



# AquaSense® AV

## ZEMS-IS Series w/ HW6 Power Converter

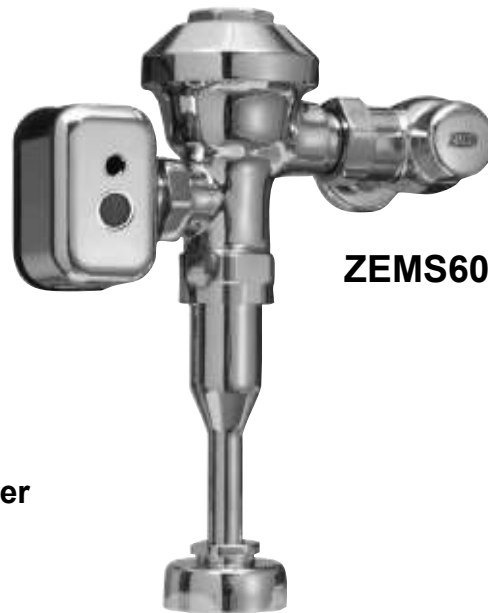
### Automatic Sensor-Operated Exposed Flushometer

### Installation, Operation, Maintenance and Parts Manual

Patented and Patents Pending



**ZEMS6000AV-IS**



**ZEMS6003AV-IS**

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

- ⚠ **WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)
- ⚠ **ADVERTENCIA:** Cáncer y daño reproductivo - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)
- ⚠ **AVERTISSEMENT:** Cancer et effets néfastes sur la reproduction - [www.P65Warnings.ca.gov](http://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.

