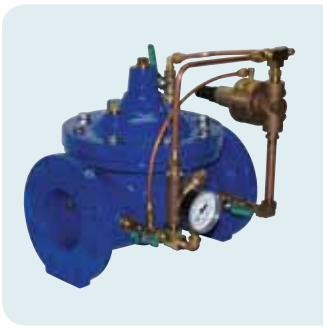
ZURN®

Automatic
Control Valves



Providing quality, performance, dependability, and value for water control applications

WILKINS®
a ZURN company

Zurn Wilkins Automatic Control Valves

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Zurn Wilkins Value

Zurn Value Proposition

Zurn Engineered Water Solutions® is a recognized leader in commercial, municipal, and industrial markets. Zurn manufactures the largest breadth of engineered water solutions in the industry, including a wide spectrum of sustainable plumbing products. Zurn delivers total building solutions for new construction and retrofit applications that enhance any building's environment.

Zurn Wilkins Automatic Control Valves are the best choice for critical water control applications including pressure regulation, pressure relief, solenoid control, and liquid level control. Our simple designs and rugged construction provide a long life of dependable operation. Available in a full range of sizes with threaded, flanged, or grooved connections. The Zurn Wilkins Automatic Control Valve product line offers our customers the highest value by providing exceptional performance, reliability, and the lowest total cost of ownership.

Introduction to Product Categories

Precise pressure control, regardless of flow rate and pressure fluctuations, is required in many piping systems. The Zurn Wilkins **Pilot Operated Pressure Reducing Control Valve ZW209** is the answer for these stringent conditions. If precision pressure control is called for in either a domestic, irrigation, or fire protection application, the Zurn Wilkins ZW209 is ready for the job.

Opening or closing a valve in a remote or dangerous location can put a strain on available human resources. The Zurn Wilkins **Solenoid Control Valve ZW206** can take the labor out of this process by opening or closing the valve electrically. The valve's simple on/off operation is used in many applications including mixing or blending of process water and the automatic closure of a water system connected to a reduced pressure principle backflow assembly in an excessive discharge condition.

Controlling the fluid level in tanks and reservoirs is critical in many applications. The Zurn Wilkins **Pilot Operated Float Control Valve ZW204** is designed to handle this crucial job. Finding numerous applications in plumbing and irrigation, the Zurn Wilkins ZW204 is up to the task.

Excessively high pressure is detrimental to any piping system, resulting in premature failure of piping components, which can cause flooding. The Zurn Wilkins **Pilot Operated Pressure Relief/ Sustaining Control Valve ZW205** is a superb choice for protection against this condition in any piping system, including all potable water and fire sprinkler systems. In the event that upstream pressure needs to be sustained at a minimum, the Zurn Wilkins ZW205 is right for the job.

Marks

c UL US LISTED

IAPMO R&T

WILKINS LEAD FREE XL PRODUCTS

BSI

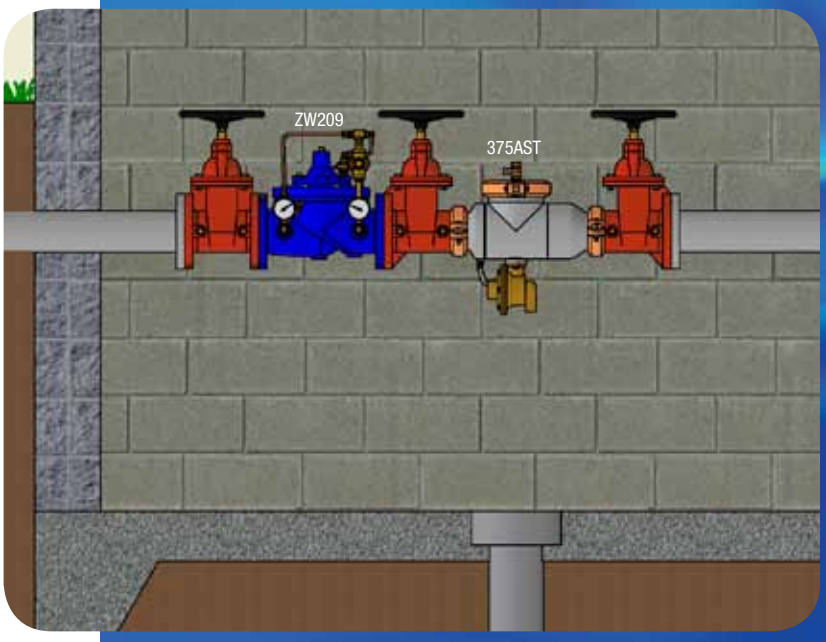
ISO 9001:2008
FM 540810

Typical Applications

Zurn Wilkins Pilot Operated Automatic Control Valves lend themselves to many applications. In this installation of a Zurn Wilkins 375ASTMS Reduced Pressure Principle Assembly, the ZW206 Solenoid Control Valve is used to shut off the supply of water if 375ASTMS experiences continuous relief valve discharge. This is accomplished by the Zurn Wilkins Electronic Solenoid Timer Electronic Solenoid Timer (EST). If excessive relief valve discharge occurs, the 375ASTMS sends an electric signal to the EST, which then signals the ZW206 to close. The relief valve discharge is stopped, preventing any potential flooding of the premises. The ZW209 positioned downstream of the 375ASTMS ensures plumbing code compliance by reducing the pressure to the building to an acceptable level. All of these actions are automatic and require no human intervention.

Backflow prevention assemblies have working pressures that may be below the municipal supply pressure. If the municipal supply pressure is greater than the working pressure of your backflow assembly, such as the 375AST shown, the ZW209 is an excellent choice for your pressure reduction needs. The ZW209, installed before the 375AST, will reduce the municipal supply pressure to a constant value that is within the operating characteristics of the 375AST. The ZW209, with its ability to hold a constant downstream pressure regardless of inlet pressure changes or flow rate changes, is highly desirable in all backflow prevention assembly installations.

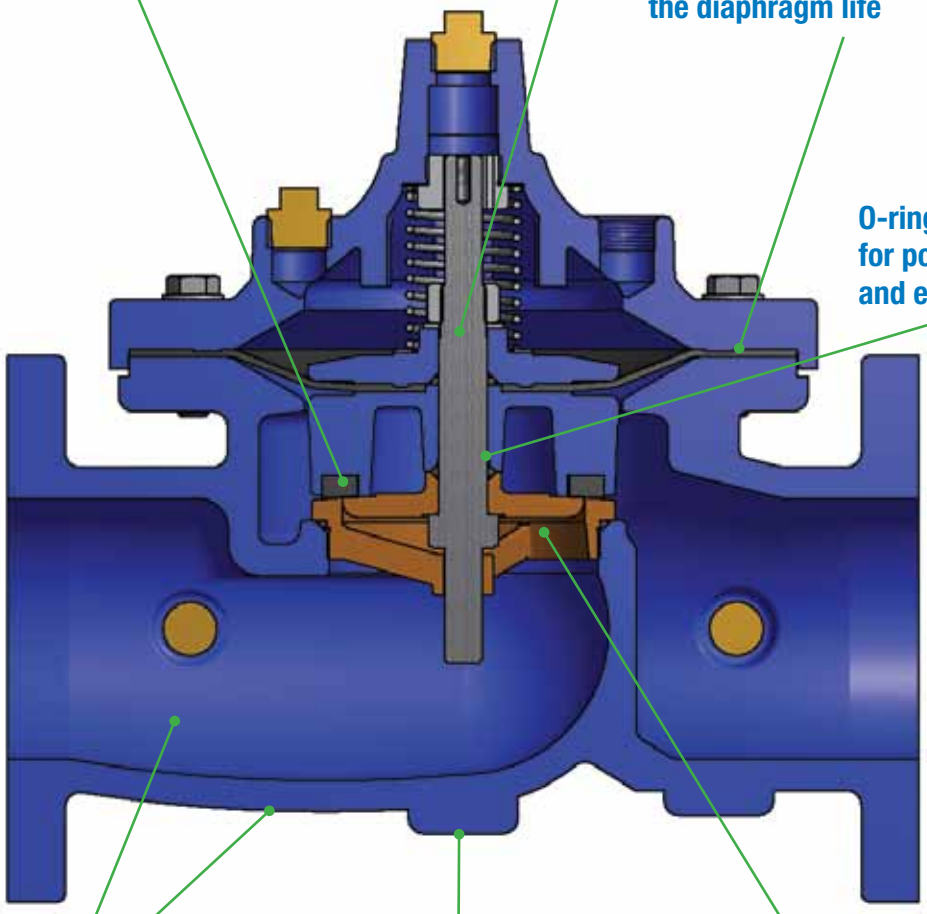
Typical installation of a ZW206 Solenoid Control Valve and ZW209 Pressure Reducing Valve in conjunction with a 375ASTMS Reduced Pressure Backflow Assembly with Relief Valve Monitor Switch



