

Non-Metallic Zone 1 Loudspeaker

Models: GEN-IIB/C and GEN-IIB/C-ISMT



Description, Installation, and User 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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1.0 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's electric codes and will follow these guidelines as well as local codes and ordinances, including any state or local noise-control ordinances.

Planning

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

After installation, service, or maintenance, test the system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.

1.1 Safety Messages to Installers

People's lives depend on your safe installation of our products. 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.

The selection of the mounting location for this system, its controls, and the routing of the wiring are to be accomplished under the direction of the Facilities Engineer and the Safety Engineer. Listed below are some other important safety instructions and precautions you should follow:

- Disconnect the device from the power supply/audio source before any installation or maintenance is performed.
- Do not open the loudspeaker enclosure when a hazardous atmosphere is present.
- To determine if the device can be used safely in the intended area, review the Certifications section in this manual.
- 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, or province and any other electrical codes having jurisdiction. Perform all work under the direction of the installation or service crew safety foreman.

- Read and understand all instructions before installing, operating, or servicing this equipment.
- All effective warning sounds may, in certain circumstances, cause permanent hearing loss. Take appropriate precautions, such as wearing hearing protection. The maximum sound level exposure limits specified in OSHA 29 CFR 1910 should not be exceeded.
- For optimum sound distribution, do not install the loudspeakers where objects would block any portion of the front of the system.
- Establish a procedure to routinely check the signal system for proper activation and operation.
- Any maintenance to the unit **MUST** be performed by a trained electrician in accordance with NEC Guidelines and local codes or a Federal Signal certified Service Provider.
- Never alter the unit in any manner.
- The nameplate should **NOT** be obscured, as it contains cautionary and/or other information of importance to maintenance personnel.
- After installation and completion of the initial system test, provide a copy of these instructions to all personnel responsible for the operation, periodic testing, and maintenance of the equipment.
- File these instructions in a safe place and refer to them when maintaining and/or reinstalling the device.

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

Installation and Service

- After installation or service, test the 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 system may not provide the intended audible warning, and service personnel may be exposed to death, permanent hearing loss, or other bodily injuries. 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 system.
- To reduce the risk of electric shock, do not perform any servicing other than what is contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Always test the system before using after repairs have been made.
- Concerning the potential electrostatic charging hazard, as mentioned in the certificate “Specific Conditions of Use,” under normal conditions of use, these devices are for fixed installations and are not generally in contact with people. The risk of ignition is low. In addition, maintenance, cleaning, and extreme environmental factors (for example, high-velocity dust-laden atmospheres or high-pressure steam) should be

taken into account by the end user, using local Explosive Atmosphere (Ex) Electrical installations design, selection, inspection, and maintenance Codes and Standards.

⚠ WARNING

POTENTIAL ELECTROSTATIC CHARGING HAZARD: If the unit requires cleaning, ONLY clean the exterior with a water-dampened cloth to avoid electrostatic charge buildup.

⚠ WARNING

FIRE/EXPLOSION HAZARD: Do not open the loudspeaker when it is energized. Failure to observe this warning could result in serious injury or death.

- Any maintenance to the loudspeaker must be done with the power turned off.
- After disconnecting power, allow ten minutes for the internal components to cool and to allow all capacitors to discharge.
- Do not open the loudspeaker enclosure when a hazardous atmosphere is present.
- Use only service parts provided by the Federal Signal factory. Only these components have been verified and certified for use in hazardous areas.
- Any repairs or modifications made to the encapsulated areas will invalidate the certification. Do not repair flameproof joints.
- The nameplate, which contains cautionary or other information of importance to maintenance personnel, should not be obscured.

Hazard Classification

Federal Signal uses signal words to identify the following:

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

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

2.0 General Description

2.1 Introduction

This document is a description, installation, and user manual for the GEN-IIB/C and GEN-IIB/C-ISMT Series Non-Metallic Zone 1 Loudspeaker. Its intended audience are those assigned to install, use, and maintain the loudspeakers.

