

Modulator® High-Powered Omni Speaker

Model: MOD Series



Shown with optional QuadraFlare lights

Description, Specifications, Installation, and Service Manual

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.



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Safety Messages

WARNING

It is important to follow all instructions shipped with this product. This device is to be installed by trained personnel who are thoroughly familiar with the country electric codes and will follow these guidelines as well as local codes and ordinances, including any state or local noise control ordinances. Listed below are important safety instructions and precautions you should follow:

Important Notice

Federal Signal reserves the right to make changes to devices and specifications detailed in the manual at any time in order to improve reliability, function or design. The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for any inaccuracies.

Publications

Federal Signal recommends the following publications from the Federal Emergency Management Agency for assistance with planning an outdoor warning system:

- The “Outdoor Warning Guide” (CPG 1-17)
- “Civil Preparedness, Principles of Warning” (CPG 1-14)
- FEMA-REP-1, Appendix 3 (Nuclear Plant Guideline)
- FEMA-REP-10 (Nuclear Plant Guideline).

Planning

- If suitable warning equipment is not selected, the installation site for the siren is not selected properly or the siren is not installed properly, it may not produce the intended optimum audible warning. Follow Federal Emergency Management Agency (FEMA) recommendations.
- If sirens are not activated in a timely manner when an emergency condition exists, they cannot provide the intended audible warning. It is imperative that knowledgeable people, who are provided with the necessary information, are available at all times to authorize the activation of the sirens.
- When sirens are used out of doors, people indoors may not be able to hear the warning signals. Separate warning devices or procedures may be needed to effectively warn people indoors.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings, and restrict access to areas near sirens. Review and comply with any local or state noise control ordinances as well as OSHA noise exposure regulations and guidelines.
- Activating the sirens may not result in people taking the desired actions if those to be warned are not properly trained about the meaning of siren sounds. Siren users should follow FEMA recommendations and instruct those to be warned of correct actions to be taken.

- After installation, service, or maintenance, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service and operating personnel do not have these instructions to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also give a copy to anyone who is going to service or repair the siren.

Installation and Service

- Electrocution or severe personal injury can occur when performing various installation and service functions such as making electrical connections, drilling holes, or lifting equipment. Therefore only experienced electricians should install this product in accordance with national, state and any other electrical codes having jurisdiction. Perform all work under the direction of the installation or service crew safety foreman.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings and restrict access to areas near the sirens. Sirens may be operated from remote control points. Whenever possible, disconnect all siren power including batteries before working near the siren.
- After installation or service, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service personnel do not have these warnings and all other instructions shipped with the equipment to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also, give a copy to anyone who is going to service or repair the sirens.

Operation

Failure to understand the capabilities and limitations of your siren system could result in permanent hearing loss, other serious injuries or death to persons too close to the sirens when you activate them or to those you need to warn. Carefully read and thoroughly understand all safety notices in this manual and all operations-related-items in all instruction manuals shipped with equipment. Thoroughly discuss all contingency plans with those responsible for warning people in your community, company, or jurisdiction.

Read and understand the information contained in this manual before attempting to install or service the siren.

Pay careful attention to the notice located on the equipment.

General Description

Introduction

Federal Signal Modulator Series siren products are a family of electronic sirens that are capable of producing high-intensity warning signals over a large area. The siren consists of a speaker array and Control/Battery Cabinets. A highly efficient design enables the siren to produce a high-sound level while making moderate demands on the power source.

Modulator models purchased after September 2017 are preconfigured to support top and side lights kits for visual signaling options that can enhance the proven technology of the Modulator's intelligible voice communication and signaling.

Federal Signal omni-directional, electronic Modulator Series siren consists of aluminum modules that use four 100-watt drivers per module. The Modulator series B is available in several models, which have the following sound output rating at 100 feet.¹ See Table 1.

The MOD6032B is a 3200-watt siren that uses the MOD6024B siren configuration. The middle two modules use eight 100-watt drivers.

Table 1 MOD Models Sound Output

Model	Decibels at 100 feet
MOD1004B ²	106 dBC
MOD2008B ²	112 dBC
MOD3012B ²	115 dBC
MOD4016B ²	118 dBC
MOD5020B ²	120 dBC
MOD6024B ²	121 dBC
MOD6032B ²	123 dBC
MOD8032B ²	124 dBC

¹Based on measurements at 500 feet.

²Add the letter C to the Modulator model name for Steel/Concrete pole mount model.

The Modulator Series siren provides virtually flat frequency response from 200-2000 Hertz. This gives the siren the ability to produce loud and clear voice messages and produce a full spectrum of warning tones.

An UltraVoice Controller (Model UV) is needed for complete operation.

Features

The Modulator Speaker has the following features:

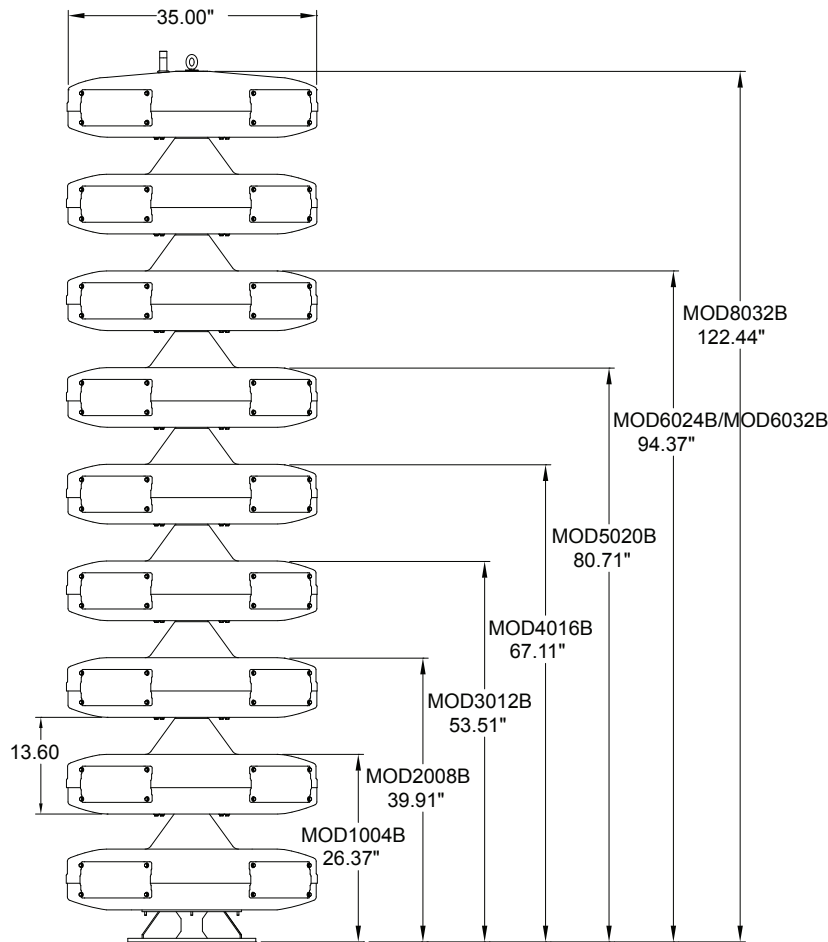
- Light-weight, compact design
- Uses Federal Signal Ultravoice® for control and amplification
- Excellent frequency response for clear voice reproduction