Typical installation of a ZW209 Pressure Reducing Valve in conjunction with a 375AST Reduced Pressure Principle Assembly

Simple Yet Efficient Design

Features and Benefits



Specification Overview

Globe, Flanged
ZW209 Shown

Globe, Grooved
ZW209FP Shown

GLOBE SIZES, END CONNECTIONS, STANDARDS, PRESSURE RATING

End Connections	ANSI Standard	Size Range	Pressure Rating
Threaded	ANSI B1.20.1	2"	400 psi
ANSI CLASS 150	ANSI B16.42; ANSI/ AWWA C110/ A21.10	2" thru 8"	250 psi
ANSI CLASS 300	ANSI B16.42	2" thru 8"	400 psi
IPS Grooved ends	ANSI/AWWA C606	2" thru 8"	300 psi

MATERIALS/INTERNALS

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	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

OPERATING TEMPERATURE RANGE:

Water 33°F to 140°F

OPTIONS AND ACCESSORIES

Function Options

BP Low-flow by-pass on ZW209 Pressure Reducing Valve
E Solenoid to add electrical shut-off to any valve
H Add a pressure sustaining feature to main valve
R Add a pressure reducing feature to main valve
C Add a hydraulic check valve feature to main valve
L Closing Speed Control
O Opening Speed Control

Connection Options

G IPS grooved connections
TH NPT female threaded connections
British threaded options available
Y ANSI Class 300 flanges
British and ISO flange connections available

Main Valve Options

SS Stainless steel seat and internal trim
V Viton rubber
Z Visual position indicator
P Purple cover for reclaimed water systems

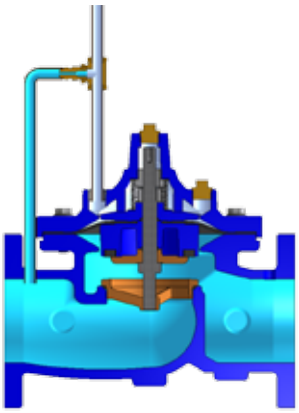
Pilot Options

See individual specs for pilot options with each model

* Refer to www.zurn.com for updated information

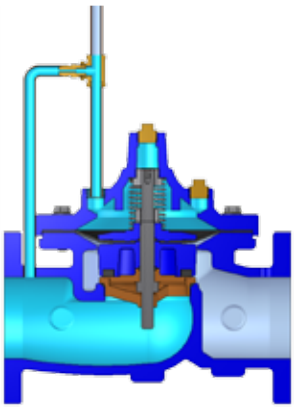
Valve Function

On/Off Control (Non-Modulating)



Valve Open

A non-modulating control valve refers to a valve that is either fully open or fully closed, accomplished by a fully open or fully closed three-way control. A non-modulating control valve cannot be positioned in a partially open condition.

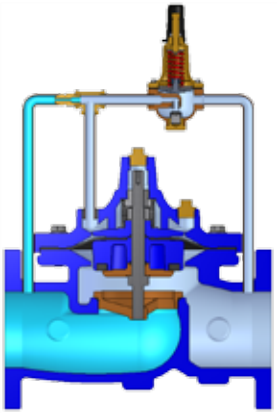


Valve Closed

The non-modulating three-way control, when fully activated, allows water to be ported into or out of the diaphragm chamber of the main valve. When the three-way control ports the incoming fluid into the diaphragm chamber of the main valve, the main valve closes fully. When the three-way control ports fluid within the main valve diaphragm chamber either to atmosphere or to a connection downstream of the main valve, the main valve will open fully.

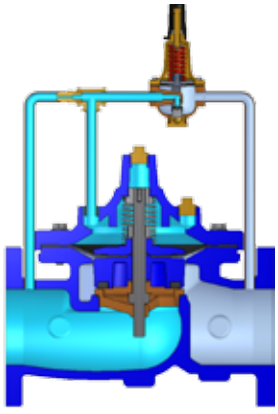
Modulating Control

A Modulating Control Valve can be fully open, fully closed, or positioned at any point in between. The control used on the valve provides the modulation capability.



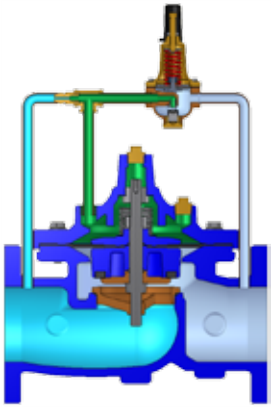
Valve Open

The main valve will open when the throttling control begins to open. The throttling control will relieve pressure from the diaphragm chamber at a faster rate than the fluid flowing through restriction can repressurize the diaphragm chamber.



Valve Closed

As the throttling control begins to close, it can no longer relieve pressure from the diaphragm chamber at a greater rate than the restriction can repressurize the diaphragm chamber. The fluid flowing through the restriction repressurizes the diaphragm chamber causing the main valve to close.



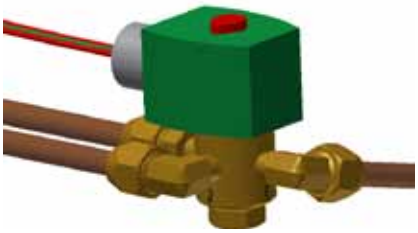
Valve Modulating

Since both the main valve and the throttling control have the ability to function at any point between fully open and fully closed, should the throttling control be partially open, the main valve will also be partially open. Any changes in the position of the throttling control will always be mirrored by the main valve. When the throttling control fully opens, fully closes, or partially opens, the main valve also fully opens, fully closes, or partially opens.

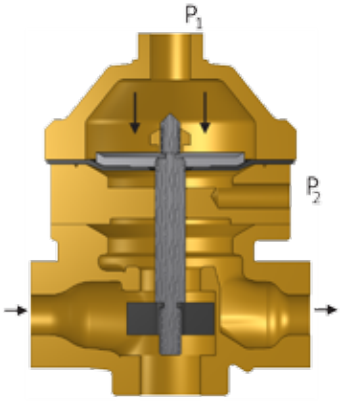
Control Function

On/Off Control

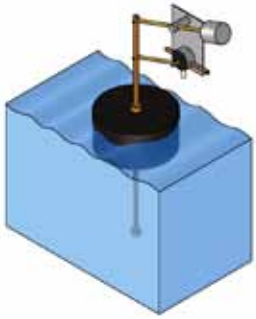
Non-Modulating three-way controls are designed to be low friction, and require very little force to operate. A number of energy sources can provide operation, but the most common are: with a manual valve solenoid; by the difference between two pressures; and by a float.



With a solenoid



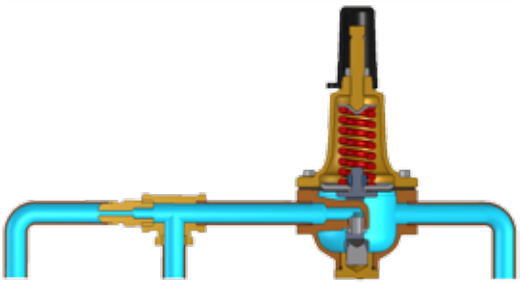
By a difference in two pressures



By a float

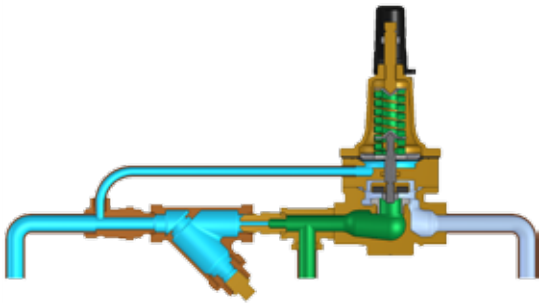
Modulating Control

Zurn Wilkins Pilot Operated Automatic Control Valves utilize a number of different controls for modulating applications.



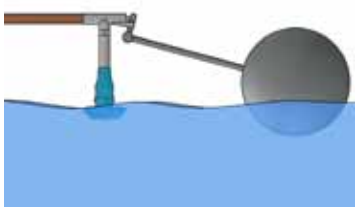
Pressure Reduction

The Pressure Reducing Control senses changes in the downstream pressure and responds accordingly. The main valve will react to track changes in the control, and the downstream pressure is held constant.



Pressure Relief

The Pressure Relief Control senses changes in the upstream pressure and responds accordingly. If the pressure rises above the set point of the control, the control opens and allows the main valve to open. When the pressure subsides, the control closes and the main valve closes.



