PERFORMANCE UNDER PRESSURE

Principles Of Backflow Prevention

WITCKING 250

3/2"100

with performance curves & typical weights & dimensions for Wilkins Backflow Prevention Assemblies

Most of us take the quality of our drinking water for granted. But when water is contaminated, it could cost you your life. Over the past 31 years, contaminated drinking water has been blamed for more than 12,000 cases of illness. In addition, over \$20 million has been paid out to settle with victims sickened by backflow.

Generally, public water supplies are safe and clean. Contaminants infect municipal water when pipes are improperly installed or when a hose is connected to a non-potable water supply. The American Backflow Prevention Association estimates more than 100,000 incidents happen every day in the

The Health & Liability Risks

Contaminated Drinking Water

When Does Backflow Occur?

Backflow may be caused by conditions of gravity, vacuum or other pressure changes. There are two factors that contribute to reversal of flow in pipelines. One is backsiphonage and the other is *backpressure*.

Backsiphonage conditions exist when there is a negative or sub-atmospheric pressure in the supply piping, allowing downstream substances to be siphoned into the potable water supply. Under-sized pipes, pipeline breaks, and high withdrawal rates can create vacuums, which contribute to the occurrence of back-siphonage.

0

Backpressure conditions exist when a pressure higher than the supply is created in the downstream piping, allowing downstream substances to be pushed into

United States. Not every incident results in illness, but every incident poses a threat.

In order to understand the concept of backflow prevention, there are some terms that must be identified and understood. Understanding the terminology is the key to knowing which backflow assembly is appropriate for a given installation. Although most municipalities that have a crossconnection control program certainly can tell the consumer which backflow prevention assembly is appropriate, many areas of the country do not have cross-connection control programs, as of this writing. Therefore, it is incumbent upon the manufacturers and their representatives to ask the correct questions in order to offer the correct backflow assembly for the application at hand. Backflow prevention assemblies are life safety products. If the wrong assembly is specified, the end result can be disastrous.

What Is Backflow?

Backflow is the undesirable reversal of the flow of water or mixture of water and other liquids, gases, or other substances into the distribution pipes of the potable supply of water from any source or sources.

the potable water supply. Backpressure can occur when higher pressures downstream are generated by pumps, thermal expansion, and elevation.

What Is A **Cross-connection?**

The term Cross-connection refers to any unprotected actual or potential connection or structural arrangement between a public or consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable water system any used water, industrial fluid, gas or substance other than the intended potable water with which the system supplied.



By-pass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices through which or because of which backflow can or may occur are considered to be cross-connections.

A HROU

It is evident that we cannot eliminate either the occurrence of backflow nor can we prevent cross-connections from being created. We must therefore provide a means of protecting drinking water systems from the hazards of backflow occurrences through cross-connections.

The Solution Is Clear!

Assemblies vs. Devices

Mechanical backflow prevention devices and assemblies offer the best protection against cross-connection hazards. Backflow prevention *devices* prevent backflow by stopping the reversal of flow, are not testable once installed because they do not have inlet and outlet shut-off valves or test cocks. Backflow prevention assemblies include an inlet and outlet shut-off valve and test cocks to facilitate testing of the assembly while it is in its functional in-line position. Furthermore, backflow preventers may be installed at the source of potential contamination or on the water service line itself.

Standards, Approvals, and Listings

Approval agencies, representing many diverse geographical areas and levels of government, have established performance criteria regarding the function, manufacturing, installation, testing and maintenance of backflow prevention devices and assemblies. Wilkins participates in the formation and implementation of these standards to the greatest degree possible.

The overall objective of the performance criteria is to ensure the sanctity of drinking water; however, each standard specifies different requirements relating to mechanical function, material requirements and testing for backflow preventers.

It is the task of backflow prevention manufacturers to produce a single product within a product category that complies with all applicable standards and the acceptance of such products are driven by the state, county and even the local city.



Selecting A Backflow Preventer

What type of backflow preventer should be used?

Backflow prevention devices and assemblies include Atmospheric Vacuum Breakers, Dual Check Valves, Pressure Vacuum Breakers, Double Check Valve Assemblies, and Reduced Pressure Principle Backflow Assemblies. The proper selection of backflow preventer is crucial to ensure that the device works properly and is providing adequate protection for the specific application. It must be stressed that these devices are not all equally acceptable as protection against all types of hazards and other factors must be taken into account with each application. In general, there are four elements to consider when designing your backflow prevention program: system characteristics, degree of hazard, type of application and type of installation.

