FEDERAL SIGNAL
Safety and Security Systems

LED UltraStar® Beacon

Installation Manual

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Limited Warranty

This product is subject to and covered by a limited warranty, a copy of which can be found at www.fedsig.com/SSG-Warranty. A copy of this limited warranty can also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484, email to info@fedsig.com or call +1 708-534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.

FEDERAL SIGNAL
Safety and Security Systems

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Safety Message to Installers and Service Personnel

⚠ WARNING

People's lives depend on your proper installation and servicing of Federal Signal products. It is important to read and follow all instructions shipped with this product. Listed below are some other important safety instructions and precautions you should follow:

- To properly install or service this equipment, you must have a good understanding of automotive mechanical and electrical procedures and systems, along with proficiency in the installation and service of safety warning equipment. Always refer to the vehicle's service manuals when performing equipment installations on a vehicle.
- To be an effective warning device, this product produces bright light that can be hazardous to your eyesight when viewed at a close range. Do not stare directly into this lighting product at a close range, or permanent damage to your eyesight may occur.
- Do not install the light system in an area that would block, impair, or blind the driver's vision. Ensure that the light system is mounted in a position that is outside of the driver's field of vision so the driver can safely operate the vehicle.
- A light system is a high current system. For the system to function properly, a separate negative (–) connection and positive (+) connection must be made. All negative connections should be connected to the negative battery terminal, and a suitable fuse should be installed on the positive battery terminal connection as close to the battery as possible. Ensure that all wires and fuses are rated correctly to handle the device and system amperage requirements.
- Never attempt to install aftermarket equipment that connects to the vehicle wiring without reviewing a vehicle wiring diagram available from the vehicle manufacturer. Ensure that your installation will not affect vehicle operation or mandated

safety functions or circuits. Always check the vehicle for proper operation after installation.

- The lighting system components, especially light bulbs, strobe tubes, LEDs, and the outer housing, get hot during operation. Be sure to disconnect power to the system and allow the system to cool down before handling any components of the system.
- Do not mount a radio antenna within 18 inches (45.7 cm) of the lighting system. Placing the antenna too close to the lighting system could cause the lighting system to malfunction or be damaged by strong radio fields. Mounting the antenna too close to the lighting system may also cause the radio noise emitted from the lighting system to interfere with the reception of the radio transmitter and reduce radio reception.
- Do not attempt to wash any unsealed electrical device while it is connected to its power source.
- DO NOT connect this system to the vehicle battery until ALL other electrical connections are made, mounting of all components is complete, and you have verified that no shorts exist. If the wiring is shorted to the vehicle body or frame, high current conductors can cause hazardous sparks resulting in electrical fires or flying molten metal.
- DO NOT install equipment or route wiring (or the plug-in cord) in the deployment path of an airbag.
- Before drilling into a vehicle structure, ensure that both sides of the surface are clear of anything that could be damaged. Remove all burrs from drilled holes. To prevent electrical shorts, grommet all drilled holes through which wiring passes. Also ensure that the mounting screws do not cause electrical or mechanical damage to the vehicle.
- Because vehicle roof construction and driving conditions vary, do not drive a vehicle with a magnetically mounted warning light installed. The light could fly off the vehicle,

causing injury or damage. Repair of damage incurred because of ignoring this warning shall be the sole responsibility of the user.

- Locate the light system controls so the VEHICLE and CONTROLS can be operated safely under all driving conditions.
- After installation, test the light system to ensure that it is operating properly.
- Test all vehicle functions, including horn operation, vehicle safety functions, and vehicle light systems, to ensure proper operation. Ensure that the installation has not affected the vehicle operation or changed any vehicle safety function or circuit.
- Scratched or dull reflectors or lenses will reduce the effectiveness of the lighting system. Avoid heavy pressure and use of caustic or petroleum-based products when cleaning the lighting system. Replace any optical components that may have been scratched or crazed during system installation.
- Do not attempt to activate or deactivate the light system controls while driving in a hazardous situation.
- You should frequently inspect the light system to ensure that it is operating properly and is securely attached to the vehicle.
- After installation and testing are complete, provide a copy of these instructions to instructional staff and all operating personnel.
- File these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

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

An Overview of the LED UltraStar® Beacon

The LED UltraStar uses an LED light source to provide a reliable signal with 14 selectable strobe-emulating flash patterns. Models are available with flush, pipe, or magnetic mounting. The available colors are red and amber. The light can operate on a 12- or 24-volt power source. An optional branch guard is available. See Doc. No. 2561137 for instructions for installing the guard.

