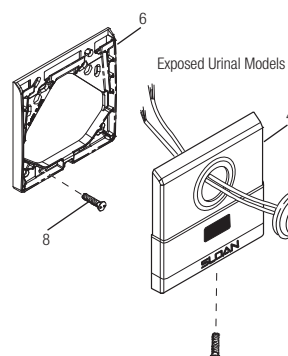
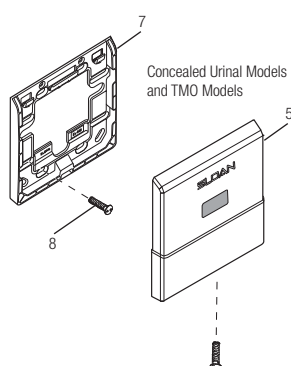


Optima® Flushometers

Current style Royal® (after 09/26/10)

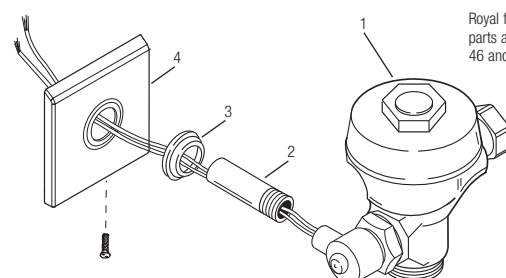
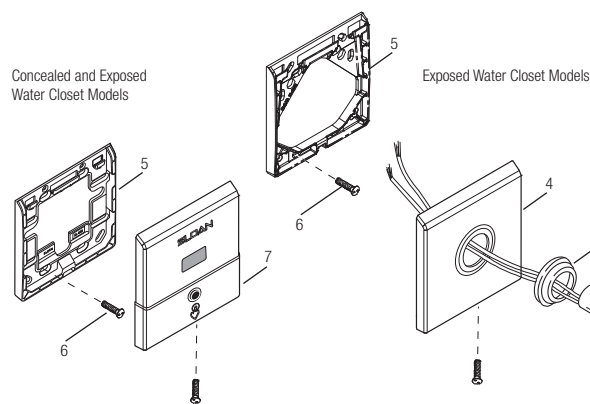
**OPTIMA®**Click Product
Code No. to
Purchase PartRoyal flushometer parts, solenoid
parts and assemblies, see page
46 and 47**CURRENT COVER AND MOUNTING PLATE PARTS FOR ROYAL® URINAL FLUSHOMETER**

Item No.	Code No.	Part No.	Description
1.	‡		Solenoid Activated Valve Assembly
2.	0306249	F-15	Tail Assembly†
3.	0345150	EL-431-A	Flange Assembly
4.	3305100	EL-640-A	CP Cover Plate with Sensor and Mounting Hardware Assembled (Exposed Models) (includes EL-549 mounting plate)

Item No.	Code No.	Part No.	Description
5.	3305101	EL-645-A	CP Cover Plate with Sensor Assembled (Concealed Models)
6.	—	EL-549	Mounting Plate (Exposed Models)
7.	—	EL-592	Mounting Plate
8.	—	EL-177	Screws (requires four (4) screws per mounting plate)
—	3305620	EL-1500	Urinal Sensor Replacement (Exposed and Concealed Models, not shown)

† NOTE: For exposed & concealed solenoids manufactured before 2003 or not shown here, consult factory for individual part assembly.

‡ Part number varies with valve model variation; consult factory.

**OPTIMA®**Royal flushometer parts, solenoid
parts and assemblies, see page
46 and 47**CURRENT COVER AND MOUNTING PLATE PARTS FOR ROYAL® CLOSET FLUSHOMETER**

Item No.	Code No.	Part No.	Description
1.	‡		Solenoid Activated Valve Assembly
2.	0306249	F-15	Tail Assembly†
3.	0345150	EL-431-A	Flange Assembly
4.	3305105	EL-625-A	CP Cover Plate with Mounting Hardware Assembled (Closet only) (includes EL-543 mounting plate)
5.	—	EL-549	Mounting Plate

Item No.	Code No.	Part No.	Description
6.	—	EL-177	Screws (requires four screws per mounting bracket)
7.	3305104	EL-595-A	CP Cover Plate with Sensor and Override Switch Assembled (Closet only)
	3305621	EL-1500-L	Closet Sensor Replacement Kit (Closet only, not shown)

† NOTE: For exposed & concealed solenoids manufactured before 2003 or not shown here, consult factory for individual part assembly.

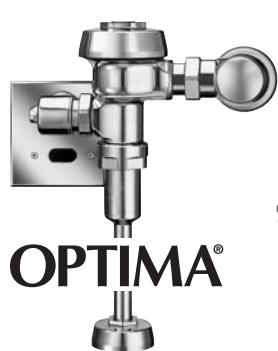
‡ Part number varies with valve model variation; consult factory.

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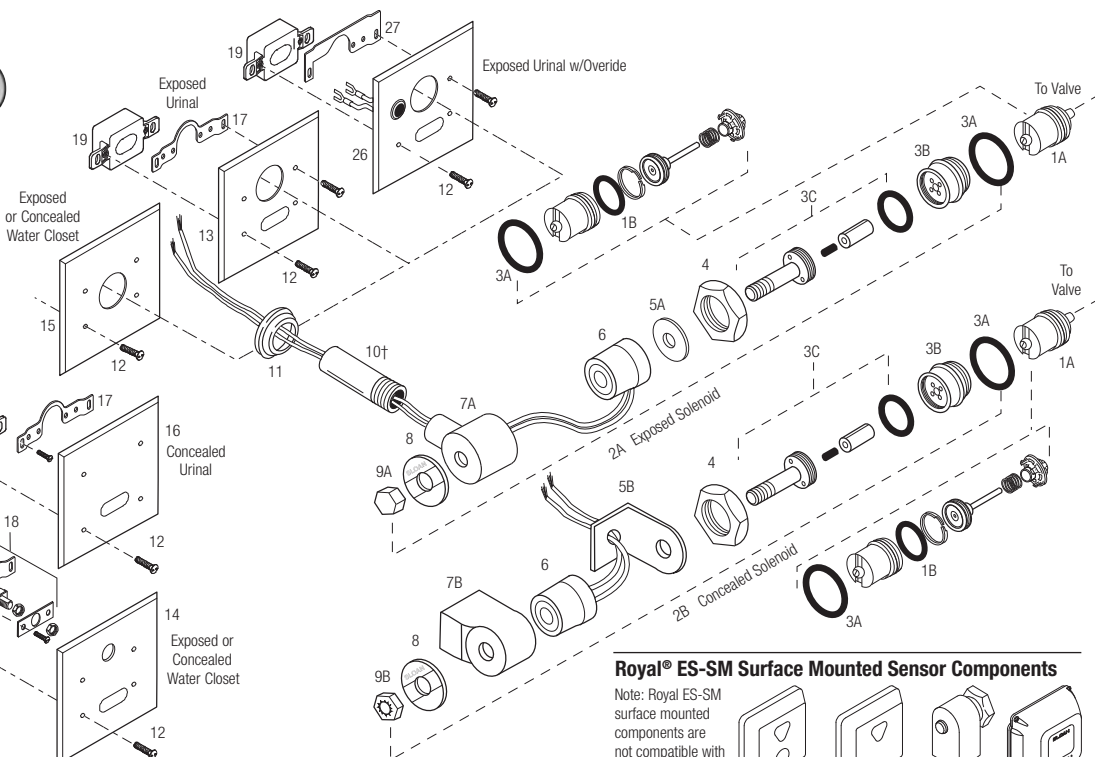
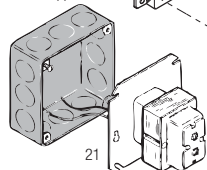
Optima® Flushometers

