



# EcoVantage® AV™

## ZR Dual Flush Series

Sensor-Operated, Battery-Powered  
Flushometer.

### Installation, Operation, Maintenance and Parts Manual

Patented and Patents Pending



**Sensor-Operated, Battery-Powered  
Dual Flush Closet  
ZR6000AV-WS1-DF 1.6/1.1 gpf**

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#### 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.

## Zurn EcoVantage Dual Flush

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The new Dual Flush ZR Flush Valve and ZRK RetroFit Kit are the latest editions to Zurn's EcoVantage breakthrough product offering. They incorporate the Zurn Dual Flush sensor technology which provides the utmost in water savings while ensuring a high level of sanitation and fixture performance.

Zurn Dual Flush sensor technology is designed to create a higher level of water conservation by distinguishing between liquid waste or solid waste in the bowl then supplying the appropriate flush volume to satisfy a proper evacuation of the fixture.

Both the complete ZR flush valve and ZRK retrofit kit are supplied in the flush volume set of 1.6/1.1 gallons per flush. The higher flush volume is fixture compatible to evacuate solid waste while the lower flush volume presents the opportunity of an approximate 30% water savings when evacuating liquid waste.

The determination of a high or low flush volume is based on the amount of time the user is present in front of the sensor. If the user remains in front of the sensor for less than one minute it is assumed the user deposited liquid waste into the bowl and a low volume flush is delivered. If the user remains in front of the sensor for longer than a minute it is assumed the user deposited solid waste in the bowl and the higher volume flush is delivered. (One must be in the sensor's range for at least 8 seconds to initiate the start of the timing for either the high or low flush volume.) The 8 second requirement also prevents actuation of the flush valve by a person walking by. Note: Excessive amounts of toilet paper and/or seat covers may not evacuate during the water saving liquid flush. If paper or seat covers remain in the bowl, the user will need to press the full flush black button on the side of the unit to clear the bowl.

The flush valve and RetroFit Kit are also equipped with color coded manual override buttons. The black button is for the higher flush volume and the green button is for the lower flush volume.

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### Suggested Applications:

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The Zurn ZR DF flush valve is a water savings device. When coupled with 1.6 water conserving toilet and a proper water supply, it will provide years of trouble free performance. When considering the Zurn ZR DF flush valve, it is important to recognize that building layout and pipe sizing for water supplies vary significantly from location to location. These variations can alter the end performance of a closet system dramatically. To achieve proper performance, a minimum of 45 psi running water pressure is recommended within the one inch supply line directly behind the flush valve and control stop. Note: Installations with running pressure below recommended value may void warranty. Please refer to our website, [www.zurn.com](http://www.zurn.com) (search "Z6000AV-WS1-DF"), for a list of recommended bowls that have been tested and proven to perform in our laboratory environment with the ZR DF flush valve.

### Optional Version Included:

Certain installations have ideal conditions where additional water savings may be achievable. A red volume control device is provided with each ZR DF flush valve. This red volume control should be installed as outlined on page 7 of this document to achieve optimal water savings in conformance with ASSE 1037-90 and CSA B125.3-05. Please consult our website [www.zurn.com](http://www.zurn.com) (search "Z6000AV-WS1-DF") for the most up to date list of qualified bowls for the dual flush application. The particular bowls listed have qualified as those that provide both good evacuation and good bowl rinse characteristics per ASME A112.19.14-2006 requirements. We continue to test bowls as they become available on the market.

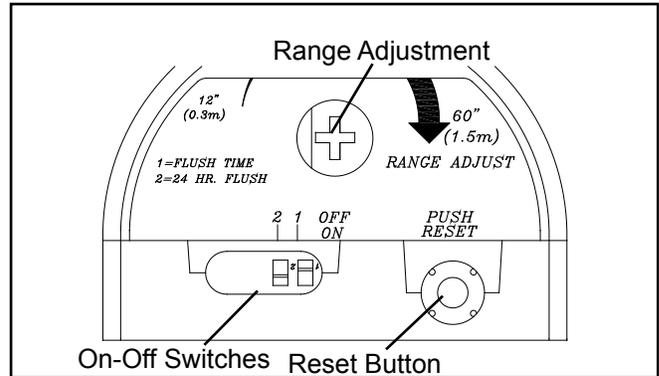
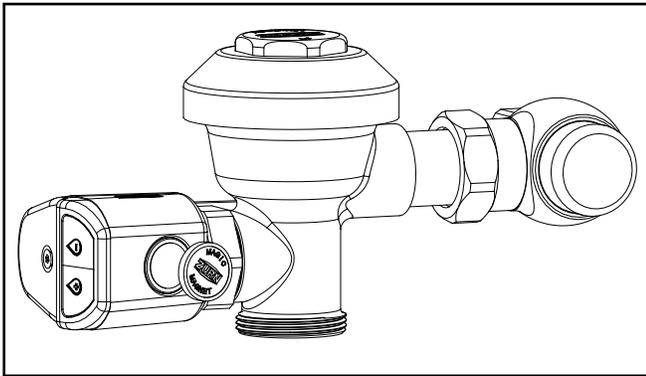
# Zurn EcoVantage Dual Flush System Features

