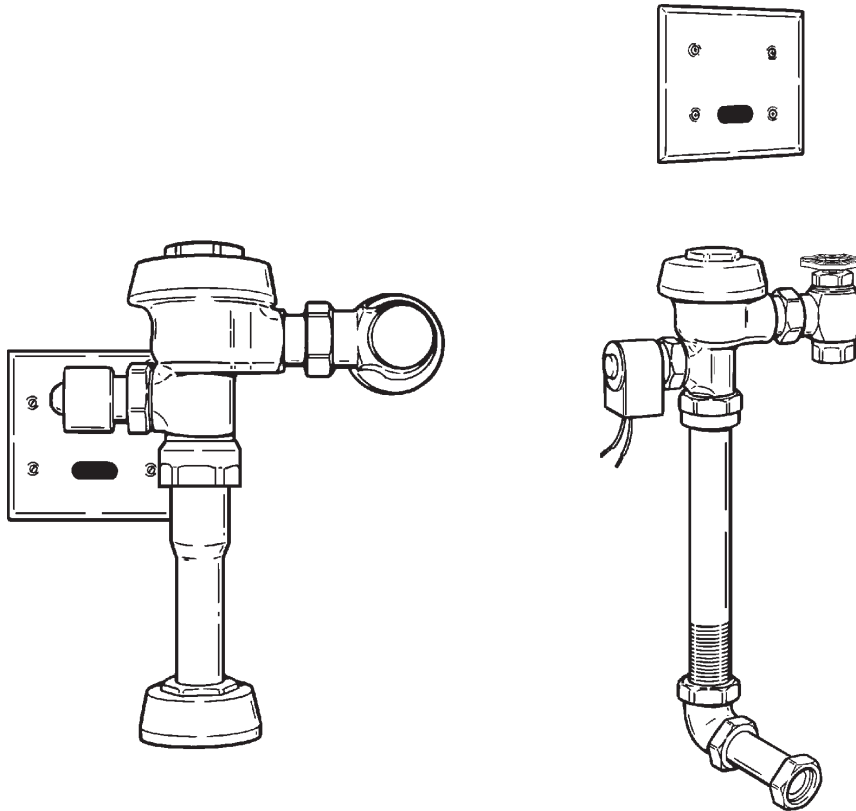




**INSTALLATION INSTRUCTIONS
OPTIMA™ SYSTEMS
SENSOR OPERATED
ROYAL FLUSHOMETER
CONCEALED & EXPOSED
URINAL INSTALLATIONS**



**Exposed Urinal Flushometer
1-1/4" Top Spud
180 ES-S**

**Exposed Urinal Flushometer
3/4" Top Spud
186 ES-S**

**Concealed Urinal Flushometer
1-1/4" Back Spud
190 ES-S**

**Concealed Urinal Flushometer
3/4" Back Spud
195 ES-S**

**Concealed Urinal Flushometer
1-1/4" Top Spud
192 ES-S**

**Concealed Urinal Flushometer
3/4" Top Spud
197 ES-S**

Made in the U.S.A.



Installation of the Sloan OPTIMA™ equipped Flushometer provides the ultimate in sanitary protection and automatic operation *plus* the water economy that makes it the most advanced flushing system ever. There are no handles to trip or buttons to push. The Flushometer uses adaptive infrared technology to sense the user's presence and initiates the flushing cycle once the user steps away.

The OPTIMA equipped Flushometer is designed for easy installation and maintenance and comes complete with the EL-1500 OPTIMA sensor, cover plate and attachment kit, 24 VAC solenoid operator, Bak-Chek® control stop with

vandal resistant stop cap, adjustable tailpiece, vacuum breaker flush connection and spud coupling, and wall and spud flanges (for exposed piping). Specify transformer separately. One Sloan EL-154 transformer can operate up to ten OPTIMA Flushometers.

The following instructions will serve as a guide when installing the OPTIMA equipped Flushometer. As always, good safety practices and care are recommended when installing your new Flushometer. If further assistance is required, contact your nearest Sloan Representative office.

LIMITED WARRANTY

Sloan Valve Company warrants its ES-S Sensor Operated Royal Flushometers to be made of first class materials, free from defects of material or workmanship under normal use and to perform the service for which they are intended in a thoroughly reliable and efficient manner when properly installed and serviced, for a period of three years (1 year for special finishes) from date of purchase. During this period, Sloan Valve Company will, at its option, repair or replace any part or parts which prove to be thus defective if returned to Sloan Valve Company, at customer's cost, and this shall be the sole remedy available under this warranty. No claims will be allowed for labor, transportation or other incidental costs. This warranty extends only to persons or organizations who purchase Sloan Valve Company's products directly from Sloan Valve Company for purpose of resale.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO EVENT IS SLOAN VALVE COMPANY RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY MEASURE WHATSOEVER.

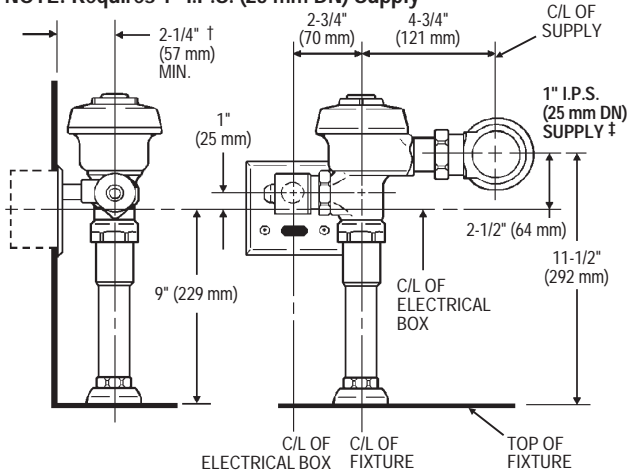
VALVE ROUGH-IN — Figure 1

MODEL 180 ES-S — Conventional, 3.5 gpf (13.2 Lpf)

MODEL 180-1.5 ES-S — Water Saver, 1.5 gpf (5.7 Lpf)

MODEL 180-1 ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)

