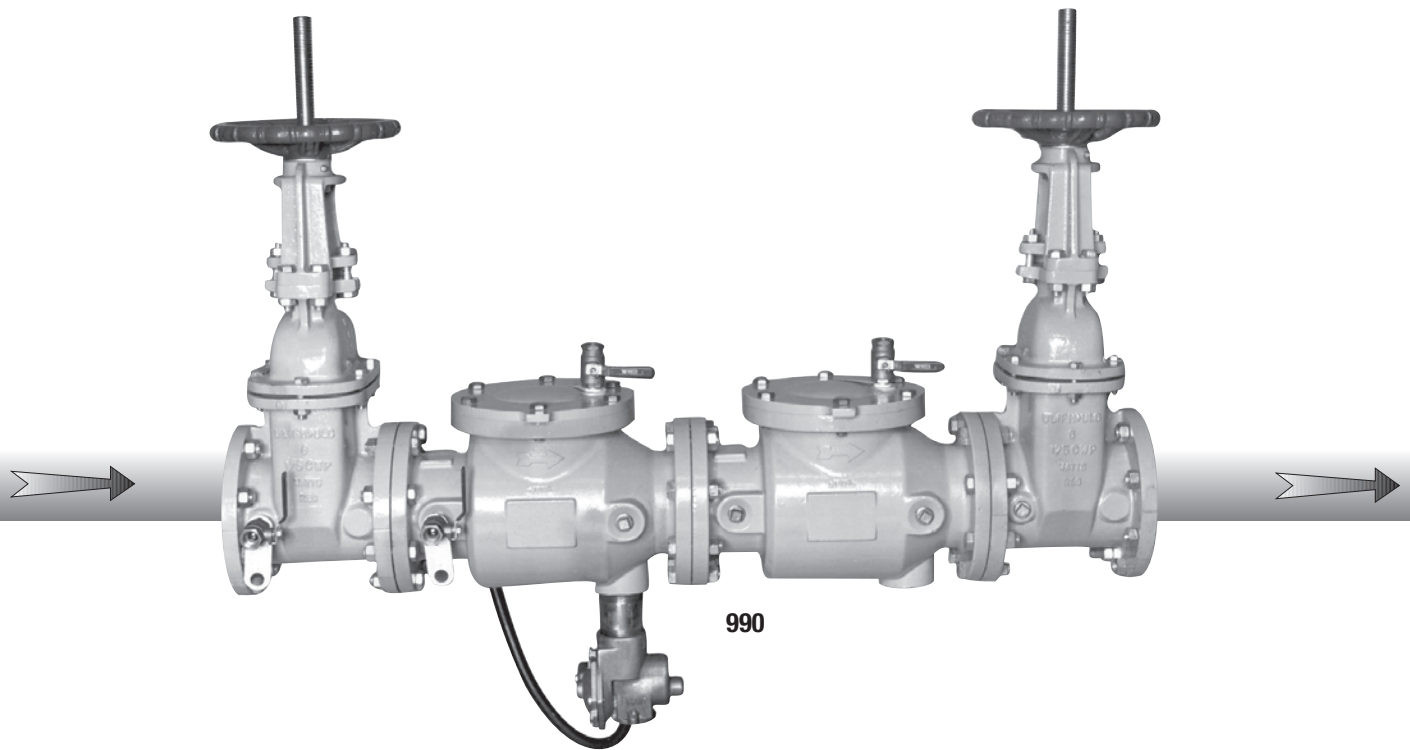


# Series 990/990RPDA

## Reduced Pressure Zone Backflow Preventer

Sizes: 4", 6", 8" (100mm, 150mm, 200mm)

- BACKFLOW PREVENTION
- CONTAINMENT
- CROSS CONNECTION CONTROL



A reduced pressure zone backflow prevention assembly shall be installed at each cross connection to prevent backsiphonage and backpressure backflow of hazardous materials into the potable water supply. The assembly shall consist of a pressure differential relief valve, accessible from either side of the assembly, located in a zone between two positive seating bronze sealed stainless steel check valves. The assembly shall feature captured springs, replaceable seats and seat discs in a modular unit. Springs shall be center stem guided. Access to each check module shall be through a top access bolted cover. The relief valve shall be compact bottom mounted with a single discharge port. The assembly shall include two shutoff valves before and after the device and four test cocks. The assembly shall be a Watts Regulator Company Series 990.