General Description

- 360° coverage without sound variation in horizontal planes
- Easy servicing through convenient access panels
- Anechoic chamber-certified
- Optional visual signaling options that enhance the Modulator's intelligible voice communication and signaling
- New models offer steel/concrete pole mounting solution

The following is a picture of the Modulator.

Figure 1 Modulator Speaker



Ordering Information

Contact our Federal Signal sales engineers to design a system that meets your specific requirements. Specify speaker array model number. Each speaker array model must be ordered with a specific corresponding UV and amplifier.

Table 2 Ordering Information

Speaker	Controller ¹
MOD1004B ²	UV + 1 UV400
MOD2008B ²	UV + 2 UV400
MOD3012B ²	UV + 3 UV400
MOD4016B ²	UV + 4 UV400
MOD5020B ²	UV + 5 UV400
MOD6024B ²	UV + 6 UV400
MOD6032B ²	UV + 8 UV400
MOD8032B ²	UV + 8 UV400

¹Controllers available in radio, IP, and landline.

²Add the letter C to the Modulator model name for Steel/Concrete pole mount model.

NOTE: For the standard cable length supplied with the siren see “Table 13 Number of Wires and Cable Length per Module” on page 19. Extension cable is also available in 10-foot increments. Mounting the UV controller farther than 100 feet is not recommended. (Farther mounting may decrease power output.)

Specifications

Table 3 General Specifications

Color	Weather Guard White III
Paint Type	TGIC Polyester Powder Coat
Modular Horn Type	Hyperbolic Flare
Frequency Response	200-2000 Hz
Horizontal Coverage	360 Degrees
Bottom (non-active) Module* Dimensions	13-1/2 x 35 inches Diameter
Input Voltage	66 V _{RMS} min., 400 W max.

* The bottom module of the siren is a passive device that does not contain any drivers. Its functional use is to complete the horn formed by the bottom and the first active module. The bottom module also provides a mounting solution for the optional side lights.

The following tables list each MOD model number with its specifications. Each speaker array model must be ordered with a specific corresponding UV and Amplifier.

Wind load calculations are for speaker array only.

Table 4 MOD1004B

Number of Active Modules	1
Power	400 watts
dB Output	106 dBC at 100 feet (30.48 m)
Height of Speaker Array	26.37 inches (66.98 cm)
Weight	125 lb (56.70 kg)
EPA at 40 feet (12.19 m)	3.30 ft ² (0.31 m ²)
Wind Load (110 mph, 40 feet above ground)	252 lb (114.31 kg)

Table 5 MOD2008B

Number of Active Modules	2
Power	800 watts
dB Output	112 dBC at 100 feet (30.48 m)
Height of Speaker Array	38.91 inches (98.83 cm)
Weight	190 lb (86.18 kg)
EPA at 40 feet (12.19 m)	4.94 ft ² (0.46 m ²)
Wind Load (110 mph, 40 feet above ground)	378 lb (171.46 kg)

Table 6 MOD3012B

Number of Active Modules	3
Power	1200 watts
dB Output	115 dBC at 100 feet (30.48 m)
Height of Speaker Array	53.51 inches (135.92 cm)
Weight	255 lb (115.67 kg)
EPA at 40 feet (12.19 m)	6.59 ft ² (0.61 m ²)
Wind Load (110 mph, 40 feet above ground)	504 lb (228.61 kg)

Table 7 MOD4016B

Number of Active Modules	4
Power	1600 watts
dB Output	118 dBC at 100 feet (30.48 m)
Height of Speaker Array	67.11 inches (170.46 cm)
Weight	320 lb (145.15 kg)
EPA at 40 feet (12.19 m)	8.24 ft ² (0.77 m ²)
Wind Load (110 mph, 40 feet above ground)	630 lb (285.76 kg)

Table 8 MOD5020B

Number of Active Modules	5
Power	2000 watts
dB Output	120 dBC at 100 feet (30.48 m)
Height of Speaker Array	80.71 inches (205.00 cm)
Weight	385 lb (174.63 kg)
EPA at 40 feet (12.19 m)	9.89 ft ² (0.92 m ²)
Wind Load (110 mph, 40 feet above ground)	756 lb (342.92 kg)

Table 9 MOD6024B

Number of Active Modules	6
Power	2400 watts
dB Output	121 dBC at 100 feet (30.48 m)
Height of Speaker Array	94.37 inches (239.70 cm)
Weight	450 lb (204.12 kg)
EPA at 40 feet (12.19 m)	11.54 ft ² (1.07 m ²)
Wind Load (110 mph, 40 feet above ground)	882 lb (400.07 kg)

Table 10 MOD6032B

Number of Active Modules	6
Power	3200 watts
dB Output	123 dBC at 100 feet (30.48 m)
Height of Speaker Array	94.37 inches (239.70 cm)
Weight	496 lb (224.98 kg)
EPA at 40 feet (12.19 m)	11.54 ft ² (1.07 m ²)
Wind Load (110 mph, 40 feet above ground)	882 lb (400.07 kg)

Table 11 MOD8032B

Number of Active Modules	8
Power	3200 watts
dB Output	124 dBC at 100 feet (30.48 m)
Height of Speaker Array	122.44 inches (311 cm)
Weight	580 lb (263.08 kg)
EPA at 40 feet (12.19 m)	14.85 ft ² (1.38 m ²)
Wind Load (110 mph, 40 feet above ground)	1134 lb (514.37 kg)

Installation

⚠ WARNING

Read and adhere to all safety warnings in this manual before installing the Modulator Series Speaker.

