AquaSense® AV

ZEMS-IS Series
with HW6 Power Converter

Automatic Sensor-Operated Exposed Flushometer
Installation, Operation, Maintenance and Parts Manual



ZEMS6000AV-IS (Closet)



ZEMS6003AV-IS (Urinal)

Compliance

- ADA Compliant
- ASSE 1037/ASME A112.1037
- CSA B125.37
- WaterSense Compliant

NOTE: The information in this manual is subject to change at any time without notice. Installations may be performed at different times of construction by different individuals. For this reason, these instructions should be left on-site with the facility or maintenance manager.

⚠ **CALIFORNIA WARNING**: Risk of cancer and reproductive harm from exposure to nickel (metallic and soluble compounds). See www.P65Warnings.ca.gov.

⚠ **AVERTISSEMENT EN CALIFORNIE:** Risque de cancer et de troubles de la reproduction en raison de l'exposition au nickel (composés métalliques et solubles). Consulter www.P65Warnings.ca.gov.

⚠ **ADVERTENCIA PARA CALIFORNIA:** Riesgo de cancer y dano reproductivo por exposicion al niquel (compuestos metalicos y solubles). Consulte www.P65Warnings.ca.gov.

LIMITED WARRANTY

All goods sold hereunder are warranted to be free from defects in material and factory workmanship for a period of three years from the date of purchase. Decorative finishes warranted for one year. We will replace at no costs goods that prove defective provided we are notified in writing of such defect and the goods are returned to us prepaid at Sanford, NC, with evidence that they have been properly maintained and used in accordance with instructions. We shall not be responsible for any labor charges or any loss, injury or damages whatsoever, including incidental or consequential damages. The sole and exclusive remedy shall be limited to the replacement of the defective goods. Before installation and use, the purchaser shall determine the suitability of the product for his intended use and the purchaser assumes all risk and liability whatever in connection therewith. Where permitted by law, the implied warranty of merchantability is expressly excluded. If the products sold hereunder are "consumer products," the implied warranty of merchantability is limited to a period of three years and shall be limited solely to the replacement of the defective goods. All weights stated in our catalogs and lists are approximate and are not guaranteed.

NOTICE: READ ENTIRE MANUAL PRIOR TO INSTALLING PRODUCT

Specifications

Sensor Range:	18” to 60” (adjustable)
Voltage:	7.6 volts DC
Operating Water Pressure:	25 psi [172 kPa] (Running); 80 Psi [552 kPa] Max (Static)
Operating Temperature:	35°F to 104°F [2°C to 40°C]

Important Safety Information

- Do not convert or modify this Zurn product. All warranties will be voided.
- All plumbing is to be installed in accordance with applicable codes and regulations.
- Water supply lines must be sized to provide an adequate volume of water for each fixture.
- Flush all water lines prior to making connections.
- Do not use pipe sealant or plumbing grease on any fitting other than the control stop inlet.
- Sensor units should not be located across from each other or in close proximity to highly reflective surfaces.
- Control stop should never be opened to allow flow greater than fixture is capable of evacuating. In the event of valve failure, fixture must be able to handle a continuous flow.

Prior to Installation

Prior to installing the Zurn Automatic Sensor-equipped Flushometer, install the items listed below.

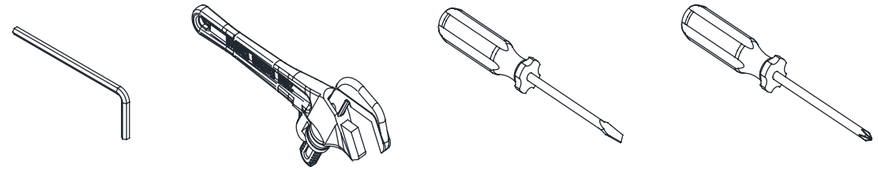
- All plumbing is to be installed in accordance with applicable codes and regulations.
- Water supply lines must be sized to supply an adequate volume of water for each fixture.
- Flush all water lines prior to making connections.
- Sensor Units should not be located across from each other or in close proximity to highly reflective surfaces.

The Zurn AquaVantage® valve is designed to operate over the entire pressure range recommended by plumbing fixture manufacturers and will produce a metered flush when activated.

Protect the chrome or special finish of this AquaVantage® valve. ***Do not use toothed tools to install or service the valve.*** Also, see “Care and Cleaning” section of this manual.