Old Royal® until 05/09, current Sloan/Regal®

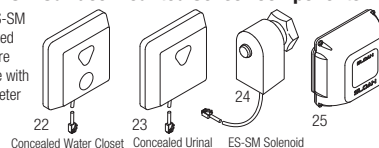


ABBREVIATIONS:
CP - Chrome Plated
RB - Rough Brass
gpf - gallons per flush
Lpf - Liters per flush

NOTE: Gang box is not supplied.

**Royal® ES-SM Surface Mounted Sensor Components**

Note: Royal ES-SM surface mounted components are not compatible with ES-S flushometer components.

**SOLENOID/SENSOR PARTS AND ASSEMBLIES LIST**

Click Product
Code No. to
Purchase Part

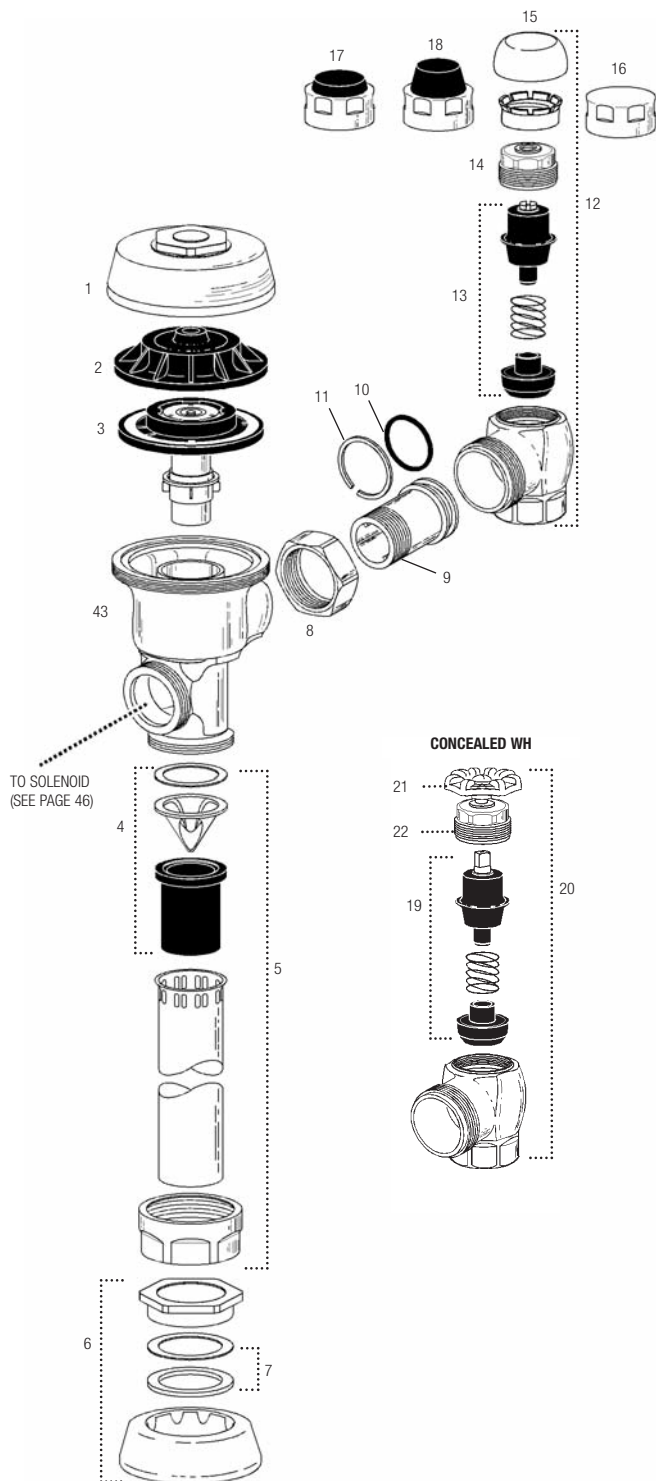
Item No.	Code No.	Part No.	Description
1A.	3305043	EL-128-A	Actuator Cartridge Assembly Repair Kit Includes Spring, Plunger Guide, Solenoid Valve Seat, Valve Piston Assembly, and O-Ring (also available for ES-SM flushometers)
1B.	0305135	EL-110	O-Ring
2A.	0305328	EL-124-1	120V only (no sensor)
	3305044	EL-1029-A	CP Cartridge/Solenoid Kit EL-124-1 (120V) and EL128-A
	0305329	EL-124-2	24 VAC Solenoid Assembly (exposed installation) Includes Handle Coupling, 24 VAC Coil, Face Plate for 24 VAC Solenoid, Solenoid Adapter, Solenoid Shaft Assembly, Nut for Solenoid, Solenoid Housing, Solenoid Flux Plate, and O-Ring
	3305045	EL-1028-A	CP Cartridge/Solenoid Kit EL-124-2 (24V) and EL128-A
2B.	0305330	EL-138-1	120V only (no sensor)
	0305331	EL-138-2	24 VAC Solenoid Assembly (concealed installation) Includes Handle Coupling, 24 VAC Coil, Face Plate for 24 VAC Solenoid, Solenoid Adapter, Solenoid Shaft Assembly, Nut for Solenoid, Solenoid Base Plate and Solenoid Cover Assembly
3A.	0337086	DO-22	O-Ring
3B.	0305132	EL-104	RB Adapter for Solenoid
3C.	0305165	EL-163-A	Solenoid Shaft Assembly Includes Gasket, Plunger, Plunger Spring, and Solenoid Shaft
4.	0301082	A-6	CP Handle Coupling (exposed installation)
5A.	0305166	EL-164	Solenoid Flux Plate (exposed installation) fine thread
5B.	—	EL-542	N/A Separately
6.	0305119	EL-165-1	120 V Coil
	0305118	EL-165-2	24 VAC Coil
7A.	0345120	EL-162-2	CP Solenoid Housing (exposed installation) fine thread
	0305164	EL-162-1	CP Solenoid Housing (120V) course thread also used on pre-2001 24 V
7B.	0305336	EL-541-A	Solenoid Cover Assembly (Includes Flux Plate)
8.	0305127	EL-102-2	Face Plate for 24 VAC Solenoid (exposed installation)