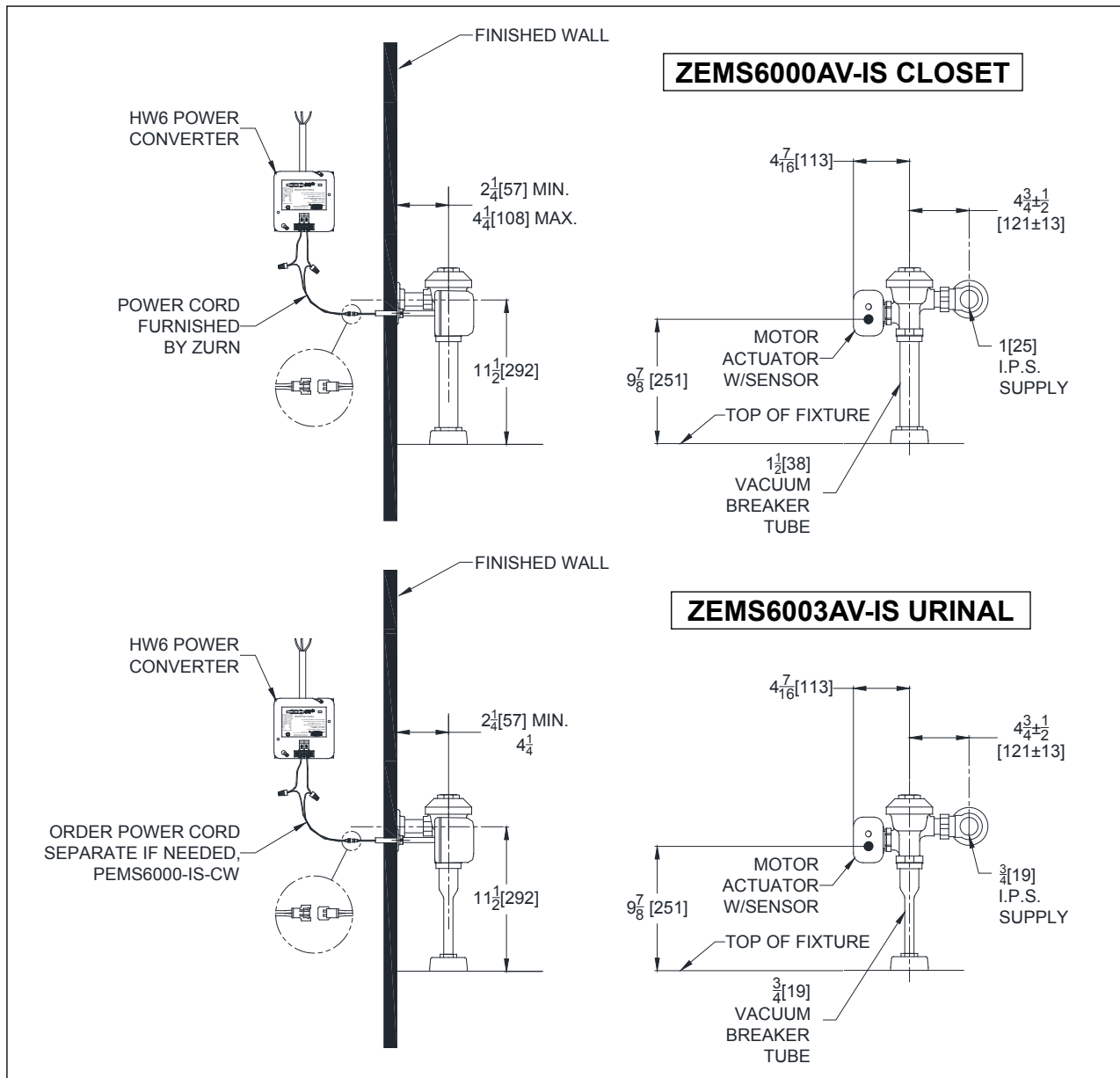
## PRIOR TO INSTALLATION

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.

