

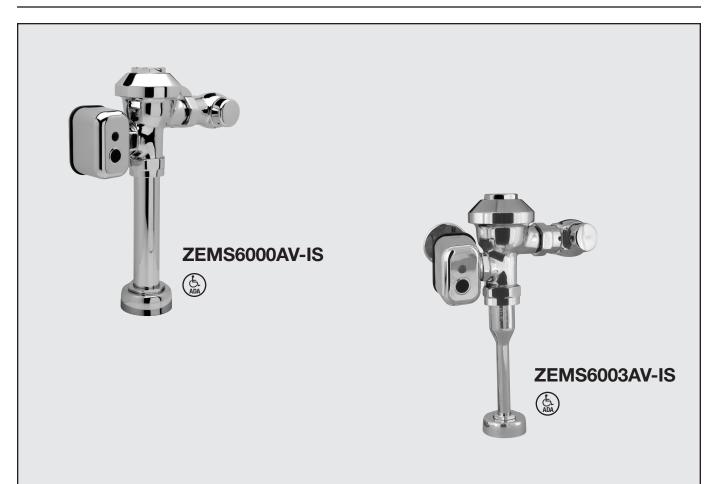
AquaSense® AV ZEMS-IS Series



Automatic Sensor-Operated Exposed Flushometer

Installation, Operation, Maintenance, and Parts Manual

Patented and Patents Pending



Sensor-Operated Exposed Flushometer ZEMS6000AV-IS Closet ZEMS6003AV-IS Urinal

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 cost 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.

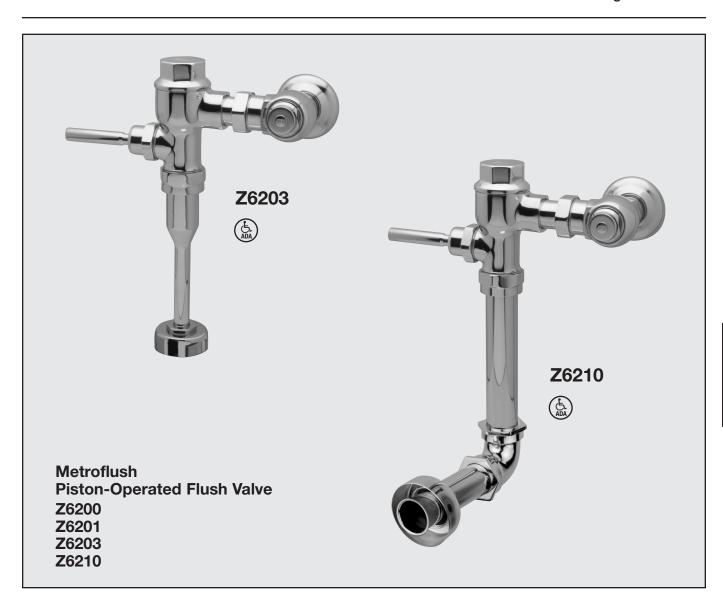


Metroflush® Z6200 Series

Metroflush Piston-Operated Flush Valve

Installation, Operation, Maintenance, and Parts Manual

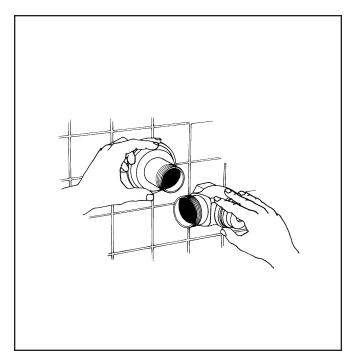
Patented and Patents Pending



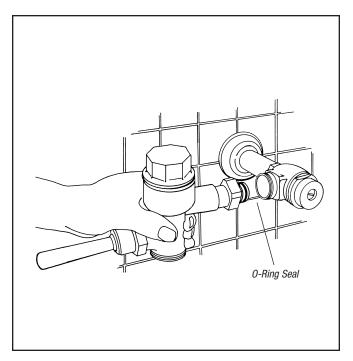
LIMITED WARRANTY

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 cost 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.

