

Installation, Maintenance, & Repair Series 919 and LF919

Reduced Pressure Zone Assemblies

Sizes: 1/4" – 2" (8 – 50mm)

⚠ WARNING



Read this Manual **BEFORE** using this equipment. Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment. Keep this Manual for future reference.



⚠ WARNING

Local building or plumbing codes may require modifications to the information provided. You are required to consult the local building and plumbing codes prior to installation. If this information provided here is not consistent with local building or plumbing codes, the local codes should be followed. This product must be installed by a licensed contractor in accordance with the local codes and ordinances.

⚠ WARNING

Need for Periodic Inspection/Maintenance: This product must be tested periodically in compliance with local codes, but at least once per year or more as service conditions warrant. All products must be retested once maintenance has been performed. Corrosive water conditions and/or unauthorized adjustments or repair could render the product ineffective for the service intended. Regular checking and cleaning of the product's internal components helps assure maximum life and proper product function.

NOTICE

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

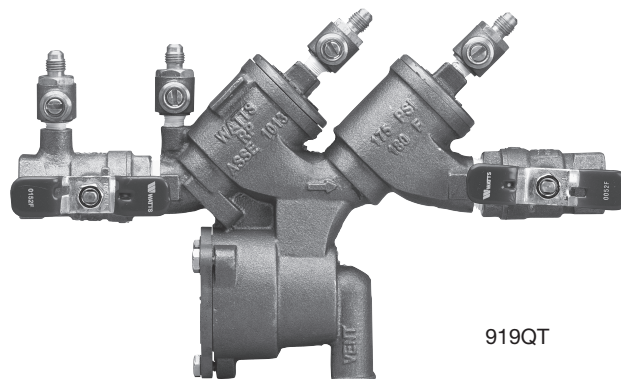
It's important that this assembly be tested periodically in compliance with local codes, but at least once per year or more as service conditions warrant. If installed on a fire sprinkler system, all mechanical checks, such as alarm checks and backflow preventers, should be flow tested and inspected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

Testing

For field testing procedure, send for IS-TK-DL, IS-TK-7, 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.



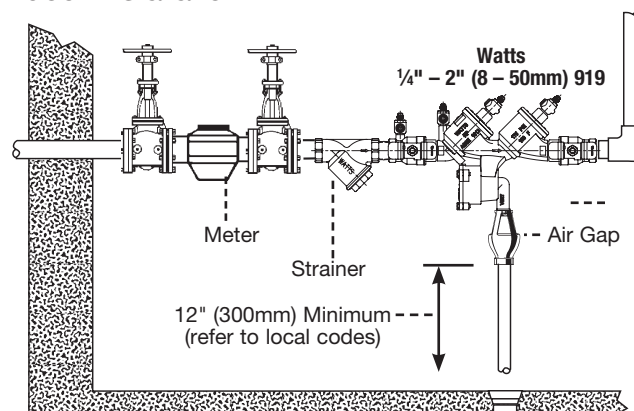
919QT

Installation Guidelines

Reduced Pressure Zone Assemblies Indoor Installation

For indoor installations, make sure the Series 919 and LF919 is easily accessible to facilitate testing and servicing. Do not install in concealed locations. If the location of the Series 919 and LF919 is parallel and close to the wall, make sure the test cocks are easily accessible, and the drain line can adequately drain if required. An air gap and drain line (see literature ES-AG/EL/TC) are piped from the relief valve connection as shown, allowing evidence of discharge to be clearly visible and preventing the occurrence of water damage.

Indoor Installation



Installation Guidelines

Series 919 and LF919

1/4" – 2" (8 – 50mm)

Outdoor, Above Ground Installation

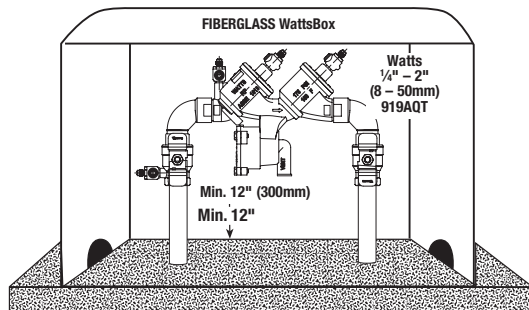
For outdoor installations, it is recommended that you install the Series 919 and LF919 where there are no freezing conditions and above ground whenever possible.