Item No.	Code No.	Part No.	Description
9A.	0305125	EL-101	CP Nut for Solenoid (exposed installation)
9B.	0305167	EL-166	Housing Nut for Solenoid (concealed installation)
10.	0306249	F-15	Tail †
	0305145	EL-123-A	Old Style ESS 24V course thread (120V also)
	0305337PK	EL-226	1-1/4" Extension for EL-123-A course thread
11.	0345150	EL-431-A	CP Flange Assembly (exposed installation)
	0305139	EL-176-A	Old Style ESS 24V course thread (120V also)
12.	0305152	EL-152	CP Screws (requires four screws per cover plate)
13.	0305151	EL-151	CP Cover Plate for Sensor and Solenoid Operator (Urinal only)
14.	0305219	EL-201	CP Cover Plate for Sensor and Override Button (Closet only)
15.	0318066	HY-66	CP Cover Plate for Solenoid Operator (Closet only)
16.	0305161	EL-161	CP Cover Plate for Sensor
17.	0305323	EL-168-A	Yoke Assembly (Urinal only)
18.	0305324	EL-141-A	Override Switch and Yoke Assembly (Closet only)
19.	3305620	EL-1500	Urinal Sensor Replacement Kit (Urinal only)
20.	3305621	EL-1500-L	Closet Sensor Replacement Kit (Closet only)
21.	0345154	EL-154	Transformer (120 VAC) (also available for ES-SM flushometers) 50 VA plate mount
	0345999	EL-342	Transformer (240 VAC) (also available for ES-SM flushometers) 50 VA plate mount
22.	3345047	EL-461	Surface Mounted Sensor and Override Button Assembly (closet only)
23.	3345048	EL-497	Surface Mounted Sensor Assembly (urinal only)
24.	3345048	EL-297	Solenoid Assembly
25.	3365003	ETF-492-A	Control Module
26.	0345266	EL-566-A	Exposed Plate with Override Button (Urinal only)
27.	0345267	EL-567-A	Yoke Assembly for EL-566-A
—	0305148	EL-227	Repair Tool Kit for EL-163-A Repair Kit
—	0345016	EL-387-A	Override Button Replacement for EL-566-A

† NOTE: For exposed & concealed solenoids manufactured before 2001 or not shown here, consult factory for individual part assembly.

Optima® Royal® Flushometers

Click Product
Code No. to
Purchase Part



ABBREVIATIONS:

CP	Chrome Plated
RB	Rough Brass
SD	Screwdriver
WH	Wheel Handle
gpf	gallons per flush
Lpf	Liters per flush

OPTIMA® ROYAL® FLUSHOMETER PARTS LIST

Item No.	Code No.	Part No.	Description
1.	0301172	A-72	CP Cover
2.	0301168	A-71	Inside Cover
3.	SEE DIAPHRAGM ASSEMBLY CHART ON PAGE 42		
4.	3323182	V-651-A	Vacuum Breaker Repair Kit
5.	3393004	V-600-AA	3/4" (19 mm) x 9" (229 mm) CP Vacuum Breaker
	3393006	V-600-AA	1-1/4" (32 mm) x 9" (229 mm) CP Vacuum Breaker
	3393007	V-600-AA	1-1/2" (38 mm) x 9" (229 mm) CP Vacuum Breaker
6.	0306125	F-5-AW	3/4" (19 mm) CP Spud Coupling Assembly
	0306140	F-5-AU	1-1/4" (32 mm) CP Spud Coupling Assembly
	0306146	F-5-AT	1-1/2" (38 mm) CP Spud Coupling Assembly
7.	SEE SLIP JOINT GASKETS AND RINGS TABLE ON ITEM 31A ON NEXT PAGE		
8.	0308676	H-550	CP Stop Coupling
9.	0308801	H-551-A	CP Adjustable Tail 2-1/16" (52 mm) long
10.	5308696	H-553	O-Ring – 24 per package
11.	5308381	H-552	Locking ring – 12 per package
12.	3308386	H-700-A	1" (25 mm) Screwdriver Bak-Chek® Angle Stop CP – complete
	3308384	H-700-A	3/4" (19 mm) Screwdriver Bak-Chek® Angle Stop CP – complete
13.	3308853	H-541-A-SD	Control Stop Repair Kit for use with 1" (25 mm) H-700-A & 3/4" (19 mm) H-700-A, 1" (25 mm) H-600-A, 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-540-A SD Stops
	3308856	H-543-A-SD	Control Stop Repair Kit for use with 3/4" (19 mm) H-600-A and H-540-A SD Stops
14.	0308612	H-622 CP	Bonnet for use with 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-600-A SD Stops
	0308843	H-577	CP Bonnet for use with 3/4" (19 mm) H-600-A SD Stops – OBSOLETE
15.	3308772	H-1010-A	1" (25 mm) Vandal Resistant Control Stop Cap Assembly for use with 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-600-A SD Stops
	3308790	H-1009-A	3/4" (19 mm) Vandal Resistant Control Stop Cap Assembly for use with 3/4" (19 mm) H-600-A SD Stops
16.	0308840	H-573	1" (25 mm) Control Stop Cap CP for use with 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-600-A SD Stops
	0308848	H-582	3/4" (19 mm) Control Stop Cap CP for use with 3/4" (19 mm) H-600-A SD Stops
17.	3308866	H-574	1" (25 mm) Control Stop Cap with Bumper for use with 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-600-A SD Stops
18.	3308867	H-576	1" (25 mm) Control Stop Cap with Extended Bumper for use with 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-600-A SD Stops
19.	3308860	H-1006-A	Repair Kit for 1" (25 mm) Stops with Concealed WH for use with 1" (25 mm) H-700-A, H-600-A, and H-543-AWH WH Series Stops
	3308859	H-1007-A	Repair Kit 3/4" (19 mm) Stops with Concealed WH for use with 3/4" (19 mm) H-700-A WH Series Stops
20.	0388010	H-730-A	1" (25 mm) Concealed WH Bak-Chek® Angle Stop RB
	0388011	H-730-A	3/4" (19 mm) Concealed WH Bak-Chek® Angle Stop RB
21.	3308872	H-1011-A	Repair Kit (for Concealed WH only; does not include bonnet)
42.	0208083	H-623	Bonnet
	0308705	H-561	Bonnet – OBSOLETE
43.	0301048	A-143-A	CP Valve Body
	0301050	A-143-A	RB Valve Body

