



**FEDERAL SIGNAL**

Safety and Security Systems / Industrial

## **Electrarray® Models 224XST, 225XST, and 225XST-I Strobe Warning Lights**

**For Use in Hazardous Locations**



*\*green lens not shown*

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## ***Installation and Maintenance Instructions***

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español.....página 35*



**Warranty** – Seller warrants all goods for five years on parts and 2-1/2 years on labor, under the following conditions and exceptions: Seller warrants that all goods of Seller's manufacture will conform to any descriptions thereof for specifications which are expressly made a part of this sales contract and at the time of sale by Seller such goods shall be commercially free from defects in material or workmanship. Seller reserves the right at the Seller's discretion to "Repair and Return" or "Replace" any item deemed defective during the warranty period. This warranty does not cover travel expenses, the cost of specialized equipment for gaining access to the product, or labor charges for removal and reinstallation of the product. This warranty shall be ineffective and shall not apply to goods that have been subjected to misuse, neglect, accident, damage, improper maintenance, or to goods altered or repaired by anyone other than Seller or its authorized representative, or if five years have elapsed from the date of shipment of the goods by Seller with the following exceptions: lamps and strobe tubes are not covered under this warranty. Outdoor warning sirens and controllers manufactured by Federal Warning Systems are warranted for two years on parts and one year on labor. No agent, employee, representative or distributor of Seller has any authority to bind the Seller to any representation, affirmation, or warranty concerning the goods and any such representation, affirmation or warranty shall not be deemed to have become a part of the basics of the sales contract and shall be unenforceable. THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OR MERCHANTABILITY, FITNESS FOR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED. These warranties shall not apply unless Seller shall be given reasonable opportunity to investigate all claims for allegedly defective goods. Upon Seller's instruction a sample only of allegedly defective goods shall be returned to Seller for its inspection and approval. The basis of all claims for alleged defects in the goods not discoverable upon reasonable inspection thereof pursuant to paragraph 8 hereof must be fully explained in writing and received by Seller within thirty days after Buyer learns of the defect or such claim shall be deemed waived.



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## **Safety Messages to Installers and Users**

### **⚠ WARNING**

It is important to follow all instructions shipped with this product. This device is to be installed by a trained electrician who is thoroughly familiar with the National Electrical Code and/or Canadian Electrical Code and will follow the NEC and/or CEC Guidelines as well as all local codes.

This device should be considered a part of the warning system and not the entire warning system.

The selection of the mounting location for the device, its controls and the routing of the wiring are to be accomplished under the direction of the facilities engineer and the safety engineer. In addition, listed below are some other important safety instructions and precautions you should follow:

- Read and understand all instructions before installing or operating this equipment.
- Never alter the light in any way. Safety may be compromised if additional openings or other alterations to the light.
- Do not connect this light to the system when power is on.
- After installation, ensure that the retaining screw and threaded joints are properly tightened.
- Keep the light tightly closed when in operation.
- After installation, test the lighting system for proper operation.
- After testing is complete, provide a copy of this instruction manual to all operating personnel.
- Establish a procedure to routinely check the light installation for integrity and proper operation.
- Not to be used as a visual public mode alarm notification appliance.

