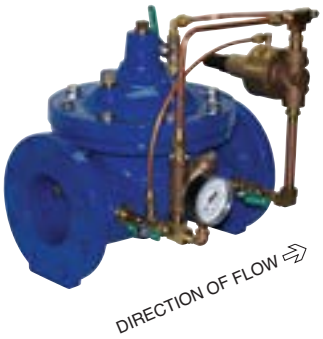
Model ZW205

Pressure Relief / Pressure Sustaining Valve

Application

The Zurn Wilkins Model ZW205 Pilot Operated Pressure Relief / Pressure Sustaining Valve is designed for applications where it is critical to maintain a pre-determined upstream pressure. The pilot assembly reacts to changes in upstream pressure allowing the main valve to modulate between the closed and open position, maintaining desired upstream set pressure. As long as the upstream pressure is below the set point of the pilot assembly, the main valve will stay in the closed position (sustaining); however, once the upstream pressure exceeds the set point of the pilot assembly, the main valve will open and relieve the excess pressure (relief).



LEAD FREE

ALS

NSF/ANSI/CAN 61

Standards Compliance:

- ANSI/AWWA C530
- Meets the requirements of NSF/ANSI/CAN 61*

*(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

Standard Features

- ☐ Blue Epoxy Coated, FDA Approved
- ☐ Pilot Assembly
  - "Wye" Type Strainer
  - Closing Speed Control (sizes 1 1/4" - 4")
  - Isolation Valves
- ☐ Inlet Pressure Gauge
- ☐ ANSI Class 150 Flanges
- ☐ Copper Tubing and Brass Fittings

Temperature Rating: ☐ Water 33°F to 140°F
Pilot Spring Range: ☐ 50-200 psi

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"-16"	3"-10"	1 1/2"-10"
	ANSI Class 300, 400 psi max.			
Grooved	300 psi max.	1 1/2"-10"	n/a	1 1/2"-10"
MINIMUM INLET PRESSURE 10 PSI				

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	Closing Speed Control
7	PV-RLF Pressure Relief Valve

Options

(Add suffix letters to ZW205)

Function

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

Body

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

Connections

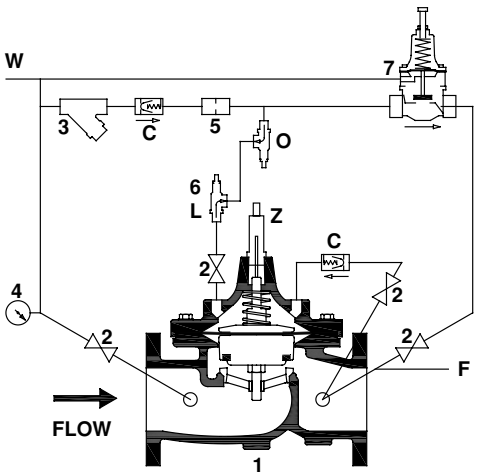
- ☐ G - IPS Grooved
- ☐ TH - NPT Threaded
- ☐ Y - ANSI Class 300 Flanges

Main Valve Options

- ☐ Z - ZPI Visual Position Indicator

Pilot System

- ☐ LP3 - 5-15 psi Low Pressure Range PV-RLF Pilot
- ☐ LP2 - 10-35 psi Low Pressure Range PV-RLF Pilot
- ☐ LP - 30-90 psi Low Pressure Range PV-RLF Pilot
- ☐ HP - 150-300 psi High Pressure Range PV-RLF
- ☐ SP - All Stainless Steel Pilotry (replaces all brass fittings, pilot valve and copper tubing. "GL" Option included)
- ☐ SH - Stainless Steel Braided Hoses (only replaces Copper Tubing)
- ☐ RV - Pilot on Reverse Side
- ☐ GL - Liquid Filled Gauge
- ☐ SO - Limit Switch Open Trip
- ☐ SC - Limit Switch Closed Trip
- ☐ SD - Limit Switch Dual Trip



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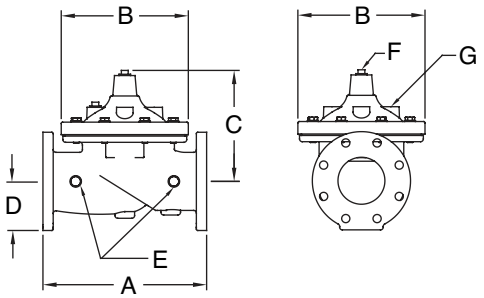
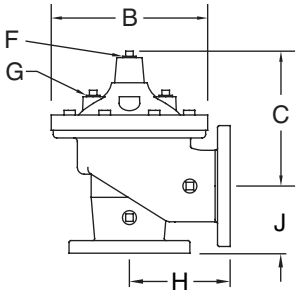
Product No. Model ZW205
Patent zurn.com/patents

