psi / 2.06 to 11.37 bar (UL)
 - Range: 20 to 200 psi / 1.38 to 13.8 bar (ULC)
 - Optional 100-300 psi / 3.89 to 20.68 bar
 - Note: Maximum outlet setting for both UL and ULC pilots is 165 psi / 11.37 bar
7. Lockable Isolation Valve J0044A_SS - optional

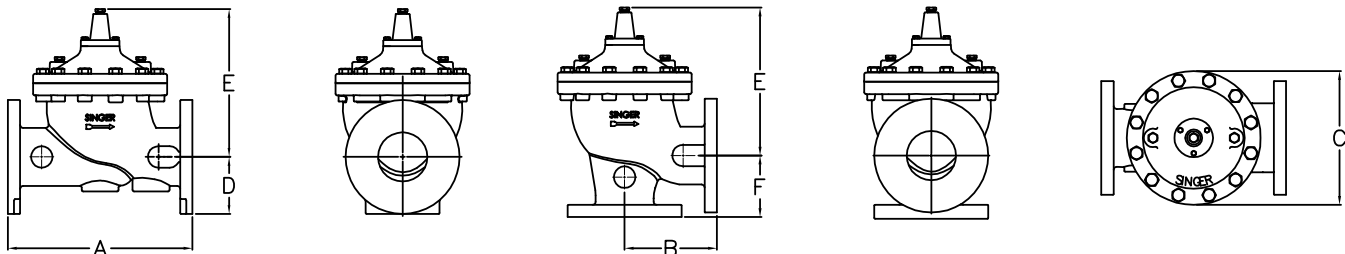
Note: UL listed valves use rolling diaphragm on 6 in / 150 mm and 8 in / 200 mm valves. ULC listed valves use flat diaphragms only. For UL dimensions, ULC dimensions and Grooved dimensions, see page 28.

Model 106-PG – UL/FM Relief & ULC Reducing Only Full Port, Single Chamber, Hydraulically Operated Valve

ANSI Valve Data (US Units)

Size	DWG	Standard	Flat Diaphragm System					
Inches	REF	ANSI	2 in	2-1/2 in	3 in	4 in	6 in	8 in
Globe Dimensions			All figures show in inches unless otherwise stated					
Lay Length	A	FNPT	9.38	11.00	13.50	-	-	-
Centerline to Bottom	D	FNPT	2.75	3.38	3.68	-	-	-
Lay Length	A	150F	9.38	11.00	12.00	15.00	20.00	25.38
Centerline to Bottom	D	150F	3.00	3.50	3.75	4.60	5.60	7.63
Lay Length	A	300F	10.00	11.63	13.25	15.63	21.00	26.38
Centerline to Bottom	D	300F	3.25	3.75	4.13	5.09	6.34	7.88
Angle Dimensions								
Center Inlet to Discharge	B	FNPT	4.69	5.50	6.63	-	-	-
Center Discharge to Inlet	F	FNPT	3.25	4.00	4.63	-	-	-
Center Inlet to Discharge	B	150F	4.75	5.50	6.06	7.50	10.00	12.75
Center Discharge to Inlet	F	150F	3.25	4.00	4.06	5.00	6.00	8.00
Center Inlet to Discharge	B	300F	5.00	5.88	6.43	7.88	10.50	13.25
Center Discharge to Inlet	F	300F	3.50	4.31	4.43	5.31	6.50	8.50
Common Dimensions (Globe & Angle)								
Width	C		6.50	8.19	9.25	10.88	16.75	21.63
Height (To Stem Cap) Globe	E		4.75	7.50	8.00	9.15	11.75	14.91
Height (To Stem Cap) Angle	E		4.75	7.50	8.00	9.15	11.75	14.91
Body Port Tapping		FNPT	3/8	3/8	3/8	3/8	3/8	1/2
Stem Cap Plug		MNPT	3/8	3/8	3/8	3/8	3/8	3/8
Cover Port Tapping		FNPT	3/8	3/8	3/8	3/8	1/2	1/2
Valve Stroke			9/16	15/16	1-1/8	1-7/16	1-11/16	2-7/8
Displaced Bonnet Volume (Gallons)			0.02	0.1	0.1	0.2	0.6	1.7
Approximate Shipping Weight (Lbs)			40	65	100	175	400	650
Flow Capacities (USGPM) Globe & Angle								
C _v - Globe			55	80	110	200	460	800
C _v - Angle			63	90	135	230	535	950
Continuous (Globe)			210	300	460	800	1800	3100
Intermittent (Globe)			260	375	575	1000	2250	3875
Momentary (Globe)			470	670	1030	1800	4000	7000
Maximum Pressure Ratings (Ductile Only)								
PSI ¹		FNPT	400	400	400	-	-	-
PSI		150F	250	250	250	250	250	250
PSI ¹		300F	400	400	400	400	400	400
Maximum Temperature								
Fahrenheit			180°	180°	180°	180°	180°	180°