System Characteristics

Each backflow preventer is designed to handle a specific group of system characteristics. System characteristics include the hydraulic requirements of the specific backflow prevention design. Factors such as the need for continuous pressure versus noncontinuous pressure, back-pressure versus back-siphonage and flow-requirements versus velocity must be specified to determine the type of device to be used.

Existing conditions of pressure loss must be taken into account prior to the installation of a backflow preventer. All plumbing systems experience pressure loss. Pressure loss begins with the friction of the water against the walls of the pipe and increases with each additional fitting added to the system. Many of the fittings and components in a plumbing system can be identified as fixed orifice items, such as pipes, fittings, gate valves and ball valves. The pressure loss for fixed orifice items can be identified as a constant value and is

PRINCIPLES OF BACKFLOW PREVENTION PRINCIPLES OF BACKFLOW PREVENTION Type Of Device Height Requirement

characteristic of each type and size of valve. Once this value is established for a particular valve, the pressure loss through that valve or fitting can be calculated by simply knowing the specific gravity of the fluid running through the pipe and the flow rate (in gallons per minute).

Elevation in the plumbing system is also a very large factor. Approximately 1 psi for every 28 inches of elevation can amount to almost a 7 psi loss in just a two-story building. A high-rise building with an elaborate fire sprinkler system cannot tolerate large losses in supply pressure and is therefore highly concerned with the effects of elevation in the supply system.

Degree Of Hazard

The ultimate purpose in control and prevention of backflow is to protect the public health. Should a backflow condition occur, the degree of hazard must be understood in order to provide the proper backflow preventer to stop the hazard on hand. The degree of protection is determined based on the degree of hazard. A low hazard application is when potential backflow can pollute the drinking water. Pollution is defined as materials that can cause undesirable effects to the water, such as discoloration, smell or taste, but will not cause sickness or death. A high hazard application is one where the potential backflow can contaminate the water supply. Contamination is defined as any impairment to the water quality such that contact with this water can result in illness or death.

Type Of Application

The *type of application* and industry, such as fire protection, irrigation and plumbing, each have particular requirements. Fire sprinkler systems may require detector by-passes or grooved end gate connections. On the other hand, an irrigation system may require pressure vacuum breakers that are not used universally in other types of systems. In certain critical applications, such as hospitals, resort hotels or industrial applications, water must be continually supplied. This requires either multiple connections or manifold assemblies.

Each application is also unique in regards to flow requirements. Plumbing and waterworks require consistent flow of water. Irrigation requires flow 2% of the time and the remaining 98% of the time is in a static condition. Fire protection must stand ready for action with 100% static water pressure. Each condition can pose a unique challenge for the backflow preventer.

ype Of Installation

Installations range from indoor to outdoor and "below grade" or pit installations. Where space is an issue, systems can require a vertical installation. Indoor installations must address the issue of discharge. Of the five standard types of backflow preventers, three spill water, two at start-up and one as a basic function of the assembly. Outdoor installations face the potential of vandalism, soil erosion and in some climates, freezing temperatures. An outdoor installation may typically require some type of covering.



Accessibility is often the most overlooked factor in backflow installations. In general, accessibility is required for any testing, maintenance or repair. Height requirements for backflow preventers are very specific:



Pressure Vacuum Breaker

Double Check Assembly

Reduced Pressure Principle Ass





Pressure Vacuum Breaker

Side clearance requin Principle Assemblies (1/2" - 3 with 24" access from one side The weight of the ch vertical installation. The che assistance.

Testable Backflow Prevention Assemblies vs. Non-Testable Backflow Devices

Typically, *testable backflow prevention assemblies* are required for use at a service connection. These "Testable" assemblies are used for containment of the entire consumer's potable system away from the public potable water system. Since their proper function is imperative in order to prevent contamination of the public potable water supply, a method of testing is necessary.

Non-testable backflow devices are usually used for internal protection, within the consumer's potable system, whereby they are isolating an internal cross-connection from the remainder of the consumer's potable system. If these types of valves fail, protection of the public potable supply is still facilitated by the "testable" assembly at the service connection.