- Full Flush  
The sensor will provide a full flush after a user is in range for 60 or more seconds. The first eight-seconds is a delay to prevent actuation of the flush valve by a person walking past the sensor.
- Automatic 24-Hour Flush  
The sensor will provide an automatic flush 24 hours after the last flush. The automatic flush feature can be manually switched on or off in the field, depending on owner preference. The option is controlled by switch number one. It is shipped from the factory in the off position.
- Maintenance Override  
One may initiate an immediate flush by placing a magnet in front of the sensor window for one-half to three seconds. This feature is typically used by the cleaning staff who do not wish to stand in front of the sensor to cause actuation. One may prevent operation of the flush valve by placing a magnet in front of the sensor window for longer than three seconds. This feature is typically used by maintenance or cleaning staff who wish to prevent automatic actuation of the valve. This feature is automatically defeated after ten minutes. If one wishes to defeat the feature prior to the ten-minute time out, simply place a magnet in front of the sensor window for one-half to three seconds.
- Indicator Light  
The sensor unit includes a red indicator light having three functions: WWW
  1. Range Adjustment: For the first ten minutes of operation, the red light will flash when an object is detected.
  2. Low Battery Indication: When the batteries have reached the

caution level, the red light will flash when an object is detected. When batteries reach a lower voltage level, a double blink every 3 seconds will occur constantly.

3. Abnormal Reflection Indicator: When a reflective surface is present for longer than 30 minutes, the red light will flash indicating that an object is being continuously detected.

- Adjustable Range  
The detection distance is field adjustable from 12 to 60 inches. Slowly rotate the range adjustment clockwise to increase range and counterclockwise to decrease range. The range adjustment will stop at minimum and maximum settings. Do not turn beyond these stops. For ten minutes after battery installation, a blinking red light in the sensor window will appear when an object is in view. For an additional ten minutes of blinking, push the reset button. Stand in front of the sensor and move forward and backward to determine range.
- Selectable Flush Volume  
For those installations that have ideal conditions for increasing the water conservation of both the high and low volume flushes, a second (red) water saving volume control is included with the unit and can be installed at the owner's option. The red volume control is stored inside the housing beside the sensor.  
**Note:** Excessive amounts of toilet paper and/or seat cover may not evacuate during water saving liquid flush. If paper or seat cover remains in the bowl, the user will need to press the water saving green button on the side of the unit to clear the bowl.



## PRIOR TO INSTALLATION

Prior to installing the EcoVantage "AV" Flushometer, install the items listed below. (New installations only.)

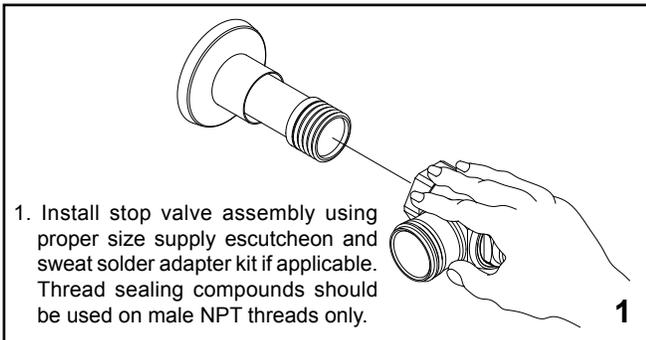
- Closet fixture
- Drain line
- Water supply line

**Important:**

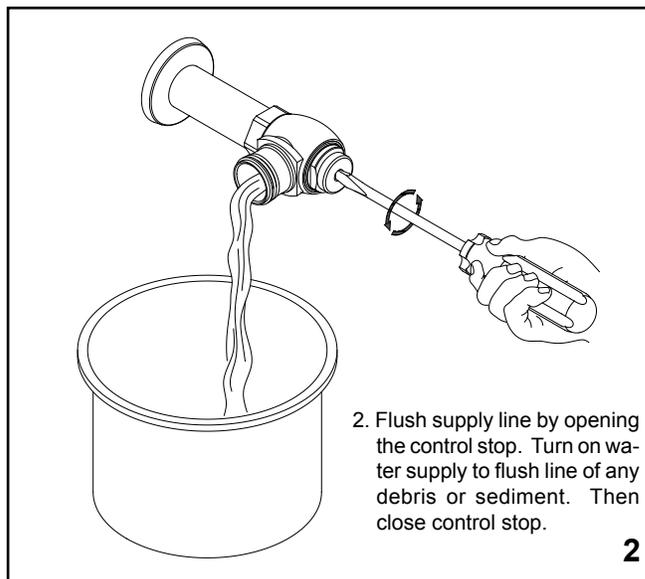
- ALL PLUMBING IS TO BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.
- WATER SUPPLY LINES MUST BE SIZED TO PROVIDE AN ADEQUATE VOLUME OF WATER FOR EACH FIXTURE.
- FLUSH ALL WATER LINES PRIOR TO OPERATION.

