SLOAN®

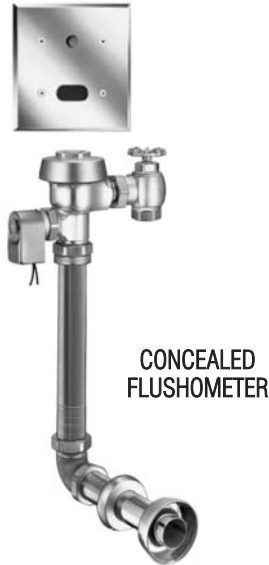## INSTALLATION INSTRUCTIONS FOR OPTIMA® SYSTEMS SENSOR ACTIVATED
ROYAL®, SLOAN® and REGAL® CONCEALED and EXPOSED CLOSET FLUSHOMETERS

EXPOSED
FLUSHOMETER

CONCEALED
FLUSHOMETER

Exposed Closet Flushometers
1-1/2" Top Spud
- Model 110/111 ES-S
- Model 115 ES-S
- Model 116 ES-S

Concealed Closet Flushometers
1-1/2" Exposed Back Spud
- Model 140 ES-S

1-1/2" Exposed Top Spud
- Model 153 ES-S

1-1/2" Concealed Back Spud
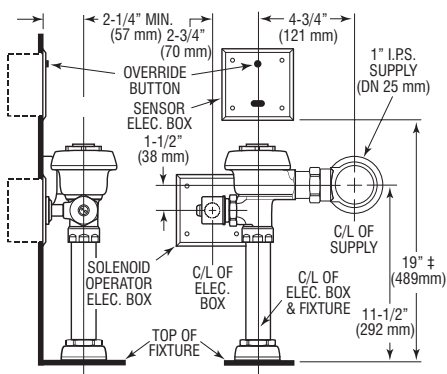- Model 152 ES-S

Made in the U.S.A.

® Listed   ® Listed by I.A.P.M.O.

® Certified

LIMITED WARRANTY

VALVE ROUGH-IN

MODELS 110/111 ES-S

- 2-1/4" MIN. (57 mm) 2-3/4" (70 mm)
- 4-3/4" (121 mm)
- 1" I.P.S. SUPPLY (DN 25 mm)
- OVERRIDE BUTTON
- SENSOR ELEC. BOX
- 1-1/2" (38 mm)
- C/L OF SUPPLY
- SOLENOID OPERATOR ELEC. BOX
- C/L OF ELEC. BOX
- C/L OF ELEC. BOX & FIXTURE
- 19" ‡ (489mm)
- 11-1/2" (292 mm)
- TOP OF FIXTURE

MODELS 115/116 ES-S

- 2-1/4" MIN. (57 mm) 2-3/4" (70 mm)
- 4-3/4" (121 mm)
- 1" I.P.S. SUPPLY (DN 25 mm)
- 1-1/2" (38 mm)
- OVERRIDE BUTTON
- SENSOR ELEC. BOX
- C/L OF ELEC. BOX
- SOLENOID OPERATOR ELEC. BOX
- C/L OF SUPPLY
- MODEL 115 ES-S 24" (610 mm)
- MODEL 116 ES-S 27" (686 mm)
- MODEL 115 ES-S 15" (381 mm)
- MODEL 116 ES-S 17" (432 mm)
- TOP OF FIXTURE

MODEL 140 ES-S

- OVERRIDE BUTTON
- 1" I.P.S. SUPPLY (DN 25 mm)
- 2-3/4" (70 mm) + WALL THICKNESS
- 2-3/4" (70 mm)
- 4-3/4" (121 mm)
- 1-1/2" (38 mm)
- 19" ‡ (483 mm)
- C/L OF SUPPLY
- C/L OF ELEC. BOX & FIXTURE
- 14-1/2" (368 mm)
- TOP OF FIXTURE

MODEL 152 ES-S

- 2-3/4" (70 mm) + WALL THICKNESS
- OVERRIDE BUTTON
- 1" I.P.S. SUPPLY (DN 25 mm)
- 2-3/4" (70 mm)
- 4-3/4" (121 mm)
- 1-1/2" (38 mm)
- C/L OF SUPPLY
- 19" ‡ (483 mm)
- 14-1/2" (368 mm)
- C/L OF ELEC. BOX & FIXTURE
- TOP OF FIXTURE

MODEL 153 ES-S

- 2-3/4" (70 mm) + WALL THICKNESS
- OVERRIDE BUTTON
- 1" I.P.S. SUPPLY (DN 25 mm)
- 2-3/4" (70 mm)
- 4-3/4" (121 mm)
- 1-1/2" (38 mm)
- C/L OF SUPPLY
- C/L OF ELEC. BOX & FIXTURE
- 19" ‡ (483 mm)
- 9" (229 mm)
- 5" (127 mm)
- TOP OF FIXTURE

‡ POSITION OF SENSOR BOX CAN BE RAISED OR LOWERED 1" (25 mm) IF IN CONFLICT WITH HANDICAP GRAB BARS.

SENSOR LOCATION & POSITIONING IS CRITICAL!

Failure to properly position the electrical boxes to the plumbing rough-in will result in improper installation and impair product performance. All tradesmen (plumbers, electricians, tile setters, etc.) involved with the installation of this product must coordinate their work to assure proper product installation.

PRIOR TO FLUSHOMETER INSTALLATION

Prior to installing the Sloan OPTIMA equipped Flushometer, install the items listed below. Refer to Rough-ins on Page 1 and illustrations on this page.

