

# Flushometer Care & Service 101

## Part 4: Side-mount Sensor Flushometers

# Presenters



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# Agenda

This presentation will cover:

- Overview of Sloan Side-Mount sensor flushometers
- Most common field service issues and solutions
- Maintenance recommendations
- Summary
- Q&A

Understand how to extend the service life of Sloan products



# Acronyms in this Presentation

- **SMO** – Side-mount Operator
- **SMOOTH** – Side-mount Operator Over The Handle
- **SFSM** – Single Flush Side-mount
- **DFSM** – Dual Flush Side-mount
- **TMO** – True Mechanical Override
- **HW** – Hard-wired



# Side-mount Sensor Flushometer Applications



Water Closets



Urinals



Utility (Service) Sinks



Bedpan Washers



Squat Toilets

Anywhere a Sloan manual exposed flushometer can be converted to side-mount sensor operated flushometer... going back to 1906

# Side-mount Retrofit Kits



	SMO	SMOOTH	SFSM	DFSM
Model	<a href="#">EBV-89-A</a>	<a href="#">EBV-200-A</a>	<a href="#">EBV-500-A</a>	<a href="#">EBV-550-A</a>
4 "C" Alkaline Batteries	X	X	X	X
Battery Life	3 yrs	2-3 yrs	3 yrs	3 yrs
Override	Electronic	TMO	TMO	TMO
Dual Flush	-	-	-	DFSM
Installation	Replaces handle	Over the handle	Replaces handle	Replaces handle
Low Battery Indicator	X	X	X	X
Estimated Installation Time	3 – 5 Min.	1 – 3 Min.	3 – 5 Min.	3 – 5 Min.

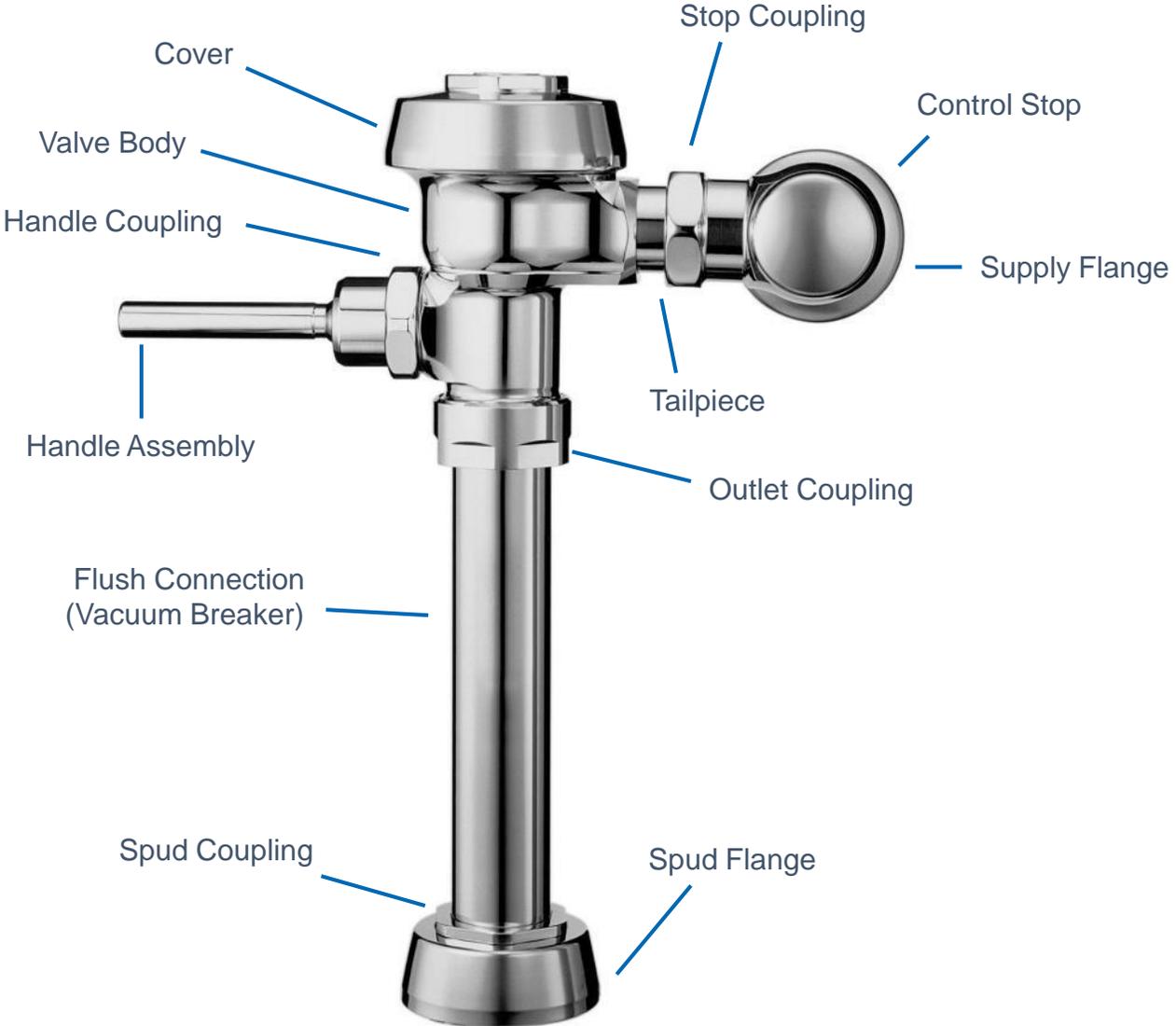
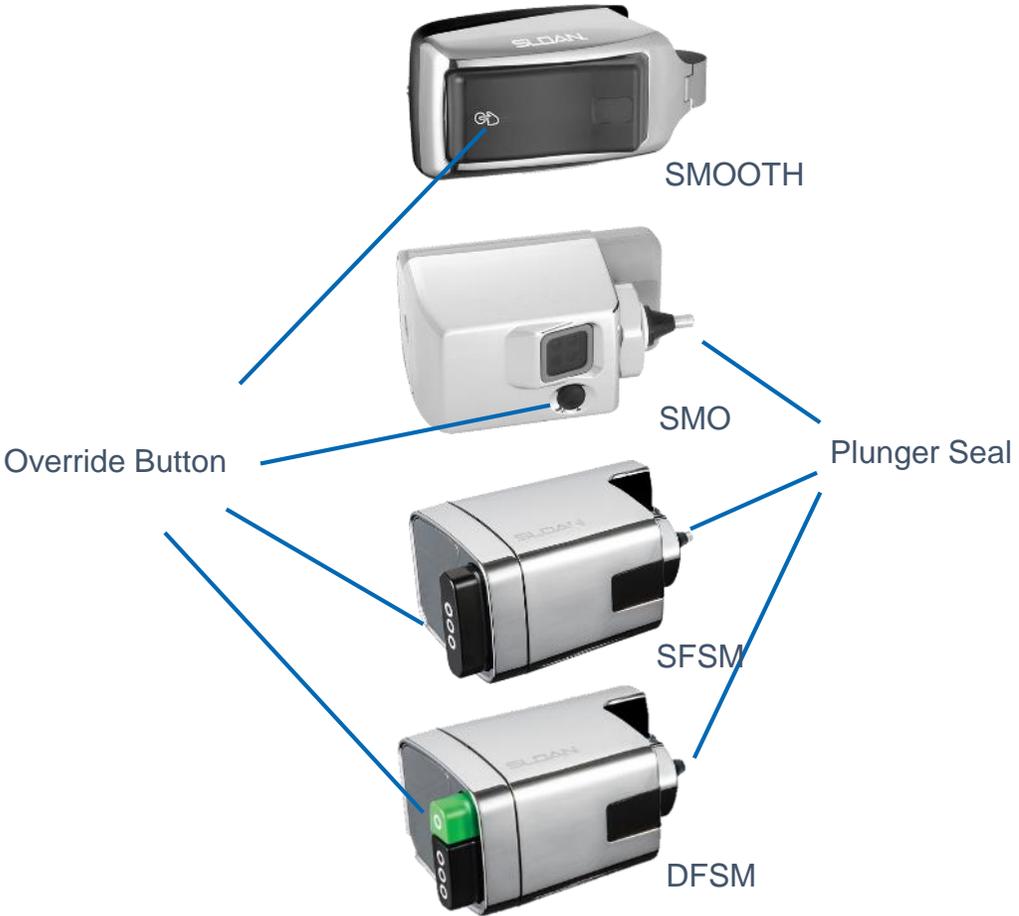
# Which Side-mount Kits for Which Application?



