



FEDERAL SIGNAL
Safety and Security Systems

Eclipse8

Electro-Mechanical DC Power Siren



Installation and Operations Manual

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Limited Warranty

The Alerting and Notification Systems Division of **Federal Signal Corporation (Federal)** warrants each new product to be free from defects in material and workmanship, under normal use and service, for a period of two years on parts replacement and factory-performed labor (one year for Informer, EAS, and Federal software products) from the date of delivery to the first user-purchaser. Federal warrants every 2001, Eclipse and 508 Siren (Top of pole only) to be free from defects in material, per our standard warranty, under normal use and service for a period of five years on parts replacement.

During this warranty period, the obligation of Federal is limited to repairing or replacing, as Federal may elect, any part or parts of such product which after examination by Federal, are determined to be defective in material and/or workmanship.

Federal will provide warranty for any unit, which is delivered, transported prepaid, to the Federal factory or designated authorized warranty service center for examination and such examination reveals a defect in material and/or workmanship.

This warranty does not cover travel expenses, the cost of specialized equipment for gaining access to the product, or labor charges for removal and re-installation of the product. The Federal Signal Corporation warranty shall not apply to components or accessories that have a separate warranty by the original manufacturer, such as, but not limited to batteries.

Federal will provide on-site warranty service during the first 60-days after the completion of the installation, when Federal has provided a turn-key installation including optimization and/or commissioning services.

This warranty does not extend to any unit which has been subjected to abuse, misuse, improper installation or which has been inadequately maintained, nor to units which have problems related to service or modification at any facility other than the Federal factory or authorized warranty service centers. Moreover, Federal shall have no liability with respect to defects arising in Products through any cause other than ordinary use (such as, for example, accident, fire, lightning, water damage, or other remaining acts of God).

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2645 Federal Signal Drive, University Park, IL 60484-3167

Phone: 708-534-3400

Website: <http://www.alertnotification.net>

Contents

Safety Message	1
Important Notice	1
Publications	1
Planning	1
Installation and Service	2
Operation	3
General Description	4
Introduction	4
Describing the Signal.....	5
Specifications	5
Installation Instructions	6
Determine a Suitable Location.....	6
Installing the Siren	11
<i>Pole Mounting</i>	11
<i>Flat Surface Mount</i>	12
Pre-Operation Checklist	15
Preventive Maintenance	15
Obtaining Service	16
Index	17

Tables

Table 1 Pre-Operation Checklist.....	15
--------------------------------------	----

Figures

Figure 1 Eclipse8	4
Figure 2 Signal Characteristics	5
Figure 3 Siren Leg Assembly. (Shown with optional surface mounting plate, Model No. RME)	8
Figure 4 Typical Pole-mounted Installation	9
Figure 5 Conduit Connection and Wiring Detail.....	10
Figure 6 Typical Surface-mounted Siren Installation	13
Figure 7 Weight Distribution Mat Construction	14

Safety Message

⚠ 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.

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.

Safety Message

- 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.
- 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.

⚠ WARNING

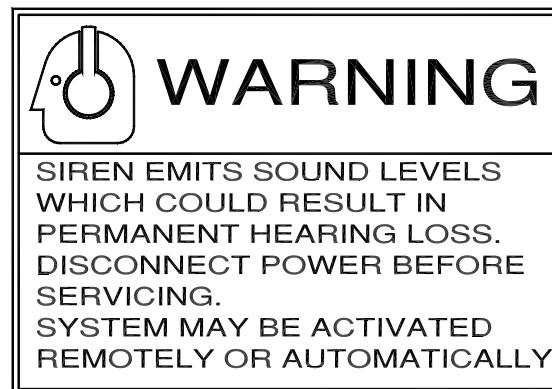
Read and understand the information contained in this manual before attempting to install or service the siren.

Pay careful attention to the following notices located on the equipment.

Notices—Externally Placed



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General Description

Introduction

This manual describes the characteristics, specifications, installation, and preventive maintenance of the Federal Signal Eclipse8 siren.