Unpacking the Product

After unpacking the product, inspect it for damage that may have occurred in transit. If it has been damaged, file a claim immediately with the carrier, stating the extent of the damage. Carefully check all envelopes, shipping labels, and tags before removing or destroying them. Ensure that the parts listed in *Table 1* are in the package.

Table 1 Kit contents

Qty.	Description	Part Number
3	Phillips Stainless Steel Pan Head Screw	7011182-12
1	Flush Mounting Gasket	8444294
1	Fuseholder	143A120
1	Slow Blow, Fast Acting 5.0 A Fuse	148A113
1	Mounting Template	2561258

The installation requires an installer-supplied minimum of 18 AWG (1 mm) red and black wire for lengths up to 15 feet (5 m) or a minimum of 16 AWG (1.5 mm) wire for lengths greater than 15 feet (5 m).

A runner wire of a minimum of 18 AWG should be used if you are synchronizing or alternating the flash pattern. Two to three installer-supplied insulated butt connectors are also required for the pipe mounting option and a switch with a current capacity of at least 5 A. An installer-supplied bushing for the wiring is optional.

Selecting a flash pattern is optional and should be done during the installation. For more information, see “Selecting a Flash Pattern” on page 13.

Table 2 Product specifications

Input Voltage	11 Vdc to 28 Vdc
Nominal	12.8 Vdc or 25.6 Vdc
Input Current (nominal)	1 A at 12.8 Vdc pulsed, 0.6 average 1 A at 25.6 Vdc pulsed, 0.3 average
Flash Rate	See Table 3 on page 12 for descriptions of the patterns.
Dimensions	
Height	5.25 inches (18.0 cm)
Diameter	6.5 inches (2.0 kg)
Weight (permanent mount)	
Net	3.5 lb (1.61 kg)
Shipping	4.41 lb (2.72 kg)
Weight (magnetic mount)	
Net	2.75 lb (1.25 kg)
Shipping	3.65 lb (1.66 kg)
Approvals	SAE J1318 and J845 Class 1

Permanently Mounting the Beacon

NOTE: Route the wires through the notch in the side of the beacon's base (see Figure 1 on page 16) or straight down through a hole drilled into the mounting location's sheet metal.

To permanently mount the beacon:

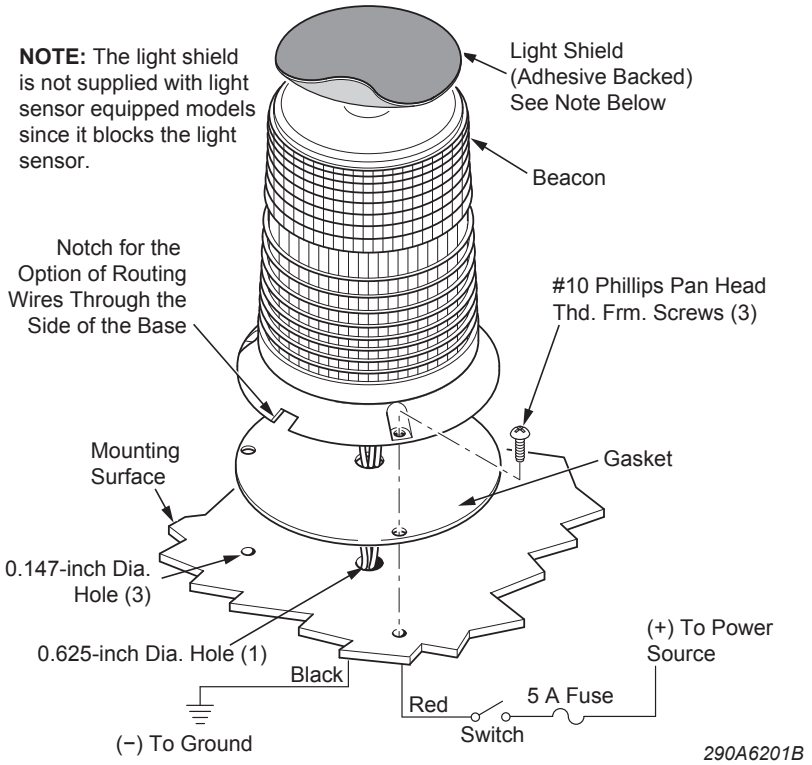
1. Place the supplied template on the mounting location and scribe the locations of the three mounting holes in the base.
2. If you are routing the wires straight down through the sheet metal, scribe the hole for the wires and the installer-supplied bushing.
3. Remove the template.