	6" above the highest point in the water system downstream
	12" above the highest point in the water system downstream with adequate clearance for testing and maintenance
	Installed between 12" - 30" above the floor or finished grade with adequate clearance for testing and maintenance. If installation is in a pit or vault, provide ample drainage to ensure the backflow preventer does not become submerged.
sembly	Installed between 12"- 30" above the floor or finished grade with adequate clearance for testing and maintenance
er El	Double Check Assembly



Reduced Pressure Principle Assembly

Side clearance requirement from the wall of Double Check and Reduced Pressure Principle Assemblies (1/2" - 3") are 24" from side test cocks, 12" from top mounted test cocks, with 24" access from one side. For sizes 4" and above, these requirements are doubled.

The weight of the checks must also be considered, especially if you are looking at a vertical installation. The check assembly weight for an 8" - 10" device may require lifting

Atmospheric Vacuum Breaker (AVB)

An Atmospheric Vacuum Breaker is a device containing a float-check, a check seat, and an air inlet port. The flow of

Types Of Backflow Preventers



water into the body causes the float to rise and close the air inlet port. When the flow of water stops, the float falls and forms a check valve against back-siphonage and, at the same time, opens the air inlet port to allow air to enter and satisfy the vacuum. A shut-off valve immediately upstream may be an integral component of the assembly. This valve is intended for use in a non-continuous pressure application (no more than 12 hours of pressure per 24 hour period) in a backsiphonage condition only. An Atmospheric Vacuum Breaker is intended to provide protection in low and high hazard situations.

Testing: This device is not testable once installed.

Pressure Vacuum Breaker (PVB)

A Pressure Vacuum Breaker is an assembly containing an independently acting, internally loaded check valve with an independently acting loaded air inlet valve, located on the discharge side of the check valve. Additionally, this assembly shall have two resilient-seated isolation valves attached at each end of the assembly and two properly located resilient seated test cocks. This assembly is intended for use in both continuous and non-continuous pressure applications, in a backsiphonage condition only. A Pressure Vacuum Breaker is intended to provide protection in low and high hazard situations.

Testing: 1) The air inlet valve shall open when the pressure in the body is no less than 1.0 psi above atmospheric pressure. And, the air-opening valve shall be fully open when the water drains from the body.

2) The check valve shall be driptight in the normal direction of flow when the inlet pressure is 1 psi and the outlet pressure is atmospheric.

Spill Resistant Vacuum Breaker (SVB)



A Spill Proof Vacuum Breaker is the same as a Pressure Vacuum Breaker except the Spill Proof Vacuum Breaker is not vented.

Double Check Valve Assembly (DC)

A Double Check Valve Assembly is an assembly containing two independently acting approved check valves, four resilientseated test cocks, and two resilient-seated isolation valves. This assembly is intended for

use in both continuous and non-continuous pressure applications, in both back-siphonage and back-pressure conditions. A Double Check Valve is intended to provide protection in low hazard situations.

Testing: 1) The No. 1 check valve shall be tight against reverse flow under all pressure differentials. The static differential pressure across the No. 1 check valve must be at least 1 psid.

2) The No. 2 check valve shall be tight against reverse flow under all pressure differentials. The static differential pressure across the No. 2 check valve must be at least 1 psid.

Double Check Detector Assembly (DCDA)

A Double Check Detector Assembly is a specially designed assembly composed



of a line-sized approved double check valve assembly, with a specific by-pass water meter, and a meter-sized approved double check valve assembly. The meter shall register accurately for all flows up to and including two GPM. The meter shall show a registration of all flows above three GPM. This assembly is intended for use in both continuous and non-continuous pressure applications, in backsiphonage and back-pressure conditions. The Double Check Detector Assembly is intended to provide protection in low hazard situations only.

Testing: 1) The static differential pressure across the No. 1 check valve must be at least 1 psid.

across the No. 2 check valve must be at least 1 psid.

Dual Check Valve Assembly & Dual Check With Atmospheric Port

Dual Checks are designed for use in low hazard applications where a fully approved, testable backflow preventer is not required. Check with the local authority having jurisdiction for acceptance.