¹Valves rated and stamped 400 psi as standard. Valves rated and stamped 600 psi on request.

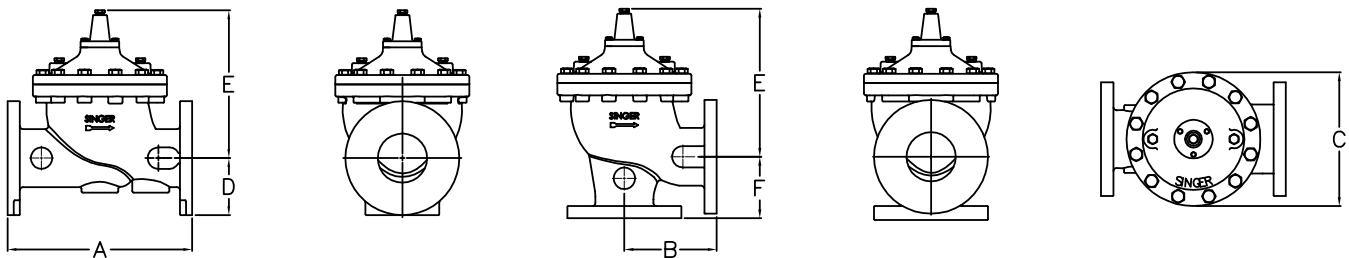


Model 106-PG – UL/FM Relief & ULC Reducing Only Full Port, Single Chamber, Hydraulically Operated Valve

ANSI Valve Data (Metric Units)

Size	DWG	Std	Flat Diaphragm System					
			mm	REF	ANSI	50 mm	65 mm	80 mm
Globe Dimensions			All figures show in mm unless otherwise stated					
Lay Length	A	FNPT	238	279	343	-	-	-
Centerline to Bottom	D	FNPT	70	86	93	-	-	-
Lay Length	A	150F	238	279	305	381	508	645
Centerline to Bottom	D	150F	76	89	95	117	142	200
Lay Length	A	300F	254	295	337	397	533	670
Centerline to Bottom	D	300F	83	95	105	129	161	200
Angle Dimensions								
Center Inlet to Discharge	B	FNPT	119	140	168	-	-	-
Center Discharge to Inlet	F	FNPT	83	102	118	-	-	-
Center Inlet to Discharge	B	150F	121	140	154	191	254	324
Center Discharge to Inlet	F	150F	83	102	103	127	152	203
Center Inlet to Discharge	B	300F	127	149	163	200	267	337
Center Discharge to Inlet	F	300F	89	109	113	135	165	216
Common Dimensions (Globe & Angle)								
Width	C		165	208	235	276	425	549
Height (to stem cap) Globe	E		121	191	203	232	298	379
Height (to stem cap) Angle	E		121	191	203	232	298	379
Body Port Tapping	FNPT	in	3/8	3/8	3/8	3/8	3/8	1/2
Stem Cap Plug	MNPT	in	3/8	3/8	3/8	3/8	3/8	3/8
Cover Port Tapping	FNPT	in	3/8	3/8	3/8	3/8	1/2	1/2
Valve Stroke		mm	14	25	29	37	43	73
Displaced Bonnet Volume (Litres)			0.1	0.3	0.3	0.8	2.1	6.3
Approximate Shipping Weight (Kilograms)			18	29	45	79	181	295
Flow Capacities (L/s) Globe & Angle								
Kv - Globe			13	19	26	47	110	190
Kv - Angle			15	21	32	55	127	225
Continuous (Globe)			13	19	29	50	114	196
Intermittent (Globe)			16	24	36	63	142	244
Momentary (Globe)			30	42	65	114	252	442
Maximum Pressure Ratings (Ductile Only)								
Bar ¹	FNPT		27.6	27.6	27.6	-	-	-
Bar	150F		17	17	17	17	17	17
Bar ¹	300F		27.6	27.6	27.6	27.6	27.6	27.6
Maximum Temperature								
Celcius			82°	82°	82°	82°	82°	82°