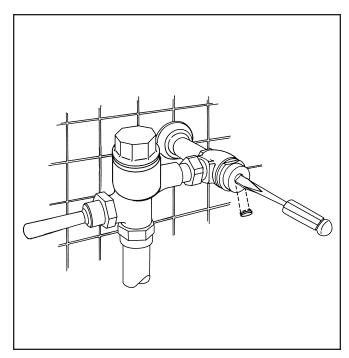




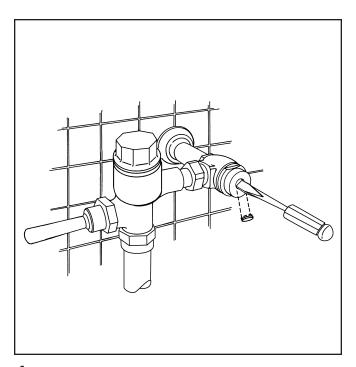
1 Install stop valve using proper supply escutcheon and sweat solder kit if applicable.



2 Insert flush valve tailpiece into stop valve, being certain 0-ring seal is in place. Wet seal with water to lubricate. Hand tighten locknut. Determine length of vacuum breaker tube required and cut as necessary. Assemble vacuum breaker tube assembly between flush valve and fixture spud.



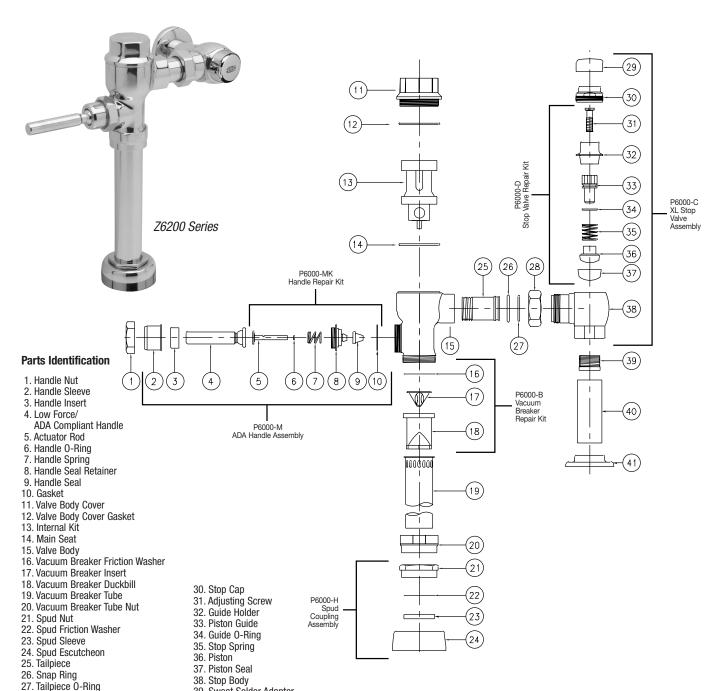
- **3** Flushing of supply lines by using the following procedure is recommended, after installation of all valves.
 - A. Close stop valves by using adjusting screw behind adjusting screw cover. Do not remove stop valve cap.
 - $\ensuremath{\mathsf{B}}.$ Remove main valve body cover and working part from flush valve.
 - C. Replace only main valve body cover. Tighten main valve body cover.
 - D. Open the stop valve, by using the adjusting screw, until debris is purged.
 - E. Shut the stop valve, replace working part and retighten cover.



4 Set flush valve for proper operation by adjusting stop valve. Stop valve adjustments can only be made by using the adjusting screw located behind the adjusting screw cover. (Water must be shut off at main supply valve if stop cap is to be removed.) Final setting should provide enough water flow to evacuate a closet fixture and should be such that a urinal fixture will not overflow when continually flushed. Secure adjusting screw cover.

Metroflush® Parts Replacement and Repair Guide





Product No.
P6200-LL
P6200-L12
P6200-EC
P6200-EU
P6200-EC-WS1
P6200-EU-WS1
P6200-E14

29. Vandal-Resistant Control Stop Cover

28. Locking Nut

39. Sweat Solder Adaptor

41. Cast Wall Escutcheon

40. Supply Cover Tube

Handle Assembly and Repair Kits	Product No.
ADA Handle Assembly (Side), Includes Items 2-10	P6000-M
Handle Repair Kit (Side), Includes Items 5-10	P6000-MK
Handle Seal, Includes Item 9	P6000-M9
Handle Gasket, Includes Item 10	P6000-M10
Control Stop Repair Kit and Parts	Product No.
Control Stop Repair Kit for 1" and 3/4", Includes Items 31-37	P6000-D-SD
Seal Seat for 1" and 3/4", Includes Item 37	P6000-D42
VP Control Stop Repair Kit for 1" and 3/4", Includes Items 31-37	P6000-D-VP
Vandal-Resistant Cover, Includes Item 29	P6000-VC

