

BACKFLOW PREVENTION

Dear Consumer:

In order to comply with State Law the City of Manteca is required to have an effective backflow prevention program to protect the public water supply from outside contamination. City Ordinance No. 926 was adopted in February 1992 to provide guidelines for such a program.

To provide the necessary protection to the public water system, certain water users are required to install backflow prevention devices at their water service entrance. The consumer is responsible for certification of the device upon installation and then at least once each year thereafter.

Attached is some background information on backflow prevention, device descriptions, the City's installation standard, Fire Department requirements for automatic sprinkler systems, a listing of persons certified to check backflow prevention devices within the City, a blank Test Report form, and the most recent list of Backflow Prevention Assemblies Approved for Service Isolation. These are being provided for your information and additional copies are available on the City's website, <http://www.ci.manteca.ca.us/eng> and at the Public Works Department, 1001 West Center Street.

If you have any questions regarding backflow prevention or your installation requirements, please call The Public Works Department's Water Division at 239-8458 or email us at water.ci.manteca.ca.us.

BACKFLOW PREVENTION INFORMATION

Backflow – The unwanted reverse flow of liquids in a piping system. This can be caused by back-siphonage, back-pressure or a combination of both.

Back-Siphonage – This condition is due to a vacuum or partial vacuum in a water supply system which is caused by any one of the following:

- a) Gravity: when the potable water supply is lost and an elevated fixture is opened (allowing air into the system) water will reverse flow due to the force of gravity.
- b) Undersized Piping: high velocity water traveling through undersized piping can cause an aspirator effect and draw water out of branch pipes causing a partial vacuum and a reversal of flow back into the supply system.
- c) Vacuum: caused by pumping water from the supply system (example is a fire truck) causing a pressure drop or negative pressure in the system resulting in water being pulled from any connected source. A break in the main or excessive usage at a low elevation in the system can also cause a vacuum.

Back-Pressure – A condition whereby pressure higher than the supply pressure is created on the premises and causes reversal of flow into the supply. A good example is a pump or thermal expansion from boilers.

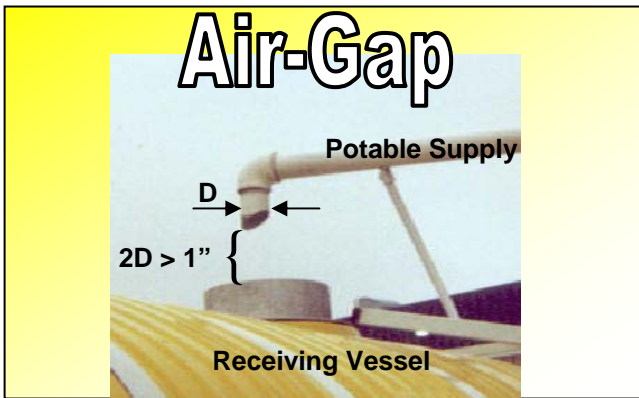
Cross Connection – Any actual or potential connection between the potable water supply and a source of contamination or pollution. There are two types of cross-connections, a direct cross-connection and an indirect cross-connection. Both types of connection are subject to back-siphonage. A direct cross-connection is subject to back-pressure and an indirect cross-connection is not subject to back-pressure. An example of a direct cross-connection would be the make-up water line feeding a recirculating system. An over-the-rim inlet used to fill an open receiving vessel would be an example of an indirect cross-connection.

Proper System Protection – To properly protect the potable system, the following two items must be addressed:

- a) Determine the degree of hazard involved: The degree of hazard is dependent on the type of substance which may flow into the potable water supply. A pollutant is considered to be any substance which would affect the aesthetics (color, taste or odor) of the water, but would not pose a health hazard. A contaminant is considered a health hazard because it causes illness or death if ingested.
- b) Determine the type of connection and the operating demands on that connection. Types of connections are Domestic, Irrigation, Fire or Industrial. Types of operating demands are Continuous, Periodic, Intermittent or Emergency Standby.

With this information, the proper backflow prevention device can be selected. The following page lists the different types of devices and under what conditions they are used.

Types of Backflow Prevention



An Air-Gap is a physical separation of the supply pipe by at least two pipe diameters, but never less than one inch, vertically above the overflow rim of the receiving vessel. With this installation line pressure is lost, so a booster pump is usually needed downstream, unless the flow of the water by gravity is sufficient for the water use. With an air-gap there is no direct connection between the supply main and the equipment. An air-gap may be used to protect against a contaminant or a pollutant, and will protect against both back-siphonage and back-pressure. An air-gap is the only acceptable means of protecting against lethal hazards.

The Atmospheric Vacuum Breaker (AVB) has an air inlet valve that closes when water flows in the normal direction. But, as water ceases to flow, the air inlet valve opens, interrupting the possible back-siphonage effect. However, if piping or a hose is attached to this assembly and run to a point of higher elevation, the back-pressure will keep the air inlet valve closed because of the pressure created by the elevation of water and it would not provide the intended protection. Therefore, this type of assembly must always be installed at least six (6) inches above all downstream piping and outlets. Additionally, this assembly may not have shut-off valves or obstructions downstream. A shut-off valve would keep the assembly under pressure and allow the air inlet valve to seal against the air inlet port and it would not provide the intended protection. The AVB may not be under continuous pressure for this same reason. An AVB must not be used for more than twelve (12) out of any twenty-four (24) hour period. It may be used to protect against either a pollutant or a contaminant, but may only be used to protect against a back-siphonage condition.

Atmospheric Vacuum Breaker (AVB)

Hose Connection Vacuum Breaker



Atmospheric Type Vacuum Breaker



Pressure Vacuum Breaker (PVB)

Pressure Type Vacuum Breaker



Backflow Preventer with Intermediate Atmospheric Vent



The Pressure Vacuum Breaker (PVB) has a check valve which is designed to close with the aid of a spring when flow stops. It also has an air inlet valve which is designed to open when the internal pressure is one psi above atmospheric pressure so that no non-potable liquid may be siphoned back into the potable water system. Being spring loaded, it does not rely upon gravity as does the atmospheric vacuum breaker. This assembly includes resilient seated shut-off valves and testcocks. The PVB must be installed at least twelve (12) inches above all downstream piping and outlets. The PVB may be used to protect against a pollutant or contaminant, however, it may only be used to protect against back-siphonage. It is not acceptable protection against back-pressure.

The Reduced Pressure Principle Assembly (RP) consists of two internally loaded independently operating check valves and a mechanically independent, hydraulically dependent relief valve located between the check valves. This relief valve is designed to maintain a zone of reduced pressure between the two check valves at all times. The RP also contains tightly closing, resilient seated shut-off valves upstream and downstream of the check valves along with resilient seated testcocks. This assembly is used for the protection of the potable water supply from either pollutants or contaminants and may be used to protect against either back-siphonage or back-pressure.