The recommended running pressure for the ZR6000AV-WS1-DF is 45 psi. Note: Installations with running pressure below recommended value may void warranty. Please refer to our web site, [www.zurn.com](http://www.zurn.com) (search Z6000AV-WS1-DF) for a list of recommended bowls that have been tested and proven to perform in our laboratory environment with ZR DF flush valve.

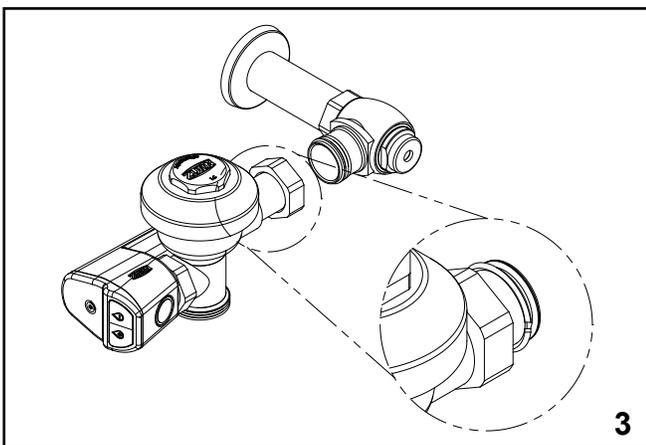
Protect the chrome or special finish of this flushometer. **DO NOT USE TOOTHED TOOLS TO INSTALL OR SERVICE THE VALVE.**



1. Install stop valve assembly using proper size supply escutcheon and sweat solder adapter kit if applicable. Thread sealing compounds should be used on male NPT threads only.

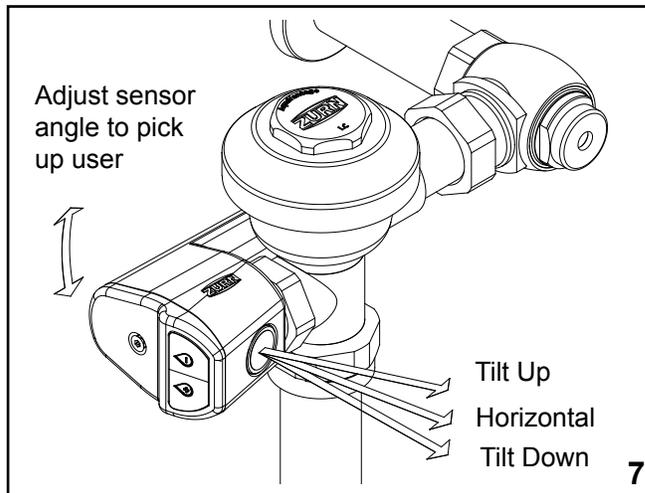


2. Flush supply line by opening the control stop. Turn on water supply to flush line of any debris or sediment. Then close control stop.



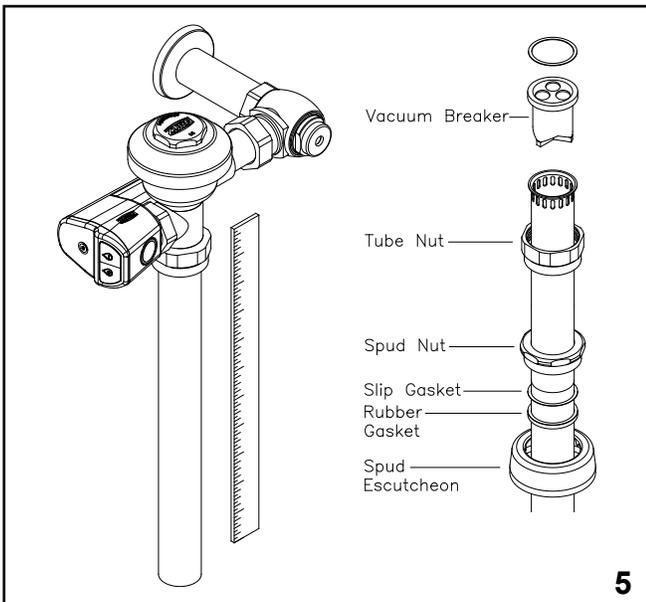
3. Prior to inserting the flush valve tailpiece into stop valve, be certain that the o-ring seal is located in o-ring sealgroove at the end of the tailpiece and the locking nut and locking snap ring are located as shown. Care should be taken not to damage the o-ring when inserting the tailpiece into the stop valve. If lubrication is needed, wetting the o-ring with water will be sufficient.  
4. Insert the flush valve tailpiece into the stop valve and hand tighten the lock nut to the stop valve. Plumb the entire unit.