NOTICE

DRILLING PRECAUTIONS: Before drilling holes, check the area into which you plan to drill to ensure that you do not damage vehicle components while drilling. All drilled holes should be deburred, and all sharp edges should be smoothed. All wires going through drilled holes should be protected by a grommet or convolute/split-loom tubing.

4. If you are routing the wires straight down through the sheet metal, drill one 0.375-inch (9.53 mm) hole at the scribed position of the bushing and wire routing hole. Seal the hole with the bushing or RTV. Otherwise, route the wires through the notch in the beacon's base. See Figure 1.

Figure 1 Permanent-mounted beacon with wiring



5. Use a #26 drill bit to drill three 0.147-inch (3.73 mm) holes at the scribed mounting hole positions.

6. Align the gasket over the drilled holes. Route the wires through the gasket and wire routing hole or through the notch in the base.

7. Secure the base to the mounting surface with the #10 Phillips thread-forming screws.

Wiring the Permanently Mounted Beacon

NOTICE

REVERSE POLARITY/MISWIRING: To avoid damage to the light, ensure that the input voltage is the same as the voltage rating of the light. Ensure that correct polarity is observed and that the unit is properly fused.

To wire the beacon:

1. Connect one terminal of an installer-supplied switch (current capacity of at least 5 A) to the red (+) wire of the beacon. Additional 18 AWG (1 mm) or larger wire may be added if needed.

2. Use 18 AWG (1 mm) or larger wire to connect the remaining switch terminal to one end of the supplied fuseholder and 5 A fuse.

3. Connect the other end of the fuseholder to the positive (+) terminal of the voltage source.

4. Connect the black (–) wire from the beacon to a known good vehicle ground as close to the beacon as practical.

Pipe Mounting and Wiring the Beacon

The base was designed for the optional installation onto the end of a threaded 1-inch (25.4 mm) NPT pipe.

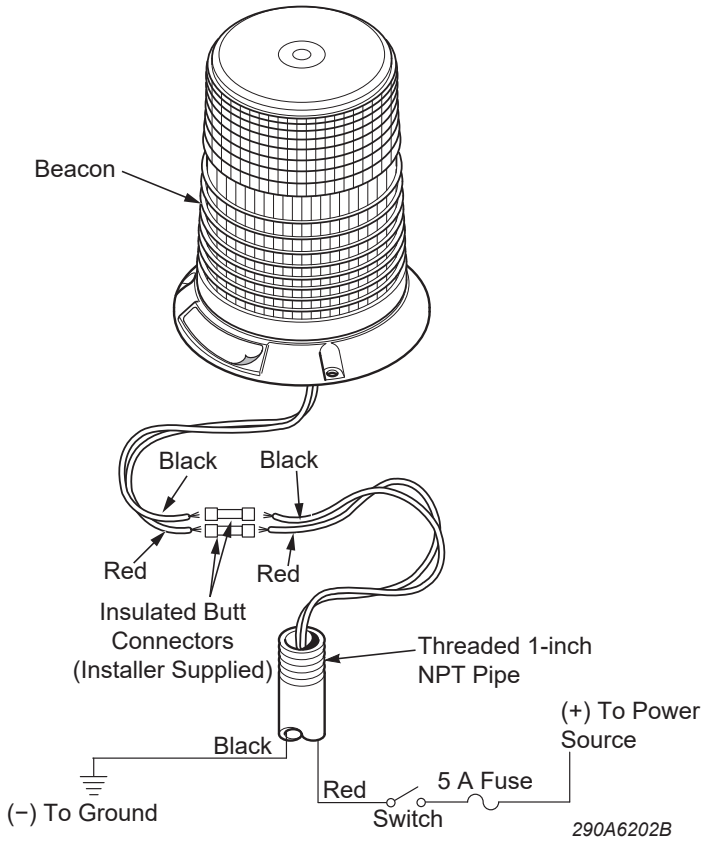
1. Determine the length of wires needed for the installation. For lengths up to 15 feet (5 m), use a minimum of 18 AWG (1 mm) wire. For lengths over 15 feet, use a minimum of 16 AWG (1.5 mm) wire.

2. Strip 1/4 inch (5 mm) of insulation from the ends of the red and black installer-supplied wires.

3. Use insulated butt connectors to connect the red and black wires to the beacon's red and black wires. Ensure that the connectors are securely crimped and properly insulated.

4. Route the red and black wires through the pipe to the location of the installer-supplied switch (current capacity of at least 5 A).