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)	12 (300)	14 (350)	16 (400)
A	Threaded	7 1/4	7 1/4	9 7/16	11	12 1/2							
	Class 150 Flange		8 1/2	9 3/8	11	12	15	20	25 3/8	29 3/4	34	39	41 3/8
	Class 300 Flange		9	10	11 5/8	13 1/4	15 5/8	21	26 7/16	31 1/8	35 1/2	40 1/2	43 1/2
	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	27 1/2	31 3/4	34 1/2
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	20 3/16	22 13/16	25 7/8
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	6 3/4	8 7/8	8 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	9 1/2	10 1/2	11 3/4
	Class 300 Flange		3	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2	8 3/4	10 1/4	11 1/2	12 3/4
E	NPT Body Tap	3/8	3/8	3/8	1/2	1/2	3/4	3/4	1	1	1	1	1
F	NPT Cvr. Plug Tap	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1	1	1	1	1
G	NPT Cover Tap	3/8	3/8	3/8	1/2	1/2	3/4	3/4	1	1	1	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 11/16	14 7/8			
	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 11/16	14 7/8			
J	Threaded	1 15/16	1 15/16	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 5/16	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	3/8-16	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	3 7/16	3 13/16	4 5/16
Approx. Wt. (lbs)		22	26	36	55	70	130	240	440	720	820	1200	1550



Globe Style Body

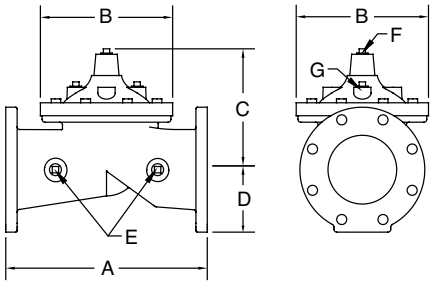


Angle Style Body

Reduced Port Main Valve Dimensions

DIM		VALVE SIZE INCHES (mm)				
		3" (80)	4" (100)	6" (150)	8" (200)	10" (250)
A	Class 150 Flange	10 1/4	14	17 3/4	21 7/16	26
	Class 300 Flange	11	14 1/2	18 11/16	22 7/16	27 7/16
B	Dia	6 3/4	9 3/16	11 11/16	15 3/4	20 1/8
C	Max	6 3/8	8 7/16	12 5/16	13 1/4	16 3/4
D	Class 150 Flange	3 3/4	4 1/2	5 1/2	6 3/4	8
	Class 300 Flange	4 1/8	5	6 1/4	7 1/2	8 3/4
E	NPT Body Tap	3/8	1/2	3/4	3/4	1
F	NPT Cvr. Plug Tap	3/8	1/2	3/4	3/4	1
G	NPT Cvr. Tap	3/8	1/2	3/4	3/4	1
Valve Stem Internal Thread		10-32	1/4-20	1/4-20	3/8-16	3/8-16
Stem Travel (in)		3/4	1	1 1/5	1 3/4	2 3/8
Approx. Wt. (Lbs)		35	80	140	275	480

Reduced Port Body



Job Name _____ **Contractor** _____

Job Location _____ **Engineer** _____

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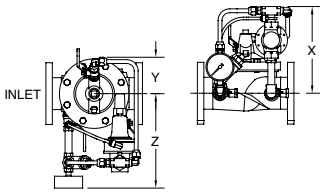
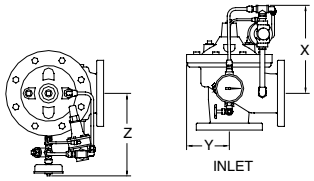
Pilot System Dimensions

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)	12" (300)	14" (350)	16" (400)
Full Port Body	X	Max. (inches)	9	8 1/2	8 1/2	8 1/2	9 1/2	12	12 1/2	15 1/2	17 1/2	20	23	26
	Y	Max. (inches)	4	4	4	4	5	6	8	10	12	14	16	17 1/2
	Z	Max. (inches)	9 1/2	9 1/2	10	10	10	11 1/2	12 1/2	14	15	18	20	21 1/2
Reduced Port Body	X	Max. (inches)					8 1/2	9 1/2	12	12 1/2	15 1/2			
	Y	Max. (inches)					4	5	6	8	10			
	Z	Max. (inches)					10	10	11 1/2	12 1/2	14			
Angle Body	X	Max. (inches)	9	8 1/2	8 1/2	8 1/2	9 1/2	12	12 1/2	15 1/2	17 1/2			
	Y	Max. (inches)	5	5	5	5	5	6	8	10	12			
	Z	Max. (inches)	9 1/2	9 1/2	10	10	10	11 1/2	12 1/2	14	15			