- 2-gang electrical box — 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) for sensor; see paragraph entitled "Sensor/Solenoid Operator Box Locations"
- 2-gang electrical box — 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) for transformer; see paragraph entitled "Transformer Installation" (mount in a convenient location)
- 2-gang electrical box — 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) for solenoid operator, see paragraph entitled "Sensor/Solenoid Operator Box Locations" (Models 110/111 ES-S, 115 ES-S and 116 ES-S)
- Electrical wiring to the transformer box (120 VAC, 2 amp service required for each EL-154, 24 VAC, 50 VA transformer used)
- Closet fixture
- Drain line
- Water supply line

Important:

- *ALL ELECTRICAL WIRING IS TO BE INSTALLED IN ACCORDANCE WITH NATIONAL/LOCAL CODES AND REGULATIONS.*
- *ALL PLUMBING IS TO BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.*
- *WATER SUPPLY LINES MUST BE SIZED TO PROVIDE AN ADEQUATE VOLUME OF WATER FOR EACH FIXTURE.*
- *A 24 VAC STEP-DOWN TRANSFORMER MUST BE USED.*
- *USE APPROPRIATE PRECAUTIONS WHILE CONNECTING TRANSFORMER TO 120 VAC POWER SOURCE.*
- *FLUSH ALL WATER LINES PRIOR TO MAKING CONNECTIONS.*

Royal®, Sloan® and Regal® Flushometers are designed to operate with 15 to 100 psi (104 to 689 kPa) of water pressure. THE MINIMUM PRESSURE REQUIRED TO THE VALVE IS DETERMINED BY THE TYPE OF FIXTURE SELECTED. Consult fixture manufacturer for minimum pressure requirements.

Most Low Consumption water closets (1.6 gallon/6.0 liter) require a minimum flowing pressure of 25 psi (172 kPa).

Protect the Chrome or Special finish of this Flushometer — **DO NOT USE TOOTHED TOOLS TO INSTALL OR SERVICE THE VALVE**. Also, see "Care and Cleaning" section of this manual.

IMPORTANT: EXCEPT FOR CONTROL STOP INLET, DO NOT USE PIPE SEALANT OR PLUMBING GREASE ON ANY VALVE COMPONENT OR COUPLING!

Transformer Installation

Install Transformer (EL-154) on a 2-Gang Electrical Box, 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) in a convenient location; refer to the illustration at upper right side of this page.

Note: One Sloan EL-154 transformer can operate up to ten OPTIMA equipped Flushometers. Run 18-gauge wire from transformer to Flushometer(s). Wire supplied by others. DO NOT supply power to transformer until installation of Flushometer is complete.

Note: A maximum of ten (10) Flushometer units can operate from one (1) Sloan EL-154 Transformer, Class 2, UL Listed, 50 VA (min.) at 24 VAC, plate mounted.

2-GANG ELECTRICAL BOX - 4" x 4" x 2½" (102 mm x 102 mm x 64 mm)

EL-154 TRANSFORMER †

† MOUNT TRANSFORMER WITHIN 50 FEET (15 m) OF FLUSHOMETER
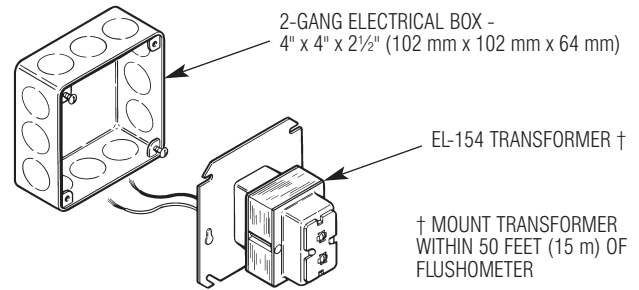
Sensor/Solenoid Operator Box Locations

Exposed closet models employ two (2) electrical boxes while concealed closet models employ one (1) electrical box. Refer to rough-in illustrations for locations.

ELECTRICAL BOX LOCATION IS CRITICAL — Failure to properly position the electrical boxes to the plumbing rough-in will result in improper installation and impair product performance. All tradesmen (plumbers, electricians, tile setters, etc.) involved with the installation of this sensor activated flushometer must be familiar with the requirements of its installation. Improper installation may void the manufacturer's warranty.

Note: A template is packaged with Models 110/111 ES-S valves to properly position electrical boxes. Refer to rough-in illustrations for installation of electrical boxes.

Note: Use Appleton #4SD1 Electrical Box and #8470 Plaster Ring or equivalent.

Exposed Closet Models

Note: Install plaster ring so screw holes are on left and right side of box.

Note: Break tiles to allow screw holes in plaster to show.

Tools Required for Installation

- *Slotted screwdriver*
- *5/64" hex wrench (supplied)*
- *Wire stripper/crimping tool*
- *Sloan A-50 Super-Wrench™, Sloan A-109 Plier Wrench or smooth jawed spud wrench*

─── **!!! IMPORTANT !!!** ───

With the exception of Control Stop Inlet, DO NOT use pipe sealant or plumbing grease on any valve component or coupling!

─── **!!! IMPORTANT !!!** ───

Protect the chrome or special finish of Sloan Flushometers — DO NOT USE toothed tools to install or service these valves. Use a Sloan A-50 Super-Wrench™, Sloan A-109 Plier Wrench or smooth jawed spud wrench to secure all couplings. Also see "Care and Cleaning" section of this manual.
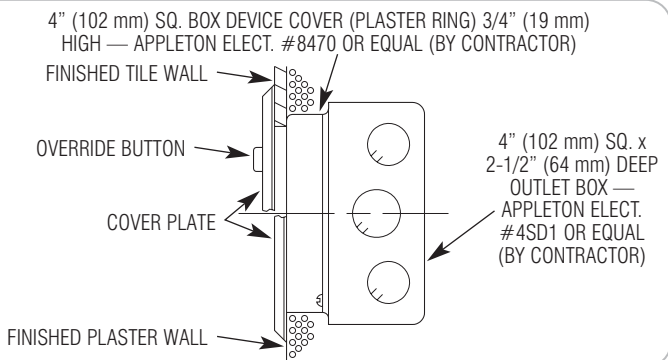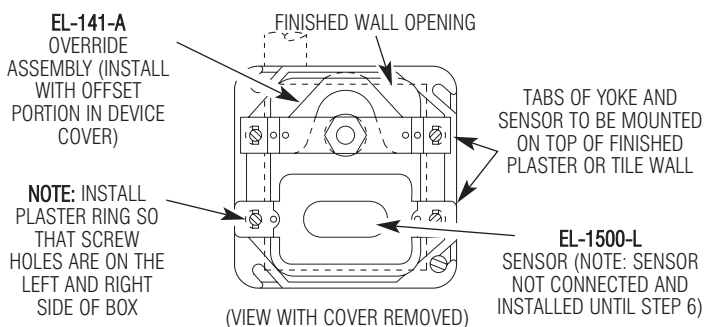
─── **!!! IMPORTANT !!!** ───

This product contains mechanical and/or electrical components that are subject to normal wear. These components should be checked on a regular basis and replaced as needed to maintain the valve's performance.