Determining a Suitable Location

⚠ WARNING

The output level of the sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan the siren location and post warnings where excessive levels may be encountered. Refer to OSHA 29 CFR 1910.95 for safe exposure limits.

Do not expose personnel to sound levels above 123 dBC.

Careful consideration of the factors affecting the propagation of sound from the siren and the response of the human ear to the sound will optimize the ability of the siren to effectively warn the community. Follow Federal Emergency Management Agency (FEMA) guidelines when designing the warning system.

The reduction of signal intensity, as the distance from the siren increases and the minimum desired signal level at the fringe of the area to be covered, are important considerations when choosing a siren installation site. As the distance from the siren increases, sound level losses accumulate. These losses are a result of weather conditions, the terrain, obstructions in the sound path, the pitch of the sound and the height of the siren.

Optimum sound propagation conditions occur when no obstructions exist in the sound path, the terrain is hard and flat, and the air is blowing away from the source. Under these conditions, you can expect a 6 dB loss per distance doubled. A loss per distance doubled of 10 dB is typically experienced because atmosphere is rarely calm, terrain may not be flat, and buildings or other obstructions are frequently present in the sound path.

Using a 10 dB per distance doubled loss factor, the following sound levels are predicted for the sirens in the following table.

Table 12 Sound levels predictions

Distance	MOD6024B
100 feet (30.5 m) the sound level is	121 dB
200 feet (61 m) the sound level is	111 dB
400 feet (122 m) the sound level is	101 dB

FEMA studies indicate typical ambient sound levels vary by location as follows:

- Industrial Areas: 70+ dBC
- Urban Areas: 60 dBC
- Rural Areas: 50 dBC

Assuming a typical 10 dB loss per distance doubled and a 70 dB minimum sound level required to warn a typical urban area, the effective range of a MOD6024B is approximately 3,900 feet.

Optimum warning is obtained when the warning signal is at least 10 dB above ambient. Do not expose personnel to sound levels above 123 dBC.

Wind speed and direction often affects the propagation of sound from the siren. Consequently, the direction of the prevailing wind may be a significant factor to consider when selecting the installation site(s) of a small, one- or two-site siren system. For example, if the prevailing wind is from the west, it may be desirable to install the siren toward the western edge of the area to be covered.

Other factors to consider when selecting the installation site(s) include the availability of suitable electrical power, the access to and ease of installation and maintenance, the height of surrounding obstructions, and security against vandalism and any applicable state or local noise control ordinance.

Installing the Sirens

⚠ DANGER

Electrocution or severe personal injury can occur when making electrical connections, drilling holes, or lifting equipment. Therefore, experienced electricians, in accordance with national and local electrical codes, acting under the direction of the installation crew safety foreman, should perform installation.

Most siren installations are one of two types: Pole Mount or Flat Surface Mount. These two configurations make it possible to install a siren in almost any situation. If the installations in this section are not suitable, modification of one of the configurations may be practical.

A siren is typically installed 40 to 50 feet above the ground. If the installation is located less than 40 feet above the ground, the sound intensity at close range may increase, but at the same time the effective range of the siren may be reduced. Conversely, if the siren is located more than 50 feet above ground, the effective range of the siren may increase, but the sound may skip over areas closer to the siren. These variables may make it desirable to test the sound coverage of the siren at various heights and locations whenever possible.

NOTE: To protect the speaker arrays from damage during shipping, all models have been shipped without drivers installed.

Connecting the Driver Wires

After uncrating the siren, connect the driver wires:

1. Remove the four (4) driver access doors from each individual active module by removing the four (4) bolt and washer sets of each door. Note the position of the flat washer and lock washer.
2. Thread the drivers clockwise onto the horn throats.

3. Hand tighten approximately a half turn after gasket engagement.
4. Locate the two (2) wires tie wrapped near the end of the horn throat. Note the label on the back of the drivers and connect the solid wire to terminal 1 and the striped wire to terminal 2 and white jumpers from 1 to 2 as shown in “Figure 6 Driver Connections” on page 19.

⚠ WARNING

Connecting driver wires out of phase may cause severe reduction in sound output.

Wooden Pole Mounting

A typical wooden pole-mounted siren installation is shown in Figure 3. The siren is mounted on a Class 2 utility pole (ANSI type wooden pole or equivalent) with a minimum horizontal ground stress rating of 3,700 pounds (1678 kg). Ensure that soil loads will conform to this size utility pole. It is attached to the pole by means of legs, as shown in Figure 2.