Pilot System Dimensions



Angle Pilot System Dimensions



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)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)
Reduced Port Globe Valve Size	inches (mm)			3 (80)		4 (100)	6 (150)	8 (200)	10 (250)				
Suggested Flow (GPM)	Max. Continuous	93	125	210	300	460	800	1800	3100	4900	7000	8400	11000
	Max Intermittent	120	160	260	375	600	1000	2250	4000	6150	8700	10500	13800
	Min. Continuous	10	10	15	20	30	50	115	200	300	435	530	690
Suggested Flow (Liters/sec)	Max. Continuous	6	8	13	19	29	50	113	195	309	550	665	870
	Max. Intermittent	7.6	10	16.4	23	37	62	142	246	388	440	530	95
	Min. Continuous	.6	.6	0.9	1.3	1.9	3.2	7.2	13	19	28	33	43

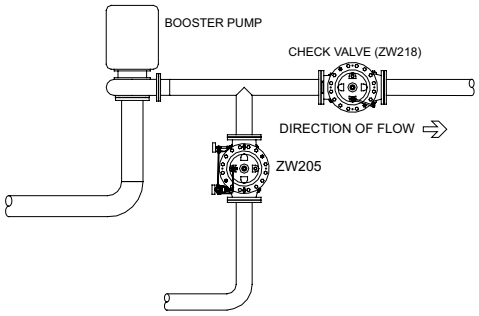
Flow Characteristics

Suggested flow calculations are based on flow through Schedule 40 Pipe. Maximum continuous flow is approx. 20 ft./sec (6.1 meters/sec) & maximum surge is approx. 45 ft./sec (13.7 meters/sec). Many factors should be considered in sizing pressure relief valves including inlet pressure, outlet pressure and flow rates.

Operation

The Model ZW205 pilot system is designed to sense upstream pressure. The pilot piping contains a normally closed, direct acting, spring loaded pilot valve, which may be preset to the particular pressure requirements of the system (Pilots are available in pressure ranges from 0 to 300 psi.). If upstream pressure does not exceed the preset on the pilot spring, the pilot and the main valve remain tightly closed. Should upstream pressure exceed the set point of the pilot, both the pilot and main valve will open, relieving the excess pressure by allowing flow through the valve. When upstream pressure returns to acceptable limits, the reverse action occurs. An adjustable flow control valve in the pilot piping provides quick opening for pressure relief and slow closing for surge protection.

Typical Installation



Caution: The recommended installation orientation for ACVs is horizontal, with the valve cover up. 6" and larger valves should only be installed horizontally, with the valve cover up, due to the difficulty of properly bleeding air out of the cover and performing maintenance on valves installed in the vertical orientation.

Specifications

The Pressure Relief / Pressure Sustaining Valve shall be a single seated, line pressure operated, diaphragm actuated, pilot controlled globe or angle valve. The valve shall seal by means of a corrosion-resistant seat and resilient, rectangular seat disc. These and other parts shall be replaceable in the field; all such service and adjustments to be possible without removing the valve from the line. The stem of the basic valve shall be guided top and bottom by integral bushings. The basic valve and its pilot control system shall contain no packing glands or stuffing boxes. The diaphragm shall not be used as a seating surface nor shall pistons be used as an operating medium. All internal and external ferrous surfaces shall be coated with a high quality, fusion epoxy coating. The pilot control system shall include a direct-acting, normally closed, spring-loaded, diaphragm actuated pilot valve with the stem guided between the diaphragm assembly and seat disc. To ensure precise pressure regulation, the appropriately rated pilot valve shall be field adjustable within the pressure control range of the spring. The valve shall be certified to NSF/ANSI/CAN Standard 61. The Pressure Relief / Pressure Sustaining Valve shall be a ZURN WILKINS Model ZW205.