If you have questions about how to install your Sloan Flushometer, consult your local Sloan Representative or call Sloan Installation Engineering Department at:
1-888-SLOAN-14 (1-888-756-2614) OR 1-847-233-2016

ELECTRICAL BOX INSTALLATION DIAGRAM

EL-141-A OVERRIDE ASSEMBLY (INSTALL WITH OFFSET PORTION IN DEVICE COVER)

FINISHED WALL OPENING

TABS OF YOKE AND SENSOR TO BE MOUNTED ON TOP OF FINISHED PLASTER OR TILE WALL

NOTE: INSTALL PLASTER RING SO THAT SCREW HOLES ARE ON THE LEFT AND RIGHT SIDE OF BOX

EL-1500-L SENSOR (NOTE: SENSOR NOT CONNECTED AND INSTALLED UNTIL STEP 6)

(VIEW WITH COVER REMOVED)

4" (102 mm) SQ. BOX DEVICE COVER (PLASTER RING) 3/4" (19 mm) HIGH — APPLETON ELECT. #8470 OR EQUAL (BY CONTRACTOR)

FINISHED TILE WALL

OVERRIDE BUTTON

COVER PLATE

FINISHED PLASTER WALL

4" (102 mm) SQ. x 2-1/2" (64 mm) DEEP OUTLET BOX — APPLETON ELECT. #4SD1 OR EQUAL (BY CONTRACTOR)
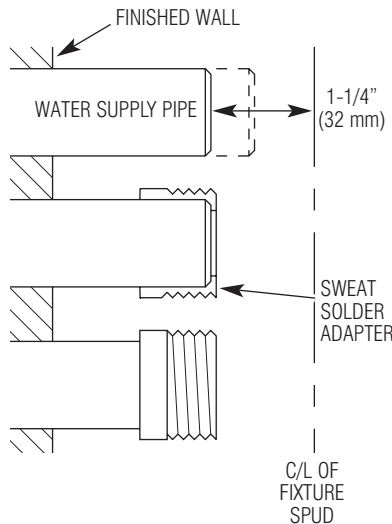
1   Install Optional Sweat Solder Adapter (only if your supply pipe does not have a male thread)

A   Measure from finished wall to C/L of Fixture Spud. Cut pipe 1¼" (32 mm) shorter than this measurement. Chamfer O.D. and I.D. of water supply pipe.

B   Slide Threaded Adapter fully onto pipe.

C   Sweat solder the Adapter to pipe.

FINISHED WALL

WATER SUPPLY PIPE

1-1/4" (32 mm)

SWEAT SOLDER ADAPTER

C/L OF FIXTURE SPUD

!!! IMPORTANT !!!
With the exception of Control Stop Inlet, DO NOT use pipe sealant or plumbing grease on any valve component or coupling!

2   Install Cover Tube, Wall Flange and Control Stop to supply pipe

A   Measure from finished wall to first thread of Adapter or threaded supply pipe (dimension "X"). Cut Cover Tube to this length.

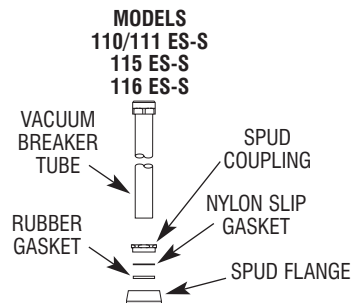**B**   Slide Cover Tube over pipe. Slide Wall Flange over Cover Tube until against wall.

C   Thread Control Stop onto pipe. Tighten with a wrench.
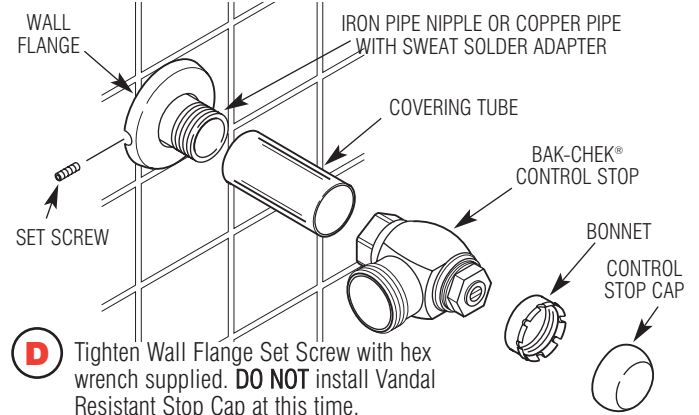
D   Tighten Wall Flange Set Screw with hex wrench supplied. **DO NOT** install Vandal Resistant Stop Cap at this time.
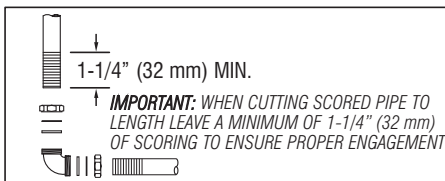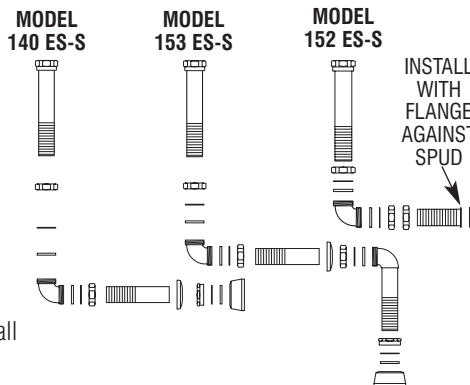
WATER SUPPLY PIPE