Optima® Regal® Flushometers

NOTE: Also for use with Regal® XL
(Since mid-2010)

Click Product
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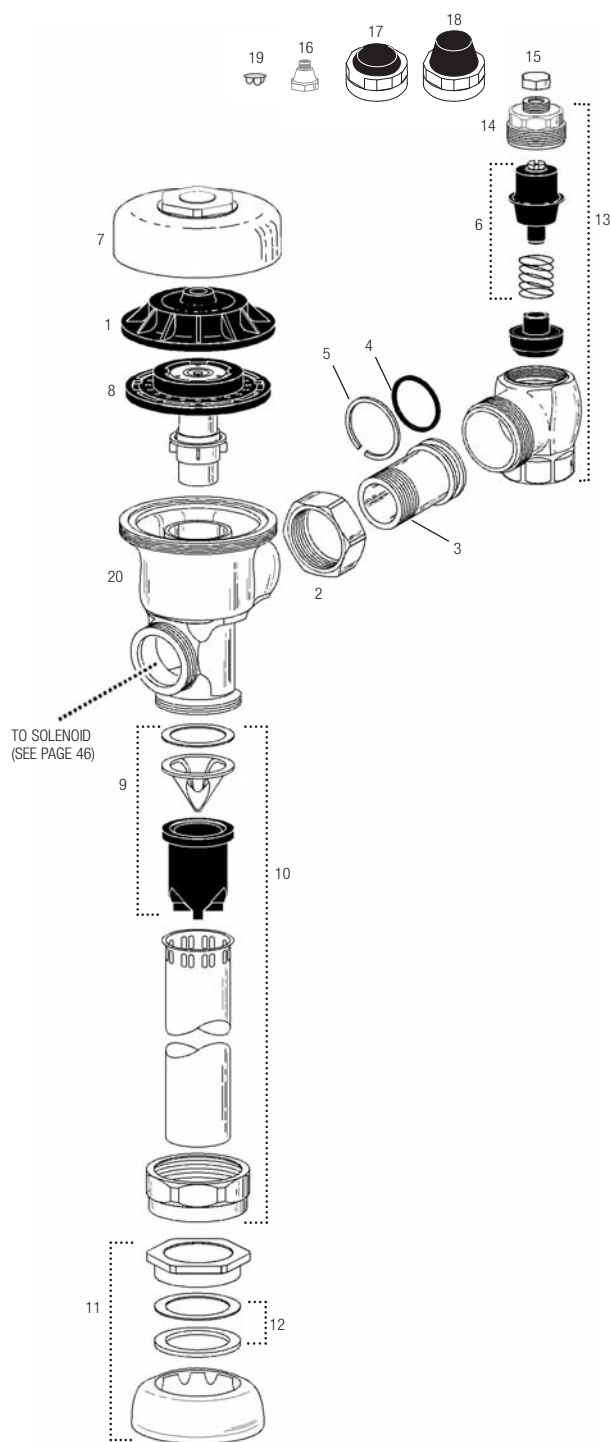
OPTIMA® REGAL® FLUSHOMETER PARTS LIST

Item No.	Code No.	Part No.	Description
1.	0301168	A-71	Inside Cover
2.	0308676	H-550	CP Stop Coupling
3.	0308801	H-551-A	CP Adjustable Tail 2-1/16" (52 mm) long
4.	5308696	H-553	O-Ring – 24 per package
5.	5308381	H-552	Locking ring – 12 per package
6.	3308853	H-541-A-SD	Control Stop Repair Kit for use with 1" (25 mm) H-700-A & 3/4" (19 mm) H-700-A, 1" (25 mm) H-600-A, 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-540-A SD Stops
	3308856	H-543-A-SD	Control Stop Repair Kit for use with 3/4" (19 mm) H-600-A
7.	0317004	R-10	CP Cover
8.	SEE INSIDE PARTS ASSEMBLY CHART ON PAGE 42		
9.	3323192	V-551-A	Vacuum Breaker Repair Kit
10.	5323005	V-500-AA	3/4" (19 mm) x 9" (229 mm) CP Vacuum Breaker
	5323006	V-500-AA	1-1/4" (32 mm) x 9" (229 mm) CP Vacuum Breaker
	5323007	V-500-AA	1-1/2" (38 mm) x 9" (229 mm) CP Vacuum Breaker
11.	0306102	F-54-A	3/4" (19 mm) CP Spud Coupling Assembly
	0306142	F-55-A	1-1/4" (32 mm) CP Spud Coupling Assembly
	0306145	F-56-A	1-1/2" (38 mm) CP Spud Coupling Assembly
12.	SEE SLIP JOINT GASKETS AND RINGS TABLE BELOW		
13.	0388065	H-790-A	1" Screwdriver Stop Adjustable
	0388064	H-790-A	3/4" Screwdriver Stop Adjustable
	0388029	H-740-A	1" (25 mm) SD Bak-Chek® Stop CP – complete
			OBSOLETE
	0388031	H-740-A	3/4" (19 mm) SD Bak-Chek® Stop CP – complete
			OBSOLETE
14.	0308612	H-622	CP Bonnet (Current Regal®)
	0308991	H-639	CP Bonnet for use with 1" (25 mm) & 3/4" (19 mm) H-700-A and 1" (25 mm) H-540-A SD Stops – Pre 2010 Regal® Stops
	0308601	H-538	CP Bonnet for use with H-700-A 3/4" (19 mm) SD Stop – OBSOLETE
15.	5388001	H-1012-A	CP Cap – 6 per package VP
16.	5310034	J-2/J-7	Bumper Assembly – 6 per package – OBSOLETE
17.	3308866	H-574	Stop Cap, chrome plated with Seat Bumper (-YO)
18.	3308867	H-576	Stop Cap, chrome plated with Extended Seat Bumper (-YG)
19.	5388002	H-528	Hole Plug
20.	0301048	A-143-A	CP Valve Body
	0301050	A-143-A	RB Valve Body