Figure 2 Siren Leg Assembly

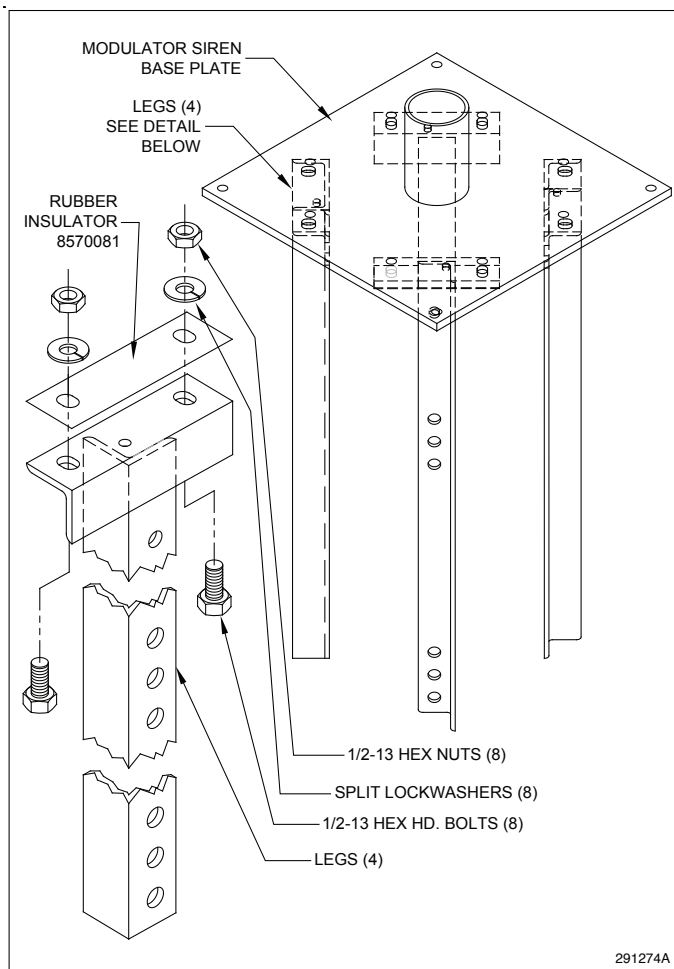
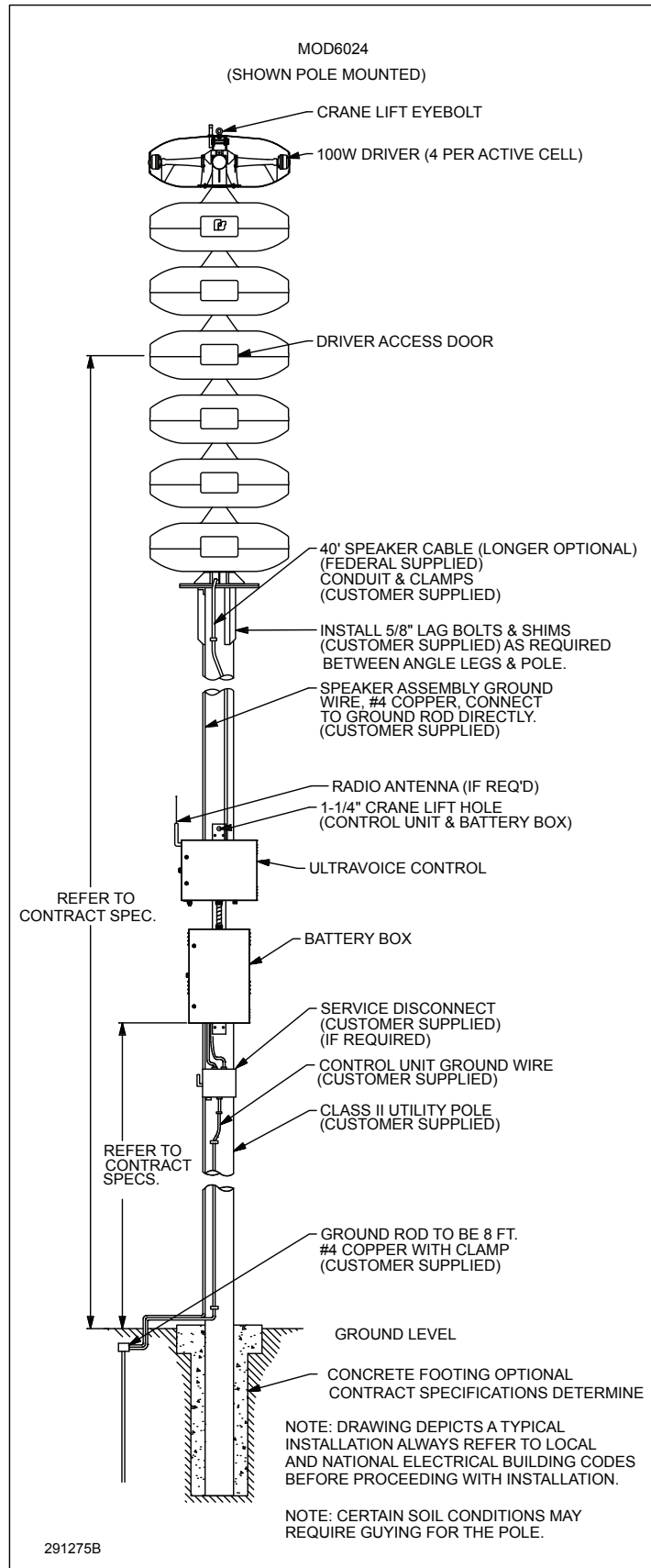


Figure 3 Typical Wooden Pole-mounted Installation



To mount the siren on the Class 2 utility pole using the three-foot-long angle iron legs:

1. Uncrate the siren and remove the nuts that hold the siren on the shipping base. Install drivers if needed. Lift the siren approximately 3-1/2 feet with a crane or hoist.

NOTE: To protect the speaker arrays from damage during shipping, all models have been shipped without drivers installed.

2. If you ordered optional top and side lights, see “Installing Lights on the Siren” on page 21. You may want to install lights prior to placing onto pole.
3. Install the four legs on the siren mounting plate, as shown in “Figure 2 Siren Leg Assembly” on page 14. Use two stainless steel 1/2-inch bolts, nuts and lock washers (provided) for each leg. All mounting hardware needed is supplied in the hardware kit shipped with this manual. Do not tighten the bolts completely.

⚠ WARNING

The eyebolt does NOT have sufficient strength to support the combined weight of the siren and a utility pole. Therefore, do NOT attempt to erect the pole and siren together using the eyebolt as a lifting point.

4. Erect the utility pole in accordance with accepted practices and FEMA guidelines (refer to warning). Be sure the pole extends at least 40 feet above the ground.
5. Raise the siren to the necessary height and lower it over the pole. Maintain tension on lifting chain until all bolts are tightened.
6. Adjust the legs and insert shims, if necessary, between the siren legs and pole. Bolt the siren to the pole using two user supplied 5/8-inch lag bolts, at least 4 inches long for each leg. Tighten all bolts, including those from step 2.

Steel Pole Mounting

In a typical steel pole-mounted siren installation the MOD1004BC, MOD2008BC and MOD3012BC sirens are mounted on a Grade A Standard galvanized steel pole. The MOD4016BC, MOD5020BC, MOD6024BC, MOD6032BC, and MOD8032BC are mounted on a Grade A Heavy galvanized steel pole. (Ensure that soil loads will conform to this size utility pole.)

NOTE: The siren leg assembly is not included with the steel/concrete pole models.

