Model ZW209BP

Pressure Reducing Valve with Low Flow By-Pass

Application

The Zurn Wilkins Model ZW209BP Pilot Operated Pressure Reducing Valve with Low Flow By-pass 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 open and closed position ensuring a constant downstream set pressure. Once the downstream pressure reaches the pilot setting, the main valve will seal shut. When the main valve closes, the low flow bypass is set to a slightly higher pressure which allows it to handle very low flows up to 10 GPM when there is off peak demand. (An additional bypass may be needed to handle flows between the bypass and main valve minimum flow.) In addition the Model ZW209BP comes standard with blue epoxy coating internally and externally for corrosion protection as well as isolation valves and pressure gauges for quick and easy maintenance or repair.

Standards Compliance:

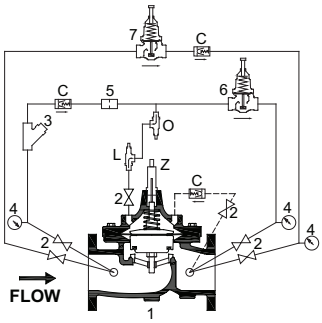
- Certified to NSF/ANSI 372* by IAPMO R&T
- ANSI/AWWA C530
- NSF® Listed-Standard 61 & 372*

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

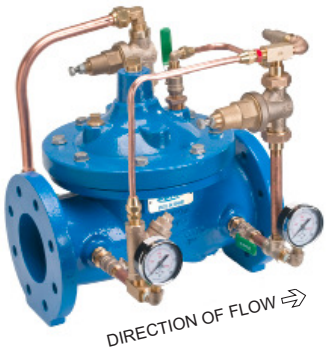
Main Valve Body	Ductile Iron ASTM A536
Main Valve Bonnet	Ductile Iron ASTM A536
Disc Guide	Stainless Steel
Seat	Stainless Steel
Disc	Buna-N Rubber
Diaphragm	Nylon Reinforced Buna-N
Stem	Stainless Steel
Spring	Stainless Steel

*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	PRXL Pressure Reducing Control
7	PRXL Pressure Reducing Control By-Pass



LOW-LEAD IAPMO R&T

Certified to NSF/ANSI 61 & 372

BODY CONFIGURATIONS		GLOBE STYLE BODY		ANGLE STYLE BODY
END CONNECTION	PRESSURE RATING	FULL PORT	REDUCED PORT	
Threaded	400 psi max.	1 1/4" - 3"	n/a	1 1/4" - 3"
Flanged	ANSI Class 150, 250 psi max.	1 1/2" - 4"	3" - 6"	1 1/2" - 4"
	ANSI Class 300, 400 psi max.			
Grooved	300 psi max.	1 1/2" - 4"	n/a	1 1/2" - 4"

Standard Features

- ☐ Blue 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
- ☐ Low-Flow By-Pass Valves: 1/2" PRXL (sizes 1 1/4" - 3) 3/4" NR3XL (size 4")

Options

(Add suffix letters to ZW209BP)

Body

- ☐ A - Angle Style Body
- ☐ R - Reduced Port Body

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

- ☐ V Viton Rubber Internals, Rated 180°F (only available with "LP" or "HP" options)
- ☐ Z ZPI Visual Position Indicator

Pilot System

- ☐ HP 30-300 psi High Pressure Range PV-PRD Pilot (replaces PRXL)
- ☐ ST Stainless Steel Tubing and Fittings
- ☐ SP - All Stainless Steel Pilotry & Pilot Valve
- ☐ SH - Stainless Steel Braided Hoses (replaces Copper Tubing)
- ☐ GL Liquid Filled Gauge

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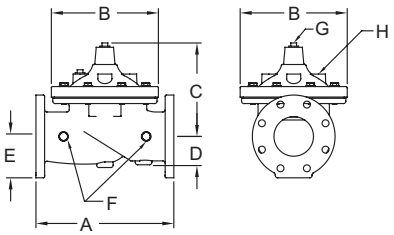
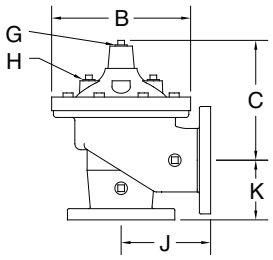
Product No. Model ZW209BP

