

# Series

## 709/709DCDA

Double Check Valve Assemblies  
Double Check Detector  
Assemblies

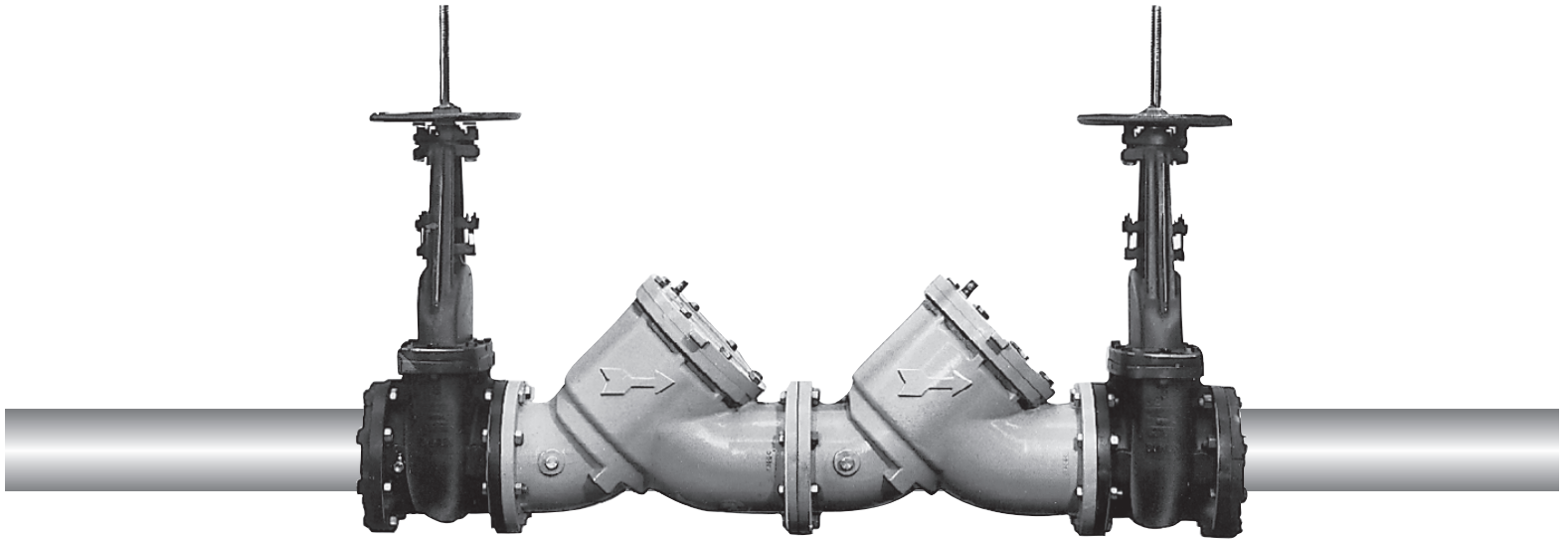
Sizes: 3/4" – 10" (20-250mm)

- Installation
- Repair Kits
- Service
- Maintenance

For field testing procedure, send for IS-TK-DP/DL, IS-TK-9A, IS-TK-99E AND IS-TK-99D.

For other repair kits and service parts, send for PL-RP-BPD.

For technical assistance, contact your local Watts representative on back page.



Watts 8" (200mm) 709 OS&Y shown

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

**NOTE:** For Australia and New Zealand, line strainers should be installed between the upstream shutoff valve and the inlet of the backflow preventer.

**Its important that this device be tested periodically in compliance with local codes, but at least once per year or more as service conditions warrant. If installed on a fire sprinkler system, all mechanical checks, such as alarm checks and backflow preventers, should be flow tested and inspected internally in accordance with NFPA 13 and NFPA 25.**

# Basic Installation Instructions

Watts Series 709 Double Check Valve may be installed in either a vertical or horizontal position.