	SMO	SMOOTH	SFSM	DFSM
Positioning	Good	Better	Best	Best
Budget	\$	\$\$\$	\$\$	\$\$
Easiest/Fastest Installation		X		
True Mechanical Override (TMO)		X	X	X
Dual Flush				X
Battery Life				
Ease of Service			X	X
Flushometer Compatibility*	ALL	No GEM	ALL	No Piston

\*Exposed Flushometers Only

# Manual Diaphragm Flushometer and Side-mount Components

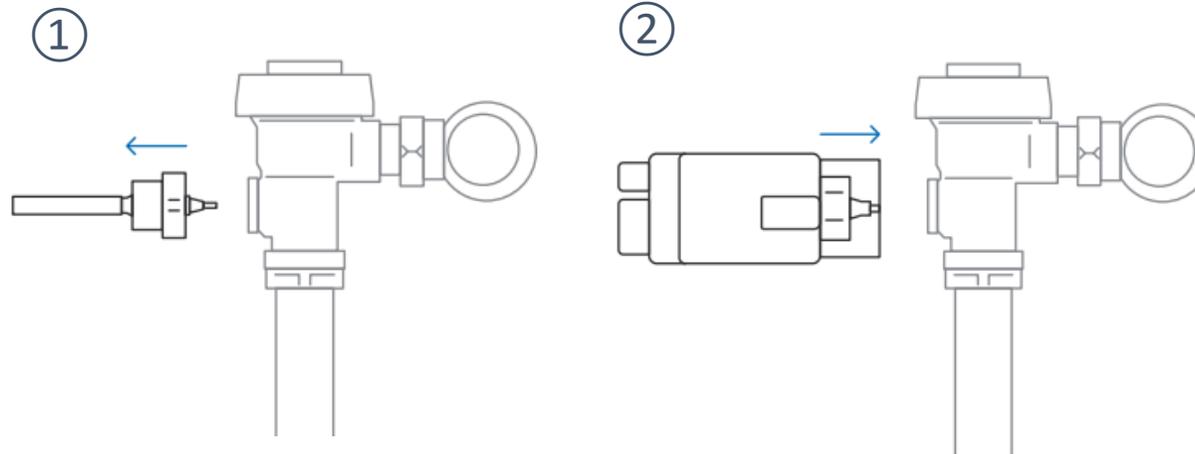


# Side-mount Installation



Click here to watch video

[Sloan SFMS Dual Flush Side Mount Retrofit](#)