The Eclipse8 siren (Figure 1) is an electro-mechanical omni-directional, DC powered siren that is capable of producing high intensity warning signals over a large area. A highly efficient design enables the siren to produce a high sound level, while making moderate demands on the power source.

Figure 1 Eclipse8



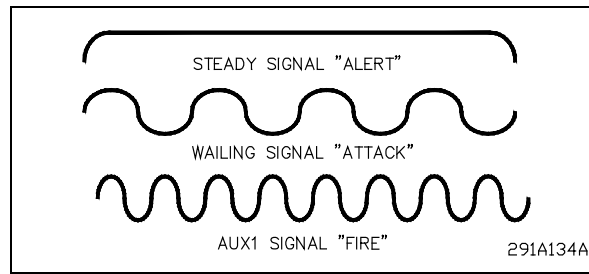
The Eclipse8 siren is a single tone siren capable of producing a 115 dB sound level at 100 feet for a minimum of 15 minutes, when using the 2001-AC or DCFC-based Controller with fully charged, standard, deep-cycle batteries. Thirty minute duty cycle operation is available with a 2001TRB option. This option supplies DC current directly to the siren from a nominal 220/240 VAC line.

A single DC motor is used to produce the sound energy. The motor is attached to a stator with a rotor mounted on the motor shaft inside the stator. The rotor and stator each contain one row of ports. As the motor rotates the rotor, air is drawn into the rotor and passes through the rotor and stator ports in pulses. These pulses are produced when the rotor alternately opens and closes the stator ports. The pulses of air produce sound at a frequency (pitch) that is dependent upon the rotational speed of the motor and the number of ports in the rotor-stator combination.

Describing the Signal

The Eclipse8 siren is capable of producing a steady signal and a wailing signal. The steady signal is frequently used as a Civil Defense “Alert” signal. The wailing signal is often used as a Civil Defense “Attack” signal. Any of the signals are capable of being used for any desired application. These signals are shown graphically in Figure 2.

Figure 2 Signal Characteristics



Specifications

General

Power Requirements	46 VDC (or full wave rectified AC) 112 amps (nominal)
Wiring	2 AWG minimum
Motor Type	Series Wound DC 7Hp
Sound Output (SPL).	115 dBc max. (on axis) at 100 feet (30.5m)
Dimensions (Height/Diameter)	63 inches/46.81 inches (Including stand) 160 cm/119 cm
Siren Weight	255 pounds (116 kg.)
Shipping Weight	380 pounds (173 kg.)
Material	Aluminum with stainless steel hardware
Operating Temperature	30°C to +60°C

Signal Information

Signal Duration 3 minutes (programmable)

Signal	Frequency Range	Sweep Rate
Steady	525 Hz	N.A.
Wail	500 – 330 Hz	10 sec.
Fast Wail	490 – 400 Hz	4 sec.

Installation Instructions

⚠ 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.

Determine a Suitable Location

The information in this section provides guidelines to aid you in the selection of installation sites that make the best possible use of the siren.

⚠ WARNING

The sound output level of some Eclipse8 sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan placement of sirens and post warnings.

⚠ WARNING

Do not expose personnel to sound levels above 123 dBC.

⚠ WARNING

When the sirens are used out of doors, people indoors may not be able to hear the warning signals. You may need separate warning devices or procedures to effectively warn people indoors.

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.

The reduction of signal intensity as 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, and 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.

Assuming a 10 dB loss per distance doubled and a 70 dB minimum sound level, the effective range of the Eclipse8 siren is approximately 1,840 feet.

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

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

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). 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.