¹Valves rated and stamped 27.6 bar as standard. Valves rated and stamped 41 bar on request



Model 106-GE/S106-GE

Grooved Ends

Valve Data (US Units)

	DWG	Standard	Flat Diaphragm System				Single Rolling Diaphragm System	
Inches	REF	Grooved Ends	2 in	2-1/2 in	3 in	4 in	6 in	8 in
Globe Dimensions			All figures shown in inches unless otherwise stated					
Lay Length	A		9.00	11.00	12.50	15.00	20.00	25.37
Centerline to Bottom	D		1.31	1.54	2.25	2.81	4.00	5.00
Common Dimensions (Globe)								
Width	C		5.87	7.75	9.25	10.88	12.13	17.16
Height (To Stem Cap) Globe	E		6.35	9.32	10.06	11.74	15.01	19.70
Body Port Tapping		FNPT	3/8	3/8	3/8	3/8	3/8	1/2
Stem Cap Plug		MNPT	3/8	3/8	3/8	3/8	3/8	3/8
Cover Port Tapping		FNPT	3/8	3/8	3/8	3/8	3/8	1/2
Valve Stroke			9/16	15/16	1 1/8	1 7/16	1 11/16	2 7/8
Displaced Bonnet Volume (Gallons)			0.02	0.07	0.1	0.2	0.6	1.7
Approximate Shipping Weight (Lbs)			28	49	80	148	350	590
Flow Capacities (USGPM) Globe								
C _v			55	80	110	200	460	800
Continuous (Globe)			210	300	460	800	1800	3100
Intermittent (Globe)			260	375	575	1000	2250	3875
Momentary (Globe)			470	670	1030	1800	4000	7000
Maximum Pressure Ratings (Ductile Only)								
PSI		Grooved Ends	400	400	400	400	400	400
Maximum Temperature								
Fahrenheit			180°	180°	180°	180°	180°	180°

Valve Data (Metric Units)

	DWG	Standard	Flat Diaphragm System				Single Rolling Diaphragm System	
MM	REF	Grooved Ends	50 mm	65 mm	80 mm	100 mm	150 mm	200 mm
Globe Dimensions			All figures shown in millimeters unless otherwise stated					
Lay Length	A		229	279	318	381	508	645
Centerline to Bottom	D		33	39	57	71	102	127
Common Dimensions (Globe)								
Width	C		149	197	235	276	308	436
Height (To Stem Cap) Globe	E		161	237	256	298	381	500
Body Port Tapping	FNPT	Inches	3/8	3/8	3/8	3/8	3/8	1/2
Stem Cap Plug	MNPT	Inches	3/8	3/8	3/8	3/8	3/8	3/8
Cover Port Tapping	FNPT	Inches	3/8	3/8	3/8	3/8	3/8	1/2
Valve Stroke		mm	14	25	29	37	43	73
Displaced Bonnet Volume (Litres)			0.1	0.3	0.3	0.8	2.1	6.3
Approximate Shipping Weight (Kilograms)			13	22.2	37	67	160	268
Flow Capacities (L/s) Globe								
K _v (Globe)			13	19	26	47	110	190
Continuous (Globe)			13	19	29	50	114	196
Intermittent (Globe)			16	24	36	63	142	244
Momentary (Globe)			30	42	65	114	252	442
Maximum Pressure Ratings (Ductile Only)								
Bar		Grooved Ends	27.6	27.6	27.6	27.6	27.6	27.6
Maximum Temperature								
Celcius			82°	82°	82°	82°	82°	82°