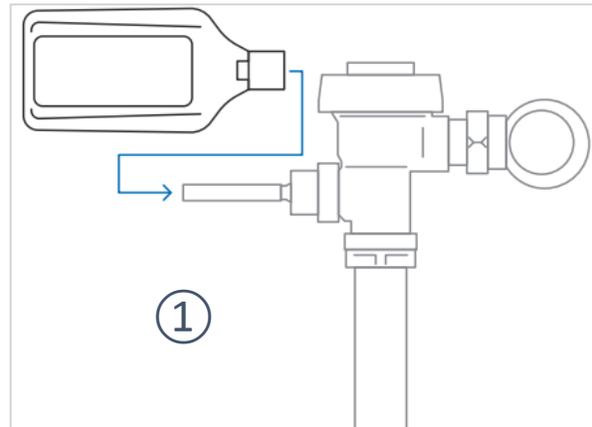


1. Remove Handle
2. Install SMO, SFMS, or DFMS



# SMOOTH Side-mount Installation

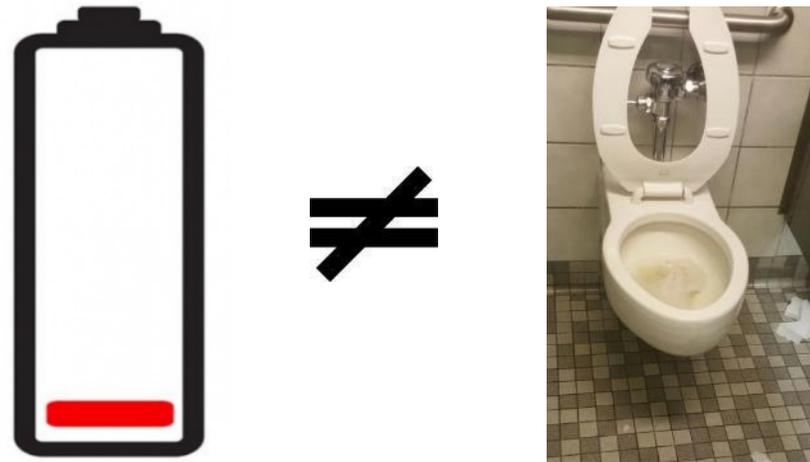
1. Clamp SMOOTH over the existing handle



# What is TMO?

## True Mechanical Override

- When batteries are depleted and the sensor no longer operates, the units can still be flushed manually
- “Non-hold Open” design prevents intentional flooding



SMOOTH



SF5M



DF5M

# Side-mount Field Issues & Solutions

from most common to least common



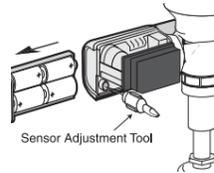
Image of an uncommon “self-inflicted” issue

# Side-mount Flushometer Indicator Lights



	SMO	SMOOTH	SFISM	DFISM
LED Color	Green / Yellow	Red	Green / Red	Green / Red
Start-up Time	7 minutes	45 seconds	3 minutes	3 minutes
Flush Delay	1s	Closet -3s / Urinal -1s		
Start-up Indicator	Green LED flashing, pause, then 3x green LED flashes	Red LED flashes and unit will flush	Intermittent Green LED flashing until complete, then 1 flush	
User is Detected	Green LED flashes 3x after 5 sec. delay	Red LED flashes for 8 seconds	Flashing Green LED	
Low Battery Indicator	Yellow LED flashes continuously	Red LED flashes 2x normal speed	Red LED flashes 4x after target present for 8 seconds	
Improper Start-up	Green LED flashes with no user	NA	Red LED flashes continuously after adaptive sensing	
Link to Installation Instructions	<a href="#">SMO</a>	<a href="#">SMOOTH</a>	<a href="#">SFISM</a>	<a href="#">DFISM</a>

# Sensor Range Adjustment and Closet/Urinal Calibration



	SMO	SMOOTH	SFSM	DFSM
Sensor Range Adjustment	Manual adjustment with potentiometer under the chrome cover (use screwdriver provided with the unit)	Adaptive Sensing Urinal 15-30 inches (38-76 cm) 1 sec delay Closet 30-45 inches (76-114 cm) 3 sec delay	Adaptive Sensing Urinal 15-30 inches (38-76 cm) 1 sec delay Closet 30-45 inches (76-114 cm) 3 sec delay	Adaptive Sensing Closet 30-45 inches (76-114 cm) 3 sec delay
Closet/Urinal Calibration	No calibration. Use manual sensor adjustment	Disconnect power for 10 sec, then adjust.*  3 setting modes <ul style="list-style-type: none"> <li>• Closet (push TMO until LED is solid (25 sec) then release)</li> <li>• Closet (Short) (push TMO until LED blinks slowly (35 sec) then release)</li> <li>• Urinal (push TMO until LED blinks quickly (45 sec), then release)</li> </ul>	Disconnect power for 10 sec, then adjust.*  2 setting modes <ul style="list-style-type: none"> <li>• Urinal (push TMO until only the green LED blinks (25 sec) then release)</li> <li>• Closet (push TMO until both the red and green LEDs blink (35 sec), then release)</li> </ul>	No adjustment. DFSM units are set up strictly for closet use

\*SMOOTH and SFSM units can be set for closet or urinal use for 1 hour after initial install. Otherwise disconnect from power for 10 seconds to adjust

# EBV-89-A SMO Parts List and Installation Guide



[Link to SMO Installation Guide](#)

SLOAN.

