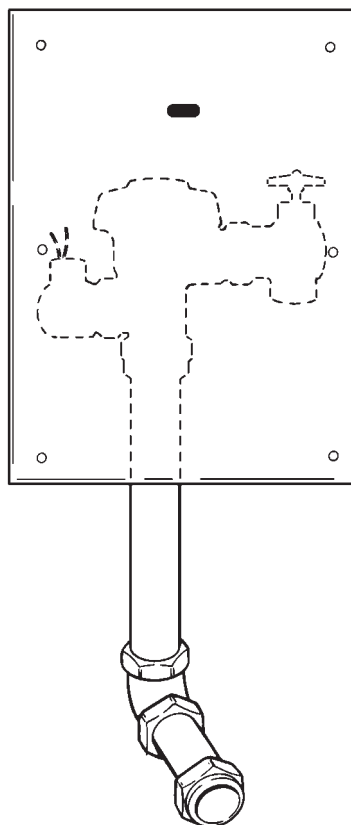
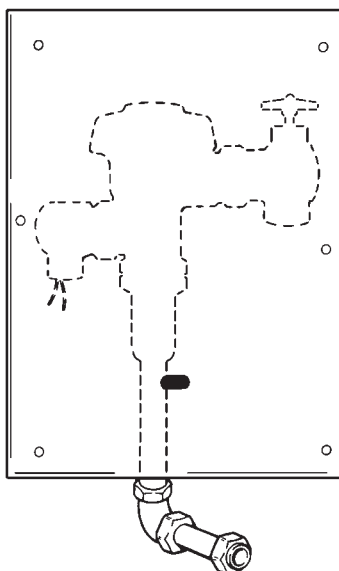




INSTALLATION INSTRUCTIONS
OPTIMA™ SYSTEMS
SENSOR OPERATED
Royal® **FLUSHOMETER**
WITH WALL BOX CONCEALED CLOSET &
URINAL INSTALLATIONS



Concealed Closet Flushometer with Wall Box — 1-1/2" Back Spud
Model 152 WB-ES-S



Concealed Closet Flushometer with Wall Box — 1-1/2" Top Spud
Model 153 WB-ES-S

Concealed Urinal Flushometer with Wall Box — 1-1/4" Back Spud
Model 190 WB-ES-S

Concealed Urinal Flushometer with Wall Box — 1-1/4" Top Spud
Model 192 WB-ES-S

Concealed Urinal Flushometer with Wall Box — 3/4" Back Spud
Model 195 WB-ES-S

Concealed Urinal Flushometer with Wall Box — 3/4" Top Spud
Model 197 WB-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 infrared technology to sense the user's presence and initiates the flushing cycle once the user steps away. The Stainless Steel Wall Box provides a vandal-proof, concealed installation where a pipe chase is not available or pipe space is limited.

The OPTIMA equipped Flushometer with Wall Box is designed for easy installation and maintenance and comes complete with the OPTIMA sensor (EL-1500-L for closet installations or EL-1500 for urinal installations), override

button (for closet installations), 13-1/8" (333 mm) x 17-1/8" (435 mm) stainless steel wall box with access panel and tamper-proof screws, 2-gang electrical box with mounting bracket, 24 VAC solenoid operator, Bak-Chek® control stop, adjustable tailpiece, vacuum breaker flush connection and spud coupling. 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 with Wall Box. As always, good safety practices and care are recommended when installing your new Flushometer with Wall Box. If further assistance is required, contact your nearest Sloan Representative office.

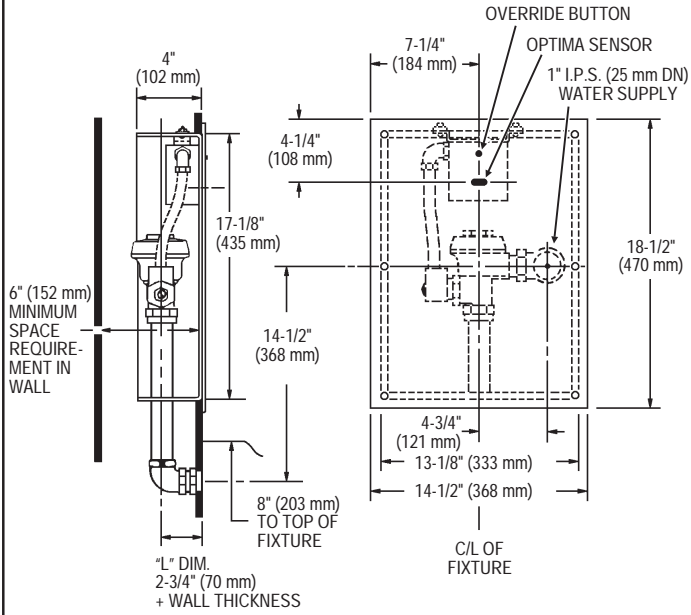
LIMITED WARRANTY

Sloan Valve Company warrants its 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.