5. Determine the length of vacuum breaker tube required to join the flush valve and fixture spud. Cut the vacuum breaker tube, if required, to this length. Assemble the vacuum breaker tube assembly and spud nut assembly to the flush valve and fixture spud.  
6. Hand tighten spud nut and vacuum breaker tube nut to fixture and flush valve. Adjust the valve assembly for plumb. Tighten fixture spud nut, vacuum breaker tube nut and lock nut with a wrench. **Do not turn water on until batteries are inserted –see 8.**



Adjust sensor angle to pick up user

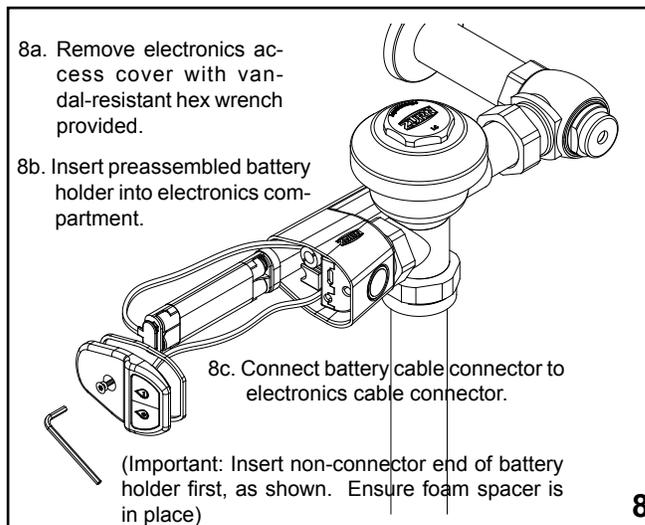
Tilt Up  
Horizontal  
Tilt Down



Vacuum Breaker  
Tube Nut  
Spud Nut  
Slip Gasket  
Rubber Gasket  
Spud Escutcheon

5

7. Loosen handle nut, aim sensor at desired tilt angle (horizontal, tilt up, or tilt down), hold in place and tighten handle nut



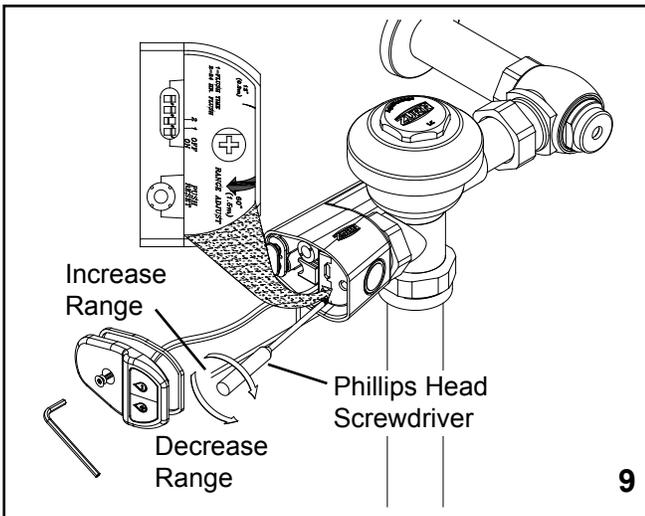
8a. Remove electronics access cover with vandal-resistant hex wrench provided.

8b. Insert preassembled battery holder into electronics compartment.

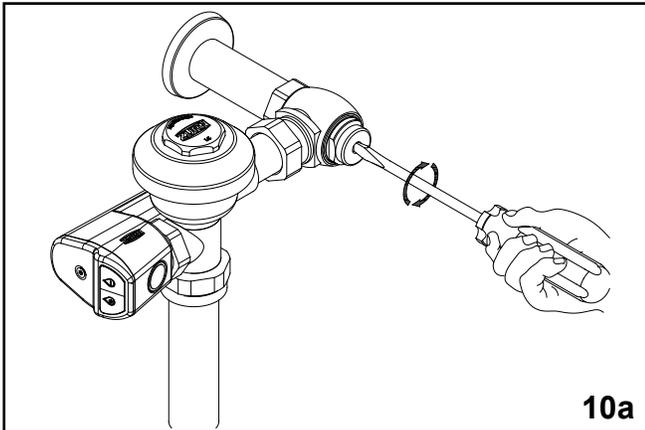
8c. Connect battery cable connector to electronics cable connector.

(Important: Insert non-connector end of battery holder first, as shown. Ensure foam spacer is in place)

8



9. Adjust feature settings as desired. The sensor range is factory set to 48". If adjustment is necessary, use a phillips head screwdriver and turn GENTLY. SEE SENSOR RANGE ADJUSTMENT. Replace electronics access cover and tighten securely with vandal-resistant hex wrench.