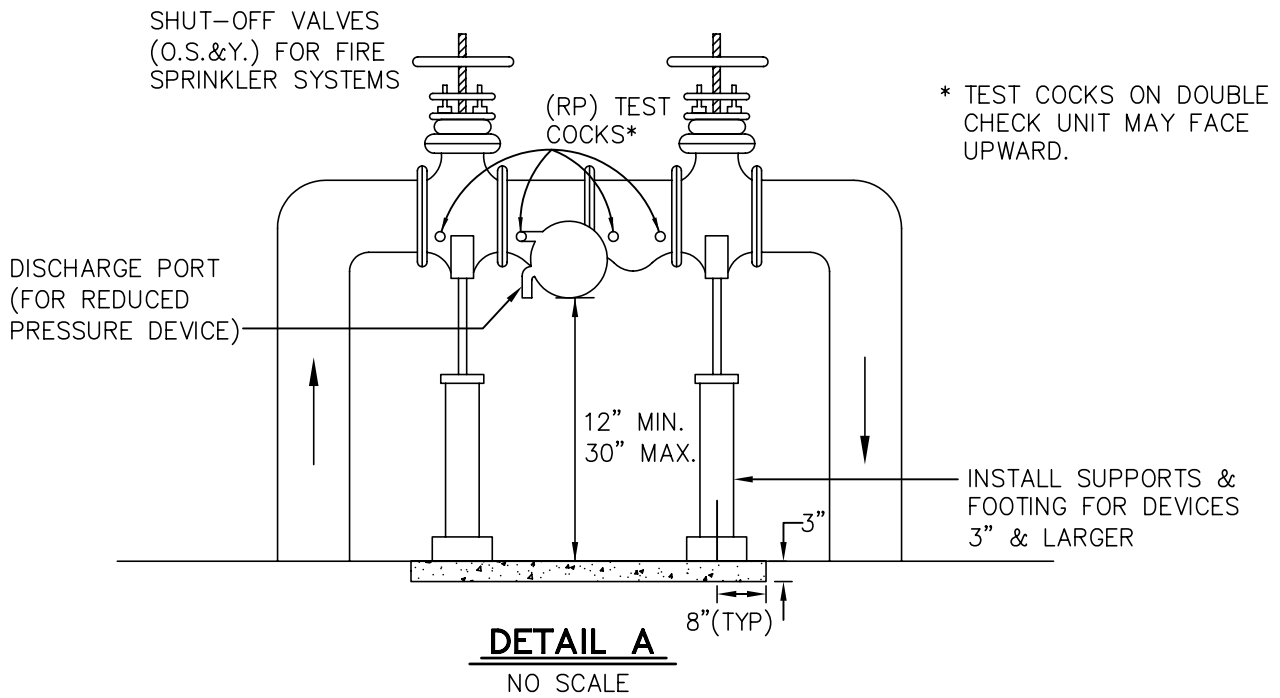
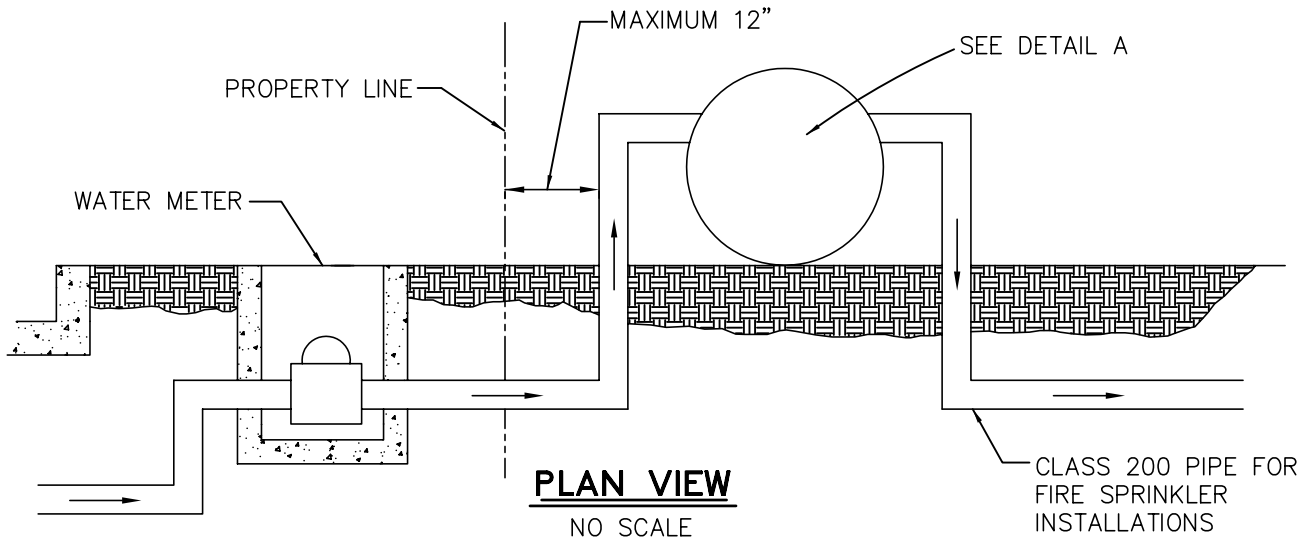
Reduced Pressure Principle Assembly (RP)

3/4" to 2" RP Device



2 1/2" and larger RP Device





NOTES:

1. ALL BACKFLOW DEVICES INSTALLED IN THE CITY OF MANTECA SHALL BE REDUCED PRESSURE ASSEMBLIES WITH THE EXCEPTION OF THOSE INSTALLED ON FIRE SYSTEMS (WITHOUT AUXILIARY SUPPLY) WHICH SHALL BE DOUBLE CHECK VALVE ASSEMBLIES. ALL DEVICES INSTALLED SHALL BE ON THE CITY'S APPROVED BACKFLOW PREVENTION ASSEMBLIES LIST.
2. DEVICES MUST BE TESTED AND APPROVED BY A CITY APPROVED CERTIFIED TESTER PRIOR TO CITY ACCEPTANCE.
3. TEST COCKS AND SHUT OFF VALVES MUST BE SUPPLIED AS SHOWN.
4. THE DISCHARGE PORT MUST BE KEPT CLEAR OF OBSTRUCTION AT ALL TIMES.
5. BACKFLOW DEVICE SHALL BE VISIBLE FROM THE STREET.
6. DEVIATION FROM THE INSTALLATION SHOWN ABOVE MUST RECEIVE PRIOR CITY APPROVAL.
7. FIRE SPRINKLER SYSTEM BACKFLOW DEVICES SHALL HAVE A WORKING PRESSURE OF 175 PSI.
8. THE CONCRETE FOOTING SHALL BE FINISHED. CONCRETE MUST BE MIXED IN TRANSIT - NO TRAILER HAULED MIX.
9. ONE UNION IS REQUIRED ON ALL NON-FLANGED PLUMBING INSTALLATIONS.

NO.	REVISED	BY	REDUCED PRESSURE/DOUBLE CHECK VALVE BACKFLOW PREVENTION DEVICE INSTALLATION	APPROVED BY:
8	APRIL, 2004	JH		DIRECTOR OF PUBLIC WORKS
DRAWN BY: J. KOESTER			CITY OF MANTECA DEPARTMENT OF PUBLIC WORKS	DRAWING NO.
CHECKED BY: J. PODESTA				DATE: MAY, 1985
SCALE: NONE				W-15

FIRE DEPARTMENT

Backflow Prevention Devices On Automatic Sprinkler Systems

Fire Department requirements for installation of backflow prevention devices in Single Riser Wet Pipe Automatic Sprinkler Systems.

If backflow prevention devices are installed in automatic sprinkler systems and are approved systems as per the City of Manteca Engineering Department the following requirements shall be met.