X

SWEAT SOLDER ADAPTER

COVER TUBE

WALL FLANGE

SET SCREW

WALL FLANGE

SET SCREW

IRON PIPE NIPPLE OR COPPER PIPE WITH SWEAT SOLDER ADAPTER

COVERING TUBE

BAK-CHEK® CONTROL STOP

BONNET

CONTROL STOP CAP

3   Install Vacuum Breaker Flush Connection

A   Assemble Pipe, Elbows, Couplings, Nylon Slip Gasket, Rubber Gaskets and Flanges as illustrated.
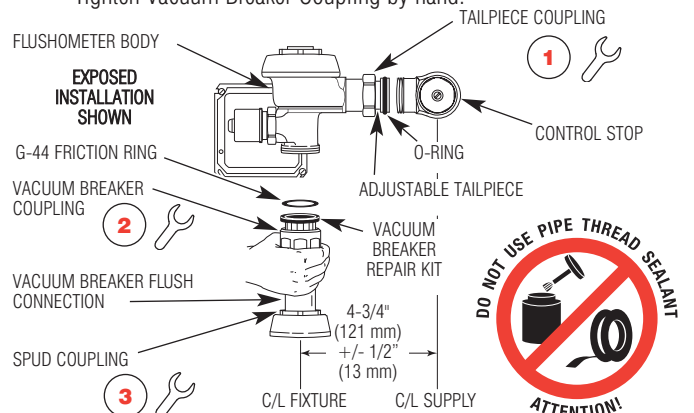
B   Insert Tube into Fixture Spud.

C   Hand tighten all Couplings.

MODELS 110/111 ES-S 115 ES-S 116 ES-S

VACUUM BREAKER TUBE

SPUD COUPLING

NYLON SLIP GASKET

RUBBER GASKET

SPUD FLANGE

MODEL 140 ES-S   **MODEL 153 ES-S**   **MODEL 152 ES-S**

INSTALL WITH FLANGE AGAINST SPUD

1-1/4" (32 mm) MIN.

IMPORTANT: WHEN CUTTING SCORED PIPE TO LENGTH LEAVE A MINIMUM OF 1-1/4" (32 mm) OF SCORING TO ENSURE PROPER ENGAGEMENT

4   Install Flushometer

A   Lubricate tailpiece O-ring with water. Insert Adjustable Tailpiece into Control Stop. Tighten Tailpiece Coupling by hand.

B   Align Flushometer directly above the Vacuum Breaker Flush Connection by sliding the Flushometer Body IN or OUT as needed. Tighten Vacuum Breaker Coupling by hand.

FLUSHOMETER BODY

EXPOSED INSTALLATION SHOWN

G-44 FRICTION RING

VACUUM BREAKER COUPLING

VACUUM BREAKER FLUSH CONNECTION

SPUD COUPLING

TAILPIECE COUPLING

1

CONTROL STOP

O-RING

ADJUSTABLE TAILPIECE

VACUUM BREAKER REPAIR KIT

2

3

4-3/4" (121 mm) +/- 1/2" (13 mm)

C/L FIXTURE   C/L SUPPLY

DO NOT USE PIPE THREAD SEALANT   ATTENTION!

C   Align Flushometer Body and securely tighten first the Tailpiece Coupling (**1**), then the Vacuum Breaker and Pipe Couplings (**2**), and finally the Spud Coupling (**3**). Use a wrench to tighten these couplings in the order shown.

NOTE
Max. adjustment of Sloan Adjustable Tailpiece is ½" (13 mm) IN or OUT from the standard 4¾" (121 mm) (c/l of Valve to c/l of Control Stop).

If roughing-in measurement exceeds 5¼" (133 mm), consult factory for longer tailpiece.

5 Connect Solenoid Operator

A To ease installation, remove the Solenoid Operator from the Flushometer; however, prior to removal, read and adhere to the following precautions.

- When removing the Coil from the Solenoid Plunger Guide, do so only with the power **OFF**. Failure to turn power off can result in damage to the Sensor, Solenoid Coil and Transformer.
- When removing the Solenoid Operator from the Valve, take care not to damage the O-ring seal on the Operator Assembly.
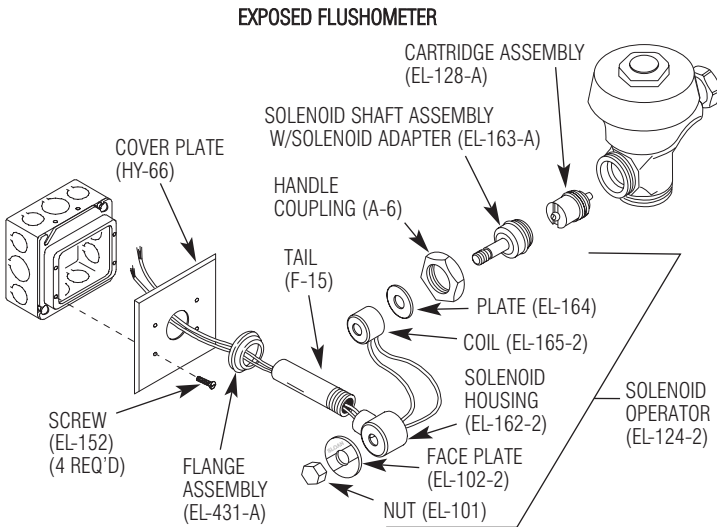
B **Exposed models only** — Slide Coil wires through Tail (F-15) and screw Tail into Solenoid Housing (EL-162-2).