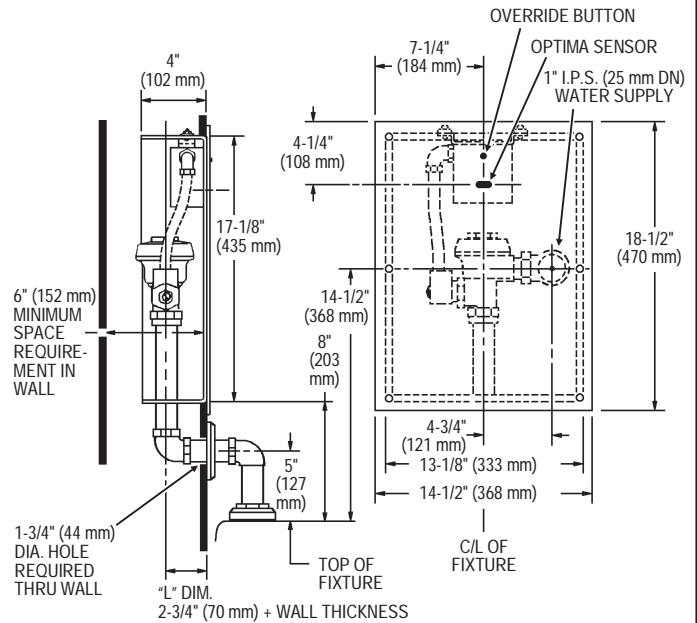
THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO EVENT IS SLOAN VALVE COMPANY RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY MEASURE WHATSOEVER.

VALVE ROUGH-IN

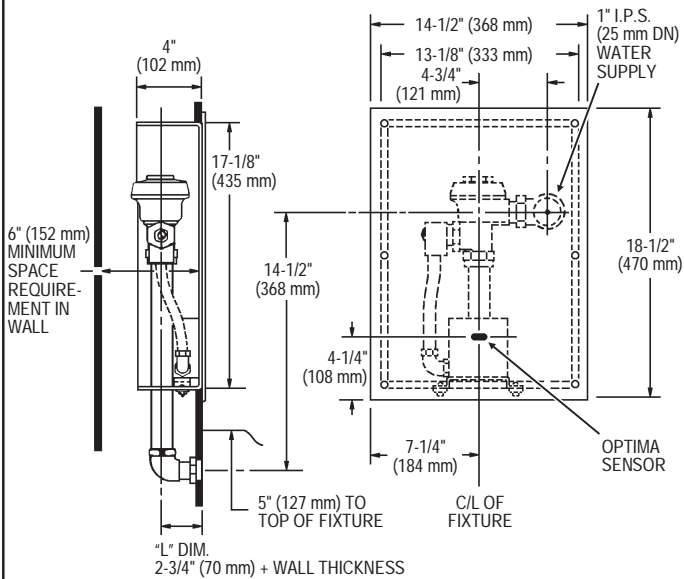
- Model 152 WB-ES-S — Water Saver, 3.5 gpf (13.2 Lpf)
- Model 152-2.4 WB-ES-S — 2.4 gpf (9.0 Lpf)
- Model 152-1.6 WB-ES-S — Low Consumption, 1.6 gpf (6.0 Lpf)



- Model 153 WB-ES-S — Water Saver, 3.5 gpf (13.2 Lpf)
- Model 153-2.4 WB-ES-S — 2.4 gpf (9.0 Lpf)
- Model 153-1.6 WB-ES-S — Low Consumption, 1.6 gpf (6.0 Lpf)



- Model 190 WB-ES-S — Conventional, 3.5 gpf (13.2 Lpf)
- Model 190-1.5 WB-ES-S — Water Saver, 1.5 gpf (5.7 Lpf)
- Model 190-1 WB-ES-S — Low Consumption, 1 gpf (3.8 Lpf)



- Model 192 WB-ES-S — Conventional, 3.5 gpf (13.2 Lpf)
- Model 192-1.5 WB-ES-S — Water Saver, 1.5 gpf (5.7 Lpf)
- Model 192-1 WB-ES-S — Low Consumption, 1 gpf (3.8 Lpf)

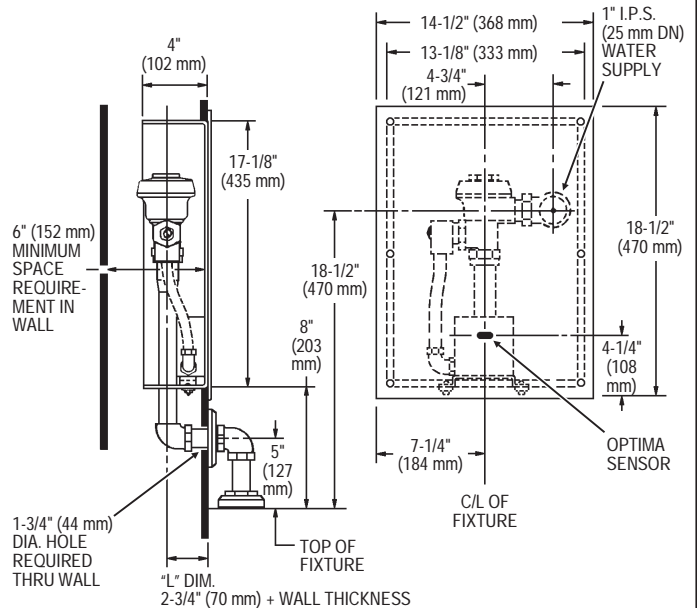


Figure 1

VALVE ROUGH-IN (Continued)

Model 195 WB-ES-S — Water Saver, 1.5 gpf (5.7 Lpf)
 Model 195-1 WB-ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)
 Model 195-0.5 WB-ES-S — 0.5 gpf (1.9 Lpf)

