Installation, Operation, and Maintenance Manual

Series 860, LF860

Reduced Pressure Zone Assemblies

½" – 2"

⚠ WARNING

THINK SAFETY FIRST

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.

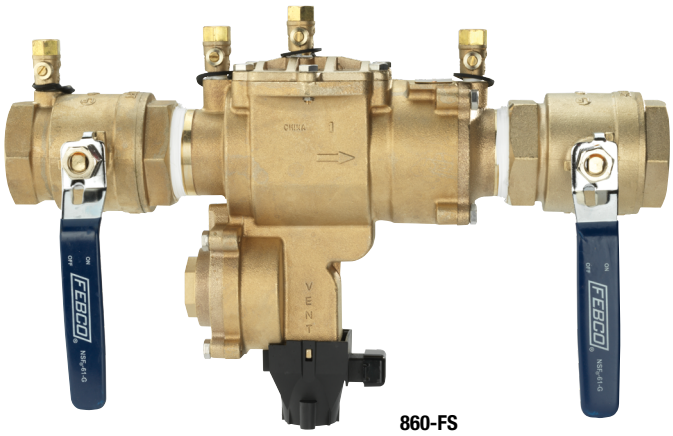
⚠ WARNING

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.

NOTICE

If an assembly is recommended where installation may be problematic, the assembly must be protected and secured. Remove the handles of shutoff valves to discourage tampering, or install a protective enclosure to discourage vandals. When opting for an enclosure, install the protective cover so that adequate clearance is available for maintenance and testing. Consult local codes before installing any type of protective enclosure.

Series 860 is designed to protect drinking water supplies from dangerous cross-connections in accordance with national plumbing codes and water authority requirements for non-potable service applications. The Lead Free series are used in potable drinking water systems where code mandates protection from backpressure and backsiphonage conditions. Series 860 Small and LF860 Small each include a flood sensor on the relief valve to detect excessive discharge.



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NOTICE

An add-on connection kit is required to activate the flood sensor. Without the connection kit, the flood sensor is a passive component and has no communication 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.

Contents

FEBCO®

A WATTS Brand

How It Operates

The FEBCO Series 860 Reduced Pressure Zone backflow preventer assembly consists of two independently operating, spring loaded check valves with a pressure differential relief valve located between the two checks. The pressure drop across the first check valve is approximately 7.0 psid with no flow. The relief valve consists of a hydraulically balanced diaphragm with the high pressure side hydraulically connected to the upstream pressure zone. The relief valve remains closed during normal operation. The low pressure side of the diaphragm is spring loaded to force the relief valve to open when the pressure drop across the first check and the diaphragm is reduced to approximately 3.0 psid. A complete assembly includes two shutoff valves and four test cocks.