You must install the Series 919 and LF919 in an accessible location to facilitate testing and servicing. The installation must also allow for adequate drainage from the air gap and the discharge line if needed.

⚠ WARNING

1. Do not allow the drain line to empty directly into a drainage ditch, sewer system, or sump.
2. Do not install the Series 919 and LF919 in any location where any part of the unit could become submerged in standing water.

Outdoor Installation



Now available, WattsBox Insulated Enclosures,
for more information, send for literature ES-WB.

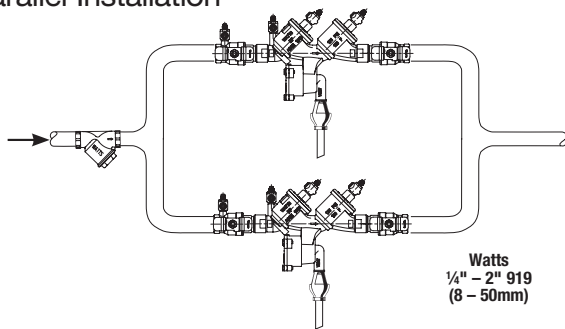
Parallel Installation

For parallel installations, you can install two or more small sized Series 919's and LF919's (when approved) to serve a large supply pipe main. You can use this type of installation in an application where increased capacity beyond that provided by a single valve is required. Additionally, this type of installation permits testing and/or servicing of a single valve without shutting down the complete line. The number of Series 919 and LF919 units installed in parallel should be determined by the engineer's judgement, based on the operating conditions of a specific application.

NOTICE

The total capacity of all the units installed in the application should equal or exceed that required by the system.

Parallel Installation



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.

- A. Shutoff Valves: If you remove the shutoff valves from the Series 919 and LF919, reassemble the shutoff valve with the test cock mounted on the inlet side of the unit.
- B. Always install the Series 919 and LF919 in an accessible location to facilitate testing and servicing (See Page 1). ***Check the state and local codes to ensure that you install the backflow preventer in compliance with those codes, such as the proper height above the ground.**
- C. It is recommended that you install a strainer ahead of the Series 919 assemblies to protect the internal components from unnecessary fouling.

⚠ CAUTION

Do not install a Series 919 and LF919 with a strainer in rarely used water lines, such as a fire sprinkler system which is only used during emergencies.

Start Up: Close the downstream shutoff. Open the upstream slowly and fill the valve. When the valve is filled, open the downstream shutoff slowly, and fill the water supply system. This is necessary to avoid water hammer and/or shock damage.

- D. Vent the air gap and drain line from the relief valve in accordance with code requirements. Terminate discharge approximately 12" (300mm) above the ground or through an air gap piped to a floor drain.

⚠ WARNING

Do not allow the drain line to empty directly into a drainage ditch, sewer system, or sump.

NOTICE

Relief Valve Discharge Rates

The Series 919 and LF919 air gap and drain line terminating above a floor drain can accommodate any moderate discharge or nuisance spitting through the relief valve. However, to prevent water damage in the case of a catastrophic failure, you may need to design the floor drain size to accommodate the increased discharge. Refer to Figure 1 for maximum relief valve discharge rates, size, and capacity of typical floor drains.

NOTICE

DO NOT reduce the size of the drain line from the air gap fitting. The drain line must remain at full line size.

- E. After initial installation of the Series 919 and LF919, a discharge from the relief valve may occur due to dirt and pipe compounds. This may be due to inadequate initial flushing of the pipe lines. If flushing the valve does not clear the unit, remove the first check valve and clean thoroughly, using the procedures in "Servicing First & Second Check Valves" on Page 4.