Repair Parts and Maintenance Guide

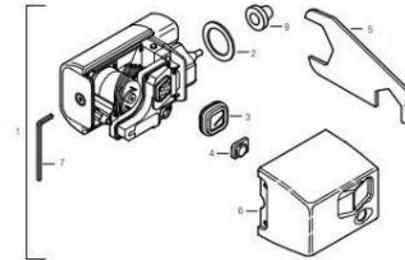
## SMO Side-Mount-Operator

Battery powered, sensor activated retrofit unit for exposed closet and urinal flushometers.

### PARTS LIST

Item No.	Code No.	Part No.	Description
1.	0325105	EBV-89-A	Side Mount Operator for Water Closets (Toilets) and Urinals
2.	0325151	EBV-121	Gasket (Red)
3.	0325148	EBV-118	Lens
4.	0325153	EBV-123	Button repair kit
5.	0325150	EBV-120	Wrench
6.	0325157	EBV-127	Metal Cover Closet w/DR
7.	0325149	EBV-119	Allen Wrench 3mm security hex
8.	0325192	EBV-157-A	Handle Adapter Kit (includes Green "L" Gasket) for GEM•2®
9.	5302297	B-39	Handle Seal (pack of 12)
10.	5325428	EBV-584	Gasket (Green) GEM SMO (pack of 5)

Note: Battery door screw is not an available part. Use M4-0.7 x 12 mm screw as suitable replacement.



[Link to SMO Repair & Maintenance Guide](#)

# EBV-89-A SMO

## Issues and Solutions



Indicator	Issue	Resolution
Green LED flashes when no user present	Sensor is covered or range is set too far out	Uncover sensor and/or adjust range
Yellow LED flashes	Batteries are low	Replace batteries
LED lights do not function	Batteries are dead	Replace batteries
Leaking at the handle coupling during flush	B39 “Cone” seal worn out	Replace B39 seal
Override button works, sensor not detecting target	Improper range adjustment or sensor issue	Adjust sensor range or replace unit
Override button and sensor work, no flush	High static pressure or worn out gears	Adjust static pressure or replace unit
Override button does not work but sensor does	Worn out button cover or broken button switch	Replace button cover

# EBV-89-A SMO Special Considerations



The SMO is the only Side-mount where the Override Button does not cancel sensor detection – leaving the potential for double flushes

The SMO has a “high mount” EBV-114 adapter available to compensate for tall mounted or high rough-in flushometers

To mount the SMO on a GEM manual piston flushometer, order the EBV-157-A SMO to GEM adapter kit

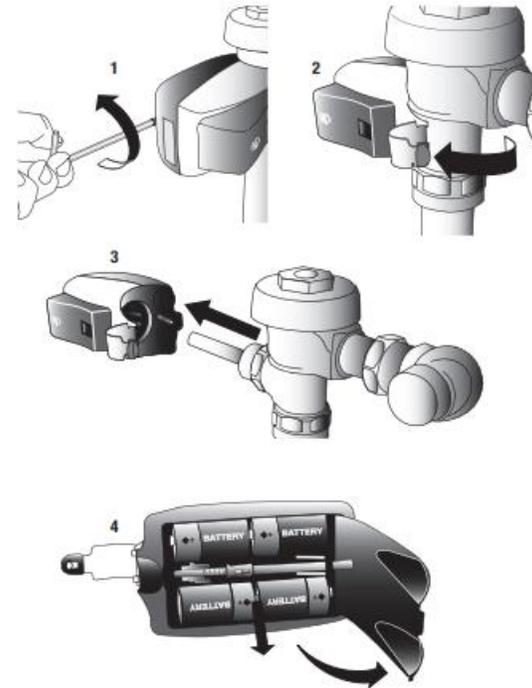
If the issue is related to the manual flushometer itself and not the side-mount unit, refer to those Sloan technical training webinars

# EBV-200-A SMOOTH Installation Guide

(No Parts List)



[Link to SMOOTH  
Installation Guide](#)



[Link to SMOOTH  
Repair & Maintenance Guide](#)

# EBV-200-A SMOOTH Issues and Solutions



Indicator	Issue	Resolution
Red LED flashes when no user is present or does not flash when user is within range	Range is not properly adjusted	Adjust sensor range
Sensor blinks rapidly when user is within range	Batteries are low	Replace batteries
LED lights do not function	Batteries are dead or unit no longer functions	Replace batteries or replace unit
Override button works, sensor not detecting target	Improper range adjustment or sensor issue	Adjust sensor range or replace unit
Override button and sensor work, no flush	High static pressure or worn out gears	Adjust static pressure or replace unit

# EBV-200-A SMOOTH

## Special Considerations



The SMOOTH is the only Side-Mount with no spare parts available

The SMOOTH is also available as an EL-600-A (hard wired version)

If the issue is related to the manual flushometer itself and not the side mount unit, refer to those Sloan technical training webinars

# EBV-500-A SFSM and EBV-550-A DFSM Install Guide and Parts List



[Link to EBV-500-A SFSM and EBV-550-A DFSM  
Installation Guide](#)

SLOAN.