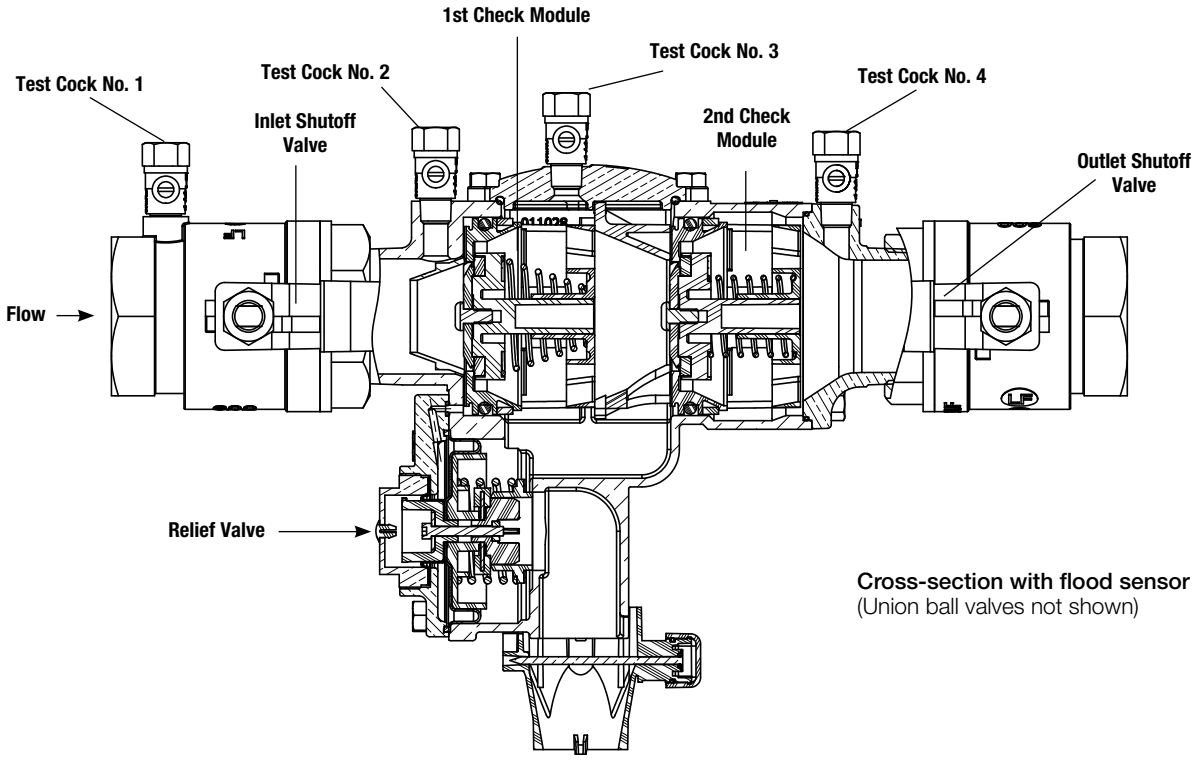
Service Procedures

FEBCO backflow prevention assemblies can be serviced with standard tools and are designed for ease of maintenance. The assemblies can be serviced in line, eliminating the need to remove and reinstall a unit.

Suggested Tool Kit

- 1 crescent wrench
- 1 medium standard screwdriver
- Differential pressure test kit
- 1 medium Phillips screwdriver
- Box/open end wrench

1. Flush the line clean of debris before assembly installation. The most common cause of check fouling and relief valve discharge is dirt and debris in the seating areas.
2. To flush the line after installation, slowly close the inlet shutoff valve, remove the cover and spring assemblies of both check valves, and open the inlet shutoff valve to allow sufficient flow of water through the assembly. Clear all sand, debris, and other particles from the line. If debris in the water continues to cause fouling, consider installation of a strainer upstream of the assembly if in compliance with local codes.
3. Rinse all parts with clean water before reassembly.
4. Carefully inspect diaphragms, seals, and seating surfaces for damage or debris. If the check valve seat disc has been severely cut at the seat ring diameter, the assembly has been subjected to extremely high and repeated backpressure. Either thermal water expansion or water hammer is the most likely cause. If backpressure persists, consider installation of a pressure relief valve downstream of the assembly.
5. Use caution to avoid damaging any guiding surfaces while handling parts. Do not force parts together. The O-ring seals used in FEBCO assemblies require only a small tightening force to ensure a positive seal.
6. Test the unit after servicing in accordance with locally approved test methods to ensure proper operation; see the "Testing" section.
7. Use the exploded drawings and parts list for visual aid information; see the "Parts" section.
8. Apply a thin coating of the lubricant supplied in the repair kit to the O-rings and other seals as directed. Any additional lubricants in use must be FDA Approved food-grade petroleum jelly.

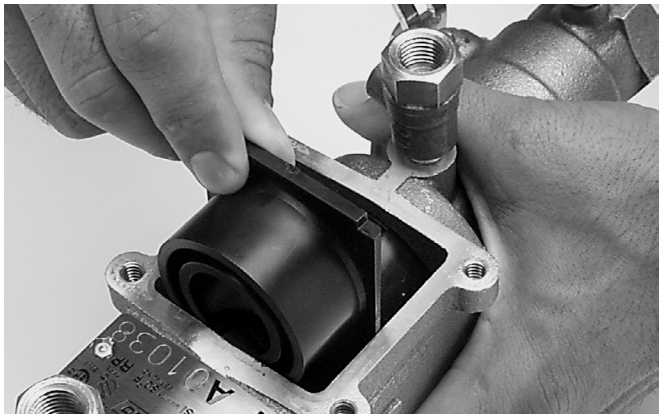


Cross-section with flood sensor
(Union ball valves not shown)

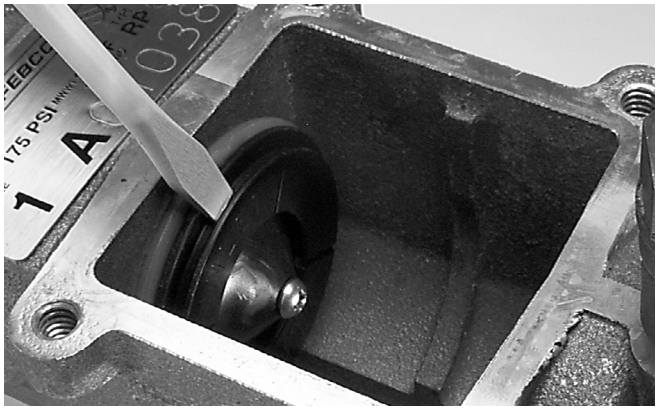
Check Module Disassembly

The complete list of items is included in the "Parts" section.

1. Slowly close the inlet and outlet ball valves. Bleed residual pressure by opening test cocks No. 2, No. 3, and No. 4. Allow the test cocks to remain open until the reassembling is completed. Test cock No. 1 should remain closed.
2. Remove the cover bolts (Item 21) using the appropriate size wrench.
3. Remove the spacer (Item 8) by grasping the flanged end of the spacer and pulling it straight up.pulling straight up.



4. Remove the inlet check assembly by pulling it in the direction of flow from the body bore until it is completely exposed, then lift it out of the body.
5. Remove the outlet check assembly by placing the tip of a medium-sized, flat-nose screwdriver in the slot of the seat (Item 3) and prying the check assembly back until the red O-ring (Item 3.1) is exposed. Then, using fingers, pull it from the body bore until it is completely exposed, then lift it out of the body.