**IMPORTANT:** Inquire with governing authorities for local installation requirements.

**ATTN. INSTALLER:** After installation, please leave this Instruction Sheet for occupant's information.

### Installation, Service, Replacement Parts and Maintenance

For field-testing procedure, send for IS-TK-DL. For technical assistance, see back page.

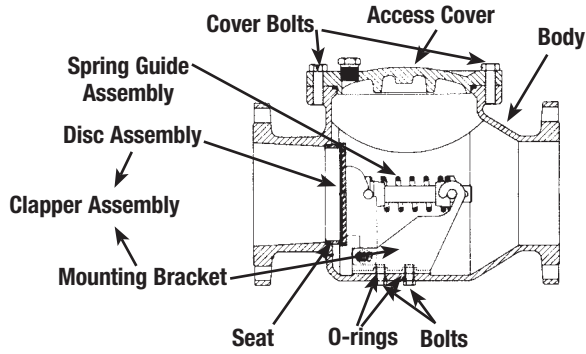
**Annual inspection of all water system safety and control valves is required and necessary. Regular inspection, testing and cleaning assures maximum life and proper product function.**

# Troubleshooting Guide

## Backflow Preventers

PROBLEM	CAUSE	Should valve be replaced?	SOLUTION
A. Valve spits periodically from the vent.	A.1 Fluctuating supply pressure. A.2 Fluctuating downstream pressure.	No No	A.1 Install a spring-loaded, soft seated check valve immediately upstream of the device. A.2 Install a spring-loaded, soft seated check valve downstream of the device as close as possible to the shutoff valve.
B. Valve drips continually from the vent.	B.1 Fouled first check. B.2 Damaged or fouled relief valve seat. B.3 Relief valve piston "O" ring not free to move due to pipe scale, dirt or build-up of mineral deposits. B.4 Excessive backpressure, freezing, or water hammer has distorted the second check. B.5 Electrolysis of relief valve seat or first check seats. B.6 Valve improperly reassembled.	No No No No No No	B.1 Flush valve. If flushing does not resolve problem, disassemble valve and clean or replace the first check. B.2 Clean or replace the relief valve seat. B.3 Clean, grease or replace the piston "O" ring. B.4 Eliminate source of excessive backpressure or water hammer in the system downstream of the device. Use Watts No. 601 to dampen out backpressure and No. 15 to eliminate water hammer. Replace defective second check assembly. In case of freezing; thaw, disassemble, and inspect internal components. Replace as necessary. B.5 Replace relief valve seat or inlet cover. Install dielectric unions (Watts Series 3001 through 3006). Electrically ground the piping system and/or electrically isolate the device with plastic pipe immediately upstream and downstream of the device. B.6 If valve is disassembled during installation, caution must be exercised to install check springs in their proper location.
C. Valve exhibits high pressure drop.	C.1 Fouled strainer. C.2 Valve too small for flows encountered.	No Yes	C.1 Clean strainer element or replace. C.2 Install proper size device based upon flow requirements.
D. No water flows downstream of valve.	D. Valve installed backwards.	No	D. Install valve in accordance with flow direction arrow.
E. Valve does not test properly.	E.1 Follow manufacturer's test procedure. E.2 Leaky downstream gate valve.	No No	E.1, E.2 Clean or replace gate valve with full port ball valves or resilient wedge shutoff valves.
F. Valve quickly and repeatedly fouls following servicing.	F. Debris in pipe line is too fine to be trapped by strainer.	No	F. Install finer mesh strainer element in the strainer.
G. Winterization of backflow preventers.			G. Prevent freeze damage by enclosing a WATTSBOX heated enclosure. For additional information, send for ES-WB or ES-WB-T.

