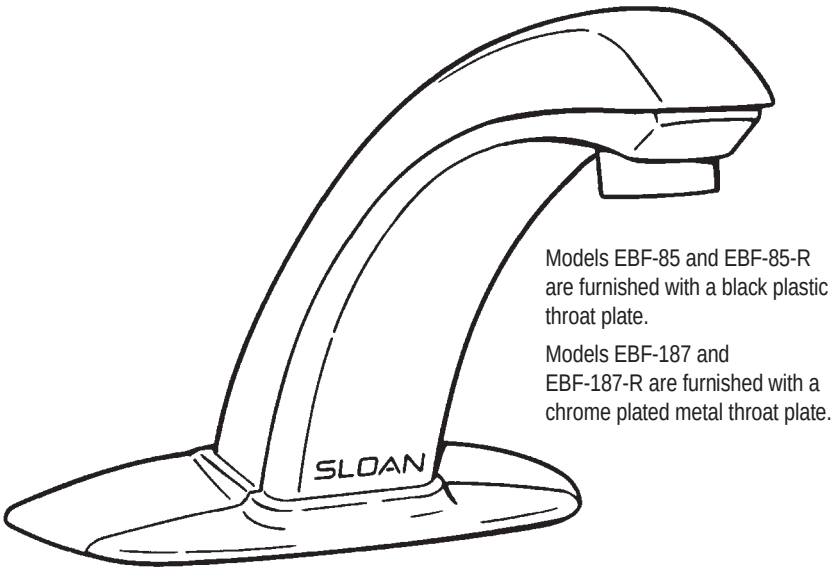
EBF-85 I.I. — Rev. 3 (08/00)
Code No. 0816302

SLOAN®

INSTALLATION INSTRUCTIONS SENSOR OPERATED LAVATORY FAUCET

OPTIMA™ *plus*



Models EBF-85 and EBF-85-R are furnished with a black plastic throat plate.

Models EBF-187 and EBF-187-R are furnished with a chrome plated metal throat plate.

EBF-85 and EBF-187
Battery Powered,
Sensor Operated
Lavatory Faucet

EBF-85-R and EBF-187-R
Transformer Powered,
Sensor Operated
Lavatory Faucet

Includes
Installation Instructions
for optional Back Checks

Listed

A112.18.1M

Installation of the Sloan OPTIMA *Plus* EBF-85 or EBF-187 Electronic Sensor Operated Lavatory Faucet makes wash-up totally "hands-free," providing the ultimate in sanitary protection and automatic operation. The OPTIMA *Plus* faucets use fiber optic and adaptive sensing technology to detect the user's presence and activate a water supply which has been pre-mixed to the desired water temperature. When the user's presence is no longer sensed, the water flow automatically stops.

The Sloan EBF-85 and EBF-187 faucets are designed for easy installation on new and retrofit applications. The complete faucets include an integral faucet and sensor assembly, valve module, Duracell alkaline batteries - Size C (EBF-85 and EBF-187) or power pack (EBF-85-R and EBF-187-R), mounting bracket, flex hose, all mounting hardware and all appropriate electrical connections (battery or transformer powered models). Also available as optional equipment are trim plates, back checks, a grid strainer, and a mixing valve. 3/8 inch copper supply tube should be supplied by the installer.

The following instructions will serve as a guide when installing the Sloan EBF-85 and EBF-187 faucets. As always, good safety practices and care are recommended when installing your new faucet. If further assistance is required, contact your nearest Sloan Representative office.

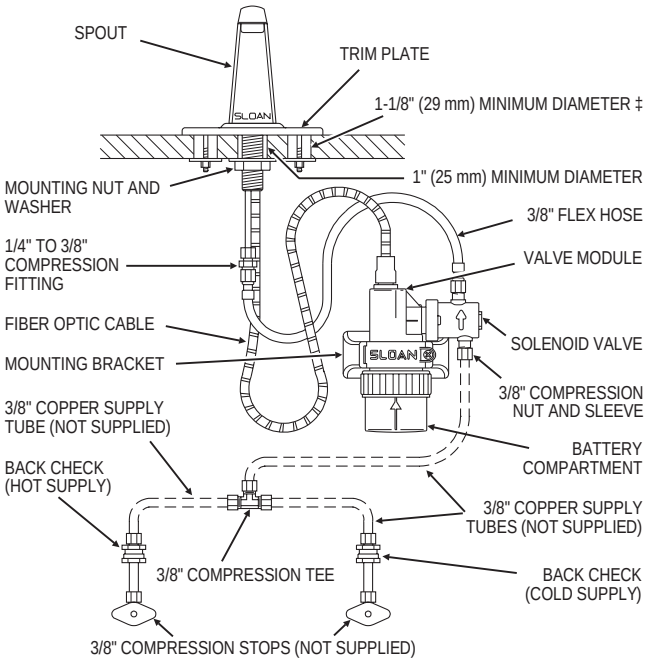
LIMITED WARRANTY

Sloan Valve Company warrants its EBF-85 and EBF-187 Faucets 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. This warranty does not cover the life of the battery.

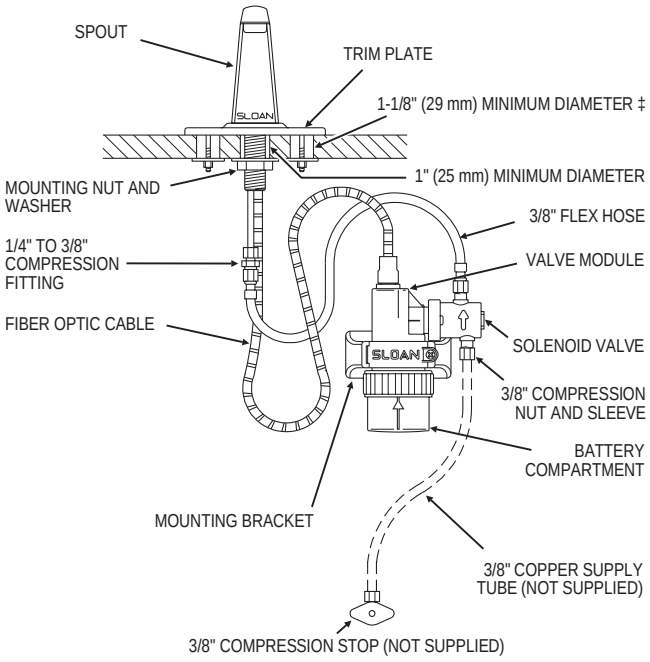
THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO EVENT IS SLOAN VALVE COMPANY RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY MEASURE WHATSOEVER.

BATTERY POWERED FAUCET ROUGH-IN † — Figure A

EBF-85 AND EBF-187 FAUCETS (DUAL LINE WATER SUPPLY)

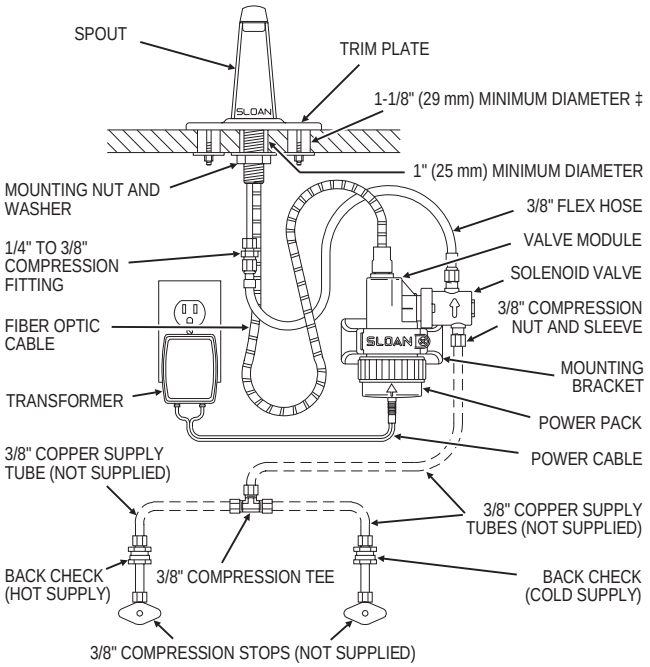


EBF-85 AND EBF-187 FAUCETS (SINGLE LINE WATER SUPPLY)