Fluid Level Control

The Fluid Level Control senses changes in the tank or reservoir volume via a float. When the level in the tank or reservoir falls, the float will fall, allowing the main valve to open. When the level in the tank or reservoir rises, the float of the Fluid Level Control will rise, causing the main valve to close.

Model ZW209 Pressure Reducing Valve

- Holds downstream pressure to a constant value
- Simple to commission and maintain in-line
- Pressure gauges, isolation valves and wye strainer standard
- Available with an optional checking feature
- Reinforced diaphragm provides long service life
- Lead-free law compliant

The Zurn Wilkins ZW209 pilot operated pressure reducing valve is designed for many applications where the reduction of high inlet pressures to a 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 ZW209 comes standard with epoxy coating internally and externally for corrosion protection, as well as isolation valves and pressure gauges for quick and easy maintenance or repair.

STANDARD EQUIPMENT

Wye Type Strainer
Opening Speed Control (sizes 2" thru 3")
Pilot Isolation Valves
Inlet and Outlet Pressure Gauges
Epoxy Coated
ANSI Class 150 Flanges

SIZES

Globe Style Body:

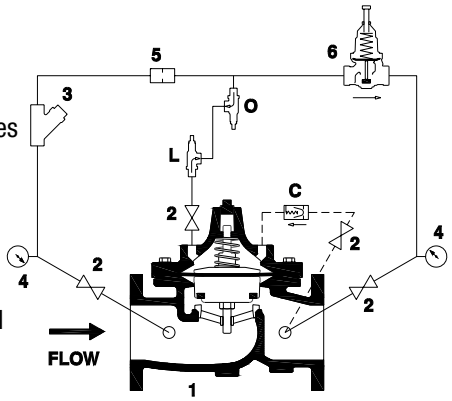
Threaded Ends	2"
Flanged Ends	2" thru 8"
Grooved Ends	2" thru 8"

MATERIALS

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	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

SCHEMATIC DIAGRAM

Item	Description of Standard Features
1	Main Valve
2	850 Isolation Valve
3	SXL Wye Type Strainer
4	Pressure Gauge
5	Restriction Fitting
6	NR3 Pressure Reducing Control



STANDARDS COMPLIANCE & PRESSURE RATINGS

	Standards Compliance	Pressure Ratings
Main Valve	ANSI/AWWA C530	
Threaded	NPT - ANSI B1.20.1	400 psi
Flanged	CLASS 150 - ANSI B16.42	250 psi
	CLASS 300 - ANSI B16.42	400 psi
Grooved	IPS - AWWA C606	300 psi

OPTIONS (add suffix letters to ZW209)

Function	C	40XL Hydraulic Check with Isolation Valve
	L	SC1 Closing Speed Control *
	O	SC1 Opening Speed Control
Connections	G	IPS Grooved
	TH	NPT Threaded
	Y	ANSI Class 300 Flanges
Pilot System	ST	Stainless Tubing and Fittings
	HP	20-200 psi High Pressure Range
		PV-PRD Pilot (Replaces NR3)
	RV	Pilot Installed on Reverse Side
	GL	With Liquid Filled Gauge(s)

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

OPERATING TEMPERATURE RANGE

Water 33°F to 140°F

PILOT SPRING RANGES

15-150 psi standard
20-200 also available

* Refer to www.zurn.com for updated information

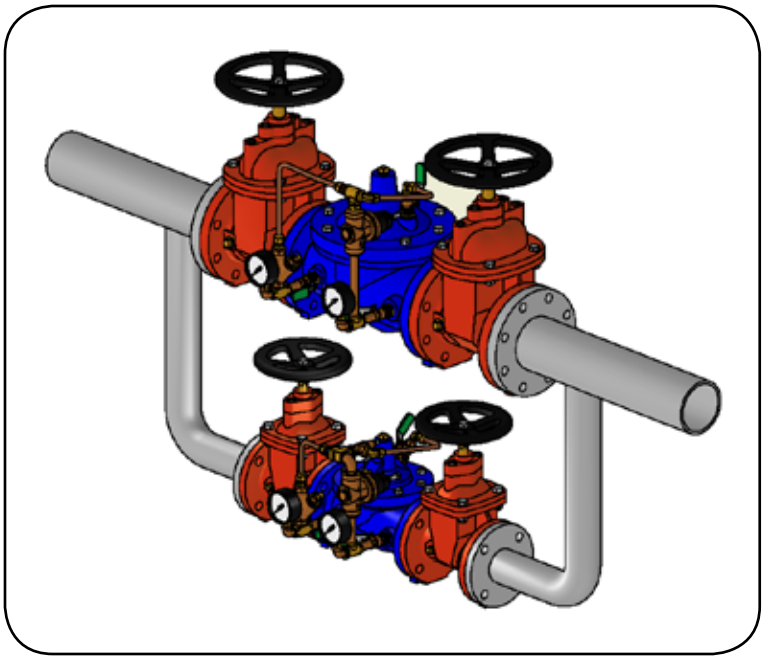
TYPICAL APPLICATION

Typical pressure reducing valve station using two Zurn Wilkins Model ZW209 valves in parallel to handle a wide range of flow rates. The larger Model ZW209 valve takes care of peak loads and the smaller Model ZW209 handles low flows.

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 setting 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.



FLOW CHARACTERISTICS

Suggested 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 approximately 25 ft./sec (7.6 meters/sec), and minimum continuous flow is approximately 1.25 ft./sec (0.4 meters/sec).

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

ZW209BP: Pressure Reducing Valve with Low-Flow By-Pass

- Same as ZW209 except provided with a low-flow by-pass
- By-pass will handle flows from 0 to 15 GPM
- Perfect for providing water to service sinks and toilets or any application that requires low-flows up to 15 GPM

Note: The by-pass is not intended to handle all low-flow applications. Refer to the Question and Answers section for more information. An additional by-pass may be necessary, depending upon system requirements. Please contact Zurn Wilkins Customer Care at 1-877-222-5356 for additional assistance in sizing additional by-passes.

Model ZW209FP Fire Protection Pressure Reducing Valve

- Listed by UL and C-UL
- Provided in a globe body configuration
- State-of-the-art design and construction
- Ductile Iron body is fusion epoxy coated inside and out
- Holds fire system pressure to a constant value
- Fully repairable while in-line

The Zurn Wilkins 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 ZW209FP and ZW209FPG come standard with red epoxy coating internally and externally for corrosion protection, as well as pressure gauges for quick and easy maintenance or repair.

APPROVALS

UL and C-UL Listed (2 1/2" thru 6")

c UL us LISTED

STANDARD EQUIPMENT

Wye Type Strainer
Inlet and Outlet Pressure Gauges (UL/FM)
3-Way Gauge Isolation Valves
Epoxy Coated
ANSI Class 300 Flanges

SIZES

Globe Style Body:

Flanged Ends	2 1/2" thru 6"
Grooved Ends	2 1/2" thru 6"

MATERIALS

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	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

SCHEMATIC DIAGRAM

Item	Description of Standard Features
1	Main Valve
2	SXL Wye Type Strainer
3	Pressure Gauge
4	Restriction Tube Fitting
5	PV-PRD Pressure Reducing Control

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

OPTIONS (add suffix letters to ZW209FP)

Item	Description
G	Grooved Ends (inlet rating 300 psi)
X	ANSI Class 150 Flanges (inlet rating 250 psi)
RV	Pilot Installed on Reverse Side

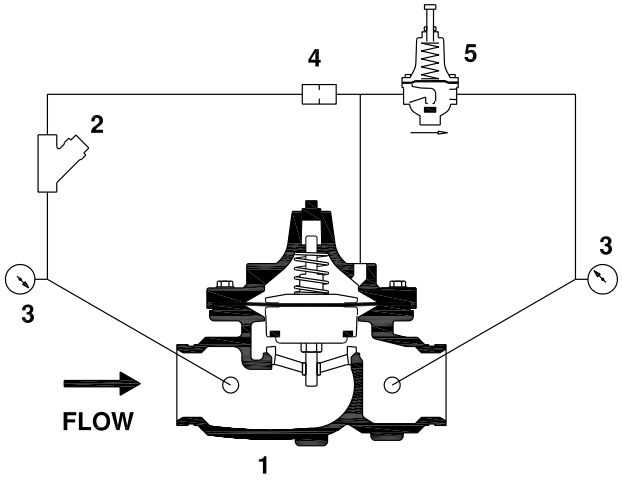
OPERATING TEMPERATURE RANGE

Water 33°F to 140°F

PILOT SPRING RANGES

50-165 psi, Residual Pressure

* Refer to www.zurn.com for updated information



Specifications · Features · Materials · Installations

Both upstream and downstream pressure gauges are required by Underwriters Laboratories® (UL) per standard. In addition, a relief valve of ½" or larger MUST be installed on the downstream side of the ZW209FP ACV. Provide drainage for the relief valve discharge, adequate to handle all relief valve capacity.