# Check Valves 4", 6" and 8" (100mm, 150mm, 200mm)



## Spring Guide Assembly Removal Instructions

1. Remove the access cover.
2. The 990 features a captured spring in a center stem guided assembly. The spring guide assembly must be removed to clean the seat disc. To remove the spring assembly from the mounting bracket, remove the two bolts on the bottom of the body opposite the access cover. This will allow the spring module to be removed from the notches on the mounting bracket. (Fig.1) As with any spring loaded mechanism, keep fingers away from pinch points. The spring guide assembly has a heavy spring pre-load and could cause injury. It is not necessary to disassemble the spring guide assembly.

## To Replace

1. Bolt the mounting bracket back in place after lubricating the bolt O-rings.
2. Position the back of the spring guide into the rear hook of the mounting bracket.
3. Apply leverage between the spring guide assembly and the disc assembly as shown in Fig.2. Compress spring assembly slightly and push down to position the spring assembly in the front notches.

## 990 Repair Kits

Ordering Code	Kit No.	Size	
1st Check Repair Kits		in.	mm

0887315	RK 990 CK1	4	100
0887316	RK 990 CK1	6	150
0887317	RK 990 CK1	8	200

### 2nd Check Repair Kits

0887318	RK 990 CK2	4	100
0887319	RK 990 CK2	6	150
0887320	RK 990 CK2	8	200

Kits consist of: Spring assembly & Cover O-ring

### Check Rubber Parts

0887321	RK 990 RC4	4	100
0887322	RK 990 RC4	6	150
0887323	RK 990 RC4	8	200

Kits consist of: Cover O-ring, 2 Bolt O-rings & Disc for one check

### Seat Kits

0887330	RK 990 S	4	100
0887331	RK 990 S	6	150
0887332	RK 990 S	8	200

Kits consist of: Seat & Seat O-ring for one check

### Complete Rubber Parts

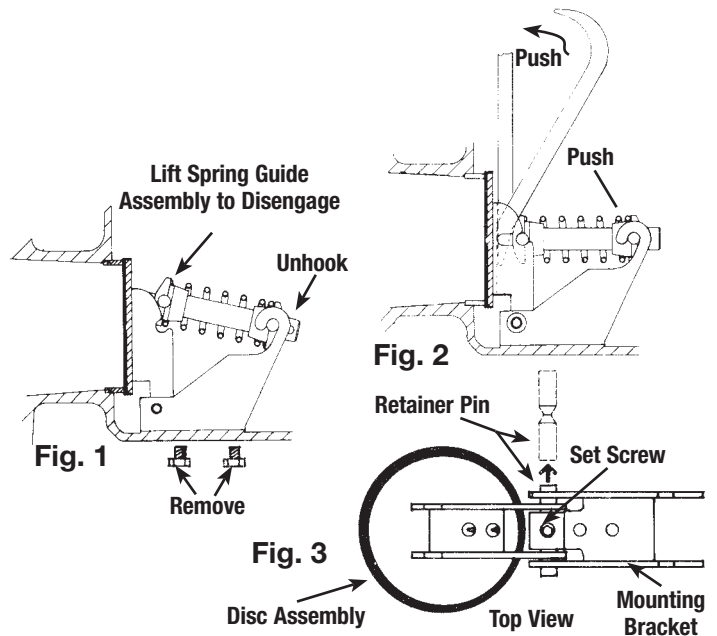
0887333	RK 990 RT	4	100
0887334	RK 990 RT	6	150
0887335	RK 990 RT	8	200

Kits consist of: 2 Cover O-rings, 4 Bolt O-rings, 2 Discs, 1 Relief valve diaphragm, Relief valve cover O-ring, Piston O-rings, Relief valve seat disc & Seat O-ring

### Complete Repair Kits

0887336	RK 990 T	4	100
0887337	RK 990 T	6	150
0887338	RK 990 T	8	200

Kits consist of: 2 Cover O-rings, 4 Bolt O-rings, 2 Discs, 2 Spring assemblies, Relief valve, Stem assembly, Seat O-ring & Cover O-ring



## Disc Assembly Removal Instructions

1. Remove the access cover.
2. Unfasten the two bolts on the bottom of the body opposite the access cover.
3. Remove the spring guide assembly.
4. Reach in through the access opening and remove the entire clapper assembly, opening the clapper assembly and laying it flat on a table. (Refer to Fig.3)
5. With an allen wrench, remove the setscrew which secures the spacer to the retainer pin on the clapper assembly.
6. Slide out the retainer pin to separate the disc assembly from the mounting bracket. **Important:** Each check repair kit fits (1) one check module.