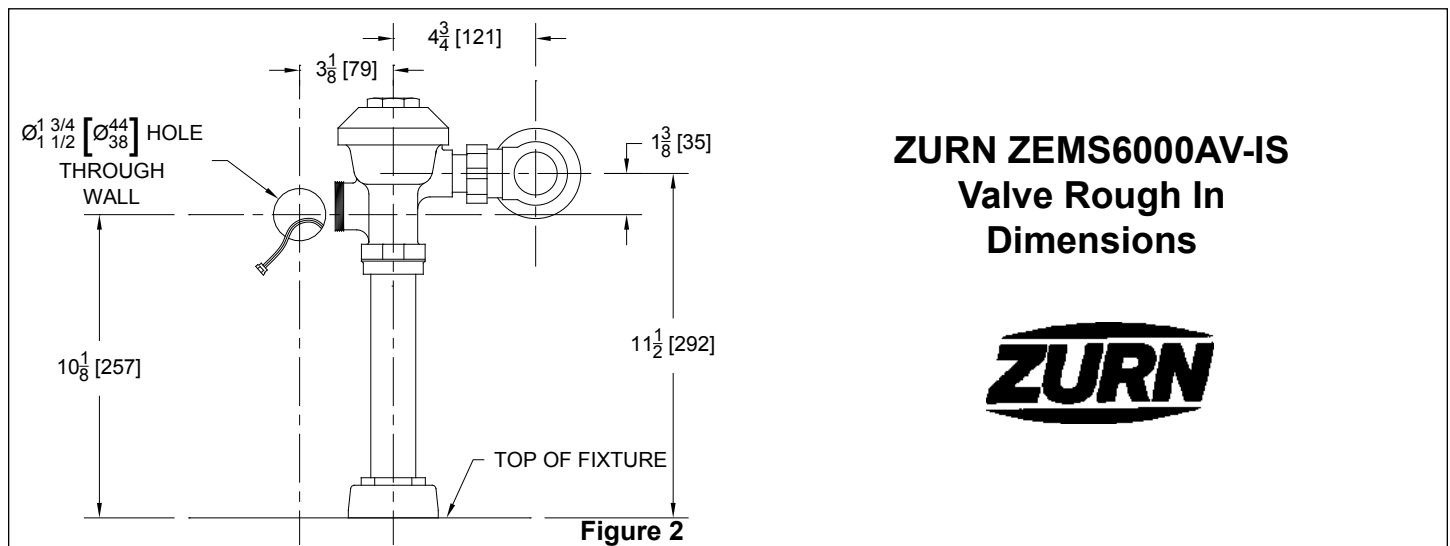
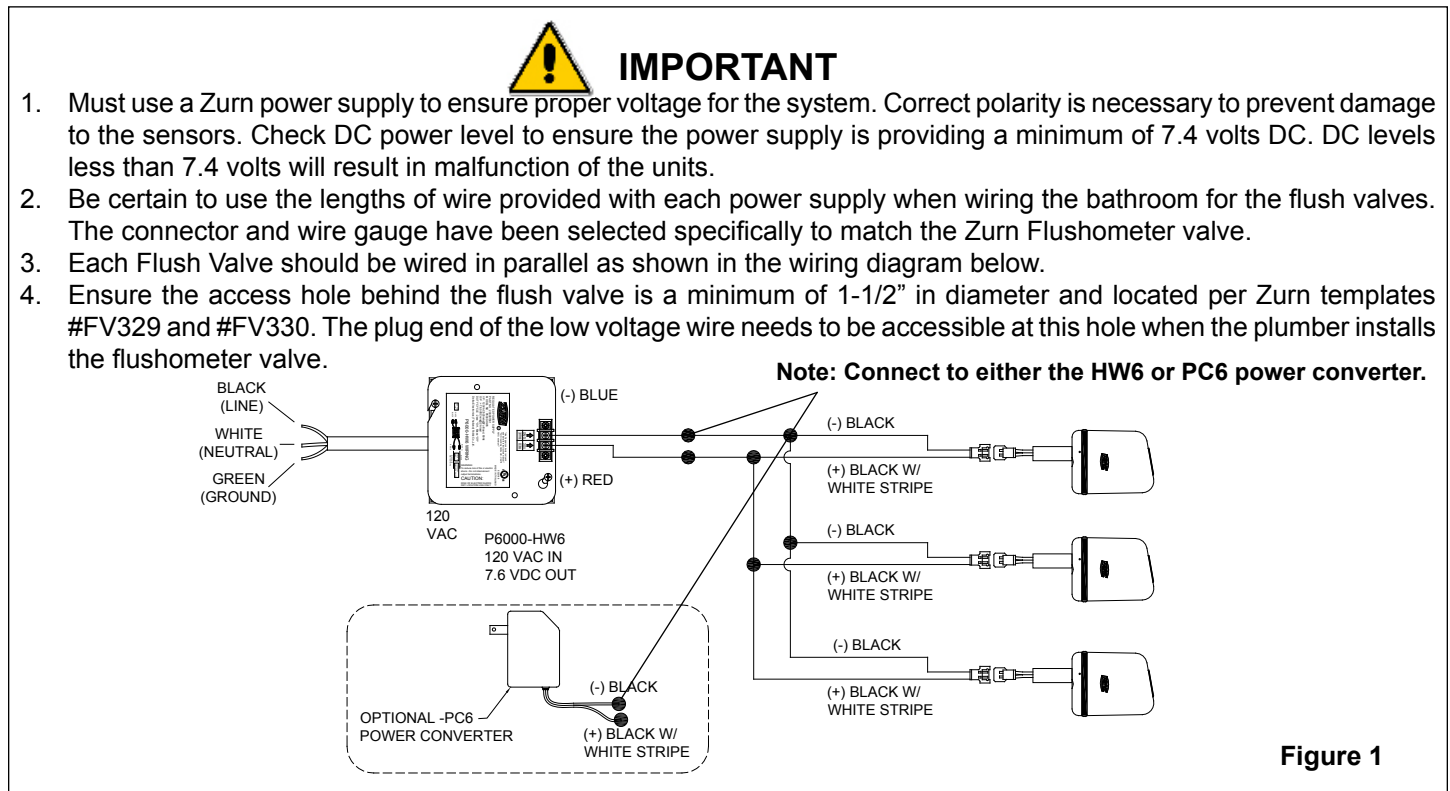
Protect the chrome or special finish of this AquaVantage® valve. **Do not use toothed tools to install or service the valve.** Also, see "Care and Cleaning" section of this manual.



