

Installation, Maintenance, and Repair Manual

Colt™ Series C400, C500, LFC500

Reduced Pressure Zone Assemblies
 Reduced Pressure Detector Assemblies

2½" – 10"

⚠ 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 the 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 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 and external components helps assure maximum life and proper product function.

⚠ WARNING

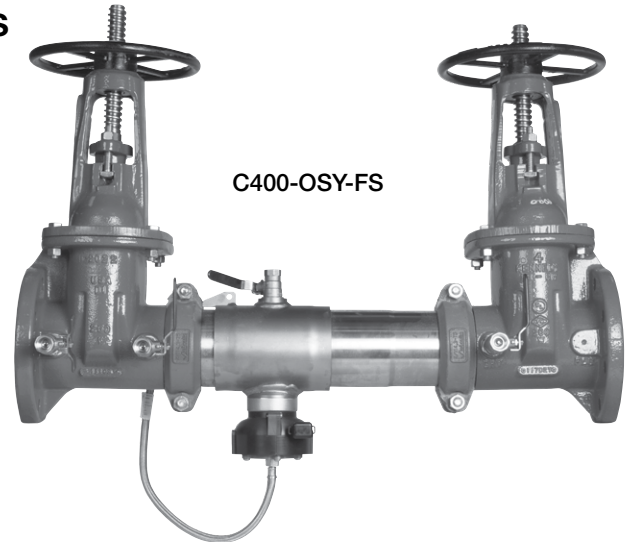
This device must be tested periodically in compliance with local codes, but at least once per year or more as service conditions warrant. If installed on a fire sprinkler system, all mechanical checks, such as alarm checks and backflow preventers, should be flow tested and inspected internally in accordance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

⚠ WARNING

Do not impede or prevent sleeve movement by installing riser cradle clamps or other obstructive elements on or around the sleeve. Sleeve movement is required to service the backflow.

NOTICE

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



C400-OSY-FS

Series C400, C500, and LFC500 each include a flood sensor on the relief valve to detect excessive discharge and trigger notification of potential flood events.

NOTICE

An add-on connection kit is required to activate the flood sensor. Without the connection kit, the sensor is a passive component that does not communicate with any other device. (A retrofit sensor connection kit is also available for existing installations. See "Add-on and Retrofit Sensor Connection Kits," for ordering details.)

NOTICE

Use of the flood sensor does not replace the need to comply with all required instructions, codes, and regulations related to installation, operation, and maintenance of this product, including the need to provide proper drainage in the event of a discharge.

Watts® is not responsible for the failure of alerts due to connectivity or power issues.

Testing

For field testing procedure, download IS-A-ATG-1 at watts.com. For technical assistance, contact your local Ames representative.

