Model 450ST, 450STR, 450STDA, 450STDAR

Double Check Valve Assembly (4” & 6”)
Double Check Detector Assembly (4” & 6”)

LEAD-FREE*

*This product contains a weighted average lead content less than 0.25% for wetted surfaces.

(Patent No. 5,913,331)

❑ Installation ❑ Testing ❑ Maintenance Instructions

INSTALLATION INSTRUCTIONS

CAUTION: Installation of Backflow Preventers must be performed by qualified, licensed personnel. The installer should be sure the proper device has been selected for the particular installation. Faulty installation could result in an improperly functioning device.

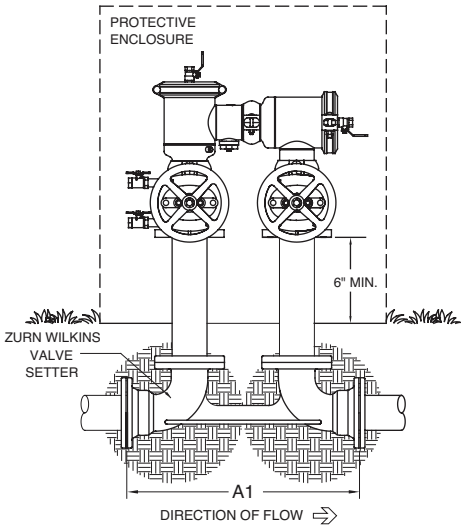
ZURN WILKINS Model 450ST Double Check Valve assemblies are for use on potable water lines where a health hazard does not exist in the event of a backflow situation.

Damage to the device could result wherever water hammer and/or water thermal expansion could create excessive line pressure. Where this could occur, shock arrestors, check valves and/or pressure relief valves should be installed downstream of the device.

If installation is in a pit or vault, the Backflow Preventer must never be submerged in water because this could cause a cross-connection. Make sure that the pit or vault always remains dry by providing ample drainage.

1. Before installing a Model 450ST Backflow Preventer, flush the line thoroughly to remove all debris, chips and other foreign matter. If required, a strainer should be placed upstream of the Backflow Preventer. **CAUTION: Do not use a strainer in seldom used emergency waterlines such as fire lines.**
2. Provide adequate space around the installed unit so that the test cocks will be accessible for testing and servicing.
3. Install valve at least 6 inches above surrounding flood level.
4. Always consult local codes for installation methods, approvals and guidance.

APPROVED VERTICAL UP - VERTICAL DOWN ORIENTATION



OUTDOOR INSTALLATION

The Model 450ST Backflow Preventer may be installed outdoors only if the device is protected against freezing conditions. Exposure to freezing conditions will result in improper function or damage to the device. The installation location must be kept above 32°F. All the basic installation instructions apply.

PLACING THE DEVICE IN SERVICE

1. Start with both shut-off valves closed. Slowly open the inlet shut-off valve until the backflow preventer is completely pressurized.
2. When the unit has been pressurized, vent any trapped air by slightly opening each of the four test cocks.
3. Slowly open the downstream shut-off valve. The Model 450ST Double Check Valve assembly is now in service.
4. After the Model 450ST has been properly installed, test the device (see “TEST PROCEDURES”). If the device fails the test, remove the first and second check valves and thoroughly flush the device. Clean rubber and seats of all debris and place unit back in service.

INDOOR INSTALLATION

Indoor installation is preferred in areas that are subject to freezing conditions. All the basic installation instructions apply to such installations.

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov
⚠ **ADVERTENCIA:** Cáncer y daño reproductivo - www.P65Warnings.ca.gov
⚠ **AVERTISSEMENT:** Cancer et néfastes sur la reproduction - www.P65Warnings.ca.gov

Testing Procedures

MODEL 450ST DOUBLE CHECK VALVE ASSEMBLY

Equipment Required: Differential pressure gauge test kit.

TEST NO. 1 - TIGHTNESS OF #1 CHECK VALVE

REQUIREMENT:

The static pressure drop across check valve #1 shall be at least 1.0 psid. If test cock #3 is not at the highest point of the check valve body, then a vertical tube must be installed on test cock #3 so that it rises to the top of the check valve body.