1. A flush of the underground systems shall be witnessed by the Fire Department prior to connecting the underground system to the aboveground system. Provisions shall be made for the disposal of water issuing from test outlets to avoid property damage.
2. Twenty-four (24) hour notice shall be given to the Fire Department prior to flushing the system.
3. The Fire Department shall be contacted twenty-four (24) hours in advance of pouring thrust blocks. Cement for thrust blocks shall not cover any joint or fitting as to impede inspection during hydrostatic test.
4. A complete, scaled set of plans for the underground shall be submitted to the Fire Department for approval, prior to the beginning of any work.
5. The contractor shall submit to the Fire Department a completed copy of the **Contractor's Material & Test Certificate For Underground Piping** upon completion of the project. The certificate can be found in the National Fire Protection Association Chapter 13.
6. A hydrostatic test of 200 psi for two (2) hours may be required depending on the configuration of the system. The hydrostatic test shall be performed while the underground system is exposed for inspection.
7. In addition to this standard all underground work shall conform to The National Fire Protection Association Chapter 13, 1999 Edition.



BACKFLOW PREVENTION TEST REPORT

ACCOUNT I.D. # _____

SERVICE ADDRESS _____ FIRM NAME _____

MAKE OF DEVICE _____ TYPE _____ SIZE _____

MODEL NUMBER _____ SERIAL NUMBER _____

DEVICE LOCATION _____

PERMANENT OR TEMPORARY DEVICE? _____

IS DEVICE A REPLACEMENT? _____ IF YES, GIVE PREVIOUS SERIAL # _____

	Reduced Pressure Devices			Pressure Vacuum Breaker	
	Double Check Devices		Relief Valve	Air Inlet	Check Valve
	1st Check	2nd Check			
Initial Test	Held at _____ psid Leaked <input type="checkbox"/>	Held at _____ psid RP - Closed tight <input type="checkbox"/> Leaked <input type="checkbox"/>	Opened at _____ psid Opened under 2.0 psid or did not open <input type="checkbox"/>	Opened at _____ psid Opened under 1.0 psid or did not open <input type="checkbox"/>	Held at _____ psid Leaked <input type="checkbox"/>
Repairs and Materials Used	Cleaned <input type="checkbox"/> Replaced: Disc(s) _____ Spring _____ Guide _____ Seat _____ Module _____ Other _____	Cleaned <input type="checkbox"/> Replaced: Disc(s) _____ Spring _____ Guide _____ Seat _____ Module _____ Other _____	Cleaned <input type="checkbox"/> Exercised <input type="checkbox"/> Replaced: Disc(s) _____ Spring _____ Diaphragm _____ Seat(s) _____ O-ring _____ Module _____ Other _____	Cleaned <input type="checkbox"/> Replaced: Disc(s) _____ Diaphragm _____ Float _____ Spring _____ Other _____	Cleaned <input type="checkbox"/> Replaced: Disc(s) _____ Module _____ Other _____
Final Test	Held at _____ psid	Held at _____ psid RP - Closed tight <input type="checkbox"/>	Opened at _____ psid	Opened at _____ psid	Held at _____ psid
Comments: _____					

INITIAL TEST BY _____ DATE _____

TESTER NO. _____ DEVICE APPROVED _____

FINAL TEST BY _____ DATE _____

TESTER NO. _____ DEVICE APPROVED _____



STATE OF CALIFORNIA—HEALTH AND HUMAN SERVICES AGENCY
Department of Health Services



**APPROVED BACKFLOW PREVENTION ASSEMBLES
FOR SERVICE ISOLATION
2002 EDITION
UPDATED AUGUST 1, 2002**

INTRODUCTION

The Department of Health Services (Department) has completed an update to the 2002 Edition of the listing of approved backflow prevention assemblies for service isolation in California. The installation of a backflow prevention assembly after August 1, 2002, that is not included in this list is a violation of Title 17, Code of California Regulations, Section 7601. The continued use of backflow prevention assemblies, that were included on previous versions of the Department's approved listing, in existing installations is allowable until the assembly fails and cannot be repaired. Failed assemblies must be replaced with a currently approved assembly or repaired with approved spare parts.

The type of protection required to prevent backflow into the public water supply must be commensurate with the degree of hazard that exists on the water user's premises. This approved backflow prevention assemblies list includes four kinds of backflow protection assemblies: Double Check Valve (DC), Reduced Pressure Principle (RP), Double Check Detector, and Reduced Pressure Detector Assemblies. This list also includes information regarding Air-gap Separation type backflow prevention information.

This list supersedes the Department's earlier edition of the 2002 approved backflow prevention assemblies' list and shall remain in effect until the Department publishes an updated edition of the list.

For additional information and questions regarding this list, please contact the Department of Health Services at (916) 323 - 6111.

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

AIR-GAP SEPARATION

DEFINITION:

An Air-gap (AG) Separation is a physical break between the supply line and a receiving vessel. (*California Code of Regulations (CCR), Title 17, Section 7583(c)*).

CONSTRUCTION AND INSTALLATION SPECIFICATIONS:

An Air-Gap separation shall be at least double the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe; however, in no case the separation shall be less than one inch. (*CCR, Title 17, Section 7602(a)*).

An Air-Gap separation shall be located as close as practical to the user's connection and all piping between the user's connection and the receiving tank shall be entirely visible unless otherwise approved in writing by the water supplier and the health agency. (*CCR, Title 17, Section 7503(a)*).

An Air-Gap separation is the minimum type of backflow protection required to protect the public water supply at the water user connection for the following situations.

- The public water system is used to supplement a recycled water supply on the water user premises.
- The public water system serves water users premises where there is wastewater pumping and/or treatment and there is no interconnection between public water supplies and the wastewater pumping and/or treatment facilities. This does not include a single-family residence that has a sewage lift pump.
- The public water system serves water users premises where recycled water is used and there is no interconnection between the water system and the recycled water system.
- The public water system serves water users premises where hazardous substances are handled in any manner in which the substances may enter the onsite potable water system.
- The public water system serves water users premises where there is an unapproved auxiliary water supply which is interconnected with the public water system.
- The public water system serves water users premises where the fire system is supplied from the public water system and is interconnected with an unapproved auxiliary water supply

**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK VALVE ASSEMBLIES

DEFINITION:

A Double Check Valve Assembly (DC) is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the watertightness of each check valve. (CCR, Title 17, Section 7583(f)).

A Double Check Detector Assembly is configured the same as the Double Check Assembly, with the exception that it is equipped with a bypass-detector that allows the visual inspection of flow through the assembly.