Installation Instructions

Figure 3 Siren Leg Assembly. (Shown with optional surface mounting plate, Model No. RME)

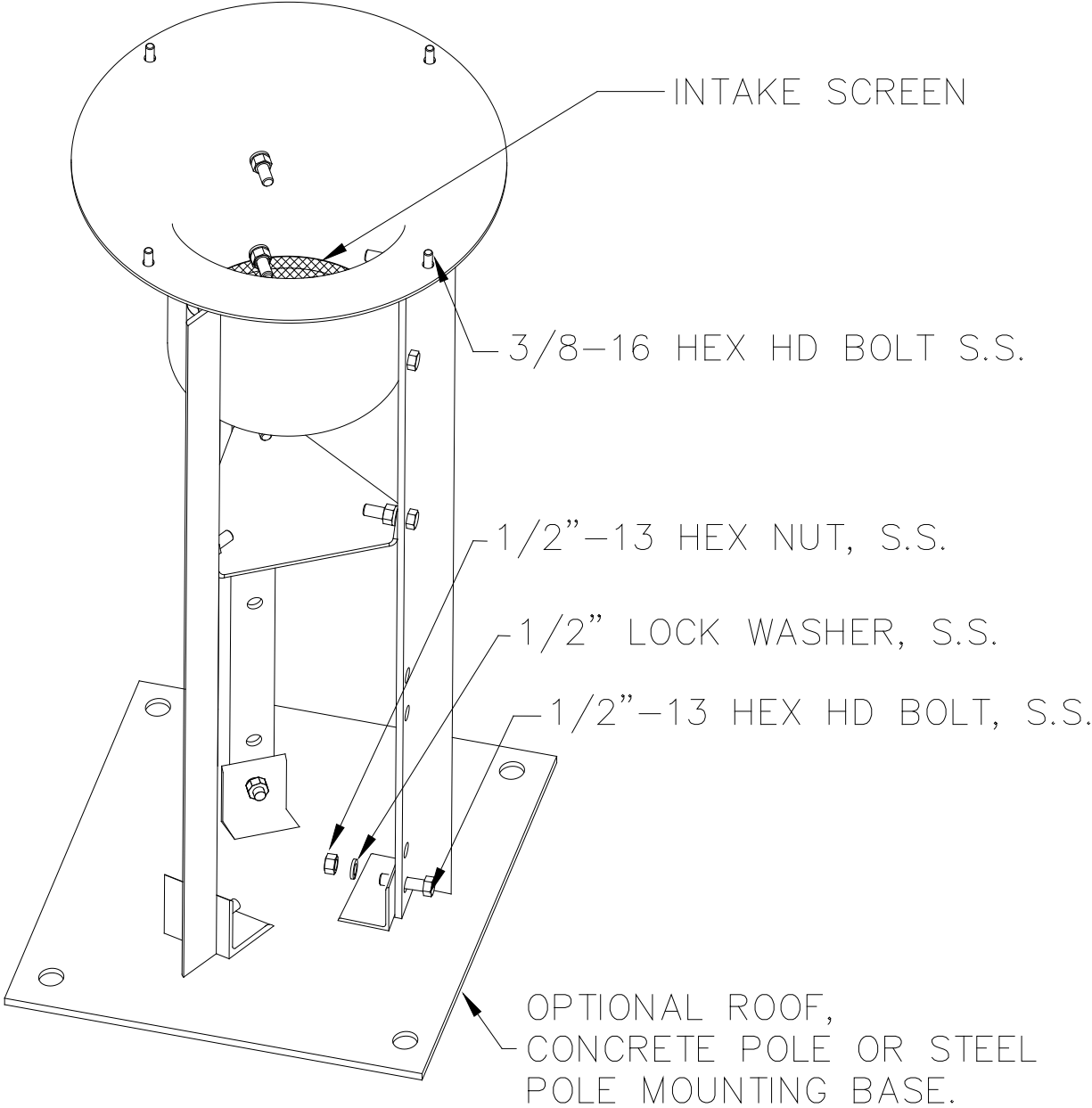