Adjustable lalipieces	Product No.
Adjustable Tailpiece for Standard Flush Valve, Includes Items 25-27	P6000-J1
Tailpiece Coupling Assembly, Includes Items 26-28	P6000-K
Tailpiece Locking Ring, Includes Item 26	P6000-C30
Tailpiece O-Ring, Includes Item 26	P6000-C31
Coupling Nut, Includes Item 28	P6000-C32
Flush Connections and Spud Coupling Kits	Product No.
Flush Connections and Spud Coupling Kits Flush Tube Assembly for Flush Valves, Includes Items 16-20 Specify diameter and length: 1-1/2", 1-1/4", 3/4"	P6000-A
Flush Tube Assembly for Flush Valves, Includes Items 16-20	111111111111111





Metroflush® Service Instructions

PROBLEM	CAUSE*	CORRECTIVE ACTION
Valve will not operate.	1.) Stop valve is closed.	1.) Open stop valve.
	2.) Supply valve is closed.	2.) Open supply valve.
Insufficient volume of water to adequately siphon fixture.	 Stop valve is not open enough. Urinal piston installed in closet valve. Insufficient volume or pressure at supply. 	 Open stop valve for desired volume of water. Replace urinal piston with proper closet piston. Consult fixture guide for minimum gallons per minute flow and running pressure for satisfactory fixture performance.
Flush valve shuts off too quick.	1.) Damaged piston.	Install new P6200-EC, P6200-EU replacement kit to remedy the problem.
	2.) Enlarged by-pass orifice.	2.) Install new P6200-EC, P6200-EU replacement kit to remedy the problem.
Valve is short flushing.	1.) Enlarged by-pass orifice.	Install new P6200-EC, P6200-EU replacement kit to remedy the problem.
	2.) Urinal piston in closet flush valves.	2.) Install closet piston (Item #13).
Valve is flushing too long or not shutting off.	Trip mechanism not seating properly due to foreign material between trip mechanism and seat.	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.
Water splashes out of fixture.	Supply volume is more than is necessary.	1.) Adjust downward on control stop.
	Lime accumulation on vortex or spreader holes of fixture.	2.) Remove the lime build up.
Flush is not considered quiet.	Control stop may not be adjusted for quiet operation.	Adjust the control stop for quiet operation keeping in mind the fixture evacuation requirements.
	2.) 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.
	3.) Piping system may be source of noise.	3.) 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 consulte
Handle assembly leaking.	1.) Handle assembly is not tight.	1.) Tighten handle assembly.

Care of Chrome-Plated Surfaces

The suggested cleaning of chrome-plated surfaces is simply to clean them with mild soap and water, then dry. Commercial cleaning compounds are never recommended.

Seasonal Use

Valves used in installations subject to shut down because of cold and freezing conditions should be maintained in the following manner. After the main supply has been shut off and the water drained from the system, remove the stop valve cap and stop valve internals to allow the water to drain from the flush valve itself.



ZURN INDUSTRIES, INC. COMMERCIAL BRASS OPERATION

5900 ELWIN BUCHANAN DRIVE, SANFORD, NC, U.S.A. 27330 PHONE: 1-800-997-3876 FAX: 919/775-3541 WEBSITE: www.zum.com

In Canada:

ZURN INDUSTRIES LIMITED 3544 NASHUA DRIVE, MISSISSAUGA, ONTARIO L4V 1L2 PHONE: 905/405-8272 FAX: 905/405-1292



PRIOR TO INSTALLATION

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

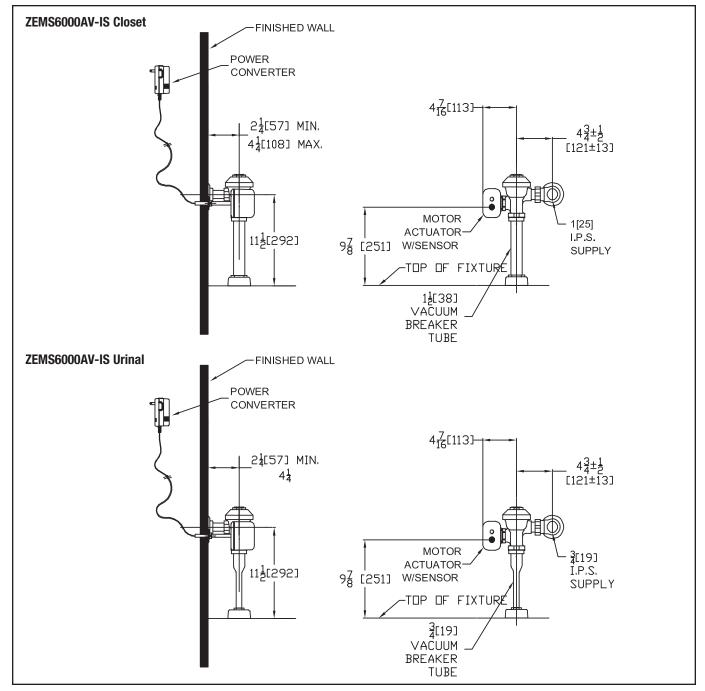
- Single-gang electrical outlet for plug-in power converter.
- Electrical wiring to the power converter outlet (120VAC, 35 watts service required for each power converter used).

IMPORTANT:

- All electrical wiring is to be installed in accordance with National/Local codes and regulations.
- 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.



Page 2 FV343

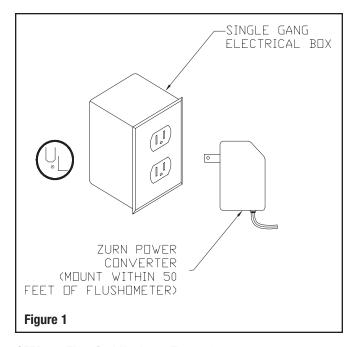
INSTALLATION

STEP 1 - Install Receptacle (Figure 1)

Install receptacle for the Zurn Power Converter in a convenient location near the flush valve. If optional power converter (P6000-HW6) is used, install 4 x 4 electrical box in accordance with local electrical codes. An optional mini junction box (P6000-MJ) is recommended to distribute power to each sensor location.

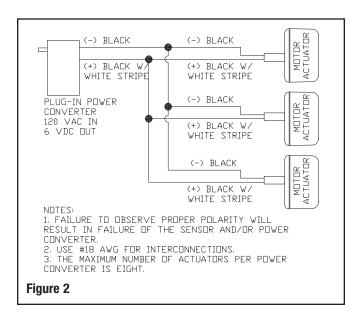
NOTE: One Power Converter can operate up to eight Automatic Sensor-equipped Flushometers. The Power Converter is supplied with a six-foot cord. If additional wire is needed from the Power Converter to the Flushometer(s), use #18 AWG (by others). **Do not supply power** to the Power Converter until installation of actuator, sensor and Flushometer is completed and checked.

Proper polarity must be observed or damage to one or all components will result.



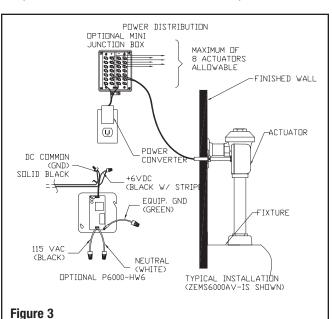
STEP 2 – Electrical Hook-up (Figure 2)

Be certain power is off to prevent damage to electrical components. Connect wires per schematic. Black wire is negative and black wire w/white stripe is positive. *Do not reverse polarity.* Multiple actuator wiring shown.



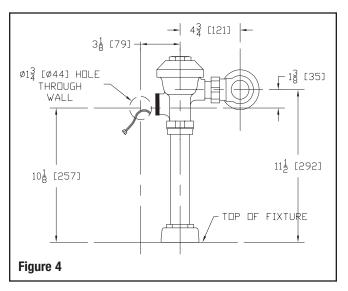
STEP 3 - Optional Mini Junction Box (Figure 3)

When using optional mini junction box, be certain power is off while making wire connections to prevent damage to electrical components. The maximum number of actuators per converter is 8.