## 990RPDA Repair Kits

Ordering Code	Kit No.	Size	
1st Check Repair Kits		in.	mm

0887340	RK 990RPDA CK1	4	100
0887341	RK 990RPDA CK1	6	150
0887342	RK 990RPDA CK1	8	200

### 2nd Check Repair Kits

0887343	RK 990RPDA CK2	4	100
0887344	RK 990RPDA CK2	6	150
0887345	RK 990RPDA CK2	8	200

Kits consist of: Spring assembly & Cover O-ring

### Check Rubber Parts

0887346	RK 990RPDA RC4	4	100
0887347	RK 990RPDA RC4	6	150
0887348	RK 990RPDA RC4	8	200

Kits consist of: Cover O-ring, Bolt O-ring & Disc for one check

### Seat Kits

0887352	RK 990RPDA S	4	100
0887353	RK 990RPDA S	6	150
0887354	RK 990RPDA S	8	200

Kits consist of: Seat & Seat O-ring for one check

### Complete Rubber Parts

0887361	RK 990RPDA RT	4	100
0887362	RK 990RPDA RT	6	150
0887363	RK 990RPDA RT	8	200

Kits consist of: 2 Cover O-rings, 4 Bolt O-rings, 2 Discs, 1 Relief valve diaphragm, Relief valve cover O-ring, Piston O-rings, Relief valve seat disc & Seat O-ring

### Complete Repair Kit

0887349	RK 990RPDA T	4	100
0887350	RK 990RPDA T	6	150
0887351	RK 990RPDA T	8	200

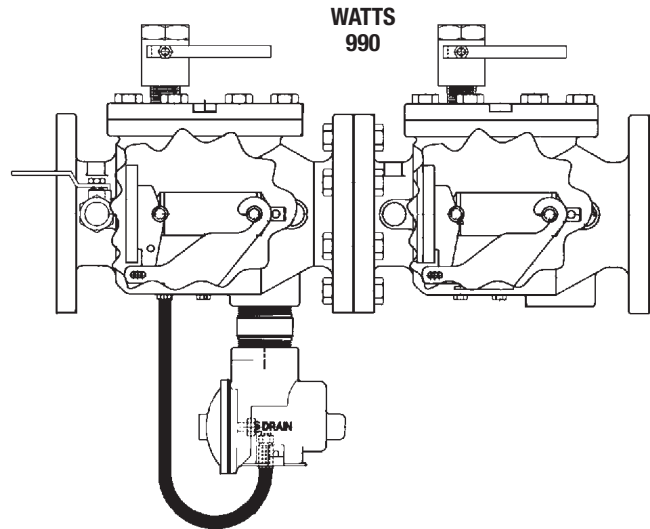
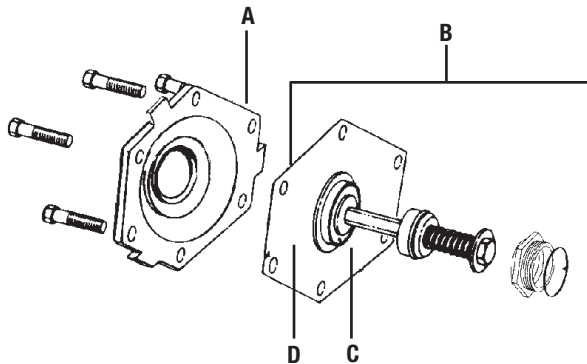
Kits consist of: 2 Cover O-rings, 4 Bolt O-rings, 2 Discs, 2 Spring assemblies, Relief valve, Stem assembly, Seat O-ring & Cover O-ring

# Servicing the Relief Valve

## 4" – 8" (100mm – 200mm)

### To Service the Relief Valve:

1. Remove sensing hose. Check for debris.
2. Remove cover (A).
3. Remove diaphragm and stem assembly (B). Check seat disc (C) for debris and diaphragm (D) for cuts or tears. Repair or replace as necessary.
4. Lubricate only sealing O-rings with Dow Corning FS 1292.  
**Do Not** lubricate seat disc or diaphragm.
5. Reassemble and test.