2.2 Overview

The Federal Signal non-metallic loudspeakers, models GEN-IIB/C and GEN-IIB/C-ISMT, are designed for use in industrial public address and general alarm applications where corrosion resistance and ATEX/IEC Certification are required.

- GEN-IIB/C and GEN IIB/C-ISMT are available in an ATEX/IEC Zone 1 explosion-proof version certified IP66 for ingress of dust and combustible gas to Group IIB + H2 (Hydrogen) or Group IIC. The speakers are manufactured from corrosion-resistant, Glass Reinforced Polyester (GRP).
- GEN IIB/C-ISMT differs from the standard model GEN IIB/C in that it includes an intelligent speaker monitoring tapping (ISMT) interface built into the speaker to allow remote monitoring and tapping of the speaker without needing to physically access the deployed speaker.
- GEN IIB/C and GEN IIB/C-ISMT loudspeakers are designed to accept an audio input of 100 V_{RMS}. Each speaker is a transformer coupled with a maximum output of 25 W and is supplied with preset taps (25, 15, 10, and 6) to adjust sound output.

Mounting is supplied by a “common template” stainless steel ratcheted mounting bracket that locks the loudspeaker in position at a specific angle without slipping. The optional swivel mounting bracket provides slotted mounting holes to further adjust speaker position and adapt to a variety of different surfaces.

Connection for field wiring is provided by two M20 x 1.5 mm threaded openings in the speaker housing and terminated via internal terminal blocks. All external hardware is manufactured from stainless steel to resist corrosion and provide serviceability for years to come.

2.3 Features

The speaker has the following features:

- SPL: 123 +/-3 dBA at 25 W, 1 m
- 100 V_{RMS}, 25 W audio input
- Re-entrant horn design
- Non-Metallic, Glass Reinforced Polyester (GRP), UV solar resistant housing
- U Mounting bracket included, optional swivel mount bracket available
- IP66 rated
- ATEX and IECEx Certified for Zone 1, Gas Group IIB+H2 or IIC
- Cable entry: 2 x M20 x 1.5 mm

General Description

2.4 Unpacking the Loudspeaker

After unpacking the loudspeaker, examine it for damage that may have occurred in transit. If the loudspeaker has been damaged, do not attempt to install or operate it. File a claim immediately with the carrier stating the extent of the damage. If you are missing any parts, contact Federal Signal Customer Support. Carefully check all envelopes, shipping labels, and tags before removing or destroying them.

2.5 Ordering Information

Table 1 Ordering Information

Part Numbers	Description
GEN-IIB	Corrosion Resistant Loudspeaker, ATEX Zone 1 Rated Gas Group IIB+H2
GEN-IIB-ISMT	Corrosion Resistant Loudspeaker, ATEX Zone 1 Rated Gas Group IIB+H2
GEN-IIC	Corrosion Resistant Loudspeaker, ATEX Zone 1 Rated Gas Group IIC
GEN-IIC-ISMT	Corrosion Resistant Loudspeaker, ATEX Zone 1 Rated Gas Group IIC

Table 2 Accessories

Part Numbers	Description
K8595172A	Swivel Mounting Bracket

2.6 Certifications

ATEX and IECEx Certified for Zone1, Gas Group, IIB+H2 or IIC

Certificate Numbers	ATEX Certificate Number: UL 22 ATEX 2889X IECEx Certificate Number: IECEx UL 22.0094X
ATEX coding	 II 2 G D
Protection	
GEN-IIB and GEN-IIB-ISMT	II 2 G Ex db IIB+H2 T4 Gb (Tamb = -50°C to +65°C) II 2 D Ex tb IIIC T135C Db IP66
GEN-IIC and GEN-IIC-ISMT	II 2 G Ex db IIC T4 Gb (Tamb = -50°C to +65°C) II 2 D Ex tb IIIC T135°C Db IP66
Standards applied	EN60079-0, EN60079-1, EN60079-31, IEC60079-0, IEC 60079-1, and IEC60079-31. Refer to Certificate Numbers for specific standard versions.