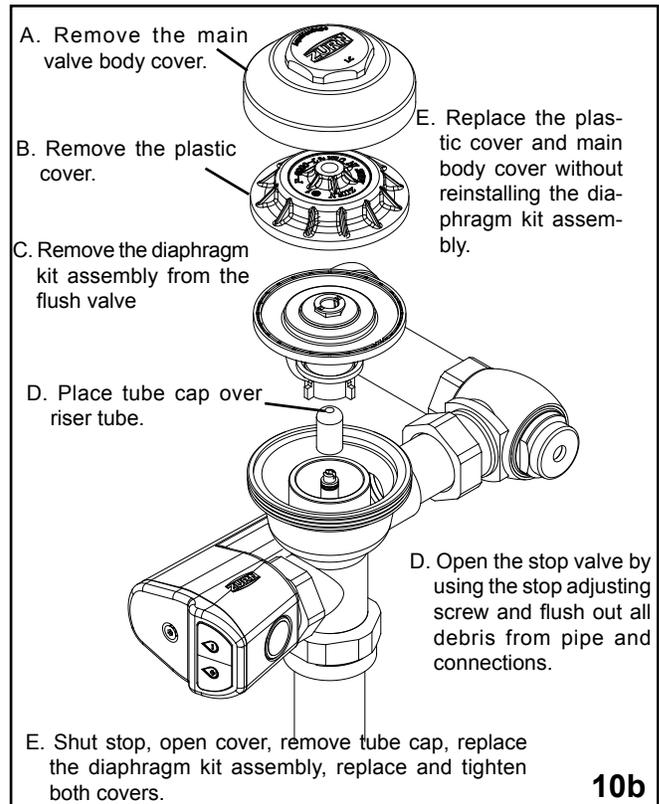
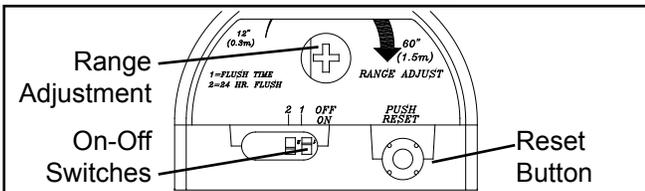
Before the supply water is turned on, be sure all stop valves to the flush valves are closed off tight. The stop valves can be opened and closed by using the adjusting screw located at the center of the stop valve cap (shown in 10a), behind the adjusting screw cover if already installed. Stop valve adjustments can only be made by using the adjusting screw. **It is not necessary to remove the stop valve cap when making adjustments. If for any reason it becomes necessary to remove the stop valve cap, be certain the water is shut off at the main supply valve.**

### Sensor Range Adjustment

The range is factory set for closet applications. If necessary, the sensor range can be adjusted. Pressing the reset button will initiate a ten minute set-up period. During these ten minutes a red light will flash through the sensor lens when an object is in view of the sensor. Use this feature to properly set the sensor range. Slowly rotate the range adjustment clockwise to increase range and counterclockwise to decrease range. The range adjustment will stop at minimum and maximum settings. Do not turn beyond these stops. For an additional ten minutes of blinking, push reset button. Stand in front of sensor (minimum 10 seconds) and move forward and backward to determine range.

Switch 1 - Flush Time- Factory setting - "ON" (1.6 gpf/1.1 gpf)  
"OFF"

Switch 2 - 24 Hour Flush - The unit will automatically flush 24 hours after the last user. On position = activate, Off position = deactivate.



10. When all flush valves are connected to the fixtures and water pressure is available, it is recommended that the supply piping be flushed to remove dirt, pipe chips, etc., from system. This procedure should also be repeated when the system is drained for seasonal use, as occurs in athletic fields, recreation parks, etc.

11. The EcoVantage flush valves are preset for fixture volume as marked on the valve cartons. The valve does not require regulation for variation in water pressure within its operating range. To set the flush valve for proper operation, open the stop valve completely by using the adjusting screw and flush the AquaSense "AV" several times. Gradually adjust the stop valve closed, using the adjusting screw, so that the rate of water flow into the fixture is not excessive, yet is sufficient to adequately evacuate the waste. The final setting for closets should provide a rate of water flow sufficient enough to evacuate thirty sheets of toilet paper from the fixture. The stop cap screw cover should be replaced after final adjustments have been made.

12. For those installations that have ideal conditions for increasing the water conservation of both the high and low volume flushes, a second (red) water saving volume control is included with the unit and can be installed at the owner's option. The red volume control is stored inside the housing beside the sensor.

13. A wall sign has been furnished with this product to inform the user of its operations. Position the wall sign over the flush valve approximately 40" above the toilet.