† NOTE: Requires 1" I.P.S. (25 mm DN) Supply

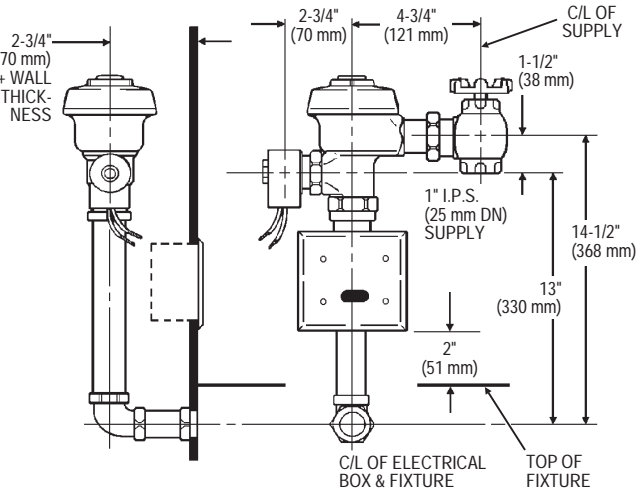


† IF THIS DISTANCE IS GREATER THAN 3" (76 mm) AN EL-226 EXTENSION ADAPTER IS REQUIRED. SPECIFY ONE EL-226 FOR EVERY 1-1/4" (32 mm) INCREMENT OVER 3" (76 mm).

MODEL 190 ES-S — Conventional, 3.5 gpf (13.2 Lpf)

MODEL 190-1.5 ES-S — Water Saver, 1.5 gpf (5.7 Lpf)

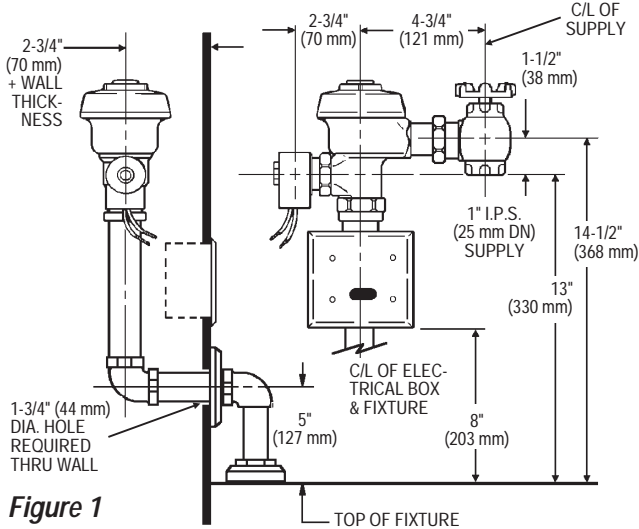
MODEL 190-1 ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)



MODEL 192 ES-S — Conventional, 3.5 gpf (13.2 Lpf)

MODEL 192-1.5 ES-S — Water Saver, 1.5 gpf (5.7 Lpf)

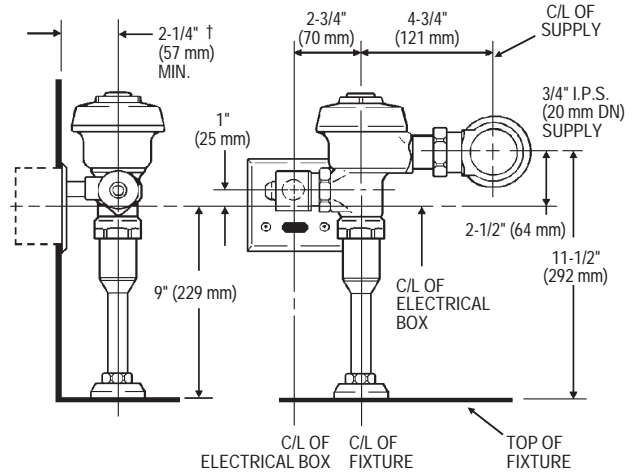
MODEL 192-1 ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)



MODEL 186 ES-S — Water Saver, 1.5 gpf (5.7 Lpf)

MODEL 186-1 ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)

MODEL 186-0.5 — 0.5 gpf (1.9 Lpf)

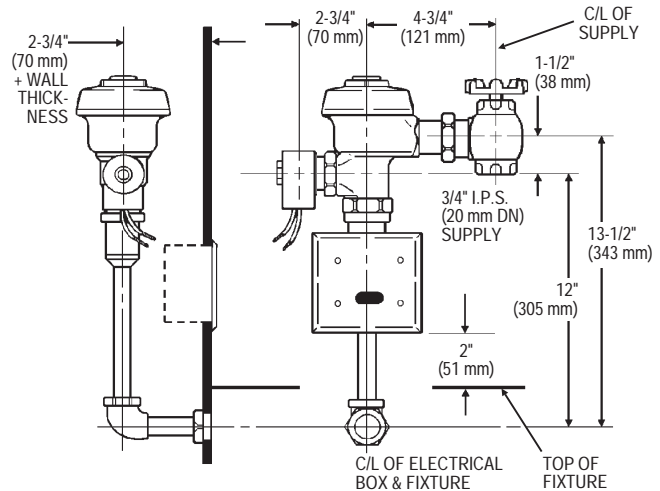


† IF THIS DISTANCE IS GREATER THAN 3" (76 mm) AN EL-226 EXTENSION ADAPTER IS REQUIRED. SPECIFY ONE EL-226 FOR EVERY 1-1/4" (32 mm) INCREMENT OVER 3" (76 mm).