3.0 Specifications

Table 3 Specifications

Electrical	Audio Line Voltage 100 V _{RMS} Max rated power 25 W
Enclosure Rating	IP66 Indoor/Outdoor Use
Gland Entry	2 x M20 x 1.5 mm
Cable Terminations	0.5 mm ² to 4 mm ² (20 AWG to 12 AWG)
Size (Height x Length)	232.2 x 347 mm (9.13 x 13.66 inches)
Material	Glass Reinforced Polyester (GRP)
Color	Black
Audio Input	100 V _{RMS}
Max Audio Output	123 +/-3 dBA at 25 W (1 meter)
Net Weight	6.58 kg (14.5 lb)
Shipping Weight	7.48 kg (16.5 lb)
Ambient Environment	T4: -50°C ≤ Ta ≤ +65°C
Max. Surface Temperature	135°C at +65°C ambient

4.0 Specific Conditions for Use

The specific conditions for use:

⚠ WARNING

POTENTIAL ELECTROSTATIC CHARGING HAZARD/INSTALLATION PRECAUTIONS:

- *The speaker housing has external non-metallic surfaces that may provide an electrostatic charging hazard. Under normal conditions of use, these devices are for fixed installations and are not generally in contact with people. The risk of ignition is low. In addition, maintenance, cleaning, and extreme environmental factors (for example, high-velocity dust-laden atmospheres or high-pressure steam) should be taken into account by the end user, using local Explosive Atmosphere Ex Electrical installations design, selection, inspection, and maintenance Codes and Standards.*
- *The equipment has a metallic mounting bracket that can store electrical charge and may provide a potential electrostatic charging hazard. The metallic mounting bracket has a capacitance of 11 pF.*
- *Due to the high ambient rating of the equipment and the internally generated temperatures at the entries and branching point of the conductors, select suitable cable, cable glands, and conductors with a minimum temperature rating of 85°C.*
- *Replacement cover screws are not standard fasteners. They must be sourced from the equipment manufacturer only. Do not repair flameproof joints.*

- *If the equipment contains an unused entry hole after installation, use only suitable ATEX and IECEx Certified Ex “tb” (IP66) and Ex “db” (IIC gas) rated components to seal the entry hole before operating. The manufacturer recommends EATON/REDAPT, Part # PD-U Series stopping plugs.*
- *The equipment terminal block shall be used with conductor sizes of 0.5 mm² to 4 mm². The protective earth ground connection conductor size shall equal the conductor size of the audio input wires at the minimum.*

5.0 Mounting the Loudspeaker

NOTICE

DRILLING PRECAUTIONS: *When drilling holes, check the area you are drilling into to ensure you do not damage anything while drilling. All drilled holes should be deburred, and all sharp edges should be smoothed.*

The Models GEN-IIB/C loudspeakers are designed for mounting on a flat horizontal or vertical surface.

To mount the loudspeaker, obtain M6 stainless steel bolts, lockwashers, and flat washers.