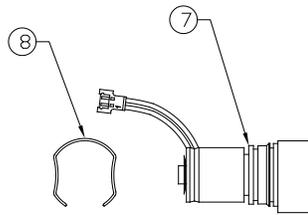
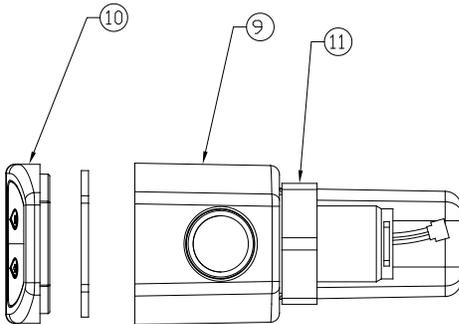
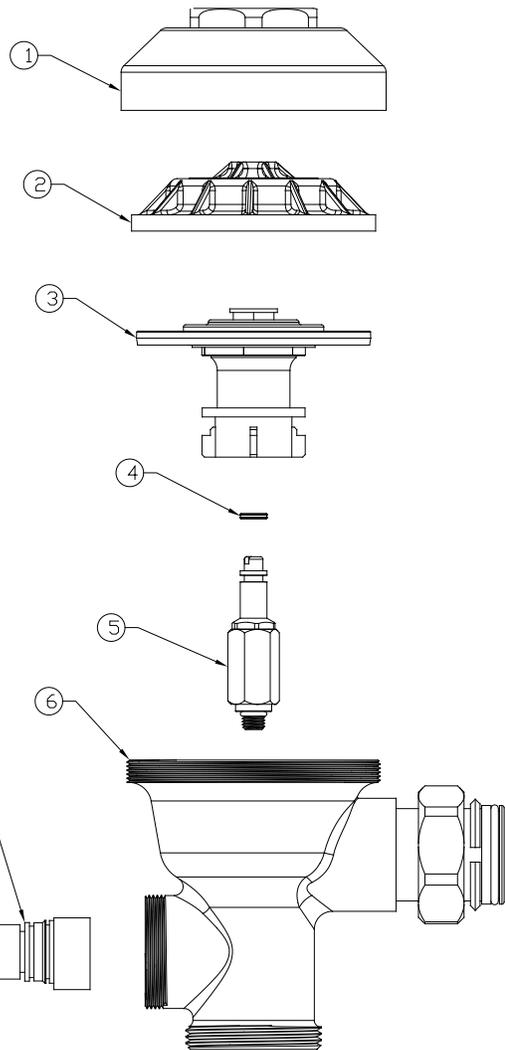
### 14. RECOMMENDED EVACUATION TEST

- Obtain 8 ft toilet paper
- Fold in 4" lengths
- Place toilet paper bundle at edge of water in toilet such that bundle is partially exposed to water
- Press green manual override button for reduced flush
- 100% evacuation-pass
- <100% evacuation: check supply line and stop for obstruction; otherwise, system is not suitable for DF feature. If applicable, re-install yellow volume control and retest.

# ZR Dual Flush Flush Valve Solenoid Replacement Instructions

## Removing the Old Solenoid

1. Turn off water supply to flush valve at shut off (S.O.).
  2. Cycle the valve once – flush it to relieve pressure holding the valve closed.
  3. Remove the main valve body cap (Item #1) from the flush valve (Item #6) using a wrench.
  4. Remove the plastic diaphragm cover (Item #2) from the top of the diaphragm assembly.
  5. Remove the diaphragm assembly (Item #3) from the flush valve (Item #6).
  6. Using a screwdriver, remove the riser tube (Item #5) from the solenoid (Item #7).
  7. Remove the RetroFlush sensor assembly (Item #9) from the flush valve handle port using a wrench on the handle nut (Item #11).
  8. Remove the solenoid retaining clip (Item #8) and gently pull the solenoid (Item #7) out of the housing.
- Note: Pay special attention to the position of the retaining clip ends to ensure proper reassembly into the proper slots.**
9. Disconnect the sensor cable connector from the solenoid.
- Note: If the white connector is not fully accessible, then see the special instructions on page 6.**



## Installing the New Solenoid

1. Connect the cable connector on the solenoid (Item #7) to the sensor cable connector.
2. Lightly lubricate the solenoid O-ring seal with silicone grease provided to prevent damage while reassembling the unit. Insert the solenoid (Item #7) into the housing and install the solenoid retaining clip (Item #8). When installed properly, the end of the solenoid housing is free to rotate. **Note: Be careful not to crimp the battery wires while inserting the solenoid into the housing.**
3. Reinstall the RetroFlush sensor assembly (Item #9) onto the flush valve using a wrench. Be sure the solenoid inlet (threaded hole) is facing upward when installed in the flush valve. If not, remove Item #9 and rotate the solenoid for proper position.
4. Remove old O-ring (Item #4) from the upper part of the riser tube (Item #5). Install new quad ring (Item #4) onto the riser tube (Item #5) making sure the quad ring is not twisted. Lightly lubricate the quad ring with the silicone grease provided.
5. Reinstall the riser tube (Item #5) onto the solenoid (Item #7). Tighten snug with screwdriver, do not overtighten.
6. Reinstall the original diaphragm assembly (Item #3) onto the flush valve (Item #6).
7. Reinstall the original plastic diaphragm cover (Item #2) on top of the diaphragm assembly (Item #3).
8. Reinstall the main valve body cap (Item #1) onto the flush valve (Item #6) using a wrench. Tighten properly.
9. Remove battery cover (Item #10) from RetroFlush sensor assembly (Item #9) with the hex key wrench provided and press reset button located on the sensor module case. Reinstall cover (Item #10).
10. Turn on water supply and cycle flush valve for normal operation. Adjust stop valve for optimal flow to the fixture.