## Installation and Maintenance Instructions

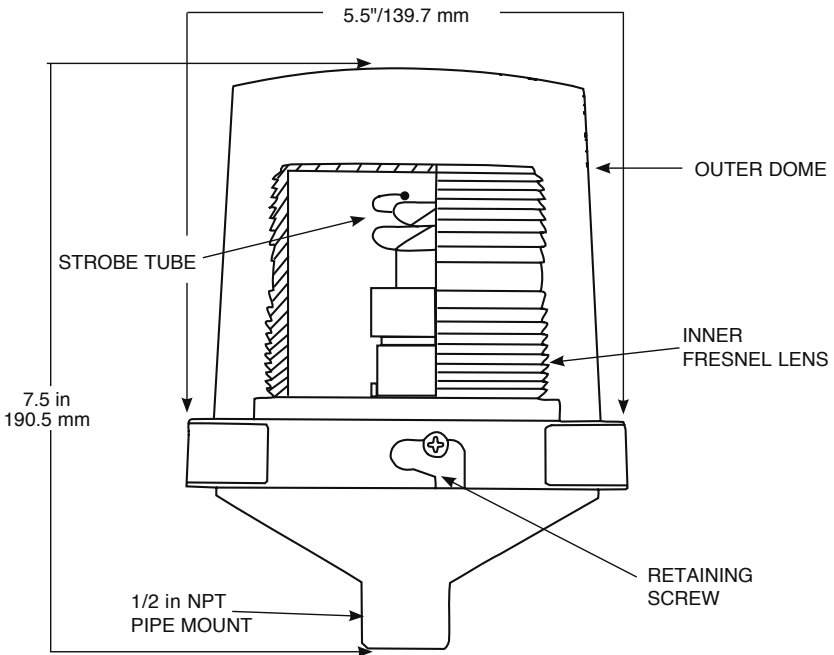
Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.

### Overview of the Light

The Model 224XST, 225XST and 225XST-I strobe lights are visual Signaling Devices intended for hazardous locations. The lights are UL listed Visual Signal Appliances for Hazardous Locations for indoor/outdoor use. Underwriters Laboratories has investigated the Models 224XST, 225XST and 225XST-I to ensure that they comply with the TYPE 4X (watertight and corrosion resistant) and IP66 (dust-tight and protection against heavy seas) enclosure requirements.

The Models 224XST and 225XST-I are available in 24 Vdc. The Model 225XST is available in 12-24Vdc, 120 Vac at 50/60 Hz, and 230-240 Vac at 50/60 Hz. The Model 224XST is also available in 120 Vac at 50/60 Hz and 230-240 Vac at 50/60 Hz.

**Figure 1** Cross section of light



## Unpacking the Light

After unpacking the light, examine it for damage that may have occurred in transit. If the light has been damaged, do not attempt to install or operate it. File a claim immediately with the carrier, stating the extent of the damage. Carefully check all envelopes, shipping labels, and tags before removing or discarding them. Disposal of all shipping materials must be carried out in accordance with national and local codes and standards. If any parts are missing, please call Federal Signal Customer Support at +1 708-534-4756 or +1 877-289-3246.

## Installation Precautions

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D; Class II, Division 2, Groups F and G; and Class III, or non-hazardous locations only.

The Model 224XST, 225XST and 225XST-I should be installed per the NFPA 70 and 72, per STATE and LOCAL CODES, and should only be performed with the approval of the authority having jurisdiction.

### **⚠ WARNING**

***SHOCK/FIRE HAZARD: For four-wire models, when installed, all four wires must be terminated. Failure to terminate both sets of wires (black/red, or black/white) will result in a shock or fire hazard.***

### **⚠ WARNING**

***SHOCK HAZARD: To avoid electrical shock hazards, do not connect or disconnect wires while power is applied.***

## Mounting the Light

Models 224XST, 225XST and 225XST-I can be mounted on 1/2 in NPT pipe. It can also be mounted on a flat surface with the LHWB bracket kit. The conduit run from the device to the splice box shall not be longer than 10 in (25.4 cm).

**NOTE:** To prevent the connection from loosening, tighten the fixture to a MINIMUM torque of 5 ft-lb (6.8 Nm) after threading it onto the pipe.

## **Wiring the Vac Models**

The 120 Vac or 230-240 Vac strobe lights are designed to operate on both 50 and 60 Hz electrical power. Special modifications are NOT required for the two different AC line frequencies.

### ***Wiring the Vac Model 224XST***

The 224XST Vac light is provided with five leads: two black, two white, and one green/yellow.