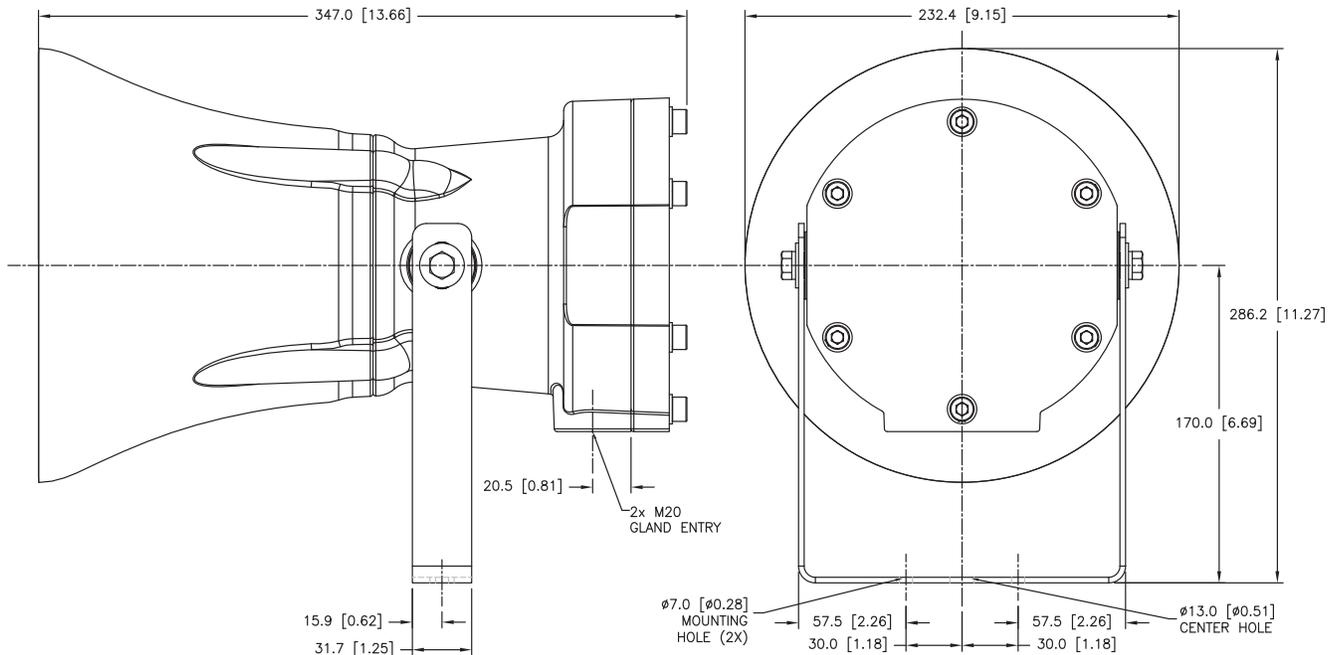
NOTICE

OBSTRUCTION HAZARD: *The nameplate, which contains cautionary or other vital information to maintenance personnel, should not be obscured.*

To mount the loudspeaker:

1. Select a mounting location that is capable of supporting more than 7.5 kg (16.5 lb).
2. Use the mounting bracket as a template to scribe the centers of the mounting holes.
3. Drill an appropriately sized hole at each scribed mark for the mounting screws.
4. Mount the bracket with the installer-supplied bolts and washers.
5. Secure the loudspeaker to the mounting bracket.

Figure 1 Loudspeaker dimensions



NOTE: Units are in millimeters [inches].

6.0 Adjusting the Vertical Angle

To adjust the vertical angle of the loudspeaker:

1. Loosen the fasteners on the mounting bracket to disengage the ratchet.
2. Vertically aim the loudspeaker.
3. Hold the loudspeaker in place while tightening the fasteners on the bracket.

7.0 Wiring the Loudspeaker

⚠ WARNING

SHOCK HAZARD: To avoid an electrical shock, do not connect the loudspeaker to the system while the power is on. Failure to heed this warning may cause serious injury or death.

Two M20 threaded entries are provided on the side of the housing for the installation of certified Ex d cable glands. All unused entries must be sealed with a suitably rated stopper plug.

A terminal block with six-pole screws is provided for field wiring. See Figure 2 on page 12 and Figure 3 on page 12. The terminals are rated for the range of 0.5 mm² to 4 mm² (20 AWG to 12 AWG).

Tighten the terminal screws to a torque of 0.45 N·m to 0.50 N·m (4.0 in·lb to 4.4 in·lb).