UL installation specifications require the ZW209FP 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 ZW209FP 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).

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 setting, 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.

FLOW CHARACTERISTICS

Valve Size	NPS (inches)	2 1/2	3	4	6
	DN (mm)	65	80	100	150
Min Flow Rate to Set Valve (GPM)		35	60	100	220
Max Flow Rate (GPM)		375	600	1000	2250

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), and minimum continuous flow is approximately 1.25 ft./sec (0.4 meters/sec).

Model ZW206 Solenoid Control Valve

The Zurn Wilkins ZW206 solenoid operated control valve is designed to be either fully open or fully closed in response to an electrical signal to the solenoid pilot assembly. The valve is equipped with a 3-way electrical solenoid-operated pilot that can be plumbed to be normally closed (energized to open) or normally open (energized to close) providing main valve on/off capabilities.

STANDARDS COMPLIANCE AND PRESSURE RATINGS

	Standards Compliance	Pressure Ratings
Main Body	ANSI/AWWA C530	
Threaded	NPT - ANSI B1.20.1	400 psi
Flanged	CLASS 150 - ANSI B16.42	250 psi
	CLASS 300 - ANSI B16.42	400 psi
Grooved	IPS - AWWA C606	300 psi

* Contact factory for solenoid operating above 200 psi

STANDARD EQUIPMENT

Wye Type Strainer
Pilot Isolation Valves
Epoxy Coated
Closing Speed Control (sizes 6" thru 8")
ANSI Class 150 Flanges

SIZES

Globe Style Body:

Threaded Ends	2"
Flanged Ends	2" thru 8"
Grooved Ends	2" thru 8"

MATERIALS

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	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

OPTIONS (add suffix letters to ZW206)

Function	Description
Function	**Description**
C	40XL Check Valve with Isolation Valve
L	SC1 Closing Speed Control
O	SC1 Opening Speed Control
Connections	
G	IPS Grooved
TH	NPT Threaded
Y	ANSI Class 300 Flanges
Pilot System	
ST	Stainless Tubing and Fittings
NC	Normally Closed (energize to open) Main Valve, 120vac Solenoid
NO	Normally Open (energize to close) Main Valve, 120vac Solenoid
24NC	Normally Closed (energize to open) Main Valve, 24vac Solenoid
24NO	Normally Open (energize to close) Main Valve, 24vac Solenoid
MO	Manual Operator on Solenoid Valve (to control during power failure)
W	Independent Operating Pressure
F	Atmospheric Drain
RV	Pilot Installed on Reverse Side

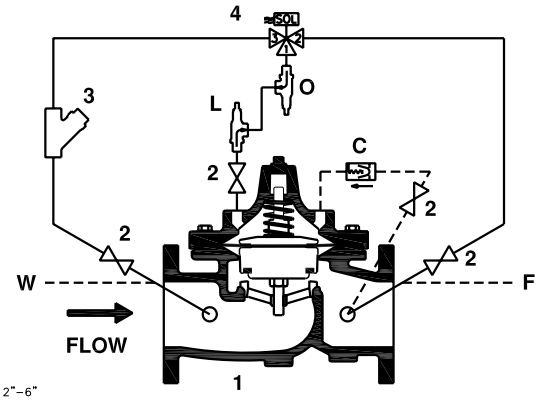
OPERATING TEMPERATURE RANGE

Water 33°F to 140°F

* Refer to www.zurn.com for updated information

SCHEMATIC DIAGRAM ZW206

Item	Description of Standard Features
1	Main Valve
2	850 Isolation Valve
3	SXL Wye Type Strainer
4	PV-SOL3 3-Way Solenoid Control



Specifications · Features · Materials · Installations

TYPICAL APPLICATION

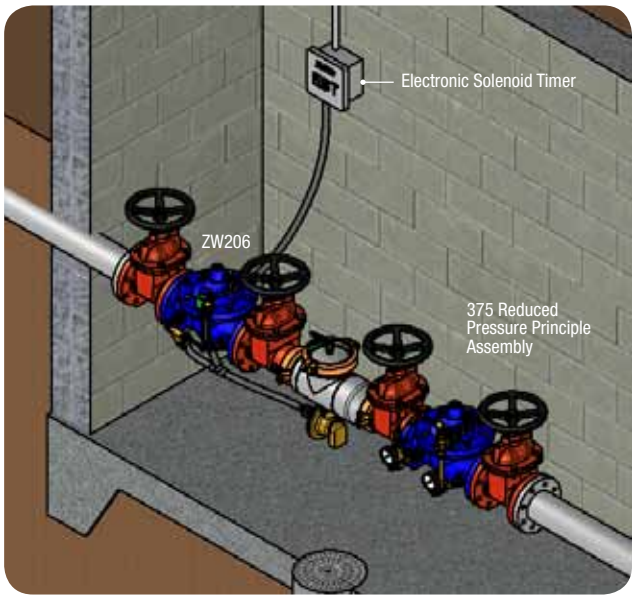
The ZW206 can be used in conjunction with the Zurn Wilkins 375MS and EST system to control relief valve discharged from reduced pressure principle backflow assemblies. Consult factory or visit www.zurn.com for information on other applications.

OPERATION

The Model ZW206 is supplied by an electrically-actuated pilot assembly. This pilot has two basic parts: 1) the solenoid, or coil, itself, and 2) the pilot valve that channels flow of the liquid being handled. These two parts combine to form a single unit called the "Solenoid Controlled Pilot."

Operating Sequence:
Assuming the use of a NORMALLY CLOSED (energized to open) 3-way Solenoid Pilot Valve:

a) The sequence begins with the solenoid de-energized. The pilot connects inlet pressure to the main valve cover holding the main valve closed.
b) When the solenoid is energized, the pilot valve switches allowing pressure in the cover to be vented downstream. This enables inlet pressure to open the main valve.
c) When the solenoid is de-energized, returns to its original position, connecting the cover back to inlet pressure which closes the main valve. Pilot and valve are now ready for the next sequence.



FLOW CHARACTERISTICS

Suggested 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 approximately 25 ft./sec (7.6 meters/sec), and minimum continuous flow is approximately 1.25 ft./sec (0.4 meters/sec).

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

PILOT SYSTEM SPECIFICATIONS

Rubber Parts:
Buna-N Rubber Synthetic Rubber
Solenoid Control Body:
Brass ASTM B283
Enclosure:
NEMA Type 1,2,3,3S,4,4X General Purpose Watertight
Voltages:
24,120,240,480-60Hz AC, 110, 220-50Hz AC,
6, 12, 24, 120, 240-DC Others Available

Max. Operating Pressure Differential:
200 psi
Coil:

Insulation Molded Class	F
Watts AC, 60Hz	6.1
AC Volt Amps Inrush	30
AC Volt Amps Holding	16
Watts DC	10.6

Model ZW205 Pressure Relief Pressure Sustaining Valve

- Accurately senses inlet pressure
- Available with an optional checking feature
- Opens rapidly to maintain line pressure
- Closes slowly to prevent surges
- Operation is fully automatic

The Zurn Wilkins 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).

