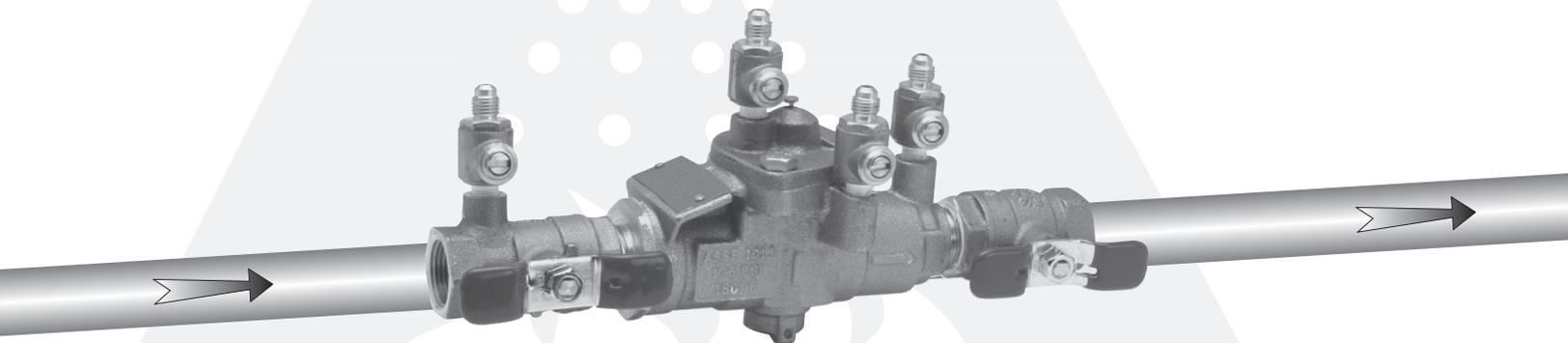


Installation, Maintenance, & Repair

Series 4000B/LF4000B Reduced Pressure Zone Assemblies

Sizes: 1/2" – 2" (15 – 50mm)



4000B/LF4000B Size: 3/4"

⚠ 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.



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 is not consistent with local building or plumbing codes, the local codes should be followed.

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. 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.

Testing

For field testing procedure, refer to Ames installation sheets IS-A-ATG-1 found on www.amesfirewater.com.

For other repair kits and service parts, refer to our Backflow Prevention Products Repair Kits & Service Parts price list PL-A-RP-BPD found on www.amesfirewater.com.

For technical assistance, contact your local Ames representative.

NOTICE

Inquire with governing authorities for local installation requirements

Basic Installation Instructions

Please Read Prior to Installation:

1. Before installing any Ames assembly, **Flush the Line thoroughly** to remove all debris, chips and other foreign objects.
2. Ames Series 4000B/LF4000B should be installed in a horizontal and upright position. This positions the relief valve below the first check valve, enabling the zone to drain through the relief valve outlet. The shutoff valve with the test cock is to be mounted on the inlet side of the backflow preventer. The test cock is on the inlet side of the shutoff valve.
3. The 4000B/LF4000B should always be installed in an accessible location to facilitate testing and servicing. **Check the state and local codes to ensure that the backflow preventer is installed in compliance**, such as the proper height above the ground.
4. Water discharge from the relief valve should be vented in accordance with code requirements. The relief valve should never be solidly piped into a drainage ditch, sewer or sump. The discharge should be funneled through an Ames air gap fitting piped to a floor drain.
5. Ames recommends that a strainer be installed ahead of Series 4000B/LF4000B assemblies to protect the discs from unnecessary fouling.

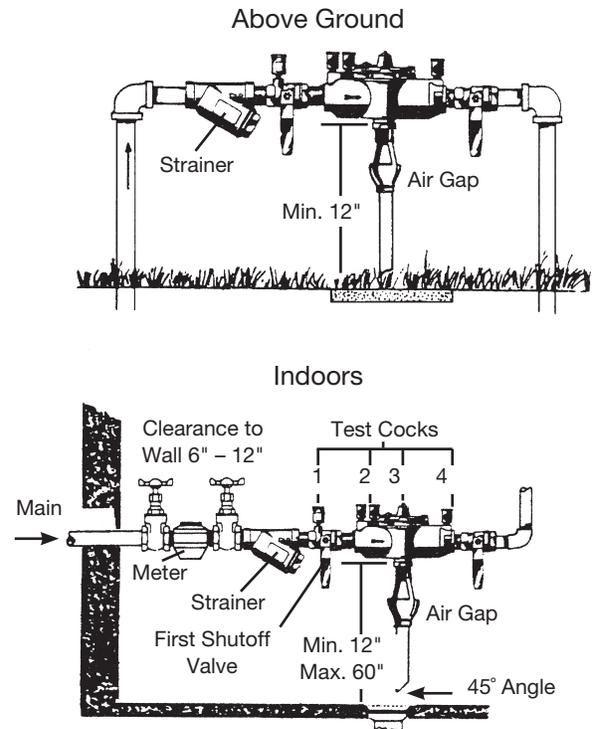
⚠ CAUTION

Do not install with strainer when backflow preventer is used on seldom used water lines which are called upon only during emergencies, such as fire sprinkler liners.