NOTICE

Periodic relief valve discharge may occur on dead end service applications, such as boiler feed lines or cooling tower makeup lines. This may be due to fluctuating supply pressure during a static or no flow condition. To avoid this discharge, install a spring-loaded, rubber seated check valve ahead of the backflow assembly.

- F. It is recommended that you not place the Series 919 and LF919 in a pit or at a depth below the ground level, unless absolutely necessary. If an installation requires below ground level installation, a modified pit installation is recommended, as well as the approval of local codes. In such cases, provision should be made to always vent the drain line above the flood level. In the case of a pit drain, ensure an adequate air gap exists between the bottom of the drain line and the bottom of the pit.
- G. It is recommended that periodic inspection of the Series 919 and LF919 be done to check for any discharge from the relief valve. This discharge is a visual indication that the valve needs cleaning or repair. In addition, it is recommended that periodic testing of the valve be done in compliance with local codes to ensure its proper operation.

The relief vent discharges water during no-flow periods when:

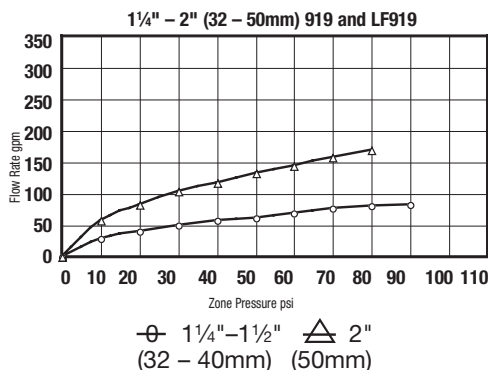
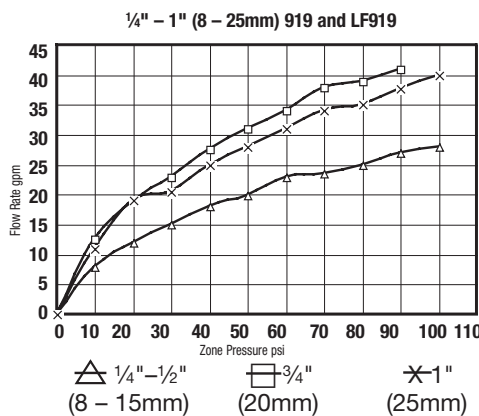
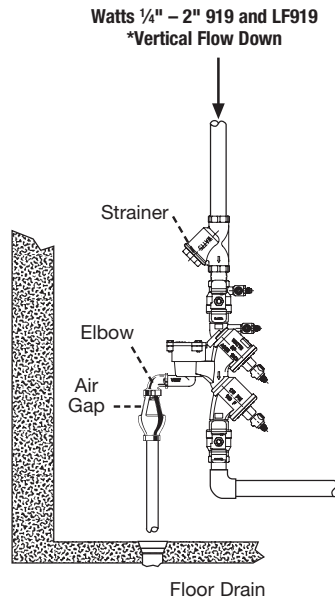
- (1) the first check valve is fouled; or
- (2) the inlet pressure to the check valve drops sufficiently due to upstream pressure fluctuations. This affects the required operating differential between the inlet pressure and the reduced pressure zone; or
- (3) the second check is fouled during emergency backflow or resulting from a water hammer condition.

For Troubleshooting Guide send for literature S-TSG.

NOTICE

When installing the Series 919 and LF919 on fire prevention systems, special considerations are required.

Fire Protection System Installations: The National Fire Protection Agency (NFPA) Guidelines require a confirming flow test be conducted by a certified tester whenever a "main line" valve is installed, such as a shutoff valve or a backflow preventer.



TYPICAL FLOW RATES AS SIZED BY FLOOR DRAIN MANUFACTURERS:

2" (50 mm) 55 GPM	5" (125 mm) 350 GPM
3" (80 mm) 112 GPM	6" (150 mm) 450 GPM
4" (100 mm) 170 GPM	8" (200 mm) 760 GPM

Figure 1

Servicing the Relief Valve

⚠ WARNING Depressurize valve before servicing.

No special tools are required to service the Series 919 and LF919 1/4" - 2".