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)
A	Threaded	7 1/4	7 1/4	9 7/16	n/a	n/a	n/a
	Class 150 Flange	n/a	8 1/2	9 3/8	11	12	15
	Class 300 Flange	n/a	9	10	11 5/8	13 1/4	15 5/8
	Grooved	n/a	8 1/2	9	11	12 1/2	15
B	Diameter	5 5/8	5 5/8	6 3/4	8	9 3/16	11 11/16
C	Max.	5 3/4	5 3/4	6 3/16	7 3/8	8 1/8	10 3/16
D	Max.	1 3/8	1 3/8	1 3/4	2 1/8	2 9/16	3 7/16
E	Class 150 Flange	n/a	2 1/2	3	3 1/2	3 3/4	4 1/2
	Class 300 Flange	n/a	3	3 1/4	3 3/4	4 1/8	5
F	NPT Body Tap	3/8	3/8	3/8	1/2	1/2	3/4
G	NPT Cvr. Plug Tap	1/2	1/2	1/2	1/2	1/2	3/4
H	NPT Cover Tap	3/8	3/8	3/8	1/2	1/2	3/4
J	Threaded	3 1/4	3 1/4	4 3/4	5 1/2	6 1/4	n/a
	Class 150 Flange	n/a	4	4 3/4	5 1/2	6	7 1/2
	Class 300 Flange	n/a	4 1/4	5	6	6 7/16	8
	Grooved	n/a	4 7/16	4 3/4	5 1/2	6	7 1/2
K	Threaded	2	2	3 1/4	4	4 1/2	n/a
	Class 150 Flange	n/a	4	3 1/4	4	4	5
	Class 300 Flange	n/a	4 1/4	3 1/2	4 5/16	4 7/16	5 1/3
	Grooved	n/a	3 3/16	3 1/4	4	4 1/4	5
Valve Stem Internal Thread		10-32	10-32	10-32	10-32	1/4-20	1/4-20
Stem Travel (in)		7/16	7/16	3/4	7/8	1	1 3/16
Approx. Wt. (lbs)		23	25	35	50	70	140

Globe Style Body

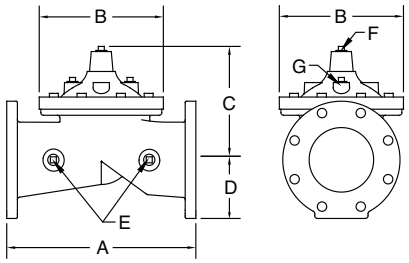




Angle Style Body

Reduced Port Main Valve Dimensions

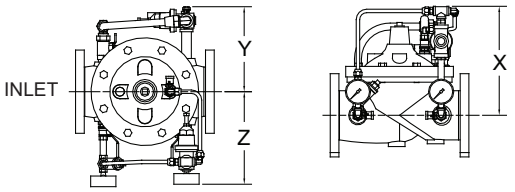
DIM		VALVE SIZE INCHES (mm)		
		3" (80)	4" (100)	6" (150)
A	Class 150 Flange	10 1/4	14	17 3/4
	Class 300 Flange	11	14 1/2	18 11/16
B	Dia	6 3/4	9 3/16	11 11/16
C	Max	6 3/8	8 7/16	12 5/16
D	Class 150 Flange	3 3/4	4 1/2	5 1/2
	Class 300 Flange	4 1/8	5	6 1/4
E	NPT Body Tap	3/8	1/2	3/4
F	NPT Cvr. Plug Tap	3/8	1/2	3/4
G	NPT Cvr. Tap	3/8	1/2	3/4
Valve Stem Internal Thread		10-32	1/4-20	1/4-20
Stem Travel (in)		3/4	1	1 1/5
Approx. Wt. (Lbs)		35	80	140



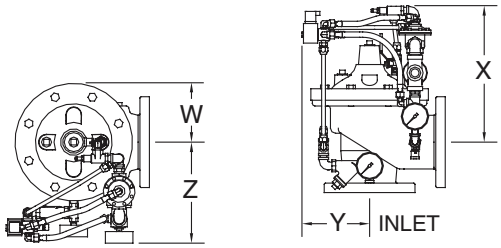
Reduced Port Body

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)
Full Port Body	X	Max. (inches)	9 1/4	9 1/4	9 1/2	9 1/2	9 3/4	12	
	Y	Max. (inches)	9	9	7 1/2	7	7 1/2	9 1/2	
	Z	Max. (inches)	9 1/4	9 1/4	9 1/2	9 1/4	9 3/4	10 1/2	
Reduced Port Body	X	Max. (inches)					9 1/2	9 3/4	12
	Y	Max. (inches)					7 1/2	7 1/2	6
	Z	Max. (inches)					9 1/2	10	10
Angle Body	W	Max. (inches)	9	9	7 1/2	7	7 1/2	9 1/2	
	X	Max. (inches)	9 1/4	9 1/4	9 1/2	9 1/2	9 3/4	12	
	Y	Max. (inches)	5	5	5	5	5	6	
	Z	Max. (inches)	9 1/4	9 1/4	9 1/2	9 1/4	10	10 1/2	