Reduced Pressure Principle Assembly (RP)

A Reduced Pressure Principle Assembly is an assembly containing two independently acting approved check valves together with a hydraulically operated, mechanically independent differential pressure relief valve located between the two check valves. This assembly is intended for use in continuous and non-continuous pressure applications, in backsiphonage and backpressure conditions. The Reduced Pressure Principle Assembly is intended to provide protection in low and high hazard situations.

Testing: 1) The pressure differential relief valve must operate to maintain the "zone" between the two check

2) The static differential pressure

valves at least 2 psi less than the supply pressure.

2) The No. 2 check valve shall be tight against reverse flow under all pressure differentials.

3) The static pressure drop across check valve No. 1 shall be greater than the relief valve opening point (test no. 1), and at least 5.0 psid.

Reduced Pressure Principle Detector Assembly (RPDA)

A Reduced Pressure Principle Detector Assembly is a specially designed assembly composed of a line-sized approved reduced pressure principle backflow assembly, with a specific by-pass water meter and a meter-sized approved reduced pressure principle backflow prevention assembly. The meter shall register accurately for all flows up to and including two GPM. The meter shall show a registration for all flows above three GPM. This assembly is intended for use in continuous and non-continuous pressure installations, in back-siphonage and back-pressure conditions. The Reduced Pressure Principle Detector Assembly is intended to provide protection in low and high hazard situations.



Testing: 1) The pressure differential relief valve must operate to maintain the "zone" between the two check valves at least 2 psi less than the supply pressure.

2) The No. 2 check valve shall be tight against reverse flow under all pressure differentials.

3) The static pressure drop across check valve No. 1 shall be greater than the relief valve opening point (test no. 1), and at least 5.0 psid.

How To Read Performance Curves

As mentioned earlier, many fittings in a plumbing system, such as pipes and gate valves, are considered fixed orifice items, whereby pressure loss can be identified as a constant value and is characteristic of each type and size of valve. In contrast, backflow preventers, by design, include check valves that are spring-loaded or force-loaded to the closed position. The orifice of a backflow preventer is constantly varying. As flow varies though, it pushes the spring-loaded check open and closed. It is not possible to have a fixed value representing the flow and pressure loss. The flow characteristics of a backflow preventer can only be defined



FLOW RATES (GPM)

by a "Performance Curve," depicting the relationship of pressure drop and flow rate throughout its full range of operation.

The full range of operation is referred to as the "usable range." Flow rates beyond the usable range will have destructive velocities to the piping system or excessive pressure loss. The basis for flow capacity and pressure loss in a backflow prevention assembly begins at zero GPM and goes up to the industry standard, American Water Works Association (AWWA) required maximum flow capacity. This maximum rate is known as "rated flow." For any flow rate from zero GPM up to the rated flow, there is an established maximum allowable pressure loss. Failure to meet the required flow rates or exceeding the maximum pressure drop at any point up to the rated flow would prevent the assembly from being approved.

All Wilkins Backflow Prevention Assembly performance curves are constructed with the "flow rate" in gallons per minute (GPM) or liters per second (l/s) on the horizontal axis and the "pressure loss" in pounds per square inch (psi) or kilopascals (kpa) on the vertical axis. Additionally, a diamond will be placed on the curve to indicate the maximum rated flow for each given assembly, according to its pipe size.

Example:

Find the pressure loss exhibited by a 1" 975XL Reduced Pressure Principle Backflow Prevention Assembly while the valve is flowing at 40 GPM (see chart below).

Solution:

69

Follow the horizontal axis out to 40 GPM. Next, move upward until the 40 GPM

axis intersects the 1" 975XL curve. At this juncture, moving to the left, read the pressure loss from the vertical axis that corresponds with the intersection of the 40GPM axis and the 1" 975XL curve. The pressure loss at 40 GPM is taken

to be 12.6 psi. Also, from the curve, we see that the diamond is at the value of 50 GPM. Therefore, the maximum rated flow of a 1" Wilkins 975XL is 50 GPM.

Model 975XL 3/4" & 1"















NOTE:

To properly interpret

the following

Wilkins backflow

performance curves,

the flow rates on the

top are indicated in

"liters per second"

and the bottom flow

rates are in "gallons

per minute."