6. Backflow preventers should never be placed in pits unless absolutely necessary and then only when and as approved by local codes. Consult your local or state plumbing or health inspector. Ames recommends installation indoors or above ground in an insulated enclosure.

Start up

7. The downstream shutoff valve should be closed. Open upstream shutoff valve slowly, fill the valve and bleed the air through test cock 2, 3 and 4. When valve is filled, open the downstream shutoff slowly and fill the water supply system. This is necessary to avoid water hammer or shock damage.
8. The installation of an Ames air gap with the drain line terminating above a floor drain will handle any normal discharge or nuisance spitting through the relief valve. However, floor drain size may need to be designed to prevent water damage caused by catastrophic failure condition. Do not reduce the size of the drain line from the air gap fitting.



Maintenance Instructions

⚠ WARNING

Depressurize the valve before servicing

Removing and Installing Check Assemblies

1. Remove the retainer from the body. The check valve cartridges can now be removed from the valve by hand or with a screwdriver. The first check cartridge must be removed before the second check cartridge can be removed.

NOTICE

The seats and springs of the first and second check cartridges are **not** interchangeable. The heavier spring and smaller diameter seat belong with the first check cartridge.

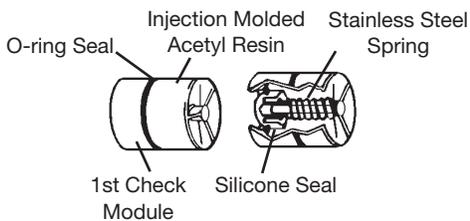
2. The check seats are attached to the cage with a bayonet type locking arrangement. Holding the cage in one hand, push the seat inward and rotate counter-clockwise against the cage. The seat, spring cage, spring and disc assembly are now individual components.

$\frac{3}{4}$ " cartridges snap apart.

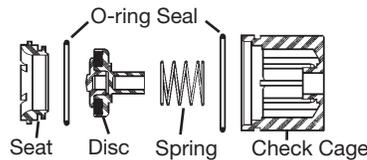
3. The disc assembly may now be cleaned and reassembled or, depending on its condition, may be discarded and replaced with a new assembly from the repair kit. O-rings should be cleaned or replaced as necessary and lightly greased with the FDA approved grease.
4. Reassemble the check valve cartridges. Check cartridges are installed in the valve body with the seat facing the valve inlet. The cartridges must be securely in place before the retainer can be replaced. On the $\frac{3}{4}$ " size retainer may have to be tilted slightly into place. Replace relief valve assembly.

Replacement Parts

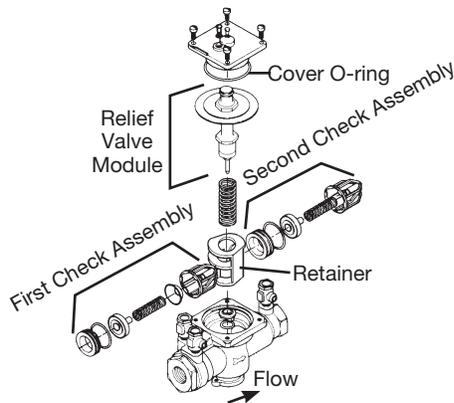
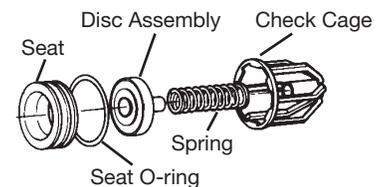
Check Assembly $\frac{1}{2}$ " – $\frac{3}{4}$ " (15-20mm)



Check Assembly $\frac{3}{4}$ " (20mm) M3



Check Assembly 1" – 2" (25-50mm)