Check Module Seal Replacement

Both check assemblies are disassembled and reassembled in the same manner. To service the checks, replace the check modules with new ones by using check module assembly kits available from FEBCO. Or, replace the rubber components in the check modules by using the replacement rubber parts kits.

1. To disassemble the unit, grasp the seat section (Item 3) in one hand and the guide section (Item 7) in the other hand, then rotate in a counterclockwise direction (approx. 1/8 turn) until the two parts disengage.

2. Remove the retaining screw (Item 5.2) and disc retainer (Item 5.1) so the rubber disc is fully exposed. Carefully pry out the rubber disc from the poppet. Be careful not to damage the poppet when removing the disc. Rinse the poppet in clean water and replace the old rubber disc with a new rubber disc. If the rubber disc is not damaged, it can be reversed and reinstalled when a new disc is unavailable. Rinse all other internal components with clean water. Replace the disc retainer and secure with the retaining screw (Item 5.2).

3. Reassemble the check module by reversing the preceding steps. When reassembling the check module, insert the poppet stem into the guide hole and keep fingers clear of the slots in the module.

Check Module Reassembly

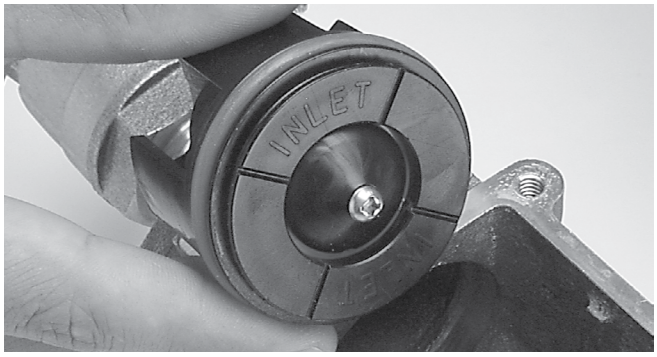
Reverse the disassembly procedure to reassemble the unit along with the following special instructions.

1. Inspect the check module O-ring (Item 3.1) for damage and replace if necessary. To ease assembly, apply a thin coating of the supplied lubricant to the O-ring before installing into the body.

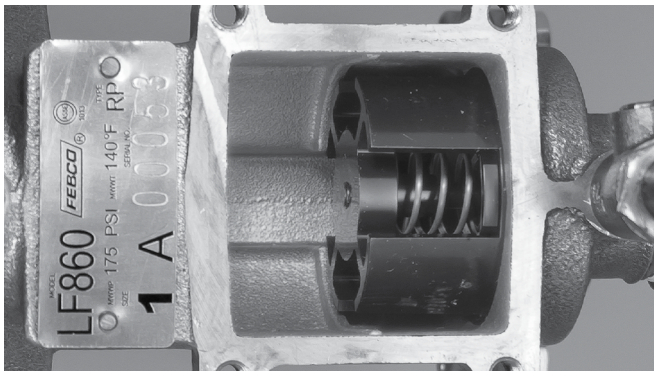
⚠ CAUTION

Excess lubricant may cause foreign debris to collect on internal components, which could foul the check assembly and result in a test failure.

2. Make sure the end of each module inscribed with the word INLET is facing the inlet of the valve.



3. When installing the check modules, make sure the check assembly with the heavy duty spring is inserted in the inlet bore of the body (first check position). Position the first check assembly so that one (1) of the four (4) flow path windows is face-down toward the relief valve. The check assembly with the weaker spring must be installed in the outlet bore of the body (second check position).



4. When replacing the spacer (Item 8) between the two check assemblies, be sure the flanged end of the spacer is touching the back side of the inlet check assembly so that the cover fits properly. Next, replace the cover making sure test cock No. 3 is on the upstream side. Do not over tighten cover bolts. (Approximately 35 inch-pounds is sufficient.)

5. After reassembling, close test cocks No. 2, No. 3, and No. 4 (test cock No. 1 should already be closed), then slowly open the inlet ball valve. Bleed air from the unit by opening and closing test cock No. 2, next No. 3, then No. 4.

NOTICE

During the bleeding process, the relief valve may discharge a high volume of water until all test cocks have been closed and pressure stabilized.

6. Check for external leaks and repair, if necessary. Slowly open the outlet ball valve.

7. Test the assembly in accordance with locally approved methods.

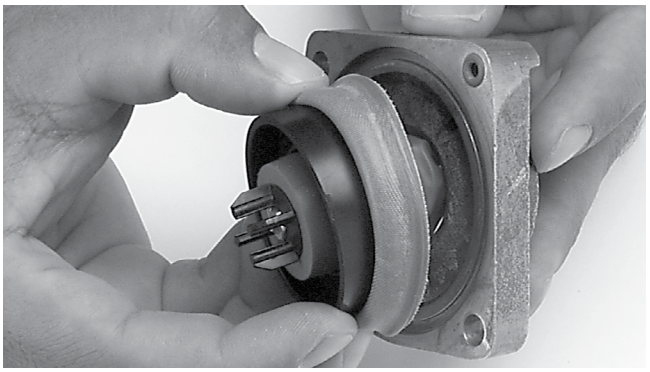
Relief Valve Repair

Discharge from the relief valve assembly may not indicate a relief valve failure. Water is discharged from the relief valve when the mainline check valves become fouled with foreign debris. (For more information, see "Troubleshooting" before disassembling the relief valve.) Detach the flood sensor and activation module if in use.