Repair Parts and Maintenance Guide

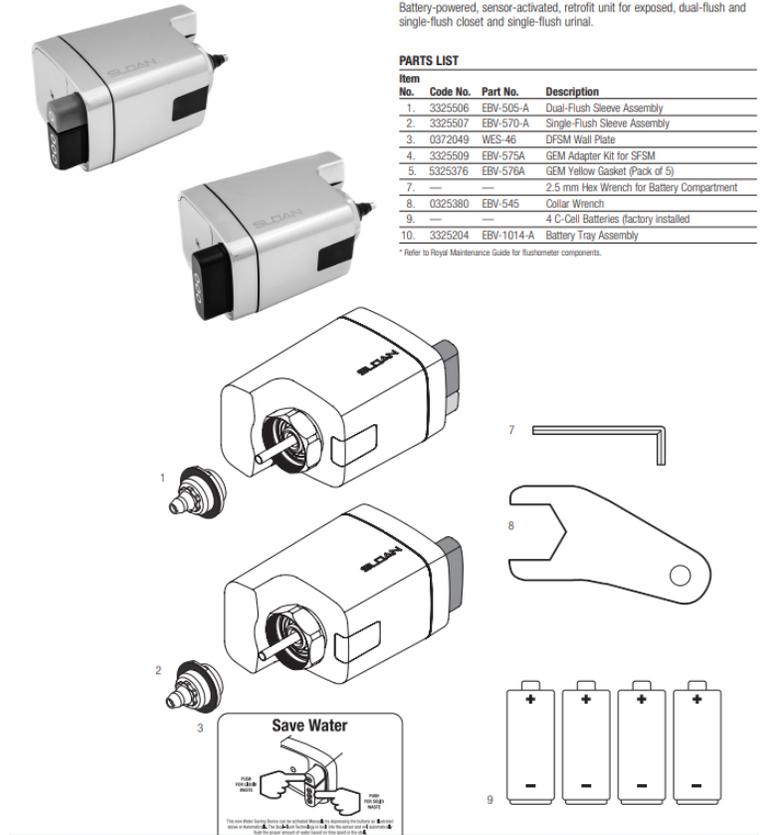
## Optima® Dual-Flush and Single-Flush Side Mount Unit

Battery-powered, sensor-activated, retrofit unit for exposed, dual-flush and single-flush closet and single-flush urinal.

### PARTS LIST

Item No.	Code No.	Part No.	Description
1.	3325506	EBV-505-A	Dual-Flush Sleeve Assembly
2.	3325507	EBV-570-A	Single-Flush Sleeve Assembly
3.	0372049	WES-46	DFSM Wall Plate
4.	3325509	EBV-575A	GEM Adapter Kit for SFSM
5.	5325376	EBV-576A	GEM Yellow Gasket (Pack of 5)
7.	—	—	2.5 mm Hex Wrench for Battery Compartment
8.	0325380	EBV-545	Collar Wrench
9.	—	—	4 C-Cell Batteries (factory installed)
10.	3325204	EBV-1014-A	Battery Tray Assembly

\* Refer to Royal Maintenance Guide for flushometer components.



[Link to EBV-500-A SFSM and EBV-550-A DFSM  
Repair & Maintenance Guide](#)

# EBV-500-A SFSM and EBV-550-A DFSM Issues and Solutions



Indicator	Issue	Resolution
Red LED flashes continuously OR Red LED flashes 4x after 8 seconds OR Red LED flashes 1x per hour with no user	Batteries are low	Replace batteries
Red LED flashes continuously after calibration	Improper start up	Remove batteries for 10 seconds and repeat installation procedure
LED lights do not function	Batteries are dead	Replace batteries
Leaking at the handle coupling during flush	Bushing assembly worn out	Replace EBV-570-A Single flush Bushing assembly (black) or EBV-505-A Dual flush Bushing Assembly (green)
Override button works, sensor not detecting target	Improper range adjustment or sensor issue	Adjust sensor range or replace unit
Override button and sensor work, no flush	High static pressure or worn out gears	Adjust static pressure or replace unit
Override button does not work but sensor does	Button damaged	Replace unit

# EBV-500-A SFSM and EBV-550-A DFSM Special Considerations



A DFSM is not designed for use with manual piston flushometers. Water savings are not significant, and erratic flushing may occur

A high mount adapter is not needed for high mounted or high rough-in SFSM or DFSM units

To mount the SFSM on a GEM manual piston flushometer, either order the EBV-500-A-G Side-mount Retrofit Kit (includes EBV-575-A SFSM to GEM adapter kit), or order the EBV-575-A SFSM to GEM adapter kit separately)

These units are available in hard wired versions. EL-700-A for the SFSM-HW and EL-750-A for the DFSM-HW

Units can be placed in “service mode” for up to 10 minutes for cleaning with no flushing by pushing the TMO for 15 seconds. Push once to release or unit will return automatically to service after 10 minutes

