Model ZW209

Pressure Reducing Valve

Application

The Zurn Wilkins Model ZW209 Pilot Operated Pressure Reducing Valve is designed for many applications where the reduction of high inlet pressures to safe and stable outlet pressure is required. 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 ZW209 comes standard with epoxy coating internally and externally for corrosion protection, as well as isolation valves and pressures gauges for quick and easy maintenance or repair.

Standards Compliance:

- Certified to NSF/ANSI 372* by IAPMO R&T
- ANSI/AWWA C530
- NSF® Listed-Standard 61 & 372* (sizes 4" - 10")

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

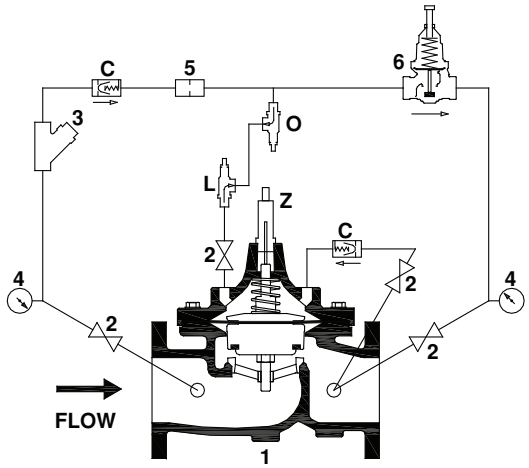
Materials

Main Valve Body	Ductile Iron ASTM A536
Main Valve Bonnet	Ductile Iron ASTM A536
Disc Guide	Bronze ASTM B 176
Seat	Bronze ASTM B 176
Disc	Buna-N Rubber
Diaphragm	Nylon Reinforced Buna-N
Stem	Stainless Steel
Spring	Stainless Steel

*The closing speed control (optional) on this valve should always be open at least three (3) turns off its seat.

Schematic Diagram

Item	Description of Standard Features
1	Main Valve
2	850XL Isolation Valve
3	SXL "Wye" Type Strainer
4	Pressure Gauge
5	Restriction Fitting
6	NR3XL Pressure Reducing Control



LEAD FREE PRODUCTS

LOW-LEAD IAPMO R&T

NSF Certified to NSF/ANSI 61 & 372

Sizes

GLOBE STYLE BODY:

Threaded ends	☐ 1 1/4" - 3" 400 psi max.
Flanged ends	☐ 1 1/2" - 10"
	☐ ANSI Class 150, 250 psi max.
	☐ ANSI Class 300, 400 psi max.
Grooved ends	☐ 1 1/2" - 10" 300 psi max.

TEMPERATURE RATING: ☐ Water 33°F to 140°F
PILOT SPRING RANGE: ☐ 15-150 psi

Standard Features

- ☐ Epoxy Coated, FDA Approved
- ☐ Pilot Assembly
  - "Wye" Type Strainer
  - Opening Speed Control (sizes 1 1/4" - 4")
  - Isolation Valves
- ☐ Inlet and Outlet Pressure Gauges
- ☐ ANSI Class 150 Flanges

Options

(Add suffix letters to ZW209)

Function

- ☐ C - 40XL2 Hydraulic Check with Isolation Valve
- ☐ L - SC1 Closing Speed Control*
- ☐ O - SC1 Opening Speed Control (Standard 1 1/4" -4")

Connections

- ☐ G - IPS Grooved
- ☐ TH - NPT Threaded
- ☐ Y - ANSI Class 300 Flanges

Main Valve Options

- ☐ SS - Stainless Steel Seat, Seal Ring Retainer & Stem Guide
- ☐ V - Viton Rubber Internals, rated 180°F (1-1/4"-4", only available with "LP" or "HP" Option)
- ☐ Z - ZPI Visual Position Indicator

Pilot System

- ☐ LP - 5-25 psi Low Pressure Range PV-PRD Pilot (replaces NR3XL)
- ☐ HP - 30-300 psi High Pressure Range PV-PRD Pilot (replaces NR3XL)
- ☐ ST - Stainless Steel Tubing and Fittings
- ☐ RV - Pilot on Reverse Side
- ☐ GL - Liquid Filled Gauge

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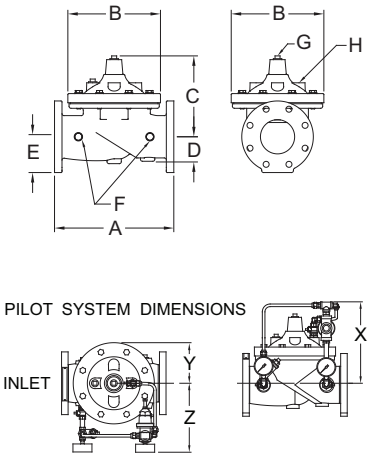
Main Valve Dimensions