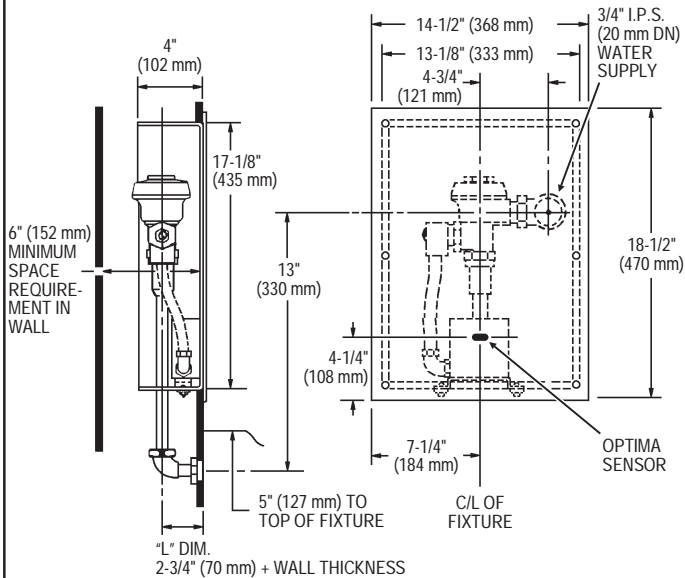


Figure 1 (Continued)

PRIOR TO INSTALLATION

Prior to installing the Sloan OPTIMA equipped Flushometer with Wall Box, install the items listed below as illustrated in Figure 1.

- 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 transformer used)
- Closet or 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.**
- **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.

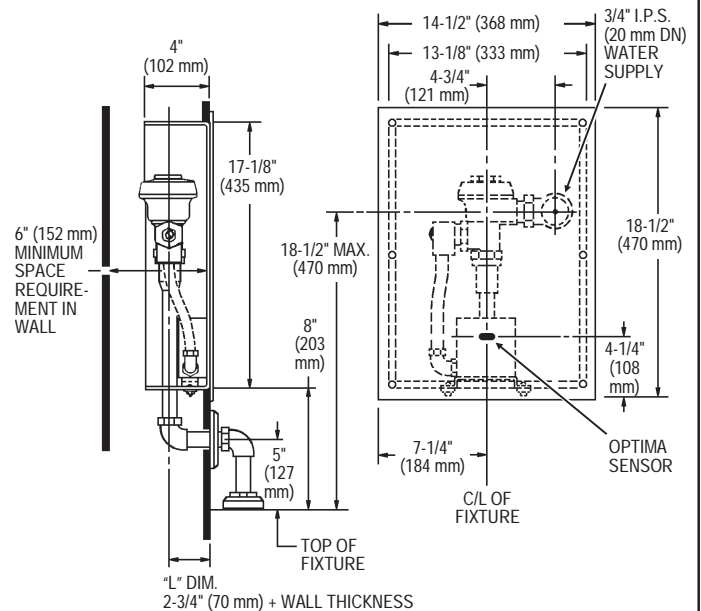
Most Low Consumption water closets (1.6 gallon/6 liter) require a minimum flowing pressure of 25 psi (172 kPa).

IMPORTANT: WITH THE EXCEPTION OF CONTROL STOP INLET, DO NOT USE PIPE SEALANT OR PLUMBING GREASE ON ANY VALVE CONNECTION OR COMPONENT.

SENSOR LOCATION (Figure 1)

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,

Model 197 WB-ES-S — Water Saver, 1.5 gpf (5.7 Lpf)
 Model 197-1 WB-ES-S — Low Consumption, 1.0 gpf (3.8 Lpf)
 Model 197-0.5 WB-ES-S — 0.5 gpf (1.9 Lpf)



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.

TOOLS REQUIRED FOR INSTALLATION

- Slotted screwdriver
- Adjustable wrench
- Sloan A-50 "Super-Wrench™" or smooth jawed spud wrench for couplings
- #8 Drilled Spanner Head screwdriver for wall box cover plate (supplied)

INSTALLATION

Step 1 — Install Transformer (Figure 2)

Install transformer (EL-154) on the 2-gang electrical box (4" x 4" x 2-1/2") (102 mm x 102 mm x 64 mm) previously installed.

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.**

For 220/240 VAC electrical service, use Sloan Transformer #EL-342.

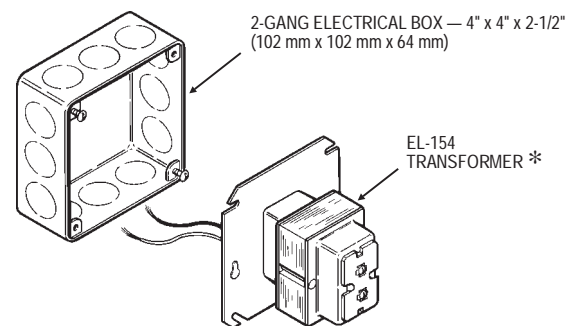


Figure 2

* MOUNT TRANSFORMER WITHIN 50 FEET (15 m) OF FLUSHOMETER

Step 2 — Install OPTIMA Sensor Electrical Box Device Cover (Figure 3)

Remove Cover from Wall Box frame using #8 Drilled Spanner Head screwdriver. Mount 4" x 4" x 3/4" (102 mm x 102 mm x 19 mm) Electrical Box Device Cover (EL-197) to 4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) Outlet Electrical Box (EL-196) using two (2) Screws provided.

Step 3 — Install Electrical Box into Wall Box (Figure 4)

Assemble Mounting Bracket to Electrical Box using two (2) Screws (EL-125), internal tooth Lock Washers (EL-127) and Nuts (EL-126) provided.

Assemble Mounting Bracket with Electrical Box to Wall Box using two (2) Screws (EL-125), internal tooth Lock Washers (EL-127) and Nuts (EL-126) provided.

Step 4 — Install Wall Box (Figure 1)

Install Wall Box in the exact location as illustrated in Figure 1. Secure Wall Box using Drive Screws provided or other appropriate fasteners.