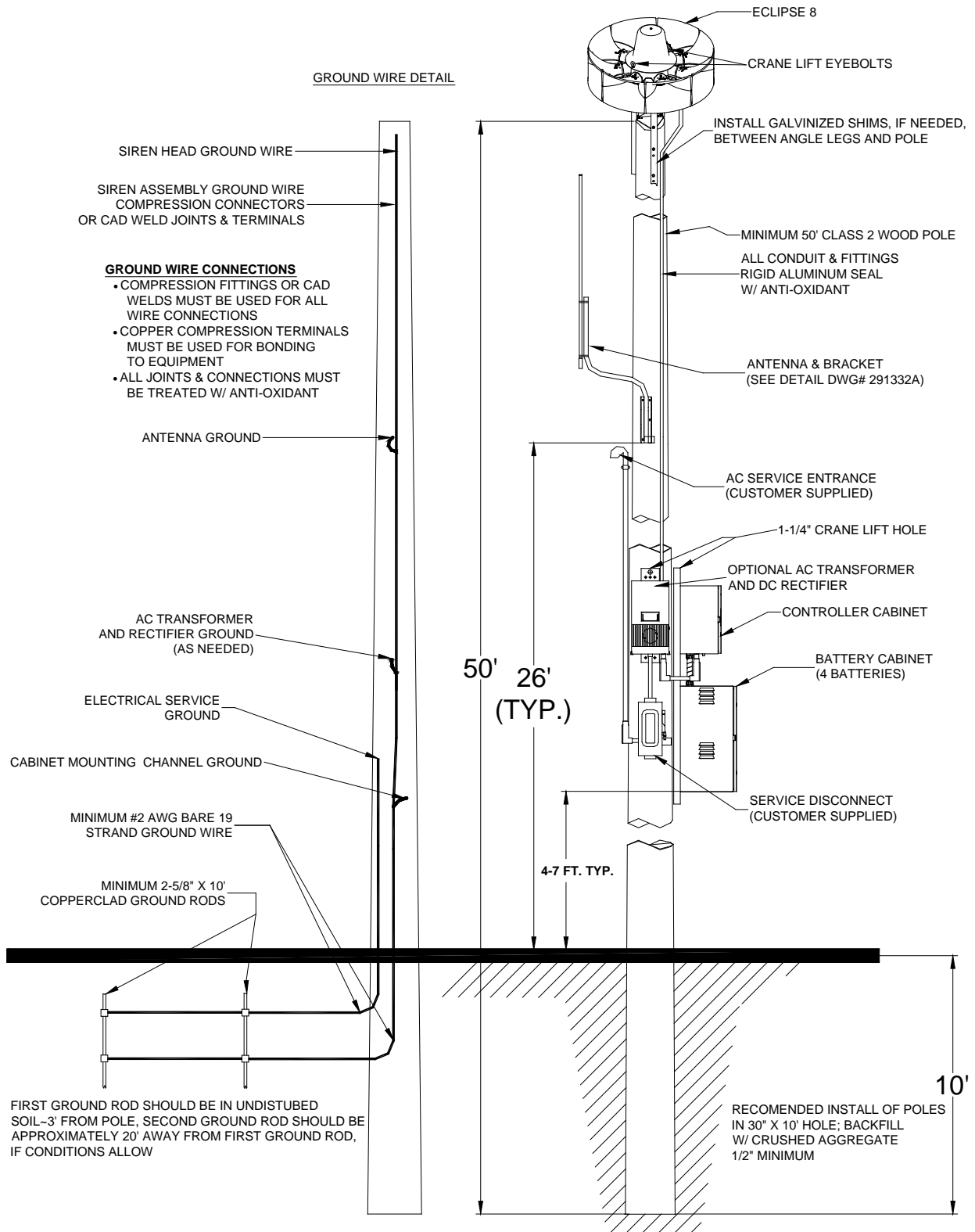
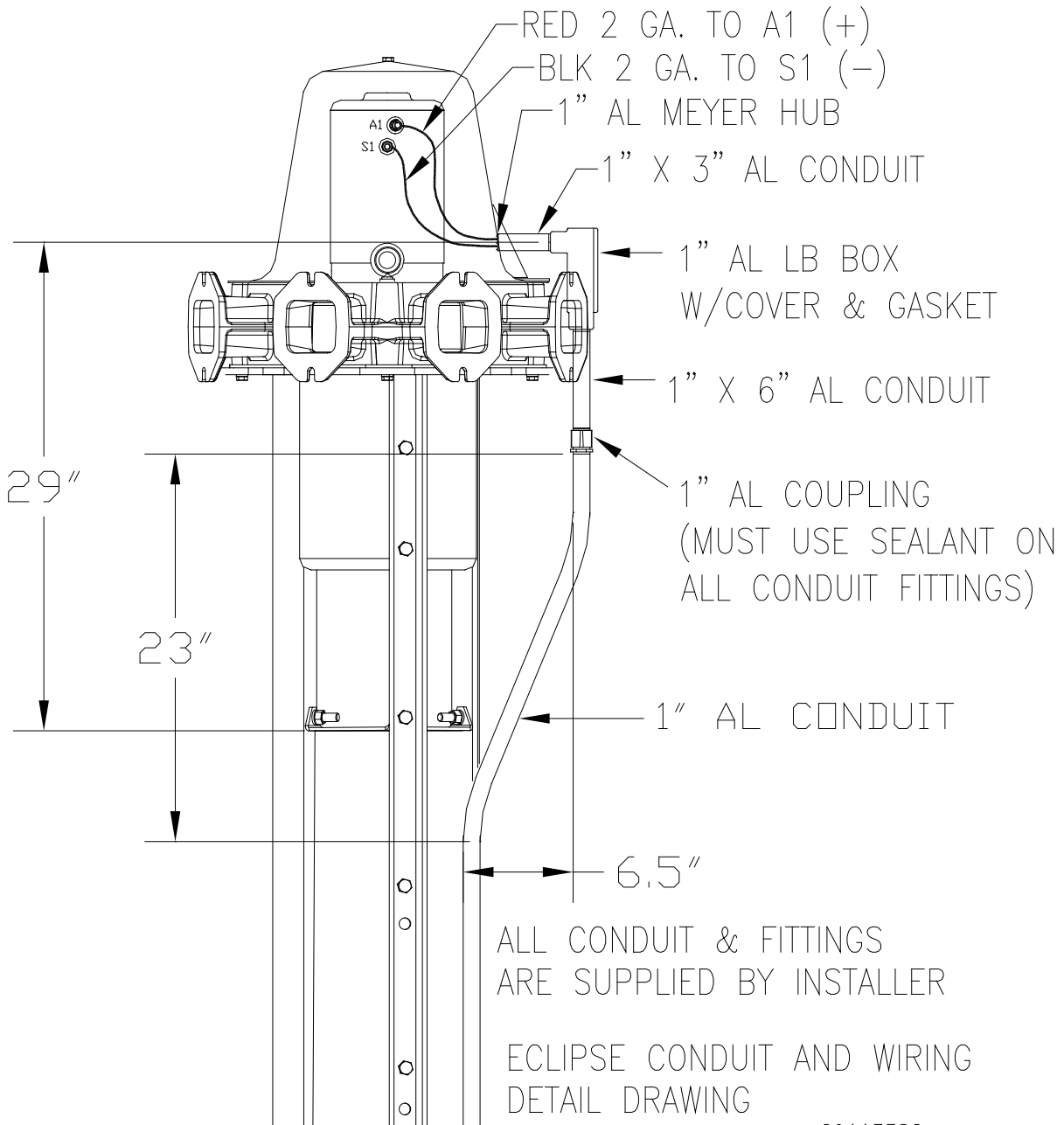