To mount the siren on a Grade A Standard galvanized steel pole:

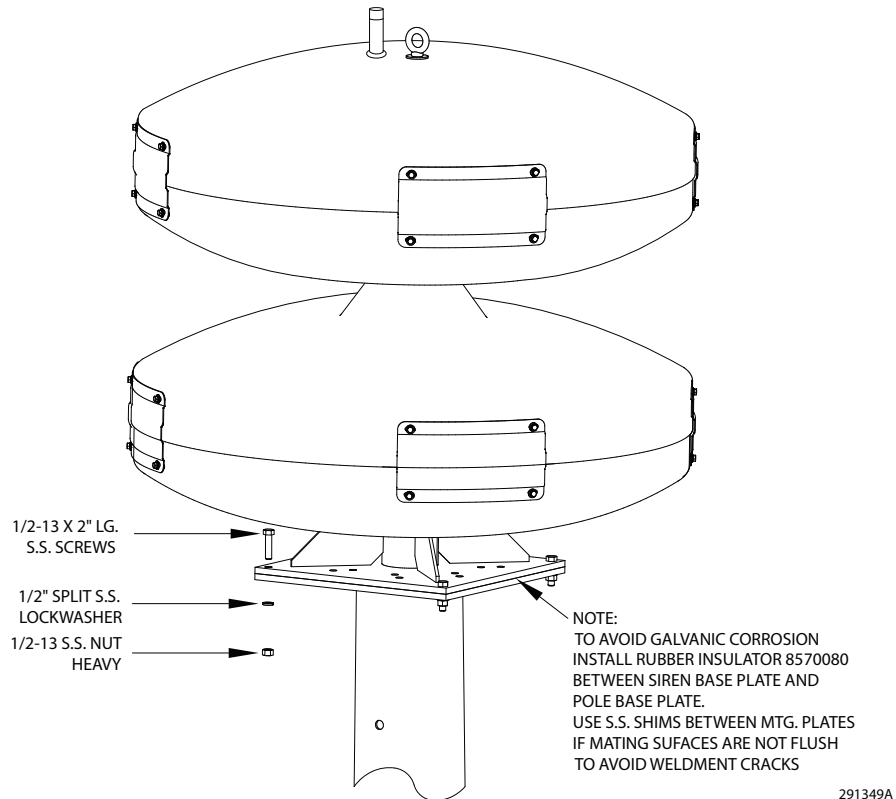
1. Erect the steel utility pole in accordance with accepted practices and FEMA guidelines.
2. Uncrate the siren. Remove and dispose of any hardware that holds the siren on the shipping base. Install drivers (see NOTE on page 13). Lift the siren with a crane or hoist to the necessary height and lower it over the pole. Maintain tension on lifting chain until all bolts are tightened.
3. If you ordered optional top and side lights, see Installing Lights on the Siren. You may want to install lights prior to placing onto pole.

NOTE: Siren cable is run through the center of the mounting plate through the steel pole. Siren cable can be pre-assembled through center of mounting plate for a no conduit installation.

⚠ WARNING

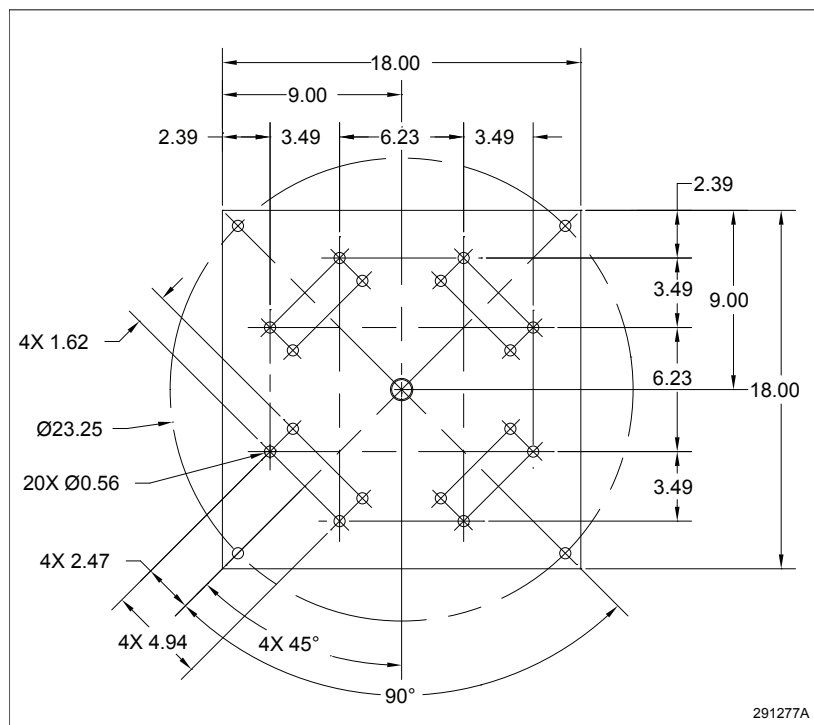
The eyebolt does NOT have sufficient strength to support the combined weight of the siren and a utility pole. Therefore, do NOT attempt to erect the pole and siren together using the eyebolt as a lifting point.

Figure 4 Steel Pole Mounting



3. Attach the modulator base to the pole's top plate with rubber insulator 8570080 between them.
4. Use four of the stainless steel 1/2 in bolts, nuts, and lock washers provided. (See Figure 4.) All mounting hardware needed is supplied in the hardware kit shipped with this manual. Not all the hardware in the kit will be used in this type of installation. Before tightening bolts, check mounting surfaces for warping. If modulator base and top plate of pole have a gap greater than approximately 1/16 inch between them, install galvanized or stainless steel shims to even out. Tighten bolts to 45-46 ft-lb torque.

Figure 5 Siren Base Plate



Flat Surface Mounting

This installation configuration is practical when the installation site is on a flat roofed building. A weight distribution mat is often required to safely distribute the siren's weight on the roof. A Structural Engineer is required.

Driver Connections

Depending on the model of siren used, the number of driver connections and wire colors will vary. This is due to the different number of drivers required for each model. See Figures 6 and 7 for wiring and position.

Observe proper polarity when making these connections:

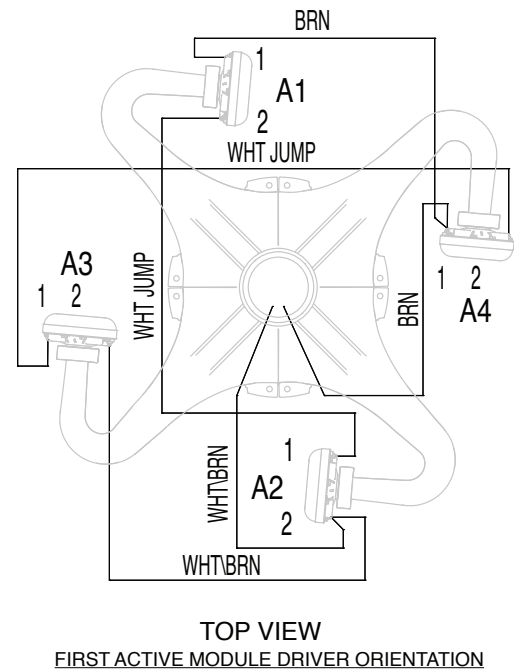
- The striped wire is common and goes to position 2.
- The solid colored wire is signal high and goes to position 1.