If the issue is related to the manual flushometer itself and not the side-mount unit, refer to those Sloan technical training webinars

# Field Issues & Solutions Not Related to The Side-mount Flushometer

from most common to least common



Images of uncommon “self-inflicted” issues

# Diaphragm Run-ons



Debris blocking diaphragm bypass



Debris under diaphragm



Degraded diaphragm assembly



Low pressure drop

Symptom	Cause	Solution
Continuous flush with no shut-off	Solenoid stuck open	Replace solenoid assembly EBV-136-A
	Debris blocking diaphragm bypass	Clean diaphragm to clear bypass orifice
	Debris under diaphragm	Remove debris
	Low pressure drop	Check facility or municipal line pressure
	Diaphragm assembly compromised O-ring, cracked plastic guide (due to age)	Replace diaphragm assembly with proper gpf kit

# Piston Run-ons



Debris blocking bypass



Debris under piston



Degraded relief valve seat



Low pressure drop

Symptom	Cause	Solution
Continuous flush with no shut-off	Debris blocking bypass	Clean piston to clear bypass orifice
	Debris under piston	Remove debris
	Degraded relief valve seat	Replace the piston assembly
	Low pressure drop	Check facility or municipal line pressure

In all cases, it's good to flush debris from the line

# No Evacuation - Diaphragm



Low pressure



Improper, low consumption, or urinal diaphragm



Perforated diaphragm



Cover not properly tightened

Symptom	Cause	Solution
No evacuation when flushed (either sensor or override button)	Low pressure (<25 psi / <1.7 bar)	Address plumbing system deficiencies
	Low consumption (LC) or urinal diaphragm installed in older closet	Install correct gpf diaphragm
	Short flushing (perforated diaphragm)	Replace diaphragm
	Cover not properly tightened (DFB - dual filter bypass diaphragm)	Tighten cover

# No Evacuation - Piston



Low pressure



Incorrect piston



Piston lip seal degradation

Symptom	Cause	Solution
No evacuation when handle is depressed	Low pressure (<25 psi/<1.7 bar)	Adjust control stop to increase flow pressure Address plumbing system deficiencies
	Incorrect piston installed	Match piston gpf (Lpf) to fixture gpf (Lpf)
	Piston lip seal degraded	Replace piston assembly

Contact Tech Service for a list of piston kits

# Noise at Shut-off - Piston



High flow pressure

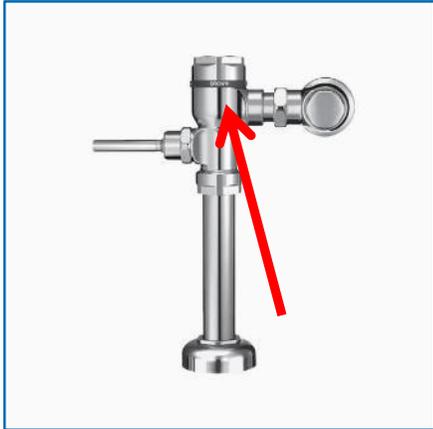
Piston lip seal degradation

Loose plumbing

Symptom	Cause	Solution
"Thump" or "Bang" upon valve shut-off	High flow pressure	Adjust control stop to decrease flow pressure Decrease plumbing system flow pressure
	Piston lip seal degraded	Replace piston assembly
	Loose plumbing	Secure piping properly Check hammer arrestors

# Cover Leak - Piston

Always use a fixed smooth jaw wrench....



Cover not tight enough

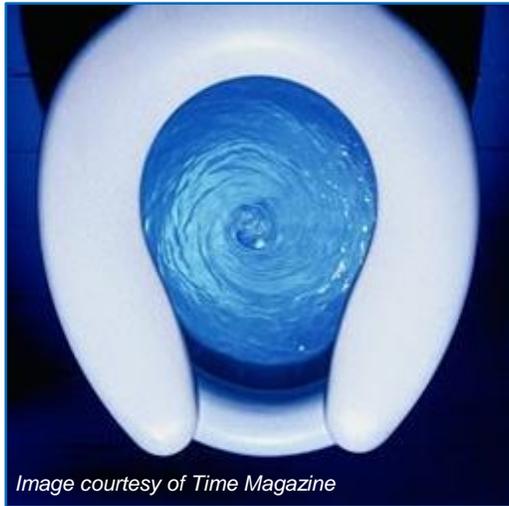
Worn cover gasket (Gem)

Worn inside cover (Crown/Naval)

Worn cover gasket (Naval)

Symptom	Cause	Solution
Water leaking from threads beneath flushometer cover	Cover not tight enough	Turn off water and tighten cover
	Worn cover gasket (Gem)	Replace cover gasket (G106)
	Cracked inside cover (Crown)	Replace inside cover (CR124A)
	Worn cover gasket (Naval)	Replace cover gasket (CN76/CN105)

# Inconsistent Flush



Symptom	Cause	Solution
Flush duration is randomly normal, long, or short	Pressure fluctuation within the facility	Check plumbing system pressure and flow capacity

# Tailpiece Leak



Tailpiece with O-ring



Sloan H553 O-ring

Symptom	Cause	Solution
Leaking at tailpiece next to control stop	Worn or degraded O-ring	Replace H553 O-ring

Clean the tailpiece O-ring groove and the control stop bore before replacing the O-ring. Use 100% silicone grease (not petroleum-based).