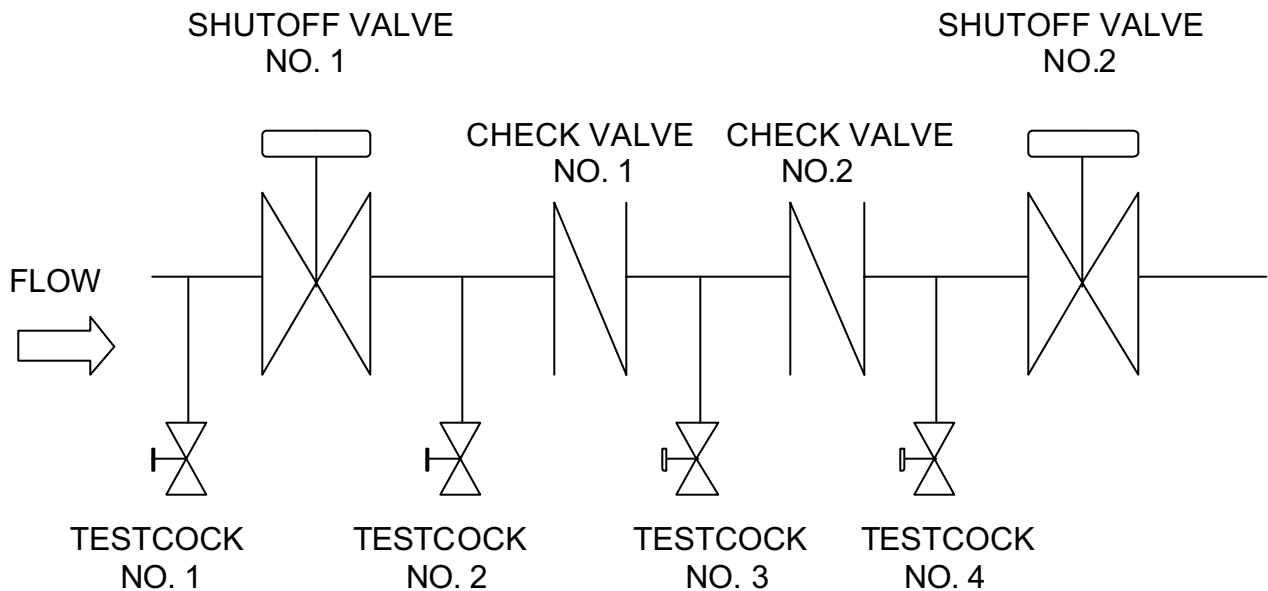
CONSTRUCTION AND INSTALLATION SPECIFICATIONS:

A required Double Check Valve Assembly, as a minimum, must conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Double Check Valve Type Backflow Preventive Devices. (CCR, Title 17, Section 7602 (b)).

A Double Check Valve Assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance. (CCR, Title 17, Section 7603 (b)). Figure No. 1 shows a Double Check schematic.

FIGURE NO. 1

DOUBLE CHECK VALVE ASSEMBLY



**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

A Double Check is the minimum type of backflow protection required to protect the public water supply at the water user connection for the following situations.

- The public water system serves water user premises where the fire protection system is directly supplied from the public water system and there is an unapproved auxiliary water supply on the premises or accessible to the premises that is not connected to the public water system.

- The public water system serves water user premises where the fire protection system is supplied from the public water system and where either elevated storage tanks or fire pumps that take suction from private reservoirs or tanks are on the users premises.

**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK VALVE ASSEMBLIES													
		SIZE (INCHES)											
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
AMES	DC									§	§	§	
	2000B	Av	Av	Av	Av	Av	Av						
	2000BM3		Av										
	2000 CIV									Av	Av	Av	Av
	2000-DC												A
	2000-G-DC												A
	2000-DCA									A	A	A	
	2000-G-DCA									A	A	A	
	2000 SE								A		A	A	
	2000 SS		§	§	§	§	§	§	A	A	A	A	A
	2000 SS-M									A	A		
BUCKNER	24100		§										
	24101			§									
	24102				§								
	24103					§							
	24104						§						
	24100/25		§										
	24101/25			§									
	24102/25				§								
	24103/25					§							
	24104/25						§						
CLA-VAL	D2		A	A	A	A							
	D4						A	A	A	A	A	A	A
	DC6LB		Av										
	DC6LW		A	A		A	A						
	DC7LW							A	A	A	A	A	A
	DC7LY							A	A	A	A	A	A
	DC8LW									Av	Av	A	
	DC8LY									Av	Av	A	
	DC8NW								§	§	§	§	§
	DC8NY								§	§	§	§	§
	DC8VW								Az	Az	Az	Az	Az
	DC8VY								Az	Az	Az	Az	Az
	CONBRACO	1/2DC	Av										
2 1/2DC								Av					
2 1/2DC-7								Av					

A signifies approval for horizontal installations only.

Av signifies approval for both, horizontal and vertical up installations.

Az signifies approval only for N and Z configurations, as shown in the Appendix.

AvA signifies approval for horizontal, vertical up inlet and vertical down outlet installations.

vA signifies approval only for vertical up inlet/vertical down outlet configurations.

vAv signifies approval only for vertical up inlet/vertical up outlet configurations.

§ signifies that these model are no longer manufactured, only spare parts are available.

**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK VALVE ASSEMBLIES													
		SIZE (INCHES)											
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
CONBRACO	2 1/2DCU							vA					
	3DC								Av				
	3DC-7								Av				
	3DCU								vA				
	4DC									Av			
	4DC-7									Av			
	4DCU									vA			
	6DC										Av		
	6DC-7										Av		
	6DCU										vA		
	40-100-02									A			
	40-100-03									A			
	40-100-05									A			
	40-103-02		A										
	40-104-02			A									
	40-104-T2 Formerly 40-104-99T			A									
	40-104-A2			A									
	40-104-A2T			A									
	40-104-TC2			A									
	40-105-02				A								
	40-105-T2 Formerly 40-105-99T				A								
	40-105-A2				A								
	40-105-A2T				A								
	40-105-TC2				A								
	40-106-02					A							
	40-106-A2					A							
	40-106-A2T					A							
	40-106-T2 Formerly 40-106-99T					A							
	40-107-02						A						
	40-107-A2						A						
	40-107-A2T						A						
	40-107-T2 Formerly 40-107-99T						A						
	40-108-02							A					
40-108-A2							A						

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AvA signifies approval for horizontal, vertical up inlet and vertical down outlet installations.

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK VALVE ASSEMBLIES														
		SIZE (INCHES)												
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10	
CONBRACO	40-108-A2T						A							
	40-108-T2 Formerly 40-108-99T						A							
	40-109-02							A						
	40-109-03							A						
	40-109-05							A						
	40-10A-02									A				
	40-10A-03									A				
	40-10A-05									A				
	40-10A-06									A				
	40-10C-02										A			
	40-10C-03										A			
	40-10C-05										A			
	40-10C-06										A			
	40-10E-02												A	
	40-10E-03												A	
	40-10E-06												A	
	40-10G-02													A
	40-10G-03													A
40-10G-06													A	
FEBCO	805		§	§		§	§		§	§				
	805Y		A	A		A	A	§	§	§	§	§	§	
	805YB		Av											
	805YR		A	A										
	805YD							A	A	A	A	A	A	
	850	AvA	AvA	AvA	AvA	AvA	AvA	Av	Av	Av	Av	Av		
	850F		AvA											
	850U	AvA	AvA	AvA	AvA	AvA	AvA							
	870							A	A	A	A	A	A	
	870V							Az	Az	Az	Az	Az	Az	
FLOMATIC	DCV		A	A		A	A	A	A	A	A			
	DCVE		A	A		A	A							
HERSEY/ GRINNELL	2								A	A	A	A	A	
	FDC		A	A		A	A							
WATTS	007							Av	Av					
	007QT	Av	§	§		§	§							

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AvA signifies approval for horizontal, vertical up inlet and vertical down outlet installations.

vA signifies approval only for vertical up inlet/vertical down outlet configurations.