Before servicing, make sure the water is turned off or shutoff valves are closed.

The following procedures provide information for replacing the diaphragm, the relief valve disc, and the relief valve seat. It is recommended that you visually inspect these parts to determine if a replacement or cleaning is required.

Disassembling the Relief Valve

1. Remove the relief valve cover bolts while holding the cover down.
2. Turn the cover counterclockwise for 1/4 turn, and lift it straight off while still applying pressure to the cover with your hand.

⚠ WARNING

Make sure you apply pressure to the cover as you lift it straight off. Due to the release of pressure when removing the cover, the relief valve spring may eject quickly.

3. Remove the relief valve assembly (includes cover O-ring, stem and diaphragm assembly).
4. Remove the relief valve spring.
5. Remove the pressed in relief valve seat and seat O-ring.

Replacing the Diaphragm

6. Using a wrench, loosen the diaphragm assembly by turning the hex bolt counterclockwise.
7. Remove the diaphragm and replace with a new diaphragm if required, or clean the existing diaphragm. The molded step of the diaphragm should point down towards the relief valve stem.
8. Using a wrench, reassemble the diaphragm assembly by turning the hex bolt clockwise to tighten.

Replacing the Relief Valve Disc and Seat

9. Using a phillips screwdriver, remove the screw in the relief valve disc and replace the disc if required, or clean the existing disc.
10. Place the screw back into the relief valve disc and tighten.
11. Replace the relief valve seat with a new seat if required, or clean the existing seat.

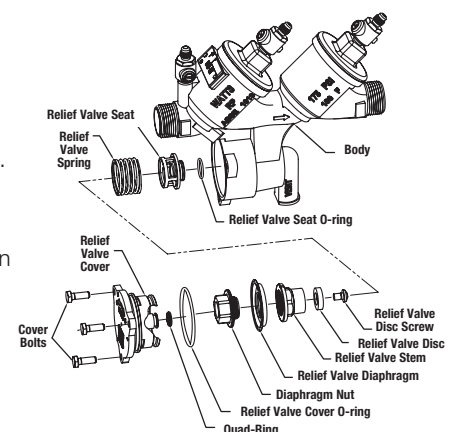
Reassembling the Relief Valve

12. Place the relief valve seat back into the chamber bore.
13. Slide the diaphragm assembly into the relief valve seat.
14. Place the spring on to the diaphragm assembly.
15. Place the cover O-ring on the diaphragm assembly.
16. Line up the grooves on the relief valve cover with the grooves in the relief valve body, and turn the cover clockwise 1/4-turn to seat the cover.
17. Using a wrench, place the bolts back into the cover and tighten.

⚠ CAUTION

If the cover does not lie flat against the relief valve body, the diaphragm assembly is not installed properly and damage can result. Remove the bolts and cover, realign the diaphragm assembly, and place the cover back on the relief valve body.

18. Open the shutoff valves.



Servicing First & Second Check Valves

⚠ WARNING Depressurize valve before servicing.

No special tools are required to service the Series 919 and LF919 ¼" - 2" (8 – 50mm).

Before servicing, make sure the water is turned off or shutoff valves are closed.

1. Close shutoff valves up and downstream of the valve.
2. Using an appropriately sized wrench, loosen the check valve cover. Unscrew the check valve cover and lift it off.
3. Remove the spring.
4. Lift out the disc holder assembly from the body of the valve.
5. To reverse the seat disc, unscrew the disc screw and disassemble the disc washer and disc rubber from the disc holder assembly. Reverse the disc rubber so the opposite face is showing.
6. Assemble the disc screw through the disc washer and disc rubber, and screw it into the disc holder.
7. To replace the seat module, pull the seat module out of the body by gripping at the reinforcement ring. Replace the seat module with the new seat by placing it into the body seat bore.