Figure 4 Typical Pole-mounted Installation



Installation Instructions

Figure 5 Conduit Connection and Wiring Detail



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Installing the Siren

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 manual are not suitable, modification of one of the configurations may be practical.

⚠ WARNING

An Eclipse8 siren must be installed at least 40 feet above the ground to ensure sound levels on the ground do not exceed safe levels.

Do not place fingers into any siren openings.

To install the siren, do the following:

1. Uncrate the siren and remove the lag bolts that hold the siren on the shipping base. Lift the siren approximately 3-1/2 feet with a crane or hoist using the two eyehooks on the siren.
2. Install the siren legs to the siren using the four 3/8 inch-16 bolts and lock washers.

Pole Mounting

A typical siren pole-mounted installation is shown in Figure 4. The siren is mounted on a Class 2 utility pole at least 40 feet above the ground. It is attached to the pole by means of legs, as shown in Figure 3.

⚠ WARNING

The lifting eyebolts do 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 bracket as a lifting point.

To mount an Eclipse8 on a pole, use a Class 2 utility pole and the 3 feet long angle iron legs and proceed as follows:

1. Erect the utility pole in accordance with accepted practices. Be sure the pole extends at least 40 feet above the ground (refer to WARNING above).
2. Raise the siren to the necessary height, and lower it over the pole.
3. Insert shims, if necessary, between the siren legs and pole. Bolt the siren to the pole using two 5/8 inch lag bolts, at least four inches long for each leg. Tighten all bolts.

Installation Instructions

4. Install the siren grounding as shown in Figure 4.
5. Refer to Figure 5 for running conduit to the siren and follow the instructions provided with the siren controller for making electrical connections—omitting any references to rotation.

Flat Surface Mount

NOTE: Prior to installation, ensure a qualified Professional Engineer approves mounting locations, materials and methods.

A model RME mounting plate is required for mounting on flat surfaces; such as, a building or top plate of a steel or concrete pole. This installation configuration is practical for buildings that have a flat roof. The siren can be anchored directly to the roof, on a platform as shown in Figure 6, or on a weight distribution mat like the one shown in Figure 7.

A mat is required when the siren mounting surface is unable to support at least 280 pounds (127kg.) over a 1.5 square foot area. The mat shown in Figure 7 distributes the siren weight over an 8 square foot area. When installing the siren on a flat roof, be sure that it clears the parapets or other obstructions by at least ten feet.

To install an Eclipse8 on a flat roof or other flat surface, proceed as follows:

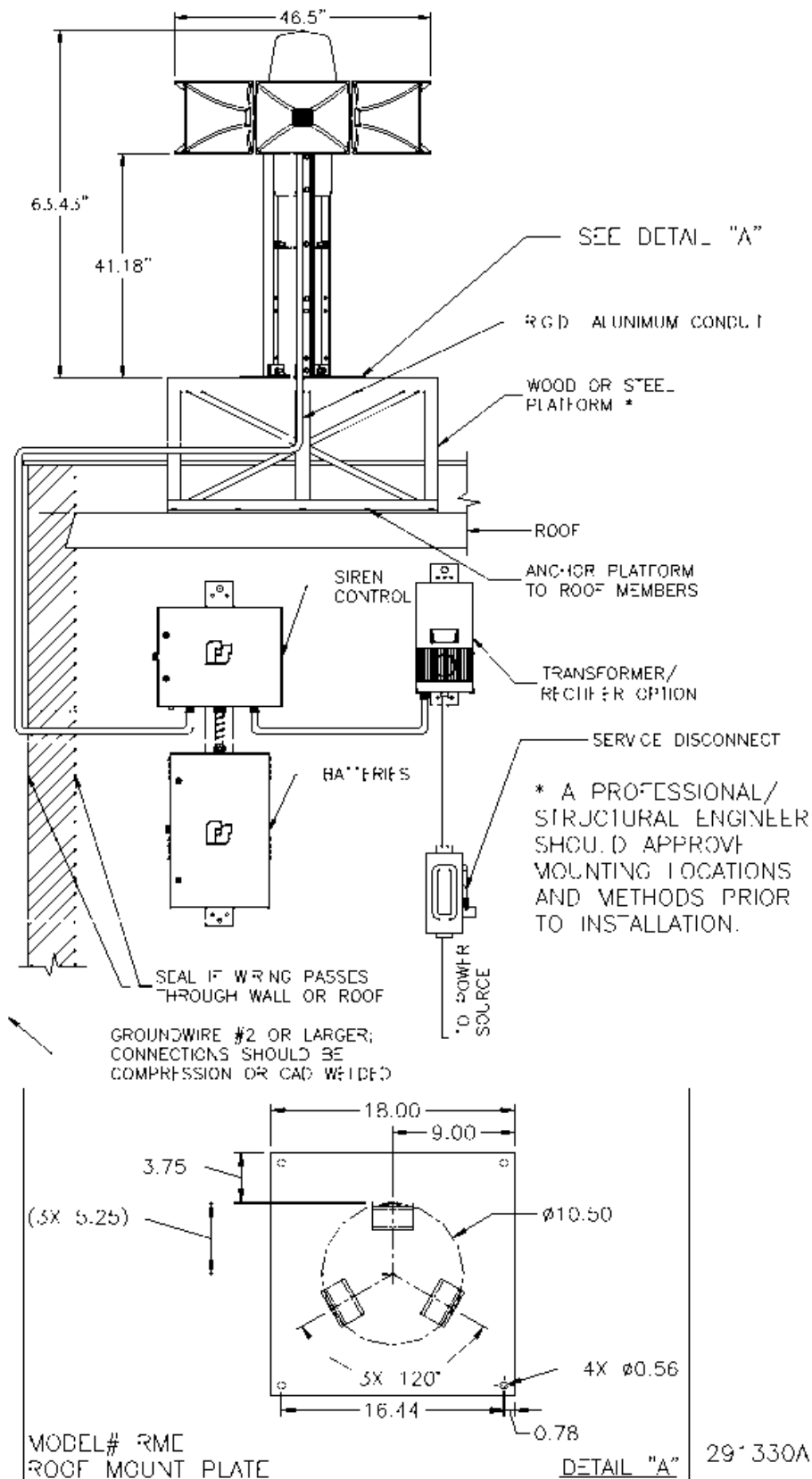
1. If required, construct a platform for mounting the siren, which must be capable of supporting at least 300 lbs. (660kg.) and withstanding a siren wind load of 110 mph. The platform must also be capable of distributing its own weight plus the siren to a value that is safe for the mounting surface. Platform design and construction details are left to the installer. Locate the platform at the siren installation site. Using suitable hardware (not supplied), anchor the platform to the mounting surface.