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK VALVE ASSEMBLIES														
		SIZE (INCHES)												
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10	
WATTS	007PCQT	A				§	§							
	007M1QT		§	Av		§	Av							
	007M1PCQT		A	A		§	A							
	007M2QT		Av		Av	Av								
	007M2PCQT				Av	A								
	007M3QT		Av											
	007SSQT		§	§		§	§							
	007SSPCQT					§	§							
	007SSM1QT		§	§										
	007SSM1PCQT		§	§										
	700								§	§				
	709 QT		§	§		§	§							
	709 BB								A	A				
	709								A	A	Av	Av	Av	Av
	709QT-FDA								A	A	A	A	A	A
	770										§		§	
	770 QT-FDA										§		§	
	772										§			§
	774		§	§	§	§	§	§	A	A	A	A	A	A
	774X								A			A	A	
	775QT	Av	Av	Av	Av	Av	Av	Av						
	SS007M1QT				Av									
	SS007M3QT	Av	Av											
	U007QT	Av	§	§			§	§						
	U007PCQT		§	§			§	§						
	U007M1AQT ¹		A					A						
	U007M1APCQ		A					A						
	U007M1PCQT		A	A			A	A						
	U007M1QT		A	A			§	A						
	U007M2AQT ¹						A							
¹ The models U007M1AQT U007M1APCQT and U007M2AQT are only approved in the configurations shown in the appendix.														
	U007M2QT				A	A								
	U007SSQT		§	§		§	§							
	U007SSPCQT		§	§		§	§							
WILKINS	350							Av	Av	Av	Av	A	A	
	350G							Av	Av	Av	Av	A		
	350GPI									Av	Av			

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK VALVE ASSEMBLIES														
		SIZE (INCHES)												
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10	
WILKINS	350PI									Av	Av			
	450							vA	vA	vA	vA			
	450G							vA	vA	vA	vA			
	550		§	§	§	§	§	§	§	§	§			
	550A		§	§										
	950		A	A	A	A	A	A	A	Av	Av	Av	A	
	950G									Av	Av			
	950XL		Av	A	A	A	A							
	950XLD		Av											
	950XLT		A	A	A	A	A							
	950XLU		A	A		A	A							
	950A		A	A	A	A	A							
	550-M8		§						(4 X 4 X 8)					
	550-M10		§						(6 X 6 X10)					

A signifies approval for horizontal installations only.

Av signifies approval for both, horizontal and vertical up installations.

Az signifies approval only for N and Z configurations, as shown in the Appendix.

AvA signifies approval for horizontal, vertical up inlet and vertical down outlet installations.

vA signifies approval only for vertical up inlet/vertical down outlet configurations.

vAv signifies approval only for vertical up inlet/vertical up outlet configurations.

§ signifies that these model are no longer manufactured, only spare parts are available.

**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK DETECTOR ASSEMBLIES													
		SIZE (INCHES)											
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
AMES	DCDC									§	§	§	
	3000B						Av						
	3000 CIV									Av	Av	Av	Av
	3000-DCDC												A
	3000-G-DCDC												§
	3000-DCDA									§	§	§	
	3000-G-DCDA									§	§	§	
	3000SE							A			A	A	
	3000SE-A											§	
	3000SS							A	A	A	A	A	A
	3000SS-A										§		
	3000SS-M									§	A		
	3000SS-WM1							A	A	A			
	3000SE-WM1										A		
CLA-VAL	DD7LY								A	A	A	A	A
	DD8LY									Av	Av	A	
	DD8NY							§	§	§	§	§	§
	DD8VY							Az	Az	Az	Az	Az	Az
CONBRACO	2 1/2DCDA							Av					
	2 1/2DCDA-6							Av					
	2 1/2DCDAU							vA					
	3DCDA								Av				
	3DCDA-6								Av				
	3DCDAU								vA				
	4DCDA									Av			
	4DCDA-6									Av			
	4DCDAU									vA			
	6DCDA										Av		
	6DCDA-6										Av		
	6DCDAU										vA		
	40-600-C3									A			
	40-600-E3									A			
	40-60A-C3										A		
	40-60A-C6										A		
40-60A-E3										A			

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DOUBLE CHECK DETECTOR ASSEMBLIES													
		SIZE (INCHES)											
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
CONBRACO	40-60A-E6									A			
	40-60C-C3										A		
	40-60C-C6										A		
	40-60C-E3										A		
	40-60C-E6										A		
	40-60E-C3											A	
	40-60E-C6											A	
	40-60E-E3											A	
	40-60E-E6											A	
	40-60G-C3												A
	40-60G-C6												A
	40-60G-E3												A
	40-60G-E6												A
FEBCO	806									§	§	§	§
	806YD								A	A	A	A	A
	856							Av	Av	Av	Av	Av	
	876							A	A	A	A	A	A
	876 V							Az	Az	Az	Az	Az	Az
HERSEY / GRINNELL	DDC-II								A	A	A	A	A
WATTS	007 DCDA						Av	Av	A	§	§		
	709 DCDA								A	Av	Av	Av	Av
	770 DCDA									§		§	
	772 DCDA									§			§
	774 DCDA							A	A	A	A	A	A
	774 XDCDA							A			A	A	
WILKINS	350DA							A	A	Av	Av	A	A
	350 DAG									Av	Av		
	350 DAGPI									Av	Av		
	350 DAPI									Av	Av		
	450DA									vA	vA		
	450DAG									vA	vA		
	950DA							Av	Av	Av	Av	Av	A
	950DAG									Av	Av		
	DCDA							§	§	§	§		

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES

DEFINITION:

Reduced Pressure Principle Backflow Prevention Assembly (RP) is a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and is equipped with the necessary test cocks for testing. (CCR, Title 17, Section 7583 (j)).

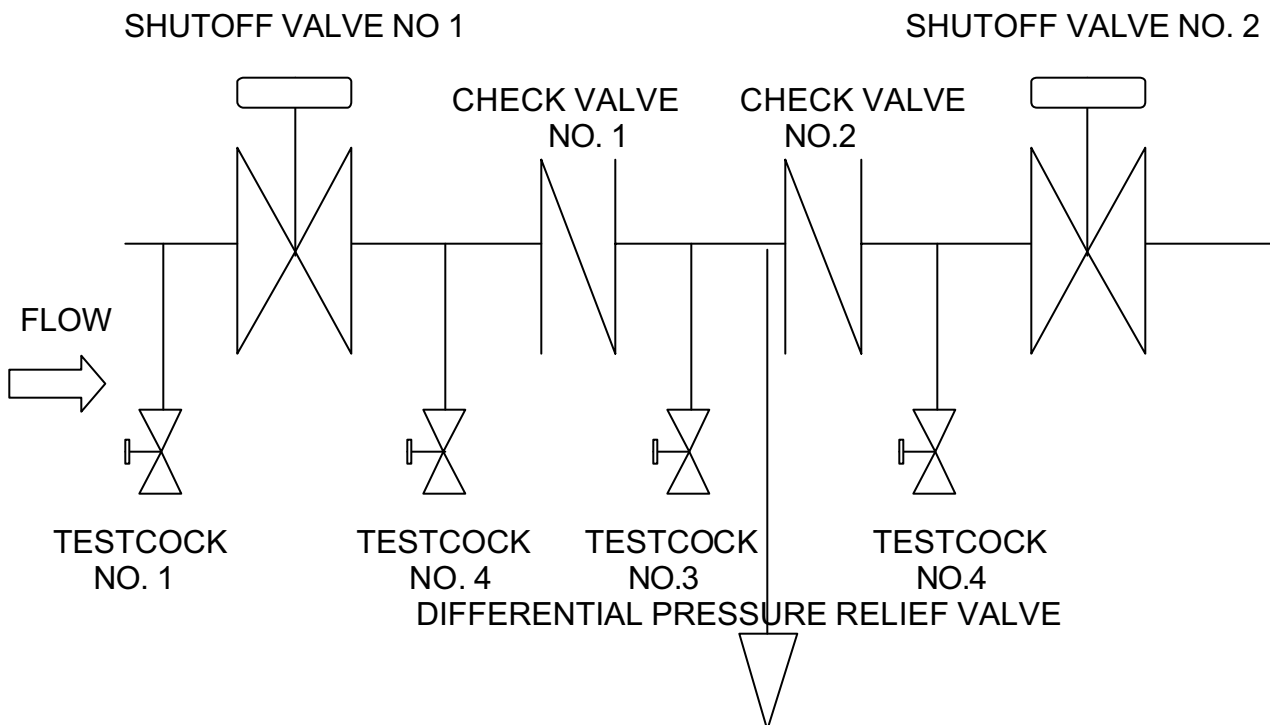
A Reduced Pressure Principle Detector Assembly is configured the same as the Reduced Pressure Principle Assembly, with the exception that it is equipped with a bypass-detector that allows the visual inspection of flow through the assembly.