For repair kits and parts, refer to Backflow Prevention Products Repair Kits & Service Parts price list PL-RP-BPD.
www.watts.com

NOTICE

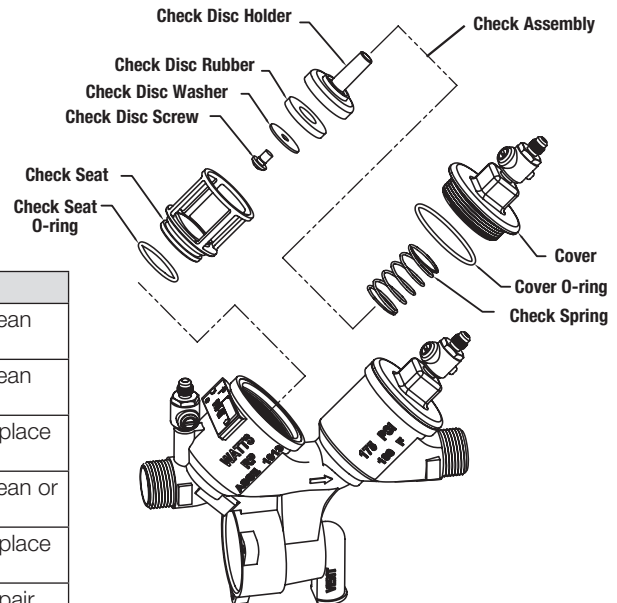
When you tighten the cover in Step 12, the cover will engage the seat module properly.

8. Insert the disc holder assembly back into the seat module.
9. Replace the spring ensuring that it seats properly on the disc holder.

⚠ WARNING

The first check valve has a heavy weight spring. The second check valve has a lighter weight spring. When reassembling the check valves, make sure you install the correct spring into the correct check valve.

10. Place the cover onto the spring with the internal guide on the cover positioned inside the end coil.
11. Screw the cover onto the valve body.
12. Tighten the cover using the appropriately sized wrench.
13. Service the second check valve using Steps 2 through 12.
14. Slowly open shutoff valves.



Troubleshooting Guide

Problem	Cause	Solution
1. Check valve fails to hold 1.0 PSID minimum	a. Debris on check disc sealing surface	Disassemble and clean
	b. Leaking gate valve	Disassemble and clean or repair
	c. Damaged seat disc or seat o-ring	Disassemble and replace
	d. Damaged guide holding check open	Disassemble and clean or replace
	e. Weak or broken spring	Disassemble and replace spring
2. Chatter during flow conditions	a. Worn, damaged or defective guide	Disassemble and repair or replace guide
3. Low flows passing through mainline valve	a. Mainline check fouled	Disassemble and clean
	b. Meter strainer plugged	Disassemble and clean
	c. Damaged mainline seat disc or seat	Disassemble and replace
	d. Broken mainline spring	Disassemble and replace

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
For more information: 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.**



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Troubleshooting Guide

Reduced Pressure Backflow Preventers

Problem	Cause	Should valve be replaced?	Solution
A. Valve spits periodically from the vent.	A.1 Fluctuating supply pressure.	No	A.1 Install a spring-loaded, soft seated check valve immediately upstream of the device.
	A.2 Fluctuating downstream pressure.	No	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.	No	B.1 Flush valve. If flushing does not resolve problem, disassemble valve and clean or replace the first check.
	B.2 Damaged or fouled relief valve seat.	No	B.2 Clean or replace the 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.	No	B.3 Clean, grease or replace the piston "O" ring
	B.4 Excessive backpressure, freezing, or water hammer has distorted the second check.	No	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. 15M2 to eliminate water hammer. Replace defective second check assembly. In case of freezing; thaw, disassemble, and inspect internal components. Replace as necessary.
	B.5 Electrolysis of relief valve seat or first check seats.	No	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 Valve improperly reassembled.	No	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.	No	C.1 Clean strainer element or replace.
	C.2 Valve too small for flows encountered.	Yes	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.	No	E.1, E.2 Clean or replace gate valve with full port ball valves or resilient wedge shutoff valves.
	E.2 Leaky downstream gate valve.	No	
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 in a WATTSBOX heated enclosure. For additional information, reference ES-WB or ES-WB-T.



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