PROCEDURE:

1. Slowly open all 4 test cocks to remove any foreign material and attach fittings.
2. Attach hose from the high side of the test kit to the #2 test cock.
3. Open test cock #2 and bleed all air from the hose and gauge by opening the high side bleed needle valve. Close high side bleed needle valve. If a tube is attached to test cock #3, open test cock #3 to fill the tube. Close test cock #3. Close #2 shut-off valve then close the #1 shut-off valve.
4. Hold gauge at same level as test cock #3 or water level in tube. Slowly open test cock #3. Record the static pressure drop across check valve #1 after gauge reading stabilizes and water stops running out of test cock #3.
5. Close all test cocks, open shut-off valve #1 and remove test equipment.

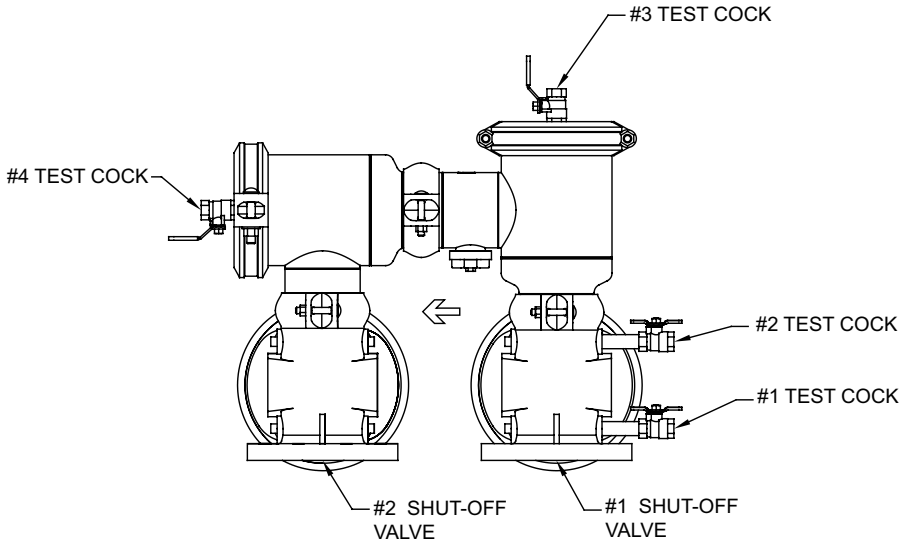
TEST NO. 2 - TIGHTNESS OF #2 CHECK VALVE

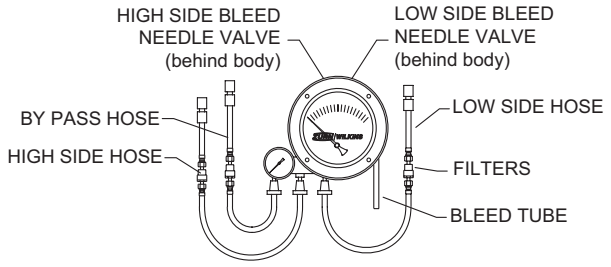
REQUIREMENT:

The static pressure drop across check valve #2 shall be at least 1.0 psid. If test cock #4 is not at the highest point of the check valve body, then a vertical tube must be installed on test cock #4 so that it rises to the top of the check valve body.

PROCEDURE:

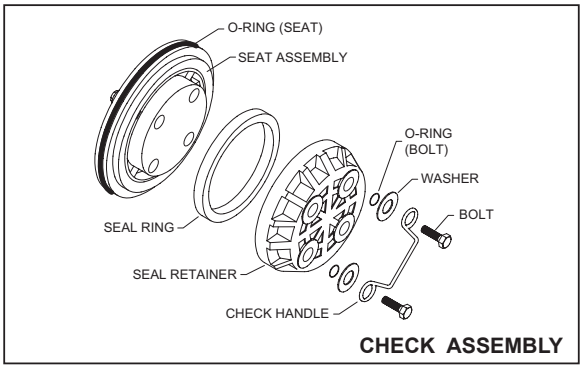
1. Attach hose from the high side of the test kit to the #3 test cock.
2. Open test cock #3 and bleed all air from the hose and gauge by opening the high side bleed needle valve. Close high side bleed needle valve. If a tube is attached to test cock #4, open test cock #4 to fill the tube. Close test cock #4. Close #1 shut-off valve.
3. Hold gauge at same level as test cock #4 or water level in tube. Slowly open test cock #4. Record the static pressure drop across check valve #2 after gauge reading stabilizes and water stops running out of test cock #4.
4. Close all test cocks, slowly open shut-off valve #1 & #2 and remove test equipment.





ZURN WILKINS
1747 Commerce Way, Paso Robles, CA 93446 Phone:855-663-9876 Fax:805-238-5766
www.zurn.com

Maintenance Instructions



CHECK ASSEMBLY

All Model 450ST Double Check Valve Backflow Preventers must be inspected and maintained by licensed personnel at least once a year or more frequently as specified by local codes. Replacement of worn or damaged parts must only be made with genuine "ZURN WILKINS" parts.

GENERAL MAINTENANCE

1. Clean all parts thoroughly with water after disassembly.
2. Carefully inspect rubber seal rings and o-rings for damage.
3. Test unit after reassembly for proper operation (refer to TESTING PROCEDURES").

SERVICING CHECK VALVES

1. Close the outlet and then the inlet shut-off valves.
2. Open No. 2, 3 and 4 test cocks to release internal pressure. Leave them open during check removal and reinstallation.
3. Loosen and remove the two nuts, bolts, gasket and grooved coupling from around the access cover.
4. Grasp one of the expose ends of the plastic retainer, push down and then pull toward the #2 check. The retainer should "spiral" out of the groove around the check.
5. Repeat numbers 3 & 4 to remove the #2 check the same way.
6. **Always service the checks one at a time to avoid mixing parts.** Start by removing the hardware and o-rings from the back of the check assembly (See "Check Assembly" illustration). Separate the seal retainer from the assembly to expose the seal ring.
7. Inspect the seal ring for cuts or embedded debris. If the reverse side of the seal is unused, the seal ring can be inverted and used temporarily until a new seal is obtained. Inspect seat o-ring and replace if cut or damaged in any way.
8. Inspect valve cavity and seating areas. Flush with water to remove any debris.
9. Reassembly: Lubricate the #2 check o-ring, install in the body and close the #4 test cock. Install the #2 check retainer into the body groove by inserting the end with short tab into the notch above the check, sliding your hand around the face of the retainer pushing it into the groove as you go. Retainer should "snap" into place. Lubricate and install the #1 check, close the #2 test cock and install.
10. Lubricate the outside surface of the grooved coupling gasket. Reassemble access covers and grooved couplings, making sure the ends of the couplings touch each other. Close any remaining open test cocks and place valve back in service.