## TYPICAL INSTALLATION

## 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 as shown in **(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. **Do not cross wires as it will cause damage to the product!**
- Connecting wire shall be run from the power supply to the predrilled 1-1/2" diameter holes in the finished wall for final connection to the flush valves. **(Figure 2)**



### 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.

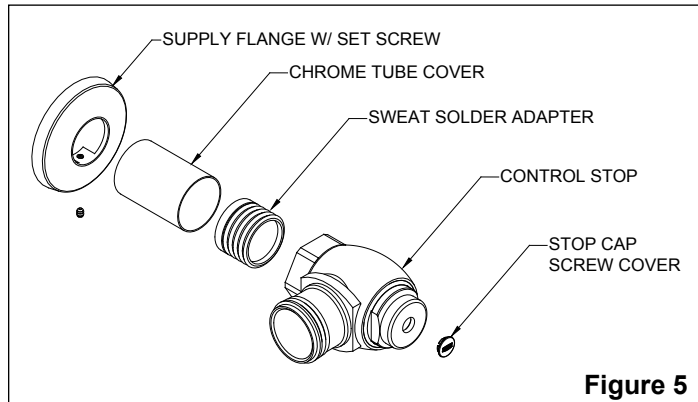


Figure 5

### STEP 6 - Vacuum Breaker Flush Connection (Figure 6)

Place vacuum breaker and vacuum breaker disc in tube as shown. Slide the tube nut, spud nut, slip washer, rubber gasket and spud escutcheon over the vacuum breaker tube and insert tube into fixture spud. Hand tighten spud nut on to fixture spud.

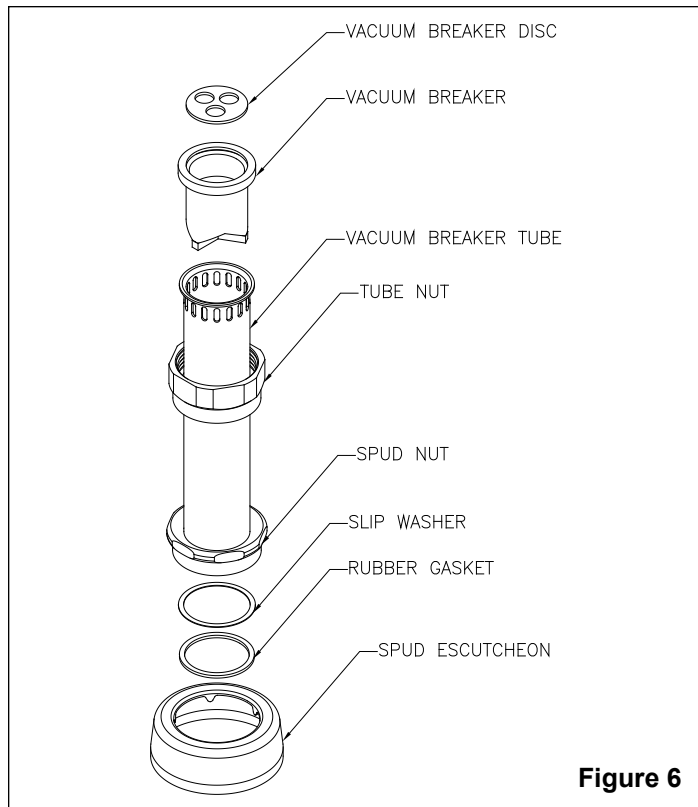


Figure 6

### STEP 7 - Valve Installation (Figure 7)

Install valve to control stop with the bottom of the valve tilted slightly up towards you and leave the valve nut loose. Make sure not to damage o-ring on valve. Make sure vacuum breaker and vacuum breaker disc are properly installed within the flush tube. Rotate valve down over vacuum breaker tube and tighten tube nut to valve. After tube nut is tight, tighten valve nut to control stop.