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Required Tools



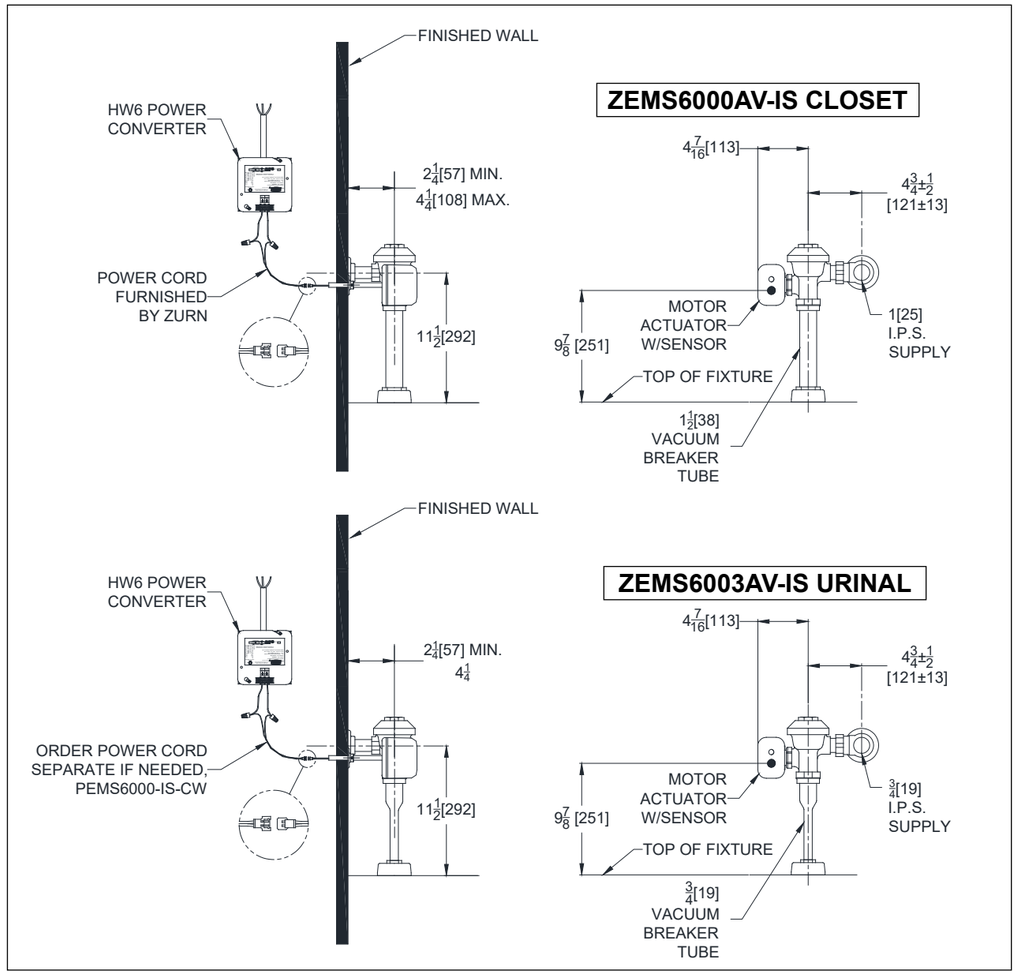
5/64” Hex Key Wrench (Supplied)

Smooth Jawed Wrench

Flat Head Screwdriver

Phillips Head Screwdriver

Typical Installation



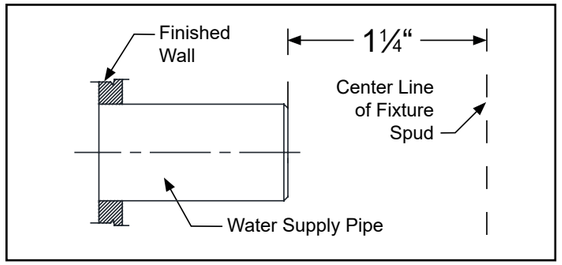
Rev. V | Date: 7/7/2026 | C.N. No. 148040 | Prod./Dwg. No. FV343

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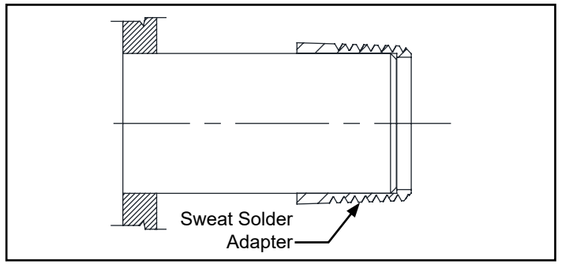
Sweat Solder Adapter Installation Instructions

NOTE: Before installation, turn off water supply and remove existing flush valve for retrofit applications.

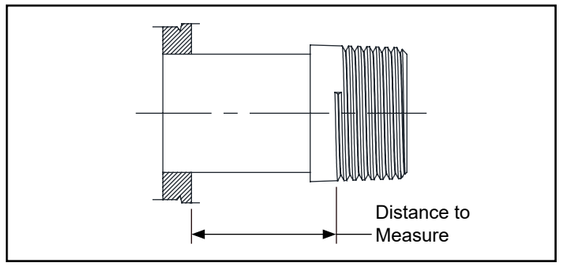
1. Measure distance from finished wall to the center line of the fixture spud. If necessary, cut water supply pipe 1-1/4" shorter than this measurement. Deburr by chamfering O.D. and I.D of end of water supply pipe.