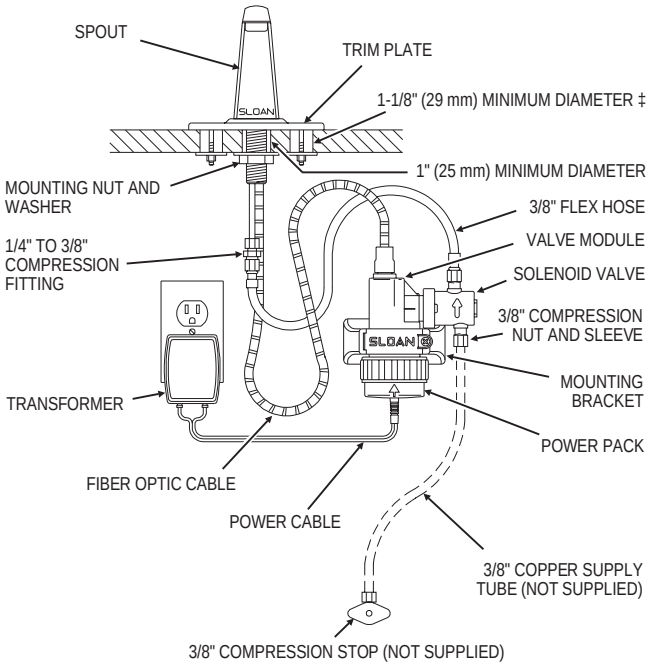


TRANSFORMER POWERED FAUCET ROUGH-IN † — Figure B

EBF-85-R AND EBF-187-R FAUCETS (DUAL LINE WATER SUPPLY)



EBF-85-R AND EBF-187-R FAUCETS (SINGLE LINE WATER SUPPLY)



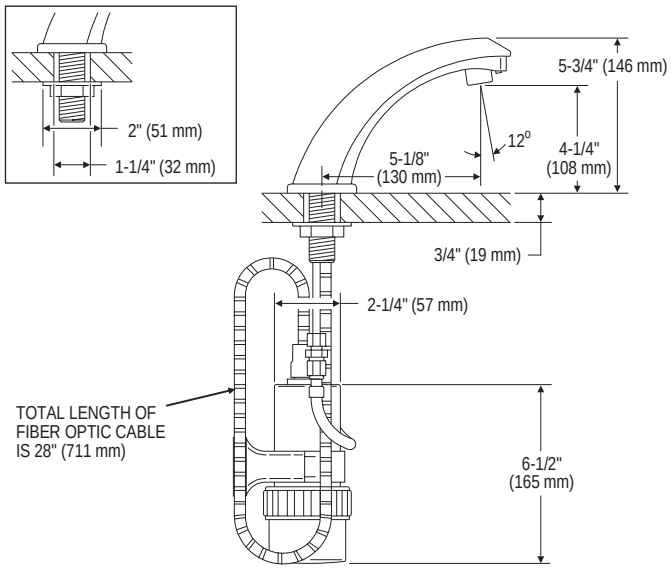
NOTES

† OPTIONAL MIXING VALVE INSTALLATIONS ARE NOT SHOWN.

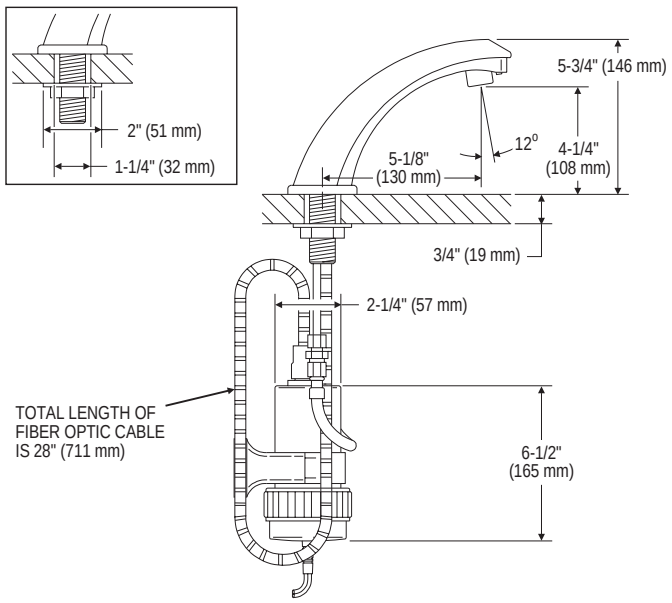
‡ MOUNTING HOLE DIMENSIONS SHOULD CONFORM TO ASME A112.19.2M-1998 FOR CENTERSET FAUCETS.

FAUCET SIDE VIEW — Figure C

EBF-85 AND EBF-187 BATTERY POWERED FAUCET



EBF-85-R AND EBF-187-R TRANSFORMER POWERED FAUCET



PRIOR TO INSTALLATION

Before installing the Sloan EBF-85 or EBF-187 faucet, install the items listed below. Refer also to Figures A, B and C.

- Lavatory/sink
- Drain line
- Hot and cold water supply lines or tempered water supply line

Important:

- *ALL PLUMBING AND ELECTRICAL CONNECTIONS SHOULD BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.*
- *FLUSH ALL WATER LINES BEFORE MAKING CONNECTIONS.*

Mixing Valve

When installing the faucet with a Sloan mixing valve, both these Installation Instructions AND those packaged with the mixing valve MUST be followed.

TOOLS REQUIRED FOR INSTALLATION

- Open end wrenches for the following hex sizes (inches): 1/2, 9/16, 5/8, 15/16
- Basin wrench
- Phillips head screwdriver, #2
- Hammer (if installing plastic or hollow wall anchors to mount valve module)
- 0.05" hex wrench (supplied)
- Spray head key (supplied)
- 1/4" drill bit (if plastic wall anchors are used to mount valve module)
- 5/16" drill bit (if hollow wall anchors are used to mount valve module)
- 3/8" drill bit (if toggle nut anchors are used to mount valve module)

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

INSTALLATION OF EBF-85 OR EBF-187 FAUCET

The Sloan EBF-85 or EBF-187 electronic sensor operated faucet can be supplied with two back checks. Back checks are required if the faucet is being installed with a Sloan MIX-25-A or MIX-30-A mixing valve. When connecting the faucet to a single line water supply or a pre-tempered water supply, no back check is required.

When connecting the faucet to both hot and cold water supplies, two back checks are required as shown in Figures A and B. Water temperature can be controlled by adjusting the supply stops.

Step 1 — Install Back Checks (Option) (Figure 1)

The Sloan Back Check is designed for installation on a 3/8" Supply Stop. If an existing Stop is used, the Stop may require replacement or additional fittings not supplied by Sloan for connection of the Back Checks to the hot and cold water supply lines. Supply Stops should be furnished by the installer.

After flushing the water supply lines through the Stops, use a compression nut and compression sleeve to connect inlet end of Back Check to the Supply Stop. Tighten Securely.

Note: *Failure to install the Back Checks can result in a cross flow connection when the faucet is in the off position and the supply stops are open. If the pressures of the hot water supply and cold water supply are different, hot water can migrate into the cold water supply or cold water can migrate into the hot water supply. Most plumbing codes require that the Back Checks be used to prevent this.*

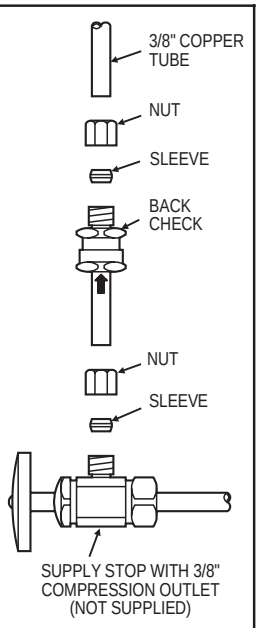


Figure 1

Step 2 — Install Faucet Spout and Trim Plate

Note: If installation includes a Sloan Mixing Valve, install Faucet and Trim Plate before installing Mixing Valve. For complete installation guidelines, refer to the Installation Instructions supplied with the Sloan mixing valve.

Step 2A — ETF-295-A Single Hole 4" Trim Plate (Figure 2A)

Slide Rubber Faucet Gasket onto Faucet Shank. Ensure that Roll Pin on base of Faucet fits into hole in Rubber Faucet Gasket.

Note: *If the Trim Plate is used on a sink with a center hole only, the Trim Plate Bolts are not used. Apply plumber's putty to underside of Trim Plate to prevent Faucet from rotating.*

Insert Hex Bolts into Black Plastic Base Plate (if sink has only a center hole, see note above). Place Chrome Cover Plate over Black Plastic Base Plate. Slide Trim Plate assembly onto Faucet Shank. Align Roll Pin with small hole in Trim Plate assembly.