NOTE: Also refer to the Royal®, Regal®, control stop and flush connection sections.

ITEM 31A. SLIP JOINT GASKETS AND RINGS

Size	Code No.	Part No.	Description
1-1/2"	5306058	F-3	Red Friction Ring
	5322001	VBF-5	Black Slip Joint Gasket
	0319086/5319086	S-30	Flexible Seat
	0319079	S-21	Rigid Seat (rubber over brass)
1-1/2" x 1-1/4"	0396062	F-105	Slip Joint Gasket – Rigid
1-1/4"	5306057	F-3	Red Friction Ring
	5322176	VBF-5	Black Slip Joint Gasket
	0307052/5307052	G-21	Rigid Seat (rubber over brass)
1"	5306056	F-3	Red Friction Ring
	5306115	F-5	Black Slip Joint Gasket
3/4"	5306055	F-3	Red Friction Ring
	5306113	F-5	Black Slip Joint Gasket



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ROYAL® ESS (ITEM 24) REPAIR KIT

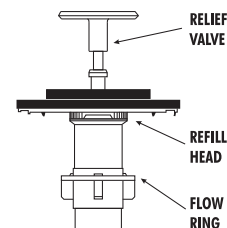
Code No.	Part No.	Description	Relief Valve	Refill Head*	Flow Ring
3345013	EL-1101-A	Low Consumption Water Closets-1.6 gpf (6.0 Lpf)	Green	Gray	Smooth
3345014	EL-1102-A	Water Saver Water Closets-3.5 gpf (13.2 Lpf)	White	Gray	Smooth
3345015	EL-1103-A	9 Liter European Water Closets-2.4 gpf (9.0 Lpf)	Blue	Gray	Smooth
3345016	EL-1106-A	Wash Down Urinals-0.5 gpf (1.9 Lpf)	Green	Black	Smooth
3345017	EL-1107-A	Low Consumption Urinals-1.0 gpf (3.8 Lpf)	Green	Black	Slotted
3345018	EL-1108-A	Water Saver Urinals-1.5 gpf (5.7 Lpf)	Black	Black	Smooth

DIAPHRAGM ONLY KIT

Code No.	Part No.	Description	Relief Valve	Refill Head*	Flow Ring
3301502	A-1041-A	Low Consumption Water Closets-1.6 gpf (6.0 Lpf)	Green	Gray	Smooth
3301501	A-1038-A	Water Saver Water Closets-3.5 gpf (13.2 Lpf)	White	Gray	Smooth
3301506	A-1045-A	High Efficiency Water Closets-1.28 gpf (4.8 Lpf)	Blue	Gray	Smooth
3301505	A-1044-A	9 Liter European Water Closets-2.4 gpf (9.0 Lpf)	Blue	Gray	Smooth
3301504	A-1043-A	Wash Down Urinals-0.5 gpf (1.9 Lpf)	Green	Black	Smooth
3321503	A-1042-A	Low Consumption Urinals-1.0 gpf (3.8 Lpf)	Green	Black	Slotted
3301500	A-1037-A	Water Saver Urinals-1.5 gpf (5.7 Lpf)	Black	Black	Smooth
3301142	A-1047-A	High Efficiency Urinals-0.25 gpf (1.0 Lpf) with White Inserts	White	HEU Black	Smooth
3301143	A-1050-A	High Efficiency Urinals-0.125 gpf (0.5 Lpf) with Green Inserts	White	HEU Black	Smooth

*NOTE: Water closet refill heads (gray) have larger slots than urinal refill heads (black).

To identify the Flush Volume of a DUAL FILTERED DIAPHRAGM ASSEMBLY, look at the color of the relief valve, the refill head and the shape of flow ring.



*NOTE: Water closet refill heads (gray) have larger slots than urinal refill heads (black).

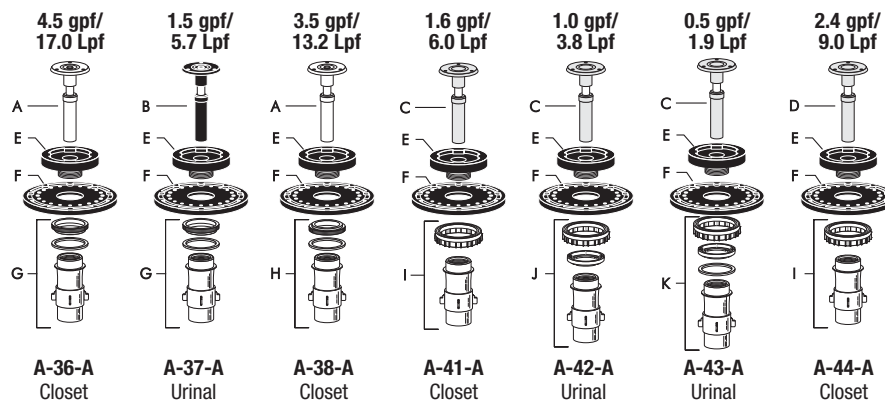
Sensor
Flushometers

REGAL® ESS (ITEM 28)

INSIDE PARTS KITS ASSEMBLY

NOTE: Also for use with Regal® XL (Since mid-2010)