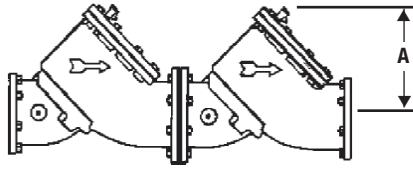
Install valve in the line with arrow on valve body pointing in the direction of flow.

They should always be installed in an accessible location to facilitate testing and servicing.

Pipe lines should be thoroughly flushed to remove foreign material before installing the unit. A strainer should be installed as shown, ahead of backflow preventers to prevent discs from unnecessary fouling.

**CAUTION:** Do not install with strainer when backflow preventer is used on seldom-used water lines which are called upon during emergencies, such as fire sprinkler lines, etc.

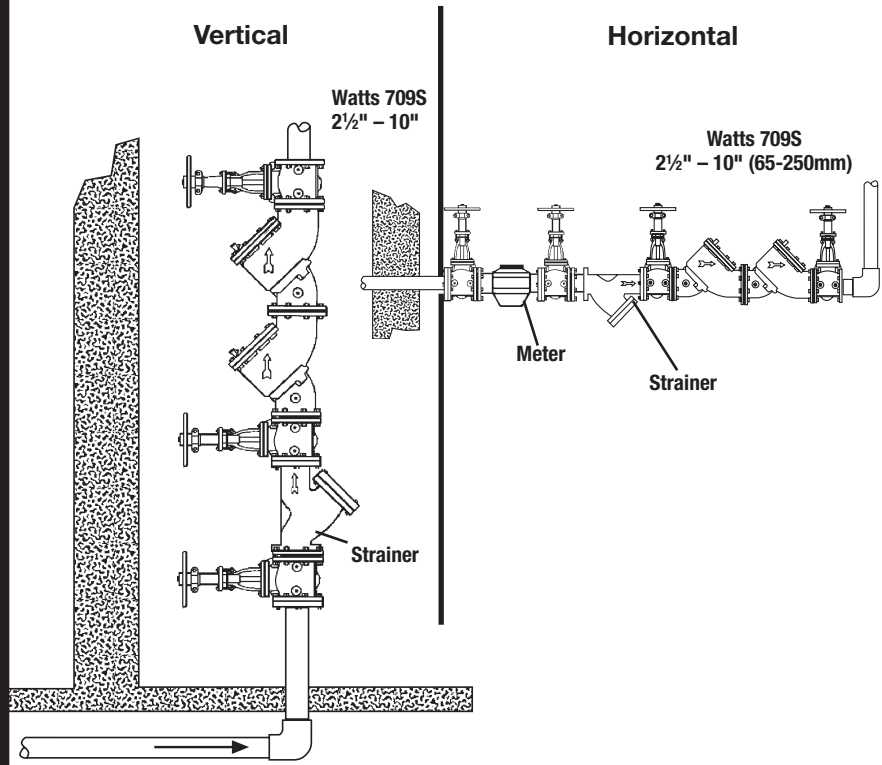
It is important that Series 709 be tested periodically in compliance with local codes, but at least once a year or more often, depending upon system conditions. (Send for IS-TK-7).



**Clearance Required for Servicing**

	mm	A	mm
2½" - 3"	65-80	10"	300
4	100	15"	450
6	150	15"	450
8	200	23"	680
10	250	25"	750

## Indoor Installations



For indoor installations, it is important that the valve be easily accessible to facilitate testing and servicing.

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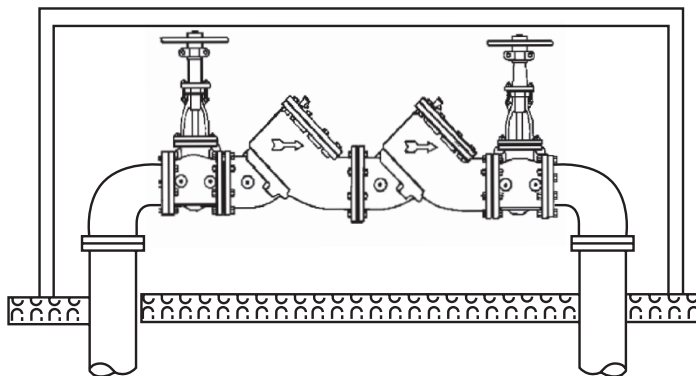
## Outdoor Installations

In area where freezing conditions do not occur, Series 709 can be installed outside of a building. The most satisfactory installation is above ground and should be installed in this manner whenever possible.