Insert Trim Plate Bolts through the 4 inch (102 mm) spread deck holes and Faucet Shank through the 1 inch (25 mm) minimum diameter deck hole. Secure Trim Plate to Deck using the large Plate Washers and Hex Nuts supplied. Secure Faucet to Deck using the Faucet Washer and Faucet Nut supplied.

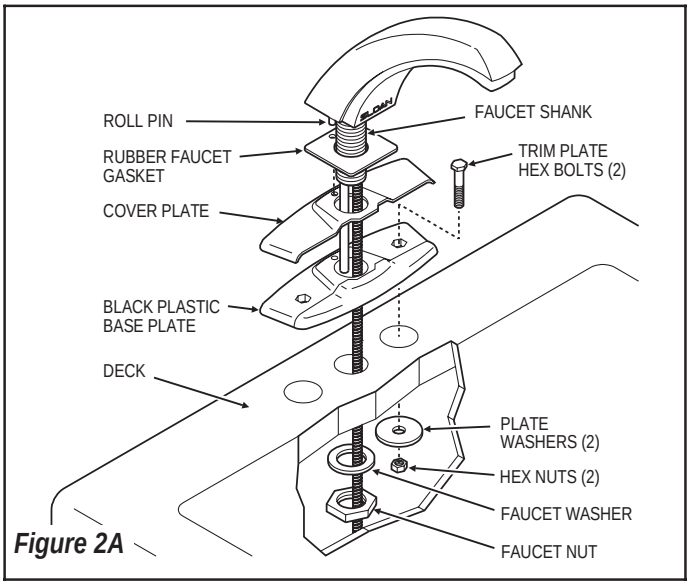


Figure 2A

Step 2B — ETF-312-A Single Hole 4" Trim Plate (Figure 2B)

Slide Rubber Faucet Gasket onto Faucet Shank. Ensure that Roll Pin on base of Faucet fits into hole in Rubber Faucet Gasket.

Slide Trim Plate and Back-up Spacer onto Faucet Shank. Align Roll Pin with small hole in Trim Plate.

Secure Faucet from below Deck using the Faucet Washer and Faucet Nut supplied.

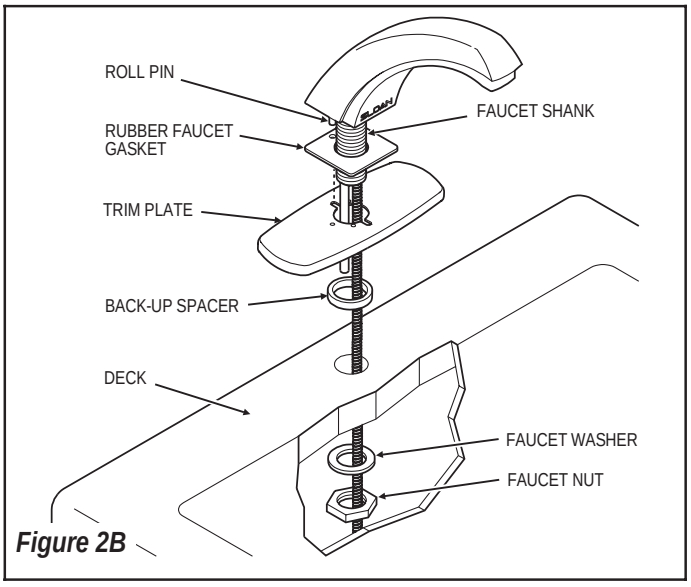


Figure 2B

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

Step 2C — ETF-510-A Single Hole 8" Trim Plate (Figure 2C)

Slide Rubber Faucet Gasket onto Faucet Shank. Ensure that Roll Pin on base of Faucet fits into hole in Rubber Faucet Gasket.

Slide Trim Plate and Back-up Spacer onto Faucet Shank. Align Roll Pin with small hole in Trim Plate.

Slide Washer Gaskets over Studs. Place Studs and Faucet Shank through Base Gasket and holes in Deck.

Secure Trim Plate from below Deck using the two (2) Fender Washers and two (2) Finger Nuts supplied.

Secure Faucet from below Deck using the Faucet Washer and Nut supplied.

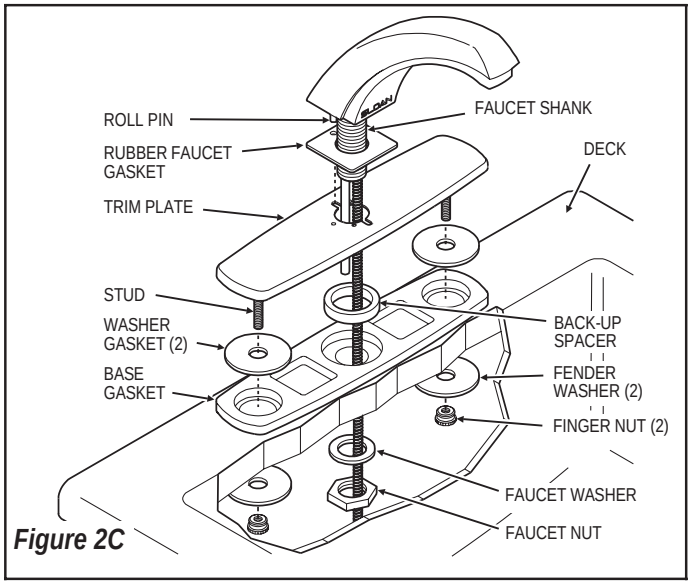


Figure 2C

Step 3 — Install Valve Module Wall Bracket (Figure 3)

Install the Wall Bracket in an appropriate location as shown in Figure A or B.

Position Wall Bracket within 20 inches (508 mm) from Faucet. When installed, the Fiber Optic Cable from the Faucet Spout to the Valve Module should have some slack.

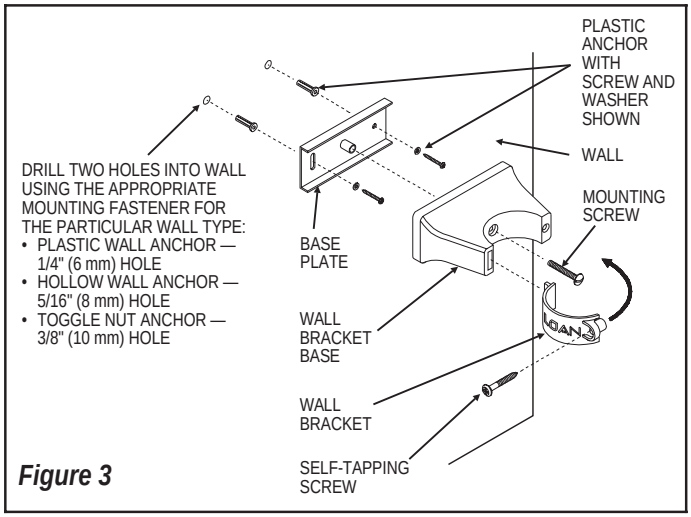


Figure 3

Use the Base Plate as a template to mark off holes on wall for Mounting Screws. Determine the appropriate Mounting Fastener for the particular wall type (three different fastener types are included; see parts list). Drill two (2) appropriately sized holes.

For Plastic Wall Anchor — 1/4" (6 mm) Holes
For Hollow Wall Anchor — 5/16" (8 mm) Holes
For Toggle Nut Anchor — 3/8" (10 mm) Holes

Install Base Plate to wall using the fastener type chosen.

Install Wall Bracket Base to Base Plate using Mounting Screw provided.

Step 4 — Connect Flex Hose to Spout (Figure 4)

Install the 1/4 inch end of the 1/4 to 3/8 inch Compression Fitting onto the Spout's copper Supply Tube.

Remove Nut and Compression Sleeve from the 3/8 inch end of Compression Fitting. Connect one end of Flex Hose to Compression Fitting.

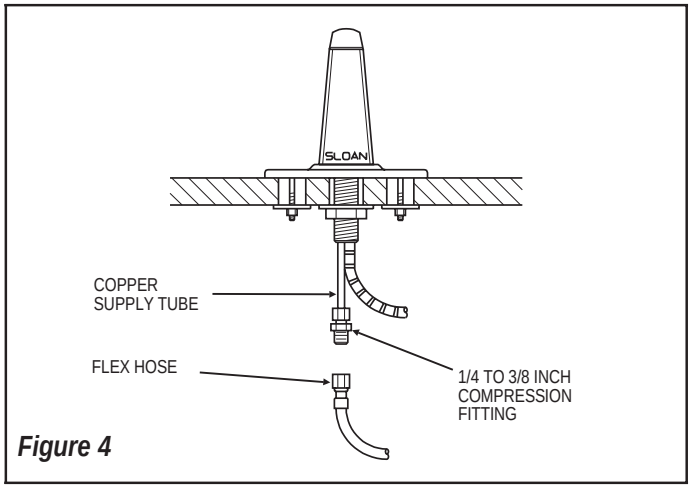


Figure 4

Step 5 — Install Valve Module (Figures 5A and 5B)

Install Valve Module into Wall Bracket Base as shown in Figure 5A.