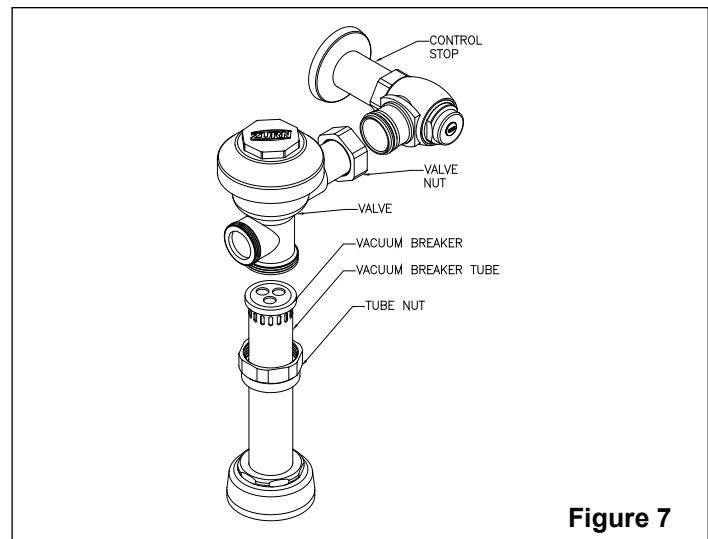


Figure 7

### STEP 8 - Actuator Installation (Figure 8)

Slide wall flange over the chrome cover tube as shown. 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 tighten set screw.

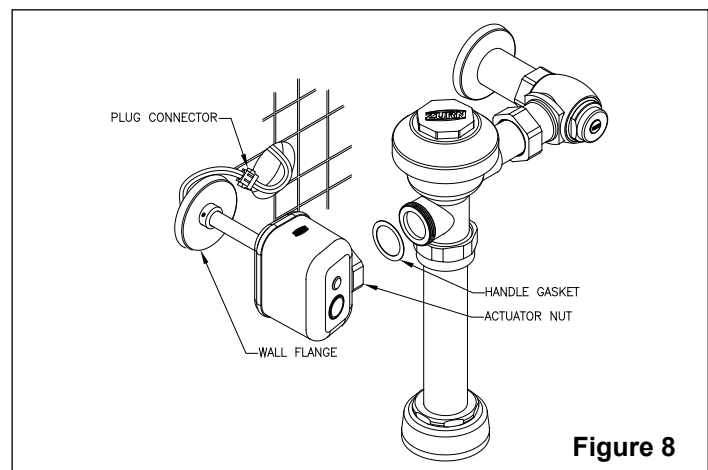


Figure 8

### STEP 9 - Flush Out Supply Line (Figure 8)

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.

## STEP 10 - 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 representative for customized sensor range setting procedure. 1-800-997-3876.

### CALIBRATION INSTRUCTIONS FOR ZEMS-IS III

1. Obtain a target. SEE FIGURE 11.
2. PRESS and HOLD button for 10 seconds \* until the LED turns solid.  
(\*Unit will blink four times and flush once while button is being held)
3. RELEASE finger after LED turns solid.
4. PRESS and HOLD button when LED starts blinking.
5. RELEASE finger when LED turns solid.
6. Set target at desired distance, (No less than 16") from sensor face and verify NO other objects are in view of sensor face.
7. Keep target steady - Unit will blink while calibrating.
8. After 15 seconds, calibration ends with a fast double blink or a solid LED for 5 seconds.
9. IF THE LED REMAINS SOLID FOR 5 SECONDS AFTER CALIBRATION, the calibration was NOT successful. REPEAT STEPS 2-8
10. For closet installations continue to "VERIFY CALIBRATION FOR CLOSET INSTALLATIONS".

### 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.

### STEP 12 - 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 eleven 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 eleven seconds, a flush will not occur.