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 or an insulated above ground insulated enclosure.

## Outdoor Installations

### Above Ground in Insulated Enclosure



Now Available,  
**WattsBox Insulated Enclosures.**

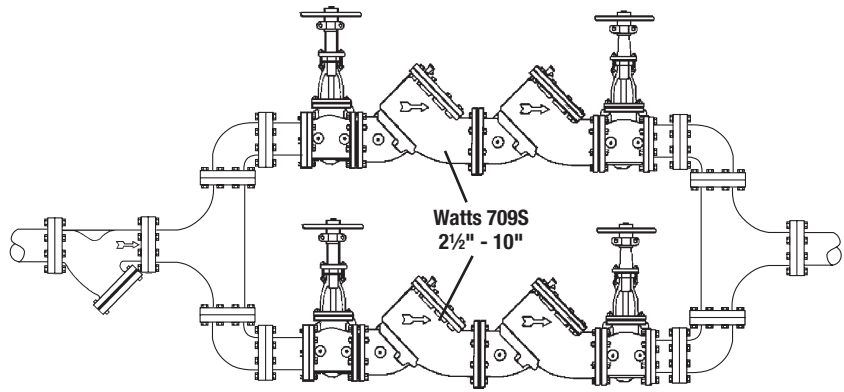
For more information, send for ES-WB or ES-WB-T.

## Basic Installation Instructions (cont.)

### Parallel Installations

Two or more Series 709 devices may be piped in parallel (where approved) to serve a large supply pipe main. This type of installation is employed whenever it is vital to maintain a continuous supply of water where interruptions for testing and servicing would be unacceptable. It also has the advantage of providing increased capacity where needed beyond that provided by a single valve.

For two valve installations the total capacity of the devices should equal or exceed that required by the system. Capacity table shows the size of the No. 709 devices required to meet a certain capacity. The quantity of devices used in parallel should be determined by the engineer's judgement based on the operating conditions of a specific installation.



#### Capacity Required for System

450 GPM	640GPM	1000GPM	2000GPM	3000GPM	5000GPM
Two 2½" Devices	Two 3" Devices	Two 4" Devices	Two 6" Devices	Two 8" Devices	Two 10" Devices

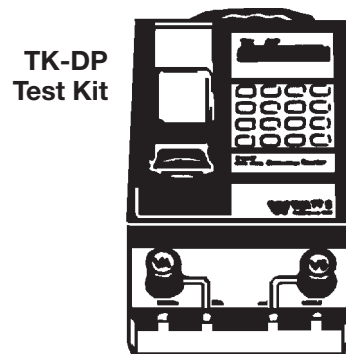
Table shows total capacity provided with dual valve installations of various sizes.

## Test Procedure for Double Check Valve Assemblies using Watts TK-DP and TK-DL Test Kit

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. Flush all test cocks
- B. Turn tester on (before connecting hoses). Tester must read all zeroes. Close VA and VB.



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

1. Install high side hose between testcock No. 2 and tester connection A.
2. Install low side hose between testcock No. 3 and tester connection B.
3. Open testcock No. 2 then VA, bleed hose then close VA.
4. Open testcock No. 3 then VB, bleed hose then close VB.
5. Install a bypass hose between VB and testcock No. 1. Open testcock No. 1 and bleed by loosening hose connection at VB. Tighten hose connection, fully open VB.  
**Push - Print Head (wait) then Push - Start Test**
6. Close shutoff valve No. 2 then No. 1.
7. Slowly open VA and lower high side pressure about -2 psid below the low side pressure (differential reading about -2.0 psid). Close VA. If reading is maintained, record as "tight". If reading returns to 0 and the pressure A increases to pressure B, the check is recorded as leaking. If the reading returns to +psid, No. 2 shutoff valve is leaking excessively and must be replaced to test the valve.
8. Close all test cocks, remove hoses from testcock No. 2 and testcock No. 3 and testcock No. 1. Reopen shutoff valve No. 1. Proceed to Test No. 2.  
**Push - Stop Test.**