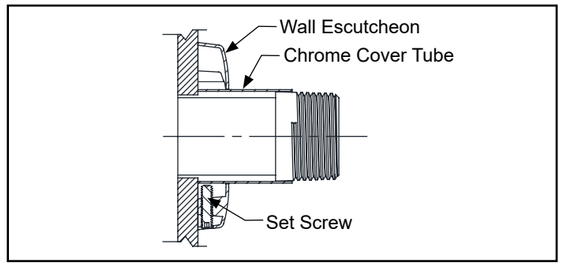
2. Slide threaded sweat solder adapter onto water supply pipe until shoulder stops on end of pipe. Then sweat-solder the adapter to water supply pipe.



3. Measure distance from finished wall to first thread of sweat solder adapter. If necessary, cut chrome cover tube this length.

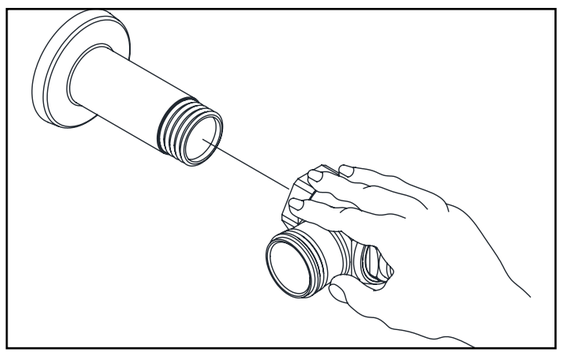


4. Slide wall escutcheon over chrome cover tube and slide both items over water supply pipe. Press wall escutcheon flush against finished wall and tighten set screw with hex wrench (supplied) to secure it in place.

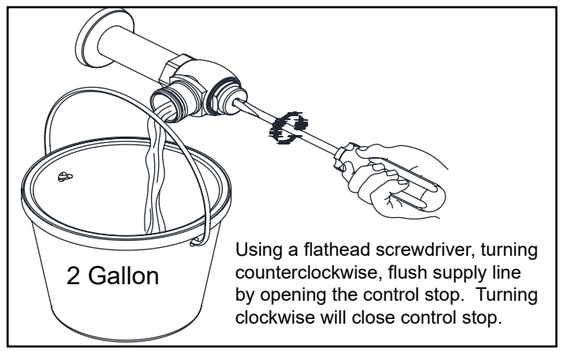


Control Stop Installation Instructions

1. Install control stop assembly by threading it onto water supply pipe and tightening with a smooth jawed wrench. Apply thread sealing compound or pipe tape to male NPT thread on sweat solder adapter only.
   Prior to turning on main water supply line ensure all stop valves are closed off tight by using a flathead screwdriver and turning the stop valve adjustment screw clockwise.



2. When all stop valves are properly connected to the water supply line and water pressure is available open the control stop using a flathead screwdriver and turning the stop valve adjustment screw counterclockwise.
   Allow the water supply line to flush any debris or sediment that may be present in the line. Close the control stop once the lines are completely flushed.

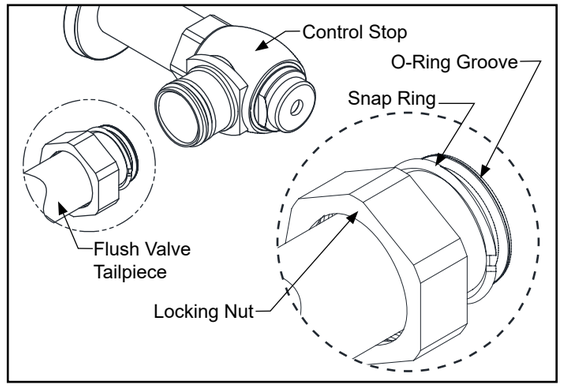


Using a flathead screwdriver, turning counterclockwise, flush supply line by opening the control stop. Turning clockwise will close control stop.

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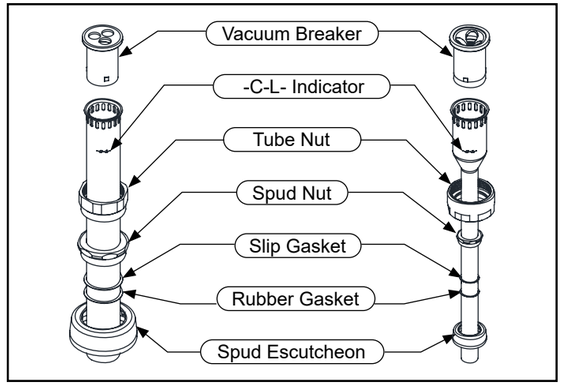
Flush Valve Installation



Prior to attaching flush valve tailpiece to control stop, inspect and verify that the O-ring seal is located within the O-ring groove at the tailpiece. Ensure that the locking nut and locking snap ring are also present on the tailpiece.