Insert tab of Wall Bracket into slot of Wall Bracket Base. Swing Wall Bracket into position as shown in Figure 5B and secure using the Self-tapping Screw provided.

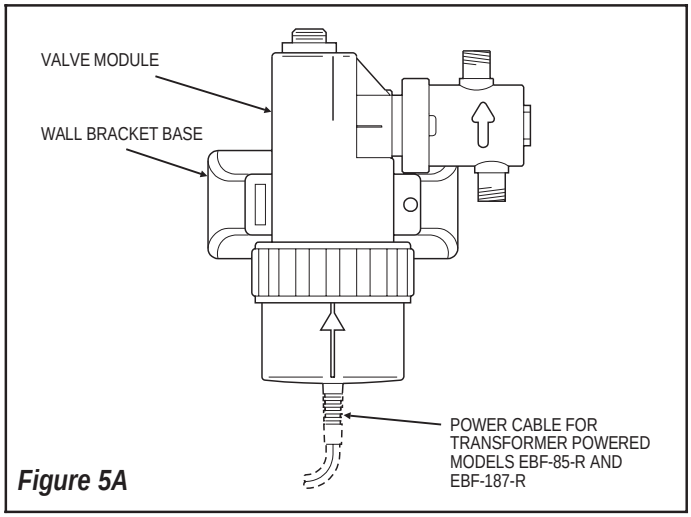


Figure 5A

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

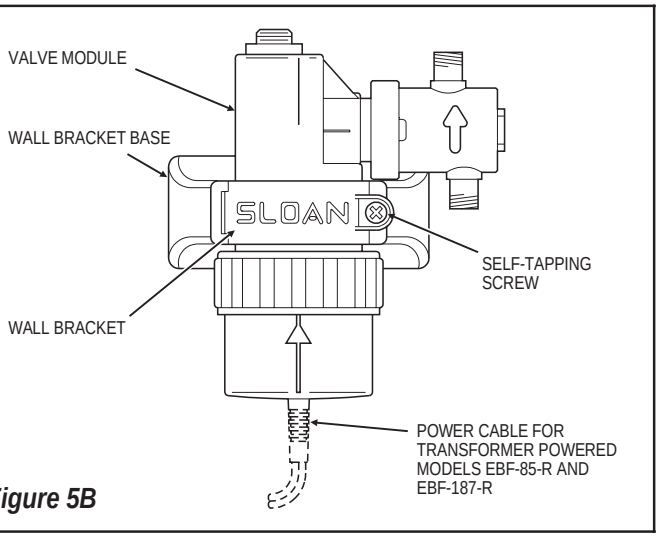


Figure 5B

Note: *DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.*

Step 6 — Connect Flex Hose to Solenoid Valve (Figure 6)

Connect the free end of the Flex Hose (now attached to the Spout) to the outlet side of the Solenoid Valve.

Note: *An arrow on the body of the Solenoid Valve indicates the water flow direction and points toward the outlet side of the Solenoid Valve. The Valve Module can be rotated and positioned in the Wall Bracket to accommodate tight installation requirements.* ***Additionally, the Solenoid Valve can be rotated 360 degrees on the Valve Module.*** *The Solenoid Valve should be rotated to the most convenient position for making water line connections.*

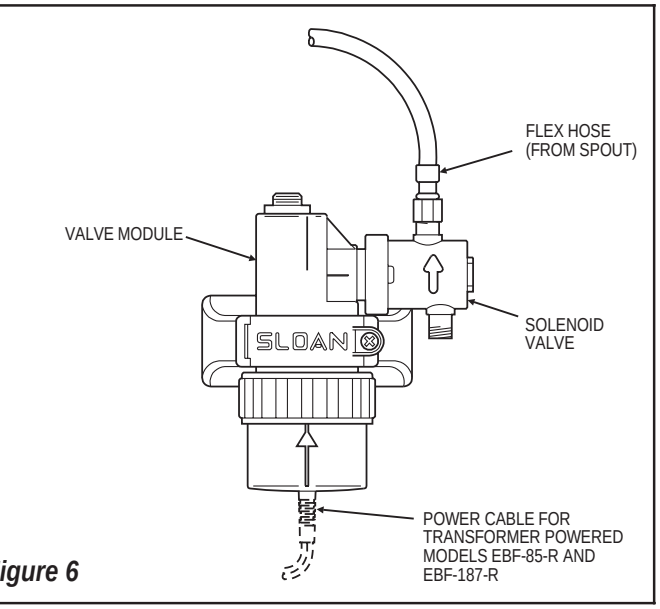


Figure 6

Step 7 — Connect Fiber Optic Cable (Figure 7)

Remove the Rubber Cap from the Valve Module's Fiber Optic Cable Connector and connect the Fiber Optic Cable to the Valve Module. The Cable Connector is keyed and will slide into the Valve Module in only one orientation. Thread the Connector Cap onto the Valve Module to secure the connection.

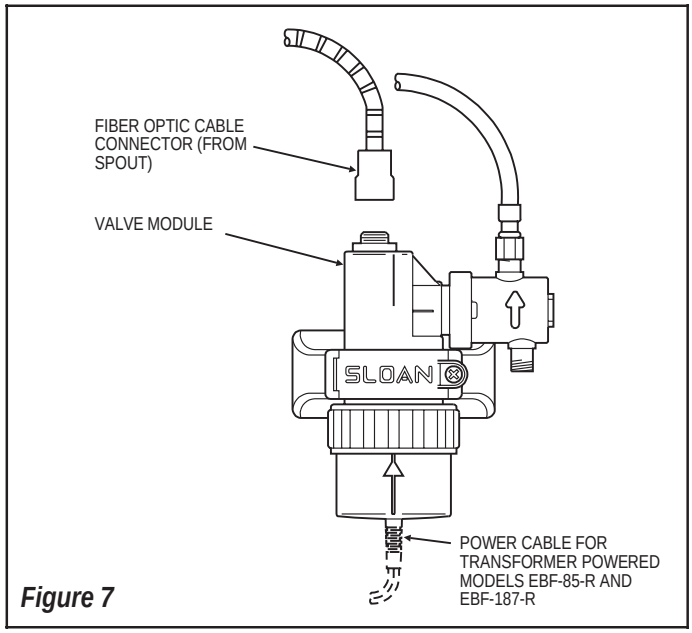


Figure 7

Step 8 — Connect Supply Line(s) (Refer to Figures A and B on Page 2)

Note: *If installation includes a Sloan mixing valve, refer to the Installation Instructions supplied with the Sloan mixing valve.*

Flush dirt, debris, and sediment from the supply line(s).

FOR DUAL LINE HOT AND COLD WATER SUPPLY APPLICATIONS

When connecting the Faucet to a hot and cold water supply, two Back Checks are required as described in Step 1. If Back Checks are not installed at this time, install them now referring back to Step 1 for instructions.

Install a 3/8 inch copper Supply Tube between each Back Check and the Compression Tee Fitting supplied (refer to Figure A or B).

Install a 3/8 inch copper Supply Tube between Compression Tee Fitting and inlet side of Solenoid Valve.

FOR SINGLE LINE WATER SUPPLY APPLICATIONS

When connecting the Faucet to a single line water supply or a pre-tempered water supply, no Back Check is required.

Install a 3/8" copper Supply Tube between the Supply Stop and inlet side of Solenoid Valve. (Refer to Figure A or B.)

Step 9 — Install Spray Head (Figure 8)

Install Spray Head into opening of Spout. Tighten Spray Head with Key provided.