NOTE: Drivers on all Modulators except MOD1004 and MOD2008 are not assembled due to shipping orientation.

The bottom module in the speaker array is an inactive module. This means there are no drivers contained in the module. The next module up is called module number one. The next one above module one is called module number two, and so forth. These are referred to as active modules. Each active module contains four (4) drivers except the MOD6032B has two modules with eight (8) drivers.

Figure 6 Driver Connections

ACTIVE MODULE	SPEAKER CABLE	DRIVER - TERMINAL	JUMPER WIRE	DRIVER - TERMINAL	LIGHT
1	PNK	---	---	---	BOTTOM MOUNT +
	BLK	---	---	---	BOTTOM MOUNT -
	---	A1 - 2	WHT	A2 - 1	---
	WHT/BRN	A2 - 2	WHT/BRN	A3 - 2	---
2	---	A3 - 1	WHT	A4 - 2	---
	BRN	A4 - 1	BRN	A1 - 1	---
	---	B1 - 2	WHT	B2 - 1	---
	WHT/RED	B2 - 2	WHT/RED	B3 - 2	---
3	---	B3 - 1	WHT	B4 - 2	---
	RED	B4 - 1	RED	B1 - 1	---
	---	C1 - 2	WHT	C2 - 1	---
	WHT/ORG	C2 - 2	WHT/ORG	C3 - 2	---
4	---	C3 - 1	WHT	C4 - 2	---
	ORG	C4 - 1	ORG	C1 - 1	---
	---	D1 - 2	WHT	D2 - 1	---
	WHT/YEL	D2 - 2	WHT/YEL	D3 - 2	---
5	---	D3 - 1	WHT	D4 - 2	---
	YEL	D4 - 1	YEL	D1 - 1	---
	---	E1 - 2	WHT	E2 - 1	---
	WHT/GRN	E2 - 2	WHT/GRN	E3 - 2	---
6	---	E3 - 1	WHT	E4 - 2	---
	GRN	E4 - 1	GRN	E1 - 1	---
	---	F1 - 2	WHT	F2 - 1	---
	WHT/BLU	F2 - 2	WHT/BLU	F3 - 2	---
7	---	F3 - 1	WHT	F4 - 2	---
	BLU	F4 - 1	BLU	F1 - 1	---
	---	G1 - 2	WHT	G2 - 1	---
	WHT/VIO	G2 - 2	WHT/VIO	G3 - 2	---
8	---	G3 - 1	WHT	G4 - 2	---
	VIO	G4 - 1	VIO	G1 - 1	---
	---	H1 - 2	WHT	H2 - 1	---
	WHT/GRY	H2 - 2	WHT/GRY	H3 - 2	---
	---	H3 - 1	WHT	H4 - 2	---
	GRY	H4 - 1	GRY	H1 - 1	---
	RED/WHT	---	---	---	TOP MOUNT +
	RED/BLK	---	---	---	TOP MOUNT -



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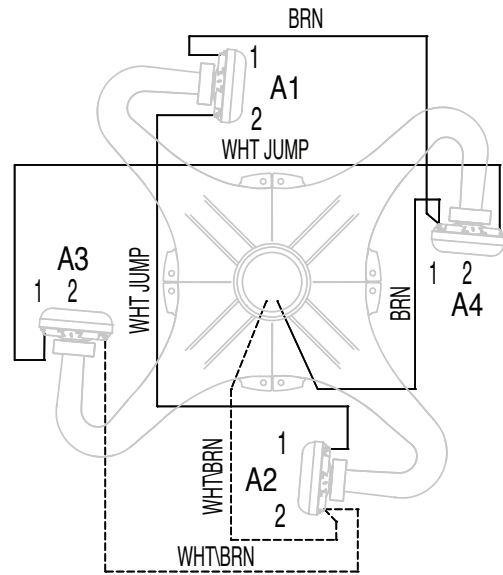
For the standard cable length supplied with the siren see Table 13. The number of conductors and colors vary from module to module. For example, in a MOD5020B, there are 16 wires with only 10 of those being used for driver connections. Note that each cable has four spare wires used for top or side light connections.

Table 13 Number of Wires and Cable Length per Module

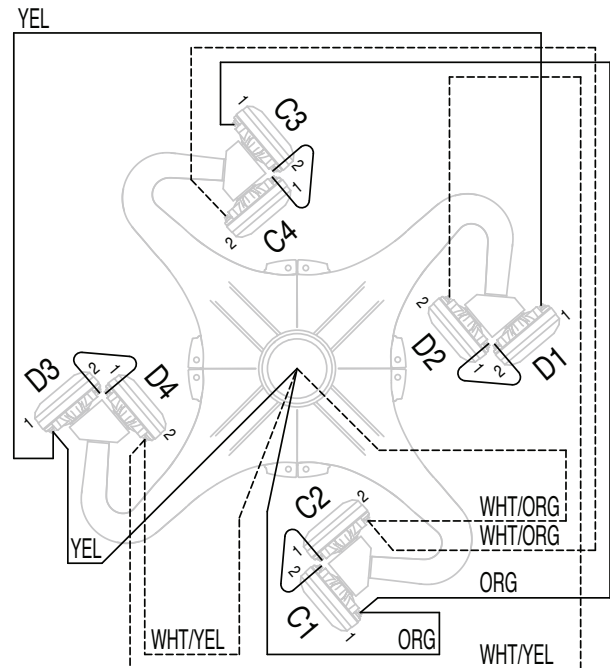
Module	Number of wire and how wires are used	Cable Length
MOD1004B/MOD1004BC	8 wires: 2 are used for driver connections, 4 are reserved for top or side lights	44 ft
MOD2008B/MOD2008BC	8 wires: 4 are used for driver connections, 4 are reserved for top or side lights	44 ft
MOD3012B/MOD3012BC	16 wires: 6 are used for driver connections, 4 are reserved for top or side lights	42.5 ft
MOD4016B/MOD4016BC	16 wires: 8 are used for driver connections, 4 are reserved for top or side lights	42.5 ft
MOD5020B/MOD5020B	16 wires: 10 are used for driver connections, 4 are reserved for top or side lights	42.5 ft
MOD6024B/MOD6024BC	16 wires: 12 are used for driver connections, 4 are reserved for top or side lights	42.5 ft
MOD8032B/MOD8032BC MOD6032B/MOD6032BC	20 wires: 16 are used for driver connections, 4 are reserved for top or side lights	44 ft