## Relief Valve Repair Kits

### Series 990

Ordering Code	Kit No.	Size	
Relief Valve Total		in.	mm
0887327	RK 990 VT	4	100
0887328	RK 990 VT	6	150
0887329	RK 990 VT	8	200

Kits consist of: Relief Valve, Stem assembly, Seat O-ring & Cover O-ring.

### Relief Valve Rubber Parts

0887324	RK 990 RV	4	100
0887325	RK 990 RV	6	150
0887326	RK 990 RV	8	200

Kits consist of: Relief valve diaphragm, Piston O-rings, Seat disc, Seat O-ring & Cover O-ring.

### Series 990RPDA

Ordering Code	Kit No.	Size	
Relief Valve Total		in.	mm
0887358	RK 990RPDA VT	4	100
0887359	RK 990RPDA VT	6	150
0887360	RK 990RPDA VT	8	200

Kits consist of: Relief valve, Stem assembly, Seat O-ring & Cover O-ring.

### Relief valve Rubber Parts

0887361	RK 990RPDA RV	4	100
0887362	RK 990RPDA RV	6	150
0887363	RK 990RPDA RV	8	200

Kits consist of: Relief valve diaphragm, Piston O-rings, Seat disc, Seat O-ring & Cover O-ring.

# Test Procedure for Reduced Pressure Zone Backflow Preventers

The following Test Procedure is one of several that is recognized throughout the United States for verification of the functioning of Backflow Preventers.

The following procedure is not a specific recommendation. The Watts series of test kits are capable of performing any of the recognized Backflow test procedures.

- A. Open TC #4 and flush test cocks Nos. 1, 2 and 3 on BF assembly, then close TC #4.
- B. Turn tester on (before connecting hoses). Tester must read all zeros. Close VA and VB.

## Test No. 1 - Relief Valve

1. Install high side hose between TC #2 and tester connection A.
2. Install low side hose between TC #3 and tester connection B.
3. Open TC #3 then VB. Now open TC #2 slowly, then VA. Close VA then VB.
4. Close #2 shutoff valve.
5. Observe the apparent first check valve differential pressure (A - B).
6. Install bypass hose between VA and VB.  
Open VB and bleed air by loosening hose connection at VA. Tighten hose connection and close VB.

### Push - Print Head (wait) then Push - Start Test

7. Open VA, then slowly open VB (no more than 1/4 turn). When relief valve drips, push the "hold" button for 2 seconds. Record reading (must be 2 psid or more).

### Push - Stop Test

8. Close VA and VB.

## Test No. 2 - Test No. 2 Check Valve

9. Install bypass hose between VA and TC #4.  
Open VA, then bleed air by loosening hose connection at TC #4. Tighten hose connection. Close VA.

### Push - Start Test

10. Open VB to reestablish pressure within the "zone". Close VB.
11. Open TC #4, then open VA. If relief valve does not drip, record second check valve as "closed tight".

## Test No. 3 - Test No. 1 Check Valve

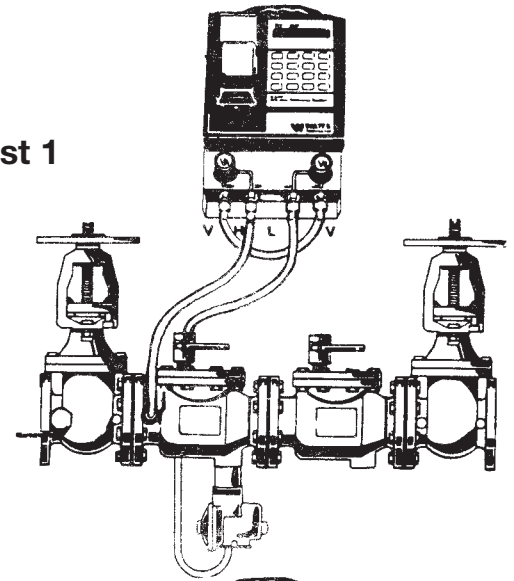
12. Open VB to reestablish first check valve differential pressure. Close VB. Record pressure differential.