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

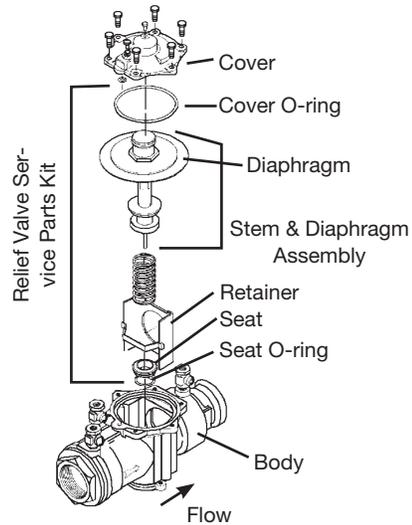
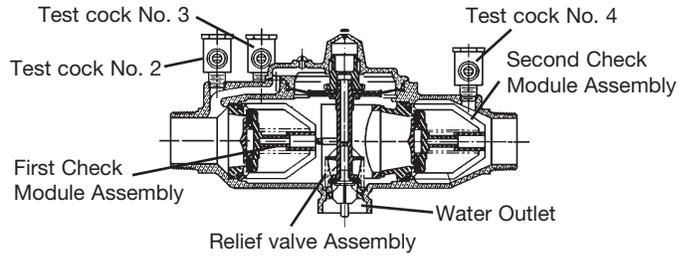
Maintenance Instructions

Removal and Service of the Relief Valve

1. Remove the relief valve cover bolts while holding the cover down.
2. Lift the cover straight off. The stem and diaphragm assembly will remain with the cover as it is removed. The relief valve spring will be free inside the body at this point.
3. The relief valve seat is located at the bottom of the body bore, and can be removed, if necessary, for cleaning. The disc can be cleaned without disassembly of the relief valve. If it is determined that the relief valve diaphragm and/or disc should be replaced, the relief valve module can be readily disassembled without the use of special tools. The disc rubber is molded into the disc holder and is supplied as a disc holder assembly.
4. To re-assemble the relief valve, press the seat firmly into place in the body, center the spring on the seat, and insert the cover and relief valve module as a unit straight into the bore. Press down on the cover to assure proper alignment. Insert and tighten bolts.

CAUTION

If cover will not press flat against body, stem assembly is crooked and damage can result. Re-align stem and cover before bolts are inserted.



After initial installation, a discharge from the relief valve opening may occur until all sealing surfaces have become seated or due to inadequate initial flushing of pipe lines to eliminate dirt and pipe compounds. If flushing will not clear, remove the first check valve and clean thoroughly.

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

It is important that Series 4000B/LF4000B backflow preventers be inspected periodically for any discharge from the relief valve which will provide a visual indication of need for cleaning or repair of check valves. Also, testing for proper operation of the assembly should be made periodically in compliance with local codes, but at least once a year or more often, depending upon system conditions. Most water purveyors require a test/inspection by a certified tester upon installation to verify the correct operation of the assembly and that the installation complies with all code requirements.

Relief vent will discharge water when, during no-flow periods, (1) the first check valve is fouled or (2) the inlet pressure to the device drops sufficiently due to upstream pressure fluctuations to affect the required operating differential between the inlet pressure and reduced pressure zone. Otherwise, such relief (spitting) can occur when the second check is fouled during emergency backflow or resulting from water hammer condition.

Testing — Reduced Pressure Zone Assemblies

Test No.1

Purpose: To test check valve No. 2 for tightness against reverse flow.

Requirements: Valve must be tight against reverse flow under all pressure differentials. Slowly open the 'high' valve A and the 'vent' valve C, and keep the 'low' valve B closed. Open test cock #4. Indicated pressure differential will decrease slightly. If pressure differential continues to decrease (until the vent opens) check valve #2 is reported as 'leaking'.

Test No. 2

Purpose: To test shutoff #2 for tightness.

Requirements: After passing Test No. 1, continue to Test No. 2 by closing test cock #2. The indicated pressure differential will decrease slightly. If pressure differential continues to decrease (approaching 'zero'), shutoff #2 is reported to be 'leaking'.

Test No. 3

Purpose: To test check Valve No. 1 for tightness.

Requirements: Valve must be tight against reverse flow under all pressure differentials. Close 'high' valve A and open test cock #2. Close test cock #4. Disconnect vent hose at test cock #4. Open valves B and C, bleeding to atmosphere. Then closing valve B restores the system to a normal static condition. Observe the pressure differential gauge. If there is a decrease in the indicated value, check valve No. 1 is reported as 'leaking'.