Figure 7 MOD6032B Driver Connections

ACTIVE MODULE	SPEAKER CABLE	DRIVER - TERMINAL	JUMPER WIRE	DRIVER - TERMINAL	LIGHT
	PNK	---	---	---	BOTTOM MOUNT +
	BLK	---	---	---	BOTTOM MOUNT -
1	---	A1 - 2	WHT	A2 - 1	---
	WHT/BRN	A2 - 2	WHT/BRN	A3 - 2	---
	---	A3 - 1	WHT	A4 - 2	---
	BRN	A4 - 1	BRN	A1 - 1	---
2	---	B1 - 2	WHT	B2 - 1	---
	WHT/RED	B2 - 2	WHT/RED	B3 - 2	---
	---	B3 - 1	WHT	B4 - 2	---
	RED	B4 - 1	RED	B1 - 1	---
3	ORG	C1 - 1	ORG	C3 - 1	---
	---	C1 - 2	WHT	C2 - 1	---
	WHT/ORG	C2 - 2	WHT/ORG	C4 - 2	---
	---	C3 - 2	WHT	C4 - 1	---
	YEL	D3 - 1	YEL	D1 - 1	---
	---	D3 - 2	WHT	D4 - 1	---
	WHT/YEL	D4 - 2	WHT/YEL	D2 - 2	---
	---	D1 - 2	WHT	D2 - 1	---
4	GRN	E1 - 1	GRN	E3 - 1	---
	---	E1 - 2	WHT	E2 - 1	---
	WHT/GRN	E2 - 2	WHT/GRN	E4 - 2	---
	---	E3 - 2	WHT	E4 - 1	---
	BLU	F3 - 1	BLU	F1 - 1	---
	---	F3 - 2	WHT	F4 - 1	---
	WHT/BLU	F4 - 2	WHT/BLU	F2 - 2	---
	---	F1 - 2	WHT	F2 - 1	---
5	---	G1 - 2	WHT	G2 - 1	---
	WHT/VIO	G2 - 2	WHT/VIO	G3 - 2	---
	---	G3 - 1	WHT	G4 - 2	---
	VIO	G4 - 1	VIO	G1 - 1	---
6	---	H1 - 2	WHT	H2 - 1	---
	WHT/GRY	H2 - 2	WHT/GRY	H3 - 2	---
	---	H3 - 1	WHT	H4 - 2	---
	GRY	H4 - 1	GRY	H1 - 1	---
	RED/WHT	---	---	---	TOP MOUNT +
	RED/BLK	---	---	---	TOP MOUNT -



TOP VIEW
ACTIVE MODULE DRIVERS 1, 2, 5 & 6 ORIENTATION



TOP VIEW
ACTIVE MODULE DRIVERS 3 & 4 ORIENTATION

Installing Lights on the Siren

Modulator models can be ordered with optional top lights and/or side lights. If not ordered with the Modulator siren, they can be added later by purchasing the Top Light Kit (Federal Signal part number 191XL-024R) or Side Light Kit (Federal Signal part number MOD-QF-KIT). Modulator models purchased after September 2017 are preconfigured to support Top Light and Side Light Kits.

NOTE: The standard light referenced is the color red, but other colors are available.

The following instructions refer to the configuration of the Modulators that have been preconfigured.

Installing the Top Light Kit

The Top Light Kit is installed onto the strobe bracket that extends out of the top module.

To install the Top Light Kit:

1. Remove the strobe bracket cap.
2. Locate the two spare wires within the strobe bracket.
3. Connect the top light wiring to the two spare wires (red/white positive and red/black negative) from the wire harness within the module.

Figure 8 Top Light

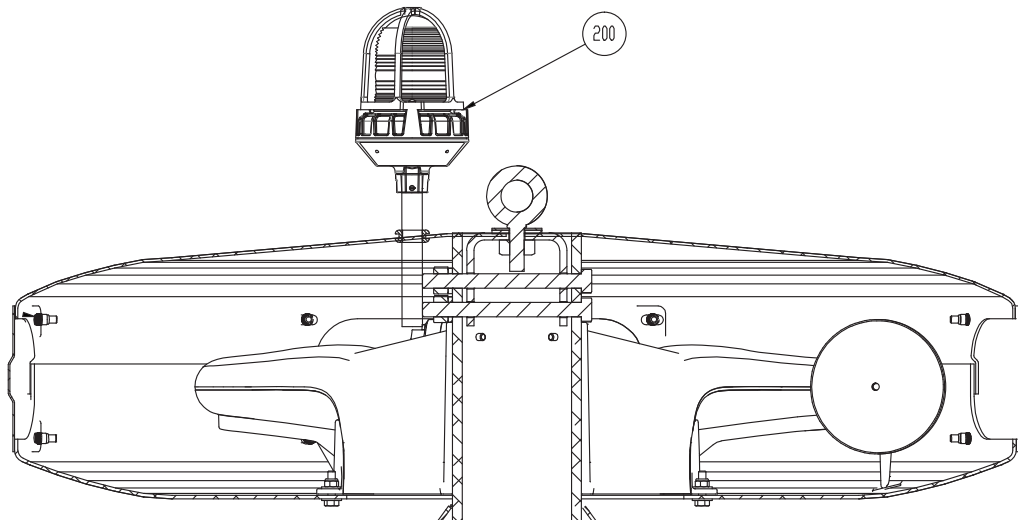


Table 14 Top Light Kit (Model 191XL-024R)

Item No.	Qty.	Description	Part Number
200	1	Light, HAZ, LOC, LED, Red	191XL-024R

Installing the Side Light Kit

The Side Light Kit is installed on the bottom (inactive) module. See Figures 9 and 10.

To install the Side Light Kit:

1. Replace the standard driver access doors with the side light mounting doors.
2. Wire the four side lights to the two spare wires from the wire harness within the module. Connect the wires (four red and one pink positive) together with a wire nut. Connect the black wires (five black negative) together with a wire nut. Zip tie the wires to the pole.