STEP 4 – Verify Plumbing Location (Figure 4)

Confirm the ZEMS-IS sensor hole is located properly per template. The 6VDC power chord (Part #PEMS6000-CW) should already be in place.

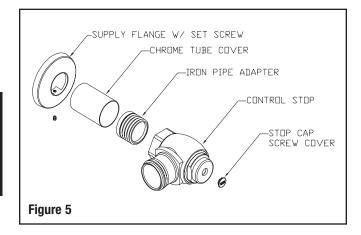




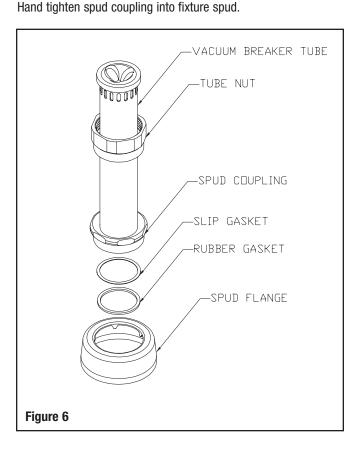
STEP 5 – Control Stop Installation (Figure 5)

Install the Zurn control stop valve and wall escutcheon to the water supply line with the outlet positioned as required.

NOTE: For sweat solder applications, see recommended instructions included in the Zurn sweat solder kit.

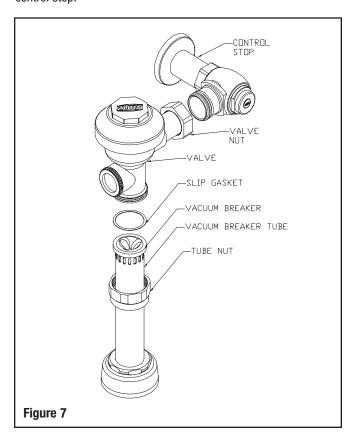


STEP 6 – Vacuum Breaker Flush Connection (Figure 6) Slide the tube nut, slip washer, rubber gasket and spud escutcheon over the vacuum breaker tube and insert tube into fixture spud.



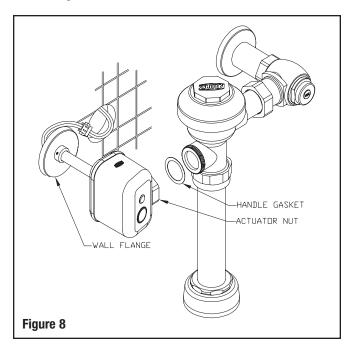
STEP 7 – Valve Installation (Figure 7)

Install valve to control stop with the bottom of the valve tilted slightly up toward you and leave the valve nut loose. Make sure not to damage O-ring on valve. Install vacuum breaker into vacuum tube and place slip gasket between vacuum breaker and valve. Then rotate valve down over vacuum breaker tube and tighten tube nut to valve. After tube nut is tight, tighten valve nut to control stop.



STEP 8 – Actuator Installation (Figure 8)

Run wires and rod through hole in wall. Install handle gasket into actuator nut and tighten actuator to valve. Push wall flange against wall and tighten setscrew.



STEP 9 - Flush Out Supply Line (Figure 9)

Close control stop. Remove valve body cover and lift out trip mechanism. Re-install 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.

STEP 10 - SENSOR CALIBRATION

Factory Setting

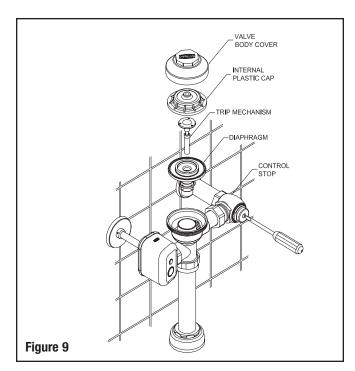
The Zurn ZEMS-IS sensor module is factory set to accommodate closet and urinal installations. Wiring the unit per the enclosed wiring diagram (Figure 2) with 6VDC power recalls the factory setting. The ZEMS-IS unit is ready for operation. **Note:** During the first 30 minutes of power up, a red flashing light (Figure 10) will illuminate to indicate an optional customized sensor range setting is available if desired.