# Parts Replacement Guide

## CoversV

Outside Cover – Chrome Plated(1)  
 Inside Cover(2)

## Product No.

P6000-LL-CP  
 P6000-L

## Replacement Kits

Low-Consumption Closet Replacement Kit(4) - 1.6/1.1

## Product No.

PR6000-EC-WS1-DF

## Replacement Parts – Inside Components

Riser Tube(5)  
 Low-Consumption Closet Volume Control - 1.6 GpF(3) - Yellow  
 Low-Consumption Dual Flush Closet Volume Control - 1.6 GpF(3) - Red  
 Diaphragm

## Product No.

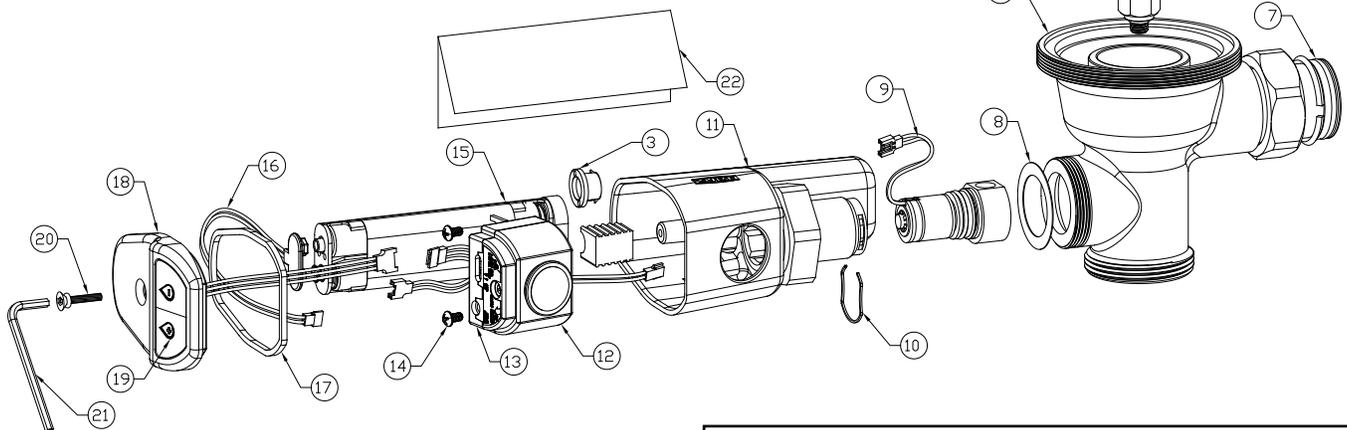
PR6000-E13F  
 PR6000-EC25-DF  
 PR6000-EC25-WS1-DF  
 P6000-E15A-ENG

## Sensor Module Replacement Kits

Solenoid Valve Replacement Kit(8, 9, 10)  
 Sensor Lens Kit for Dual Flush(12)  
 1.6/1.1 Sensor(13)  
 Battery Holder with Connecting Cable(15, 16)  
 Metal Housing(11)  
 Vandal-Resistant Cover Wrench(21)  
 Cover with Screw and Seal for Dual Flush(17-20)  
 Push Button Switch for Dual Flush(19)

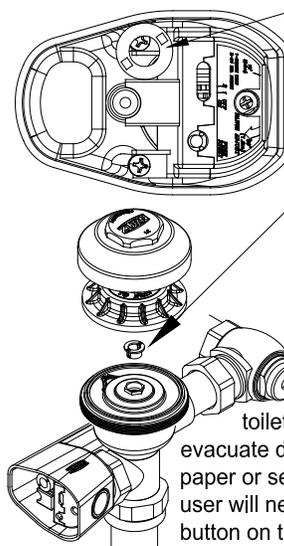
## Product No.

PR6000-M  
 PR6000-SC-DF  
 PR6000-DF-1.6  
 PR6000-MB  
 PR6000-MH  
 PR6000-W  
 PR6000-MC-DF  
 PR6000-PB-DF



- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1 Main Valve Body Cover            | 12 Sensor Electronics              |
| 2 Plastic Cover                    | 13 Sensor Lens Kit for Dual Flush  |
| 3 Volume Control (Yellow or Red)   | 14 Sensor Screws - 2               |
| 4 Diaphragm                        | 15 Battery Holder and Battery      |
| 5 Riser Tube                       | 16 Connecting Cable                |
| 6 Main Valve Body (with Tailpiece) | 17 O-Ring Seal                     |
| 7 O-Ring                           | 18 Metal Housing Cover             |
| 8 Gasket                           | 19 Push-Button Assembly            |
| 9 Solenoid Valve                   | 20 Cover Screw & O-ring            |
| 10 Solenoid Valve Retainer Clip    | 21 Cover Screw Wrench              |
| 11 Metal Housing                   | 22 Red Volume Control Instructions |

## Volume Control Instruction Sheet



Red Volume Control: For those conditions suitable for maximum water savings.