Code No.	Part No.	Description
3301036	A-36-A	4.5 gpf/17.0 Lpf-Closet
3301037	A-37-A	1.5 gpf/5.7 Lpf-Urinal
3301038	A-38-A	3.5 gpf/13.2 Lpf-Closet
3301041	A-41-A	1.6 gpf/6.0 Lpf-Closet
3301044	A-42-A	1.0 gpf/3.8 Lpf-Urinal
3301081	A-43-A	0.5 gpf/1.9 Lpf-Urinal
3301024	A-44-A	2.4 gpf/9.0 Lpf-Closet



REGAL® INSIDE PARTS LIST**

NOTE: Also for use with Regal® XL (Since mid-2010)

Item No.	Code No.	Part No.	Description
A.	5301058	A-19-AC	Relief Valve, White (Closet)
B.	5301059	A-19-AU	Relief Valve, Black (Urinal)
C.	5301211	A-19-ALC	Relief Valve, Green (Closet/Urinal-Low Consumption)
D.	0301143	A-19-AL	Relief Valve, Blue (9 Liter Closet)
E.	5301111	A-15-A	Disc
F.	5301188	A-156-A	Diaphragm
G.	5301236	A-163-A	Guide Assembly 4.5 gpf/17.0 Lpf Closet and 1.5 gpf/5.7 Lpf Urinal
H.	5301032	A-152-A	Guide Assembly 3.5 gpf/13.2 Lpf Closet
I.	5301031	A-151-A	Guide Assembly 1.6 gpf/6.0 Lpf Closet
J.	5301155	A-155-A	Guide Assembly 1.0 gpf/3.8 Lpf Urinal
K.	5301157	A-157-A	Guide Assembly 0.5 gpf/1.9 Lpf Urinal

**NOTE: All Regal® inside part items are supplied in 12 per package.

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SOLENOID/SENSOR KITS LIST

Code No.	Part No.	Description
3305045	EL-124-2	CP 24 VAC Solenoid Assembly for exposed applications. Includes 24 VAC solenoid assembly and actuator cartridge assembly repair kit.
3305154	EL-1001-A	Closet flushometer Electronic Accessories Kit with Override. Includes screws, hex wrench, plate for 2-gang electrical box, mounting plate, override switch, yoke assembly, closet sensor replacement kit, an Optima® sticker and sensor Installation Instructions.
3305170	EL-1005-A	Exposed Urinal flushometer Electronic Accessories Kit. Includes plate for 2-gang electrical box, four screws, yoke, hex wrench, washer, urinal sensor replacement kit, an Optima® sticker and sensor Installation Instructions.
3305172	EL-1007-A	Concealed Urinal flushometer Accessories Kit. Includes screws, yoke, plate for 2-gang electrical box, hex wrench, washer, urinal sensor replacement kit, an Optima® sticker and sensor Installation Instructions.

WALL BOX KITS CLOSET MODELS

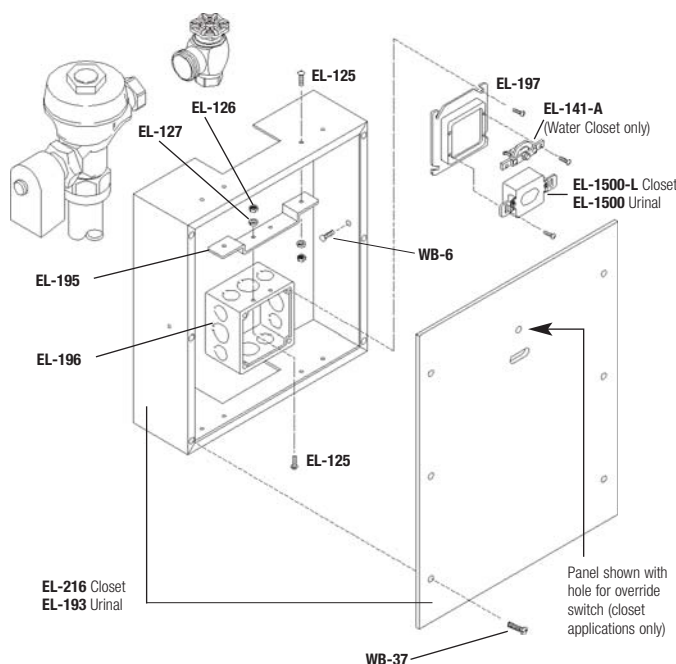
Code No.	Part No.	Description
3305180	EL-192-A	Closet Wall Box Kit – Stainless Steel. Includes four Mounting Screws, four Hex Nuts, four Lock Washers, Mounting Bracket, Electrical Box, Electrical Box Cover, Override Switch Subassembly, Wall Box 13" x 17" (330 mm x 432 mm) with 14.5" x 18.5" (368 mm x 470 mm) Stainless Steel Wall Box Cover with hole for override switch, Spanner Bit and Closet Sensor Replacement Kit.
3305160	EL-192-ALS	Same as EL-192-A. Sensor NOT included.

WALL BOX KITS URINAL MODELS

Code No.	Part No.	Description
3305178	EL-191-A	Urinal Wall Box Kit – Stainless Steel. Includes Mounting Screws, Hex Nuts, Lock Washers, Wall Box 13" x 17" (330 mm x 432 mm) with 14.5" x 18.5" (368 mm x 470 mm) Stainless Steel Wall Box Cover, Mounting Bracket, Electrical Box, Electrical Box Cover, Spanner Bit, Urinal Sensor Replacement Kit.
3305158	EL-191-ALS	Same as EL-191-A. Sensor NOT included.

WALL BOX PARTS

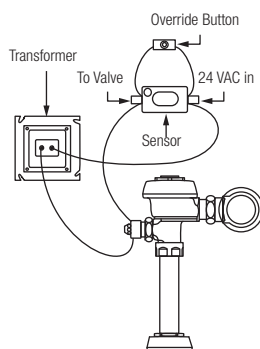
Code No.	Part No.	Description
0305845	EL-318	#8 Spanner Bit for WB-37 Spanner Screws (#8)
0334021	WB-37	Spanner Head Screws for ESS WB
5334000	WB-1000-A	6 Pack of WB-37 Screws
—	EL-216	Wall Box Frame and Stainless Steel Wall Box Cover for Water Closet. Mounting Hardware and Sensor NOT Included.
—	EL-193	Wall Box Frame and Stainless Steel Wall Box Cover for Urinal. Mounting Hardware and Sensor NOT Included.



