



Model ZW221E

One Way Altitude Level Control Valve with Solenoid Shut-off Valve

Application

The Zurn Wilkins Model ZW221E One Way Altitude Level Control Valve accurately controls the high water level in a storage tank or reservoir without the need for floats or sensors. The valve features on/off service and is installed on the fill line to close drip tight once the high water level is reached. The water level is measured by a field installed remote sensing line installed from the reservoir to the pilot control valve. This valve is used where water distribution is through a separate line. A check valve option can be added to prevent return flow. An adjustable delayed drawdown level is optional to allow the tank level to drop 3-20 feet before the valve re-opens. A solenoid control is provided to intercept the operation of the pressure reducing control and close the main valve. The solenoid can be used in conjunction with a sensor(s) to trigger opening or closing electronically when low or high fluid levels are sensed.

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
Coating	FDA Approved Fusion Epoxy

Adjustment Range

The pilot adjustment range can be selected between 5' and 230'

Standard Features

- Globe Style Body
- Blue Epoxy Coated, FDA Approved
- Pilot Assembly
 - SXL "Wye" Type Strainer
 - Accelerator Pilot Control
 - 850XL Isolation Valves
- Closing Speed Control
- ANSI Class 150 Flanges
- Position Indicator
- Pressure Gauges
- Gauges Isolation and Sensing Line Flush Valve
- Stainless Steel Braided Hoses/Brass Fittings

Temperature Rating: Water 33°F to 140°F
 Pilot Rating: 300 psi max.

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

MINIMUM INLET PRESSURE 10 PSI

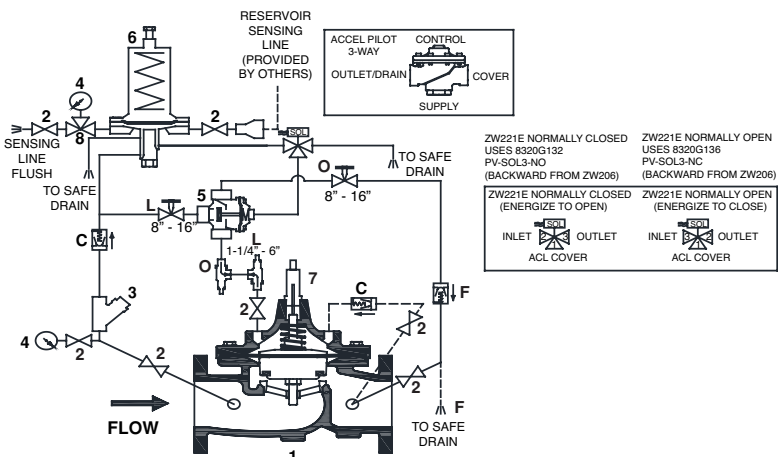


Options (Add suffix letters to ZW221)

- Function**
- D - Delayed drawdown level before valve reopens(3 - 20ft)
 - H - With Pressure Sustaining
 - C - Hydraulic Check with Isolation Valve
 - O - Opening Speed Control (Standard on 4" or smaller)
- Body**
- A - Angle Style Body
 - R - Reduced Port Body
- Connections**
- G - IPS Grooved
 - TH - NPT Threaded
 - Y - ANSI Class 300 Flanges
- Pilot System**
- L1 - 5'-55' adjustment range
 - L2 - 45'-85' adjustment range
 - L3 - 75'-230' adjustment range
 - F - Atmospheric "wet" drain
 - NC - Normally Closed (energize to open) Main Valve, 120vac Solenoid
 - NO - Normally Open (energize to close) Main Valve, 24vac Solenoid
 - RV - Pilot Installed on reverse side
 - SO - Limit Switch Open Trip
 - SC - Limit Switch Closed Trip
 - SD - Limit Switch Dual Trip