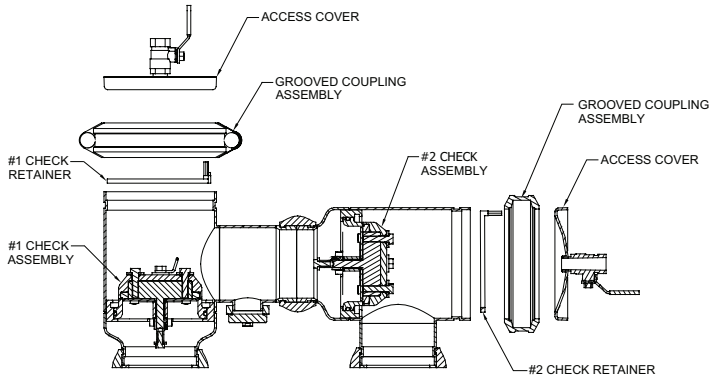


FIGURE 1

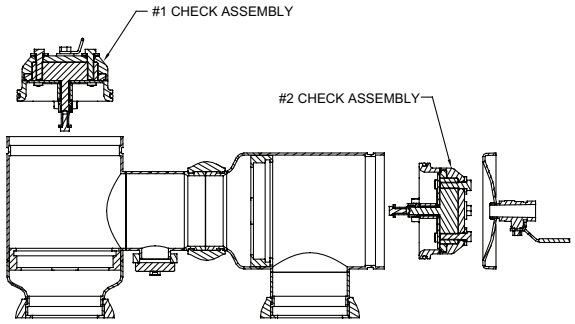


FIGURE 2

Capacity thru Schedule 40 Pipe				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687

SPECIFICATIONS

Maximum working water pressure:	175 PSI
Maximum working water temperature:	140°F
Hydrostatic test pressure:	350 PSI
End connections:	Grooved AWWA C606

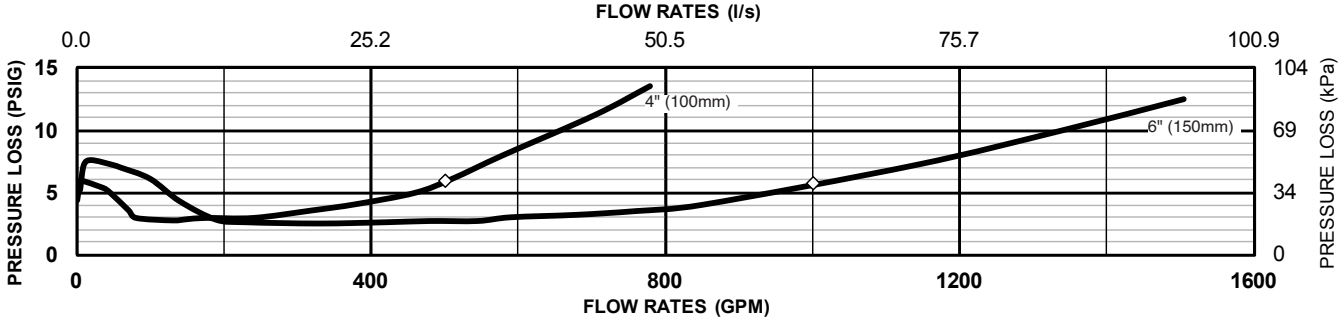
Proper performance is dependent upon licensed, qualified personnel performing regular, periodic testing according to ZURN WILKINS' specifications and prevailing governmental & industry standards and codes and upon following these installation instructions. Failure to do so releases ZURN WILKINS of any liability that it might otherwise have with respect to that device. Such failure could also result in an improperly functioning device.

Troubleshooting

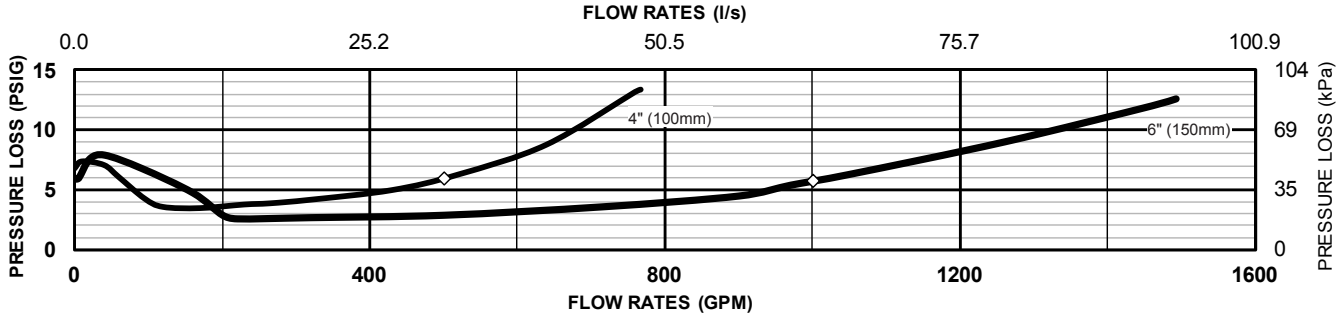
PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
1. LEAKING CHECK VALVES	1. Debris on seat or seal ring.	1. Clean seat area
	2. Damaged seat area	2. Replace check assembly
	3. Damaged seat o-ring	3. Replace seat o-ring
	4. Damaged bolt o-ring(s) on check retainer	4. Replace o-ring(s)
2. LOW OR NO FLOW	1. Device installed backwards	1. Verify flow direction arrow
	2. Gate valves not fully open	2. Turn handles counterclockwise
	3. Low supply pressure	3. Attach pressure gauge to test cock #1 and verify pressure