Step 5 — Control Stop Installation (Figure 5)

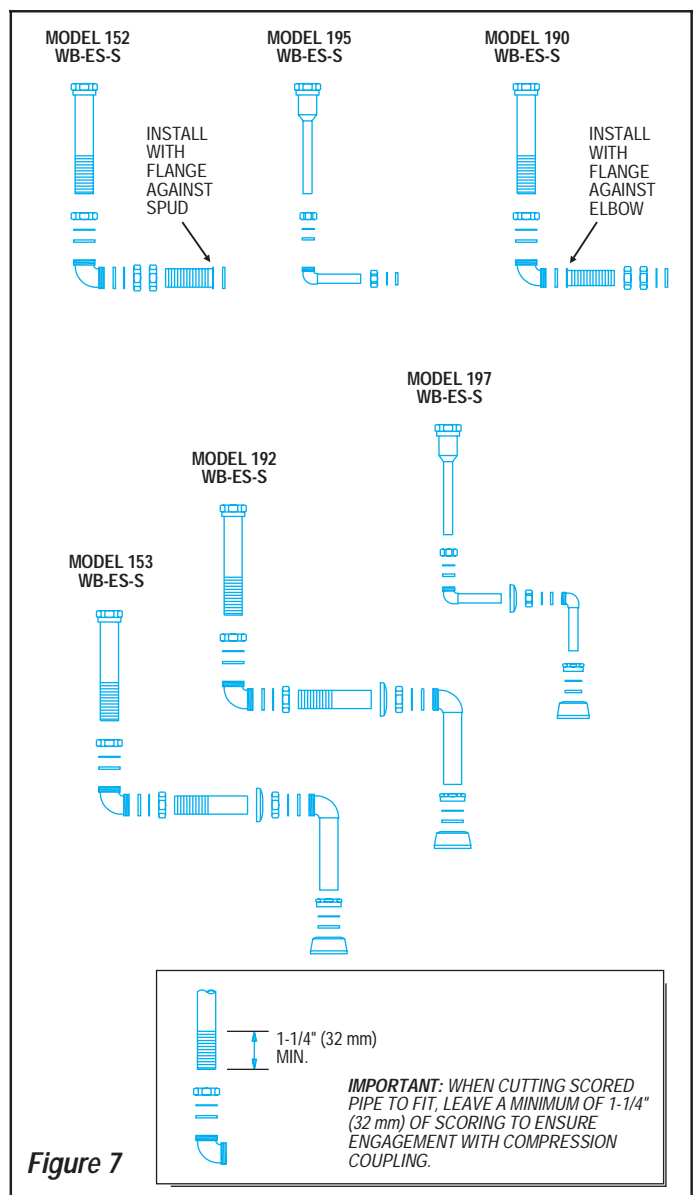
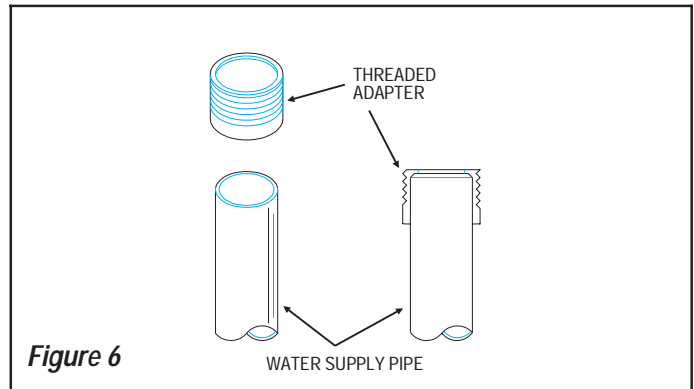
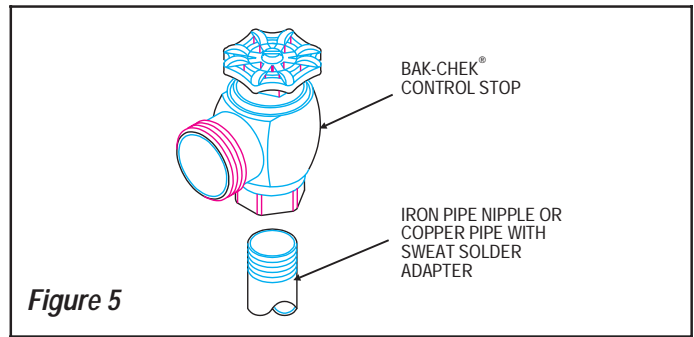
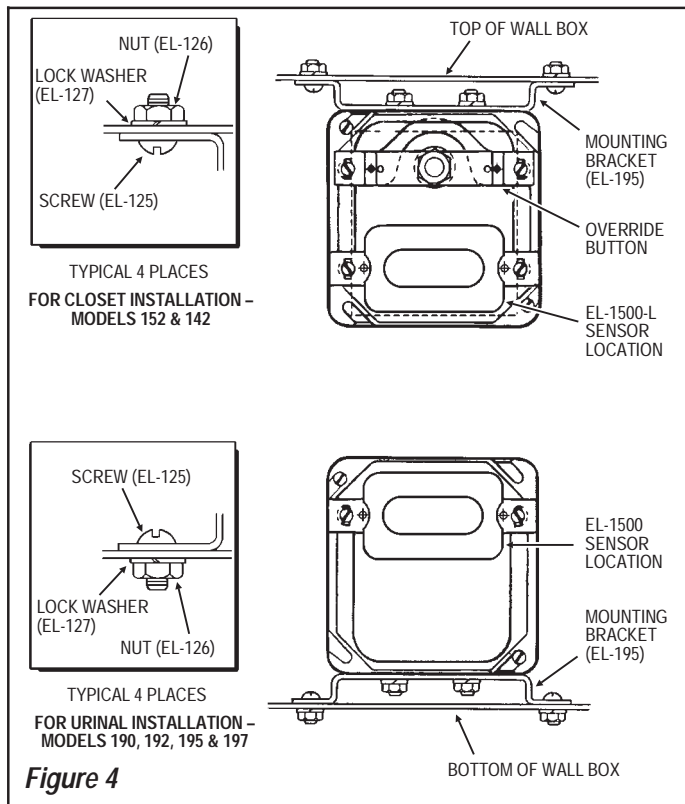
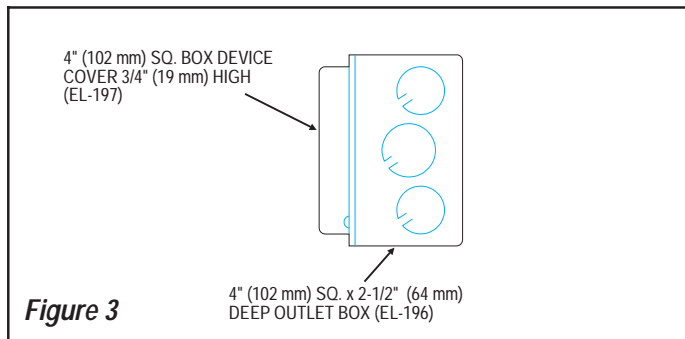
Install the Sloan Bak-Chek® Control Stop to the water supply line with the outlet positioned as required.