1. Slowly close the inlet and outlet ball valves. Bleed off air from the unit by opening and closing test cock No. 2, next No. 3, then No. 4. Test cock No. 1 should remain closed.

2. Loosen the brass cylinder in the center of the relief valve cover (Item 18) by unscrewing ¼ turn (counterclockwise). Remove the relief valve cover bolts (Item 21) and the relief valve cover (Item 19).

3. The internal relief valve assembly module is attached to the relief valve cover. Unscrew the brass cylinder and remove from cover. Grasp the outer diameter of the large outer diaphragm (Item 15) and pull it away from the cover until the small outer diaphragm (Item 16) comes out through the relief valve cover hole and is completely separated from the relief valve cover. Discard the old internal relief valve assembly module. Remove the plastic slip rings (Item 18.1) and discard each one. Slide out the seat ring (Item 12) and seat gasket ring (Item 12.1) from the relief valve body and discard.

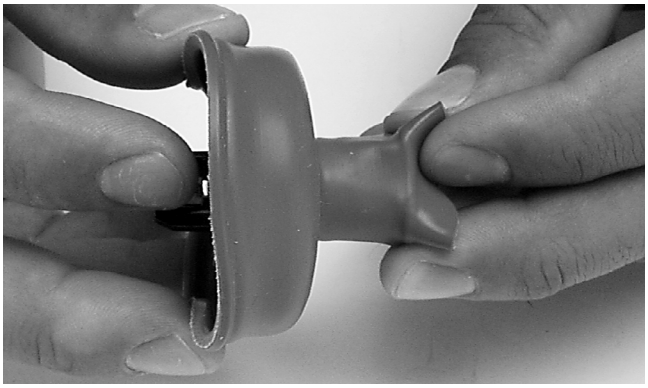


4. Apply a thin coating of the supplied lubricant to both sides of the new seat gasket ring (Item 12.1), and slide it on the short end of the new seat ring (Item 12). Slide the short end of the new seat ring into the hole of the relief valve body. (The adhesion from the lubricant holds the seat ring in place during the rest of the assembly process.)

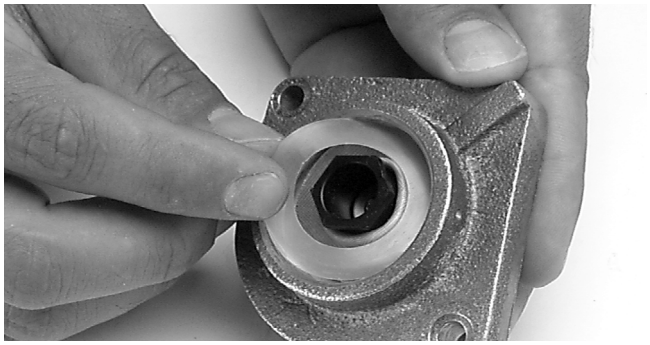
NOTICE

If applying new diaphragms from a rubber kit, ensure the smooth rubber side of each diaphragm is facing outward before assembly.

5. Before installing the new internal relief valve assembly module, apply a thin coating of the supplied lubricant to both sides of one slip ring (Item 18.1) and insert it into the top of the relief valve cover. Install the new internal relief valve assembly module by grasping the outside of the outer diaphragm in one hand and the smaller diaphragm in the other hand. Then pull upward gently on the small outer diaphragm (Item 16) so that it forms the shape of a tulip. Hold the small diaphragm so that it maintains the tulip shape while sliding it through the relief valve cover hole and plastic diaphragm gasket.



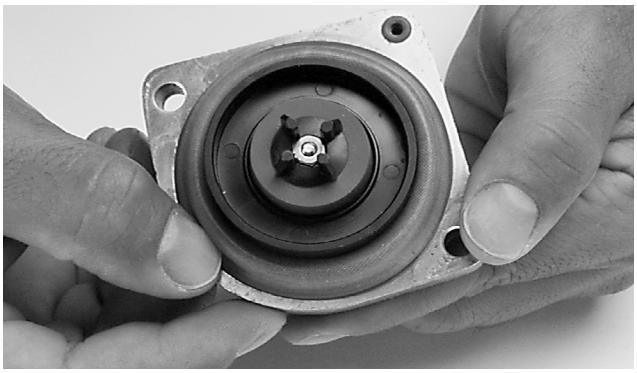
6. Apply a thin coating of the supplied lubricant to both sides of the second slip ring (Item 18.1) and place it over the top of the small diaphragm, making sure the outer diaphragm (Item 16) is not folded or creased under the slip ring. Push the slip ring down flat until the adhesion from the grease holds the small diaphragm in place. This should roll the diaphragm as shown. Thread the brass cylinder (Item 18) into the relief valve cover and hand tighten.