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

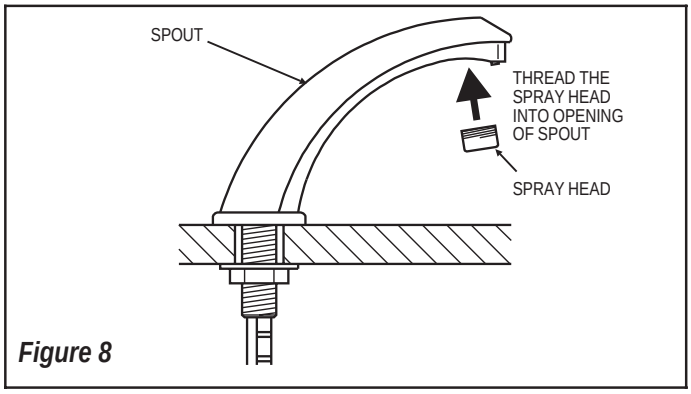


Figure 8

Step 10 — Electrical Connection

Note: *Use Step 10A for EBF-85 and EBF-187 Battery Powered Faucet Models and Step 10B for EBF-85-R and EBF-187-R 6 Volt Transformer Powered Faucet Models.*

Step 10A — Battery Installation (Figure 9)

MODELS EBF-85 AND EBF-187

Note: *DO NOT INSTALL THE BATTERIES UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.*

Loosen security set screw on the Coupling Ring with a 0.05" hex or allen wrench. Unscrew Battery Compartment Coupling Ring. Remove Battery Compartment.

To ensure proper operation, insert four (4) new C-size Alkaline batteries. Check that the orientation of each battery matches the positive (+) and negative (-) symbols shown in the bottom of the Battery Compartment. Make sure that Spout is properly centered and that no objects are in the sink.

Reattach the Battery Compartment to the Valve Module by aligning the arrow on the Battery Compartment with the arrow on the solid tab of the Valve Module. Secure by tightening Battery Compartment Coupling Ring. To deter unauthorized removal of batteries, use a 0.05" hex or allen wrench to tighten the security set screw on the Coupling Ring.

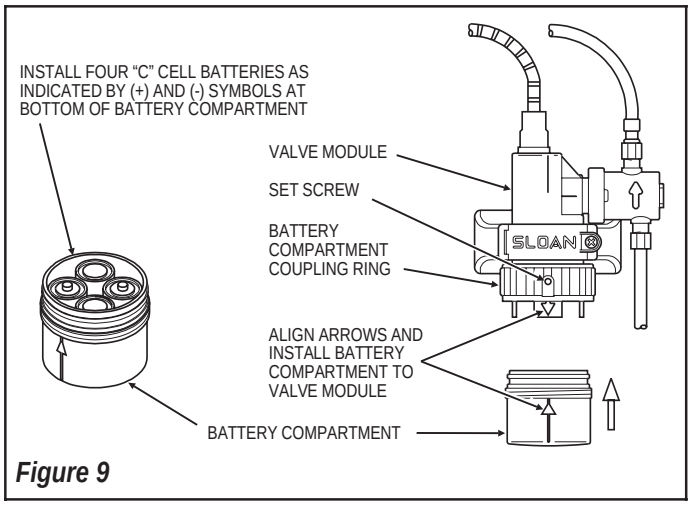


Figure 9

Step 10B — Transformer Installation (Figures 10, 11 and 12)

MODELS EBF-85-R AND EBF-187-R

Note: *DO NOT APPLY ELECTRIC POWER TO FAUCET OR PLUG TRANSFORMER INTO RECEPTACLE UNTIL THE FAUCET IS COMPLETELY INSTALLED. If power is applied to the faucet before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.*

Important: DO NOT plug Transformer into receptacle until all wiring has been completed.

INSTALL POWER PACK (Figure 10)

Attach the Power Pack to Valve Module by aligning the arrow on the Power Pack with the arrow on the solid tab of the Valve Module. Secure by tightening Power Pack Coupling Ring. To deter unauthorized removal of Power Pack, use a 0.05" hex or allen wrench to tighten the security set screw on the Coupling Ring.

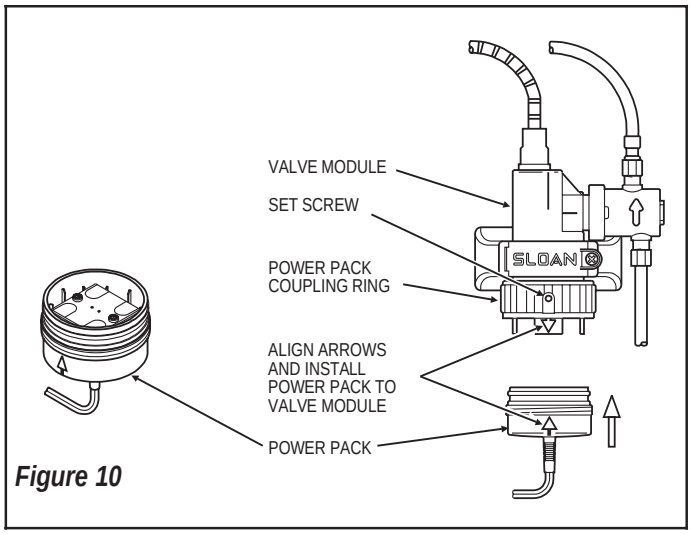


Figure 10

INSTALL TRANSFORMER (Figures 11 and 12)

The type of Transformer shown in Figure 11 is designed to be plugged into a 120 VAC wall receptacle. The Transformer is supplied with a 10 foot Cable; however, this Cable can and should be shortened to meet installation requirements.

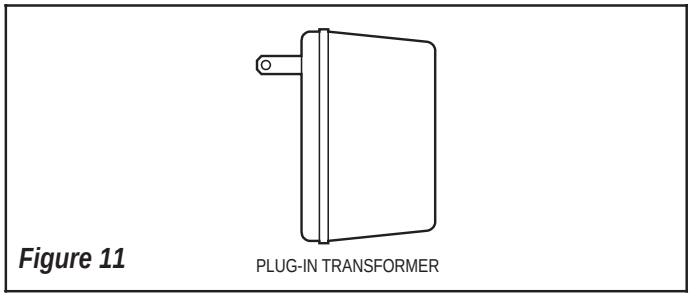


Figure 11

Separate and strip free ends of Transformer Power Cable approximately 3/16 to 1/4 inch (5 to 6 mm).

IMPORTANT NOTES

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DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

Install Crimp Connectors to stripped ends of Transformer Power Cable and connect Power Cable ends to Transformer Terminals as shown in Figure 12.

Make sure that Spout is properly centered and that no objects are in the sink. Plug Transformer into a 120 VAC wall receptacle.

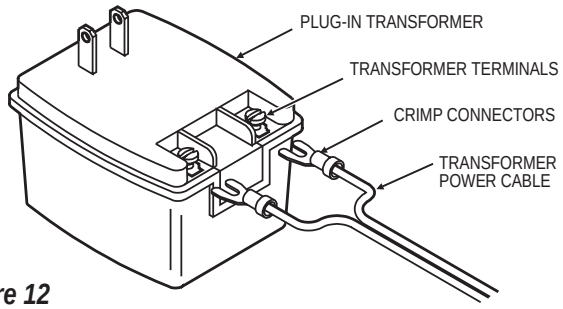


Figure 12

START UP MODE

The Sloan OPTIMA EBF-85 and EBF-187 Electronic, Sensor Operated Lavatory faucets use *Adaptive Sensing* technology to automatically set its sensing range once the batteries or power pack are installed. No mechanical range adjustments are required. The faucet automatically adapts its range to its surrounding environment.

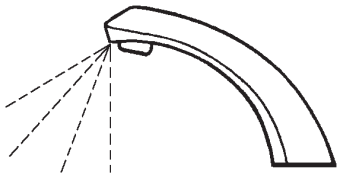
SELF-CALIBRATION PROCEDURE

When the Battery Compartment or Power Pack is assembled to the Valve Module with full electrical power, the faucet initiates a self-calibration mode and uses *BEEP*s to indicate the status of this mode. To prevent improper calibration, ensure that the Spout is centered properly and that no targets are in the detection range of the sensor when the electrical connections are made. An initial series of *BEEP*s indicates that power is being supplied to the faucet. For the next thirty (30) seconds, the sensor determines the most suitable range setting for its environment. Water will not flow from the faucet during this automatic range calibration. After the range is calibrated, a second series of *BEEP*s indicates that the faucet is ready for use. Under normal operation, this faucet adapts its range to changes in the environment.