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

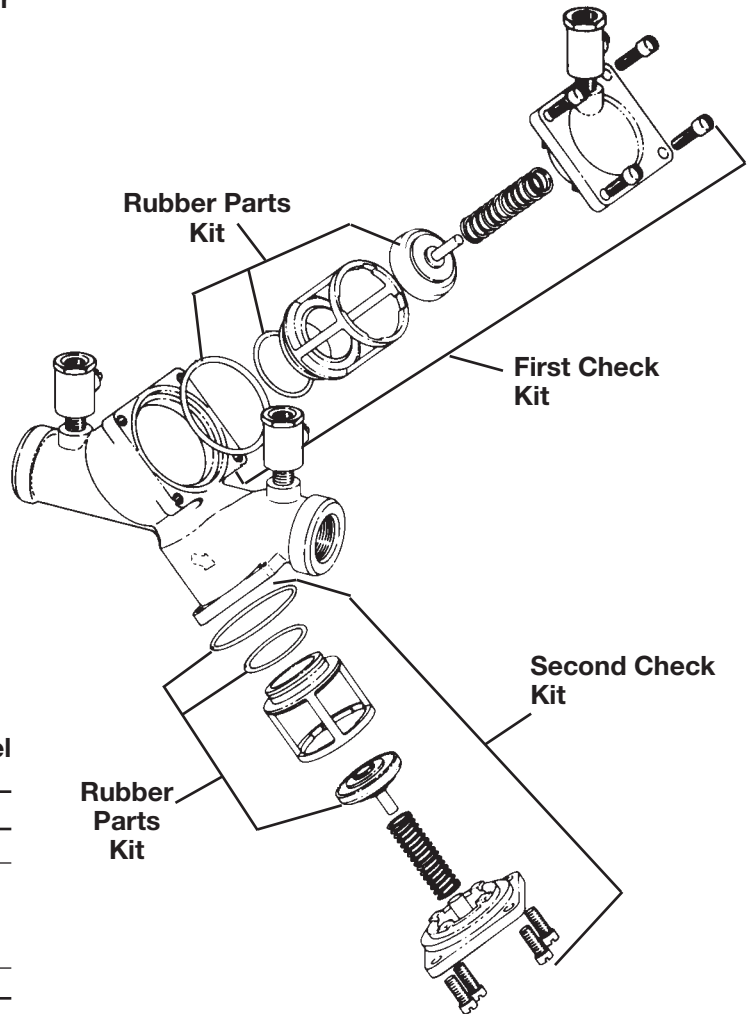
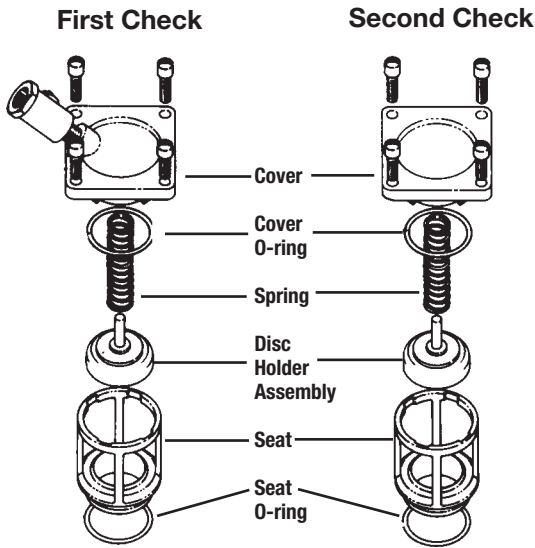
1. Install high side hose between testcock No. 3 and tester connection A.
2. Install low side hose between testcock No. 4 and tester connection B.
3. Open testcock No. 3 then VA, bleed hose then close VA.
4. Open testcock No. 4 then VB, bleed hose then close VB.
5. Install a bypass hose between VB and testcock No. 1. Open testcock No. 1 and bleed by loosening hose connection at VB. Tighten hose connection, fully open VB.  
**Push - Start Test**
7. Close shutoff valve No. 1.
8. Slowly open VA and lower high side pressure about -2 psid below the low side pressure (differential reading about -2.0 psid). Close VA. If reading is maintained, record as "tight". If reading returns to 0 and the pressure A increases to pressure B, the check is recorded as leaking. If the reading returns to +psid, No. 2 shutoff valve is leaking excessively, and must be replaced to test the valve.  
**Push - Stop Test.**