MODEL 195 ES-S — Water Saver, 1.5 gpf (5.7 Lpf)

MODEL 195-1 ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)

MODEL 195-0.5 — 0.5 gpf (1.9 Lpf)



MODEL 197 ES-S — Water Saver, 1.5 gpf (5.7 Lpf)

MODEL 197-1 ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)

MODEL 197-0.5 — 0.5 gpf (1.9 Lpf)

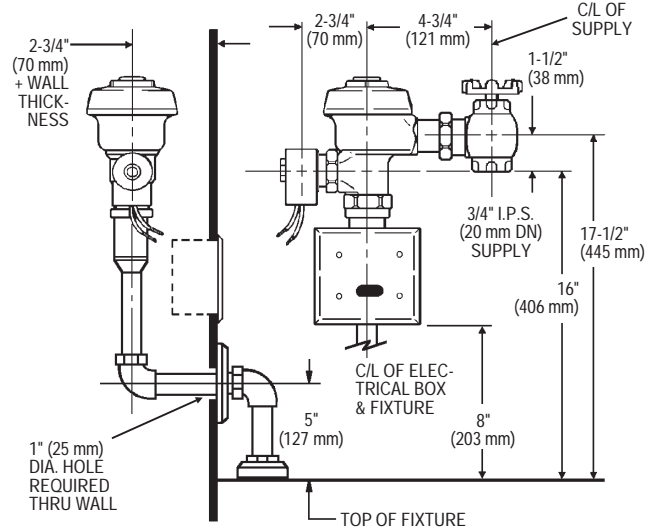


Figure 1

PRIOR TO INSTALLATION

Prior to installing the Sloan OPTIMA equipped Flushometer, install the items listed below as illustrated in Figures 1 through 3.

- 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 Location"
- 2-gang electrical box — 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) for transformer (mount in a convenient location)
- Electrical wiring to the transformer box (120 VAC, 2 amp service required for each EL-154, 24 VAC, 50 VA transformer used)
- Urinal 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.

The Sloan ROYAL[®] is 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 pressure requirements.

Most Low Consumption water closets (1.6 gallon/6 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: WITH THE EXCEPTION OF CONTROL STOP INLET, DO NOT USE PIPE SEALANT OR PLUMBING GREASE ON ANY VALVE COMPONENT OR COUPLING!

SENSOR LOCATION (Figures 1 and 2)

SENSOR LOCATION IS CRITICAL — Failure to properly position the electrical box 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 operated flushometer must be familiar with the requirements of its installation. Improper installation may nullify the manufacturer's warranty.

Note: A template is packaged with Model 180/186 ES-S valves to properly position electrical boxes.

MODELS 180 ES-S & 186 ES-S

Locate the centerline of the 2-gang electrical box by measuring 2-1/2" (64 mm) BELOW the centerline of the water supply and 2-3/4" (70 mm) to the LEFT of the centerline of the Flushometer as shown in Figure 1. Use Appleton #4SD1 Electrical Box and Appleton #8470 Plaster Ring or equivalent.

MODELS 190 ES-S, 192 ES-S, 195 ES-S & 197 ES-S

Locate the 2-gang electrical box on the centerline of the Flushometer and 2" (51 mm) above the top of the urinal fixture as shown in Figure 1. Use Appleton #4SD1 Electrical Box and Appleton #8470 Plaster Ring or equivalent.

ALL 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 ring to show.

TOOLS REQUIRED FOR INSTALLATION

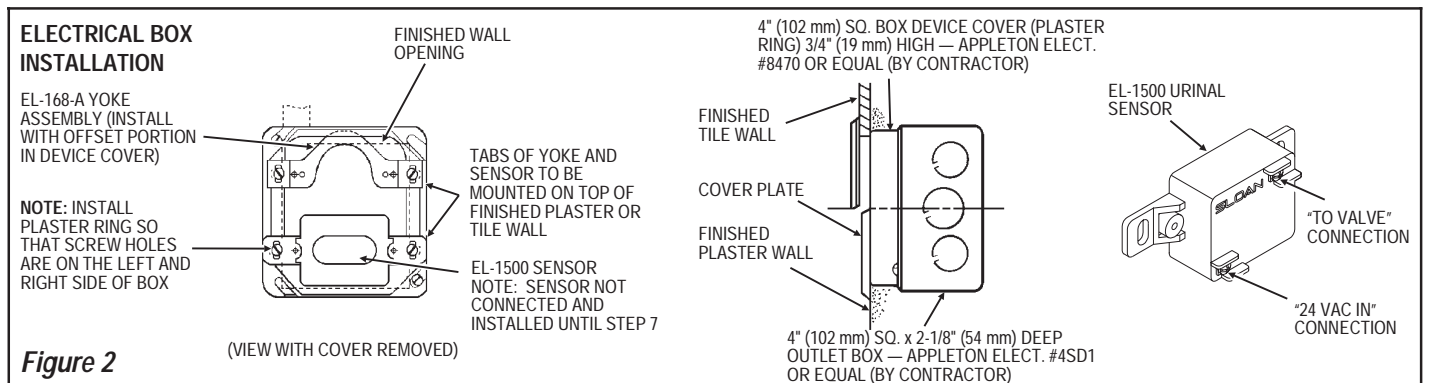
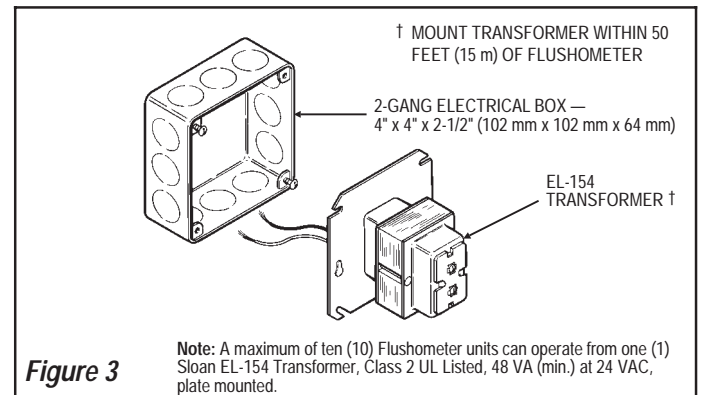
- Slotted screwdriver
- 5/64" hex wrench (supplied)
- Sloan A-50 "Super-Wrench™" or smooth jawed spud wrench
- Wire stripper/crimping tool

INSTALLATION

Step 1 — Install Transformer (Figure 3)

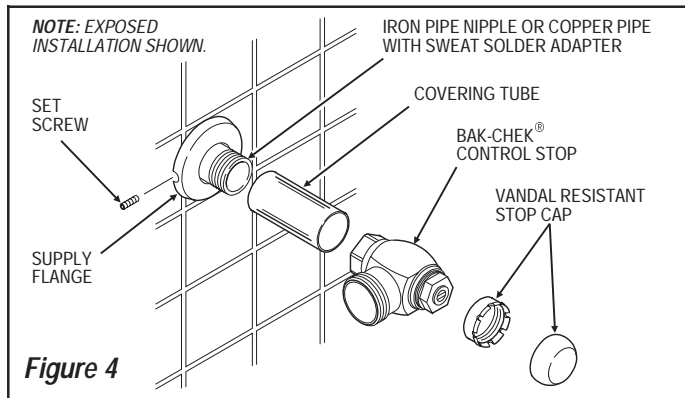
Install Transformer (EL-154) on a 2-Gang Electrical Box, 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) in a convenient location as shown in Figure 3.