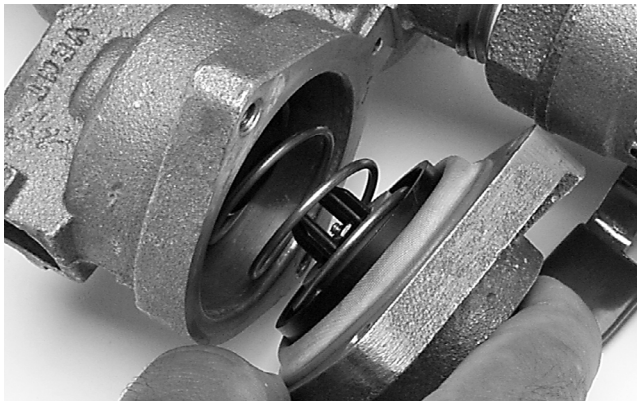


⚠ CAUTION

Do not twist the internal parts when the cylinder is tightened. The small diaphragm may become folded or creased if the internal assembly is restricted while tightening the cylinder.

7. Replace the O-ring (Item 20) in the relief valve cover. Properly seat the round bead on the large diaphragm in the counterbore of the relief valve cover. Position the spring (Item 13) over the seat ring in the relief valve body and hold it in place while inserting the guide end (Item 23) of the relief valve assembly module and relief valve cover. Position the assembly so the O-ring aligns with the sensing hole in the body and the guide slides into the seat ring. Replace the relief valve cover bolts and tighten to approximately 35 inch-pounds. Do not over tighten. Tighten the brass cylinder (Item 18) in the relief valve cover to approximately 30 feet pounds of torque. Do not over tighten.





8. After reassembly, with all test cocks closed, slowly open the inlet ball valve and bleed air from the unit by opening and closing test cock No. 2, No. 3, then No. 4.

NOTICE

During the bleeding process, the relief valve may discharge a high volume of water until all test cocks have been closed and pressure has been stabilized.

9. Check for external leaks and repair, if necessary. Slowly open the outlet ball valve.
10. Test the assembly in accordance with locally approved methods.
11. Upon completion of successful testing, reattach the flood sensor and activation module if in use.

Testing

All mechanical devices should be inspected on a regular basis to ensure proper functioning. The assembly should be tested at the time of initial installation, after servicing or maintenance, and at least annually thereafter. Acceptable test procedures are published by Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California (USC), American Water Works Association (AWWA), American Society of Sanitary Engineering (ASSE Series 5000), and Canadian Standards Association (CAN/CSA B64.10). Consult the local regulatory authority for specific information.

Air Gap Drain

1. Before installation, check local codes. This type of drain may not be approved for use in some areas.

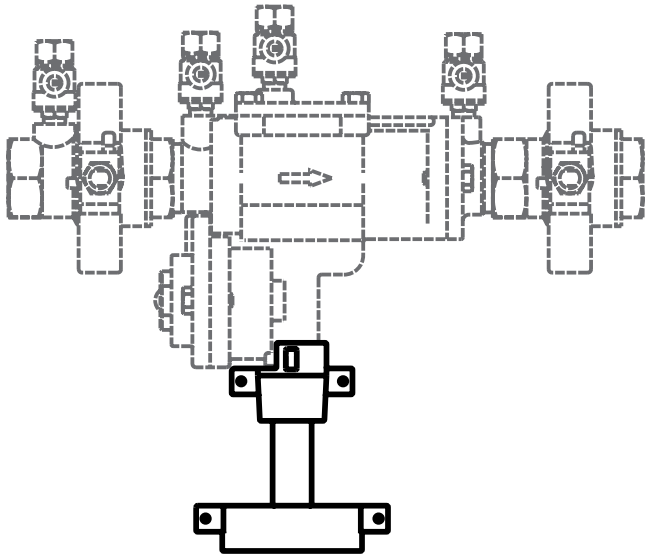
   ⚠ CAUTION

   This drain is intended to catch moderate relief valve discharges due to line pressure fluctuations and minor check valve fouling. Under certain conditions relief valves can discharge water at rates greater than the air gap drain capacity.

2. For an indoor installation, locate the assembly near a floor drain sized to adequately handle discharge. A strainer before the backflow assembly is strongly suggested.

3. After installation of backflow assembly and piping, attach the drain funnel to the relief valve as shown in the illustration by using the self-tapping screws provided in the kit to join the drain funnel halves together, making sure the slots in the drain funnel align with the tabs on the relief valve port.

   If the flood sensor is in use, attach the air gap directly to the sensor. For valve sizes ½" to 1", use air gap 909AGA (ordering code 0881399). For valve sizes 1¼" to 2", use air gap 909AGC (ordering code 0881376).



NOTICE

The discharge of the drain funnel is a slip-fit design. The drain funnel is not designed or able to support drainpipe weight.