### Stop Test (Push - Stop Test twice)

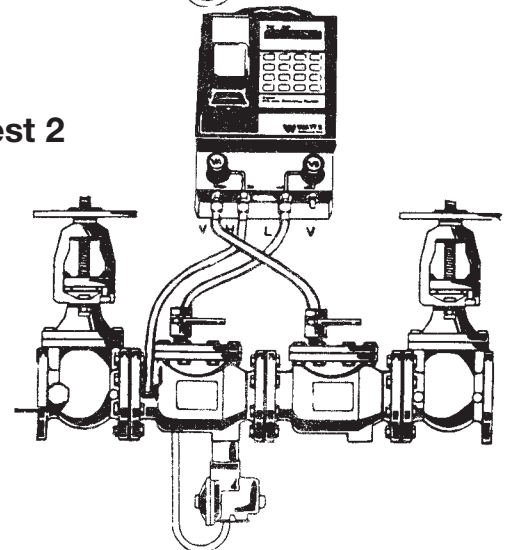
13. Close test cocks and remove tester, return assembly to normal operating condition.

**For complete testing information send for IS-TK-DL.**

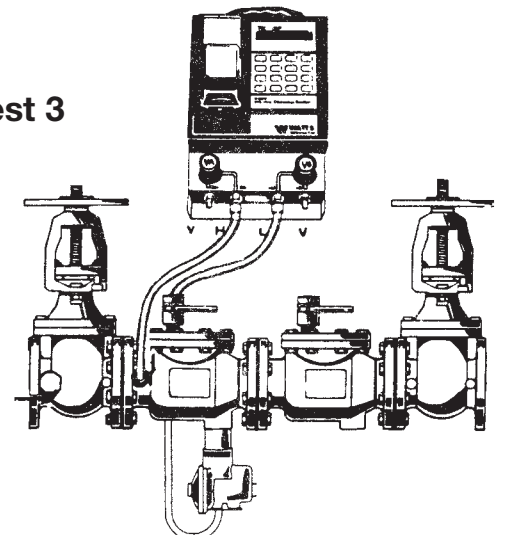
## RPZ Test 1



## RPZ Test 2



## RPZ Test 3

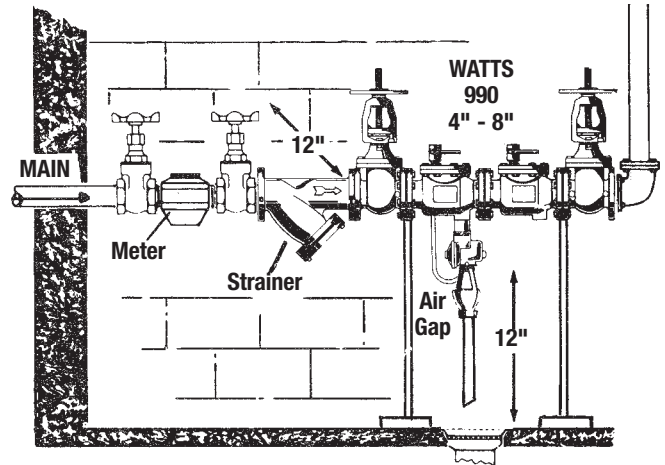


## Installation - Indoors

For indoor installations, it is important that the device be easily accessible to facilitate testing and servicing. If it is located in a line close to wall, be sure the test cocks are easily accessible. A drain line and air gap should be piped from the relief valve connection as shown, where evidence of discharge will be clearly visible and so that water damage will not occur. Therefore, never install in concealed locations.