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.



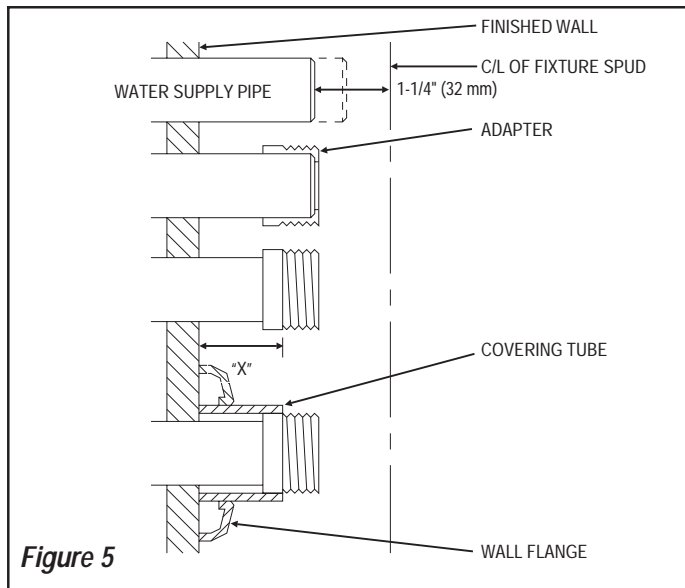
Step 2 — Control Stop Installation (Figures 4 and 5)

Install the Sloan Bak-Chek® Control Stop (and Supply Flange on exposed Flushometer installations) to the water supply line with the outlet positioned as required.



For Sweat Solder applications, refer to the following instructions and Figure 5:

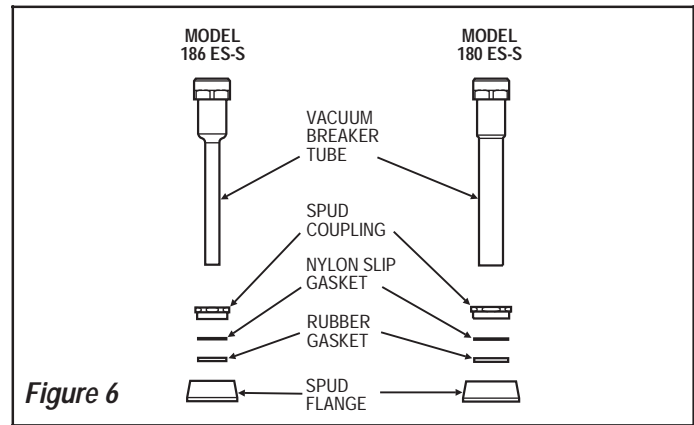
- Measure distance from finished wall to centerline of fixture spud. Cut water supply pipe 1-1/4" (32 mm) shorter than this measurement. Chamfer O.D. and I.D. of water supply pipe.
- Slide Threaded Adapter onto water supply pipe until end of pipe rests against shoulder of Adapter. Sweat solder Adapter to water supply pipe.
- Determine length of Covering Tube by measuring distance from finished wall to the first thread of Adapter (dimension "X" in Figure 5). Cut Covering Tube to this length.
- Slide Covering Tube onto water supply pipe. Slide Wall Flange over Covering Tube until it rests against the finished wall.
- Install the Sloan Bak-Chek® Control Stop to the water supply line with the outlet positioned as required.



Step 3 — Install Vacuum Breaker Flush Connection

MODELS 180 ES-S & 186 ES-S (Figure 6)

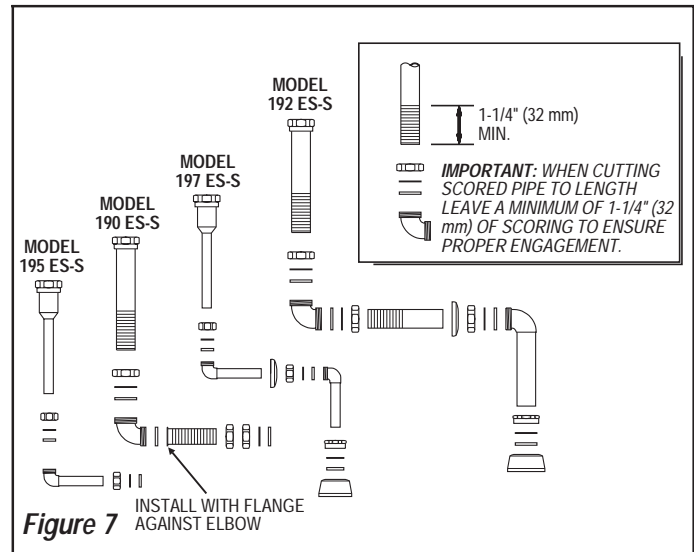
Slide the Spud Coupling, Nylon Slip Gasket, Rubber Gasket and Spud Flange over the Vacuum Breaker Tube and insert tube into fixture spud. Hand tighten Spud Coupling onto fixture spud.



MODELS 190 ES-S, 192 ES-S, 195 ES-S & 197 ES-S (Figure 7)

Note: When cutting scored pipe to fit, leave a minimum of 1-1/4" (32 mm) of scoring to ensure engagement with compression coupling.