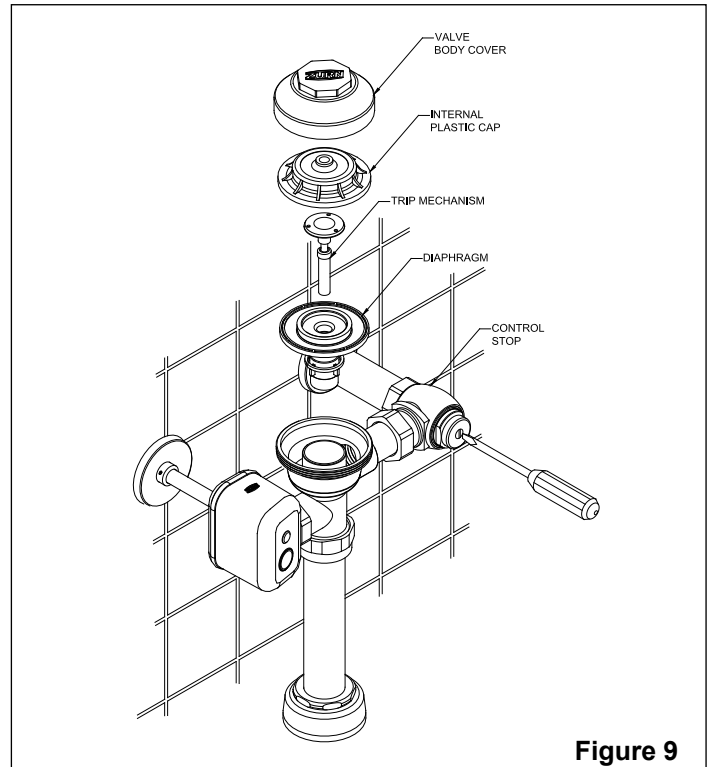


Figure 9

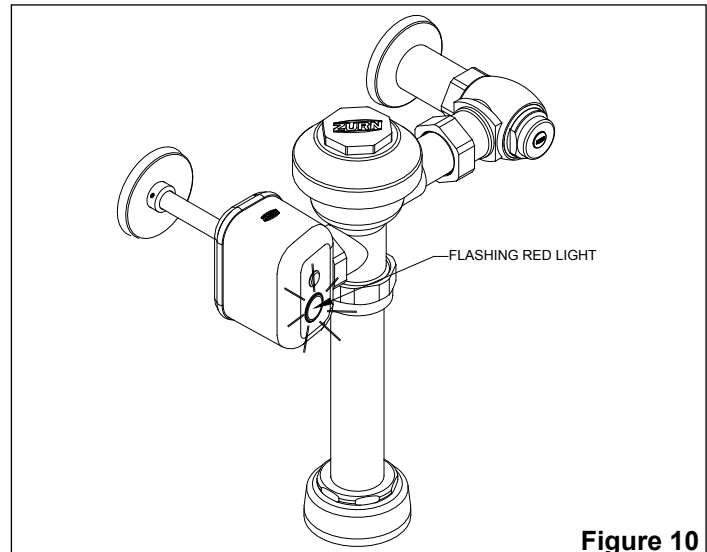


Figure 10

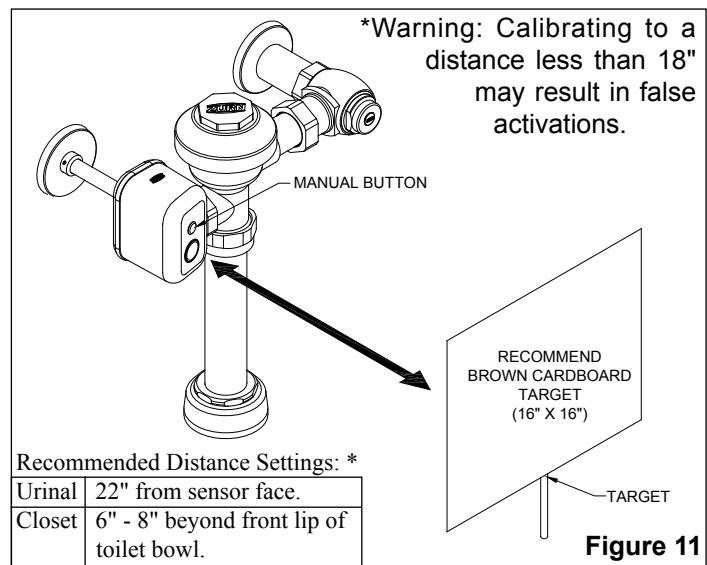


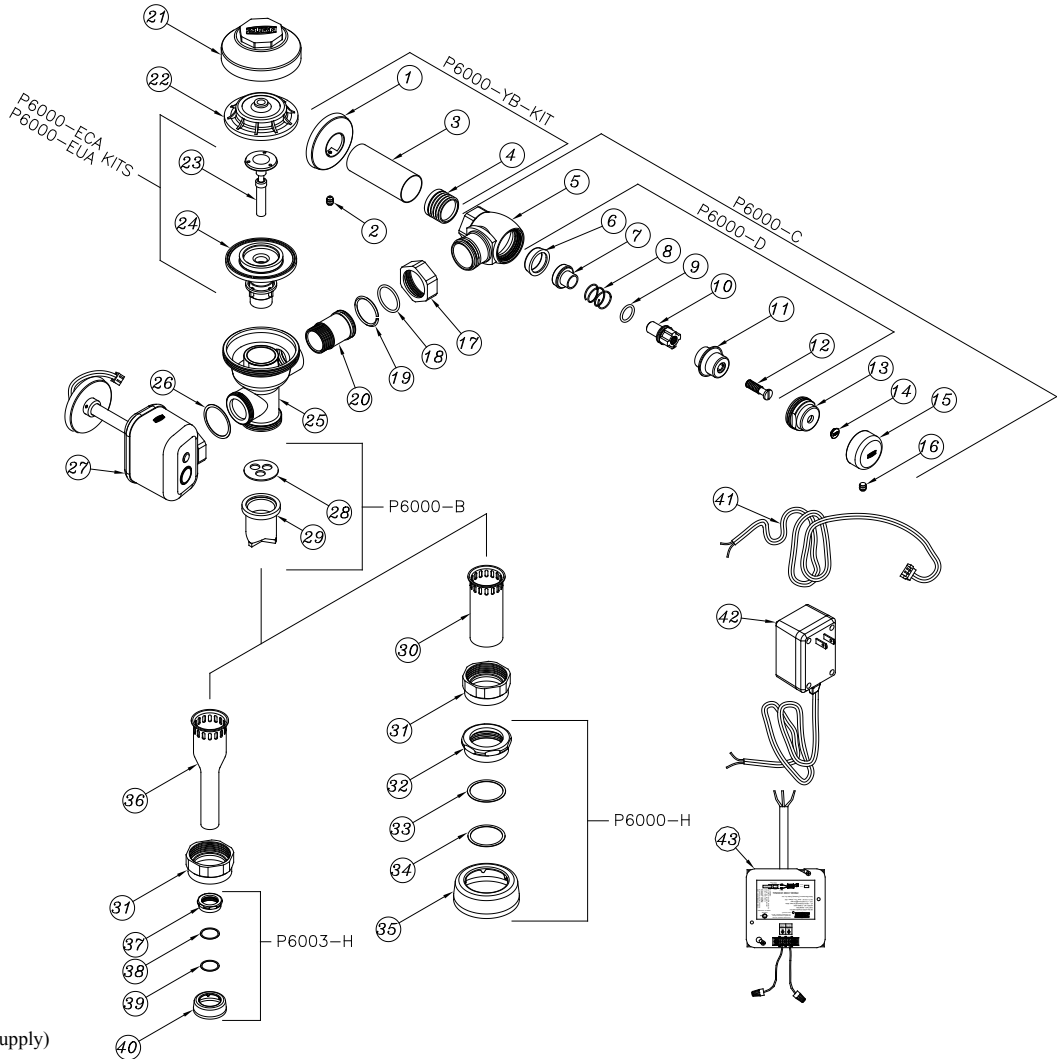
Figure 11



# 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/6 VDC Plug-in Power Converter (Un-Regulated)
43. Power Converter P6000-HW6 (Regulated Supply)



Covers and Repair Kits	Product No.
Outside Cover - Item 21	P6000-LL
Inside Cover - Item 22	P6000-L
High Efficiency Closet Kit - 1.28 gal. flush	P6000-ECA-HET
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
Ultra Low Flow Urinal Kit - 0.125 gal. flush	P6000-EUA-ULF
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 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-ULF-RK

Actuator Assembly and Repair Kits	Product No.
Outside Cover - Item 21	PEMS6000-HYM-IS
Power Cord (Item 41)	PEMS6000-CW
120 VAC/7.6 VDC Plug-in Power Converter (Item 42)	P6000-PC6
Power Converter (Item 43)	P6000-HW6
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 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	P6000-H
3/4" Flush Connection and Spud Coupling	P6003-H
Vacuum Breaker Repair Kit Includes Items 28, 29	P6000-B
Spud Coupling Assembly ( Specify Size )	P6000-HH