\*For Air Gap information contact your technical sales representative on back page.

\***Note:** For non-strainer models, test cock must be located on the first or inlet shutoff valve.

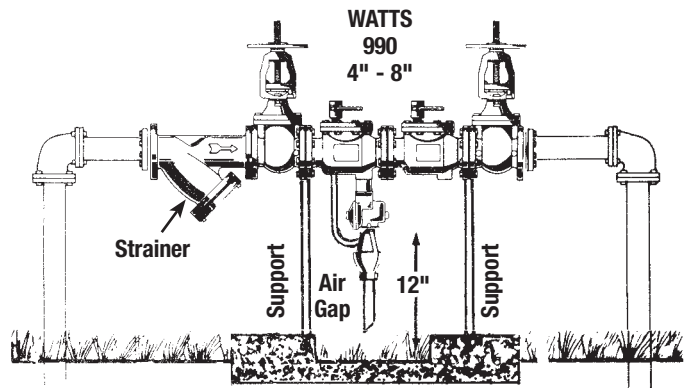


## Installation - Outside Building Above Ground

In an area where freezing conditions occur, Series 990 can be installed inside a protective insulated or heated enclosure. The most satisfactory installation is above ground and should be installed in this manner whenever possible.

Series 990 should be installed in an accessible location to facilitate testing and servicing. A discharge line should be piped from the air gap at the relief valve connection making sure that there is adequate drainage. Never pipe the discharge line directly into a drainage ditch, sewer or sump. Series 990 should never be installed where any part of the unit could become submerged in standing water. Consideration should be given to the installation of external support structure as applicable.

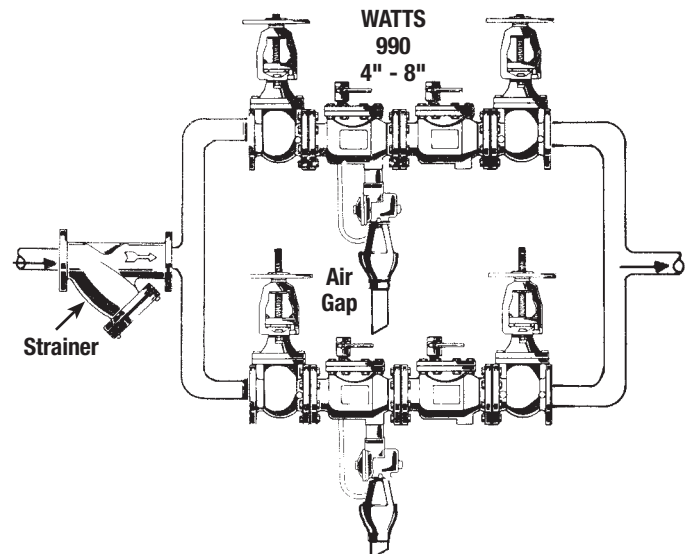
It is generally recommended that backflow preventers never be placed in pits unless absolutely necessary and then only when approved by local codes. In such cases, a modified pit installation is preferred.



## Installation - Parallel Devices CONSULT LOCAL CODES FOR APPROVAL

Two or more smaller size valves can be piped in parallel (when approved) to serve a larger supply pipe main. This type of installation is employed where increased capacity is needed beyond that provided by a single valve and permits testing or servicing of an individual valve without shutting down the complete line.

The number of assemblies used in parallel should be determined by the engineers judgement based on the operating conditions of a specific installation.



*(Drawings not to scale)*



For additional information, visit our web site at: [www.watts.com](http://www.watts.com)

**CALIFORNIA PROPOSITION 65 WARNING**

**WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law requires this warning to be given to customers in the State of California.)

For more information: [www.watts.com/prop65](http://www.watts.com/prop65)

**Limited Warranty:** Watts Regulator Co. (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge.

**THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product.

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**Backflow Prevention Products**

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**Canada:** 5435 North Service Rd., Burlington, ONT. L7L 5H7; [www.wattscanada.ca](http://www.wattscanada.ca)