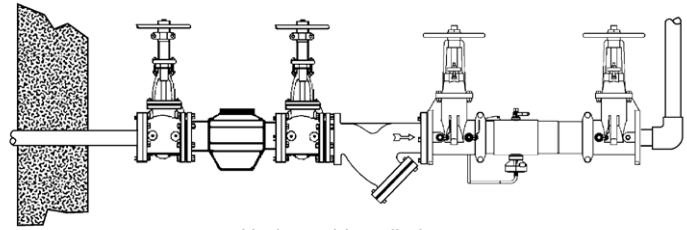


Installation Guidelines

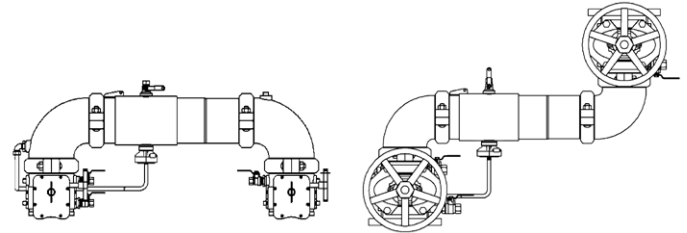
- Most field problems occur because dirt and debris are present in the system at the time of installation and becomes trapped in check #1. The system should be flushed before the backflow valve is installed. If the system is not flushed until after the backflow valve is installed, remove both check modules from the valve and open the inlet shutoff to allow water to flow for a sufficient time to flush debris from the water line. If debris in the water system continues to cause fouling, a strainer can be installed upstream of the backflow assembly.
- Series C400, C500, and LFC500 can be installed in either horizontal, "N" pattern, or "Z" pattern position as long as the backflow assembly is installed in accordance with the direction of the flow arrow on the assembly and the local water authority approves the installation.
- The assembly should be installed with adequate clearance around the valve to allow for inspection, testing, and servicing. Ensure a minimum clearance of 12" between the lower portion of the assembly and the floor or grade. Protect the valve from freezing.
- Installing a backflow preventer in a pit or vault is not recommended.
- Normal discharge and nuisance spitting are accommodated by the use of an Ames air gap fitting and a fabricated indirect waste line. Provide floor drains of the same size in case of excessive discharge.
- Have a certified technician test the series at the time of installation.

NOTICE

Assembly body should not be painted.



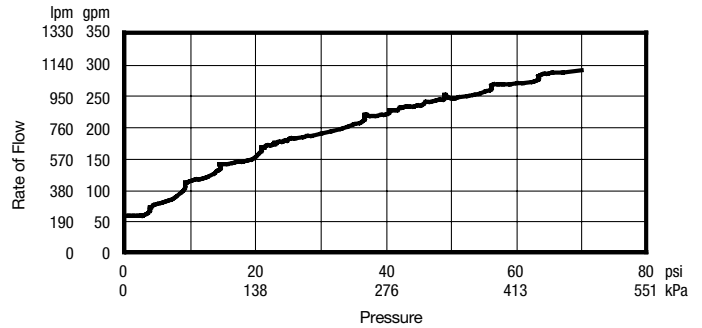
Horizontal Installation



N Pattern

Z Pattern

Relief Valve Discharge Rates 2½" – 10"



Maintaining the Check Modules

2½" – 6"



Figure A Figure B Figure C



Figure D Figure E Figure F



Figure D Figure E Figure F

⚠ WARNING

Before servicing any Ames valve, it is mandatory to shut down the water system by closing both the inlet and outlet shutoff valves. After the shutoff valves are closed, open test cocks No. 2, No. 3, and No. 4 to relieve pressure within the backflow assembly.

1. After test cock No. 3 has been opened to relieve pressure, remove the test cock from the housing. (See Figure A.)
2. Insert a #3 screwdriver through the hole on the top of the cover sleeve and using both hands rotate the cover sleeve approximately a quarter turn clockwise and a quarter turn counterclockwise to break the sleeve O-ring seals. Using the screwdriver, slowly slide the cover sleeve to the downstream side of the housing. (See Figure B.)
3. Remove the stainless steel check retainer from the housing. (See Figure B.)
4. Remove the check #1 module by inserting two flat blade screwdrivers into the slots on either side of the check module and gently pry the check module toward the open zone. (See Figure C.)
5. Remove the check #2 module with the same instructions as in step 4. (For servicing 6" checks, see the maintenance instructions for valve sizes 8" to 10".)
6. To clean or inspect either check module, insert a #3 screwdriver through the downstream side of the check module. (See Figures D and E.) When the screwdriver is in place, remove the E-clip and pin connecting the structural members. (See Figure F.) The check clapper opens with no tension.
7. Thoroughly clean the seating area. The sealing disc can be removed, if necessary, by detaching the screws connecting the keeper plate to the clapper. Reverse and reinstall the sealing disc if the elastomer is cut or damaged.
8. Wash the check module and O-ring and inspect for any damage. If damaged, reinstall new parts.
9. After a thorough cleaning, lubricate the O-ring with an FDA Approved lubricant, replace the pin and E-clip in the structural members, remove the screwdriver, and reinstall the check modules. Reverse the order of these steps to reassemble the parts and housing.