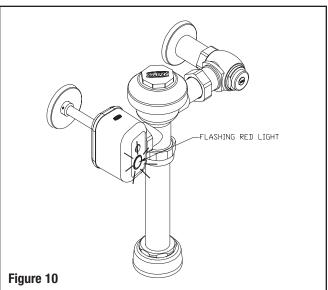
Customized Sensor Range Setting

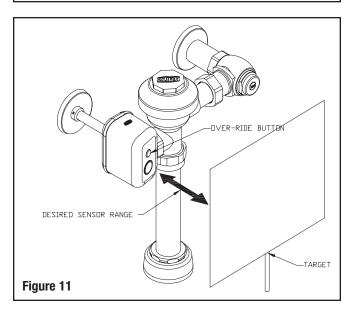
To customize the sensor range for a particular installation, simply set a dummy target (stall door or light colored piece of cardboard) at the desired sensor range distance as illustrated in Figure 11. Disrupt the 6VDC power source for two minutes then restore power. PRESS and HOLD the manual override button for ten seconds anytime during the first 30 minutes of power up (red light blinks during the first 30 minutes of power up to help identify this time period). Pressing the override button activates the motor actuator. Continue to HOLD the override button until the flashing red light stops. This indicates that a ten second HOLD was achieved. Step back away from the valve so as not to be in the view of the sensor. The ZEMS-IS unit will self-calibrate to the given target over the next 45 seconds. A series of lights will follow (3 flashes, 16 flashes, 1 flash, a solid 16-second red light followed by 2 more flashes). This pattern of flashing lights indicates the sensor has self-adjusted to the given environment and is now calibrated to the new target.

STEP 11 – Activating the Motor Actuator with the Sensor

To activate the motor actuator with the sensor, simply place a target in front of the sensor. A single red light will flash indicating the sensor has recognized the target. If the target stays in view for eight seconds, two flashing red lights will occur. This indicates that the target has been in view for the required time and upon leaving the view, a signal will be sent to the motor actuator to flush the flush valve. **Note:** If the target does not stay in view for the required eight seconds, a flush will not occur.









AquaVantage® ZEMS-IS Parts Breakdown

Part Identification

- 1. Cast Wall Escutcheon
- 2. Setscrew for Cast Wall Escu
- 3. Supply Cover Tube
- 4. Sweat Solder Adapter
- 5. Stop Body
- 6. Piston Seal
- 7. Piston
- 8. Stop Spring
- 9. Guide 0-Ring
- 10. Piston Guide
- 11. Guide Holder
- 12. Adjusting Screw
- 13. Stop Cap
- 14. Snap Cap Screw Cover
- 15. Vandal-Resistant Control St
- 16. Setscrew for Control Stop C
- 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 Friction Wa
- 29. Vacuum Breaker Insert
- 30. Vacuum Breaker Duckbill
- 31. Vacuum Breaker Tube
- 32. Vacuum Breaker Tube Nut
- 33. 1-1/2" Spud Nut 34. 1-1/2" Spud Friction Washe
- 35. 1-1/2" Spud Sleeve
- 36. Spud Escutcheon
- 37. 3/4" Spud Nut
- 38. 3/4" Spud Friction Washer
- 39. 3/4" Spud Sleeve
- 40. 3/4" Spud Escutcheon
- 41. 10' Power Cord
- 42. 120VAC/6VDC Plug-in Power Converter

cutcheon	(1) P6000 L
	\$\frac{\chi_000_{\chi_00}}{\chi_000_{\chi_00}} \frac{\chi_000_{\chi_00}}{\chi_000_{\chi_00}} \frac{\chi_000_{\chi_00}}{\chi_000} \frac{\chi_000_{\chi_00}}{\chi_000} \frac{\chi_000_{\chi_00}}{\chi_000} \frac
Stop Cover Cover	
	P6000-B
oly Vasher	
	99 O P6000-H
ner r	88 Pe003-H 88
	89 9