CONSTRUCTION AND INSTALLATION SPECIFICATIONS:

A required Reduced Pressure Principle Backflow Prevention Assembly shall, as a minimum conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Reduced Pressure Type Backflow Prevention Devices. (CCR, Title 17, Section 7602(c)).

A Reduced Pressure Principle Backflow Prevention Assembly shall be located as close as practical to the user's connection and shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six inches (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance. (CCR, Title 17, Section 7603 (c)). Figure No. 2 shows a RP schematic.

**FIGURE NO. 2
REDUCED PRESSURE PRINCIPLE ASSEMBLY**



**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

DIFFERENTIAL PRESSURE RELIEF VALVE

A Reduced Pressure Principle Backflow Prevention Assembly is the minimum type of backflow protection required to protect the public water supply at the water user connection for the following situations.

- The public water system serves water users premises where there is an irrigation system that can inject fertilizers, herbicides, or pesticides.
- The public water system serves water users premises where there is an unapproved auxiliary water supply and there are no interconnections between the unapproved auxiliary water supply and the public water system.
- The public water system serves water user premises where there are pier hydrants that supply water to vessels for any purpose.
- The public water system serves water users premises where there are marine facilities.
- The public water system serves water users premises where entry to the premises is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connection do not exist.
- The public water system serves water users premises where there is a history of cross-connections being established or re-established on the premises.

**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES														
		SIZE (INCHES)												
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10	
AMES	4000B	A	A	A	A	A	A							
	4000BM2			A										
	4000BM3		A											
	4000CIV							A	A	A	A	A	A	
	4000SS							A	A	A	A			
	4000-RP									A	A	A	A	
BUCKNER	24000		§											
	24001			§										
	24002				§									
	24003					§								
	24004						§							
	24000/25		§											
	24001/25			§										
	24002/25				§									
	24003/25					§								
	24004/25						§							
CLA-VAL	RP-2		A	A	A	A								
	RP-4						A	A	A	A	A	A	A	
	RP4V									A				
	Model RP4V is approved for vertical installation with the flow of water vertically upward as shown in the Appendix.													
	RP6LW		A	A	A	A	A							
	RP6VW		A	A		A	A							
	RP7LW							A	A	A	A	A	A	
	RP7LY							A	A	A	A	A	A	
	RP8LW							A	A	A	A	A		
	RP8LY							A	A	A	A	A		
	RP8NW							§	§	§	§	§	§	
	RP8NY							§	§	§	§	§	§	
	RP8VW							Az	Az	Az	Az	Az	Az	
	PR8VY							Az	Az	Az	Az	Az	Az	

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vAv signifies approval only for vertical up inlet/vertical up outlet configurations.

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES															
COMPANY	MODEL	SIZE (INCHES)													
		1/4	3/8	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
CONBRACO	40-200-02											A			
	40-200-03											A			
	40-200-05											A			
	40-201-02	A													
	40-201-A2	A													
	40-201-A2S	A													
	40-201-T2 Formally 40-201-99T	A													
	40-202-02		A												
	40-202-A2		A												
	40-202-A2S		A												
	40-202-T2 Formally 40-202-99T		A												
	40-203-02			A											
	40-203-A2			A											
	40-203-A2S			A											
	40-203-T2 Formally 40-203-99T			A											
	40-204-02					A									
	40-204-T2 Formally 40-204-99T					A									
	40-204-A2					A									
	40-204-A2S					A									
	40-204-A2U ⁴					A									
	40-204-A2Z ⁴					A									
	40-204-TC2					A									
	40-204-TCU ⁴					A									
	40-205-02						A								
	40-205-T2 Formally 40-205-99T						A								
	40-205-A2						A								
	40-205-A2S						A								
	40-205-A2U ⁴						A								
	40-205-A2Z ⁴						A								
	40-205-TC2						A								
40-205-TCU ⁴						A									

⁴ The A2Z, A2U, and TCU series assemblies are approved in the orientation shown in the Appendix

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES														
COMPANY	MODEL	SIZE (INCHES)												
		1/4	3/8	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8
CONBRACO	40-206-02						A							
	40-206-A2						A							
	40-206-A2U ⁴						A							
	40-206-A2Z ⁴						A							
	40-206-T2 Formally 40-206-99T						A							
	40-207-02							A						
	40-207-A2							A						
	40-207-A2U ⁴							A						
	40-207-A2Z ⁴							A						
	40-207-T2 Formally 40-207-99T							A						
	40-208-02								A					
	40-208-A2								A					
	40-208-A4								A					
	40-208-A2U ⁴								A					
	40-208-A2Z ⁴								A					
	40-208-T2 Formally 40-208-99T								A					
	40-209-02									A				
	40-209-03									A				
	40-209-05									A				
	40-20A-02											A		
	40-20A-03											A		
	40-20A-05											A		
	40-20C-02												A	
	40-20C-03												A	
	40-20C-05												A	
	40-20E-02													A
	40-20E-03													A
	40-20G-02													
40-20G-03														A
⁴ The A2Z, A2U, and TCU series assemblies are approved in the orientation shown in the Appendix														
FEBCO	825									§	§	§	§	§
	835B				§	§		§	§					
	925D									§	§	§	§	§

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES																
COMPANY	MODEL	SIZE (INCHES)														
		1/4	3/8	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10	
FEBCO	825Y				A	A	A	A	A							
	825YA ⁵				A	A		A	A							
	⁵ The models 825Y and 825YAR are approved in the configurations shown in Appendix.															
	825YAR ⁵				A	A		A	A							
	⁵ The models 825Y and 825YAR are approved in the configurations shown in Appendix.															
	825YD										A	A	A	A	A	A
	825YR				A	A		A	A							
	860			A	A	A	A	A	A	A	A	A	A	A	A	
	860U			A	A	A	A	A	A							
	880										A	A	A	A	A	A
880V										Az	AZ	AZ	AZ	AZ	AZ	
FLOMATIC	RPZ				A	A		A	A	A	A	A	A			
	RPZE				A	A		A	A							
	RPZ-II			A	A											
	RPZ-IIIE			A	A											
HERSEY / GRINNELL	6CM									A	A	A	A	A	A	
	FRP-II				A	A	A	A	A							
	6CM-BRONZE									A	A	A	A			
WATTS	009									A	A	§	§			
	009M1QT						§	§	§							
	009M1PCQT						§	§	§							
	009M2QT				A	A	A	A	A							
	009M2PCQT					A	A	A	A							
	009M3QT				A											
	009PCQT			A	A	§	§	§	§							
	009QT	A	A	A	A	§	§	§	§							
	009SSM1QT								§							
	009SSM1PCQT								§							
	009SSPCQT				§	§	§	§	§							
	009SSQT				§	§	§	§	§							
	909										A	A	A	A	§	§
	909BB										A	A				
	909HWQT				A	A										
	909HWM1QT						A	A	A							
909M1														A	A	