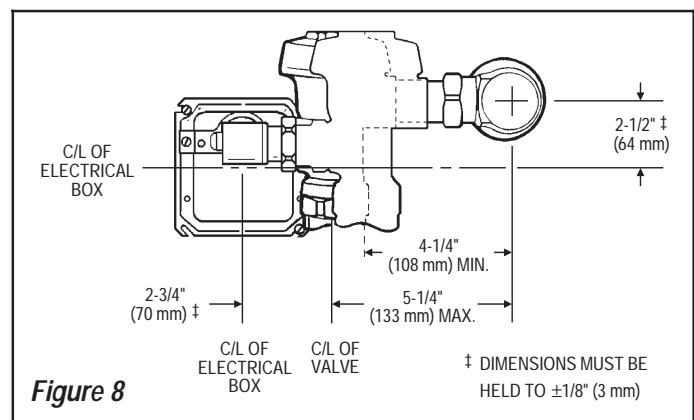
Assemble Pipe, Elbows, Couplings, Nylon Slip Gaskets and Rubber Gaskets as illustrated in Figure 7. Hand tighten all Couplings.



Step 4 — Install Flushometer

SLOAN ADJUSTABLE TAILPIECE (Figure 8)

The Sloan Adjustable Tailpiece compensates for "off-center" roughing-in on the job. Maximum adjustment is 1/2" (13 mm) IN or 1/2" (13 mm) OUT from the standard 4-3/4" (121 mm) (centerline of flushometer to centerline of control stop).



ALL FLUSHOMETER INSTALLATIONS (Figure 9)

Insert Adjustable Tailpiece into Control Stop. Wet O-ring seal with water to lubricate. Secure by hand tightening Tailpiece Coupling.

Align Flushometer Body on top of Vacuum Breaker Flush Connection and secure by hand tightening Vacuum Breaker Coupling.

Align Flushometer Body and securely tighten Tailpiece Coupling, Vacuum Breaker Coupling and Spud Coupling, respectively.

Important Note: Use a Sloan A-50 "Super-Wrench™" or smooth jawed spud wrench to secure all couplings. This will eliminate damage to chrome or special finish that normally occurs when slip-joint pliers, pipe wrenches or other "toothed" tools are used.

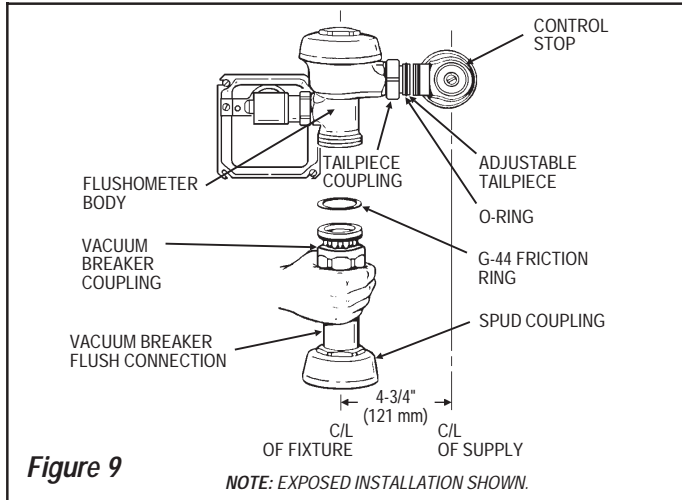


Figure 9

NOTE: EXPOSED INSTALLATION SHOWN.

Step 5 — Remove Solenoid Operator from Valve

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

- Be certain that power to transformer is OFF. Failure to turn power off may result in damage to the EL-1500 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.
- 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 EL-1500 Sensor, Solenoid Coil and Transformer.

Step 6 — Connect Solenoid Operator

EXPOSED FLUSHOMETER INSTALLATIONS — MODELS 180 ES-S & 186 ES-S (Figure 10)

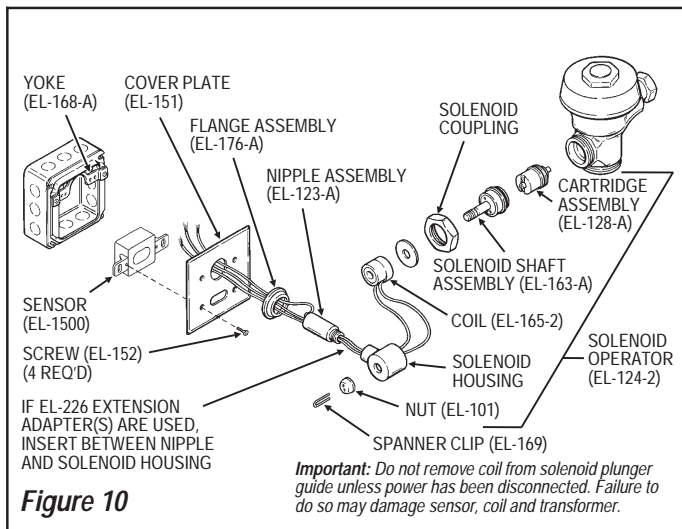


Figure 10

Slide Coil wires through Solenoid Nipple Assembly (EL-123-A) and screw Nipple into Solenoid Housing. Slide Flange Assembly (EL-176-A) and Cover Plate (EL-151) over Nipple Assembly, respectively.

If rough-in from wall exceeds 3" (76 mm), use EL-226 Extension Adapter with Nipple Assembly (not supplied as standard).

Step 7 — Electrical Hook-Up (Figure 11)

Be certain power is OFF to prevent damage to electrical components. Connect Sensor to Transformer and Solenoid Coil EXACTLY as shown in Figure 11 and instructed below.

WIRING DIAGRAM

Note: A maximum of ten (10) sensor Flushometer units can operate from one (1) Sloan EL-154 transformer. Class 2 UL Listed, 48 VA (min.) at 24 VAC, plate mounted.