# Vacuum Breaker Leak



Worn vacuum breaker sack



Sloan V651A repair kit



Sloan V551A repair kit

Symptom	Cause	Solution
Dripping from <b>above</b> the vacuum breaker coupling during or after flush	Vacuum breaker sack damaged by over-tightening the vacuum breaker coupling	Clean vacuum breaker tube and replace vacuum breaker sack with V551A or V651A high backpressure VB repair kit
Dripping from <b>below</b> the vacuum breaker coupling during or after flush	Worn or degraded vacuum breaker sack	

Wet the gasket prior to installation and hand tighten then “snug” with wrench

# Control Stop Leak



Control Stop Screw



Sloan H541ASD repair kit



Sloan H543ASD repair kit

Symptom	Cause	Solution
Leaking from control stop adjustment screw	O-ring inside the control stop is worn	Replace with H541ASD control stop repair kit (for older urinals, use H543ASD control stop repair kit)

If unsure of which urinal control stop kit you have for units manufactured between 1964 and 1994, contact Sloan Tech Service

# Spud Flange Coupling Leak



Sloan F3 friction ring



Sloan VBF5 gasket



Sloan F5 gasket

Symptom	Cause	Solution
Leaking from spud flange coupling	The spud flange coupling has loosened	Tighten spud flange coupling
	Spud flange coupling gaskets have become worn	Replace F3 friction ring and VBF5 gasket (1-1/4" or 1-1/2") or F5 gasket (3/4" or 1")

Clean the threads prior to installation, and never use pipe dope or grease!

# Maintenance Recommendations

DOMINICK

SENIOR FIELD & TECHNICAL SUPPORT TECHNICIAN

# Best Practices

- Battery lifespans differ from top mounted units because these units are operating a motor and not a solenoid. Adjust your battery maintenance schedules accordingly
- No Teflon tape
- Tighten couplings and covers by hand, then “snug” with a wrench
- Fixed smooth-jawed wrench
- Avoid compression wrenches
- Carry 100% silicone grease
- Clean threads with a brass bristle brush
- Wet the gaskets before installing
- Clean with soap and water only



Clean with soap and water



Use Genuine Sloan Parts



“Snug” – don’t over tighten

# Summary

- Sloan invented the diaphragm flushometer in 1906 and the piston flushometer in 1928
- Side-mount retrofit kits are often the easiest and cost effective method to convert manual flushometers to touch-free sensor operation
- Most installed units are Sloan and can be readily converted. Backwards compatibility to 1906!
- Easy access to Genuine Sloan Parts
- World class Tech Support team
- Vast network of reps to provide assistance
- Follow best practices



Globe Life Field (Texas Rangers)  
Arlington, TX – SFSM Units



Sprint Center  
Kansas City, MO – SMO Units



University of Wyoming,  
Laramie, WY – SMOOTH Units

# Next Sections in this Series

Part 5 – ESS Exposed  
Electronic Solenoid Sensor

Part 6 – ESS Concealed

Part 7 – Hydraulic 900 Series

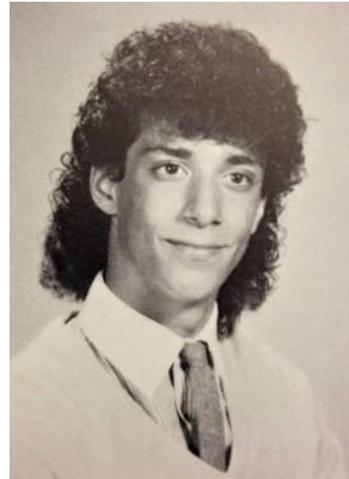
Part 8 – CX Sensor

Part 9 – CX Manual

Part 10 – Bedpan Washers

## Companion Webinars

- [Piston vs Diaphragm](#)
- [Regal vs Sloan vs Royal](#)
- Flushometer Components 101
- [Converting Manual to Sensor](#)
- [Battery Truths and Myths](#)



Dominick after  
Part 1



Dominick after  
Part 5



Dominick after  
Part 10

# Product Installation & Maintenance Materials

## Product Repair and Maintenance Guides

[Sloan Optima Plus Flushometers](#)

[Sloan Ecos Flushometers](#)

[Sloan Solis Flushometers](#)

## Videos

[Flushometer Basic Maintenance](#)

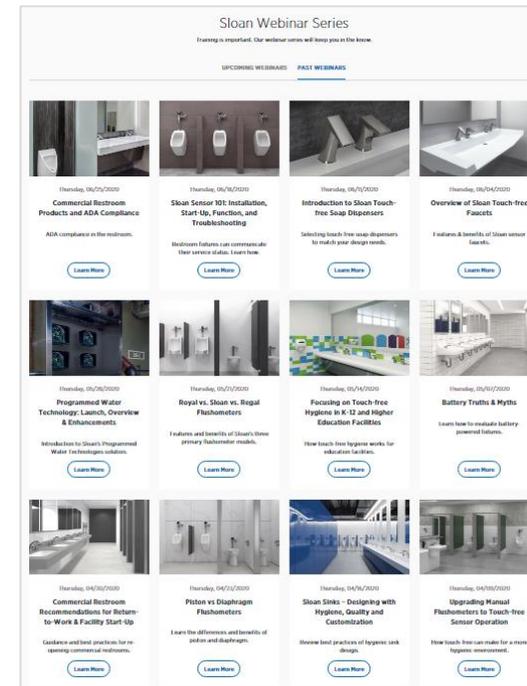
[Flushometer Tailpiece Removal Instructions](#)