OF BACKFLOW PREVENT PLES OF BACKFLOW PREVENTION PRIN FS**Double Check Assembly Double Check Dector Assembly**



2000

3000

4000



Dual Check Valve

4", 6", & 8" Double Check Detector Assembly

25.2



0

1000



Reduced Pressure Principle Assembly











4", 6", 8" & 10" Reduced Pressure Principle Detector Assembly



Single Detector Check Valve



Operating Principle Reduced Pressure

Both check valves are closed in a static (no flow) condition. Pressure on the supply side of the valve is approximately 8 psi higher than the pressure in the reduced pressure zone, therefore the relief valve is held in a closed position.

Both check valves are open in a normal flow condition. The relief valve is held in a closed position because of the higher pressure on the supply side of the valve. Pressure in the reduced pressure zone is approximately 8 psi lower than the supply side of the valve.

<u>Static Co</u> <u>Ch</u> a static (no flov

In a static (no flow) condition with the 1st check fouled, fluid will leak from the inlet into the reduced pressure zone. As the zone pressure increases to within 2 psi of the inlet pressure, the relief valve begins to open and discharges to the atmosphere. The amount of fluid discharging from the relief valve is proportional to the extent of the foul across the 1st check.

> In a backpressure condition with the 2nd check fouled, potentially contaminated liquid will flow into the reduced pressure zone of the valve. As the zone pressure increases to within 2 psi of the inlet pressure, the relief valve begins to open and discharges to the atmosphere.

Backsiphonage with 2nd Check Fouled:

In a backsiphonage condition with the 2nd check fouled, the inlet pressure becomes negative or subatmospheric. Because the pressure on the supply side is lower than the zone pressure, the relief valve goes to a full open position and discharges to the atmosphere.

TROUBLESHOOTING GUIDE -----

Before calling about a Reduced Pressure Backflow Assembly, refer to this simple procedure to identify the cause of discharge from the relief valve port.

After observing water discharge from relief valve port:

- 1. Close #2 shut off valve.
 - If discharge stops, the problem is a fouled second check.
- 2. If discharge continues, open #4 testcock.
 - If discharge stops or is reduced, the problem is a fouled first check.
- 3. If discharge continues, the problem is most likely in the relief valve.

SOLUTION: Disassemble and clean affected components and remove debris from the backflow preventer.



ICIPLES OF BACKFLOW PREVENTION Operating Principles of the Wilkins Model 975XL Reduced Pressure Principal Backflow Preventer

Static Condition:

Normal Flow:

Static Condition with 1st Check Fouled:



Backpressure with 2nd Check Fouled:

100 PS 130 PS 130 PS

➢ FLOW DIRECTION ➤

- INLET PRESSURE
- ZONE PRESSURE
- OUTLET PRESSURE
- POSSIBLE CONTAMINANTS

Typical Dimensions & Weights



	9 <i>7</i>	75	XL	S	eri	ies															
							[DIMENS	SIONS (approxii	mate)								WEI	GHT	
MODE	L SIZE	ļ	Ą	A UN BA VAL	NON ILL VES	B LESS VALV	BALL ES	(0	[)	ł	Ξ	F	:	(3	LESS VAL	BALL VES	WITH VAL	BALL VES
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg
3/4	20	12	305	14	356	7 3/4	197	2 1/8	54	3	76	3 1/2	89	5	127	15 3/4	400	10	4.5	12	5.5
1	25	13	330	14 1/4	362	7 3/4	197	2 1/8	54	3	76	3 1/2	89	5	127	17 3/4	451	10	4.5	14	6.4
1 1/4	32	17	432	19	483	10 15/16	278	2 3/4	70	3 1/2	89	5	127	6 3/4	171	22	559	22	10	28	12.7
1 1/2	40	17 3/8	441	20	508	10 15/16	278	2 3/4	70	3 1/2	89	5	127	6 3/4	171	23 1/8	587	22	10	28	12.7
2	50	18 1/2	470	21 1/4	540	10 15/16	278	2 3/4	70	3 1/2	89	5	127	6 3/4	171	25 1/2	648	22	10	34	15.4