Pilot System Dimensions



Angle Pilot System Dimensions

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Flow Characteristics

Full Port Globe and Angle Valve Size	inches (mm)	1 1/4" (32)	1 1/2" (40)	2" (50)	2 1/2" (65)	3" (80)	4" (100)
Reduced Port Globe Valve Size	inches (mm)			3" (80)		4 (100)	6 (150)
Main Valve Flow (GPM)	Max. Cont.	93	125	210	300	460	800
	Max. Inter.	120	160	260	375	600	1000
	Min. Cont.	10	10	15	20	30	50
*By-Pass Flow (GPM)	Min/Max	1-10	1-10	1-10	1-10	1-10	1-20
Main Valve Flow (L/s)	Max. Cont.	6	8	13	19	29	50
	Max. Inter.	7.6	10	16.4	23	37	62
	Min Cont.	.06	.06	.9	1.3	1.9	3.2
By-Pass Flow (L/s)	Min/Max	.06-.63	.06-.63	.06-.63	.06-.63	.06-.63	.06-1.26
*Suggested Extra By-Pass	Valve sizes	-	-	1" Model 500XL	1-1/4"Model 500XL	1-1/2" Model 500XL	2" Model 500XL

*Adding an extra by-pass bridges the gap between the flow range of by-pass and main valve.

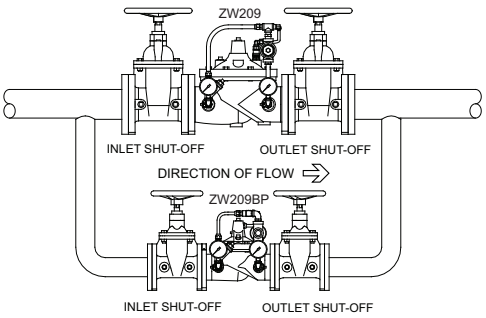
Valve Size	inches (mm)	6" (150)	8" (200)	10" (250)	12" (300)	14" (350)	16" (400)
Low Flow Bypass Required		112-ZW209BP	2-ZW209BP	212-ZW209BP	3-ZW209BP	4-ZW209BP	4-ZW209BP

Operation

The Model ZW209BP 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 ZW209BP begins with accurately sizing the valve, then fine tuning the control circuit by adjusting the pilot spring to the desired downstream pressure. It is hydraulically operated and controlled by a PRXL pilot control, which senses pressure at the main valve outlet. An increase in outlet pressure closes the control. This causes the main valve cover pressure to vary, modulating the main valve and thereby maintaining constant outlet pressure. The Model PRXL low flow pressure reducing by-pass is preset to a higher pressure than the pilot control. The PRXL responds to pressure changes from the main valve outlet. When the pilot control closes, the Model PRXL by-pass valve remains open allowing water to flow through. The by-pass closes when the flow decreases and the downstream pressure reaches its set point.

Typical Installation

The ZW209BP is not a substitute for a low flow by-pass in all cases. The valve is commonly used in buildings where 1-15 GPM low flows are common in off peak usage. Many factors should be considered in sizing a pressure reducing valve: inlet pressure, outlet pressure, and flow rates. The sizing of additional low flow by-pass valves are based on a minimum of a 50 psi differential between the inlet and set outlet pressure. To develop a smooth seamless flow response, it may be necessary to add an additional low flow by-pass valve to the ZW209BP installation to compensate for a range of anticipated flows below the minimum continuous flow rate. To control the opening point of the additional by-pass valves, set the valve you want to open first 5 psi higher in static downstream set pressure.



NOTICE:

Contact the Zurn Wilkins factory for additional by-pass recommendations based on your unique flow applications.

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 with by-pass shall be a ZURN WILKINS Model ZW209BP.