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES															
COMPANY	MODEL	SIZE (INCHES)													
		1/4	3/8	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
WATTS	909M1QT						A	A	A						
	909M1QTFDA													A	A
	909PCHWM1QT						A	A	A						
	909PCHWQT				A	A									
	909PCM1QT						A	A	A						
	909PCQT					Av	Av								
	909QT					Av	Av								
	909QTFDA										A	A	A	A	
	990												§		§
	990QT-FDA												§		§
	992												§		§
	994										A	A	A	A	
	995QT				A	A	A	A	A						
	FAE909QT							A	A	A					
	FAE909HWQT							A	A	A					
	SS009M3QT	A	A	A	A										
	SS009QT					A									
	U009APCQT ⁶				A	§									
	U009AQT ⁶				A	§									
	U009M1APCQT ⁶								§	§					
	009M1AQT ⁶								§	§					
	U009M1PCQT							A	A	A					
	U009M1QT							A	§	§					
	U009M2APCQT ⁶					A			A	A					
	U009M2AQT ⁶					A			A	A					
	U009M2PCQT					A			A	A					
	U009M2QT					A	A		A	A					
	U009PCQT				A	A	§	§	§	§					
	U009QT				A	§	§	§	§	§					
	U009SSPCQT					§	§	§	§	§					
	U009SSQT					§	§	§	§	§					
	U909QT					Av	Av								
U909HWQT					A	A									

⁶ The models U009APCQT, U009AQT, U009M1APCQT, U009M1AQT, U009M2APCQT and U009M2AQT are approved in the configurations shown in the Appendix.

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE ASSEMBLIES														
COMPANY	MODEL	SIZE (INCHES)												
		1/4	3/8	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8
WILKINS	375									A	A	A	A	
	375G									A	A	A	A	
	375GPI											A	A	
	375PI											A	A	
	475									vA	vA	vA	vA	
	475G									vA	vA	vA	vA	
	475V									vA	vA	vA	vA	
	475VG									vA	vA	vA	vA	
	575				§	§	§	§	§	§	§	§	§	
	575A				§	§								
	975				A	A	A	A	A	A	A	A	A	A
	975A				A	A	A	A	A					
	975BMS									A	A	A	A	A
	975G											A	A	
	975MS									A	A	A	A	A
	975XL	A	A	A	A	A	A	A	A					
	975XLBMS				A	A	A	A	A					
	975XLMS				A	A	A	A	A					
	975XLU				A	A		A	A					
	975XLSE ⁷				A	A	A	A	A					
	975XLSEU ⁷				A	A	A	A	A					
	975XLV ⁷				A	A								
575-M8	§ [4 X 4 X 8]													
575-M10	§ [6 X 6 X 10]													

⁷ The models 975XLSE, 975XLSEU, and 975XLV are approved in the orientation shown in the Appendix.

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLIES													
		SIZE (INCHES)											
COMPANY	MODEL	1/2	3/4	1	1¼	1½	2	2½	3	4	6	8	10
AMES	5000									A	A	A	A
	5000CIV							A	A	A	A	A	A
CLA-VAL	18-4												A
	RD7LY							A	A	A	A	A	A
CONBRACO	40-700-C3								A				
	40-700-E3								A				
	40-70A-C3									A			
	40-70A-E3									A			
	40-70C-C3										A		
	40-70C-E3										A		
	40-70E-C3											A	
	40-70E-E3												A
	40-70G-C3												
40-70G-E3													A
FEBCO	826YD								A	A	A	A	A
HERSEY/ GRINNELL	6CMDA									A	A	A	A
WATTS	009NRS RPDA									§	§		
	009OSY RPDA									§	§		
	909 RPDA							A	A	A	A	A	A
	990 RPDA									§		§	
	992 RPDA									§			§
WILKINS	375 DA									A	A		
	375 DAG									A	A		
	375 DAGPI									A	A		
	375 DAPI									A	A		
	475 DA									vA	vA		
	475 DAG									vA	vA		
	475 DAV									vAv			
	475 DAVG									vAv			
	975 DA								A	A	A	A	A
	975 DA									A	A		

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**DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES**

APPENDIX

DEFINITIONS:

"AIR-GAP" is a physical break between the supply line and a receiving vessel.

"AWWA STANDARD" is an official standard developed and approved by the American Water Works Association (AWWA).

"BACKFLOW" means a flow condition, caused by a differential in pressure that causes the flow of unapproved water or other contaminants into the potable supply source.

"BACKSIPHONAGE" is backflow caused by negative or reduced pressure in the supply piping.

"BACKPRESSURE" is backflow caused by positive or higher pressure in the users system.

"BACKFLOW PREVENTION ASSEMBLY" means an assembly that has passed laboratory and field evaluation tests performed by a recognized testing organization, which has demonstrated their competency to perform such tests to the Department of Health Services.

"CROSS-CONNECTION" is an unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe and potable.

"DOUBLE CHECK VALVE ASSEMBLY" is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the watertightness of each check valve.

"HEALTH AGENCY" means the California Department of Health Services, or the local health officer with respect to a small water system.

"USER CONNECTION" is the point of connection of a user's piping to the water supplier's facilities.

"REDUCED PRESSURE PRINCIPLE" is a backflow device incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.

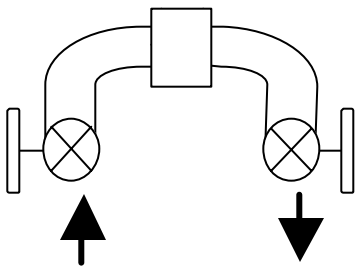
DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES