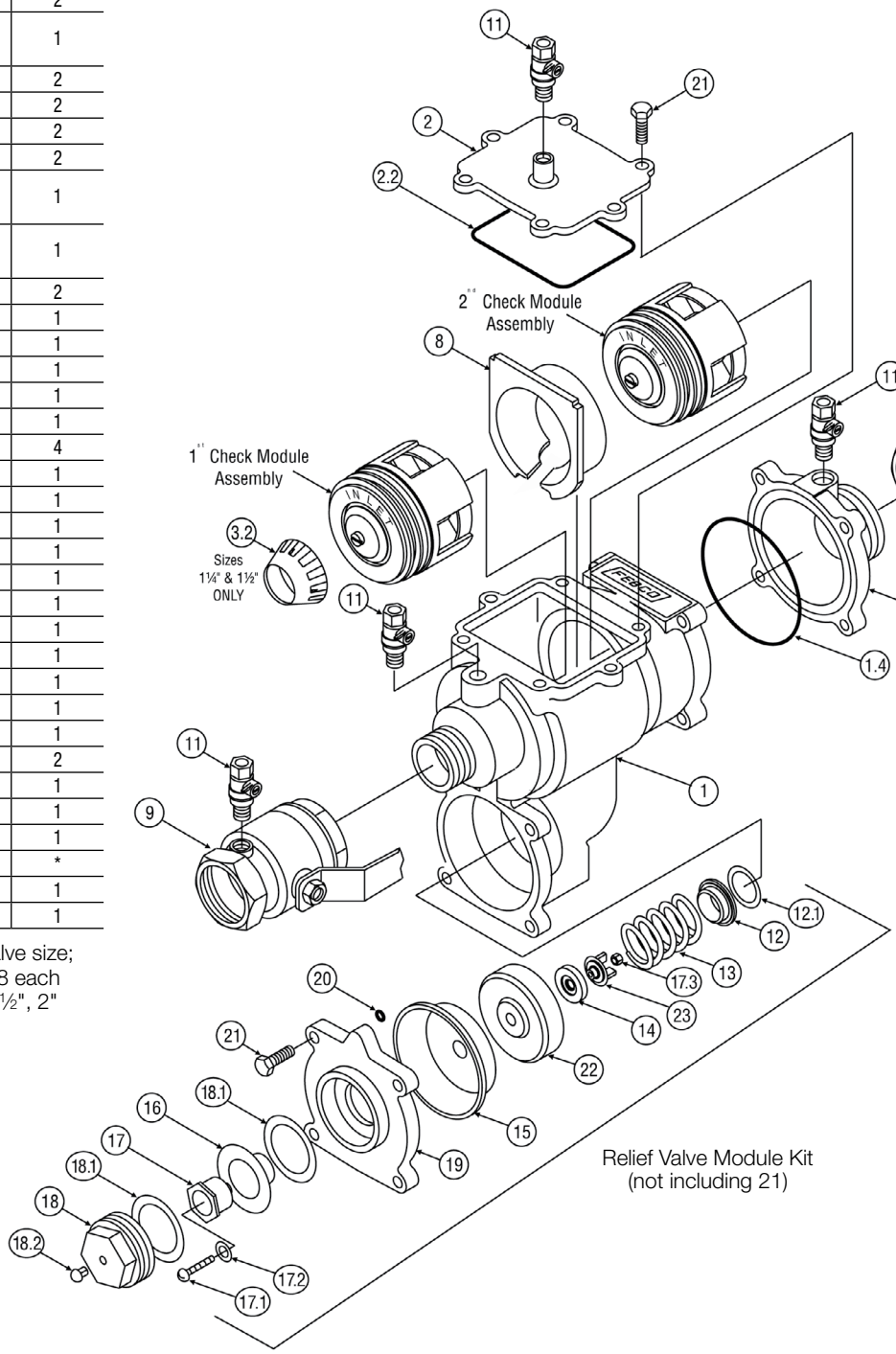
VALVE SIZE	PLASTIC PART NO.	METAL PART NO.
1/2"	905358	905532
3/4"	905358	905532
1"	905358	905532
1 1/4"	905359	905533
1 1/2"	905359	905533
2"	905359	905533

Parts

Call customer service if you need assistance with technical details.

ITEM	DESCRIPTION	QUANTITY
1	Body	1
1.2	Tailpiece	1
1.4	O-Ring	1
2	Cover	1
2.2	O-Ring	1
3	Seat	2
3.1	O-Ring	2
3.2	Inlet Ring (1¼" & 1½")	1
4	Poppet	2
5	Seat Disc	2
5.1	Disc Retainer	2
5.2	Round HD Screw	2
6	Spring (1st Check Spring)	1
6.1	Spring (2nd Check Spring)	1
7	Guide	2
8	Retainer Spacer	1
9*	Ball Valve Tapped	1
	Union End BV Tapped	1
9.1*	Ball Valve	1
	Union End Ball Valve	1
11	Test Cock	4
12	Seat Ring - RV	1
12.1	Gasket Ring - RV	1
13	Spring - RV	1
14	Seat Disc - RV	1
15	Diaphragm - RV	1
16	Outer Diaphragm - RV	1
17	Small Piston - RV	1
17.1	Round HD Screw - RV	1
17.2	Washer - RV	1
17.3	Hex Nut - RV	1
18	Cylinder - RV	1
18.1	Slip Ring Cylinder - RV	2
18.2	Slide (Plug) - RV	1
19	Cover - RV	1
20	O-Ring - RV	1
21	Hex HD Capscrew	*
22	Large Piston - RV	1
23	Guide - RV	1

* Quantity varies with valve size; 6 each for ½" and ¾, 8 each for 1", 14 each 1¼", 1½", 2"



Repair Kits

Before contacting the local FEBCO parts distributor, write down the following information to have on hand when placing the order. The serial number located on the assembly ID plate can assist in ordering the proper kit.