C **Exposed models only** — Slide Flange Assembly (EL-431-A) and Cover Plate (HY-66) over Tail, respectively.

EXPOSED FLUSHOMETER

CONCEALED FLUSHOMETER
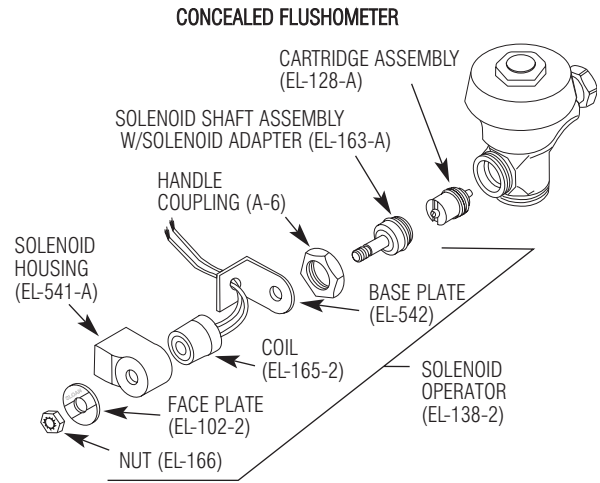
Important: Do not remove coil from solenoid plunger guide unless power has been disconnected. Failure to do so may damage sensor, coil and transformer.

---

6 Electrical Hook-Up

A Be certain power is **OFF** to prevent damage to electrical components. Connect Sensor to Transformer and Solenoid coil EXACTLY as shown.

B Connect 24 volt source lead to terminal labeled "24 VAC IN" of Sensor.

C Connect solenoid lead to terminal labeled "TO VALVE" of Sensor.

D Connect remaining solenoid lead to remaining 24 volt source lead.

E Connect Override Button parallel to the EL-1500-L Sensor. Use 18 gauge wire between Override Button terminals and the connection of the EL-1500-L Sensor

WIRING DIAGRAM
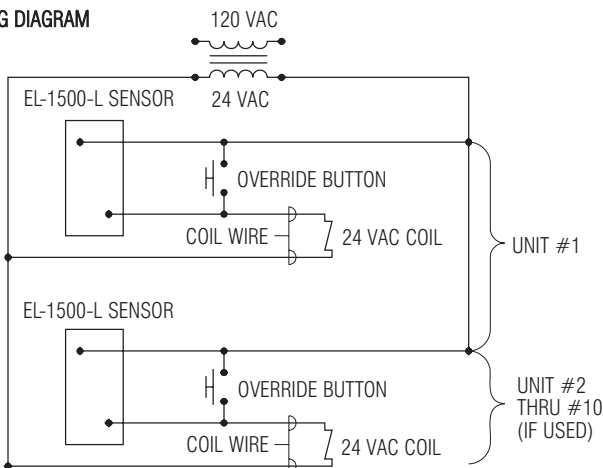
7 Install Sensor, Yoke, Override Button and Cover Plate

A Install OPTIMA Sensor (EL-1500-L) into the 2-gang Electrical Box using two (2) long screws provided. Ensure that Sensor Lens faces outward and horizontally from finished wall

B Install Inner Nut, Bracket and Outer Nut on threaded shaft of Override Button.

C Mount Bracket to Yoke.

D Adjust distance that Override Button will protrude through Wall Plate using Nut on each side of Bracket. Threaded shaft end of Override Button should be flush with Wall Plate. Override Button should be connected parallel to the EL-1500-L Sensor.

E Mount assembled Yoke to Electrical Box.

F Install Sensor Cover Plate (EL-201) and secure with Tamper-Proof Screws (EL-152).
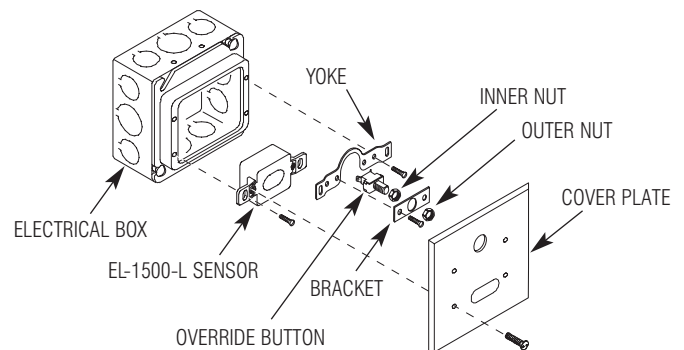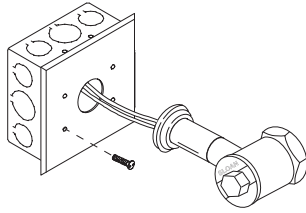
8 Install Solenoid Cover Plate and Secure Solenoid Housing and Coil Assembly (exposed models only)
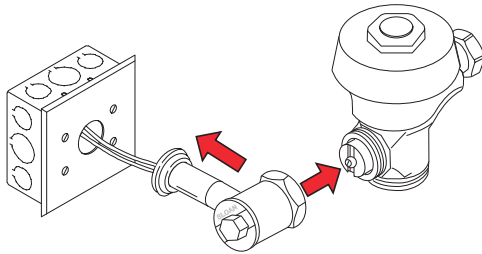
A Install Solenoid Operator Cover Plate (HY-66) and secure with the Tamper-Proof Screws (EL-152) provided.

B Slide Solenoid Flange Assembly (EL-431-A) against Cover Plate (HY-66) and tighten Setscrew to Tail (F-15).
*Note:* Hex key wrench services Tamper-Proof Screws and Setscrew. Tighten solenoid Nut (EL-101).