Lubricate O-ring with water if necessary and insert flush valve tailpiece into the control stop valve. Tighten locking nut using a smooth jawed wrench.

Vacuum Breaker & Flush Connection Installation



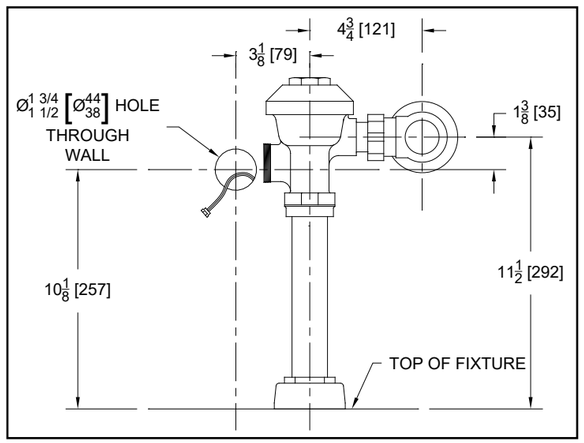
Determine the length of vacuum breaker tube required to join the flush valve and fixture spud, and cut if necessary.

Slide the tube nut, spud nut, slip gasket, rubber gasket and spud escutcheon over the vacuum breaker tube and insert tube into fixture spud. Hand tighten tube nut to valve body and hand tighten spud nut onto fixture spud. Adjust the valve assembly for plumb. Tighten fixture spud nut, vacuum breaker tube nut and locking nut with a wrench.

Adjust and plumb the valve assembly. Tighten all connections with smooth jawed wrench and turn on water supply at the control stop.

DO NOT cut vacuum breaker tube shorter than 6" below the -C-L- indicator mark, as vacuum breaker must be 6" above the fixture. Consult plumbing Codes & Regulations for specific details.

Valve Rough In Dimesions



The predrilled 1-1/2" diameter hole in the finished wall is necesary for the connecting wire run from the power supply for final connection to the flush valves. Shown below is the typical ZEMS6000AV-IS layout.

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HW6 Power Converter Installation (STEPS 1-4)

- The Zurn HW6 Power Converter shall be installed in accordance with National/Local electrical codes.
- The HW6 is shipped intergrated within a 4 11/16" X 4 11/16" X 2 1/8" electrical box.
- It is advisable to install the HW6 power supply in an accessible location, as close as possible to the flush valves it will power. Ideal location is behind an access panel, in a pipe chase, or above a drop ceiling. The greatest distance to any valve shall ideally be less than 20 ft., (40 ft. max.).
- The Zurn-HW6 Power Converter shall be direct wired with continuous 120VAC, 60Hz from the building supply.
- The HW6 can be used to power up to 8 ZEMS-IS flush valves.
- Enclosed with each valve is 1 (one) connecting wire to power ZEMS-IS actuator.
- The wire shall be wire nut connected to the low voltage red (+) and blue (-) leads from the power supply, see **(Figure 1).**
- The connecting wire is polarized. The black lead with white trace is (+) and connects to the red wire from the power supply. The plain black lead is (-) and connects to the blue lead on the power supply.

IMPORTANT

1. Must use a Zurn power supply to ensure proper voltage for the system. Correct polarity is necessary to prevent damage to the sensors. Check DC power level to ensure the power supply is providing a minimum of 7.4 volts DC. DC levels less than 7.4 volts will result in malfunction of the units.

2. Be certain to use the lengths of wire provided with each power supply when wiring the bathroom for the flush valves. The connector and wire gauge have been selected specifically to match the Zurn Flushometer valve.

3. Each Flush Valve should be wired in parallel as shown in the wiring diagram below.

4. Ensure the access hole behind the flush valve is a minimum of 1-1/2” in diameter and located per Zurn templates #FV329 and #FV330. The plug end of the low voltage wire needs to be accessible at this hole when the plumber installs the flushometer valve.