## ZEMS-IS AQUAVANTAGE TROUBLE SHOOTING

Problem	Cause*	Corrective Action*
Valve will not operate.	<ol style="list-style-type: none"> <li>1.) Stop valve is closed</li> <li>2.) Supply valve is closed.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Open Stop valve.</li> <li>2.) Open supply valve.</li> </ol>
Insufficient volume of water to adequately flush fixture.	<ol style="list-style-type: none"> <li>1.) Stop valve not open enough.</li> <li>2.) 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.</li> <li>3.) Insufficient volume or pressure at supply.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Open stop valve for desired volume of water.</li> <li>2.) Install appropriate parts or kit.</li> <li>3.) 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.</li> </ol>
Flush valve does not activate after user leaves.	<ol style="list-style-type: none"> <li>1.) Sensor does not recognize a user.</li> <li>2.) Power supply may be disrupted.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Re-calibrate sensor per step 10.</li> <li>2.) Check available voltage where escutcheon is attached to wall with DC voltmeter. 7.4-9 VDC is required.</li> </ol>
Flush valve shuts off too quick.	<ol style="list-style-type: none"> <li>1.) Damaged or punctured diaphragm.</li> <li>2.) Enlarged by-pass orifice.</li> <li>3.) Cylinder guide assembly and diaphragm assembly are not tight.</li> <li>4.) ) Enlarged by-pass orifice.</li> <li>5.) Urinal trip mechanism (black) in closet flush valves.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Install new replacement kit to remedy the problem.</li> <li>2.) Install new replacement kit to remedy the problem.</li> <li>3.) Screw the two assemblies hand tight.</li> <li>4.) Install new Z6000-ECA, Z6000-EUA replacement kit to remedy the problem.</li> <li>5.) Install closet trip mechanism (white).</li> </ol>
Valve activates repeatedly when power is provided.	<ol style="list-style-type: none"> <li>1.) Insufficient DC power level (less then 7.4 volts DC)</li> </ol>	<ol style="list-style-type: none"> <li>1.) Upgrade the -HW6 power supply to the new ZURN power supply (greater than 7.4 volts DC) or replace the PC6 supply.</li> </ol>
Valve is flushing too long or not shutting off.	<ol style="list-style-type: none"> <li>1.) Trip mechanism not seating properly due to foreign material between trip mechanism and retainer disc.</li> <li>2.) By-pass orifice is plugged or partially plugged.</li> <li>3.) Line pressure is not adequate to force trip mechanism to seal.</li> <li>4.) Cracked cover.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Disassemble parts and rinse thoroughly.</li> <li>2.) Examine by-pass orifice and clean if necessary being certain not to enlarge orifice opening.</li> <li>3.) Pressure is inadequate or has dropped below minimum operating range. Steps should be taken to increase the line pressure.</li> <li>4.) Replace cover with new one.</li> </ol>
Water splashes out of fixture.	<ol style="list-style-type: none"> <li>1.) Supply volume is more than is necessary.</li> <li>2.) Lime accumulation on vortex or spreader holes of fixture.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Adjust downward on control stop.</li> <li>2.) Remove the lime build up within the fixture.</li> </ol>
Flush is not considered quiet.	<ol style="list-style-type: none"> <li>1.) Control stop may not be adjusted for quiet operation</li> <li>2.) Fixture may be contributing to noise</li> <li>3.) Piping system may be source of noise.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Adjust the control stop for quiet operation keeping in mind the fixture evacuation requirements.</li> <li>2.) 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.</li> <li>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 arrestor, loose pipes, improper size pipes, etc. In these cases the building engineer should be consulted.</li> </ol>
Flush valve "ghost" flushes or activates randomly with no user present.	<ol style="list-style-type: none"> <li>1.) Lens may be dirty.</li> <li>2.) Power supply output is out of tolerance.</li> <li>3.) Sensor is viewing stall door.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Clean lens.</li> <li>2.) DC voltage must be between 7.4-9 volts. Check for power fault or malfunction in a unit or replace with a Zurn power converter.</li> <li>3.) Re-calibrate sensor per step 10.</li> </ol>
Sensor assembly leaking	<ol style="list-style-type: none"> <li>1.) Sensor assembly is not tight.</li> </ol>	<ol style="list-style-type: none"> <li>1.) Tighten sensor assembly.</li> </ol>

**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 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 internals to allow the water to drain from the flush valve itself.