350A/375A Grooved Series

	חבו							DIME	INSIC	DN (app	roxim	ate)										W	EIGHT		
375 Si	ADA ZE	ļ	1	B LES GAT VALV	SS E ES	С	;	D		E OS& OPE	kY EN	E OS& CLOS	kY SED	F		(3	Н		WITH GA	iout Tes	WITH GATES	OS&Y G (GXF)	WITH GATES	OS&Y G (GXG)
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lhs	ka	lhs	ka	lhs	ka
4	100	38	965	19 7/8	505	4 1/2	114	9	229	22 3/4	578	18 1/4	464	6	152	8	203	7 1/4	184	98	45	252	114	226	103
6	150	47	1194	25 7/8	657	5 1/2	140	10 1/2	267	30 1/8	765	23 3/4	603	7	178	10	254	9 1/4	235	151	69	387	176	357	162
8	200	61 5/8	1565	38 1/2	978	10	254	12	305	37 3/4	959	29 1/4	743	8 1/2	216	11	279	13 7/8	333	321	146	797	362	773	351





M							DI	MENSIC)N (a	pproxim	ate)								WEI	GHT	
375AE S	DABGVIC Bize	A	١	B LE BUTTE VALV	SS RFLY /ES	С		D		E		F		(G	Н		WITH BUTTE	iout Erfly	WIT BUTTE VAL	TH IRFLY VE
in. mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg
4	100	33 3/8	848	19 7/8	505	34 1/4	870	9	229	10 3/4	273	6	152	5 1/4	133	7 1/4	184	98	45	136	62
6	150	40 1/8	1019	25 7/8	657	41 1/4	1048	10 1/2	267	12 1/8	308	7	178	7 1/2	178	9 1/4	235	151	69	207	94
8	200	54 3/4	1391	38 1/2	978	55	1397	12	305	13	330	8 1/2	216	9	191	13 7/8	333	321	146	443	201
Dimen	sions and	weights	s are s	hown fo	r 375/	ADA to g	give m	ost extr	eme	inform	ation.	Pleas	se ch	neck sp	pecifica	ation sh	eets to	verify	actua	ls.	



1225 556

530

																						3	7	5	S	er	ie	S
											DIMEN	SIONS	(approx	imate)											WE	EIGHT		
	MODE Siz	E L 375 Ze	A		B LESS VALV	GATE 'ES	С		D		E OS&Y (OPEN	E OS& CLOS	AY Sed	E NRS G	ATE	F		G	i	ŀ		WIT G/ VAL	HOUT ATE LVES	WITI Vai	H NRS LVES	WITH G/ VAL	OS&Y ATE LVES
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg	lbs.	kg
	2 1/2	65	31	787	15 7/8	403	7 1/4	184	3 3/4	95	16 3/8	416	13 7/8	352	11 3/8	289	9 1/2	241	8 3/8	213	41 1/4	1048	60	27.2	162	73.5	170	77.2
E	3	80	32	813	15 7/8	403	7 1/4	184	3 3/4	95	18 7/8	479	15 5/8	397	12 3/8	314	9 1/2	241	8 3/8	213	42 3/4	1086	60	27.2	184	83.5	190	86.3
	4	100	37 5/8	956	19 1/2	495	8	203	4 1/2	114	22 3/4	578	18 1/4	464	14 3/4	375	11	279	7 1/4	184	52 3/4	1340	98	44.5	278	126.2	288	130.8
ŧ	6	150	44 3/4	1137	23 1/2	597	10	254	6	152	30 1/8	765	23 3/4	603	19	483	12 3/8	314	9 1/4	235	62 3/4	1594	175	79.5	459	208.4	475	215.6
F 	8	200	60 3/4	1543	37 3/4	959	11	279	10	254	37 3/4	959	29 1/4	743	22 1/2	572	15 3/8	391	16 3/4	426	85	2159	377	171	829	376.4	853	387.3

10 254 45 3/4 1162 35 3/8 899 26 1/2 673 15 3/8 391 16 3/4 426 93 1/4 2369 407

Dimensions and weights are shown for 375DA to give most extreme information. Please check specification sheets to verify actuals

37 3/4

10 250 63 3/4

							DIMEN	ISIONS	(approx	(imate)							WEI	GHT	
MO	DEL															LE	SS	W	TH
350	SIZE		A		В	()	[)	I	Ξ		F	(3	BA	LL	BA	LL
																VAL	VES	VAL	VES
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg
3/4	20	11	279.4	6 5/8	168	1 7/8	47.6	3 3/4	95.3	3	76.2	1 1/4	31.8	15 1/8	384	2.3	1.0	4.3	2.0
1	25	12 1/4	311	7	177.8	2 1/16	52.4	4 1/8	104.8	3 1/4	82.6	1 3/4	44.5	17	431	3.0	1.4	6.0	2.7



