



— MODEL — **ZW109BP**

## Pressure Reducing Valve with Low Flow By-Pass

The Wilkins ZW109BP Pressure Reducing Valve with Low Flow By-Pass automatically reduces a higher inlet pressure to a steady lower downstream pressure regardless of changing flow rate. The pressure reducing valve is hydraulically operated and controlled by a BR4 pilot control, which senses pressure at the main valve outlet. An increase in outlet pressure forces the BR4 pilot control to close and a decrease in outlet pressure opens the control. This causes the main valve cover pressure to vary, modulating the main valve and thereby maintaining constant outlet pressure. The control system is very sensitive to slight pressure changes and immediately controls the main valve to maintain the desired downstream pressure. Pressure setting adjustment is made with a single adjusting screw

### INSTALLATION

1. Allow sufficient room around the valve assembly to make adjustments and for servicing.

2. It is recommended that gate or line block valves be installed on both ends of the ZW109BP valve assembly to facilitate isolating the valve for maintenance. Minimum one pipe diameter apart.

**NOTE: BEFORE THE VALVE IS INSTALLED, PIPE LINES SHOULD BE FLUSHED OF ALL CHIPS, SCALE, AND FOREIGN MATTER.**

3. Place the valve assembly in the line with flow through the valve in the direction indicated on the inlet plate or by flow arrows. Check all fittings and hardware for proper makeup and that no apparent damage is evident. Be sure main valve cover nuts/bolts are tight. Pressure in some applications can be very high so be thorough in checking and inspecting for proper installation and makeup.

4. Wilkins Valves operate with maximum efficiency when mounted in horizontal piping with the cover UP; however, other positions are acceptable. Due to size and weight of cover and internal components of six inch and larger valves, installation with the cover up is advisable. This makes periodic inspection of internal parts readily.

### OPERATION AND START-UP

1. Prior to pressurizing the valve assembly make sure the necessary gauges to measure pressure in the system are installed as required by the system engineer. An X101 Valve Position Indicator may be installed in the center cover port to provide a visual indication of the valve movement during startup.

**CAUTION:** During start-up and test procedures a large volume of water may be discharged downstream. Check that the downstream venting is adequate to prevent damage to personnel and equipment. **All adjustments in pressure should be made slowly while under flowing conditions.** If the main valve closes too fast it may cause surging in upstream piping.

2. If isolation valves (B) are installed in pilot system open these valves (see ZW109BP schematic).

3. Optional CV Flow Controls (C or S) provide adjustable regulation of flow in and out of the main valve chamber to minimize pulsations that sometimes occur at very low flow rates. If CV Controls are installed, loosen jam nut and turn adjustment screw counterclockwise from closed position 3.5 turns for an initial setting.

4. Open the upstream gate or block valve just slightly to allow the main valve assembly and pilot system to fill with liquid.

5. Carefully loosen tube fittings at highest points and bleed air from pilot control system. Carefully loosen the plug at top of main valve cover to bleed air from cover. If an indicator is installed, carefully loosen the air bleed valve at top of indicator. Tighten tube fittings.

6. Open the upstream gate or block valve fully.

7. Slowly open the downstream gate or block valve. Flow should occur and pressure should remain constant.

8. Adjust the Wilkins BR4 Controls to desired pressure. To change pressure setting, turn the adjusting screw clockwise to increase pressure, counterclockwise to decrease pressure. There must be liquid flowing through the valve during pressure adjustments. When the desired setting has been made, tighten jam nut and replace cover. Low flow by-pass control (3A) must be set higher than main BR4 (3B).

9. To check the operation of the valve, open and close the downstream gate valve. The downstream pressure should remain constant.

10. If opening and closing speed controls (C or S) are installed in the valve pilot system, fine tune the opening and closing speed of the main valve while performing step 9. Turn the CV adjustment screw clockwise on the opening speed control to make the main valve open slower. Turn the adjustment screw clockwise on the closing speed control to make the main valve close slower. When adjustments have been completed tighten jam nuts.