# Service, Replacement Parts and Maintenance $\frac{3}{4}$ " – 2" (20-50mm)

1. After removing the cover screw, the check comes out with the cover.
2. Holding the check Valve module in both hands, rotate the assembly  $\frac{1}{4}$  turn. This will disengage the disc and spring assembly into individual components. The disc assembly may be cleaned or replaced. O-rings should be cleaned or replaced as necessary and lightly greased with the FDA approved silicon grease. Reassemble the check valve module in the reverse order.

**NOTE:** The springs of the first and second check valves are interchangeable.

**(Before servicing, be certain water is turned off or shutoff valves are closed)**



## 709 $\frac{3}{4}$ " – 2"

\*Stainless Steel

EDP No.	Kit No.	Size	
		in.	mm
<b>First or Second Check Kits</b>			
0887150	RK 709 CK4	$\frac{3}{4}$ – 1	20-25
0887151	RK 709 CK4	$1\frac{1}{2}$ – 2	32-50
0887154	RK 709 CK4SS*	$\frac{3}{4}$ – 1	20-25
0887155	RK 709 CK4SS*	$1\frac{1}{2}$ – 2	32-50

Kit includes: Disc assembly, Spring, Seat, Seat o-ring and Cover O-ring.

### Complete Rubber Parts

0887152	RK 709 RT	$\frac{3}{4}$ – 1	20-25
0887153	RK 709 RT	$1\frac{1}{2}$ – 2	32-50

Kit includes: Diaphragm, Disc assembly, Seat o-ring and Cover o-ring.

### Seat Kits

0887160	RK 709 S4	$\frac{3}{4}$ – 1	20-25
0887161	RK 709 S4	$1\frac{1}{2}$ – 2	32-50
0887162	RK 709 S4SS*	$\frac{3}{4}$ – 1	20-25
0887163	RK 709 S4SS*	$1\frac{1}{2}$ – 2	32-50