⚠ WARNING

The siren's lifting eyebolts do not have sufficient strength to support the combined weight of the siren and a mounting platform. Therefore, do not lift the siren and platform together using the siren's eyebolts as the lifting points.

2. Hoist the siren to the installation site using the two eyebolts as a lifting point (refer to WARNING above).

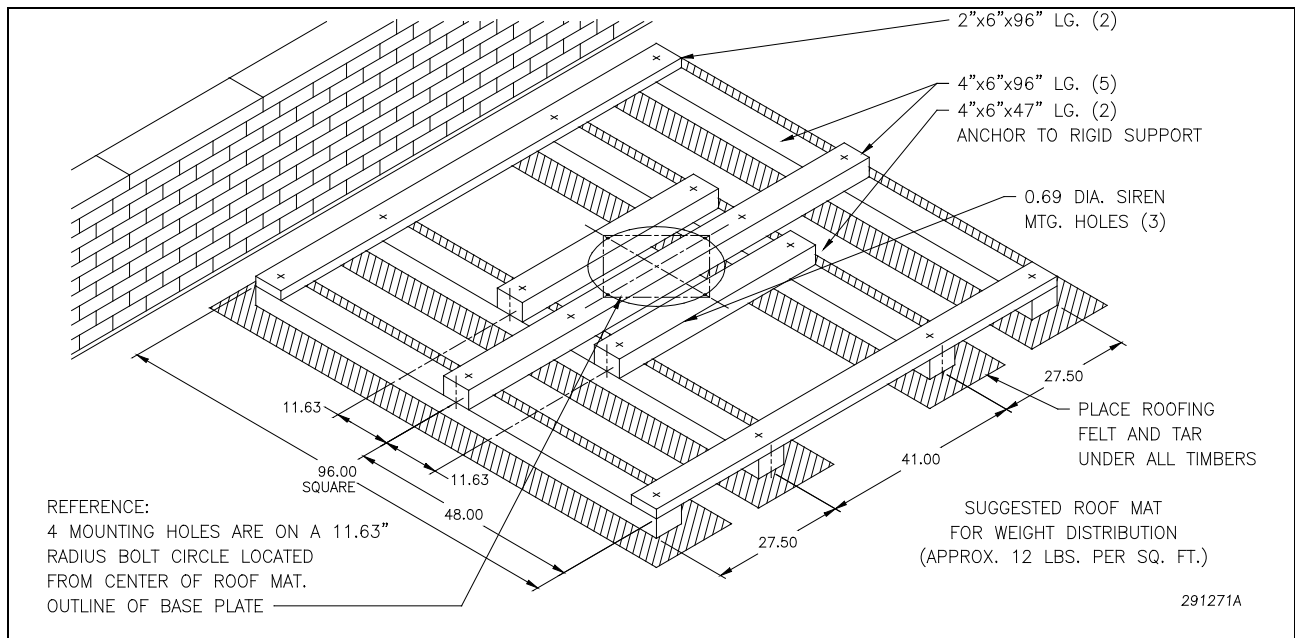
Figure 6 Typical Surface-mounted Siren Installation