C Carefully install Solenoid Operator to Flushometer while aligning Tail to Solenoid Cover Plate. Wet O-Ring seal of Solenoid Operator with water to lubricate. Secure Solenoid Operator to Flushometer by tightening Solenoid Coupling. Slide Solenoid Flange Assembly against Solenoid Cover Plate and tighten Set Screw to Tail.
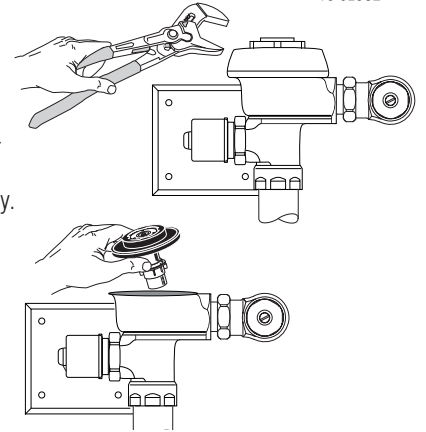
9 Flush Out Supply Line

Exposed Model Shown

A Make sure Control Stop is CLOSED.

TURN COUNTER-CLOCKWISE TO OPEN

TURN CLOCKWISE TO CLOSE
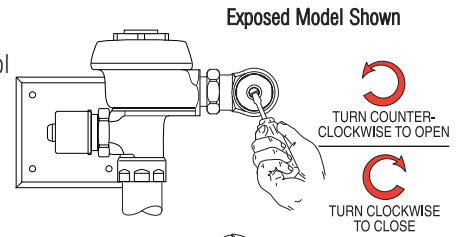
B Remove Flushometer Cover and lift out Inside Parts Assembly. Install Flushometer Cover wrench tight.

C Open Control Stop. Turn on water supply to flush line of any debris or sediment.

D Shut off Control Stop, remove Cover and reinstall Inside Parts Assembly. Install Flushometer Cover wrench tight. Do Not open Control Stop until Step 12.

10 Power and Start-up Mode

*Note: It is recommended that all electronic connections be tested with the water supply **OFF**.*

A Turn Power **ON**. The self adaptive sensor automatically adapts to the surrounding environment when 24 volt supply is activated. No manual adjustments are required.

B Start-up mode will take approximately five (5) minutes 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., a wall or stall door), it must be removed from the view of the sensor. If this 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 completed, no light is visible in sensor window.

Note: If 24 volt power supply is interrupted at any time for more than fifteen (15) seconds, the start-up mode automatically repeats itself when power is restored.

C If indicator light flashes three (3) times slowly, three (3) times rapidly and again three (3) times slowly and continually repeats this signal, this indicates incorrect wiring or a short in the 24 volt supply.
The EL-1500-L self-adaptive sensor is equipped with the sentinel flush feature (automatically flushes every twenty-four (24) hours after last use).

11 Detection/Activation

A When an object is detected, a slowly flashing red light will appear in the sensor window. After approximately eight (8) to ten (10) seconds, the light will flash rapidly indicating sensor is armed and ready to activate solenoid when the object leaves the detection area. The solenoid will be activated within two (2) to four (4) seconds after non–detection.
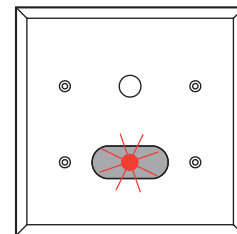
12 Turn Water on and Adjust Control Stop

A Adjust Control Stop to meet the flow rate required for proper cleansing of the fixture. Open Control Stop COUNTERCLOCKWISE 1/2 turn from the closed position.

Exposed Model Shown

TURN COUNTER-CLOCKWISE TO OPEN

TURN CLOCKWISE TO CLOSE
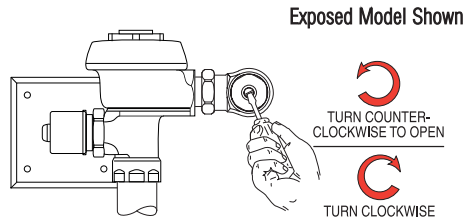
B Activate Flushometer by placing hand in front of OPTIMA Sensor Lens for ten (10) seconds and then moving it away.

C Adjust Control Stop after each flush until the rate of flow delivered properly cleanses the fixture.


!!! IMPORTANT !!!

The Royal®, Sloan® and Regal® Flushometer is engineered for quiet operation. Excessive water flow creates noise, while too little water flow may not satisfy the needs of the fixture. Proper adjustment is made when plumbing fixture is cleansed after each flush without splashing water out from the lip AND a quiet flushing cycle is achieved.


Never open Control Stop to where the flow from the valve exceeds the flow capability of the fixture. In the event of a valve failure, the fixture must be able to accommodate a continuous flow from the valve.

13 Vandal Resistant Control Stop Cap Installation and Removal (exposed models only)

A Thread the Plastic Sleeve onto the Stop Bonnet until it is snug (hand tight only; do not use pliers or a wrench).

B Place the metal Control Stop Cap over the plastic Sleeve and using the palm of the hand, push or "pop" the Cap over the fingers of the Sleeve. The Cap should spin freely on the insert.
Important: DO NOT install the Cap onto the Sleeve unless the Sleeve has been threaded onto the Control Stop Bonnet. If assembled when off of the Control Stop, the Sleeve WILL NOT come apart from the Cap.
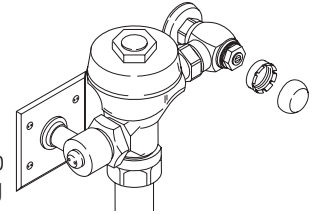
C **To remove Vandal Resistant Stop cap** — Using a large flat screwdriver, gently lift the Cap from the Control Stop as follows. Insert the screwdriver blade between the bottom edge of the Cap and the flat surface of the Control Stop body. Using the screwdriver as a lever, push the screwdriver handle straight back toward the wall. Gently lift the Cap from the Sleeve. It may be necessary to work the screwdriver around the diameter of the cap to further lift the Cap from the Sleeve.
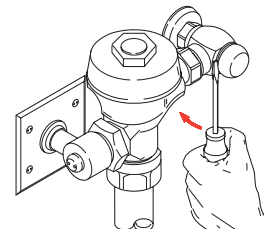
D Once the Cap has been lifted away from the Control Stop, grasp the Cap and pull it off the Sleeve.