STANDARD EQUIPMENT

Wye Type Strainer
Closing Speed Control (sizes 1 1/4" thru 4")
Pilot Isolation Valves
Inlet Pressure Gauge
Epoxy Coated
ANSI Class 150 Flanges

SIZES

Globe Style Body:	
Threaded Ends	2"
Flanged Ends	2" thru 8"
Grooved Ends	2" thru 8"

MATERIALS

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	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

STANDARDS COMPLIANCE AND PRESSURE RATINGS

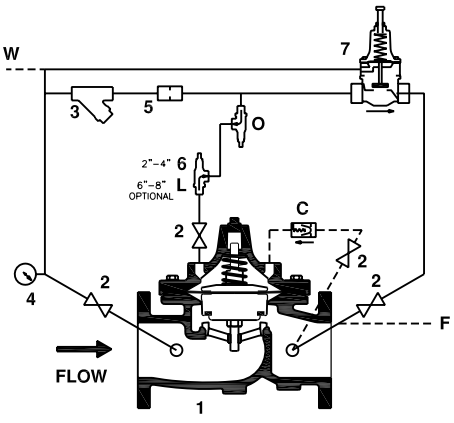
	Standards Compliance	Pressure Ratings
Main Body	ANSI/AWWA C530	
Threaded	NPT - ANSI B1.20.1	400 psi
Flanged	CLASS 150 - ANSI B16.42	250 psi
	CLASS 300 - ANSI B16.42	400 psi
Grooved	IPS - AWWA C606	300 psi

OPTIONAL FEATURES

Function	Description
Function	**Description**
C	40XL Hydraulic Check with Isolation Valve
L	SC1 Closing Speed Control
O	SC1 Opening Speed Control
Connections	
G	IPS Grooved
TH	NPT Threaded
Y	ANSI Class 300 Flanges
YX	Flanges Class 300 Inlet x Class 150 Outlet
Pilot System	
ST	Stainless Tubing and Fittings
W	Independent Operating Pressure
F	Atmospheric Drain
RV	Pilot Installed on Reverse Side
GL	With Liquid Filled Gauge(s)

SCHEMATIC DIAGRAM

Item	Description of Standard Features
1	Main Valve
2	850 Isolation Valve
3	SXL Wye Type Strainer
4	Pressure Gauge
5	Restriction Fitting
6	SC1 Closing Speed Control
7	PV-RLF Pressure Relief Valve



OPERATING TEMPERATURE RANGE

Water 33°F to 140°F

PILOT SPRING RANGES

20 to 200 psi (standard)

* Refer to www.zurn.com for updated information

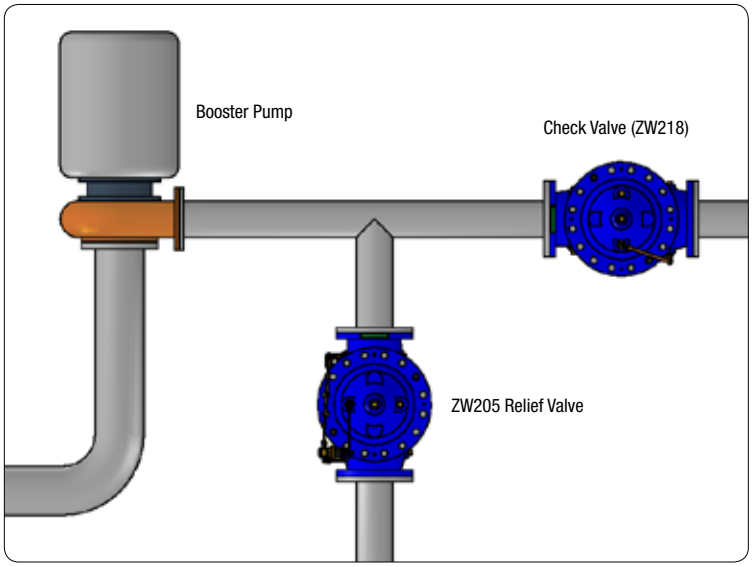
TYPICAL INSTALLATION

Pressure Relief Service - Limit excessive inlet pressure to prevent system damage.
Pressure Sustaining Service -Sustains inlet pressure to a desired level.

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.

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.

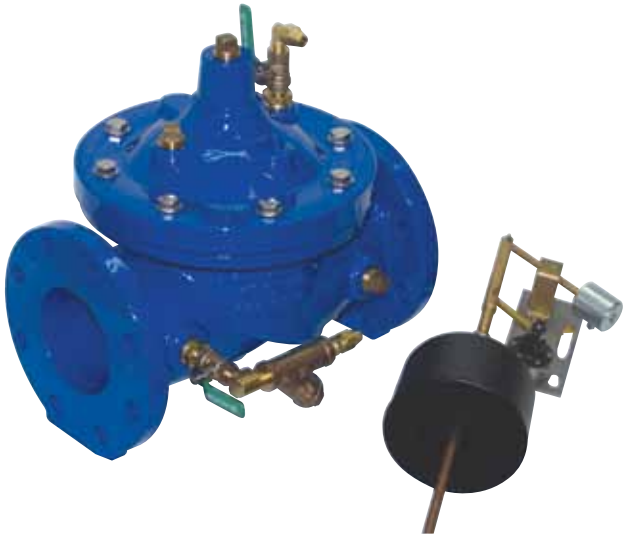


FLOW CHARACTERISTICS

Suggested flow calculations are based on flow through schedule 40 pipe. Maximum continuous flow is approximately 20 ft./sec (6.1 meters/sec) and maximum surge is approximately 45 ft./sec (13.7 meters/sec).

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

Model ZW204 Float Valve



The Zurn Wilkins ZW204 pilot operated non-modulating float valve is designed to maintain accurate fluid levels in tanks. Once the fluid level reaches the low set-point of the float rod assembly, the main valve opens to fill the tank. Once the fluid level reaches the high set-point of the float rod assembly, the main valve closes drip-tight.

STANDARDS COMPLIANCE

	Standards Compliance	Pressure Ratings
Main Body	ANSI/AWWA C530	
Threaded	NPT - ANSI B1.20.1	400 psi
Flanged	CLASS 150 - ANSI B16.42	250 psi
	CLASS 300 - ANSI B16.42	400 psi
Grooved	IPS - AWWA C606	300 psi

STANDARD EQUIPMENT

Wye Type Strainer
Pilot Isolation Valves
Epoxy Coated
ANSI Class 150 Flanges

SIZES

Globe Style Body:

Threaded Ends	2"
Flanged Ends	2" thru 8"
Grooved Ends	2" thru 8"

MATERIALS

Main Valve Body	Ductile Iron ASTM A536
Main Valve Cover	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
Float	Polypropylene

SCHEMATIC DIAGRAM

Item	Description of Standard Features
1	Main Valve
2	850 Isolation Valve
3	SXL Wye Type Strainer
4	PV-FNM Float Control

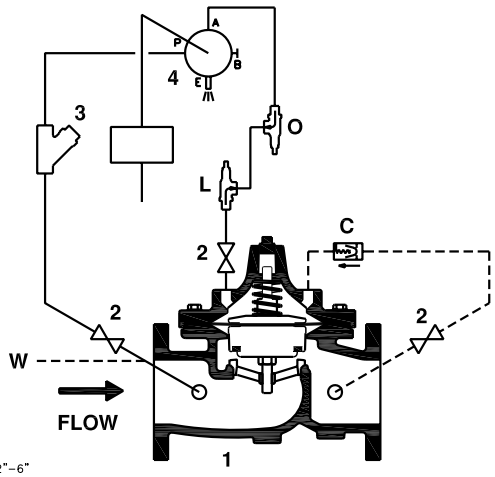
OPTIONS (add suffix letters to ZW204)

Function	Description
Connections	
C	40XL Hydraulic Check with Isolation Valve
L	SC1 Closing Speed Control
O	SC1 Opening Speed Control
G	IPS Grooved
TH	NPT Threaded
Y	ANSI Class 300 Flanges
Pilot System	
ST	Stainless Tubing and Fittings
SF	Stainless Float and Rod
R1	12" Float Rod Extension
W	Independent Operating Pressure
RV	Pilot Installed on Reverse Side

OPERATING TEMPERATURE RANGE

Water 33°F to 140°F

* Refer to www.zurn.com for updated information

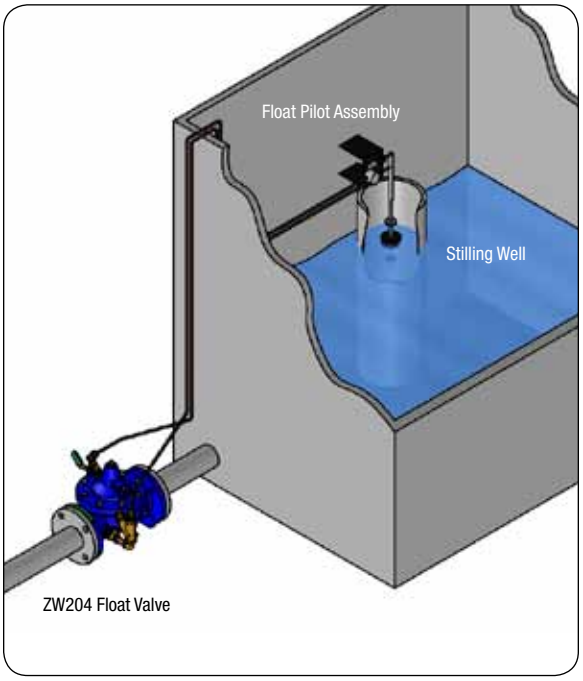


2"–6"

Specifications · Features · Materials · Installations

TYPICAL APPLICATION

The Model ZW204 Float Valve provides on/off liquid-level control in a tank.