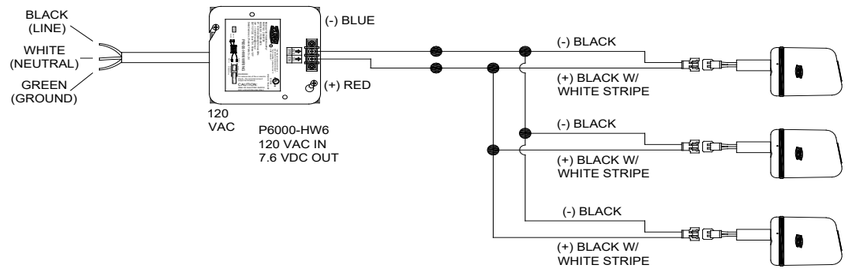


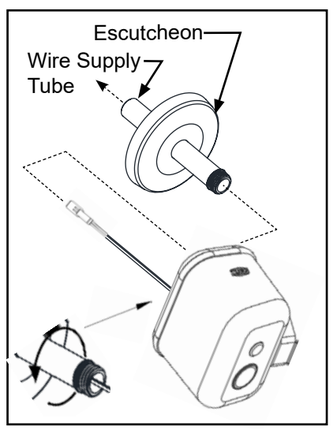
Figure 1

Actuator Installation (Wall Assembly)

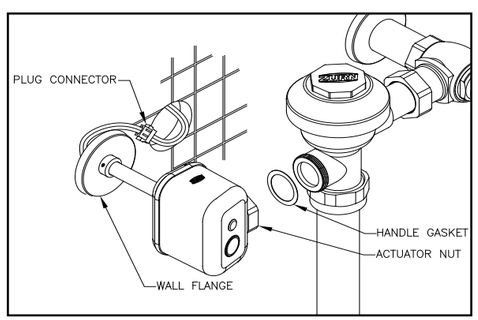
1. Slide wall escutcheon over the chrome wire supply tube as shown.

2. Feed the plug connector wire from the ZEMS-IS actuator through the front of the tube and pull out from the back as shown.

3. Insert both the power supply cable and wire supply tube into a thru-hole on the wall. Hand-tighten the wire supply tube into the back of the ZEMS-IS actuator.



4. Connect the plug connector on the ZEMS-IS actuator with the DC power plug located within the access hole just behind the flush valve. Carefully tuck the wires back into the access hole. Install handle gasket into actuator nut and tighten actuator to valve. Push wall flange against wall and secure the escutcheon with the set screw.



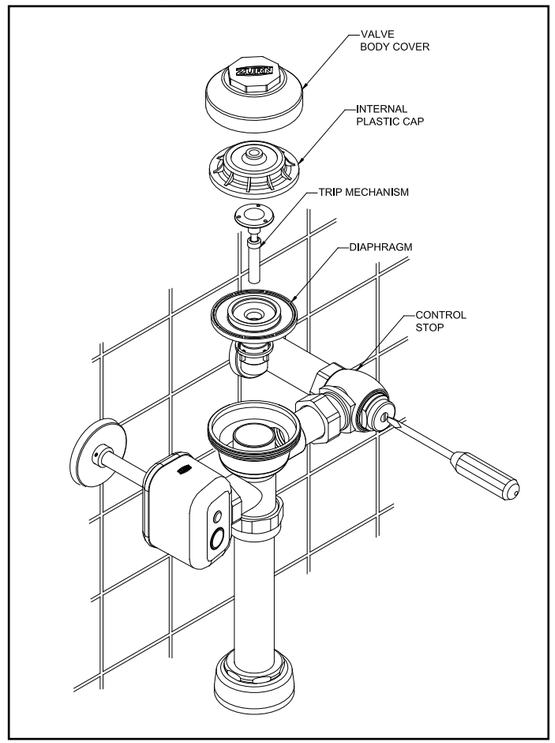
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Actuator Installation (Flush Valve Assembly)

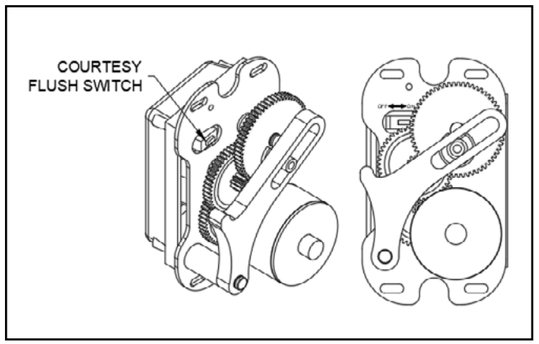
Flush Out Supply Line

Close control stop. Remove valve body cover and lift out trip mechanism. Reinstall internal cap and valve body cover. Turn on water supply to flush line of any debris or sediment. After completion, shut off control stop, remove cover and reinstall the trip mechanism. Install the internal cap and valve body cover wrench tight.

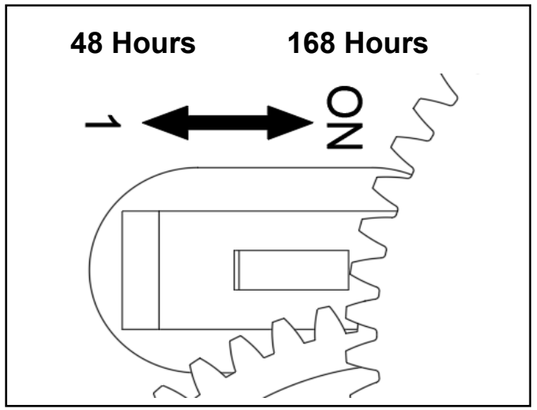


Maintenance flush options (Courtesy)

Remove the shell to expose a dip switch located on the board visible through a window behind the gears.