Schematic Diagram

Item	Description of Standard Features
1	Main Valve
2	850XL Isolation Valve
3	SXL "Wye" Type Strainer
4	Pressure Gauge
5	PV-ACL-3A Accelerator Pilot
6	PV-ALT Altitude Control Pilot
7	ZPI Position Indicator
8	3-Way Gauge Isolation/Sensing Line Flush Valve

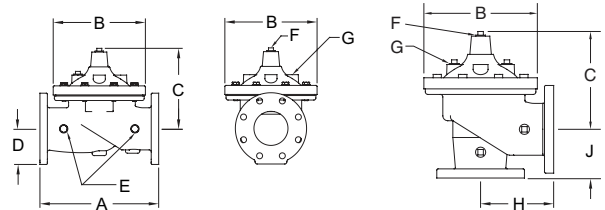


Globe and Angle Main Valve Dimensions

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

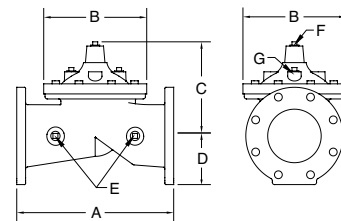
Reduced Port Main Valve Dimensions

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) Class 150		50	90	160	280	480



Globe Style Body

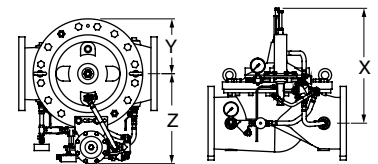
Angle Style Body



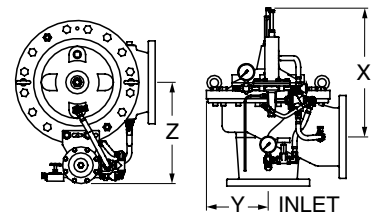
Reduced Port Body

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)	8" (200)	10" (250)	12" (300)	14" (350)	16" (400)
		Full Port Body	X	15 3/4	15 3/4	16	16 3/4	17	18 1/2	19 1/2	21	23 1/4	26 1/2
Y	2 3/4		2 3/4	3 5/8	4 3/8	5 1/16	6 1/4	8 1/16	10 1/4	11 3/4	13 5/8	15 3/4	17 1/8
Z	11		11	11	10 3/4	11 1/2	12 3/4	14 1/2	17	18 3/4	19 1/4	21 1/4	23 1/2
Reduced Port Body	X					16 3/4	17	18 1/2	19 1/2	21			
	Y					4 3/8	5 1/16	6 1/4	8 1/16	10 1/4			
	Z					10 3/4	11 1/2	12 3/4	14 1/2	17			
Angle Body	X	15 1/2	15 1/2	16	16 1/4	17	18 1/4	19 1/2	21	22 1/4			
	Y	7 1/2	7 1/2	7 1/4	7	7 1/2	7 1/4	8	10 1/4	11 7/8			
	Z	12	12	12 1/4	11 3/4	12	12 3/4	14 1/2	16 1/2	18 3/4			



Globe Pilot System Dimensions



Angle Pilot System Dimensions

Operation

The Zurn Wilkins One Way Altitude Valve Model ZW221E, has a pilot that senses the water level in the reservoir through a field installed pressure sensing line. This pressure opens and close the main altitude pilot. When the reservoir is at low water level, the altitude pilot pressurizes the cover of the accelerator pilot. The accelerator pilot vents the cover of the main valve downstream. The main valve opens to allow water to fill the reservoir. When the reservoir reaches the high water level, the altitude pilot vents the cover of the accelerator pilot. This allows the inlet water supply to refill the cover of the main valve, closing the valve drip tight. The high water level is adjusted by screwing the altitude pilot adjustment bolt in (clockwise) to increase the water level set point and unscrewing the adjustment bolt out (counterclockwise) to decrease the set point. The closing speed control valve can be screwed in (clockwise) to slow the main valve closing. An opening speed control is optional. The position indicator shows the main valve position. There is a bleed cock on the top of the position indicator to vent air from the main valve cover and indicator. The gauge isolation valve allows for the pressure gauge to be isolated when not in use to extend its life. To flush the reservoir sensing line of any air or debris, sensing line isolation valves are provided these valves also allow setting and verification of the set point and valve function