OPERATION

The Model ZW204 utilizes a float pilot that opens the valve fully at a predetermined low set point and closes it tightly at the high set point. This pilot consists of a body, rotary disc and the float. The body of the pilot contains three sets of flow passages: the supply, the common, and the exhaust. The rotary disc is correspondingly keyed to these same functions of supply, common, and exhaust. The pilot is so constructed that when the float reaches its low level set point, the supply port of the pilot is blocked, and the common port connects to the exhaust. This vents pressure in the upper chamber of the main valve allowing inlet pressure to open the valve and fill the tank. As the float reaches its high level set point, the opposite action takes place with the exhaust port blocked and supply connected to the common port. This pressurizes the upper diaphragm chamber of the main valve and the valve closes. If the float is between set points, the main valve stays in its last position. Minimum operating pressure 10 psi. A means of flow control may be required downstream to limit maximum flow rate.

To facilitate smooth, free movement of the pilot's float and mechanical linkage, the weight of the float arm is counterbalanced on a pivot. Properly adjusted, this counterweight allows the float to effortlessly move the float arm through the full range between the low and high level set points. Establishing these set points is a simple matter of appropriately positioning the float with upper and lower stop collars on the float rod.

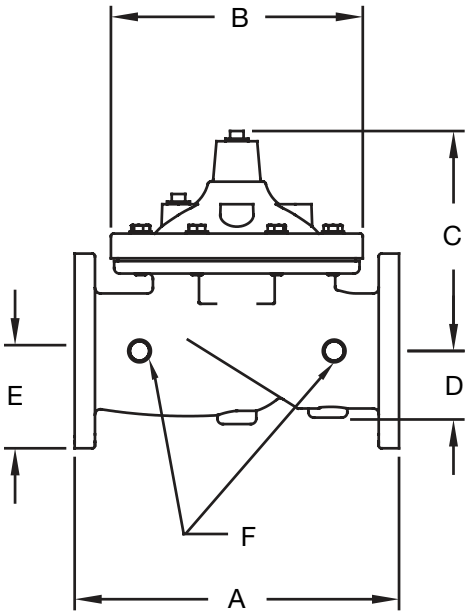
FLOW CHARACTERISTICS

Suggested 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 approximately 25 ft./sec (7.6 meters/sec), and minimum continuous flow is approximately 1.25 ft./sec (0.4 meters/sec).

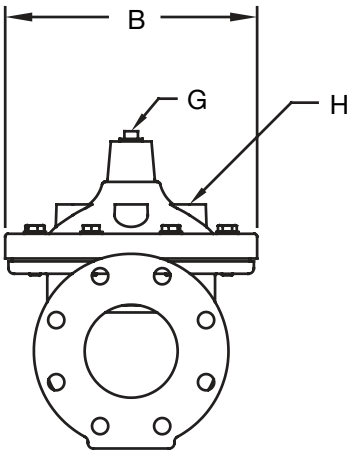
Valve Size	**NPS (inches)**	**2**	**2 1/2**	**3**	**4**	**6**	**8**
	DN (mm)	50	65	80	100	150	200
Suggested Flow (GPM)	**Min. Continuous**	15	20	30	50	115	200
	Max. Continuous	210	300	460	800	1800	3100
	Max. Intermittent	260	375	600	1000	2250	4000
Suggested Flow (Liters/sec)	**Min. Continuous**	0.9	1.3	1.9	3.2	7.2	13
	Max. Continuous	13	19	29	50	113	195
	Max. Intermittent	16.4	23	37	62	142	246

Main Valve Dimensions

DIM	ANSI CLASS	VALVE SIZE inches					
		2	2 1/2	3	4	6	8
A	Threaded	9 7/16	n/a	n/a	n/a	n/a	n/a
	150	9 3/8	11	12	15	20	25 3/8
	300	10	11 5/8	13 1/4	15 5/8	21	26 7/16
	Grooved	9	11	12 1/2	15	20	25 3/8
B	Diameter	6 3/4	8 1/16	9 3/16	11 11/16	15 3/4	20 1/8
C	Max	6 3/16	7 3/8	8 1/8	10 3/16	12 5/16	15 9/16
D	Max	1 3/4	2 1/8	2 9/16	3 7/16	4 15/16	5
E	150	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4
	300	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2
F	NPT Body Tap	3/8	1/2	1/2	3/4	3/4	1
G	NPT Cover Plug Tap	1/2	1/2	1/2	3/4	3/4	1
H	NPT Cover Tap	3/8	1/2	1/2	3/4	3/4	1
Valve Stem Internal Thread UNF		10-32	10-32	1/4-28	1/4-28	3/8-24	3/8-24
Stem Travel		3/4	7/8	15/16	1 3/16	1 3/4	2 3/8
Approximate Weight Lbs.		35	50	70	140	285	500



DIM	ANSI CLASS	VALVE SIZE mm					
		50	65	80	100	150	200
A	Threaded	238	n/a	n/a	n/a	n/a	n/a
	150	238	279	305	381	508	645
	300	254	295	337	397	533	670
	Grooved	229	279	318	381	508	645
B	Diameter	171	205	232	296	400	511
C	Max	156	187	205	258	312	395
D	Max	44	53	65	86	124	127
E	150	76	89	95	114	140	171
	300	83	95	105	127	159	191
F	NPT Body Tap	0.38	0.50	0.50	0.75	0.75	1.00
G	NPT Cover Plug Tap	0.50	0.50	0.50	0.75	0.75	1.00
H	NPT Cover Tap	0.38	0.50	0.50	0.75	0.75	1.00
Valve Stem Internal Thread UNF		10-32	10-32	1/4-28	1/4-28	3/8-24	3/8-24
Stem Travel (mm)		18	21	23	29	43	60
Approximate Weight (kg)		16	23	32	64	129	227



Wilkins Control Valves **Functional Data**

Valve Size	Inches	2"	2-1/2"	3"	4"	6"	8"
	DN (mm)	50	65	80	100	150	200
Cv Factor	GPM	55	80	130	200	460	830
	Liters/sec	13	19	31	48	110	200
Equivalent Length	Feet	55	63	70	116	170	206
	Meters	17	19	21	35	52	63
K Factor		5.4	5.2	4.7	5.9	5.7	5.3
Liquid displaced from Diaphragm Chamber When Valve Opens	Gallons	0.04	0.06	0.09	0.16	0.52	1.29
	Liters	0.13	0.21	0.32	0.59	1.95	4.88

C_V Factor

Formulas for computing C_V Factor, Flow (Q) and Pressure Drop ($\blacktriangle P$):

$$C_V = \frac{Q}{\sqrt{\blacktriangle P}} \qquad Q = C_V \sqrt{\blacktriangle P} \qquad \blacktriangle P = \left(\frac{Q}{C_V}\right)^2$$

K Factor (Resistance Coefficient)
The Value of K is calculated from the formula: $K = \frac{894\,d^4}{C_V{}^2}$
(U.S. system units)

Equivalent Length of Pipe
Equivalent lengths of pipe (L) are determined from the formula: $L = \frac{K\,d}{12\,f}$
(U.S. system units)

Fluid Velocity
Fluid velocity can be calculated from the following formula: $V = \frac{.4085\,Q}{d^2}$
(U.S. system units)

Where:

C_V = U.S. (gpm) @ 1 psi differential at 60° F water
or
= (l/s) @ 1 bar (14.5 PSIG) differential at 15° C water

d = inside pipe diameter of Schedule 40 Steel Pipe (inches)

f = friction factor for clean, new Schedule 40 pipe (dimensionless) (from Cameron Hydraulic Data, 18th Edition)

K = Resistance Coefficient (calculated)