To achieve electrical supervision:

1. Connect one black lead to the phase (line) side of the incoming power source and the other black lead to the phase (line) side of the outgoing power.
2. Connect one white lead to the common (neutral) side of the incoming power source and the other white lead to the common (neutral) side of the outgoing power.
3. Connect the green/yellow lead to earth ground.

### ***Wiring the Vac Model 225XST***

The 225XST Vac light is provided with three leads: one black, one white, and one green/yellow.

To wire the light:

1. Connect the black lead to the phase (line) side of the AC power source.
2. Connect the white lead to the common (neutral) side of the AC power source.
3. Connect the green/yellow lead to earth ground.

## **Wiring the DC Models**

### **NOTICE**

**REVERSE POLARITY/MISWIRING:** *The DC lights are polarity sensitive, and MAY BE DAMAGED by incorrect electrical hookup. When connecting the DC strobe light to the voltage supply lines, POLARITY MUST BE OBSERVED. In addition, damage will result if the voltage rating of the model is exceeded.*

### **Wiring the Vdc Model 224XST**

The Model 224XST Vdc light is provided with five leads: two red, two black, and one green/yellow.

To achieve electrical supervision:

1. Connect one red (+) lead to the positive side of the incoming power source and the other red (+) lead to the positive side of the outgoing power source.
2. Connect one black (–) lead to the negative side of the incoming power source and the other black (–) lead to the negative side of the outgoing power source.
3. If required by local codes, connect the green/yellow lead to earth ground.

### **Wiring the Vdc Model 225XST**

The Model 225XST and 225XST-I Vdc lights are provided with three leads: one red, one black, and one green/yellow.

To wire the light:

1. Connect the red (+) lead to the positive (+) power source terminal.
2. Connect the black (–) lead to the negative (–) power source terminal.
3. If required by local codes, connect the green/yellow lead to earth ground.

## Safety Message to Maintenance Personnel

**⚠ WARNING**

Listed below are some important safety instructions and precautions you should follow:

- Read and understand all instructions before operating this system.
- Any maintenance to the light system must be performed by a trained electrician who is thoroughly familiar with all applicable national and local codes in the country of use.
- Any maintenance to the light system must be done with power turned off.
- **EXPLOSION HAZARD: Substitution of any component may impair suitability for Class 1, Division 2.**
- **EXPLOSION HAZARD: Do not disconnect the light while the circuit is live or unless the area is known to be free of ignitable concentrations.**
- Do not connect this light to the system when power is on.
- Keep the light closed when in operation.
- Do not alter the light in any way. In hazardous areas, safety may be compromised if additional openings or other alterations in units specifically designed for use in these locations are made.
- The nameplate should NOT be obscured, as it contains cautionary and/or other information of importance to maintenance personnel. Ensure the nameplate remains readable if the housing exterior is painted.
- If the dome is damaged in any way, it MUST be replaced.
- After performing any maintenance, test the light system to ensure that it is operating properly.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death.

## Replacing the Strobe Tube

### ⚠ WARNING

**SHOCK HAZARD:** Strobe systems generate high voltages. Disconnect power from the strobe system and wait at least 5 minutes before opening the light. Do not apply power to the light while it is open. Failure to follow this warning could result in serious injury or death.

### ⚠ CAUTION

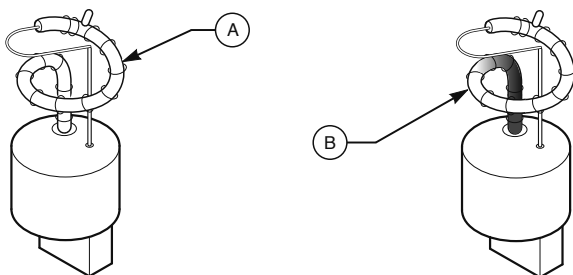
**HANDLE STROBE LAMPS CAREFULLY:** Strobe lamps get hot enough to burn you. Always allow these lamps to cool before handling them. Strobe lamps are also pressurized and, if broken, can result in flying glass. Failure to follow this warning may result in personal injury.