Operation

1. A continuous, invisible light beam is emitted from the OPTIMA Sensor.

2. When a user enters the beam's effective range, 22 to 42 inches (559 mm to 1067 mm), the beam is reflected into the OPTIMA's scanning window and transformed into a low voltage electrical signal that activates a ten-second time delay circuit. The time delay circuit eliminates false operation from passers-by in the rest room. Once the time delay is completed, the output circuit is alerted and continues in a "hold" mode for as long as the user remains within the effective range of the sensor.

3. When the user steps away from the OPTIMA Sensor, the loss of reflected light initiates an electrical "one-time" signal that energizes the Solenoid Operator, and activates the Flushometer to flush the fixture. This occurs approximately three (3) seconds after indication. This delay is built into the Sensor to help prevent false flushing due to movement by the user. The circuit then automatically resets and is ready for the next user.
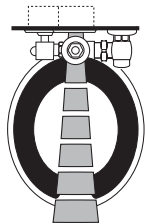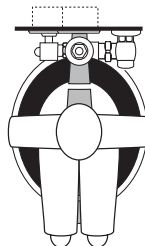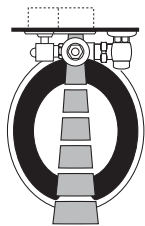
Care and Cleaning

DO NOT use abrasive or chemical cleaners (including chlorine bleach) to clean Flushometers as they may dull the luster and attack the chrome or special decorative finishes. Use ONLY soap and water, then wipe dry with clean cloth or towel.

While cleaning the bathroom tile, the Flushometer should be protected from any splattering of cleaner. Acids and cleaning fluids can discolor or remove chrome plating.
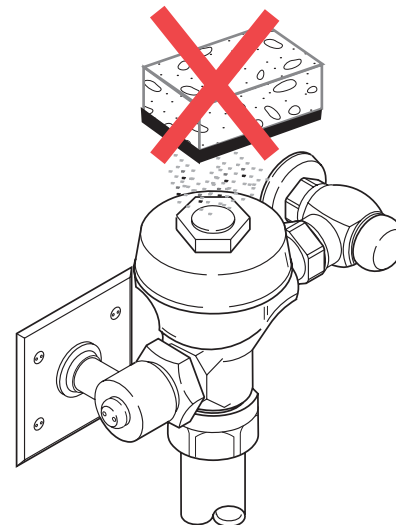
TROUBLESHOOTING GUIDE

NOTE: *Upon detection of the user, the red indicator light flashes **slowly** for a period of eight seconds. When the user leaves the detection range, the indicator light flashes **rapidly** and the Sensor initiates the flush sequence. Then the indicator light **stops** flashing and the valve flushes. The valve will flush after a three-second delay.*

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

CAUSE: *No power is being supplied to sensor.*

SOLUTION: Ensure that the main power is turned "ON." Check transformer, leads and connections. Repair or replace as necessary.

CAUSE: *EL-1500-L Sensor is not operating.*

SOLUTION: Replace EL-1500-L Sensor.

2. PROBLEM: **Valve does not function (red light flashes when user steps in front of Sensor).**

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

CAUSE: *No water is being supplied to the valve.*

SOLUTION: Make certain that water supply is turned "ON" and the Control Stop is open.

CAUSE: *EL-128-A cartridge is fouled or jammed.*

SOLUTION: 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.***

CAUSE: *EL-163-A solenoid shaft assembly is fouled or jammed.*

SOLUTION: 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) short flashes, three (3) long flashes then three (3) short flashes ("S-O-S") and continues to repeat this cycle even when user steps out of the sensor's detection range.***

CAUSE: *EL-1500-L Sensor wiring connections are incorrect.*

SOLUTION: 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.

CAUSE: *Wiring to Sensor is ground shorted.*

SOLUTION: Find short in wiring circuit and correct.

CAUSE: *EL-165-2 solenoid coil is burnt out or coil is not connected to solenoid plunger shaft.*

SOLUTION: Reinstall or replace coil as necessary.

3. PROBLEM: **Volume of water is insufficient to adequately siphon fixture.**

CAUSE: *Control Stop is not open wide enough.*

SOLUTION: Adjust control stop for desired water delivery.

CAUSE: *Low Consumption unit is installed on Water Saver or Conventional fixture.*

SOLUTION: Replace Diaphragm component parts of valve with kit that corresponds to appropriate flush volume of fixture.

CAUSE: *Inadequate water volume or pressure available from supply.*

SOLUTION: Increase pressure or supply (flow rate) to the valve. Consult factory for assistance.

4. PROBLEM: **Length of flush is too long (long flushing) or valve fails to shut off.**

CAUSE: *Water Saver valve is installed on Low Consumption fixture.*

SOLUTION: Replace Diaphragm component parts of valve with kit that corresponds to appropriate flush volume of fixture.

CAUSE: *Relief valve in diaphragm is not seated properly or bypass hole in diaphragm is clogged.*

SOLUTION: Disassemble inside Diaphragm component parts and wash parts thoroughly. Replace worn parts if necessary.

5. PROBLEM: **Water splashes from fixture.**

CAUSE: *Supply flow rate is more than necessary.*

SOLUTION: Adjust Control Stop to meet flow rate required for proper cleansing of the fixture.