- Item number and name. Locate the number and name of the item in the "Parts" section.
- Kit number. Use the tables below to find the number of the kit containing the item.
- Valve size. Verify the size of the valve that the item is to be used on.
- Model number. Record the full model number found on the assembly ID plate.

Complete Rubber Kit

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905355	ALL	1/2 & 3/4	15 & 20
905356	ALL	1	25
905357	ALL	1 1/4 - 2	32 - 50

Kit includes all rubber parts.

Check Module Rubber Kit

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905342	ALL	1/2 & 3/4	15 & 20
905343	ALL	1	25
905344	ALL	1 1/4 - 2	32 - 50

Both checks. Kit includes Items 2.2, 3.1 (qty 2), and 5 (qty 2).

Relief Valve Rubber Kit

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905345	ALL	1/2 & 3/4	15 & 20
905345	ALL	1	25
905346	ALL	1 1/4 - 2	32 - 50

Kit includes Items 12, 12.1, 14, 15, 16, 18.1 (qty 2), and 20.

Single Poppet Kit

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905339	ALL	1/2 & 3/4	15 & 20
905340	ALL	1	25
905341	ALL	1 1/4 - 2	32 - 50

Valve has two poppets. Kit includes Items 4 to 5.2.

#1 Check Module Kit (inlet)

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905348	ALL	1/2 & 3/4	15 & 20
905350	ALL	1	25
905352	ALL	1 1/4 - 2	32 - 50

Kit includes Items 3 to 7 for inlet check.

#2 Check Module Kit (outlet)

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905347	ALL	1/2 & 3/4	15 & 20
905349	ALL	1	25
905351	ALL	1 1/4 - 2	32 - 50

Kit includes Items 3 to 7 for outlet check.

Full Relief Valve Module Kit

ORDERING CODE	STYLE	SIZE	
		in.	*mm*
905353	ALL	1/2 & 3/4	15 & 20
905353	ALL	1	25
905354	ALL	1 1/4 - 2	32 - 50

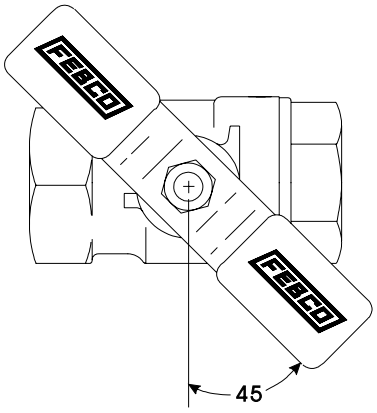
Kit includes Items 12 to 17.3, 18.1 (qty 2), 20, 22, 23

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Freeze Protection

The freeze protection backflow prevention assembly may be subject to damage if the internal water is allowed to freeze. The unit must be protected from freezing using a heated enclosure, insulation using heat tape, or other suitable means. The unit must always be accessible for testing and maintenance. If the system is shut down during freezing weather, use the following procedures to drain internal passages.

Main Valve Draining



1. Close the main shutoff valve.
2. Open the inlet drain.
3. Open the inlet and outlet ball valves 45 degree (half open/half closed).
4. Open all test cocks then open the outlet drain.
5. Remove the cover and inlet check module until all water inside the valve drains back through the inlet drain.
6. If the piping downstream of the backflow assembly is blown out with compressed air, connect the air supply to the outlet drain and close the outlet ball valve. After clearing the system with air, partially open the outlet ball valve.
7. Leave all drain valves, test cocks, and ball valves in the half open/half closed position for the winter.
8. For reduced pressure units only. Loosen the relief valve cover to drain, then tighten when draining is completed.
9. Reset the ball valve to the close position (handle perpendicular to the valve) before repressurization..

Ball Valve Shutoff Draining

If the assembly has been installed with ball valve shutoff valves, the ball valves must also be properly drained to prevent freeze damage.

1. Ensure the main valve draining is finished and all ball valve shutoffs and test cocks are in a half open/half closed (45 degree) position.
2. Drain the pipeline to allow water between the ball valves and valve body to drain.
3. Leave the ball valves in the half open/half closed position for the winter to prevent freeze damage.
4. Fully close the ball valves before the system is repressurized.

NOTICE

OPEN AND CLOSE BALL VALVES SLOWLY TO PREVENT DAMAGE TO THE SYSTEM CAUSED BY WATER HAMMER.