Figure 2 Pipe-mounted beacon with wiring



5. Screw the beacon onto the pipe. Ensure that the wires are not pinched inside the pipe.

6. Connect one terminal of the installer-supplied switch to the red (+) wire of the beacon.

7. Use a minimum of 18 AWG (1 mm) wire to connect the remaining switch terminal to one end of the supplied fuseholder and 5 A fuse.

8. Connect the other end of the fuseholder to the positive (+) terminal of the voltage source.

9. Connect the black (–) wire from the beacon to a known good vehicle ground as close to the beacon as practical.

Magnetically Mounting the Beacon

⚠ WARNING

Because vehicle roof construction and driving conditions vary, Federal Signal does not recommend driving a vehicle with a magnetically mounted warning light installed. The light could fly off the vehicle, causing injury and damage. Repair of damage incurred because of ignoring this warning shall be the sole responsibility of the user.

The holding power of magnetic mounting systems is dependent upon surface finish, surface flatness, and thickness of the steel mounting surface. Therefore, to promote proper magnetic mounting:

- Keep the mounting surface and magnets clean, dry, and free of foreign particles that prevent good contact with the surface.
- Ensure that the mounting surface is flat.
- To prevent the light assembly from sliding on the mounting surface, avoid quick acceleration and hard stops.
- If the light is to be held directly to the roof by the magnet, ensure that the power cable is not under the magnet.

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

To magnetically mount the beacon on a vehicle:

1. Route the power cable through the notch in the beacon's base.
2. Place the beacon on a level, steel surface that is clean and dry.
3. Plug the beacon's electrical connector into the cigarette lighter.

Selecting a Flash Pattern

⚠ WARNING

LIGHT HAZARD: This product contains a high-intensity LED device. To prevent permanent eye damage, DO NOT stare into the light beam at close range.

Selecting a flash pattern from the beacon's library of 12 flash patterns is optional and should be done during installation. You can select a flash pattern by cycling the power switch.

You have 15 seconds to watch the pattern and change it again before Programming Mode stops. When programming, cycle the power switch once per second. If you take too long, the beacon ignores the request to program. If you cycle the switch or pins too quickly, the beacon also ignores the request. The connection must stay closed for a minimum of 1/10 of a second to register. Table 3 on page 14 lists the flash patterns.

To select a flash pattern:

1. To enter Programming Mode, start with the unit off, and cycle power from off to on three times.
2. To display the next pattern in the sequence, cycle the power switch off and on. Continue to operate the switch until you see the pattern you want.
3. To exit Programming Mode and set the pattern in memory, let the beacon operate for at least 15 seconds or turn it off for more than five seconds.

Table 3 Flash patterns

Pattern	Description	Rate (FPM)
1	4 single 2 quad	120-60
2 *	7X flash	65
3	chopped double	60
4	single flash	60
5	single flash	80
6	single flash	120
7	test	—
8	double flash	80
9	double flash	120
10	triple flash	60
11	triple flash	120
12	pulsing double flash	80
13	quad flash	60
14	pulsing quad flash	60
15	5X flash	75

* *Shipped with Pattern 2 as the active pattern*

Maintaining the Beacon

Frequently inspect the beacon to ensure that it is securely attached to the vehicle and operates properly. Clean the beacon with mild soap and a soft rag.

Getting Technical Support and Service

For technical support and service, please contact:
Service Department
Federal Signal Corporation
Phone: 1-800-433-9132
Email: empserviceinfo@fedsig.com

Getting Repair Service

The Federal Signal factory provides technical assistance with any problems that cannot be handled locally. Any product returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization (RMA). Obtain an RMA from a local Distributor or Manufacturer's Representative. Provide a brief explanation of the service requested or the nature of the malfunction.

Address all communications and shipments to the following:

Federal Signal Corporation
Service Department
2645 Federal Signal Dr.
University Park, IL 60484-3167

Ordering Replacement Parts

To order the replacement parts in Table 4:

Customer Support
Federal Signal Corporation
Phone: 1-800-264-3578

Table 4 Replacement parts

Description	Part Number
Dust Cover, Amber	8444375-04
Dust Cover, Red	8444375-02
Dust Cover, Clear	8444374-01
Dome, Red, Short	8444374-02
Dome, Amber, Short	8444374-03
Gasket, O-Ring	8444376
Mylar Magnet Cover	439374
Magnet Assembly	8550A012-02
Branch Guard	8433061

Returning a Product to Federal Signal

Before returning a product to Federal Signal, call 800-264-3578, 800-433-9132, or 800-824-0254 to obtain a Returned Merchandise Authorization number (RMA number).

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