- Close stop; activate MOB
- Remove valve body cover & plastic cover
- Replace yellow volume control with red volume control.
- Reassemble plastic cover & valve body cover
- Open Stop
- Test valve for proper function

Note: Excessive amounts of toilet paper and/or seat cover may not evacuate during water saving liquid flush. If paper or seat cover remains in the bowl, the user will need to press the water saving green button on the side of the unit to clear the bowl.

## Product Specifications

Sensor Range: 12" to 60" (adjustable)  
 Battery Type : AA Duracell Alkaline – Model MN-1500  
 Battery Life: 3 years at 4,000 flushes per month  
 Flush Volume: ZR6000-WS1-DF – 1.6/1.1 gallons per flush  
 Voltage: 6 VDC

### Operating Water

Pressure: 45 psi min running; 80 psi max static.  
 Note: Installations with running pressure below recommended value may void warranty.

Automatic Flush: Flush 24 hours after the last use (switchable)

### Maintenance

Override: Magnetic flush triggering or inhibiting switch (see page 2)

Indicator Light: Range Adjustment (first ten minutes)  
 Low Battery Indication (see page 2)  
 Reflective surface in view for greater than 30 minutes (see page 2)

Reset Button: To restart ten-minute rangeadjustment cycle  
 To enter option changes in the electronics after repositioning switches (see page 2)

### Operating

Temperature: 35°F to 104°F (2°C to 40°C)

### Outside Case

and Cover: Chrome-Plated Die Casting

## Operation

1. Invisible light rays are continually emitted from the RetroFlush sensor.
2. When the user comes into range of the sensor's detection zone (range 12 to 60 inches), the beam is reflected back to the sensor's receiver and converted to a low voltage electrical signal that activates an eight-second time delaycircuit. This time delay prevents the unit from incidental activation in the restroom. Once this circuit is completed, the output circuit is signaled and continues in a "hold" mode for as long as the user remains within range of the sensor. User must be in sensor range for at least 10 seconds.

3. After the user moves away from the sensor, the absence of reflected light starts an electrical "one-time" signal that operates the solenoid operator (6 VDC) and activates the flushing cycle to flush the fixture. The circuit then automatically resets for the next user.

Note: Excessive amounts of toilet paper and/or seat cover may not evacuate during water saving liquid flush. If paper or seat cover remains in the bowl, the user will need to press the water saving green button on the side of the unit to clear the bowl.

### Care and Cleaning Instructions

**DO NOT** use abrasive or chemical cleaners to clean faucets as they will dull the luster and attack the chrome or special decorative finishes. Use only mild soap and water, then wipe dry with a clean cloth or towel. While cleaning the bathroom tile and floor, the faucet and electronics should be protected from splattering of water, cleaner, acids and cleaning fluids that can damage the sensor faucet.

## TROUBLESHOOTING GUIDE

Problem	Cause	Solution
Valve will not operate	Water supply shut off	Turn on water supply, check control stop and supply
	Sensor range adjustment set too short	Increase sensor range adjustment
	Expired batteries	Replace batteries
	Difficulty with electronic control module	check batteries. If problem continues, consult factory.
	Solenoid problem	Replace solenoid
Red light flashes when user is not present	Obstruction in front of the sensor	Remove the obstruction
	Sensor range set too long	Shorten sensor range
	Sensor is detecting opposite wall	
Red light flashes when user comes into view	Batteries about to expire	Replace batteries
	Unit is in start-up mode	Light will stop in 10 minutes
	Range adjustment reset button was pressed.	Light will stop in 10 minutes
Valve does not shut off	Dirt in diaphragm bypass hole	Clean bypass hole
	Dirt or debris at valve seat or sealing area	Clean valve seat and clean diaphragm kit
	Riser tube filter plugged	Clean filtered riser tub
	Solenoid problem	Replace solenoid
Not enough water to fixture	Wrong RetroFlush unit installed	Check fixture requirements. Install proper RetroFlush unit.
	Control stop improperly adjusted	Adjust control stop
	Diaphragm damaged	Replace diaphragm
	Low running pressure	Adjust water supply to ensure 45 psi running pressure at each valve. Move switch #1 to the off position and press RESET for more water per flush.
	Solenoid problem	Replace solenoid
Too much water for fixture	Wrong RetroFlush unit installed	Check fixture requirements. Install proper RetroFlush unit.
	Control stop improperly adjusted	Adjust control stop
	Dirt in diaphragm bypass hole	Clean bypass hole
	Customer wishes to realize maximum water savings. (ZR6000AV-WS1-DF only)	Change out yellow volume control to red volume control included with kit.
Water drips from chrome cap	The plastic cover has been cracked by freezing or abuse	Replace plastic cover
	The chrome cap is not tight	Tighten chrome cap