DIM		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	11	12 1/2	n/a	n/a	n/a	n/a
	Class 150 Flange	n/a	8 1/2	9 3/8	11	12	15	20	25 3/8	29 3/4
	Class 300 Flange	n/a	9	10	11 5/8	13 1/4	15 5/8	21	26 7/16	31 1/8
	Grooved	n/a	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 1/16	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 1/8	10 3/16	12 5/16	15 9/16	17 5/8
D	Max.	1 3/8	1 3/8	1 3/4	2 1/8	2 9/16	3 7/16	4 15/16	5	5 13/16
E	Class 150 Flange	n/a	2 1/2	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4	8
	Class 300 Flange	n/a	3 1/16	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2	8 3/4
F	NPT Body Tap	3/8	3/8	3/8	1/2	1/2	3/4	3/4	1	1
G	NPT Cvr. Plug Tap	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1	1
H	NPT Cover Tap	3/8	3/8	3/8	1/2	1/2	3/4	3/4	1	1
Valve Stem Internal Thread UNF		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 (inches)		7/16	7/16	3/4	7/8	15/16	1 3/16	1 3/4	2 3/8	2 13/16
Approx. Wt. Lbs.		23	25	35	50	70	140	285	500	700
Pilot System Dimensions										
X	Max. (inches)	8 3/4	8 3/4	8 3/4	8 3/4	9 3/4	11 3/4	12 13/16	15 3/8	17 5/8
Y	Max. (inches)	2 7/8	2 7/8	3 1/2	4	4 1/2	6	8	10	12
Z	Max. (inches)	9 1/8	9 1/8	9 1/2	9 3/16	9 1/2	10 1/4	11 3/8	13 1/4	14 3/4



Operation

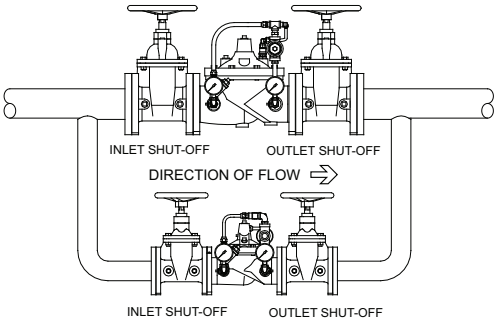
The Model ZW209 utilizes a pressure reducing pilot valve that installs on the discharge side of the control circuitry. The pilot is a direct acting, normally open, spring loaded, diaphragm actuated valve. The operation of the ZW209 begins with accurately sizing the valve, then fine tuning the control 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 bonnet 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.

Flow Characteristics

Valve Size	inches	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
	mm	32	40	50	65	80	100	150	200	250
Suggested Flow (GPM)	Max. Continuous	93	125	210	300	460	800	1800	3100	4900
	Max Intermittent	120	160	260	375	600	1000	2250	4000	6150
	Min. Continuous	10	10	15	20	30	50	115	200	300
Suggested Flow (Liters/sec)	Max. Continuous	6	8	13	19	29	50	113	195	309
	Max. Intermittent	7.6	10	16.4	23	37	62	142	246	388
	Min. Continuous	.6	.6	0.9	1.3	1.9	3.2	7.2	13	19

Suggested flow calculations are based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 20 ft./sec (6.1 meters/sec) & maximum intermittent is approx. 25 ft./sec (7.6 meters/sec) and minimum continuous flow is approx. 1.25 ft./sec (0.4 meters/sec). Many factors should be considered in sizing pressure reducing valves including inlet pressure, outlet pressure and flow rates.

Typical Installation



Notice:

In cases where design flow falls below the minimum continuous flow rate, a low flow by-pass shall be installed.

Specifications

The Pressure Reducing Valve shall be a diaphragm actuated, pilot controlled valve. 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 be field adjustable from 15 psi to 150 psi. The valve shall be certified to NSF/ANSI Standard 372. The Pressure Reducing Valve shall be a ZURN WILKINS Model ZW209.