This switch directs the timing of the standard automatic maintainance (courtesy) feature to flush the fixture either once every two days, or once per week. There is no override option for this automatic feature. By default, the swich is in the 1 position, which is once every 48 hours. The alternate position is ON, which is once every 168 hours.



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Actuator Setup (Flush Valve Operation)

CUSTOMIZED SENSOR RANGE SETTING

The ZEMS-IS is factory set to accommodate most closet and urinal installations. If this factory setting does not accommodate your specific environment, follow steps below to customize your range settings for your specific ZEMS-IS model.

NOTE: If your ZEMS-IS actuator has a rubber override button, consult your local Zurn representantive for customized sensor range setting procedure. 1-800-997-3876.

CALIBRATION INSTRUCTIONS FOR ZEMS-IS III

1. Obtain a target. (Cardboad, or use your body)
2. PRESS and HOLD button until the LED turns solid.

(*Unit will flush)

LED Change	ACTION
LED turns SOLID	Remove finger from button
LED starts to BLINK	Press & Hold button
LED turns SOLID	Remove finger from button

3. Set target at desired distance, (No less than 18") from sensor eye. Ensure NO other objects are in view of sensor eye.
4. Keep target steady - Unit will blink while calibrating.
5. Calibration ends with a fast double blink.
6. IF THE LED REMAINS SOLID FOR 5 SECONDS AFTER CALIBRATION, the calibration was NOT successful. REPEAT STEPS 2-8
7. Verify calibration distance by standing 2” closer than the target distance for 15 seconds (wait for double blink), then evacuate sensor area and wait for flush.

VERIFY CALIBRATION FOR CLOSET INSTALLATIONS

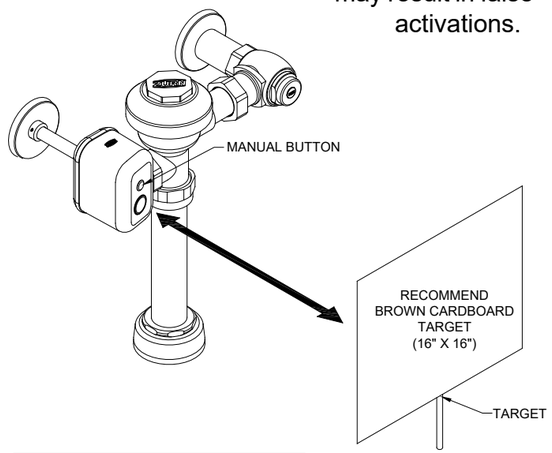
1. Stand outside closet stall and close door.
2. Slowly open door to closet stall while looking at ZEMS-IS sensor.
3. If led blinks while door is opening, recalibrate to a shorter range.

FAILURE TO DO SO WILL RESULT IN GHOST FLUSHING.

Activating the Motor Actuator with the Sensor

Input Action	LED Change
Place Target	Red LED will blink
Maintain target 11 sec.	Red LED will flash twice
Remove target	Motor initializes flush

*Warning: Calibrating to a distance less than 18" may result in false activations.



Recommended Distances	
Urinal	22" from sensor face.
Closet	6" - 8" beyond front lip of toilet bowl.

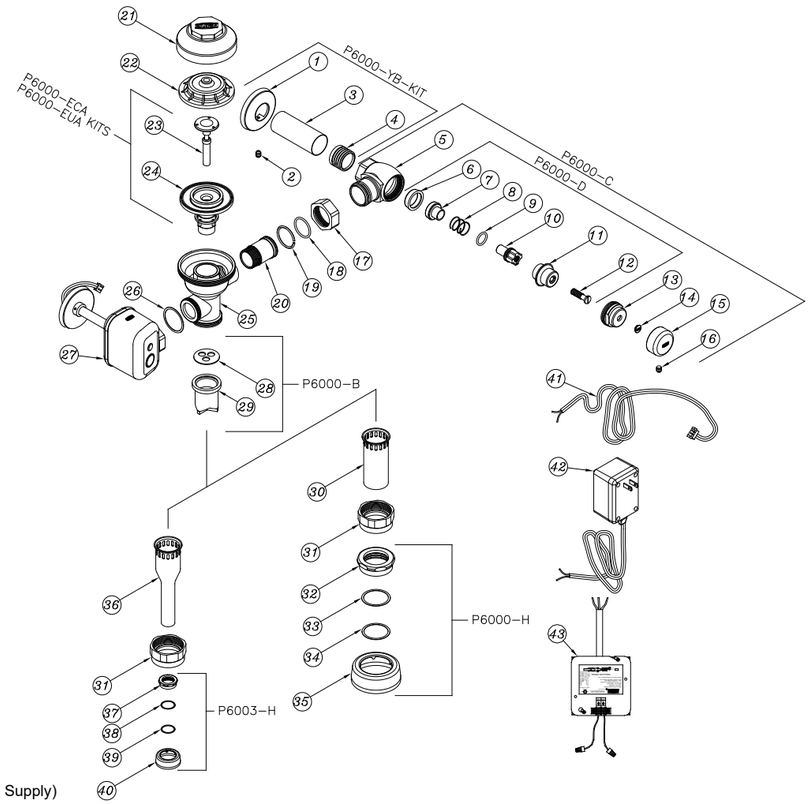
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Aquavantage ZEMS-IS Parts Breakdown