Maintaining the Check Modules

8" – 10"

Tool Requirements

- #4 Phillips screwdriver or $\frac{3}{8}$ " diameter rod, length sufficient to span the diameter of the checks (See Figures A and B.)
- $\frac{1}{2}$ " 13 x 5 fully threaded hex bolt (service bolt)
- $\frac{3}{4}$ " open end or socket wrench

NOTICE

Due to shipping, storage, and general handling, the Victaulic Coupling for the shutoff valves may have loosened and should be retightened during installation.

Instructions

⚠ WARNING

Before servicing any Ames valve, it is mandatory to shut down the water system by closing both the inlet and outlet shutoff valves. After the shutoff valves are closed, open test cocks No. 2, No. 3, and No. 4 to relieve pressure within the backflow assembly.

1. After test cock No. 3 has been opened to relieve pressure, remove the test cock from the housing. (When repairing an 8" or 10" device, remove both Victaulic couplers from the body. Slide the downstream Victaulic coupler gasket to the downstream side of the housing. The upstream Victaulic coupler gasket stays in place.)
2. Remove the check(s) to be serviced.
3. Locate the service hole and thread in the service bolt by hand until it contacts the linkage. (See Figure A.)
4. Continue to thread in service bolt with the wrench until the service hole in the linkage is aligned with the service notches on the spring arbors. (See Figure A.)
5. Insert the Phillips screwdriver through the arbors and service hole of the linkage making sure that the tip of the screwdriver extends past the ends of the arbors by a minimum of $\frac{1}{4}$ ". (See Figure B.)
6. Loosen the service bolt until the load is transferred to the screwdriver. Continue to loosen the service bolt until there is sufficient clearance to remove the complete spring mechanism.
7. To disconnect the linkage, remove the retaining clip and pin. Store both items in a safe location for reinstallation.
8. To remove the spring mechanism, grasp the screwdriver at the center and pull the complete assembly straight out and store in a safe place.
9. Reverse the order of these steps to reassemble the parts and housing.

⚠ WARNING

While the spring mechanism is removed for check servicing, never pull the screwdriver out or off the support notches on the arbors. Doing so may cause bodily injuries.

Figure A



Figure B



Servicing the Relief Valve

⚠ WARNING

Before to servicing the relief valve, it is mandatory to shut down water system by closing both the inlet and outlet shutoff valves and relieving pressure within the assembly by opening test cocks No. 2, No. 3, and No. 4.

DO NOT REMOVE SPIDER BUSHING FOR SERVICING

1. Detach the activation module, if installed, from the flood sensor.
2. Use a #2 Phillips screwdriver to remove the sensor from the relief valve.
3. Disconnect the hose from the bottom cover plate to the relief valve.
4. An O-ring seals the relief valve body to the main housing. Avoid tightening the connection beyond firm hand tightening. Loosen the relief valve by hand to remove it, then unscrew the relief valve from the housing.
5. Remove the cover plate of the relief valve by detaching the four connecting screws.
6. Remove the rubber diaphragm from the relief valve. Notice how the diaphragm is configured to reinstall it in the same manner. The hard rubber tab in the diaphragm fits into a similar socket in the head of the piston. (See Figure A.)
7. Hold the relief valve in both hands with the threaded end up and both thumbs on the head of the piston. Push up on the piston until the piston shaft with the attached E-clip is exposed. Remove the E-clip. (See Figure B.)
8. Remove the piston and spring from the relief valve housing and thoroughly clean all parts including the diaphragm. Inspect all rubber parts and replace any that are damaged.
9. Reverse the order of these steps to reassemble the parts and housing.