Performance Characteristics

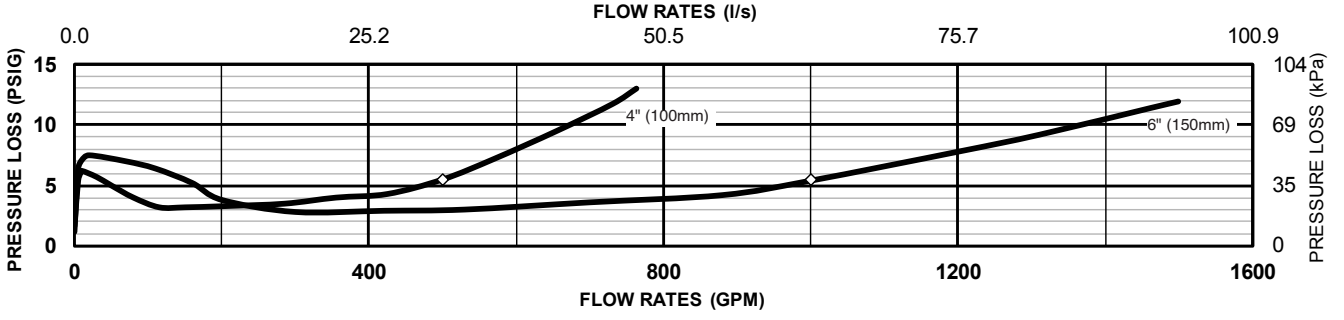
MODEL 450ST 4" & 6" (STANDARD & METRIC)



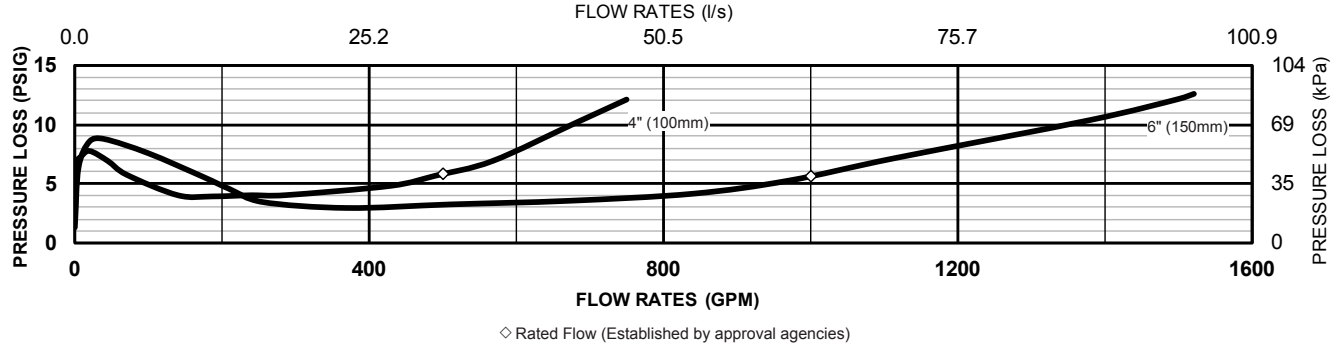
MODEL 450STDA 4" & 6" (STANDARD & METRIC)



MODEL 450STR 4" & 6" (STANDARD & METRIC)



MODEL 450STDAR 4" & 6" (STANDARD & METRIC)



◇ Rated Flow (Established by approval agencies)