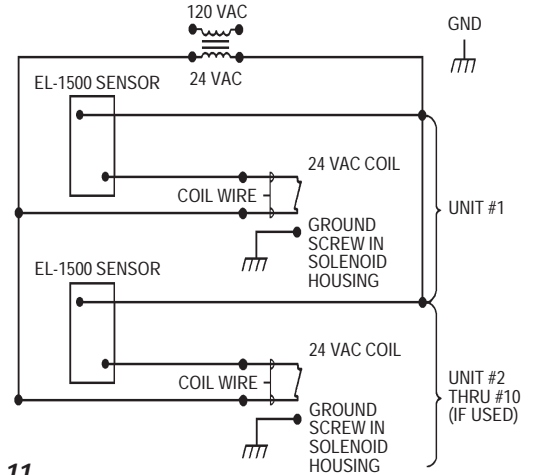


Figure 11

INSTALLATION OF THE EL-1500 SENSOR (Figure 2)

- Connect 24 volt source lead to terminal labeled "24 VAC IN" of new Sensor shown in Figure 2.
- Connect solenoid lead to terminal labeled "TO VALVE" of new Sensor shown in Figure 2.
- Connect remaining solenoid lead to remaining 24 volt source lead.

Step 8 — Mount OPTIMA Sensor and Yoke (Figure 2)

Install OPTIMA Sensor (EL-1500) into the 2-gang Electrical Box using two (2) long screws provided. Ensure that Sensor Lens faces outward and horizontally from finished wall. Mount Yoke (EL-168-A) using two (2) long screws provided.

Step 9 — Install Sensor Cover Plate (Figure 10)

Install Sensor Cover Plate (EL-151, Exposed; EL-161, Concealed) and secure with Tamper-Proof Screws (EL-152), provided.

Step 10 — Secure Solenoid Housing and Coil Assembly (Figure 10)

MODELS 180 ES-S & 186 ES-S

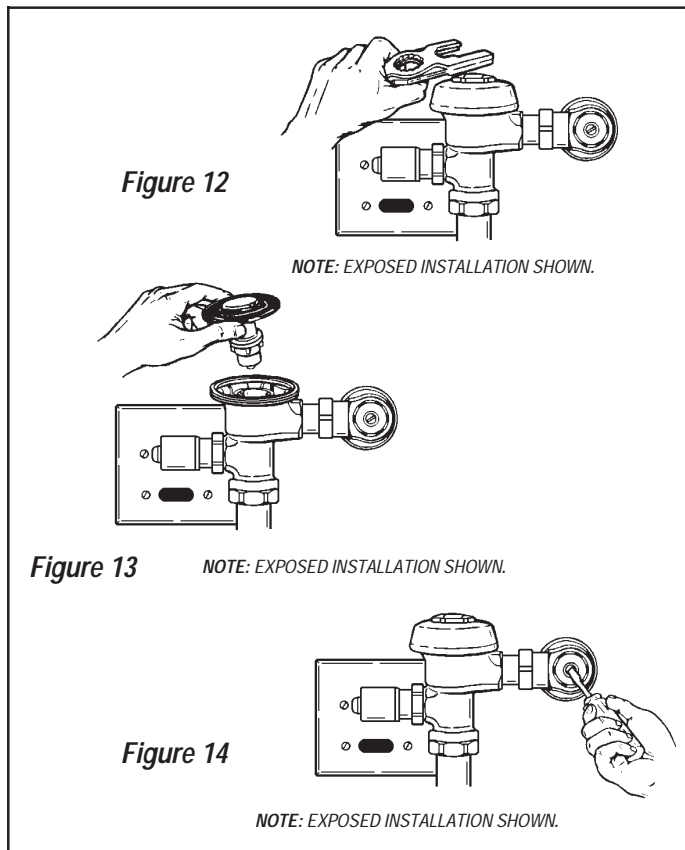
Carefully install Solenoid Operator to Flushometer while aligning Nipple Assembly to Cover Plate. Wet O-Ring seal of Solenoid Operator with water to lubricate. Secure Solenoid Operator to Flushometer by tightening Solenoid Coupling. Slide Solenoid Flange Assembly (EL-176-A) against Sensor Cover Plate (EL-151) and tighten Setscrew to Nipple (EL-123-A).

Note: Hex key wrench services Tamper-Proof Screws and Setscrew. Tighten solenoid Nut (EL-101) with Spanner Clip (EL-169).

Step 11 — Flush Out Supply Line (Figures 12 and 13)

Shut off Control Stop and remove Flushometer Cover. Lift out the Inside Parts Assembly as a complete unit. Install Flushometer Cover wrench tight and open Control Stop. Turn on water supply to flush line of any debris or sediment.

After completion, shut off Control Stop, remove Cover and reinstall Inside Parts Assembly. Install Flushometer Cover wrench tight.



Step 12 — 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 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, there will be no light 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.

When 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 self adaptive sensor is equipped with the sentinel flush feature (automatically flushes every twenty-four (24) hours after last use).

Step 13 — Detection/Activation

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 is no longer detected. The solenoid will be activated within two (2) to four (4) seconds after non-detection.

Step 14 — Adjust Control Stop (Figure 15)

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. Activate Flushometer by placing hand in front of OPTIMA Sensor Lens for ten (10) seconds and then moving it away. Adjust Control Stop after each flush until the rate of flow delivered properly cleanses the fixture.

Important Note: The Sloan ROYAL[®] 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:

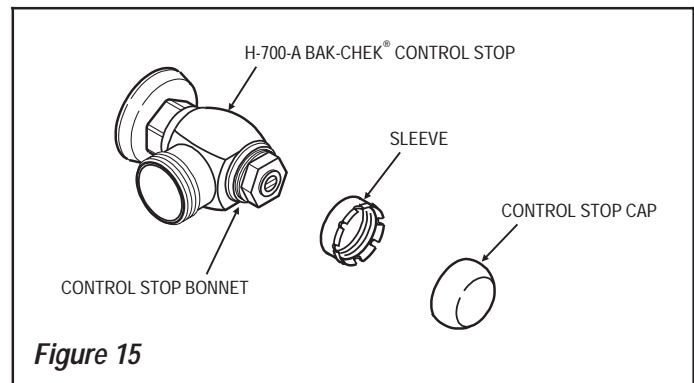
1. The plumbing fixture is cleansed after each flush without splashing water out from the lip.
2. A quiet flushing cycle is achieved.

After adjustment: Install the Vandal Resistant Control Stop Cap to the Control Stop (refer to Vandal Resistant Control Stop Cap installation instructions).