Figure 9 Side Light

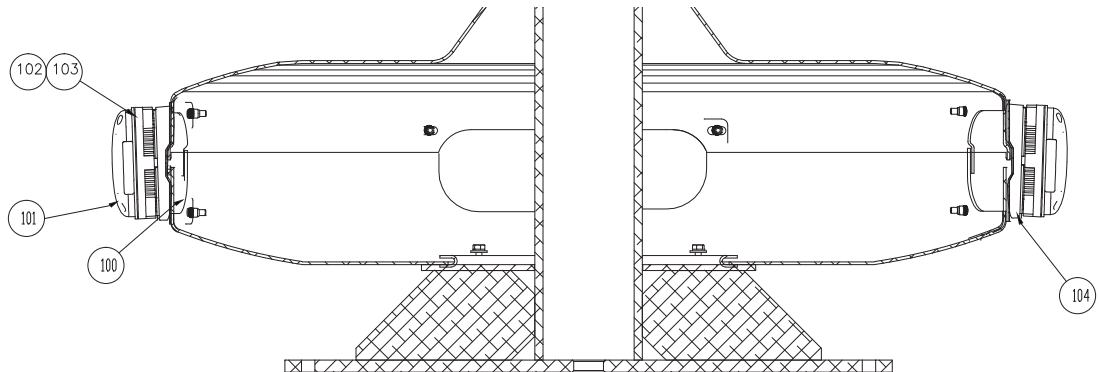
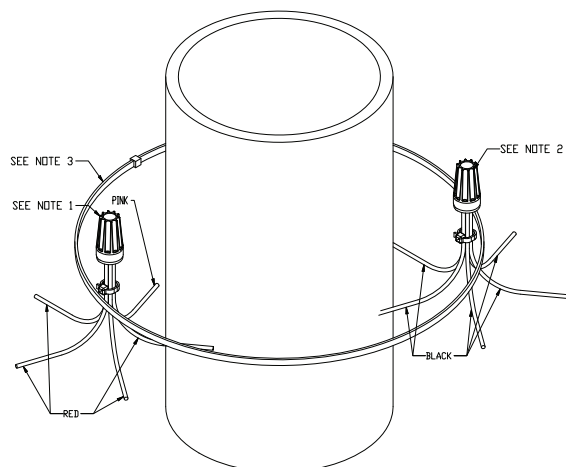


Table 15 Side Light Kit (Model MOD-QF-KIT)

Item No.	Qty.	Description	Part Number
100	4	Door, Driver Access, QF MNT	857000018A-01
101	4	QuadraFlare LED, 24 V, Red	QL64-24RR-ANS
102	16	Screw, Machine, 6-32, Phillips, Stainless Steel	7000A427-28
103	16	Nut, Hex, Ext KEPS, 6-32	7058A046
104	4	QL64, Radiused Wedge, Gasket	801201900A

Figure 10 Side Light Wiring



NOTES:

1. RED WIRES FROM QUADRAFLARE SHOULD BE WIRE TIED TO PINK WIRE FROM 17501367A AND TWISTED INTO 19901365A.
2. BLACK WIRES FROM QUADRAFLARE SHOULD BE WIRE TIED TO BLACK WIRE FROM 17501367A AND TWISTED INTO 19901365A.
3. WIRE BUNDLE SHOULD THEN BE CABLE TIED TO POLE.

Pre-Operation Checkout

After the siren has been completely installed, perform the following checks before putting the siren into service.

⚠ WARNING

The output sound level of a siren is capable of causing severe hearing discomfort or permanent hearing damage. Therefore, ALWAYS wear appropriate hearing protection when performing tests or maintenance on the siren, and post warnings to warn people before they are exposed to excessive sound pressure levels.

1. Make sure all connections in the Control/Battery Cabinets are correct and properly tightened.
2. Activate wail on the control panel. Check for proper sound output and siren tone.
3. After the installation is complete and it has been established that the siren is operating properly, Federal Signal recommends that all control devices be padlocked to discourage tampering and vandalism.

Maintenance

⚠ WARNING

Service or maintenance should be performed by qualified personnel familiar with the siren, associated controls, and power sources being used.

The sound output of the siren is capable of causing permanent hearing damage. Use adequate hearing protection and avoid excessive exposure.

Before servicing or maintaining, ensure that remote activation cannot occur and disconnect power to the siren and its controls.

⚠ WARNING

The output level of a Modulator Series Siren is capable of causing permanent hearing damage. Therefore, ALWAYS wear hearing protection when performing tests or maintenance on the siren.

To prevent the siren from sounding always turn off the power to the siren at the disconnect switch and remove any DC power being supplied by the battery box before inspecting or maintaining the siren.

Test the siren for proper operation at least once a month. A daily test at noon, curfew, or other selected time is preferred. This not only enhances the usefulness of the siren and verifies that it remains ready for use in an emergency, but also instills public confidence in the reliability of the warning system.

In order to minimize the possibility of siren failure, annual inspection and maintenance is desirable.

Perform a driver inspection as described in the next section.

Replacing the Driver

To determine if a driver is defective, refer to the procedure outlined in the installation instruction for the amplifier control unit or remove the speaker circuit from the terminal block and measure the impedance of the circuit. The impedance of each 400 W cell of the siren will measure approximately 4.5 ohms. If the reading is higher, (9 ohms), one driver is bad. If the circuit is open, then either multiple drivers are bad or a wire has been severed. The impedance of a single driver should be 2.25 ohms.

To determine the location of the bad driver refer to Figures 6 and 7.

To replace a defective driver:

1. Remove the four hex head 1/4-inch mounting bolts that are holding the inspection plate. Make sure the flat washer and split washer are not misplaced. Note the color and location of the wires going to the driver.
2. Remove the wire from the terminals on the driver.
3. Remove the driver by turning it counterclockwise.
4. Add new driver by turning it clockwise.
5. Make sure that the male threads are greased.
6. Reconnect the wires as previously noted.

Ordering Parts

To order replacement parts, call Customer Care. See Getting Service.

Table 16 Replacement Parts

Description	Part Number
Top Light Kit	191XL-024R
Side Light Kit	MOD-QF-KIT
Driver, 100 watt	K8570063A

Getting Service

If you are experiencing any difficulties, contact Federal Signal Customer Support at: 800-548-7229 or 708-534-3400 extension 7511 or Technical Support at: 800-524-3021 or 708-534-3400 extension 7329 or through e-mail at: techsupport@fedsig.com. For instruction manuals and information on related products, visit: <http://www.fedsig.com/>