Figure A

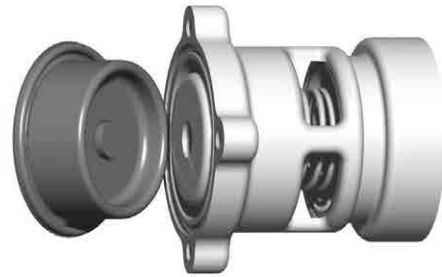


Figure B



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 No. 4. Indicated pressure differential is expected to decrease slightly. If pressure differential continues to decrease (until the vent opens) check valve No. 2 is reported as 'leaking.'

Test No. 2

Purpose: To test shutoff No. 2 for tightness.

Requirements: After passing Test No. 1, continue to Test No. 2 by closing test cock No. 2. The indicated pressure differential is expected to decrease slightly. If pressure differential continues to decrease (approaching 'zero'), shutoff No. 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 No. 2. Close test cock No. 4. Disconnect vent hose at test cock No. 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

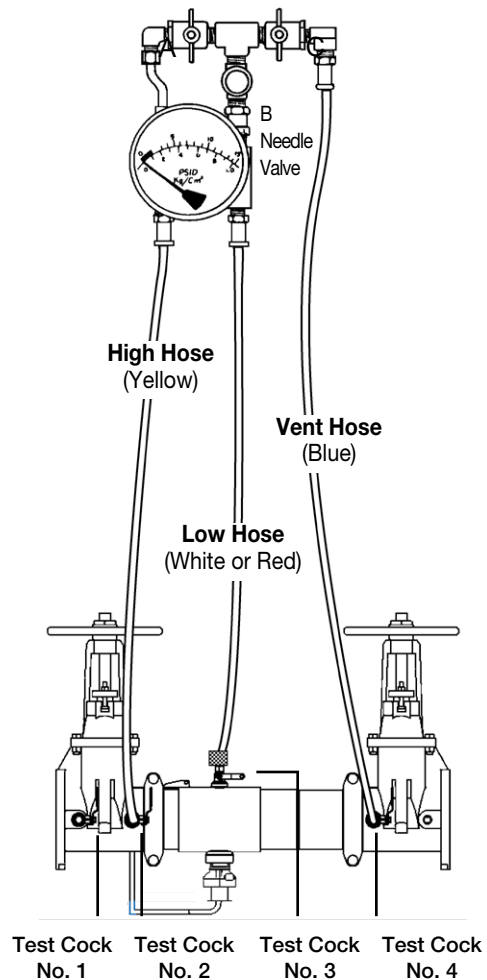
Purpose: To test operation of pressure differential relief valve.

Requirements: The pressure differential relief valve must operate to maintain the 'zone' between the two check valves at least 2 psi 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 when the first discharge is noted from the relief valve. Record this as the opening differential pressure of the relief valve.

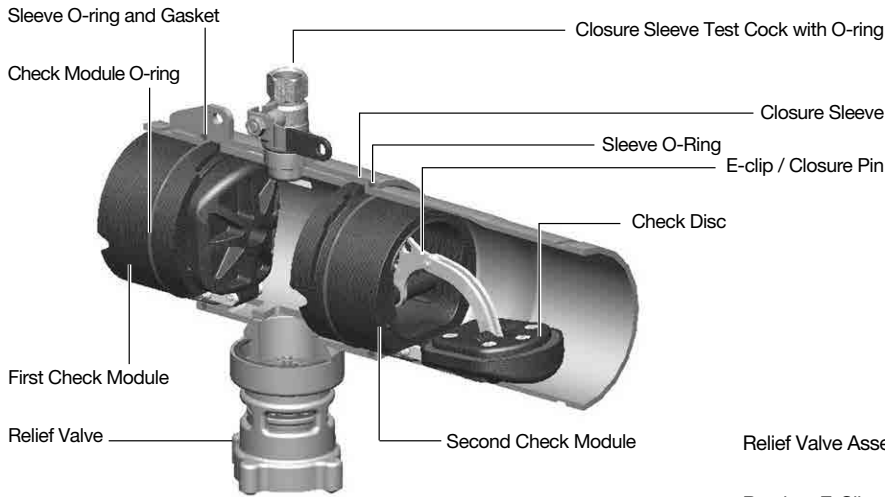
NOTICE

The differential gauge needle **MUST** drop slowly. Close test cocks No. 2 and No. 3. Use the 'vent' hose to relieve pressure from the test kit by opening valves A, B, and C. Remove all test equipment and open shutoff No. 2.