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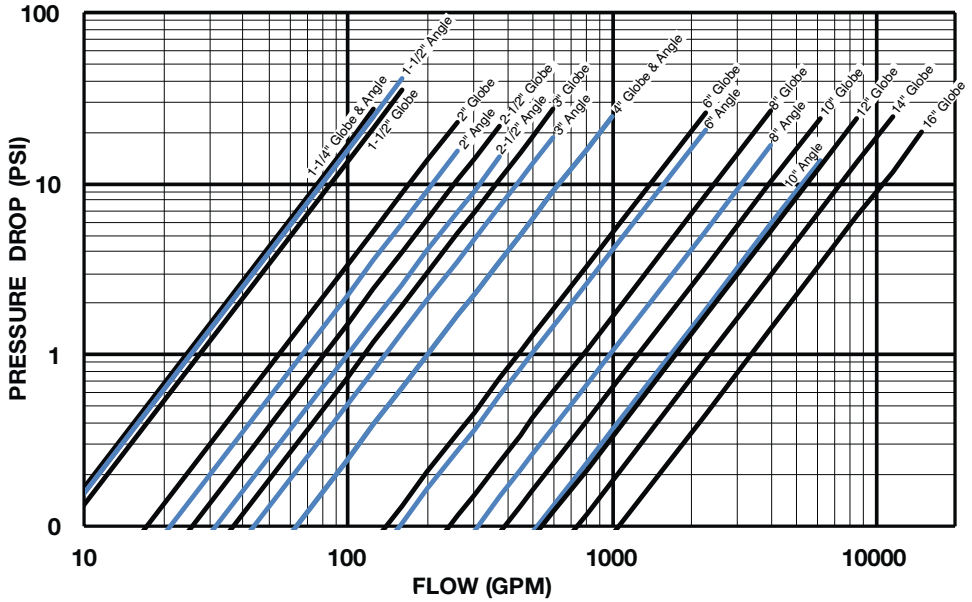
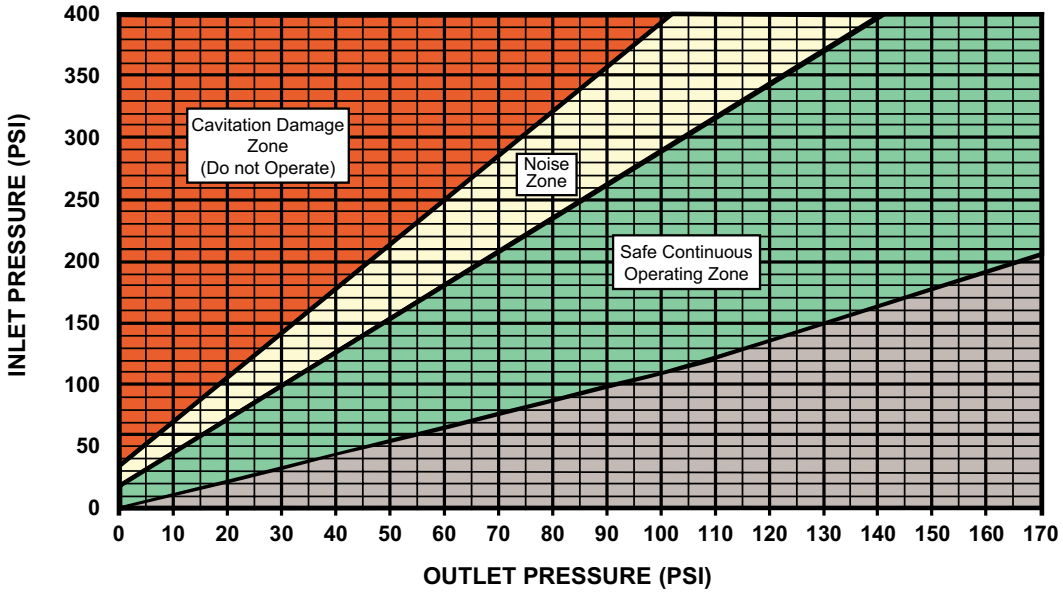
BODY MINIMUM FRICTION LOSS



*** Notes for Body Minimum Friction Loss Chart:**
Minimum inlet pressure is 10 psi higher than set point or the additional body friction loss 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.

WATERWORKS PRESSURE REDUCTION LIMIT CHART



Notes for Pressure Reduction Limit Chart: Determine if the outlet reduced flowing pressure is within the safe operating zone for your Zurn Automatic Control Valve. First, find the system inlet pressure on the left axis and draw a horizontal line from that point across the chart. Then find the outlet reduced flowing pressure on the bottom axis and draw a vertical line up to where it meets the first line. The point where the lines intersect should be in the green “Safe Continuous Operating Zone” below and to the right of the yellow “Noise Zone”. If the operating point is in the area labeled “Noise Zone” or “Cavitation Damage Zone”, the valve seal ring, plunger, or body may be damaged. The lifespan of the valve will be reduced. Damage from cavitation to internal components may cause high pressure downstream and/or external leaks. To move out of the cavitation or noise zone you will need to place two valves in series in order to safely reduce pressure. Use the chart to pick an intermediate pressure in the green zone that you will set the first valve in series to. The intermediate pressure you pick will then become the inlet pressure for the 2nd valve and you can verify it will be in the green zone using the chart.