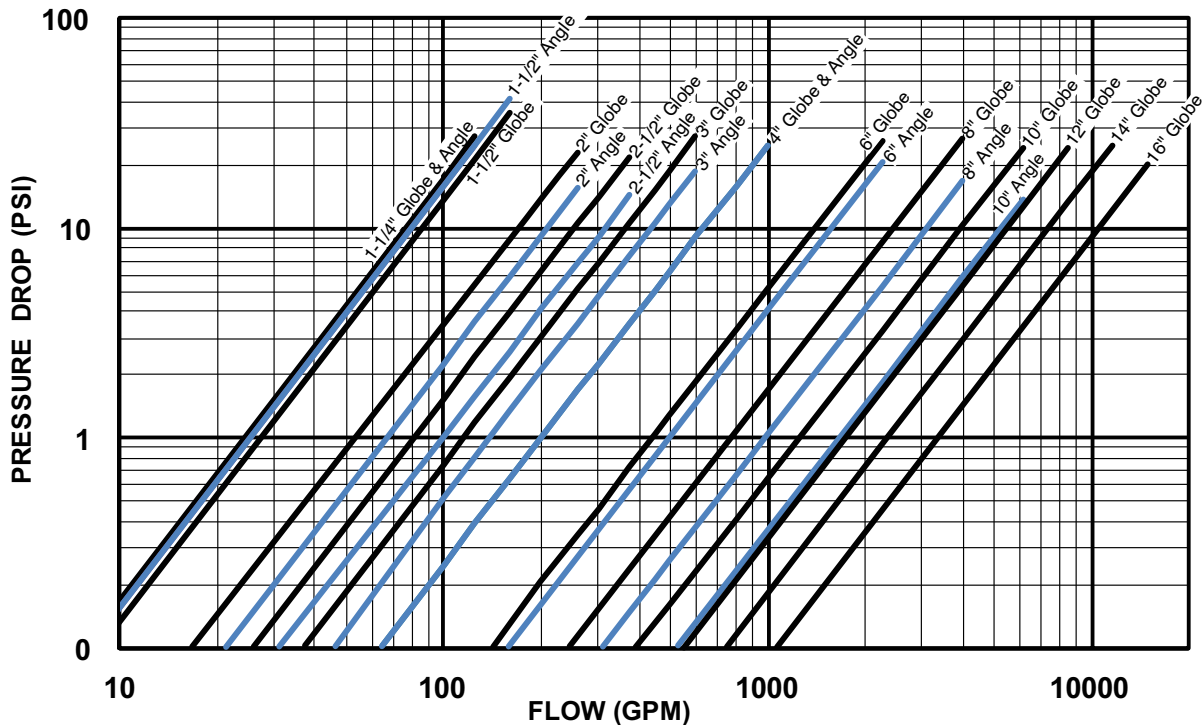
Flow Characteristics

Valve Size	inches	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16
	mm	32	40	50	65	80	100	150	200	250	300	350	400
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
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

Note: Supply adequate flow restriction downstream of the ACV to keep the flow rates below maximum recommended values to prevent premature damage to the ACV. 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).

Flow Characteristics

BODY MINIMUM FRICTION LOSS



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 One Way Altitude Level Control Valve shall be a single seated, line pressure operated, diaphragm actuated, 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 will be possible without removing the valve from the line. The main valve body shall be ductile iron ASTM A 536. The stem of the basic valve shall be guided top and bottom. 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, FDA Approved fusion epoxy coating. Pilot control shall include a solenoid to override hydraulic controls and operate the main valve. The valve shall be certified to NSF/ANSI/CAN Standard 61. The One Way Altitude Level Control Valve shall be a ZURN WILKINS Model ZW221E.

Job Name _____

Contractor _____

Job Location _____

Engineer _____