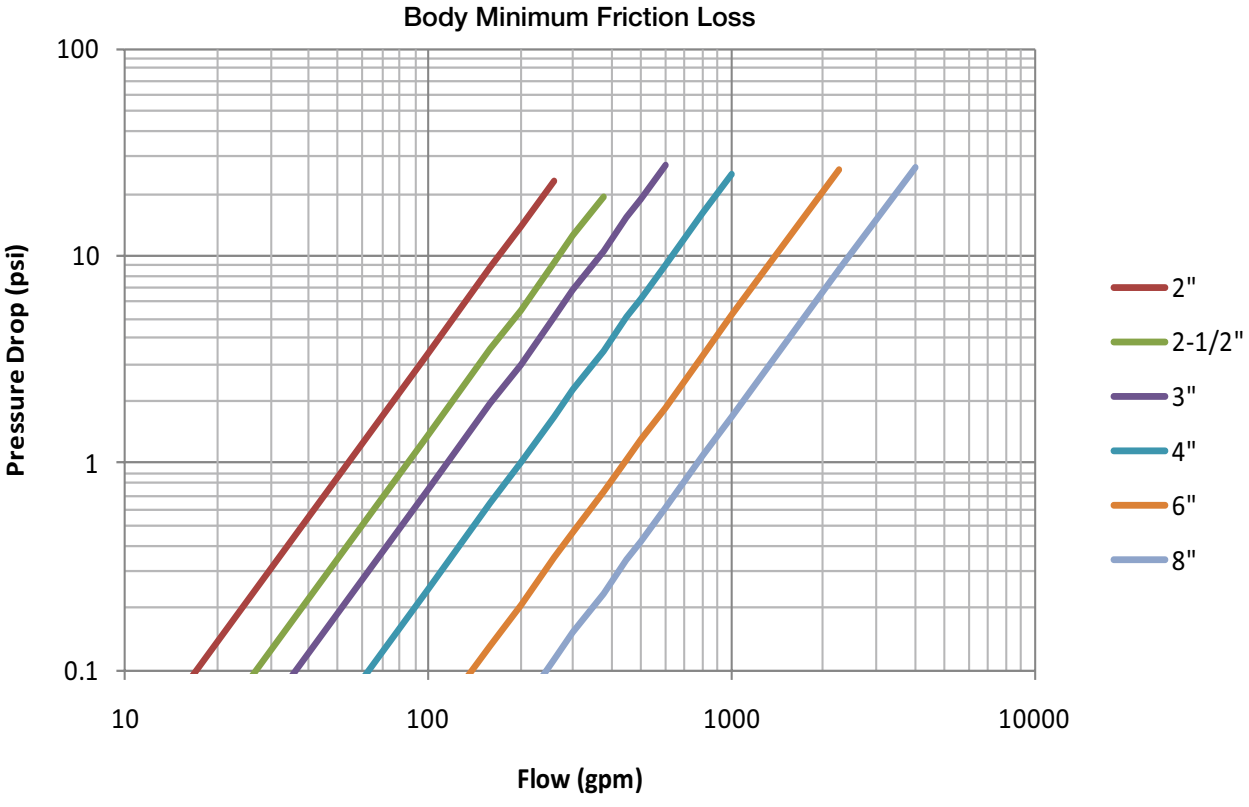
L = Equivalent Length of Pipe (feet)

Q = Flow Rate in U.S. (gpm) or (l/s)

V = Fluid Velocity (feet per second) or (meters per second)

$\blacktriangle P$ = Pressure Drop in (psi) or (bar)

FLOW CHART (Based on normal flow through a wide open valve)



Questions and Answers

Q **How do I size a Pilot Operated Pressure Reducing Automatic Control Valve?**

A In order to properly size a pressure reducing automatic control valve, one must know the actual and desired hydraulic characteristics of the system where the valve will be installed. The actual inlet pressure, the desired outlet pressure, and the maximum and minimum continuous flow rates must be determined. Utilizing the Specification Submittal Sheet (found at zurn.com), choose the size of valve that will satisfy the maximum and minimum continuous flow rates of the system. Ensure that the valve will not be in a potential cavitation zone. Utilizing the Zurn Wilkins Cavitation Chart (also found at zurn.com), make certain that the desired pressure drop across the valve does not fall into a cavitation zone. If the pressure drop across a single valve does result in cavitation, the use of two Pressure Reducing Control Valves piped in series would be warranted. With pressure reduction performed by two valves in series, each valve is set such that the pressure is dropped in fairly equal steps. This method ensures that cavitation will not occur, and serves to drastically increase valve longevity.

Q **How do I control water hammer or surging that is caused by my Automatic Control Valve?**

A Water hammer and water surges can be created by a control valve. Water hammer is caused by a rapidly closing valve and surging is caused by a rapidly opening valve. Both of these conditions can be resolved by the use of Model SC1 speed controls. To eliminate water hammer, use a Model SC1 closing speed control. The closing speed control can be adjusted to prevent the rapid closure of the control valve, and the opening speed control would be adjusted to allow the control valve to open slowly. Zurn Wilkins Pressure Reducing Control Valves, in sizes from 1 1/4" to 3", are furnished with speed controls as standard equipment. On 4" and larger valves, speed controls are optional.

Q **My flow rate is below the minimum continuous flow rate of the Automatic Control Valve. How do I handle this?**

A Water flows under the minimum continuous flow rate for the pressure reducing control valve are generally handled by a direct acting pressure reducing valve (PRV) piped in parallel to the automatic pressure reducing automatic control valve (ACV). The PRV is sized according to its ability to flow the proper rate with a fall-off of approximately 5 psi. When installed in parallel with the ACV, the PRV is set to the desired static operating pressure required by the water system. The ACV is then set 5 psi below the setting of the PRV. This ensures that all low flows, from zero up to the minimum continuous flow rate of the ACV will flow through the PRV. When the flowing pressure through the PRV drops to the set point of the ACV, the ACV will begin to open and provide flow up to its maximum continuous rated flow. This method of installation provides a seamless flow rate from zero up to the maximum.

Q **How do I adjust a Pressure Reducing Automatic Control Valve?**

A All pilot operated automatic control valves are relatively easy to set up. Nevertheless, there are distinct procedures that must be followed in order to ensure proper performance and function. Please refer to the instruction sheet for the specific valve, which can be found at zurn.com.

Q **What is the difference between a Direct Acting Pressure Reducing Valve (PRV) and a Pilot Operated Pressure Reducing Automatic Control Valve (ACV)?**

A Aside from the difference in physical size, a pilot operated pressure reducing automatic control valve (ACV) has the ability to hold its downstream pressure at a fairly constant value, regardless of changes in inlet pressure or changes in water demand. Direct acting pressure reducing valves (PRV's) exhibit a condition called fall-off. With PRV's, the downstream pressure decreases as the flow rate increases. Additionally, ACV's have the ability to achieve flow rates far in excess of what a comparably size PRV could provide.

If you still have questions, please contact Zurn Wilkins Customer Care at 1-877-222-5356 for additional assistance.

Accessories

Model ZPI Valve Position Indicator

- Positive Visual Indicator
- Frictionless
- Leak Proof
- Easy Maintenance and Cleaning
- Protected Indicator Rod

The valve position indicator provides a visual indication of the current operating position of any Zurn Wilkins automatic control valve. The valve position indicator is comprised of a rod that is attached to the stem of the main valve, enclosed within a glass tube and affixed to the top of the main valve cover. A quick glance at the valve position indicator will allow confirmation of the current position of the main valve. The position indicator is also helpful in the removal of air trapped under the cover of the main valve. Located at the top of the visual indicator is a manual purge valve that will release trapped air. This option is especially useful when the fluid within the system is quite aerated, causing improper operation.

The ZPI can be installed on any Zurn Wilkins basic main valve in a few minutes. Simply replace the plug on top of the valve cover with the indicator assembly.

Model ZPI Size	Height Above Cover	NPT
2"	4 1/4"	1/2"
2 1/2"	4 1/4"	1/2"
3"	4 1/4"	1/2"
4"	4 1/4"	3/4"
6"	6"	3/4"
8"	6 3/8"	1"

Pressure Gauges

Standard Equipment on all Zurn Wilkins Pressure Reducing and Pressure Relief Automatic Control Valves

Face Diameter:	2 1/2" for 1 1/4" thru 4" Valves (2004-25) 3 1/2" for 6" and Larger Valves (2010-25)
Connection Size:	1/4" NPT Bottom Mount
Range:	0-300 psi for 150# Flange and Grooved End Connections, 0-400 psi for Threaded, 300# Flange and Grooved End Connections
Accuracy:	+/- 3-2-3% of Span
Bourdon Tube:	Phosphor Bronze
Window:	Glass
Movement:	Brass
Dial:	Galvalume
Pointer:	Aluminum, Painted Black
Case:	Black Painted Steel

Accessories

Model 40XL Check Valve

Size:	3/8" thru 3/4"
Body:	Cast Brass
Poppet:	Polyetherimide
Seal Ring:	NBR
Spring:	Stainless Steel

Model SXL Wye Strainer

Size:	3/8" thru 3/4"
Body and Cap:	Cast Bronze ASTM B584 or B806, Lead-Free
Screen:	20 Mesh Stainless Steel, 300 Series

Pilot Restriction Fitting

Size:	3/8"
Body and Restriction:	Brass ASTM B16

Model 850XL Isolation Valve

Size:	3/8" thru 3/4"
Body:	Cast Bronze ASTM B584 or B806, Lead-Free
Ball:	Chrome Plated Bronze ASTM B584 or B806, Lead-Free
Seats:	TFE Virgin Teflon
Stem:	Brass ASTM B16
Stem Packing:	TFE Virgin Teflon
Thrust Washer:	TFE Virgin Teflon
Handle and Nut:	Electroless Nickel Plated

For more information, see spec sheet.