							D	IMENS	IONS (a	pprox	imate)							WEI	GHT	
1 3	MOI 75 (del Size	A		E	3	C)	D		E		F	:	G		LE BA	SS ILL VES	WI BA	TH
i	n.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg
3	8/4	20	8 7/8	225	7	178	1 5/16	41	1 5/8	41	2 15/16	75	3 7/8	98	12 5/8	321	4.7	2.1	5.7	2.6
	1	25	11 3/16	284	9	229	2 1/4	57	2 1/4	57	3 7/16	87	4	102	14 9/16	370	8.2	3.7	9.7	4.4



м							DI	MENSI	ONS (approxi	imate))							WEI	GHT	
IVI	SIZE	ļ	١	A UN BA	ion Ll	B LESS VALV	BALL 'ES	()	D		E		F	:	G		LE BA	SS ILL	WI BA	TH
in	mr	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg
3/4	4 20	11 1/4	286	12 1/2	318	7	178	1 1/2	38	3	76	3 1/2	89	3	76	15	381	5	2.3	7	3.2
1	25	13	330	13 3/4	349	7	178	1 1/2	38	3	76	3 1/2	89	3	76	17 3/4	451	8	3.6	12	5.4
11	4 32	15 1/2	419	18 1/2	470	10 9/16	268	2	51	3 1/2	89	4 1/2	114	4 1/2	114	21 1/2	546	16	7.3	22	10
11	/2 40	17 1/8	435	19 1/8	486	10 9/16	268	2	51	3 1/2	89	4 1/2	114	4 1/2	114	22 3/4	578	16	7.3	22	10
2	50	18 1/4	460	20	508	10 9/16	268	2	51	3 1/2	89	4 1/2	114	4 1/2	114	25 1/8	638	16	7.3	28	12.7



Small 350 Series



Small 375 Series

	D	IMENSIC	ONS (a	approxim	ate)						WEI	GHT		
e With Val	3 GATE VES	B LESS G VALV	ATE ES	C OS OPE	&Y N	C OS CLOS	&Y ED	D		LE G/ VAI	ESS ATE LVES	OS G/ VAL	S&Y ATE LVES	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg	
30	762	21	533	22 3/4	578	18 1/4	464	23 3/16	589	113	51.3	303	137.6	
6 1/2	907	18 1/2	470	22 3/4	578	18 1/4	464	21	533	113	51.3	303	167.6	
5 1/2	902	25	635	30 1/8	765	23 3/4	603	26	660	187	84.9	487	221	
42	1067	21	533	30 1/8	765	23 3/4	603	22	559	187	84.9	487	221	
46	1168	34 7/16	875	37 3/4	959	29 1/4	743	33 1/4	845	421	191.1	897	407.2	
3 1/2	1359	30 5/16	770	37 3/4	959	29 1/4	743	37 7/8	962	421	191.1	897	407.2	
7 1/2	1207	34 7/16	875	45 3/4	1162	35 3/8	899	33 1/4	845	439	199.3	1113	505.3	
6 1/2	1435	30 5/16	770	45 3/4	1162	35 3/8	899	39 3/8	1000	439	199.3	1113	505.3	

most extreme information. Please check specification sheets t

950XL Series







			DIME	INSIONS	(approx	imate)		WEI	спт
INIQUE		A		В		С		VVEI	
in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg
3/4	20	6 3/4 172		4 1/4	108	3 13/16	97	4	1.8
1	25	7 15/16	202	4 15/16	125	4 1/2	114	5	2.3