Parts Identification

1. Cast Wall Escutcheon
2. Setscrew for Cast Wall Escutcheon
3. Supply Cover Tube
4. Sweat Solder Adapter
5. Stop Body
6. Piston Seal
7. Piston
8. Stop Spring
9. Guide O-Ring
10. Piston Guide
11. Guide Holder
12. Adjusting Screw
13. Stop Cap
14. Snap Cap Screw Cover
15. Vandal-Resistant Control Stop Cover
16. Setscrew for Control Stop Cover
17. Locking Nut
18. Tailpiece O-Ring
19. Snap Ring
20. Tailpiece
21. Valve Body Cover
22. Plastic cover
23. Trip Mechanism
24. Diaphragm Repair Kit
25. Valve Body
26. Gasket
27. ZEMS-IS Actuator Assembly
28. Vacuum Breaker Disc
29. Vacuum Breaker
30. 1-1/2" Vacuum Breaker Tube
31. Vacuum Breaker Tube Nut
32. 1-1/2" Spud Nut
33. 1-1/2" Spud Friction Washer
34. 1-1/2" Spud Sleeve
35. Spud Escutcheon
36. 3/4" Vacuum Breaker Tube
37. 3/4" Spud Nut
38. 3/4" Spud Friction Washer
39. 3/4" Spud Sleeve
40. 3/4" Spud Escutcheon
41. Power Cord
42. 120 VAC/7.5VDC Plug-in Power Supply
43. Power Converter P6000-HW6 (Regulated Supply)



Covers and Repair Kits	Flow Volume (GPF)	Product No.
Outside Cover - Item 21		P6000-LL-CP
Inside Cover - Item 22		P6000-L
High Effeciency Closet Kit	1.28	P6000-ECA-HET
Low Consumption Closet Kit	1.6	P6000-ECA-WS1
Water Saving Closet Kit	3.5	P6000-ECA-WS
Full Flow Closet Kit	4.5	P6000-ECA-FF
Ultra Low Flow Urinal Kit	0.125	P6000-EUA-ULF
Low Consumption Urinal Kit	1.0	P6000-EUA-WS1
Water Saving Urinal Kit	1.5	P6000-EUA-WS
Full Flush Urinal Kit	3.0	P6000-EUA-FF

Repair Parts - Inside Parts	Product No.
Urinal Trip Mechanism - Item 23	P6000-EUA13
Closet Trip Mechanism - Item 23	P6000-ECA13

Aquavantage Rebuild Kits	Product No.
Closet and Urinal Rebuild Kits Include Items 18, 23, 24, 26, 28, 29	P6000-ECA-WS-RK
	P6000-ECA-WS1-RK
	P6000-ECA-HET-RK
	P6000-EUA-WS-RK
	P6000-EUA-WS1-RK
	P6000-EUA-ULF-RK

Actuator Assembly and Repair Kits	Product No.
Actuator - Item 27	PEMS6000-HYM-IS
Power Cord (Item 41)	PEMS6000-CW
120 VAC/7.5 VDC Plug-in ACA Power Supply (Item 42)	P6900-ACA
Power Converter (Item 43)	P6000-HW6

Control Stop Repair Kit and Parts	Product No.
Control Stop Repair Kit for 1” and 3/4”, Includes Items 6-12	P6000-D-SD
Seal Seat for 1” and 3/4”, Includes Item 6	P6000-D42
Sweat Solder Adapter	P6000-YBA

Adjustable Tailpieces	Product No.
Adjustable Tailpiece for Standard Flush Valve Includes Items 18-20	P6000-J1
Tailpiece Locking Ring Includes Item 19	P6000-C30
Tailpiece O-Ring Includes Items 18	P6000-C31
Coupling Nut Includes Item 17	P6000-C32