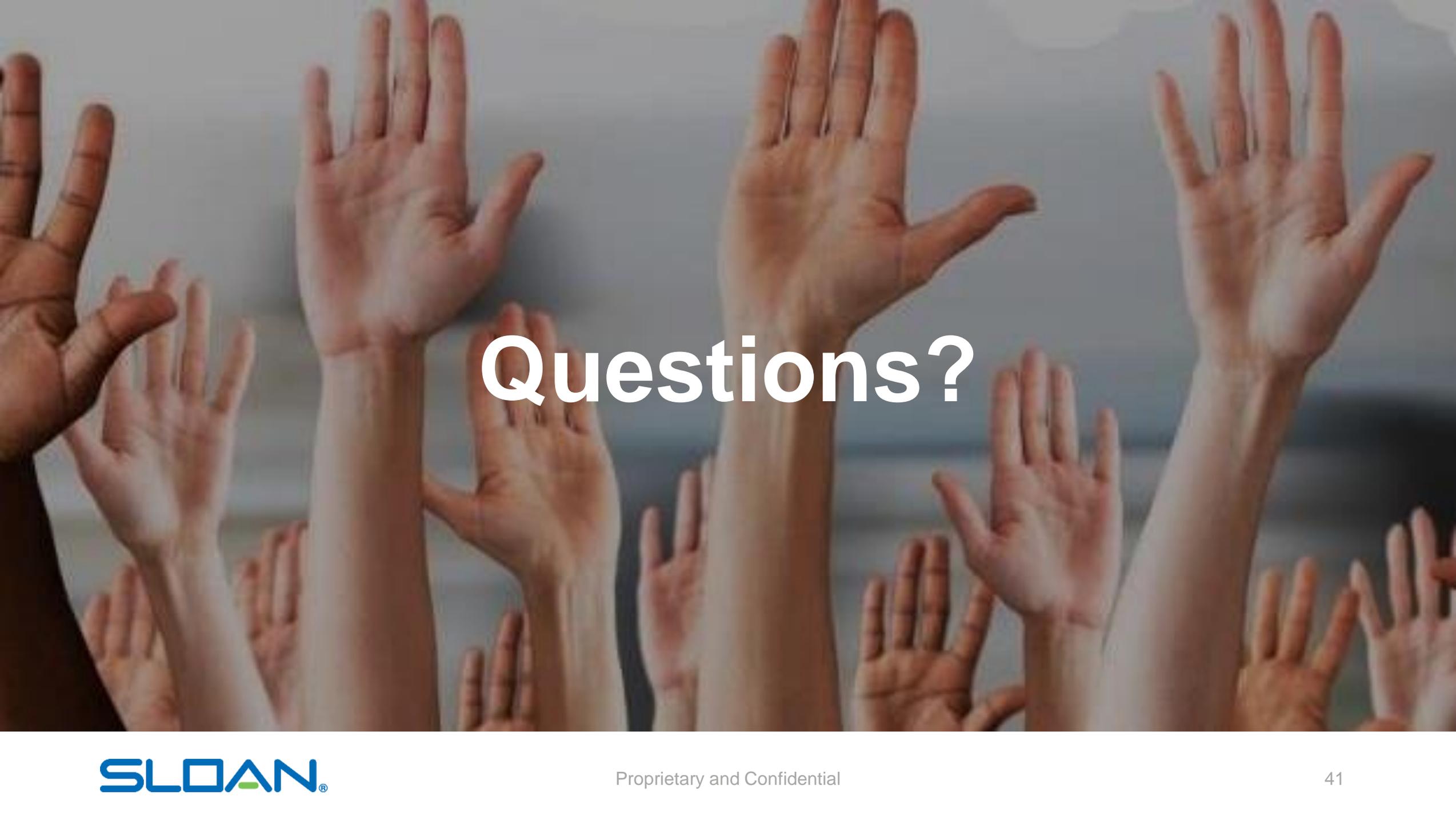
[Control Stop Repair kit Installation](#)

[Ground Joint Control Stops and Adjustable Control Stops Explained](#)

## [Sloan Online Training Materials Catalog](#)

## [Sloan Webinar Series](#)





# Questions?

Find your local Sloan representative for more information

## Sloan Rep Locator tool

- Local code knowledge
- Familiarity with existing sites
- Product knowledge
- Available for onsite consultation

### **Sloan Customer Care Center**

Phone: 800.982.5839

Hours: 7:00 AM - 5:00 PM (CST) Monday – Friday

[customer.service@sloan.com](mailto:customer.service@sloan.com)

### **Sloan Technical Support**

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Sloan Mobile Showroom



C A Riner Co., Inc., North Little Rock, Arkansas



Whitaker Point



Little Rock, Arkansas

# Upcoming Sloan Training Webinars



March 11<sup>th</sup>

[Sloan Sensor  
Faucets and  
Best Practices for  
Thermal Disinfection](#)



March 25<sup>th</sup>

[Sloan Flushometer  
Care and Service  
\(Part 5\) – ESS  
Exposed Sensor  
Flushometers](#)

# Training Comments, Questions, or Suggestions?

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