Мос	lel 72	20A	
		DIMENSIONS (a	approximate)
WODEL SIZE	A	В	C

WUDE	L SIZE	A		B		()	[)	LES	S BV	WIT	H BV
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg
1/2	15	6 7/8	175	3 13/16	97	4	102	3 1/2	89	4	1.8	6	2.7
3/4	20	7	178	4 1/8	105	4 1/8	105	3 1/2	89	4	1.8	6	2.7
1	25	7 5/8	194	4 1/2	114	4 5/8	118	3 1/2	89	4	1.8	8	3.6
1 1/4	32	10 13/16	275	7 1/4	184	7 1/4	184	4 1/2	114	14	6.4	20	9
1 1/2	40	10 3/8	264	6 7/8	175	6 7/8	175	4 1/2	114	14	6.4	20	9
2	50	11	279	7 1/2	191	7 5/8	194	4 1/2	114	14	6.4	26	10.4

TYPICAL BACKFLOW PREVENTER INSTALLATIONS



Model 350 Double Check Valve Assembly



Model 975XLV **Reduced Pressure Principle** with Elbows



Model 700 Dual Check Valve



Model 350AOSYG **Double Check Valve**



WEIGHT

Model 720A **Pressure Vacuum Breaker**



Model 450DABGVIC **Double Check Detector** Assembly

DETERMINING WHICH TYPE OF BACKFLOW PREVENTER TO USE Selection Guide For All Wilkins Backflow Assemblies

		APPLICATION					
MODEL	TYPE	BACK SIPHONAGE	BACK PRESSURE		LOW HAZARD	HIGH HAZARD	EXAMPLES OF INSTALLATION
375 375A 475 975	Reduced Pressure Principle	•	•	•	٠	•	Irrigation, Plumbing, Waterworks, Industrial, Medical, Fire
975XL 975XLV 975XLSE		•	•	•	•	•	
975BMS/MS 975XLBMS/MS EST SYSTEM	RP with Integral Monitor Switch	•	•	•	•	•	Indoor applications where undetected discharge could cause water damage
375DA 375ADA 475DA 975DA	Reduced Pressure Principle Detector Assembly	•	•	•	•	•	Fire Protection System Supply Main. Detects Leaks and Unauthorized Use of Water
350 350A 450	Double Check Assembly	•	•	•	•		Irrigation, Plumbing, Waterworks, Industrial, Medical, Fire
950XL 950XLT 950XLV							
350DA 350ADA 450DA 950XLTDA(BF)	Double Check Detector Assembly	•	•	•	•		Fire Protection, System Supply Main. Detects Leaks and Unauthorized Use of Water
700 700FP 705	Dual Check	•	•	•	•		Residential Supply Lines and Fire Sprinkler Systems
760	Dual Check with Atmospheric Vent	•	•	•	•		Boiler Feed Lines, Laboratory Equipment, Residential
40XL	In-Line Spring-Loaded Check Valve	•	•	•	•		Irrigation, Pump and Water Hammer Applications
310L	Single Check	•	•	•	•		
310DA	Single Check Detector Assembly	•	•	•	•		Fire Protection System Supply Main. Detects Leaks and Unauthorized Use of Water
420 460 720A	Pressure Vacuum Breaker	•		•	•	•	Irrigation and Lawn Sprinkler Systems
35	Atmospheric Vacuum Breaker	•			•	•	Laboratory Sinks, Lawn Sprinklers, Commercial Laundry
BFP-8F BFP-9	Hose Connection Vacuum Breaker	•			•		Hose Bibbs, Service Sinks, Hydrants

PERFORMANCE UNDER PRESSURE

SERVICE CENTERS

West 263 East Gardena Blvd. Gardena, CA 90247 Phone: 310•719•1926 Fax: 310•719•7062

2875 South Elm Ave. Ste. 108 Fresno, CA 93706 Phone: 559-485-1400 Fax: 559-485-5345

Southwest 12847 Valley Branch Lane Dallas, TX 75234 Phone: 972•241•4898 Fax: 972•241•0671

Midwest 2569 Tracy Court Northwood, OH 43619 Phone: 419•661•8582 Fax: 419•661•8630

Northeast 37 Runway Rd. Levittown, PA 19057 Phone: 215•604•3090 Fax: 215•604•0126

Southeast 6485 Crescent Dr. NW, Ste. A-2 Norcross, GA 30071 Phone: 770•448•8990 Fax: 770•448•0228



Customer Service Representatives are available Monday through Friday 5:30 a.m. to 5:00 p.m., PT. Call 877-222-5356 or 805-226-6297, email info@zurnwilkins.com or visit us online at www.zurn.com.

WK-BPC 1010