### NOTICE

**ELECTROSTATIC DISCHARGE:** The circuitry of this warning light can be damaged by electrostatic discharge (ESD). Always follow anti-static procedures while replacing the strobe tube.

As strobe lights are used, the strobe tubes begin to darken, causing the light output to decrease. This darkening is characteristic of strobe tubes. The darkening will begin near the base of the tube and progress upward. In addition, as strobe tubes age, they may have a tendency to misfire (not fire periodically).

**Figure 2** Good tube (A) and degraded tube (B)



After extended operation, occasionally check for strobe tube degradation. Should the strobe tube misfire, have a noticeable decrease in light output, glow continuously or darken to a point

## ***Installation and Maintenance Instructions***

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beyond that shown in Figure 2, it should be replaced. See "Ordering Replacement Parts and Accessories" on page 15.

### **1. Remove the strobe tube:**

- a. Disconnect power from the electrical circuit.
- b. Wait at least 5 minutes before removing the dome.
- c. Loosen the retaining screw located on the bottom of dome.
- d. Grasp the top of the dome and push down while turning the dome counterclockwise approximately 3/4 inch (19 mm).
- e. Gently lift the dome away. Ensure that the gasket between the dome and base is not lost.
- f. Loosen the screws in the retaining ring approximately 1/2 turn. The retaining ring can then be turned counterclockwise approximately 1/2 inch (13 mm), allowing it to be lifted free of the light.
- g. Lift the interior lens from the light.
- h. Grasp the strobe tube by the base and pull it out of the socket using a gentle rocking motion.

### **2. Install the new strobe tube:**

#### **NOTICE**

***DO NOT TOUCH THE LAMP WITH BARE HANDS: Oil deposits on the glass portion of the strobe lamp can cause the glass to fracture during use. If you are unsure if the glass has been handled without gloves, clean the glass using a soft cloth and isopropyl alcohol before installing the lamp.***

- a. Install the new strobe tube, ensuring that the strobe tube is fully seated in the socket.
- b. Reinstall the interior lens.
- c. Reinstall the retaining ring, turning it clockwise approximately 1/2 inch (13 mm), and secure it with the screws.

- d. Before replacing the dome, ensure that the gasket is properly seated and shows no signs of cracking or other deterioration. Replace the gasket if it is damaged or shows signs of deterioration. See "Ordering Accessories and Replacement Parts" on page 15.
- e. Place the dome over the base, aligning the recesses inside the dome lip with the four pins on the base.
- f. Push down on the dome and turn it clockwise approximately 3/4 inch (19 mm) until it locks in place.
- g. Insert and tighten the retaining screw into the bottom of the dome.
- h. Test the light for proper operation.

## Replacing the Circuit Board

**⚠ WARNING**

***SHOCK HAZARD—Strobe systems generate high voltages. Disconnect power from the strobe system and wait at least 5 minutes before opening the light. Do not apply power to the light while it is open. Failure to follow this warning could result in serious injury or death.***

**NOTICE**

***ELECTROSTATIC DISCHARGE: The circuitry of this warning light can be damaged by electrostatic discharge (ESD). Always follow anti-static procedures while replacing the circuit board.***

1. **Remove the circuit board:**
  - a. Disconnect power from the electrical circuit.
  - b. Wait at least five minutes before removing the dome.
  - c. Remove the retaining screw located at the bottom of the dome.
  - d. Grasp the top of the dome and push down while turning the dome counterclockwise approximately 3/4 inch (19 mm).
  - e. Gently lift the dome away. Ensure that the gasket between the dome and base is not lost.