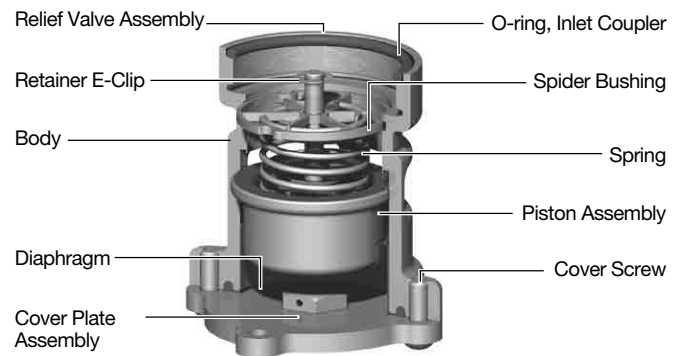
Ball Type Test Valves



Parts





For repair kits and parts, refer to the Backflow Prevention Products, Repair Kits, and Parts PL-AMES price list at watts.com.





Troubleshooting

PROBLEM	CAUSE	SOLUTION
Relief valve discharges water while system is not flowing	Check #1 is fouled	Remove and clean check #1
	Relief valve does not properly close	Service relief valve
	Municipal water pressure is fluctuating	Install check valve upstream of backflow assembly
Relief valve does not shut off properly	Fouled relief valve seat	Service relief valve
	Incorrectly Installed diaphragm	Remove diaphragm and correctly install
	Damaged rubber surface on piston	Replace with new piston
	Damaged or plugged pressure hose	Repair or replace hose

Add-on and Retrofit Sensor Connection Kits for Building Management Systems

ORDERING CODE	ADD-ON/RETROFIT KIT	DESCRIPTION
88009418	 FP-BF-BMS BMS Sensor Connection Kit Series C400, C500, and LFC500 Sizes 2½" to 10"	Includes sensor activation module with cable, ground wire, and power adapter. Use this kit to activate the flood sensor and enable flood detection capabilities on the relief valve of a new installation linked to a BMS controller (not included).
88009419	 FP-RFK-BF-BMS-CFS BMS Sensor Retrofit Connection Kit Series C400, C500, LFC500 Sizes 2½" to 10"	Includes flood sensor, sensor activation module with cable, ground wire, and power adapter. Use this kit to install the flood sensor and enable flood detection capabilities on the relief valve of an existing installation linked to a BMS controller (not included).

Add-on and Retrofit Sensor Connection Kits for Cellular Communication

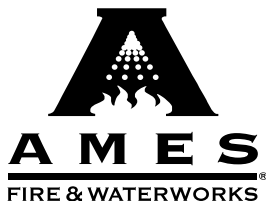
ORDERING CODE	ADD-ON/RETROFIT KIT	DESCRIPTION
88009420	 FP-BF-CFS Cellular Sensor Connection Kit Series C400, C500, and LFC500 Sizes 2½" to 10"	Includes sensor activation module with cable, Cellular Gateway with mounting kit, ground wire, and power adapter. Use this kit to activate the flood sensor and enable flood detection capabilities on the relief valve of a new installation linked to a cellular network to send alerts by email message, SMS text message, or voice call.
88009421	 FP-RFK-BF-CFS Cellular Sensor Retrofit Connection Kit Series C400, C500, LFC500 Sizes 2½" to 10"	Includes flood sensor, sensor activation module with cable, Cellular Gateway with mounting kit, ground wire, and power adapter. Use this kit to install the flood sensor and enable flood detection capabilities on the relief valve of an existing installation linked to a cellular network to send alerts by email message, SMS text message, or voice call.

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.**



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