Troubleshooting

Check Procedure with Differential Pressure Gauge

CHECKLIST	READING	PROBLEM
Check differential across check valve No. 1	2 to 3 psid	Leak in check valve No. 1 or No. 2
	6 to 8 psid and steady	Malfunctioning pressure relief valve
	2 to 7 psid and steady	Inlet pressure fluctuating
Check differential across check valve No. 1	2 to 3 psid	Check valve No. 1 held open
	6 to 8 psid and steady	Malfunctioning pressure relief valve

Check Procedure Without Differential Pressure Gauge

CHECKLIST	READING	PROBLEM
Close gate valve No. 2	If discharge stops	Leak in check valve No. 2
	If discharge does not stop	Try the next remedy
Open test cock No. 4 to produce a flow greater than the differential relief valve discharge	If discharge stops	Leak in check valve No. 1
	If discharge does not stop	Malfunctioning pressure relief valve

PROBLEM	CAUSE	SOLUTION
Continuous discharge from relief valve during NO FLOW conditions (Discharge stops with water flow) With this symptom, the pressure drop across check valve No. 1 would be 2 to 3 psid. If a flow of water (more than discharge) is created through the valve, the pressure drop should increase to approximately 7 psi	Debris fouling check valve No. 1	Inspect and clean
	Outlet pressure highter than inlet pressure and deris fouling check valve No. 2	
	Spring stem not moving freely	Inspect for dirt or other foreign material
	Damaged seat or seat disc	Inspect and replace (If necessary, the seat disc can be reversed in sizes ½" to 2".)
	Leakage at check module O-ring	nspect and replace seal or O-ring
Intermittent discharge from relief valve during NO FLOW conditions. With the symptom, the pressure drop across the check valve No. 1 would vary from about 2 to 7 psid	Inlet line pressure variations causing relief valve to discharge	Eliminate or reduce pressure variations by installing a soft-seated, spring-loaded check on upstream side of device
	Pressure surges (water hammer) causing relief valve to discharge as pressure wave passes through the zone	Eliminate or reduce pressure surges
Continuous discharge from relief valve during FLOW and NO FLOW conditions With this symptom, the pressure drop across the check valve No. 1 would be 7 psid or more at all time	Seat disc dislodged from cavity in the main stem (This can be caused by pressure surges during initial filling of system lines.)	Reposition disc in main stem cavity Repressurize system slowly
	Debris fouling the relief valve seat	Inspect and clean
	Debris blocking the relief valve sensing passage	
	Dirt or scale jamming main stem	Inspect and clean, or replace
	Leakage at main stem	
Relief valve does not open above 2.0 psid during field testing	Outlet gate valve not closed completely	Inspect and clean
	Plugged low pressure hydraulic passage (from “ZONE” to inner diaphragm)	
	Improper alignment of internal parts during reassembly (causing high resistance to movement)	Reassemble
	Jammed main stem due to debris blocking gate valve	Clean
Check No. 1 pressure drop is low (less than 5 psid) during field testing	Debris fouling first check seat	Inspect and clean
	Debris fouling second seat with backpressure	
	Inlet pressure variations causing inaccurate gauge reading	Eliminate pressure variations by installing a soft-seated, spring-loaded check on upstream side of device
	Damaged seat or seat disc	Inspect and clean as required
	Worn guide, bushing, or stem	Inspect and replace as required
Check No. 2 fails to hold back pressure during field testing	Outlet gate valve not closed completely	Inspect and clean
	Debris fouling second check seat	
	Damaged seat or seat disc	Inspect and replace if required
	Worn guide, bushing, or stem	

Add-on and Retrofit Sensor Connection Kits

For Building Management Systems

ORDERING CODE		ADD-ON/RETROFIT KIT	DESCRIPTION
88009431		FP-FBF-BMS BMS Flood Sensor Connection Kit Series 860 Small, LF860 Small Sizes ½" to 2"	Includes sensor activation module with cable, power adapter, and ground wire. Use this kit to activate the flood sensor and enable flood detection capabilities on the relief valve of a new installation in a BMS configuration.
88009425		FP-RFK-FBF-BMS-CFS BMS Flood Sensor Retrofit Connection Kit Series 860 Small, LF860 Small Sizes ½" to 2"	Includes flood sensor (2), sensor activation module with cable, power adapter, and ground wire. Use this kit to add flood detection capabilities to the relief valve of an existing installation in a BMS configuration.

For Cellular Communication

ORDERING CODE	ADD-ON/RETROFIT KIT		DESCRIPTION
88009432		FP-FBF-CFS Cellular Flood Sensor Connection Kit Series 860 Small, LF860 Small Sizes ½" to 2"	Includes sensor activation module with cable, Cellular Gateway with mounting kit, power adapter, and ground wire. Use this kit to activate the flood sensor and enable flood detection capabilities as well as e-mail, text, and voice notifications.
88009426		FP-RFK-FBF-CFS Cellular Flood Sensor Retrofit Connection Kit Series 860 Small, LF860 Small Sizes ½" to 2"	Includes flood sensor (2), sensor activation module with cable, Cellular Gateway with mounting kit, power adapter, and ground wire. Use this kit to add flood detection capabilities to the relief valve of an existing installation and enable e-mail, text, and voice notifications.

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