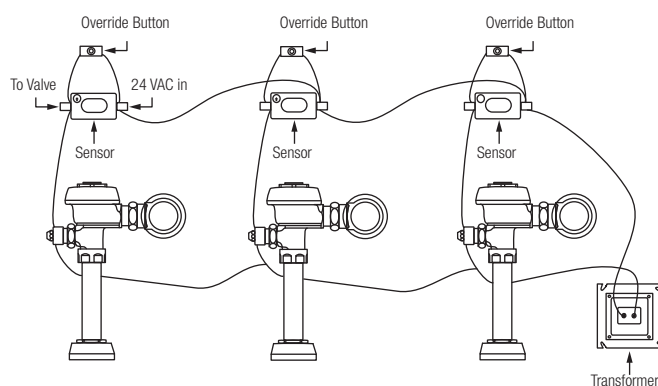
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TYPICAL WIRING DIAGRAM FOR ONE FLUSH VALVE



TYPICAL WIRING DIAGRAM FOR ONE OR MORE FLUSH VALVE(S)



Optima® Flushometers

SENSOR REPLACEMENT

NOTE: The EL-1500 series Optima sensor (a two-wire unit) replaces the older EL-150 series sensors (either three-wire or four-wire units). Refer to the wiring history shown below.

IMPORTANT

- Be certain to disconnect the 24 VAC power supply either at the transformer or the fuse box. Failure to disable the power supply can result in damage to the EL-1500 series sensor.
 - The solenoid activated must be removed from the valve on exposed urinal installations. Do not damage the O-ring seal on the operator assembly.
- Remove the cover plate (for wall box installation, remove cover panel) and old sensor from the wall installation. Use a 5/64" hex wrench to remove the cover plate screws (or #8 drilled spanner head screwdriver EL-318 to remove the vandal-resistant screws from the wall box cover panel.)

FIGURE 1A

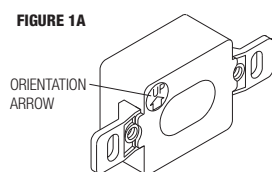
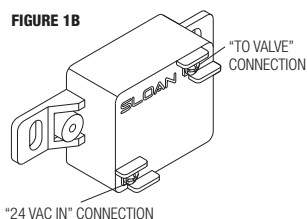


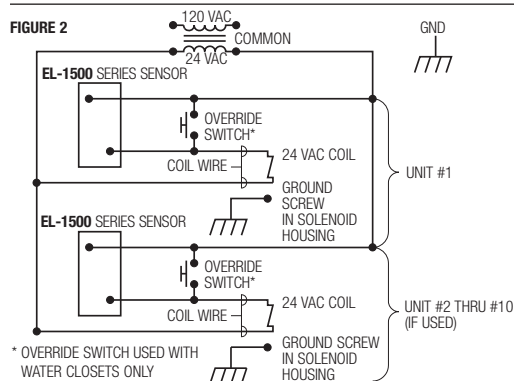
FIGURE 1B



- Connect one 24 VAC lead to the sensor terminal labeled "24 VAC IN" (see Figure 1B).
 - On an old three-wire series EL-150 sensor, this wire was connected to the BLACK sensor lead.
 - On an old four-wire series EL-150 sensor, this wire was connected to the BROWN sensor lead.
- Connect one solenoid lead to the sensor terminal labeled "TO VALVE" (see Figure 1B).
 - On an old three-wire or four-wire EL-150 series sensor, this wire was connected to the RED sensor lead.
- Connect the remaining 24 VAC lead to the remaining solenoid lead.
 - On an old three-wire series EL-150 sensor, these wires were connected to the WHITE sensor leads.
 - On an old four-wire EL-150 series sensor, these wires were connected to the YELLOW and BLUE (or in very early models, the inner BROWN) sensor leads.
- On Water Closet installations only, connect the override button (shown as the override switch in wiring diagram) parallel to the EL-1500-L sensor.
- Reinstall the sensor with the orientation arrow on the lens side of the sensor pointing UP (see Figure 1A). Replace the cover plate (or wall box panel) and tighten the cover plate (or wall box panel) screws.
- Reconnect the 24 VAC power supply at the transformer or the fuse box.

WIRING DIAGRAM

FIGURE 2



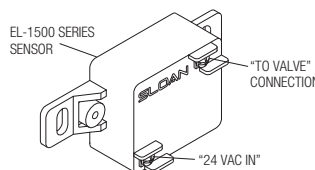
NOTE: A MAXIMUM OF TEN (10) SENSOR FLUSHOMETER UNITS CAN ACTIVATE FROM ONE (1) SLOAN EL-154 TRANSFORMER. CLASS 2 UL LISTED, 48 VA (MIN.) AT 24 VAC, PLATE MOUNTED.

START-UP MODE

The self-adaptive sensor automatically adapts to the surrounding environment when 24 volt supply is activated. No manual adjustments are required. Start-up mode will take approximately one (1) minute to complete its cycle and is important that no non-permanent target is present at this time. A continuous red light visible in sensor window indicates sensor is in the start-up mode. If the red light is flashing, this indicates that the sensor is picking up a target. Unless this target is a permanent fixture in the sensor's environment (i.e., wall or stall door), it must be removed from the view of the sensor. Then, either disconnect the 24 volt supply for twenty (20) seconds or more, or push the manual override button for more than twenty (20) seconds in closet set-up. Reconnect the 24 VAC power supply at the transformer or the fuse box. When the start-up cycle is complete, there will be no light visible in the sensor window.

NOTE: If the 24 volt power supply is ever interrupted for longer than twenty (20) seconds, the start-up mode automatically begins when power is restored.

Incorrect wiring or a short in the 24 volt power supply is indicated by a continuous warning signal seen in the sensor window. The visible red light flashes an "SOS" signal: three (3) slow, three (3) fast, three (3) slow flashes.



START-UP MODE (FOR PREVIOUS SENSOR)

NOTE: It is important that only permanent targets are present at this time.

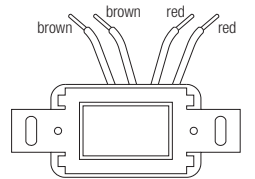
The self-adaptive sensor automatically adjusts to the surrounding environment when the 24 volt supply is activated. No manual adjustment is required. The start-up cycle completes in approximately five (5) minutes. A continuous red light visible in the sensor window indicates the start-up mode. If the red light flashes, the sensor detects a target. Unless this target is a permanent fixture in the sensor's environment (i.e., a wall or stall door), it must be removed from the view of the sensor. If a target is permanent, the sensor will adapt itself around this target. In this case, the start-up mode may take up to ten (10) minutes. When the start-up cycle is complete, the red light will no longer be visible in the sensor window.