### Cover Kits

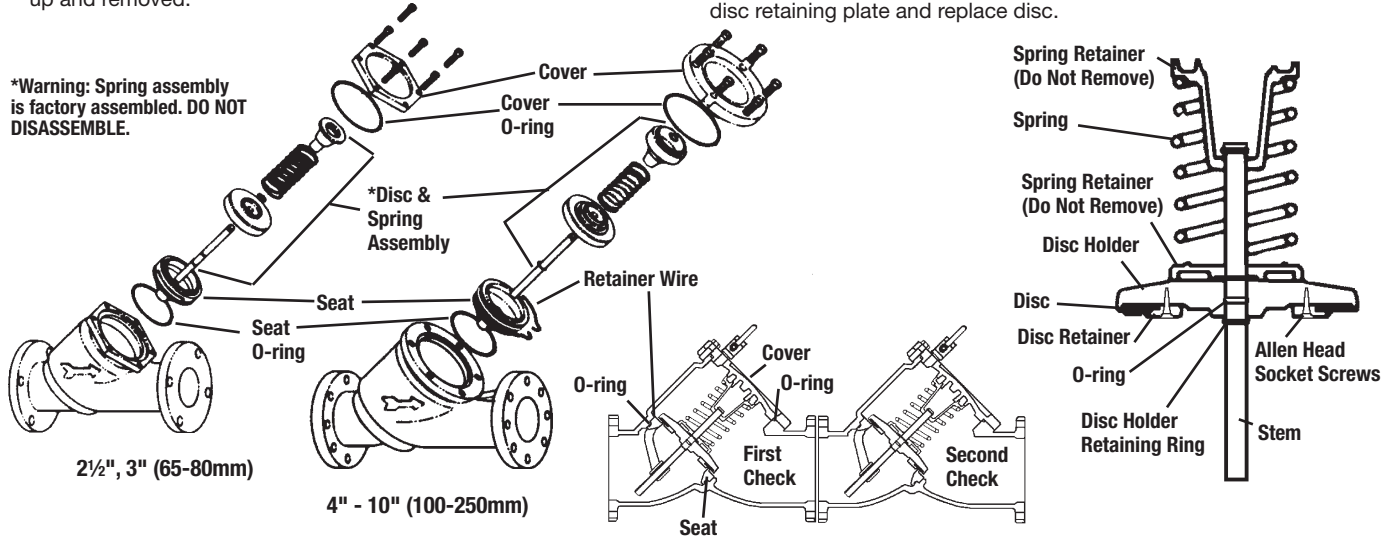
0887156	RK 709 C1	$\frac{3}{4}$ – 1	20-25
0887157	RK 709 C1	$1\frac{1}{2}$ – 2	32-50
0887158	RK 709 C2	$\frac{3}{4}$ – 1	20-25
0887159	RK 709 C2	$1\frac{1}{2}$ – 2	32-50

Kit includes: Cover and Cover o-ring.

# Service, Replacement Parts and Maintenance 2½" – 10" (65-250mm)

1. Remove hatch cover bolts. **NOTE:** The 709 is designed so that, when the bolts are backed off ½", all the spring load is released from the cover and retained by the check module. **CAUTION: Be sure to verify this before removing all the bolts.**
2. Lift check valve module straight out, taking care not to hit and damage seat ring.
3. The seat ring may be removed and replaced by pulling out the two wire retainers. The wire retainers are 10" long. One is drawn out clockwise and the other is drawn out counterclockwise.
4. With the retainer wires removed, the seat ring can be lifted straight up and removed.

**CAUTION:** The check valve disc and spring assembly are in compression. The spring load is captured by the two spring retainers and the stem. The spring retainers are **not** to be removed for servicing. If there is a need to replace the spring, spring retainer or stem, replace the disc and spring assembly. If the disc holder has been damaged by freezing or severe water hammer, it can be replaced in the field. Remove the disc holder retaining ring and slide the disc holder off the stem. Remove the o-ring from the stem and replace with a new one. Apply grease to the o-ring and slide the new disc holder into place. Reinstall the retaining ring. **NOTE:** The disc holder should not be removed when servicing only the disc, remove allen head screws holding the disc retaining plate and replace disc.



## 709 2½" – 10" (65-250mm)

EDP No.	Kit No.	Size	
		in	mm
<b>First or Second Check Kits</b>			
0887900	RK 709 CK4	2½ – 3	65-80
0887901	RK 709 CK4	4	100
0887902	RK 709 CK4	6	150
0887903	RK 709 CK4	8	200
0887904	RK 709 CK4	10	300

Kit includes: Disc & spring assembly and Cover O-ring.

### Rubber Parts (for one check)

0887905	RK 709 RC4	2½ – 3	65-80
0887906	RK 709 RC4	4	100
0887907	RK 709 RC4	6	150
0887908	RK 709 RC4	8	200
0887909	RK 709 RC4	10	250

Kit includes: Disc and Cover O-ring.

### Complete Rubber Parts

0887915	RK 709 RT	2½ – 3	65-80
0887916	RK 709 RT	4	100
0887917	RK 709 RT	6	150
0887918	RK 709 RT	8	200
0887919	RK 709 RT	10	250

Kit includes: Two discs and Two Cover O-rings.