Flush Connections and Spud Coupling Kits	Product No.
1-1/2" Flush Connection and Spud Coupling Items 32-35	P6000-H
3/4" Flush Connection and Spud Coupling Items 37-40	P6003-H
Vacuum Breaker Repair Kit Includes Items 28, 29	P6000-B-HP
Spud Coupling Assembly (Specify Size)	P6000-HN

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Trouble Shooting Guide

Problem	Indicator	Cause	Corrective Action
Flush valve does not flush.	Valve will not operate	Stop valve is closed	Open stop valve
	Flush Valve will not activate after user leaves	Supply valve is closed	Open supply valve
		No LED visible during approach	Check power is (7.6 VDC)
		No Activation	Ensure proper calibration distance
Valve does not evacuate fixture	Insufficient volume of water to adequately flush fixture	Stop valve not open enough	Turn stop valve screw to increase water volume to 25 psi minimum.
		Urinal trip mechanism installed in closet kit. Urinal kit installed in closet valve, or 1.0 gal. urinal kit installed in place of 1.5 gal urinal kit.	Install appropriate parts or kit.
	Flush valve shuts off too quick	Damaged or punctured diaphragm.	Install a new replacement kit
		Enlarged by-pass orifice.	Install a new replacement kit
		Cylinder guide assembly and diaphragm assembly are not tight.	Screw the two assemblies hand tight.
		Urinal trip mechanism (black) in closet flush valves.	Install closet trip mechanism (white).
Continuous Flow	Valve is flushing too long or not shutting off	Trip mechanism not seating properly due to foreign material between trip mechanism and retainer disc.	Disassemble parts and rinse thoroughly.
		By-pass orifice is plugged or partially plugged.	Examine by-pass orifice and clean if necessary being certain not to enlarge orifice opening.
		Line pressure is not adequate to force trip mechanism to seal.	Pressure is inadequate or has dropped below minimum operating range. Steps should be taken to increase the line pressure.
		Cracked cover.	Replace cover with new one.
Random flushing (ghost flush)	Random activation with no user present	Lens may be dirty	Clean lens with soft, damp cloth.
		Power supply output is out of tolerance.	DC voltage must be between 7.4-9 volts. Check for power fault or mal-function in a unit or replace with a Zurn power converter.
		Courtesy flush switch is activated	Disassemble shell and change dipswitch setting on board.
		Electrical noise present	Ensure proper wiring
			Avoid excessive wire length
			Limit wire coils
			Remove potential low voltage noise sources (ex. LED lighting power)

Trouble Shooting Guide

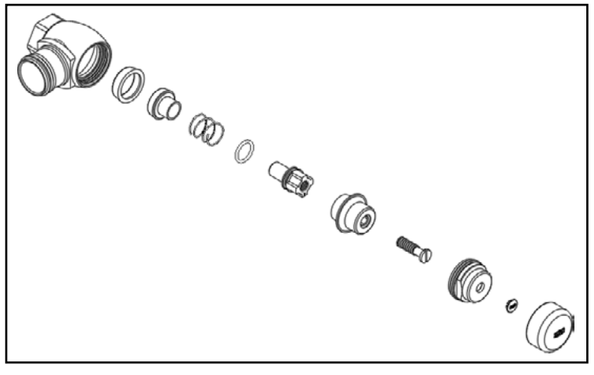
Problem	Indicator	Cause	Corrective Action
Water splashes	Water splashes onto floor during flush cycle.	Supply volume is too high.	Slowly close the control stop to lower water pressure.
		Mineral accumulation on vortex or spreader holes of fixture.	Remove the mineral build up.
Flush is not considered quiet.	Flush is loud.	Control stop may not be adjusted for quiet operation.	Adjust the control stop for quiet operation keeping in mind the fixture evacuation requirements.
		Fixture may be contributing to noise.	Check noise created by fixture by placing a cover over the bowl opening to separate valve noise from bowl noise. If it is determined the fixture is too noisy, consult with fixture manufacturer.
		Piping system may be source of noise.	High pressure in the system can sometimes be controlled by the stop valve. Other sources of noise may be the absence of air chambers and shock arrestors, loose pipes, improper size pipes, etc. In these cases, the building engineer should be consulted.
Valve leaking near valve head.	Water droplets seen between valve head and valve body.	Locking ring not tight.	Tighten locking ring. See Sensor Angle Adjustment section for reference.

Care of Chrome Plated Surfaces

Chrome surfaces should only be cleaned with mild soap and water and dried with a soft cloth. Commercial cleaning products are not recommended.

Seasonal Operation and Maintenance

Valves that are subject to cold and freezing conditions require seasonal shut down maintainance. After the main supply has been shut off and water drained from the system, remove the stop valve cap and stop internals to allow the water to drain from the flush valve itself.



For further assistance with troubleshooting, visit http://www.zurn.com/