APPROVED CONFIGURATIONS

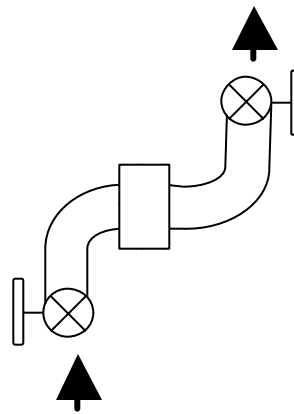
VERTICAL UP CONFIGURATIONS



"N AND Z" CONFIGURATIONS



N CONFIGURATION

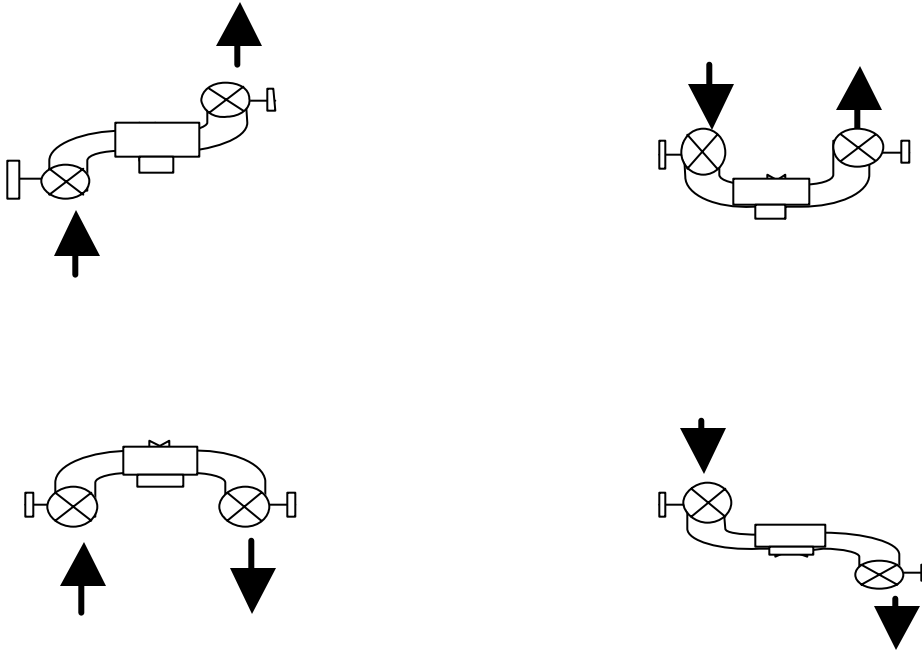


Z CONFIGURATION

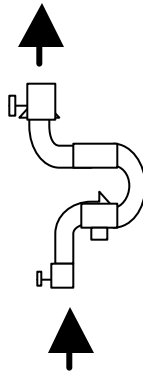
DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES

APPROVED CONFIGURATIONS

WATTS MODELS (Footnote 1)



CLA-VAL MODEL RP4V (Footnote 3)

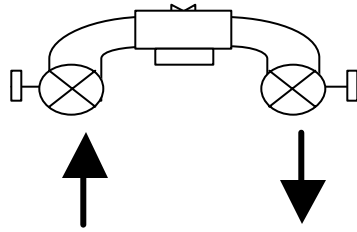


DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES

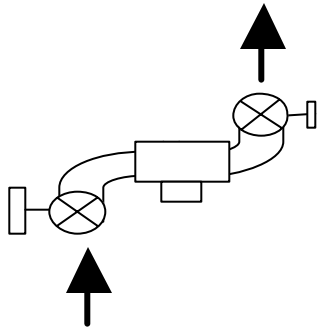
APPROVED CONFIGURATIONS

CONBRACO (Footnote 4)

A2U and TCU Series



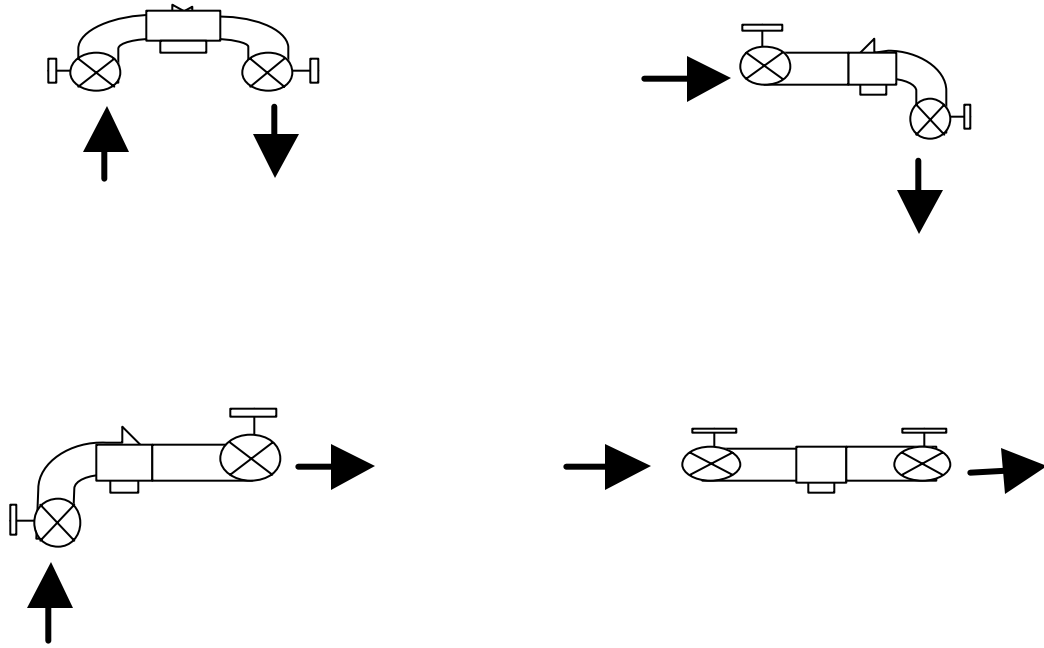
A2Z Series



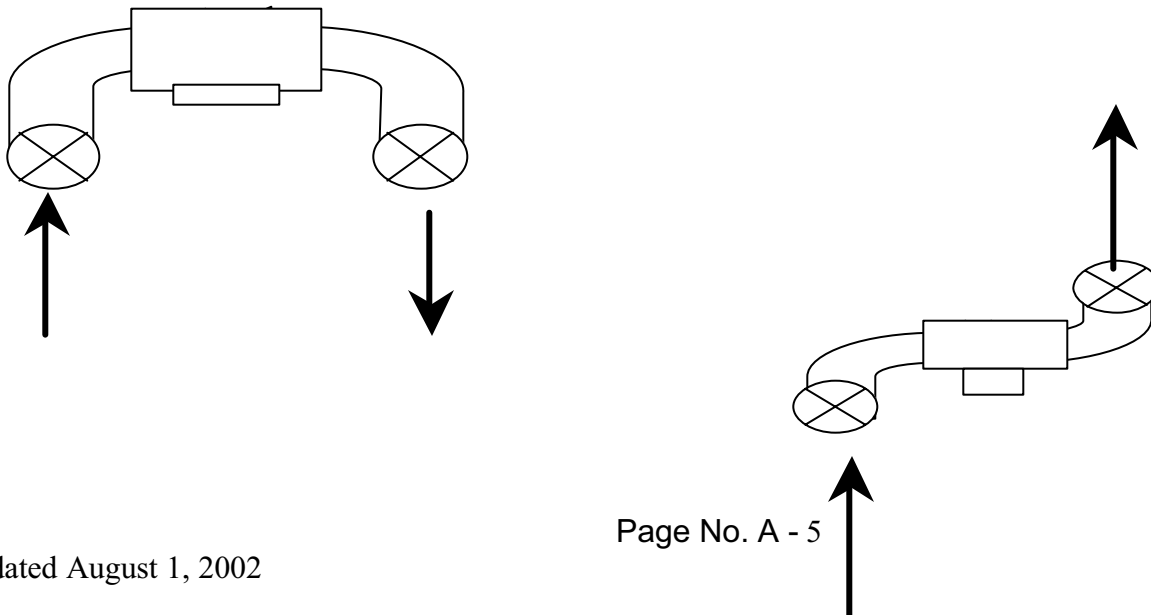
DEPARTMENT OF HEALTH SERVICES
APPROVED BACKFLOW PREVENTION ASSEMBLIES

APPROVED CONFIGURATIONS

FEBCO MODELS 825YA AND 825YAR (Footnote 5)



WILKINS MODEL 975 XLV, 975XLSE, 975XLSEU (Footnote 7)



For a current list of certified backflow testers, contact the Public Works Water Division at (209) 239-8458 or the Public Works Department at (209) 239-8460.