For Sweat Solder applications, slide Threaded Adapter onto water supply pipe until end of pipe rests against shoulder of Adapter. Sweat solder Adapter to water supply pipe. (Refer to Figure 6.)

Step 6 — Install Vacuum Breaker Flush Connection (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 7 — 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, slip joint couplings and spud coupling, respectively.

DO NOT USE PIPE DOPE OR THREAD SEALANT ON ANY CONNECTION.

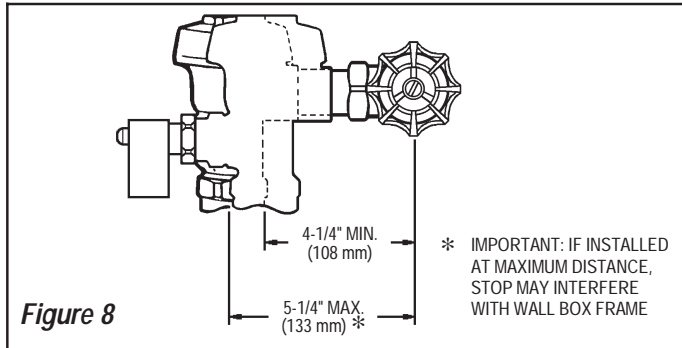


Figure 8

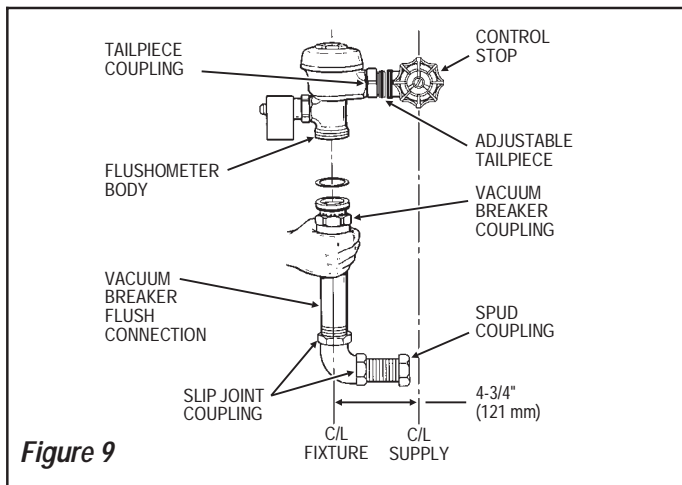


Figure 9

Step 8 — Electrical Hook-Up (Figure 10)

Be certain power is OFF to prevent damage to electrical components. Connect sensor to transformer, override button (closet applications only) and solenoid coil EXACTLY as shown in Figure 10 and instructed below.

- Connect 24 volt source lead to terminal labeled “24 VAC IN” of sensor shown in Figure 11.
- Connect solenoid lead to terminal labeled “TO VALVE” of sensor shown in Figure 11.
- Connect remaining solenoid lead to remaining 24 volt source lead.

CLOSET INSTALLATIONS ONLY

- 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.

Step 9 — Mount OPTIMA Sensor (Figure 12)

Install OPTIMA Sensor EL-1500 (urinal installation) or EL-1500-L (closet installation) into the 2-gang electrical box using two (2) long screws provided. Ensure that sensor lens faces outward and horizontally from finished wall.

Step 10 — Assemble Yoke and Override Button (Closet Installation Only) (Figure 12)

Assemble Inner Nut, Bracket and Outer Nut on threaded shaft of Override Button as illustrated in Figure 12. Mount Bracket to Yoke using two (2) Screws provided. Adjust distance that override button will protrude through wall box cover plate using the nut on each side of the bracket. Threaded shaft end of override button and lens of sensor should rest against wall box cover plate. Override button should be connected parallel to the EL-1500-L sensor. Mount assembled yoke to electrical box.

Step 11 — Flush Out Supply Line (Figures 13 and 14)

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.