### MAINTENANCE

1. Wilkins Valves and Controls require no lubrication or packing and a minimum of maintenance. However, a periodic inspection schedule should be established. Minimum of once per year.

**2. When ordering parts always refer to the catalog number and stock number on the valve nameplate.**

### BR4 DISASSEMBLY

1. Note: distance that adjustment bolt protrudes from bell housing. Loosen locknut on adjustment bolt, then turn adjustment bolt out of bell housing to remove spring tension.

2. Unscrew bell housing counterclockwise and remove spring, spring disc and friction ring.

3. Remove cartridge from BR4 by gripping retaining bolt with pliers and pulling outwards away from body.

### TO REASSEMBLE:

1. Replace old cartridge assembly with new cartridge assembly. Push the cartridge into bore in body making sure o-ring seal tight against both the cartridge and body.

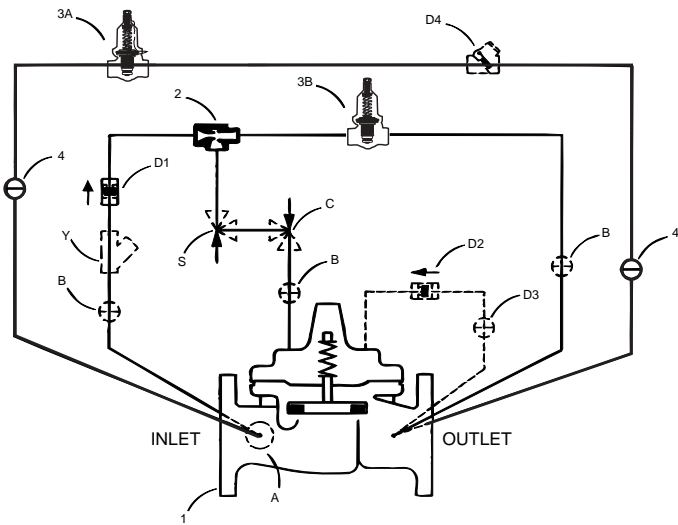
2. Replace friction ring, spring, spring disc and bell housing. Make sure friction ring is installed with raised edge facing up. Tighten bell housing onto body by threading clockwise.

3. Adjust BR4 to desired pressure by following steps 9 and 10 above.

4. Tighten locknut when desired pressure is achieved.

SYMPTOM	PROBABLE CAUSE	REMEDY
Main valve fails to open	No pressure at valve inlet	Check inlet pressure
	Main valve diaphragm assembly inoperative	Disassemble, clean and polish stem, replace defective parts
	Pilot Valve (BR4) not opening: 1. No spring compression 2. Damaged spring	1. Tighten adjusting screw 2. Disassemble and replace
	Flow Control (CV) disc inoperative, corrosion or excessive scale buildup on stem	Disassemble, clean and polish stem. Replace worn parts
Main valve fails to close	Foreign matter between disc and seat or worn disc. Scale on stem or Diaphragm ruptured Flow Clean Strainer plugged CK2 (isolation valves) closed	Disassemble main valve, remove matter, clean parts and replace defective parts Remove and clean or replace Open isolation valves
	Pilot Valve (BR4) remains open: 1.Spring compressed solid 2.Mechanical obstruction  3.Worn seal ring	1. Back off adjusting screw 2. Disassemble and remove obstruction 3. Disassemble remove and replace cartridge assembly
	Fails to regulate	Air in main valve cover and/or tubing