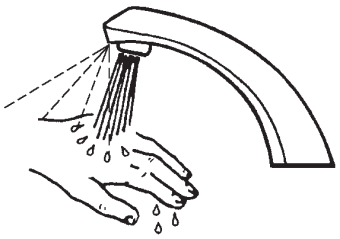
If manually starting the recalibration procedure is necessary, unscrew the Coupling Ring to break the electrical connection between the Battery Compartment or Power Pack and the Valve Module. Reconnect the electrical connection by reattaching Battery Compartment (with batteries) or Power Pack to the Valve Module and tighten the Coupling Ring. The self-calibration procedure should start automatically after proper electrical connections are made.

OPERATION

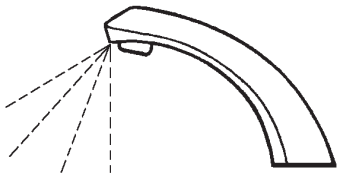
1. Continuous, invisible light beams are emitted from the fiber optic sensor "eyes" located on the front of the lavatory faucet.



2. As the user's hands enter the beam's effective range (beneath the spray head), the beam is reflected into the receiver "eye" and activates the valve. Tempered water flows from the faucet into the sink until the hands are removed from the sensor's beam or until the faucet reaches the automatic time-out limit setting (factory set at 30 seconds).



3. When hands are moved away from the OPTIMA faucet, the loss of reflected light initiates an electrical signal that deactivates the valve, shutting off the water flow. The circuit then automatically resets and is ready for the next user.



CARE AND CLEANING OF CHROME AND SPECIAL FINISHES

DO NOT use abrasive or chemical cleaners (including chlorine bleach) to clean faucets that 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, protect the faucet from any splattering of cleaner. Acids and cleaning fluids will discolor or remove chrome plating.

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

TROUBLESHOOTING GUIDE

Note: *BEEP sounds are emitted from the Solenoid Valve Module (not from the Spout of the Faucet). For the first ten (10) minutes of operation (or after battery replacement or electrical power is reconnected), the unit BEEPS every time the faucet is activated to indicate that the range limits are set. To conserve battery power, the battery model will not BEEP again until it indicates low battery power.*

1. PROBLEM: Module emits audible "BEEPs" when activated.

CAUSE: Electrical power supplied to the faucet is extremely low (battery power is nearly exhausted or brownout electrical conditions exist).

SOLUTION: Reconnect electrical power.

For a battery powered model: To ensure proper operation, insert four (4) new C-size Alkaline batteries. Check that the orientation of each battery matches the positive (+) and negative (-) symbols shown in the bottom of the Battery Compartment. Reattach Battery Compartment to Valve Module.

For a transformer powered model (-R variation): Wait for normal operating electrical conditions to return. If necessary, manually recalibrate the faucet.

2. PROBLEM: Sensor is activated but faucet does not deliver water.

INDICATOR: ***Module DOES NOT produce audible "BEEPs."***

CAUSE: No electrical power is supplied to the faucet (battery power is fully exhausted or blackout electrical conditions exist).

SOLUTION: Replace or reconnect electrical power supply.

For a battery powered model: To ensure proper operation, insert four (4) new C-size Alkaline batteries. Check that the orientation of each battery matches the positive (+) and negative (-) symbols shown in the bottom of the Battery Compartment. Reattach Battery Compartment to Valve Module.

For a transformer powered model (-R variation): Wait for normal operating electrical conditions to return. If necessary, manually recalibrate the faucet.

CAUSE: Electrical power supply is not properly connected (batteries, Battery Compartment, Power Pack, and/or Transformer are not installed properly).

SOLUTION: **For a battery powered model:** Check that the orientation of the batteries match the positive (+) and negative (-) symbols shown in the bottom of the battery compartment. Reattach the Battery Compartment to the Valve Module.

For a transformer powered model (-R variation): Check all electrical connections (Valve Module to Power Pack, Power Pack to Transformer, and Transformer to 120 VAC receptacle). If necessary, manually recalibrate the faucet.

CAUSE: Solenoid Valve Module is defective.

SOLUTION: Replace Solenoid Valve Module.

For a battery powered model: Replace EBF-11-A Solenoid Valve Module.

For a transformer powered model (-R variation): Replace EBF-175-A Solenoid Valve Module.

INDICATOR: ***Module produces audible "BEEPs" when all electrical connections are made and after 30-second calibration procedure, but NOT when a target is placed in the detection zone of the Sensor.***

CAUSE: Fiber Optic Cable is not connected correctly to Solenoid Valve Module or was not connected when proper electrical connections were made.

SOLUTION: Reconnect Fiber Optic Cable to Solenoid Valve Module. Unscrew Coupling Ring to open Battery Compartment or Power Pack and reset the electrical system. Reattach the Battery Compartment or Power Pack to the Valve Module. Tighten Coupling Ring.

CAUSE: Fiber Optic Cable is defective.

SOLUTION: Replace EBF-179-A Sensor Cable, EBF-1009-A Sensor Cable, or the Faucet/Sensor Assembly listed below.

For an EBF-85 model: Replace EBF-10-A Faucet/Sensor Assembly.

For an EBF-187 model: Replace EBF-170-A Faucet/Sensor Assembly.

CAUSE: Solenoid Valve Module is defective.

SOLUTION: Replace Solenoid Valve Module.

For a battery powered model: Replace EBF-11-A Solenoid Valve Module.

For a transformer powered model (-R variation): Replace EBF-175-A Solenoid Valve Module.

INDICATOR: ***Module produces audible "BEEPs" when a target is placed in the detection zone of the Sensor and Solenoid Valve produces an audible "CLICK", but NO water flows.***

CAUSE: Water supply to faucet is not open.

SOLUTION: Open supply stop(s).

CAUSE: Back Check is installed backwards.

SOLUTION: Reinstall Back Check(s).

CAUSE: Solenoid Filter is clogged.

SOLUTION: Remove, clean, and reinsert. Replace with EBF-1004-A Solenoid Filter Kit if necessary.

CAUSE: Aerator or Spray head is clogged.

SOLUTION: Remove, clean, and reinsert.

INDICATOR: ***Module produces audible "BEEPs" when a target is placed in the detection zone of the Sensor, but Solenoid Valve does NOT produce an audible "CLICK" and NO water flows.***

CAUSE: Solenoid Valve Module is defective.

SOLUTION: Replace Solenoid Valve Module.

For a battery powered model: Replace EBF-11-A Solenoid Valve Module.

For a transformer powered model (-R variation): Replace EBF-175-A Solenoid Valve Module.

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

TROUBLESHOOTING GUIDE (Continued)

3. **PROBLEM:** **Faucet delivers only a slow flow or dribble when Sensor is activated.**
   CAUSE: *Water supply valve is partially closed.*
   SOLUTION: Open the Supply Stop(s) completely.
   CAUSE: *Solenoid Filter is clogged.*
   SOLUTION: Remove, clean, and reinsert. Replace with EBF-1004-A Solenoid Filter if necessary.
   CAUSE: *Aerator or Spray head is clogged.*
   SOLUTION: Remove, clean, and reinsert.
4. **PROBLEM:** **Faucet does not stop delivering water or continues to drip after user is no longer detected (automatic shut-off fails even when batteries are removed or Power Pack is disconnected from the electric supply).**
   CAUSE: *Solenoid Valve has been connected backwards.*
   SOLUTION: Disassemble Solenoid Valve compression fittings at the inlet and outlet positions. Water should flow from inlet through the Solenoid Valve to outlet according to the direction shown by the arrow on the side of the Solenoid Valve. Reconnect the fittings in the correct orientation.
   CAUSE: *Solenoid Valve seat is dirty.*
   SOLUTION: Remove, clean, and reinsert Solenoid Filter. Activate faucet several times to flush out dirt.
   CAUSE: *Solenoid Valve is dirty.*
   SOLUTION: Backflush by reversing water flow (opposite to the direction shown by the arrow on the side of the Solenoid Valve) through the Solenoid Valve. Reconnect the compression fittings in the correct orientation. Activate faucet.
   CAUSE: *Solenoid Valve Module is defective.*
   SOLUTION: Replace Solenoid Valve Module.
   For a battery powered model: Replace EBF-11-A Solenoid Valve Module.
   For a transformer powered model (-R variation): Replace EBF-175-A Solenoid Valve Module.
5. **PROBLEM:** **The water temperature is too hot or too cold on a faucet connected to hot and cold supply lines with two Back Checks.**
   CAUSE: *Supply Stops are not adjusted properly.*
   SOLUTION: Adjust Supply Stops.
   CAUSE: *One Back Check is installed backwards.*
   SOLUTION: Reinstall Back Check.
   NOTE: ***For some systems, a thermostatic mixing valve may be required.***

For additional information about Sloan Mixing Valves or Trim Plates, consult our Installation Instructions and our Maintenance Guides.