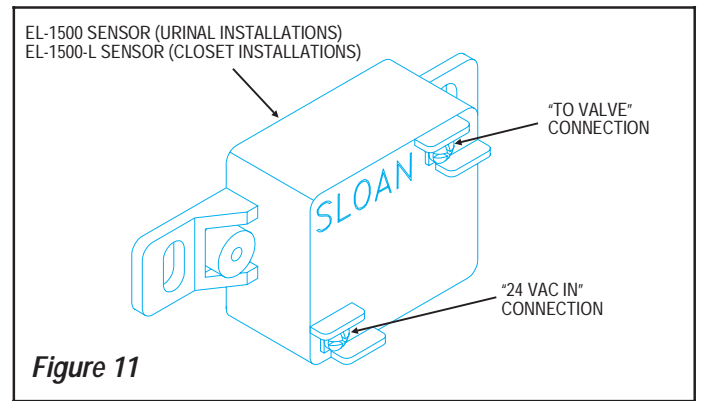


Figure 11

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.

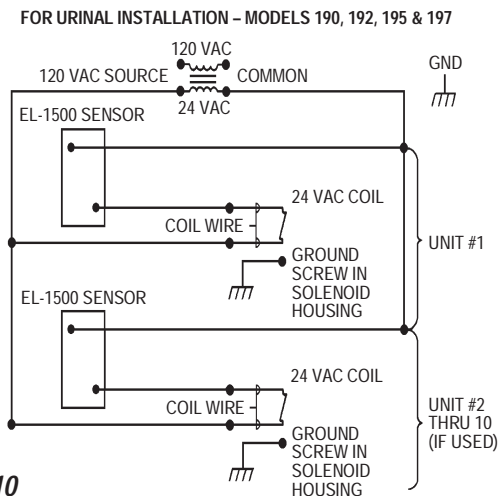
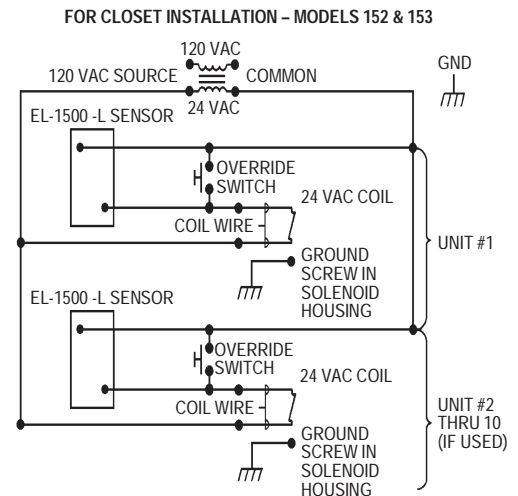


Figure 10



After completion, shut off control stop, remove cover and reinstall Inside Parts Assembly. Install Flushometer cover wrench tight.

Step 12 — Start-Up Mode

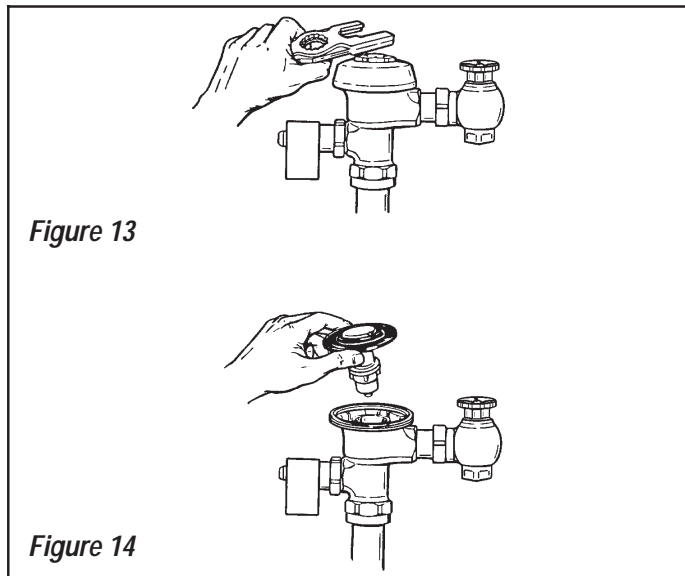
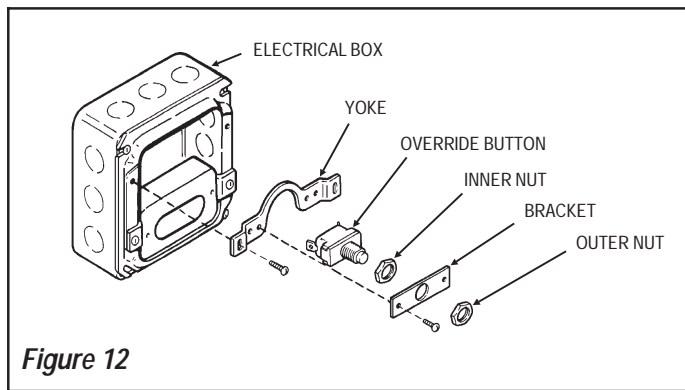
The self adaptive sensor automatically adapts to the surrounding environment when 24 volt supply is activated. No manual adjustments are required.

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 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 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. For urinal installations, the solenoid will be activated immediately after non-detection. For Closet installations, the solenoid will be activated within two (2) to four (4) seconds after non-detection.

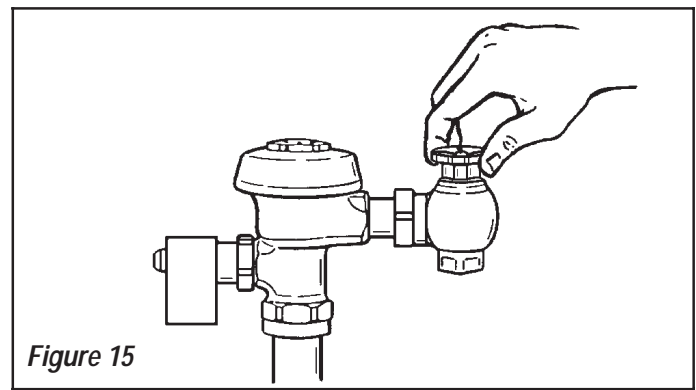
Step 14 — Adjust Control Stop (Figure 15)

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 10 seconds and then moving it away. Adjust control stop after each flush until the rate of flow delivered properly cleanses the fixture.