# ZW109BP SCHEMATIC

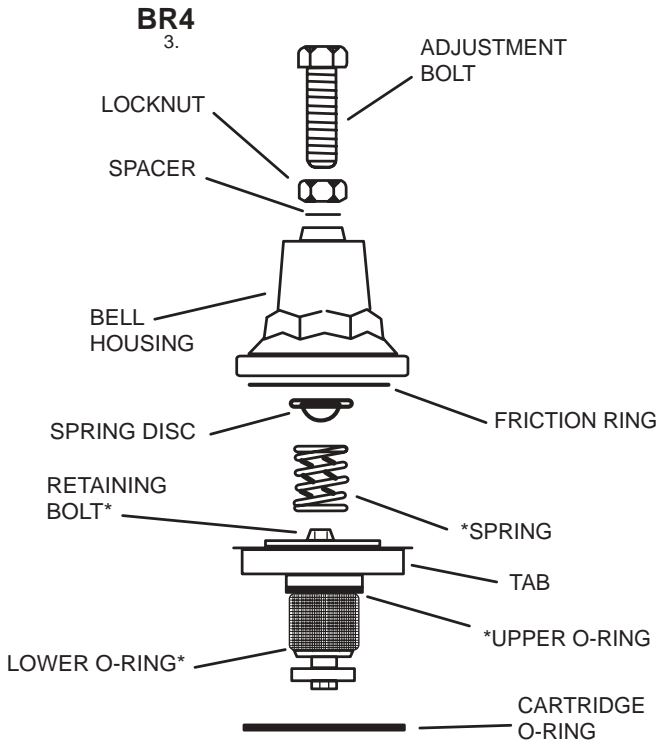


### BASIC COMPONENTS

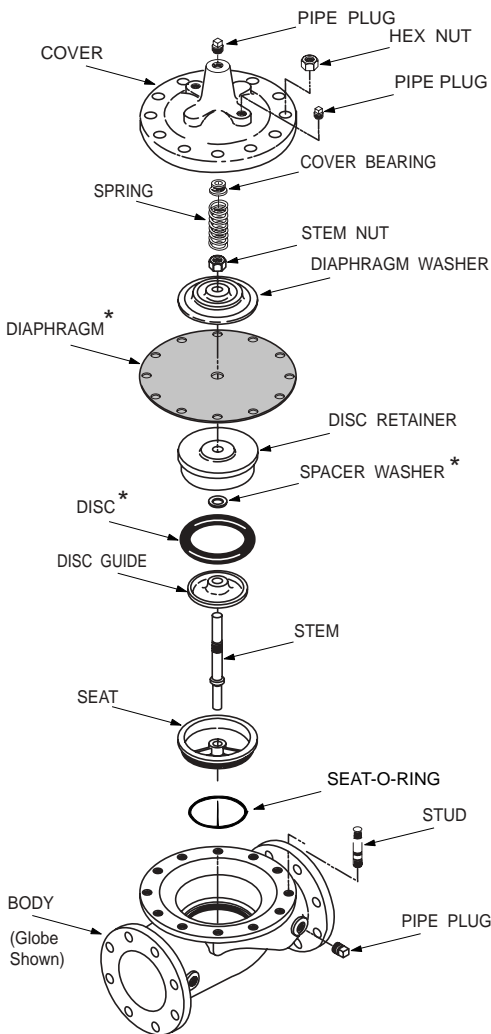
- 1 100-01 Hytrol (Main Valve)
- 2 X47A Restriction Fitting
- 3 BR4 Pressure Reducing Control
- 4 CK2 (Isolation Valve)

### OPTIONAL FEATURES

- A X46A Flow Clean Strainer (3" and smaller std.)
- B CK2 (Isolation Valve) (4" and larger std.)
- C Closing Speed Control
- D Check Valves with Isolation Valve
- S Opening Speed Control (3" and smaller std.)
- Y X43 "Y" Strainer (4" and larger std.)



## 1. HYTOL MAIN VALVE



X47A  
2.



X46A  
A.



CK2  
4.



CV  
C.



CDC-1  
D.



X43  
Y.



\*SUGGESTED REPAIR PARTS

**WILKINS**

a ZURN company