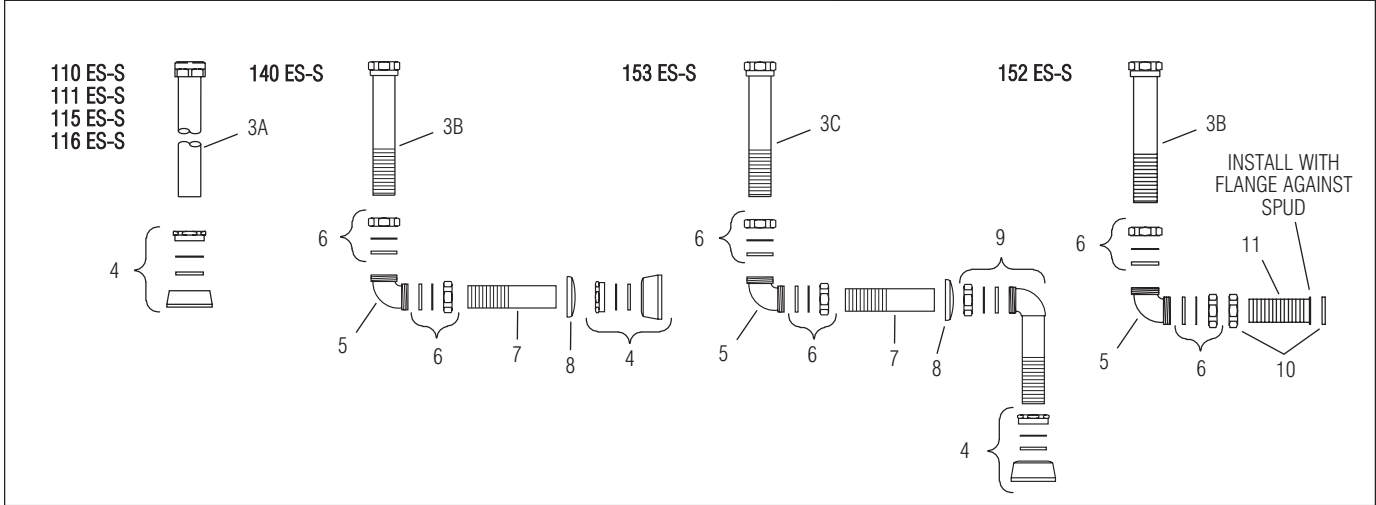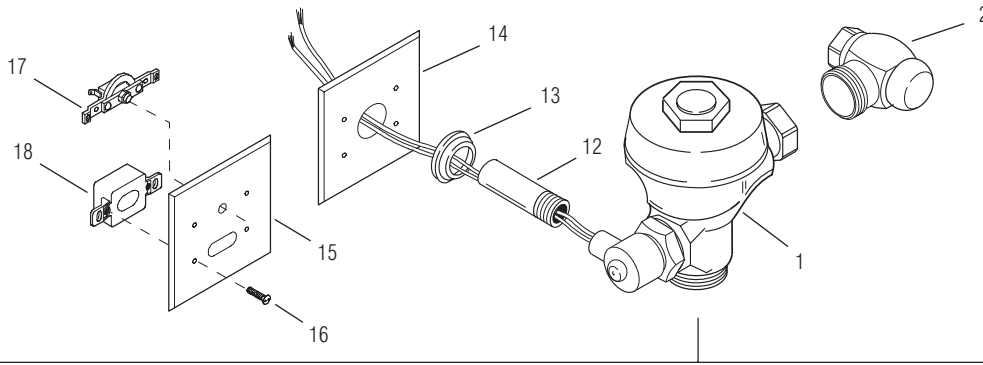**!!! IMPORTANT — Control Stop Setting !!!**

Never open Control Stop to where the flow from the valve exceeds the flow capability of the fixture. In the event of a valve failure, the fixture must be able to accommodate a continuous flow from the valve.

If further assistance is required, please contact Sloan Valve Company Installation Engineering Department at:

1-888-SLOAN-14 *(1-888-756-2614).*

ROYAL PARTS LIST

See Note in Table Below
for Sloan and Regal Parts

Item No.	Part No.	Description
1	‡	Solenoid Operated Valve Assembly
2	H-700-A ‡	Bak-Chek® Control Stop
3A	V-600-A	1-1/2" (38 mm) x 9" (229 mm) Vacuum Breaker Assembly CP (Model 110/111 ES-S)
		1-1/2" (38 mm) x 21-1/2" (546 mm) Vacuum Breaker Assembly CP (Model 115 ES-S)
		1-1/2" (38 mm) x 24-1/2" (622 mm) Vacuum Breaker Assembly CP (Model 116 ES-S)
3B	V-500-A	1-1/2" (38 mm) x 11-1/2" (292 mm) Vacuum Breaker Assembly RB (Models 140 ES-S & 152 ES-S)
3C	V-500-A	1-1/2" (38 mm) x 6" (152 mm) Vacuum Breaker Assembly RB (Model 153 ES-S)
4	F-5-A	1-1/2" (38 mm) Spud Coupling Assembly CP
5	F-21	1-1/2" (38 mm) Double Slip Elbow
6	F-2-AA	1-1/2" (38 mm) Slip Joint Coupling (Set of Two)
7	F-102	1-1/2" (38 mm) Outlet Tube CP
8	F-7	Flange
9	F-25-A	1-1/2" (38 mm) Elbow Assembly
10	F-2-A	Coupling with S-21 Gasket
11	F-102	1-1/2" (38 mm) Outlet Tube CP
12	F-15	Tail Assembly
13	EL-431-A	Flange Assembly
14	HY-66	Cover Plate
15	EL-201	Cover Plate
16	EL-152	Screw (4 Required per Plate)
17	EL-141-A	Yoke and Override Button Assembly
18	EL-1500-L	Closet Sensor

Royal, Sloan and Regal Detailed Parts Breakdown

For a detailed parts breakdown of Royal and Regal Optima ES-S Flushometers, see Maintenance Guide 0816510.

For a detailed parts breakdown of Sloan Optima ES-S Flushometers, see Maintenance Guide 0816725.

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

INSTALLATION TEMPLATE: For Models 110/111 ES-S: Code # 0816157

NOTICE: The information contained in this document is subject to change without notice.