### Seat Kits

0887910	RK 709S	2½ – 3	65-80
0887911	RK 709S	4	100
0887912	RK 709S	6	150
0887913	RK 709S	8	200
0887914	RK 709S	10	250

Kit includes: Seat, Seat o-ring, Retainer Wire and Cover O-ring.

### Cover Kits

0887920	RK 709 C	2½ – 3	65-80
0887921	RK 709 C	4	100
0887922	RK 709 C	6	150
0887923	RK 709 C	8	200
0887924	RK 709 C	10	250

Kit includes: Cover and Cover O-ring.

## 709DCDA 3" – 10" (80-250mm)

EDP No.	Kit. No.	Size	
		in	mm
<b>First Check Kits</b>			
0887930	RK 709DCDA CK1	3	80
0887931	RK 709DCDA CK1	4	100
0887932	RK 709DCDA CK1	6	150
0887933	RK 709DCDA CK1	8	200
0887934	RK 709DCDA CK1	10	250

### Second Check Kits

0887935	RK 709DCDA CK2	3	80
0887936	RK 709DCDA CK2	4	100
0887937	RK 709DCDA CK2	6	150
0887938	RK 709DCDA CK2	8	200
0887939	RK 709DCDA CK2	10	250

Kit includes: Disc assembly, Spring assembly and Cover O-ring.

### Rubber Parts (for one check)

0887940	RK 709DCDA RC4	3	80
0887941	RK 709DCDA RC4	4	100
0887942	RK 709DCDA RC4	6	150
0887943	RK 709DCDA RC4	8	200
0887944	RK 709DCDA RC4	10	250

Kit includes: Disc and Cover O-ring.

### Seat Kits

0887945	RK 709DCDA S	3	80
0887946	RK 709DCDA S	4	100
0887947	RK 709DCDA S	6	150
0887948	RK 709DCDA S	8	200
0887949	RK 709DCDA S	10	250

Kit includes: Seat, Retainer Wire and Cover O-ring.

### Cover Kits

0887950	RK 709DCDA C	3	80
0887951	RK 709DCDA C	4	100
0887952	RK 709DCDA C	6	150
0887953	RK 709DCDA C	8	200
0887954	RK 709DCDA C	10	250

Kit includes: Cover and Cover O-ring.