VANDAL RESISTANT CONTROL STOP CAP INSTALLATION INSTRUCTIONS (Figure 15)

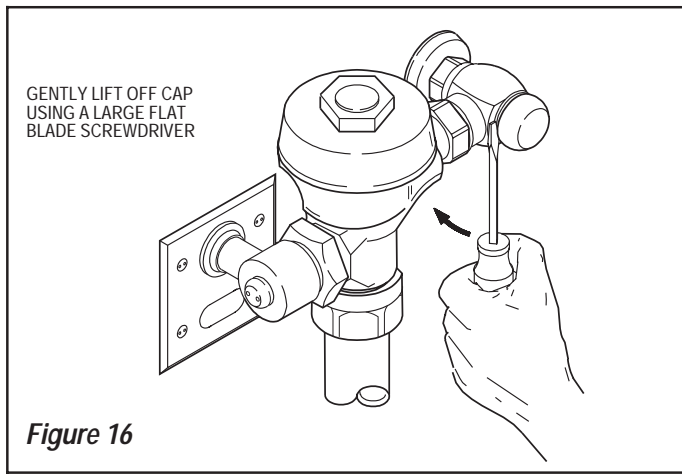
1. Thread the Plastic Sleeve onto the Stop Bonnet until it is snug (hand tight only; do not use pliers or a wrench).
2. Place the metal Control Stop Cap over the plastic Sleeve and using the palm of the hand, push or "pop" the Cap over the fingers of the Sleeve. The Cap should spin freely on the insert.

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.



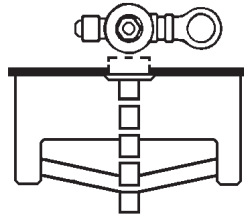
VANDAL RESISTANT CONTROL STOP CAP REMOVAL INSTRUCTIONS (Figure 16)

1. 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 as shown in Figure 16. 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.
2. Once the Cap has been lifted away from the Control Stop, grasp the Cap and pull it off the Sleeve.

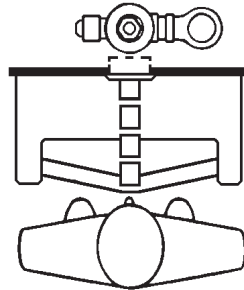


OPERATION

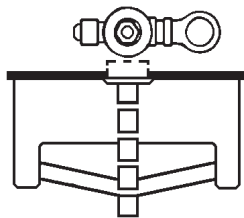
1. A continuous, invisible light beam is emitted from the OPTIMA Sensor.



2. As the user enters the beam's effective range, 15 to 30 inches (381 mm to 762 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. The circuit then automatically resets and is ready for the next user.



CARE AND CLEANING INSTRUCTIONS

DO NOT use abrasive or chemical cleaners 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

- I. Valve does not Function (red light does not flash when user steps in front of sensor)**
 - A. **No power to sensor** — Make certain that power is on. Check Transformer, leads and connections. Repair or replace as necessary.
 - B. **EL-1500 sensor not operating** — Replace EL-1500 Sensor.
- II. Valve does not Function (red light flashes when user steps in front of sensor)**

Under normal operation, the red light should flash slowly for the first 8 seconds of user detection. Light should then flash rapidly which indicates that the Sensor is armed and ready to flush the fixture when user leaves the field of view.

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

 - A. **No water to the valve** — Make certain that water is on and Control Stop is open.
 - B. **EL-128-A Cartridge is fouled or jammed (refer to Figure 10)** — Turn off power to valve. Remove Solenoid Operator from valve and remove EL-128-A Cartridge. Clean and/or replace as necessary.

If red light stops flashing when user steps away and valve does not make a "clicking" sound and does not flush:

 - A. **EL-163-A Solenoid Shaft Assembly is fouled or jammed (refer to Figure 10)** — Turn off power to valve. Remove Coil from Solenoid Operator. Using a spanner wrench or pliers, remove EL-163-A Solenoid Shaft Assembly from Valve. Clean and/or replace as necessary.

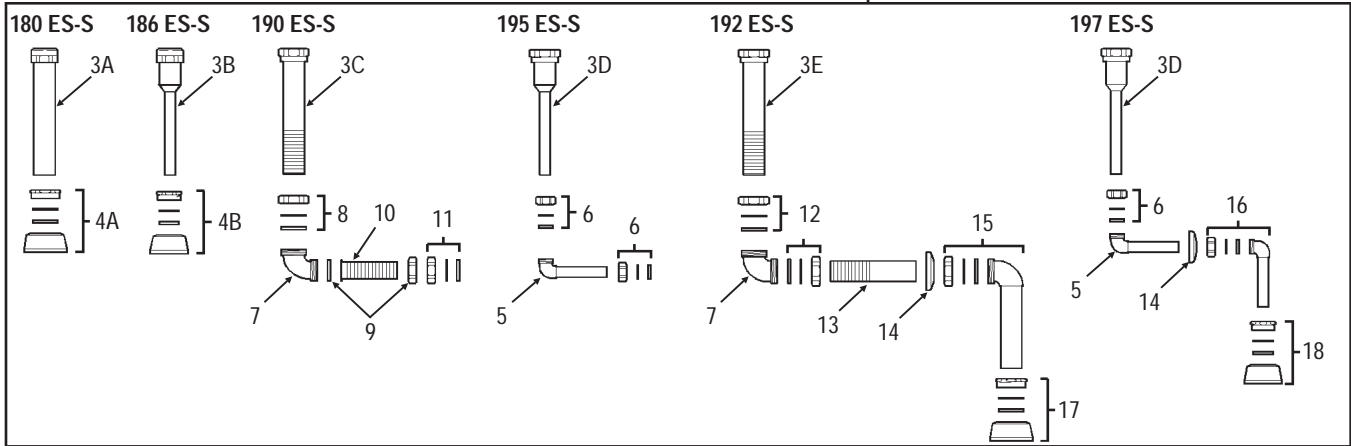
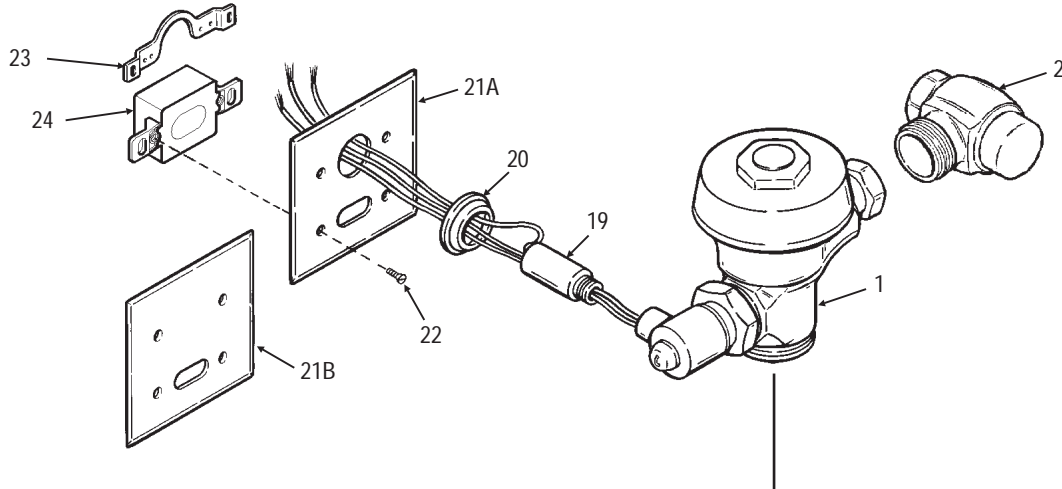
If red light is flashing (3) short flashes, (3) long flashes then (3) short flashes (S-O-S) and continues to repeat this cycle even when the user steps away from the valve:

 - A. **EL-1500 Sensor is wired incorrectly** — Rewire Sensor and Valve properly (refer to Figure 11).
 - B. **Wiring to sensor is ground shorted** — Find short in wiring and correct.
 - C. **EL-165-2 Solenoid Coil burned out or coil is off solenoid plunger shaft** — Reinstall or replace Coil as necessary.
- III. Insufficient Volume of Water to Adequately Siphon Fixture**
 - A. **Control stop not open enough** — Adjust Control Stop for desired delivery of water.
 - B. **Low consumption valve installed on water saver or conventional fixture** — Replace Inside Parts of Valve with kit for proper flush delivery.
 - C. **Inadequate volume or pressure at supply** — Increase water pressure or supply (flow) to the Valve. Consult factory for assistance.
- IV. Length of Flush Too Long (long flushing) or Valve Fails to Close Off**
 - A. **Water Saver valve installed on low consumption fixture** — Replace Inside Parts of Valve with kit for proper flush delivery.
 - B. **Relief valve in Inside Parts Kit is not seating properly or bypass hole in diaphragm is clogged because of foreign material or closed by an invisible gelatinous film caused by over treated water** — Disassemble the Inside Parts assembly and wash thoroughly. Replace if necessary.
- V. Water Splashes from Fixture**
 - A. **Supply volume is open more than necessary** — Adjust Control Stop to meet flow rate required for proper cleansing of the fixture.

For more information concerning OPTIMA and Royal Flushometer valve troubleshooting, consult Sloan OPTIMA and Royal Repair and Maintenance guides or contact your local Sloan Representative.

If further assistance is required, please contact the Sloan Valve Company Installation Engineering Department at 847/671-4300.

PARTS LIST



Item No.	Part No.	Description
1	†	Solenoid Operated Valve Assembly
2	H-700-A ‡	Bak-Chek® Control Stop
3A	V-600-AA	1-1/4" (32 mm) x 9" (229 mm) Vacuum Breaker Assembly CP (Model 180 ES-S)
3B	V-600-AA	3/4" (19 mm) x 9" (229 mm) Vacuum Breaker Assembly CP (Model 186 ES-S)
3C	V-500-AA	1-1/2" (38 mm) x 11-1/2" (292 mm) Vacuum Breaker Assembly RB (Model 190 ES-S)
3D	V-500-AA	3/4" (19 mm) x 10-1/2" (267 mm) Vacuum Breaker Assembly RB (Models 195 ES-S and 197 ES-S)
3E	V-500-AA	1-1/2" (38 mm) x 7-1/2" (191 mm) Vacuum Breaker Assembly RB (Model 192 ES-S)
4A	F-5-A	1-1/4" (32 mm) Spud Coupling Assembly (Model 180 ES-S)
4B	F-5-A	3/4" (19 mm) Spud Coupling Assembly (Model 186 ES-S)
5	F-15-A	ELL with 3/4" (19 mm) Tail (Models 195 ES-S and 197 ES-S)
6	F-2-AW	3/4" (19 mm) Slip Joint Coupling (Models 195 ES-S and 197 ES-S)
7	F-21	Double Slip Elbow (Models 190 ES-S and 192 ES-S)
8	F-2A	1-1/2" (38 mm) Slip Joint Coupling (Model 190 ES-S)
9	F-2A	Coupling with S-21 Gasket
10	F-110	1-1/4" (32 mm) O.D. Outlet
11	F-2-A-U	1-1/4" (32 mm) Slip Joint Coupling
12	F-2-AA	1-1/2" (38 mm) Slip Joint Coupling (Set of Two) (Model 192 ES-S)
13	F-102	1-1/2" Outlet Tube CP
14	F-7	Flange
15	F-25-A	1-1/4" Elbow Assembly
16	F-15-A	ELL with 3/4" Tail CP (Model 197 ES-S)
17	F-5-A	1-1/4" Spud Coupling Assembly CP
18	F-5-A	3/4" Spud Coupling Assembly CP
19	EL-123-A	Nipple Assembly
20	EL-176-A	Flange Assembly
21A	EL-151	Cover Plate (Models 180 ES-S and 186 ES-S)
21B	EL-161	Cover Plate (Models 190 ES-S, 192 ES-S, 195 ES-S and 197 ES-S)
22	EL-152	Screw (4 Required)
23	EL-168-A	Yoke Assembly
24	EL-1500	Urinal Sensor

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

INSTALLATION TEMPLATE:

For Models 180/186 ES-S: Code # 0816156

NOTICE:

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