If further assistance is required, please contact the Sloan Valve Company Installation Engineering Department at 1-888-SLOAN-14 (1-888-756-2614).

BATTERY REPLACEMENT PROCEDURE (Figure 13)

The Sloan OPTIMA EBF-85 and EBF-187 Battery Powered, Sensor Operated Lavatory faucet models are furnished with four (4) Duracell C cell Alkaline batteries that provide up to 3 years of operation (at 8000 cycles per month). When the batteries are low and need to be replaced, the EBF-85 and EBF-187 will signal you. When 256 cycles remain in the unit, the faucet will *BEEP* each time it is activated. At this point we recommend battery replacement. Sloan Valve recommends the use of Duracell MN-1400 C cell batteries.

To Replace Batteries:

Note: *Water supply to the faucet does not need to be turned off when replacing batteries.*

Loosen security set screw on the Coupling Ring with a 0.05¨ hex or allen wrench. Unscrew Battery Compartment Coupling Ring. Remove Battery Compartment. To ensure proper operation, remove old batteries and insert four (4) new C-size Alkaline batteries. Check that the orientation of each battery matches the positive (+) and negative (-) symbols shown in the bottom of the Battery Compartment. Reattach the Battery Compartment to the Valve Module by aligning the arrow on the Battery Compartment with the arrow on the solid tab of the Solenoid Valve Module. Secure by tightening Battery Compartment Coupling Ring. To deter unauthorized removal of batteries, use a 0.05" hex or allen wrench to tighten the security set screw on the Coupling Ring.

Upon installation of the batteries, the EBF-85 and EBF-187 faucet will begin a new self calibration procedure (see START UP MODE).

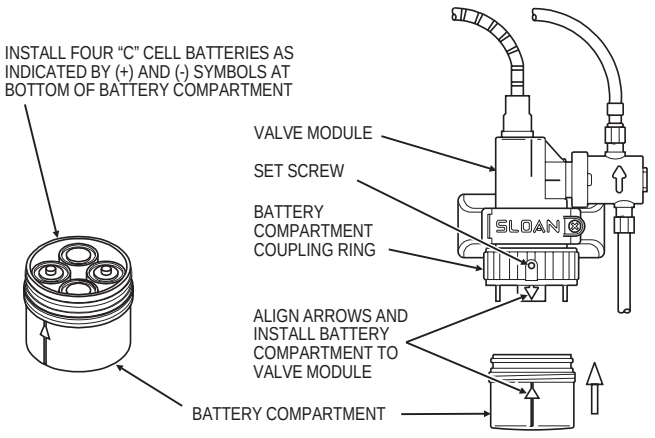


Figure 13

BATTERY TO POWER PACK CONVERSION PROCEDURE (Figures 14 and 15)

Loosen security set screw on the Coupling Ring with a 0.05¨ hex or allen wrench. Unscrew Battery Compartment Coupling Ring. Remove Battery Compartment and batteries. Attach the Power Pack to the Valve Module by aligning the arrow on the Power Pack with the arrow on the solid tab of the Solenoid Valve Module. Secure by tightening Power Pack Coupling Ring. To deter Power Pack removal, use a 0.05" hex or allen wrench to tighten the security set screw on the Coupling Ring.

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

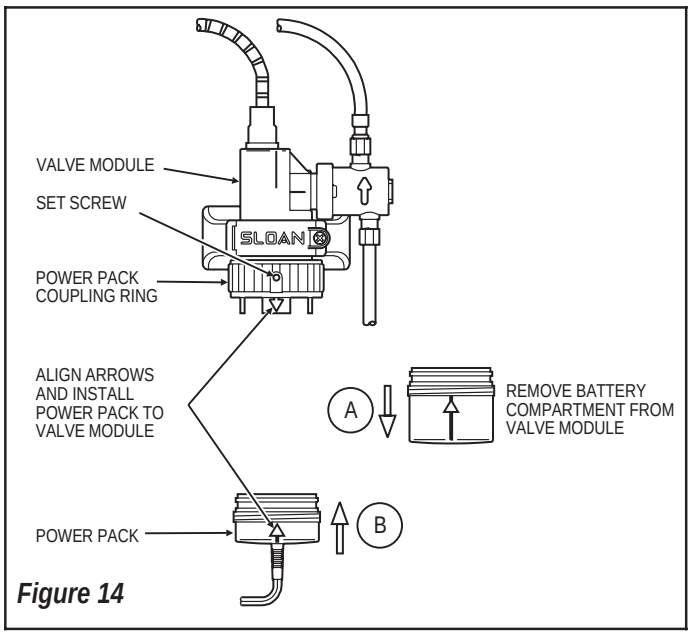


Figure 14

Separate and strip free ends of Transformer Power Cable approximately 3/16 to 1/4 inch (5 to 6 mm). Install Crimp Connectors to stripped ends of Transformer Power Cable. Connect Transformer Power Cable ends to Transformer Terminals. Plug Transformer into appropriate 120 VAC receptacle.

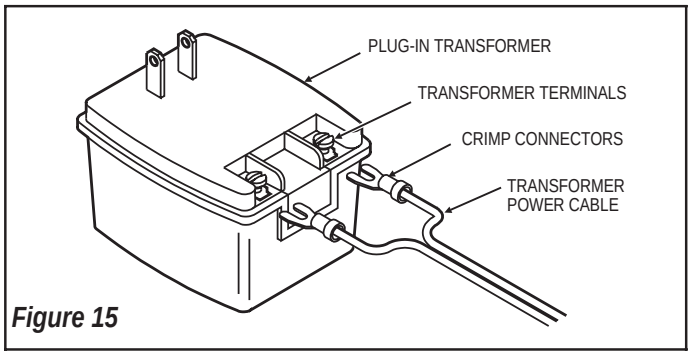


Figure 15

POWER PACK REPLACEMENT PROCEDURE

Loosen security set screw on the Coupling Ring with a 0.05¨ hex or allen wrench. Unscrew Power Pack Coupling Ring. Remove and replace Power Pack. Reattach the Power Pack to the Valve Module by aligning the arrow on the Power Pack with the arrow on the solid tab of the Solenoid Valve Module. Secure by tightening Power Pack Coupling Ring. To deter unauthorized removal of batteries, use a 0.05" hex or allen wrench to tighten the security set screw on the Coupling Ring.

SOLENOID SCREEN FILTER CLEANING PROCEDURE (Figure 16)

Before cleaning the Screen Filter, turn off the water supply at the supply stop(s). Activate the faucet to relieve any pressure in the system. Unscrew the Filter Plug and remove it from the Solenoid Valve Housing. Carefully pull the Screen Filter with attached rubber seals out of the Solenoid Valve Housing.

Clean the Screen Filter using fresh tap water only. If necessary, use a small brush to clean. Use caution while cleaning to prevent damage to the Solenoid Screen Filter. If any Filter components are damaged, order Filter Replacement Kit EBF-1004-A.

Carefully replace the Screen Filter into the groove of the Solenoid Valve Housing. Examine the Filter Plug O-Ring for wear or damage; replace if necessary. If necessary, lubricate the Filter Plug O-Ring with water to keep it in place in the groove of the Filter Plug. Screw the Filter Plug into the Solenoid Valve Housing.

Turn on the water supply at the supply stop(s). Activate the faucet to purge any air from the system lines. Check for leaks and repair as necessary.