Accessories

Model SC1 Opening and Closing Speed Controls

- Corrosion Resistant
- Automatic Operation
- Operates In Any Position
- Easy Adjustments
- No Lubrication Required
- Easy Maintenance

Opening and closing speed controls are used to slow down the rate at which the main valve opens and closes, and are vitally important when a Zurn Wilkins automatic control valve is expected to cycle between a fully open and a fully closed position. These controls prevent the system from potentially damaging surges or water hammer caused by rapid cycling of the automatic control valve which could harm sensitive system components. The SC1 allows free flow in one direction and restricted flow needle valve in the opposite direction.

SPECIFICATIONS

Size	3/8"
End Detail	3/8" NPT (one connection male one connection female)
Pressure Rating	400 psi Max
Temperature Rating	140° F Max

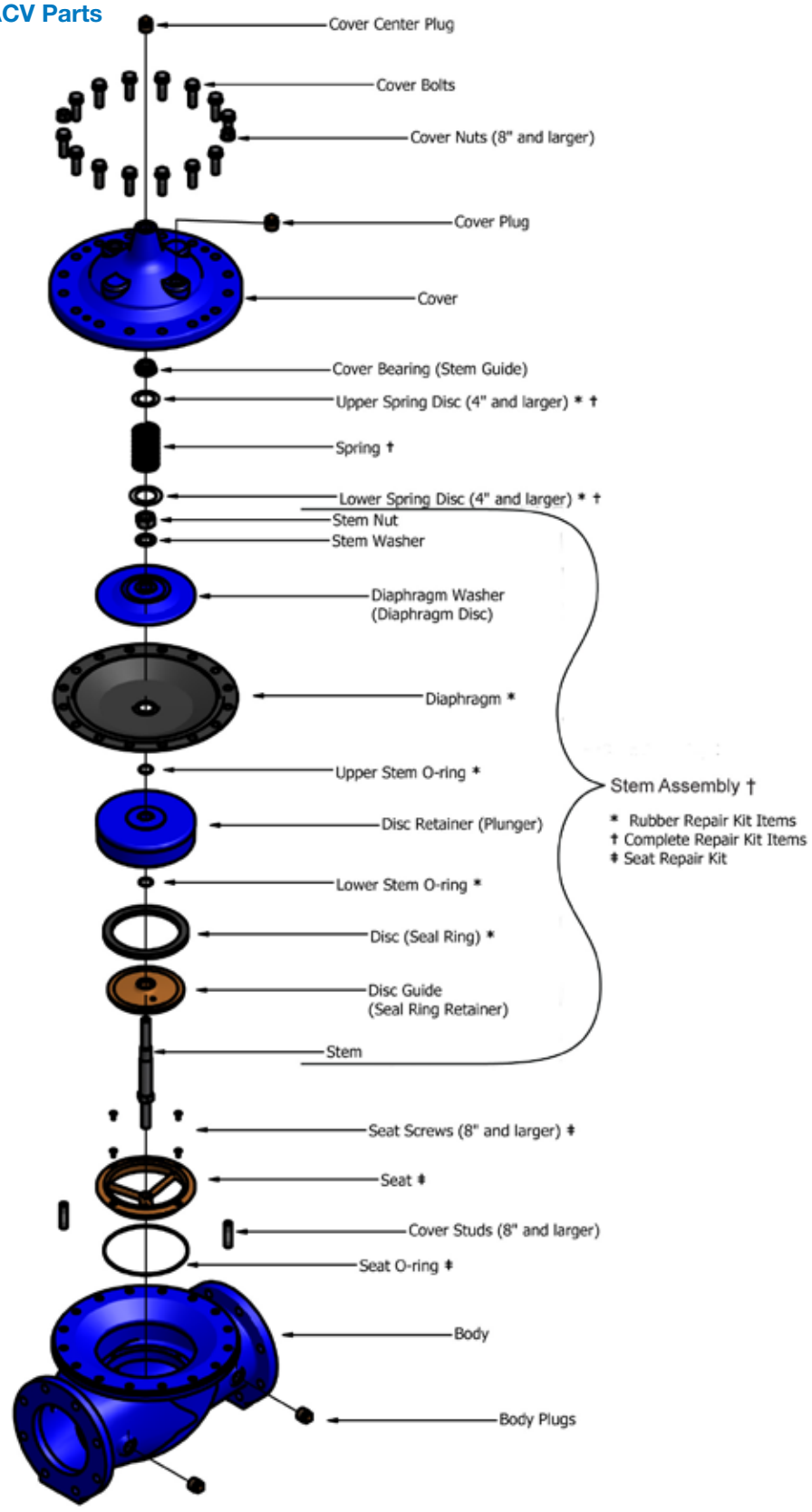
Repair Parts

Repair Kits for All Zurn ZW200 Series ACV Parts

Wilkins ZW200 Series ACV Rubber Repair Kits	
Rubber Repair Kit contains: diaphragm, stem o-rings, and disc (with spring discs for 4" and larger sizes)	
Size	Repair Kit Part Number
2"	RK2-ZW200R
2 ½"	RK212-ZW200R
3"	RK3-ZW200R
4"	RK4-ZW200R
6"	RK6-ZW200R
8"	RK8-ZW200R

Wilkins ZW200 Series ACV Complete Repair Kits	
Complete Repair Kit contains: spring and complete stem assembly (with spring discs for 4” and larger sizes)	
Size	Repair Kit Part Number
2”	RK2-ZW200C
2 ½”	RK212-ZW200C
3”	RK3-ZW200C
4”	RK4-ZW200C
6”	RK6-ZW200C
8”	RK8-ZW200C

Wilkins ZW200 Series ACV Seat Repair Kits	
Seat Repair Kit contains: seat and seat o-ring (with seat screws for 8” and larger sizes)	
Size	Repair Kit Part Number
2”	RK2-ZW200SK
2 ½”	RK212-ZW200SK
3”	RK3-ZW200SK
4”	RK4-ZW200SK
6”	RK6-ZW200SK
8”	RK8-ZW200SK



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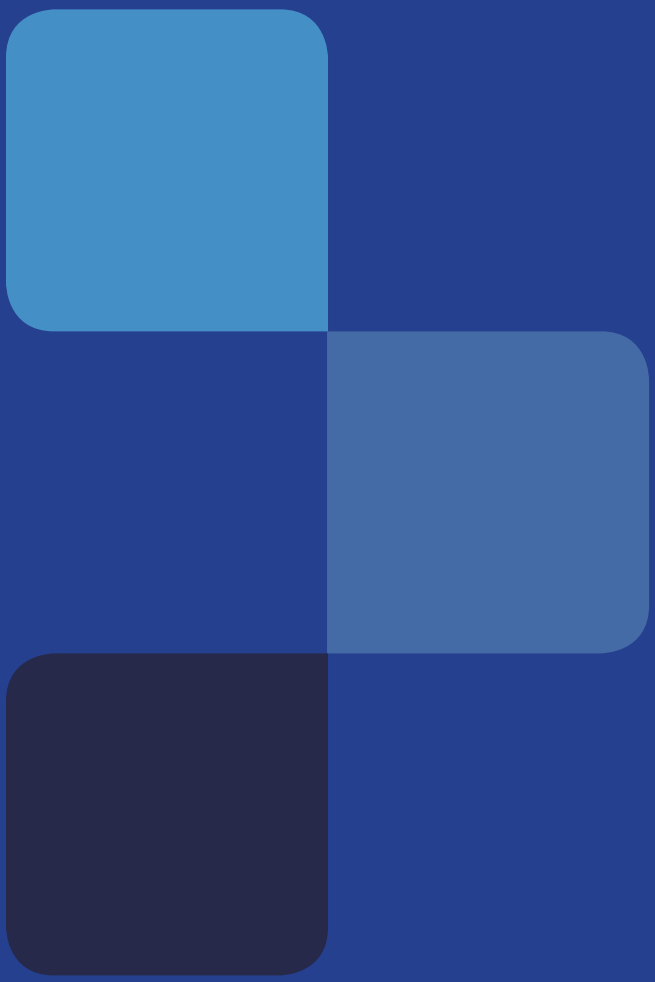

Performance under pressure for over 100 years

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5:30 am to 5:00 pm PST Monday-Friday.
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