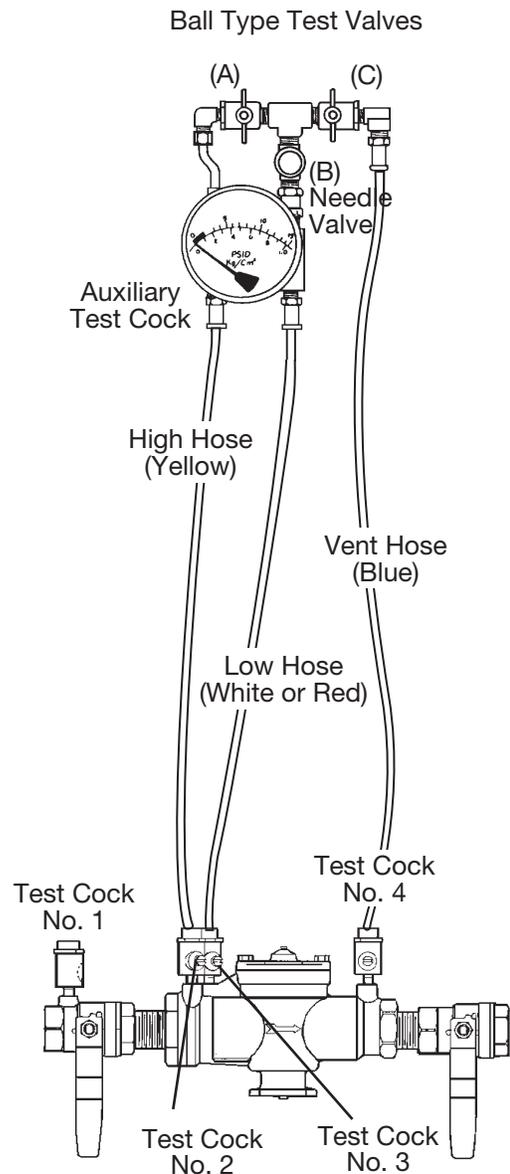
Test No. 4

Purpose: To test operation of pressure differential relief valve.

Requirements: The pressure differential relief valve must operate to maintain the 'zone' between the two check valves at least 2psi less than the supply pressure. Close 'vent' valve C. Open 'high' valve A. Open the 'low' valve B very slowly until the differential gauge needle starts to drop. Hold the valve at this position and observe the gauge reading at the moment the first discharge is noted from the relief valve. Record this as the opening differential pressure of the relief valve.

NOTICE

It is important that the differential gauge needle drops slowly. Close test cocks #2 and #3. Use 'vent' hose to relieve pressure from test kit by opening valves A, B and C. Remove all test equipment and open shutoff #2.



Troubleshooting Guide

PROBLEM	CAUSE	SOLUTION
A. Assembly discharges from differential relief valve during no flow condition.	Fouled first check	Disassemble and clean No. 1 check valve
	Fluctuating inlet pressure	Control supply line water pressure
	Outlet pressure higher than inlet pressure & leak in No. 2 check valve	Disassemble, clean #2 check valve & identify cause of back pressure.
	Leak through diaphragm or around flange bolt holes of relief valve	Service relief valve (page 4)
	Pressure relief valve does not close	See problem D
B. Assembly discharges from differential relief valve during a flow conditions.	No. 1 check valve wedged open	Disassemble and clean No. 1 check valve
	O-ring displaced from groove in 1st check	Disassemble and replace
	Pressure relief valve does not close	See problem D
C. Differential pressure relief valve does not open during test	Fluctuating line pressure	See problem D
	Differential pressure across No. 1 check valve stays above 2psi due to leaking outlet gate valve	Repair shutoff valves
	Weak or broken relief valve spring	Disassemble and replace relief valve spring
	Shutoff seat tube bound in body	Disassemble and repair
	Plugged hydraulic hose	Disassemble and repair
D. Pressure relief valve does not close	Debris on sealing surface	Remove relief valve and clean
	Plugged hydraulic hose	Disassemble and clean
	Damaged seat or rubber shutoff disc	Remove relief valve assembly and replace
	Ruptured diaphragm	Disassemble and replace diaphragm
	Wrinkled or improperly installed diaphragm	Disassemble and properly position diaphragm

Problem Identification Procedures

When using differential pressure gauge:

A. Check differential across No. 1 check valve

READING	PROBLEM
2 to 3 psid	Leak in No. 1 or No. 2 check valve
4 to 7 psid and steady	Malfunctioning pressure relief valve
2 to 7 psid fluctuating	Inlet pressure fluctuation

A. Close gate valve No. 2

RESULT	PROBLEM
If discharge stops	Leak in No. 2 check valve
If discharge does not stop	Go to B

B. Open No. 4 testcock to produce a flow greater than differential relief valve discharge

RESULT	PROBLEM
If discharge stops	Leak in No. 1 check valve
If discharge does not stop	Malfunctioning pressure relief valve

Without using differential pressure gauge:

For additional information, visit our web site at: www.amesfirewater.com

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: Ames Fire & Waterworks (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.**



www.amesfirewater.com



A Watts Water Technologies Company

USA: Backflow- Tel: (916) 928-0123 • Fax: (916) 928-9333
Control Valves- Tel: (713) 943-0688 • Fax: (713) 944-9445
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068

RP/IS-A-4000B 1322

EDP# 1915338

© 2013 Ames Fire & Waterworks