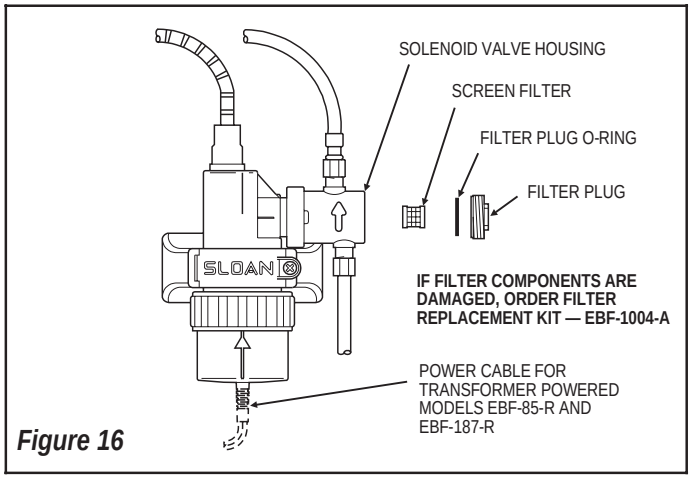


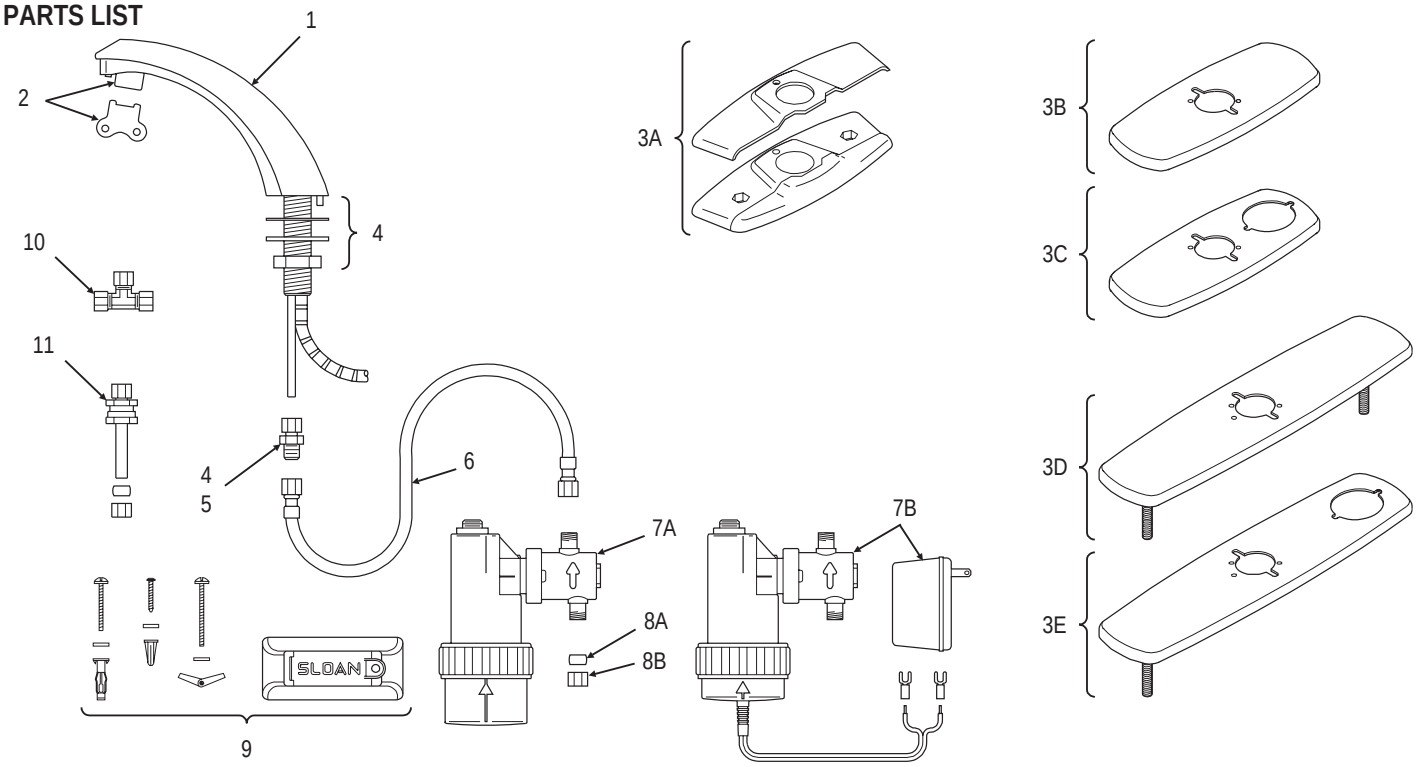
Figure 16

IMPORTANT NOTES

DO NOT INSTALL THE BATTERIES OR CONNECT THE TRANSFORMER UNTIL THE FAUCET IS COMPLETELY INSTALLED. If the batteries are installed or the transformer is connected before the fiber optic cable has been connected to the electronic module, the faucet will not properly set the sensing range for the sink on which it has been installed.

DO NOT INSTALL THE SPRAY HEAD UNTIL AFTER THE SUPPLY LINES HAVE BEEN FLUSHED.

PARTS LIST



Item No.	Part No.	Description
1	EBF-10-A	Faucet and Sensor Assembly (EBF-85 with Black Plastic Throat Plate)
	EBF-170-A	Faucet and Sensor Assembly (EBF-187 with CP Metal Throat Plate)
	EBF-179-A	Fiber Optic Sensor Cable Assembly Only (replaces EBF-12-A)
	EBF-1009-A	Fiber Optic Sensor Cable Assembly Only (replaces EBF-12-A, includes lens holder)
2	ETF-1021-A	0.5 gpm (1.9 Lpm) Spray Head with Key (female thread)
	ETF-1022-A	2.2 gpm (8.3 Lpm) Aerator Spray Head with Key (female thread)
	ETF-237	2.2 gpm (8.3 Lpm) Laminar Flow Spray Head (female thread)
	ETF-435	Replacement Key ONLY for ETF-1021-A 0.5 gpm (1.9 Lpm) Spray Head and ETF-1022-A 2.2 gpm (8.3 Lpm) Aerator Spray Head (NOT required for ETF-237 2.2 gpm/8.3 Lpm Laminar Flow Spray Head)
3A	ETF-295-A	4¨ (102 mm) Centerset Trim Plate Kit for EBF-85 or EBF-187 Faucet (Faucet Only) includes two (2) Nuts, two (2) Hex Screws, two (2) Flat Plate Washers, Single Hole CP Cover Plate, and Black Plastic Base Plate
3B	ETF-312-A	4¨ (102 mm) Centerset Trim Plate Kit for EBF-85 or EBF-187 Faucet (Faucet Only) includes Back-up Spacer, Self-tapping Screw and CP Single Hole Trim Plate Assembly
3C	MIX-101-A	4¨ (102 mm) Centerset Trim Plate Kit for EBF-85 or EBF-187 Faucet with Optional Mixing Valve includes Back-up Spacer, Self-tapping Screw and CP Dual Hole Trim Plate Assembly
3D	ETF-510-A	8¨ (203 mm) Centerset Trim Plate Kit for EBF-85 or EBF-187 Faucet (Faucet Only) includes two (2) Finger Nuts, two (2) Washer Gaskets, two (2) Fender Washers, Base Gasket, Back-up Spacer and CP Single Hole Trim Plate Assembly
3E	MIX-104-A	8¨ (203 mm) Centerset Trim Plate Kit for EBF-85 or EBF-187 Faucet with Optional Mixing Valve includes Back-up Spacer, Self-tapping Screw and CP Dual Hole Trim Plate Assembly
4	ETF-290-A	Faucet Mounting Kit includes Rubber Gasket, Mounting Washer, Mounting Nut, and ETF-297 Compression Fitting Connector
5	ETF-297	1/4¨ to 3/8¨ Compression Fitting Connector
6	MIX-19	20¨ (508 mm) Flex Hose
7A	EBF-11-A	Solenoid Valve Module Assembly for Battery Powered Model includes Solenoid Enclosure, Solenoid Body, and Filter Cap
	EBF-4	Four (4) “C” size Alkaline Batteries
7B	EBF-175-A	Solenoid Valve Module Assembly for Transformer Powered Model (-R Variation) includes Solenoid Enclosure, Solenoid Body, and Filter Cap
	EBF-176	6 Volt Power Pack for Transformer Powered Model (-R Variation) includes 10-ft (3.05 m) Transformer Power Cable and two (2) Crimp Connectors
	EL-386	6 Volt Transformer for Transformer Powered Model (-R Variation)
8A	ETF-208	3/8¨ (10 mm) Ferrule
8B	ETF-209	3/8¨ (10 mm) Compression Nut
9	EBF-25-A	Mounting Bracket Kit includes Base Plate, Wall Bracket Base, Wall Bracket, Mounting Screw, Self-tapping Screw, two (2) Wood Screws plus Washers and Plastic Anchors, two (2) Screws plus Washers and Toggle Nuts, two (2) Screws plus Washers and Hollow Wall Anchors
10	ETF-259	3/8¨ (10 mm) Tee Compression Fitting
11	ETF-470-A	Back Check
—	EBF-1004-A	Solenoid Filter Replacement Kit includes Filter Screen Assembly and O-ring
—	EBF-1008-A	Solenoid Valve Module Assembly Replacement Kit for Transformer Powered Model (-R Variation) includes 6 V Power Pack and 6 V Transformer

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

SLOAN

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