Figure 2 Loudspeaker connections for GEN-IIB and GEN-IIC

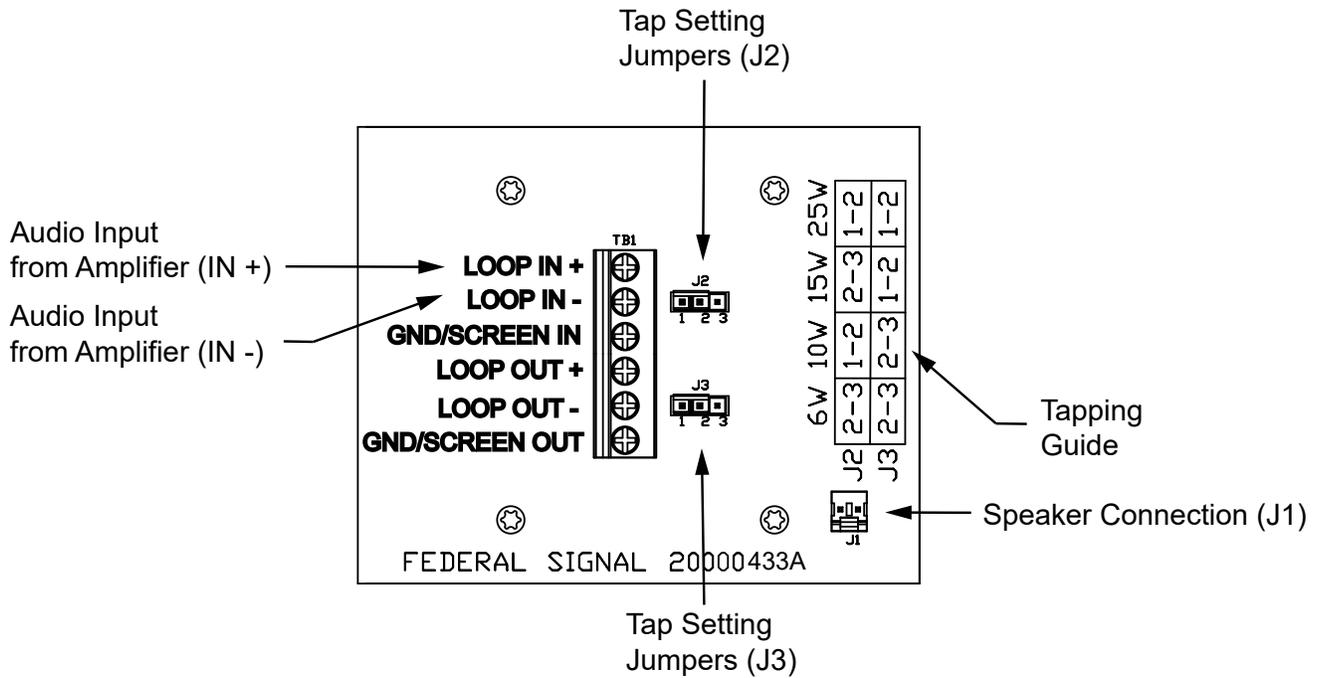
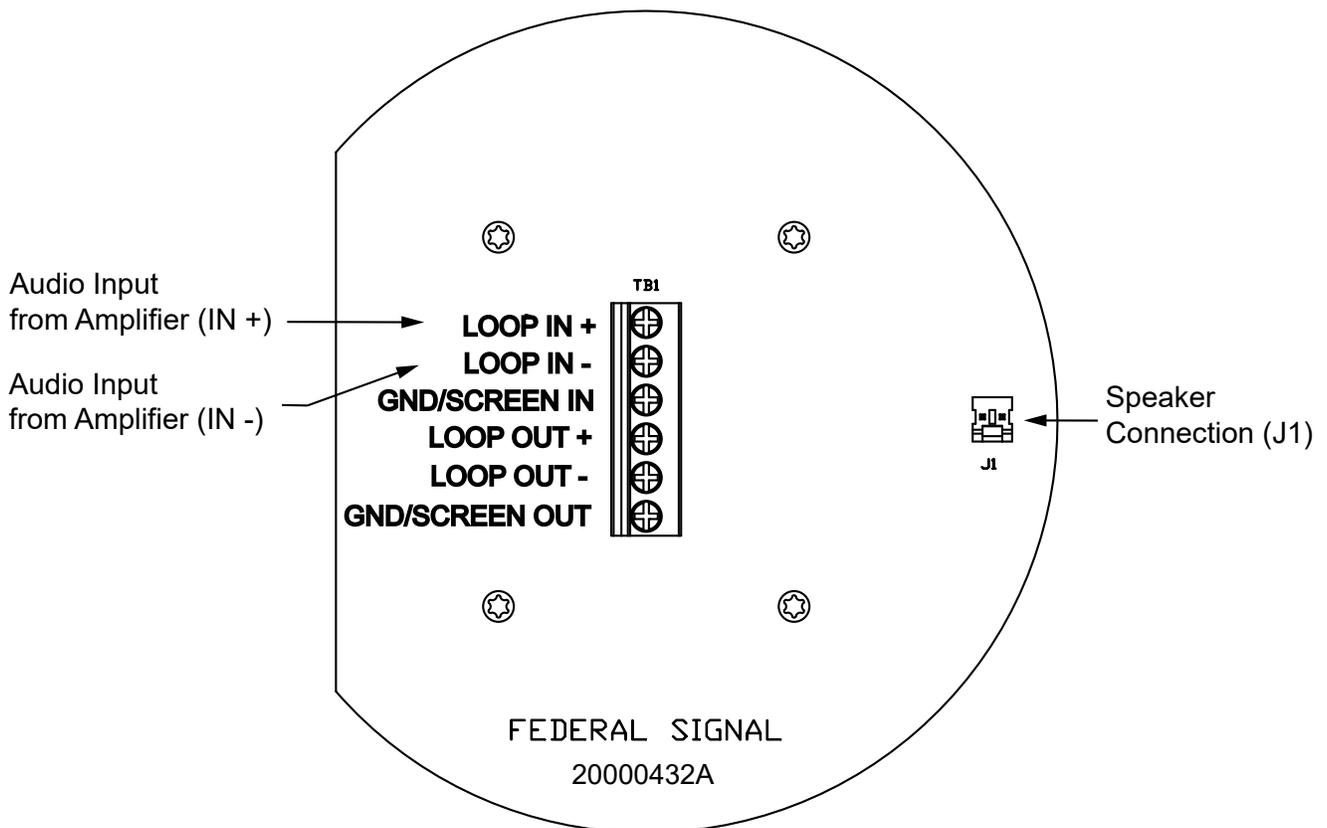