Covers and Repair Kits	Product No.
Outside Cover – Item 21	P6000-LL
Inside Cover – Item 22	P6000-L
Low Consumption Closet Kit - 1.6 gal. flush	P6000-ECA-WS1
Water Saving Closet Kit - 3.5 gal. flush	P6000-ECA-WS
Full Flow Closet Kit - 4.5 gal. flush	P6000-ECA-FF
Low Consumption Urinal Kit - 1.0 gal. flush	P6000-EUA-WS1
Water Saving Urinal Kit - 1.5 gal flush	P6000-EUA-WS
Full Flush Urinal Kit - 3.0 gal. flush	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	P6000-ECA-WS-RK
Items 18, 23, 24, 26, 28-30	P6000-ECA-WS1-RK
	P6000-EUA-WS-RK
	P6000-EUA-WS1-RK

Actuator Assembly and Repair Kits	Product No.
Motor Actuator/Sensor – Item 27	PEMS6000-HYM-IS
10-Foot Length of Power Cord – Item 41	PEMS6000-CW
120VAC/6VDC Plug-in Power Converter – Item 42	P6000-PC6
Handle Gasket Includes – Item 26	P6000-M10

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, Include Item 19	P6000-C30
Tailpiece O-Ring, Includes Item 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	P6000-H
3/4" Flush Connection and Spud Coupling	P6003-H
Vacuum Breaker Repair Kit, Includes Items 28-30	P6000-B
Spud Coupling Assembly (Specify Size)	P6000-HN

AquaVantage® ZEMS-IS Trouble-Shooting Guide

Problem	Cause*	Corrective Action*
Valve will not operate.	1.) Stop valve is closed.	1.) Open stop valve.
	2.) Supply valve is closed.	2.) Open supply valve.
Insufficient volume of water to adequately flush fixture.	1.) Stop valve is not open enough.	1.) Open stop valve for desired volume of water.
	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.	2.) Install appropriate parts or kit.
	3.) Insufficient volume or pressure at supply.	If gauges are not available to measure supply pressure or volume of water at the valve, completely remove the working parts and open the stop valve to allow water to pass through the empty valve. If the water supply proves unsatisfactory, steps should be taken to increase the pressure and/or supply.
Flush valve does not activate after user leaves.	1.) Sensor does not recognize a user.	Shut off the 6VDC power supply for 2 minutes and recalibrate sensor per step 10.
	2.) Power supply may be disrupted.	Check available voltage where escutcheon is attached to wall. 6-9VDC is required.
Flush valve shuts off too quickly.	1.) Damaged or punctured diaphragm.	Install new replacement kit to remedy the problem.
	2.) Enlarged by-pass orifice.	2.) Install new replacement kit to remedy the problem.
	3.) Cylinder guide assembly and diaphragm assembly are not tight.	3.) Screw the two assemblies hand tight.
	4.) Enlarged by-pass orifice.	4.) Install new Z6000-ECA, Z6000-EUA replacement kit to remedy the problem.
	5.) Urinal trip mechanism (black) in closet flush valves.	5.) Install closet trip mechanism (white).
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.
	2.) 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.	3.) Pressure is inadequate or has dropped below minimum operating range. Steps should be taken to increase the line pressure.
	4.) Cracked cover.	4.) Replace cover with new one.
Water splashes out of fixture.	1.) Supply volume is more than is necessary.	1.) Adjust downward on control stop.
	Lime accumulation on vortex or spreader holes of fixture.	2.) Remove the lime buildup within the fixture.
Flush is not considered quiet.	Control stop may not be adjusted for quiet operation.	Adjust the control stop for quiet operation keeping in mind the fixture evacuation requirements.
	2.) 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.
	3.) 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.
Chattering noise in flush valve.	1.) Diaphragm has been installed upside down.	Reposition diaphragm as instructed by the markings on the diaphragm (this side up)
	2.) The inside cover has been distorted by freezing	Replace both inside plastic cover and outside chrome-plated brass cover.
Sensor assembly leaking.	1.) Sensor assembly is not tight.	1.) Tighten sensor assembly.

Care of Chrome-Plated Surfaces

The suggested cleaning of chrome-plated surfaces is simply to clean them with soap and water then dry. Commercial cleaning compounds are never recommended.

Seasonal Use

Valves used in installations subject to shutdown because of cold and freezing conditions should be maintained in the following manner. After the main supply has been shut off and the water drained from the system, remove the stop valve cap and stop valve internals to allow the water to drain from the flush valve itself.