JOB NAME _____ **CONTRACTOR** _____

JOB LOCATION _____ **ENGINEER** _____

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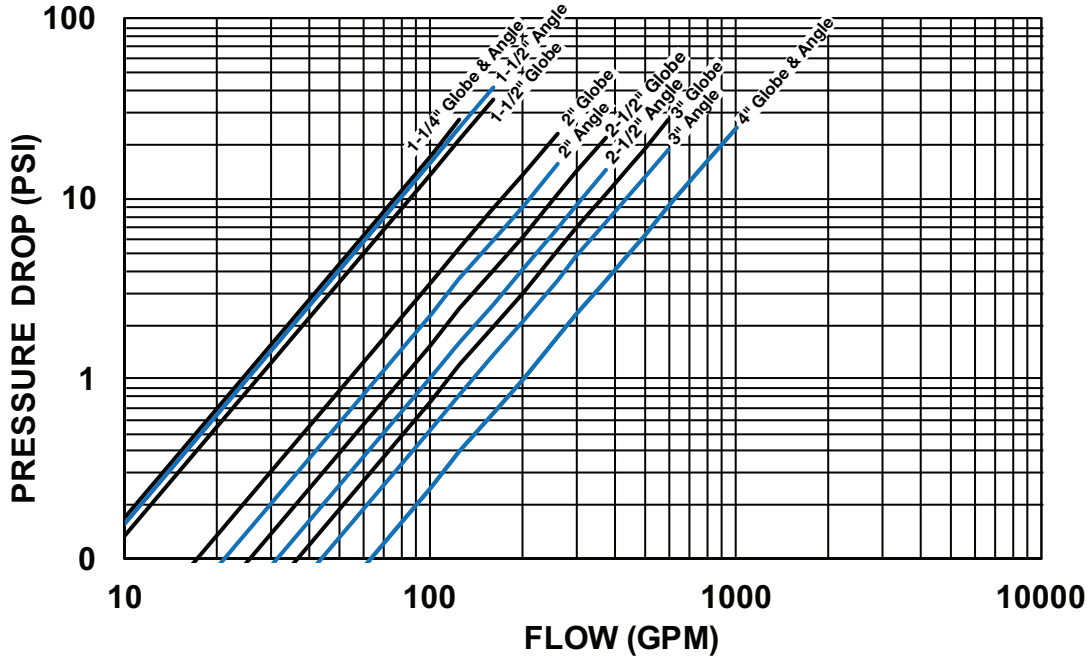
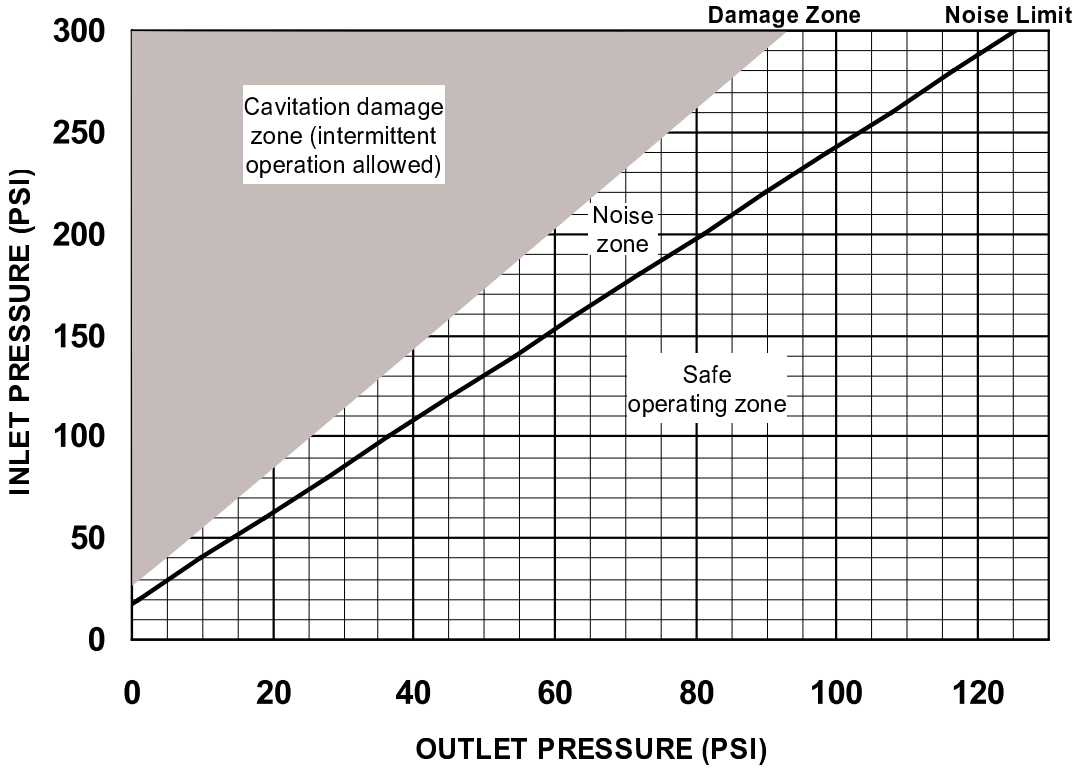
BODY MINIMUM FRICTION LOSS



PRESSURE REDUCTION LIMIT



Note: If the valve is to be used for continuous flow, supply adequate back pressure to operate the valve below the "Damage Zone" shown on the "Pressure Reduction Limit" chart. If the valve discharges to atmosphere adequate back pressure is very important, contact Zurn Wilkins for assistance.

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