NOTE: If the 24 volt power supply is ever interrupted for longer than fifteen (15) seconds, the start-up mode begins automatically when power is restored.

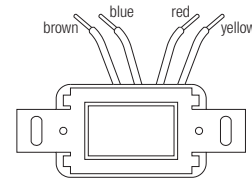
Incorrect wiring or a short in the 24 volt power supply will initiate a warning signal in the sensor window. The visible light flashes a continuous "S-O-S" signal: three (3) fast, three (3) slow, and three (3) fast flashes.

EL-150 Wiring History for 4-wire and 3-wire sensors

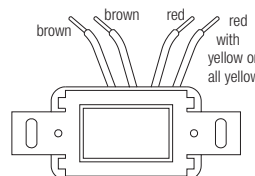
Release date 03/09/78



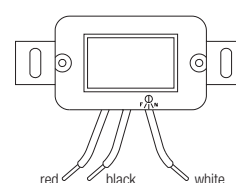
Release date 02/02/87



Release date 08/11/83



Release date 12/12/90



Optima® Flushometers

TROUBLESHOOTING GUIDE

ATTENTION INSTALLERS With the exception of the control stop inlet, DO NOT USE pipe sealant or plumbing grease on any valve component or coupling! To protect the chrome or special finish of Sloan flushometers, DO NOT USE toothed tools to install or service these valves. Use our A-50 Super-Wrench™ or other smooth-jawed wrench to secure couplings. Regulations for low consumption fixtures (1.6 gpf/6.0 Lpf closets and 1.0 gpf/3.8 Lpf urinals) prohibit use of higher flush volumes.

Urinals (EL-1500 Sensor)

When the sensor detects a user, a slow flashing red light appears in the sensor window. After eight (8) to ten (10) seconds, the light flashes rapidly to indicate that the sensor is armed. When the sensor no longer detects a user, the sensor immediately activates the solenoid valve after a 0.5 second delay.

Water Closets (EL-1500-L Sensor)

Detection and activation are the same as for the urinal EL-1500 sensor (ABOVE) except when the sensor no longer detects an user, the sensor activates the solenoid valve after a three (3) second delay.

The EL-1500 urinal and EL-1500-L closet self-adaptive sensors are equipped with a "Sentinel Flush" feature. These units automatically activate the solenoid every twenty-four (24) hours after the last user.

1. Valve does not function (red light does not flash when user steps in front of sensor).

- No power is being supplied to sensor. Ensure that the main power is turned "ON". Check transformer, leads and connections. Repair or replace as necessary.
- EL-1500/EL-1500-L sensor is not operating. Replace sensor.

2. Valve does not function (red light flashes when user steps in front of sensor).

INDICATOR: The red light stops flashing when user steps away and the valve makes a "clicking" sound but does not flush.

- No water is being supplied to the valve. Make certain that water supply is turned "ON" and the control stop is open.
- EL-128-A cartridge is fouled or jammed. Turn electronic power to valve "OFF" (failure to do so could result in damage to the solenoid coil). Remove the solenoid operator from the valve and remove the EL-128-A cartridge. Clean and/or repair as necessary.

INDICATOR: The red light stops flashing when user steps away but the valve does NOT make a "clicking" sound and does NOT flush.

- EL-163-A solenoid shaft assembly is fouled or jammed. Turn electronic power to valve "OFF" (failure to do so could result in damage to the solenoid coil). Remove EL-101 or EL-166 nut from the solenoid operator. Remove the coil from the solenoid operator. Use a spanner wrench or pliers to remove the EL-163-A solenoid shaft assembly from valve. Clean and/or replace as necessary. Be sure to replace plunger spring when reassembling solenoid shaft assembly.

INDICATOR: The red light flashes three (3) fast flashes, three (3) slow flashes then three (3) fast flashes ("S-O-S") and continues to repeat this cycle even when user steps out of the sensor's detection range.

- EL-1500/EL-1500-L sensor wiring connections are incorrect. Rewire sensor to valve. One solenoid lead connects to the "TO VALVE" connection on sensor. One transformer lead connects to the "24 VAC IN" connection on sensor. Second solenoid lead and second transformer lead connect together.
- Wiring to sensor is ground shorted. Find short in wiring circuit and correct.
- EL-165-2 solenoid coil is burnt out or coil is not connected to solenoid plunger shaft. Reinstall or replace coil as necessary.

3. Range too short.

- Power down unit for 30 seconds. Power up. Wait six minutes for calibration.
- If reset does not work, replace.

4. Volume of water is insufficient to adequately siphon fixture.

- Control stop is not open wide enough. Adjust control stop for desired water delivery.
- Low consumption unit is installed on water saver or conventional fixture. Replace diaphragm component parts of valve with kit that corresponds to appropriate flush volume of fixture.
- Inadequate water volume or pressure available from supply. Increase pressure or supply (flow rate) to the valve. Consult factory for assistance.

5. Length of flush is too long (long flushing) or valve fails to shut off.

- Water saver valve is installed on low consumption fixture. Replace diaphragm component parts of valve with kit that corresponds to appropriate flush volume of fixture.
- Relief valve in diaphragm is not seated properly or by-pass hole in diaphragm is clogged. Disassemble inside diaphragm component parts and wash parts thoroughly. Replace worn parts if necessary.

6. Water splashes from fixture.

- Supply flow rate is more than necessary. Adjust control stop to meet flow rate required for proper cleansing of the fixture.
- Closet valve is installed on urinal fixture. Replace closet diaphragm component parts with proper urinal kit (inside diaphragm assembly or inside parts kit).

CARE AND CLEANING INSTRUCTIONS

DO NOT USE abrasive or chemical cleaners to clean flushometers or sensor that may dull the luster and attack the chrome or special decorative finishes. Use **ONLY** mild soap and water, then wipe dry with a clean towel or cloth.

When cleaning the bathroom tile, protect the flushometer from any splattering of cleaner. Acids and cleaning fluids can discolor or remove chrome plating.

When assistance is required, please contact Sloan Technical Support at: 1-888-SLOAN-14 (1-888-756-2614).

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