# For Basic Types of Backflow Preventers

	Type & Purpose	Description	Installed At	Examples of Installations
<b>1</b>	REDUCED PRESSURE ZONE BACKFLOW PREVENTER For High Hazard Cross-connections and continuous pressure application.	Two independent check valves with intermediate relief valve. Supplied with shutoff valves and ball type test cocks	All cross-connections subject to backpressure or back siphonage where there is a high potential health contamination. Continuous pressure.	Main supply lines Commercial boilers Hospital equipment Laboratory equipment Waste digesters Car washes
	REDUCED PRESSURE DETECTOR ASSEMBLY High Hazard	RPZ valve backflow preventers with a water meter and RPZ in bypass line.	Fire protection system supply main. Detects leaks and unauthorized use of water.	Fire Sprinkler Lines
<b>2</b>	DOUBLE CHECK VALVE ASSEMBLY For Low Hazard Cross-connections and continuous pressure applications.	Two independent check valves. Checks are replaceable for repair & testing.	All cross-connections subject to backpressure or back siphonage where there is a low potential health contamination. Continuous pressure.	Main supply lines Food cookers Tanks & Vats Lawn Sprinklers Fire Sprinkler Lines Commercial Pools
	DOUBLE CHECK DETECTOR ASSEMBLY Low Hazard	Double check valve backflow preventers with a water meter and double check in by pass line.	Fire protection system supply main. Detects leaks an unauthorized use of water.	Fire Sprinkler Lines
	DUAL CHECK VALVE BACKFLOW PREVENTER For low hazard cross-connections. Continuous pressure applications.	Two independent check valves. Checks are replaceable for repair & testing.	Cross-connections where there is a low potential health hazard and moderate flow requirements	Residential Supply Lines (at the meter) Residential fire sprinkler systems
<b>3</b>	SPECIALTY BACKFLOW PREVENTERS with INTERMEDIATE ATMOSPHERIC VENT For low hazard cross-connections in small pipe sizes. Continuous pressure applications	Two independent check valves with intermediate vacuum breaker and relief vent.	Cross-connections subject to backpressure or backsiphonage where there is low health hazard. Continuous pressure.	Boilers (small) Cooling towers (small) Dairy equipment
			Pressure outlet to prevent backflow of carbon dioxide gas and carbonated water into the water supply system to beverage machines	Post-Mix Carbonated Beverage Machine
	LABORATORY FAUCET DUAL CHECK VALVE with INTERMEDIATE VACUUM BREAKER In small pipe sizes for low hazard	Two independent check valves with intermediate vacuum breaker and relief vent.	Cross-connections subject to backpressure or backsiphonage where there is low health hazard.	Laboratory Faucets and Pipe Lines Barber shop and Beauty Parlor sinks
<b>4</b>	ATMOSPHERIC VACUUM BREAKERS For high hazard cross-connections not subject to continuous pressure - 6" above flood rim.	Single float and disc with large atmospheric port	Cross-connection not subject to backpressure or continuous pressure. Install at least 6" above fixture rim. Protection against backsiphonage only.	Process Tanks Dishwashers Soap Dispensers Washing Machines Lawn Sprinklers
	PRESSURE VACUUM BREAKERS For high hazard cross-connections. Continuous pressure applications -12" above flood rim.	Spring loaded single float and disc with independent 1st check. Supplied with shutoff valves and ball type test cocks.	Valve is designed for installation in a continuous pressure potable water supply system 12" above the overflow level of the system being supplied. Protection against backsiphonage only.	Laboratory equipment Cooling towers Commercial Laundry Machines Swimming Pools Chemical Planting tanks Lawn Sprinklers
	ANTI-SIPHON, ANTI-SPILL VACUUM BREAKER 1" above flood rim Factory installed 6" above flood rim Field installed	Anti-spill vacuum breaker with modular check & float assembly of thermo plastic Housing bronze body	Indoor point of use	Chemical Dispenser Commercial Dishwasher Sterilizers
	HOSE CONNECTION VACUUM BREAKERS For residential and industrial hose supply outlets not subject to continuous pressure	Single check with atmospheric vacuum breakers vent.	Install directly on hose bibbs, service sinks and wall hydrants. Not for continuous pressure.	Hose bibbs Service sinks Hydrants

# Troubleshooting Guide

Symptom	Cause	Solution
1. Check valve fails to hold 1.0 PSID minimum	<ul style="list-style-type: none"> <li>a. Debris on check disc sealing surface</li> <li>b. Leaking gate valve</li> <li>c. Damaged seat disc or seat o-ring</li> <li>d. Damaged guide holding check open</li> <li>e. Weak or broken spring</li> </ul>	<p>Disassemble and clean</p> <p>Disassemble and clean or repair</p> <p>Disassemble and replace</p> <p>Disassemble clean or replace</p> <p>Disassemble and replace spring</p>
2. Chatter during flow conditions	<ul style="list-style-type: none"> <li>a. Worn, damaged or defective guide</li> </ul>	<p>Disassemble and repair or replace guide</p>
3. Low flows passing through mainline valve (709DCDA only)	<ul style="list-style-type: none"> <li>a. Mainline check fouled</li> <li>b. Meter strainer plugged</li> <li>c. Damaged mainline seat disc or seat</li> <li>d. Broken mainline spring</li> </ul>	<p>Disassemble and clean</p> <p>Disassemble and clean</p> <p>Disassemble and replace</p> <p>Disassemble and replace</p>

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.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. **SO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.**



**Backflow Prevention Products**



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