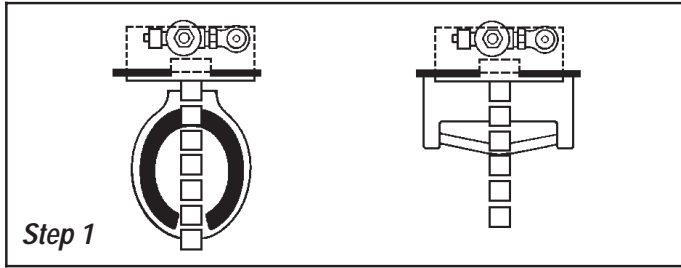
Important Note: The Sloan ROYAL[®] Flushometer is engineered for quiet operation. Excessive water flow creates noise, while too little water flow may not satisfy the needs of the fixture. Proper adjustment is made when:

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

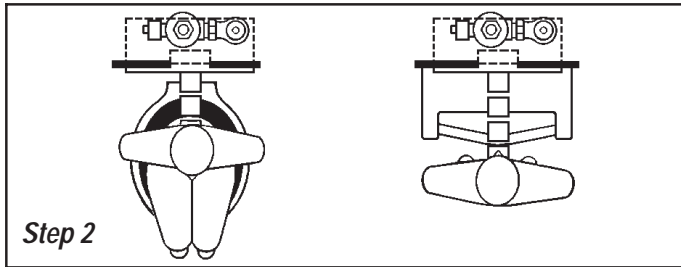
After adjustment: Install wall box cover plate using 6 Drilled Spanner Head tamper-proof screws. Tighten securely to Eliminate Vandalism.



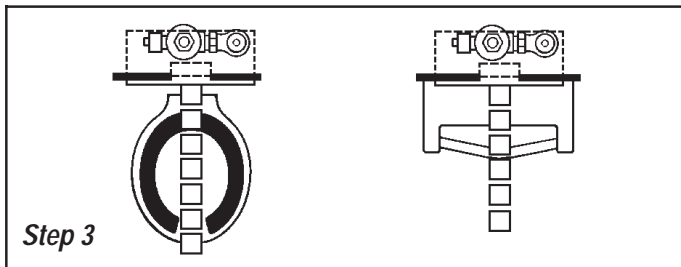
OPERATION



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



2. As the user enters the beam's effective range, (25 to 40 inches (635 to 1016 mm) for closet installations and 15 to 30 inches (381 to 762 mm) for urinal installations), 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. For closet installations, this occurs approximately 3 seconds after indication. This delay is built into the sensor to help prevent false flushing due to movement by the user of the commode. 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 and wall box as they may dull the luster and attack the chrome or special decorative finishes. Use ONLY soap and water (or approved stainless steel cleaner), then wipe dry with clean cloth or towel.

While cleaning the bathroom tile, the Flushometer and wall box 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 (urinal installations) or EL-1500-L (closet installations) sensor not operating** - Replace EL-1500 or EL-1500-L 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** - 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** - 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 or EL-1500-L Sensor is wired incorrectly** - Rewire sensor and valve properly (refer to Figure 10).
- 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