Job Name _____ **Contractor** _____

Job Location _____ **Engineer** _____

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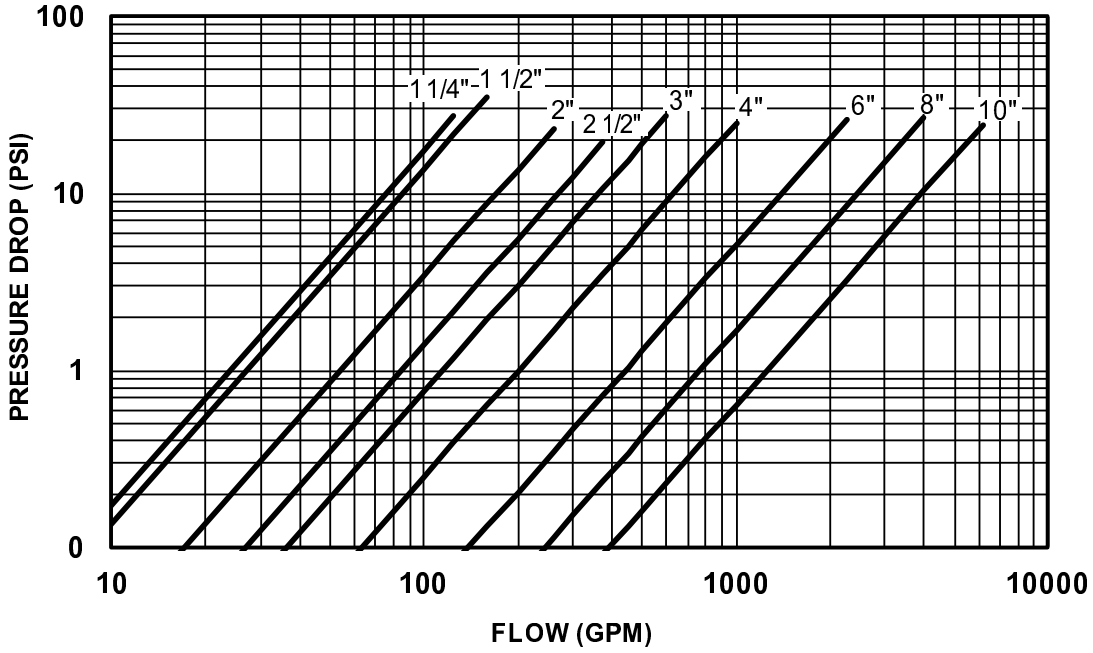
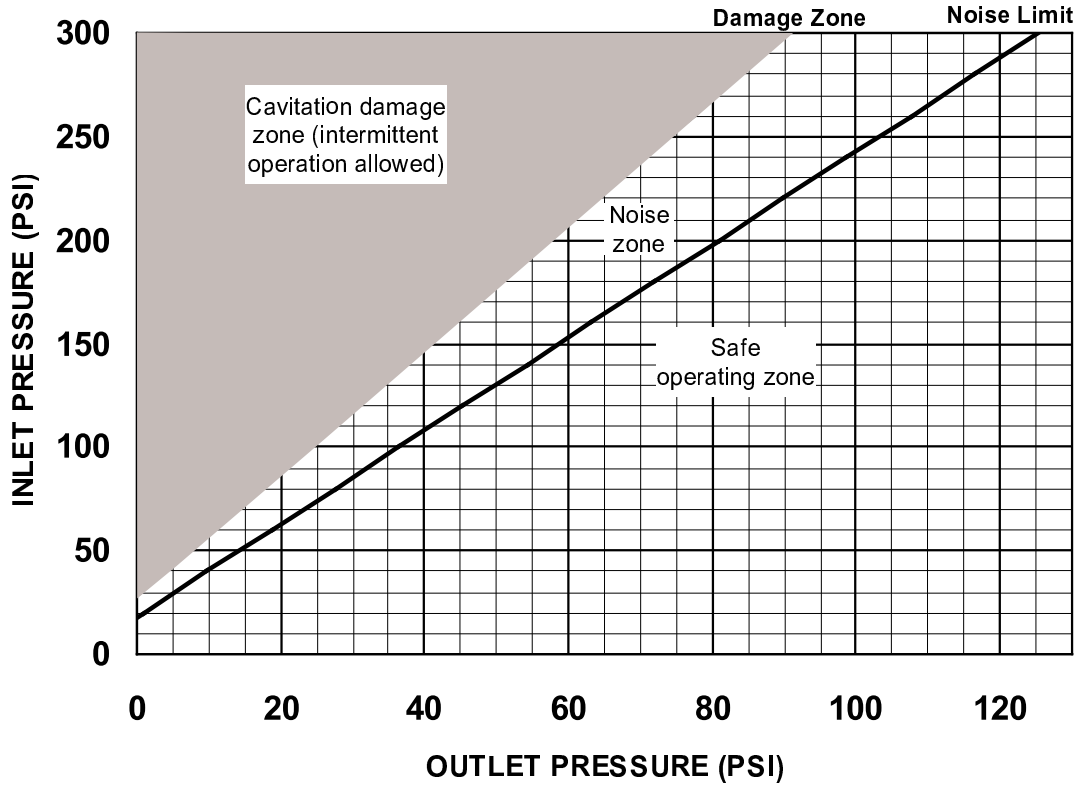
FLOW CHARACTERISTICS

BODY MINIMUM FRICTION LOSS



PRESSURE REDUCTION LIMIT



*** 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.