Installation Instructions

- Anchor the siren to the mounting surface with ½ inch lag bolts or nuts and bolts, as appropriate through the mounting holes (one in each corner) in the siren base plate (see Figure 6, detail A). If the siren is mounted directly on a roof, (without a platform or weight distribution mat) install waterproof joints at the points where the mounting bolts pass through the roof so that water does not enter the building.
- Refer to Figure 5 for running conduit to the siren and follow the instructions provided with the siren controller for making electrical connections—omitting any references to rotation.

Figure 7 Weight Distribution Mat Construction



- Either bolt down or add weight to a non-penetrating roof mount. If you add weight to a non-penetrating roof mount, have a qualified Professional Engineer check your weight distribution.

Pre-Operation Checklist

After installing the siren, perform the following checks before putting the siren into service. This procedure is also recommended as a maintenance procedure.

⚠ WARNING

The output sound level of a siren is capable of causing severe hearing discomfort or permanent hearing damage. Therefore, always wear hearing protection when performing tests or maintenance on the siren.

Table 1 Pre-Operation Checklist

Check	Action Item
	All air intakes and sound outlets are not obstructed.
	All connections in the Control Unit/Battery Box (if applicable) are correct and properly tightened.
	The mounting structure is secure and all siren hardware properly attached and secure.
	All people and animals are at least 40 feet away from the siren in every direction to avoid hearing damage.
	Activate a siren function at the control panel and check for proper sound output.
	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.

Preventive Maintenance

Test the Eclipse8 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, but instills public confidence in the reliability of the warning system.

In order to minimize the possibility of siren failure, annual inspection is desirable. If applicable, perform battery replacement approximately every 3-5 years. This schedule is only a suggested guideline. It may be necessary to vary the schedule if the siren is used frequently or if it is used in an extreme climate.

⚠ DANGER

Service should be performed by qualified personnel familiar with the siren, associated controls, and power sources being used. The siren has moving parts, high operating currents, and may have explosive gases and corrosive materials that could cause severe personal injury, electrocution, or death. Before servicing or maintaining, ensure that remote activation cannot occur and disconnect power to the siren and its controls.

⚠ WARNING

The output level of an Eclipse8 siren is capable of causing permanent hearing damage. Therefore, always wear hearing protection when performing tests or maintenance on the siren.

Obtaining Service

If you are experiencing any difficulties, contact Federal Signal Customer Care at: 800-548-7229 or 708-534-3400 extension 5822 or Technical Support at: 800-524-3021 or 708-534-3400 extension 7329 or through e-mail at: techsupport-ans@federalsignal.com. For instruction manuals and information on related products, visit: <http://www.alertnotification.net/>

Index

	C		P	
Customer Care		16	Preventive Maintenance	15
			Publications	1
	E			S
Eclipse8, Introduction		4	Safety Message	1
			Signal	5
	G		Specifications	5
General, Specifications		5	Specifications, General	5
	I			T
Installation, Instructions		6	Technical Support	16
Installing the Siren		11		
	O			W
Obtaining Service		16	Warranty, Limited	2



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