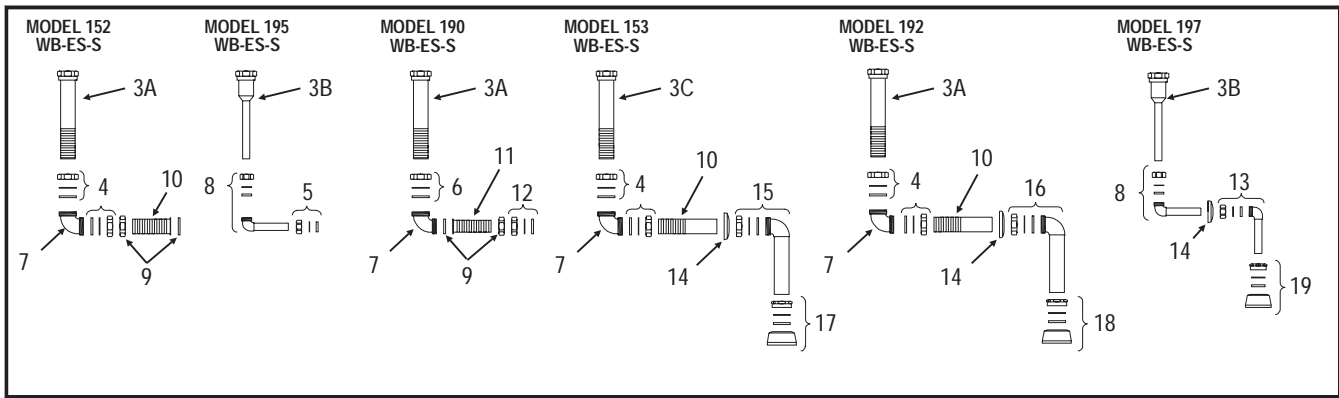
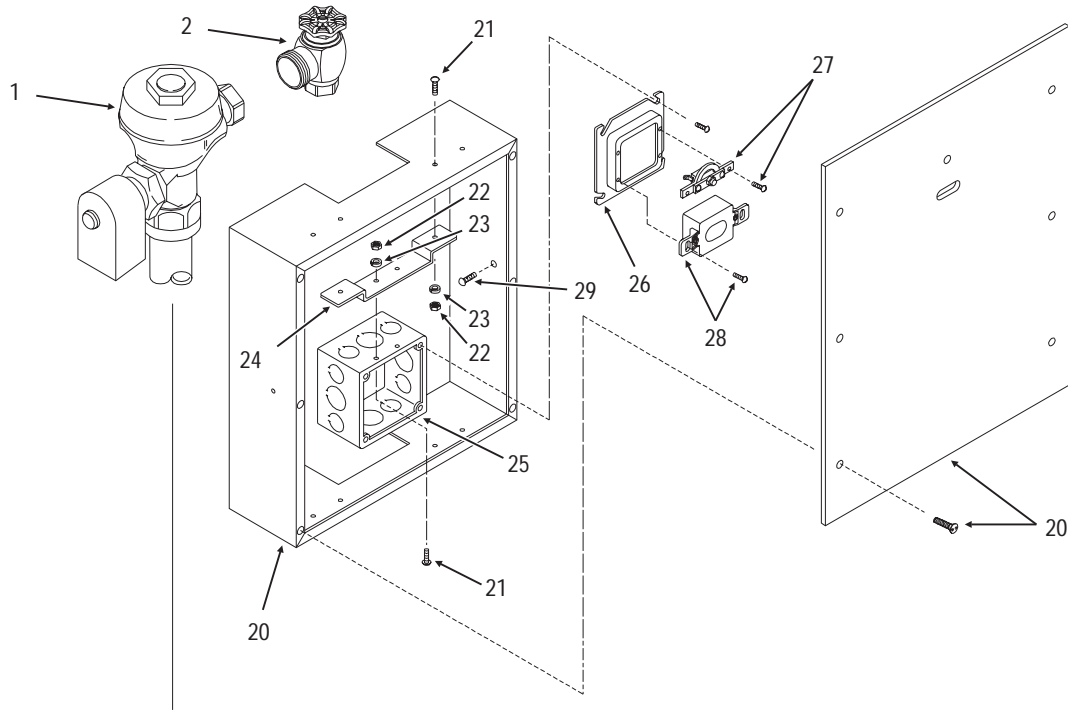
- A. **Supply volume is open more than necessary** - Adjust control stop to meet flow rate required for proper cleansing of the fixture.

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.

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

PARTS



Item No.	Part No.	Description
1	*	Solenoid Operated Valve Assembly
2	H-730-A	Bak-Chek® Control Stop
3A	V-500-AA	1-1/2" x 11-1/2" (38 mm x 292 mm) Vacuum Breaker Assembly RB (Models 152, 190 & 192 WB-ES-S)
3B	V-500-AA	3/4" x 10-1/2" (19 mm x 267 mm) Vacuum Breaker Assembly RB (Models 195 & 197 WB-ES-S)
3C	V-500-AA	1-1/2" x 7-1/2" (38 mm x 191 mm) Vacuum Breaker Assembly RB (Model 153 WB-ES-S)
4	F-2-AA	1-1/2" Slip Joint Coupling (Set of Two)
5	F-2-AW	3/4" Slip Joint Coupling
6	F-2A	1-1/2" Slip Joint Coupling
7	F-21	1-1/2" Double Slip Elbow
8	F-15-A	ELL with 3/4" Tail
9	F-2A	1-1/2" Coupling with S-21 Gasket
10	F-102	1-1/2" Outlet Tube CP
11	F-110	1-1/4" O.D. Outlet
12	F-2-A-U	1-1/4" Slip Joint Coupling
13	F-15-A	ELL with 3/4" Tail CP
14	F-7	Flange
15	F-25-A	1-1/2" Elbow Assembly
16	F-25-A	1-1/4" Elbow Assembly
17	F-5-A	1-1/2" Spud Coupling Assembly CP
18	F-5-A	1-1/4" Spud Coupling Assembly CP
19	F-5-A	3/4" Spud Coupling Assembly CP

Item No.	Part No.	Description
20	EL-216	13" x 17" (330 mm x 432 mm) Stainless Steel Wall Box with Cover Plate (152 and 142 WB-ES-S) and (6) #8-32 x 3/4" Drilled Spanner Screws
	EL-193	13" x 17" (330 mm x 432 mm) Stainless Steel Wall Box with Cover Plate (190, 192, 195 and 197 WB-ES-S) and (6) #8-32 x 3/4" Drilled Spanner Screws
21	EL-125	#8-32 x 3/8" Screw (4 Required)
22	EL-126	#8-32 Hex Nut (4 Required)
23	EL-127	#8 Internal Tooth Lock Washer (4 Required)
24	EL-195	Mounting Bracket
25	EL-196	4" x 4" x 2-1/2" (102 mm x 102 mm x 64 mm) 2-Gang Electrical Box
26	EL-197	4" x 4" x 3/4" (102 mm x 102 mm x 19 mm) Electrical Box Device Cover
27	EL-141-A	Yoke and Override Button Assembly (Models 152 and 142 WB-ES-S)
28	EL-1500-L	Closet Sensor (Models 152 and 142 WB-ES-S)
	EL-1500	Urinal Sensor (Models 190, 192, 195 and 197 WB-ES-S)
29	WB-6	Drive Screw (4 Required)
Complete Wall Box Assembly (Item Numbers 20 - 29):		
	EL-192-A	Models 152 and 142 WB-ES-S
	EL-191-A	Models 190, 192, 195 and 197 WB-ES-S

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