## ***Installation and Maintenance Instructions***

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- f. Loosen the screws in the retaining ring approximately 1/2 turn.
- g. Turn the retaining ring counter-clockwise approximately 1/2 inch (13 mm), and lift it from the light.
- h. Lift the interior lens from the light.
- i. Remove and retain the screws and heat-sink clip (DC models only) that secure the circuit board to the mounting plate.
- j. Remove the power connector(s) from the circuit board.
- k. Remove the circuit board.

### **2. Install the new circuit board:**

- a. Since some strobes are polarity sensitive, connect matching colored wires together.

#### **NOTICE**

***CIRCUIT BOARD DAMAGE: Do not overtighten the mounting screws. Damage to the printed circuit board will result.***

- b. Secure the new circuit board to the mounting plate with the screws. For the DC circuit board, reattach the heat-sink clip.
- c. Install the strobe tube as described on page 12. Ensure that the strobe tube is fully seated in the socket.
- d. Reinstall the interior lens.
- e. Reinstall the retaining ring, turning it clockwise approximately 1/2 inch (13 mm), and secure it with the screws.
- f. Before replacing the dome, ensure that the gasket is properly seated and shows no signs of cracking or other deterioration. Replace the gasket if it is damaged or shows signs of deterioration. (For replacement parts, see Table 1).
- g. Place the dome over the base, aligning the recesses inside the dome lip with the four pins on the base.

- h. Push down on the dome and turn it clockwise until it locks into place (approximately 3/4 in [19 mm]).
- i. Insert and tighten the retaining screw into the bottom of the dome.
- j. Apply power and test the light for proper operation.

## Cleaning the Enclosure

The fixture should be cleaned periodically to maintain maximum light output. Use only mild, non-abrasive cleaning agents. The dome should be regularly inspected for scratches and chips, and if damaged, it **MUST** be replaced.

## Ordering Replacement Parts and Accessories

**▲ WARNING**

**EXPLOSION HAZARD: Substitution of components may impair suitability for Class I, Division 2.**

Typical spare parts are listed in Table 1. Due to certification, certain component parts are not available for field replacement. Lights with this type of damage must be either replaced entirely or returned to Federal Signal for service. To order accessories and replacement parts, please call Federal Signal Customer Support at 708-534-4756 or 877-289-3246.

**Table 1** Replacement Parts

| Description   | Part Number  | Description          | Part Number  |
|---------------|--------------|----------------------|--------------|
| Lens, Amber   | K8550C095-02 | Dome Exterior, Clear | K8444D219-04 |
| Lens, Blue    | K8550C095-01 | Strobe Tube          | K8107177     |
| Lens, Clear   | K8550C095    | PCBA, 12-24 Vac      | K2001202     |
| Lens, Green   | K8550C095-04 | PCBA, 120 Vac        | K2001905     |
| Lens, Magenta | K8550C095-07 | PCBA, 240 Vac        | K2001905-01  |
| Lens, Red     | K8550C095-03 | Gasket, Dome         | K8444286     |

**Table 2** Optional accessories

| <b>Description</b> | <b>Part Number</b> |
|--------------------|--------------------|
| Light Mounting Kit | LHWB               |

## **Getting Repair Service or Technical Assistance**

Products returned for repair require a Return Authorization form from your local distributor or from Federal Signal. For repair service or technical assistance from Federal Signal, call 708-534-4756 or 877-289-3246.

For instruction manuals and information on related products, visit: [www.federsignal-indust.com](http://www.federsignal-indust.com).

## **Returning the Product for Credit**

Product returns for credit require a return authorization from your local distributor prior to returning the product to Federal Signal. Please contact your distributor for assistance.

A product is qualified to be returned for credit when the following conditions are met:

- Product is resalable and in the original cartons
- Product has not been previously installed
- Product is the current revision
- Product has not been previously repaired
- Product is a standard product
- Product is not a service part

All returns are subject to a re-stock fee.

Defective products that are returned within the warranty period will be repaired or replaced at Federal Signal's sole discretion. Defective products do not include those products with lamp failure.

Circumstances other than those listed above will be addressed on a case-by-case basis.