Figure 3 Loudspeaker connections for GEN-IIB-ISMT and GEN-IIC-ISMT



To wire the loudspeaker:

1. Loosen the six screws securing the rear cover to the loudspeaker, and remove the cover.
2. Route audio input leads to the LOOP IN+ and LOOP IN- terminals.

The LOOP OUT+/LOOP OUT- terminals may be used to connect to an additional speaker if required. Loudspeakers in close proximity must be connected in phase.

8.0 Setting Transformer Wattage Taps

The Model GEN-IIB and GEN-IIC loudspeakers have four wattage tap settings that enable you to select the loudness of each loudspeaker in the system. (See Table 4.) The higher the wattage tap, the louder the speaker output. Move the jumpers on J2 and J3 to change the wattage tap.

Table 4 Wattage tap settings

J2	J3	Tap
2-3	2-3	6 W
1-2	2-3	10 W
2-3	1-2	15 W
1-2	1-2	25 W

9.0 Completing the Installation

To complete the installation of the loudspeaker system:

1. Make sure that the cover is properly seated
2. Replace the rear cover and tighten the screws securing it to approximately 10-12 N•m (90-106 in-lb).
3. Test the speaker system to verify that it operates properly.

10.0 Periodically Inspecting the Loudspeaker

Establishing a regular inspection schedule for the loudspeaker extends the life of the loudspeaker and ensures safety. For a list of replacement parts, see “Table 5 Replacement parts” on page 14.

- Ensure that the loudspeaker is maintained in line with the regulations in force and at regular intervals, at least once per year.
- Check for external damage and repair and replace as necessary.
- Check that the gasket is seated properly and that it is not brittle or damaged.
- Periodic checks should be made to ensure that the effectiveness of this device has not been reduced because the speaker has become clogged with a foreign substance or because objects have been placed in front of the speaker.
- Check all earth connections.
- Check for water and dust ingress and replace seals as necessary.

⚠ WARNING

ELECTROSTATIC CHARGING HAZARD: *If the unit requires cleaning, ONLY clean the exterior with a water-dampened cloth to avoid electrostatic charge buildup.*

11.0 Servicing the Loudspeaker

⚠ WARNING

SHOCK HAZARD: *To avoid an electrical shock, do not connect the loudspeaker to the system while the power is on.*

The loudspeaker is fully encapsulated and the speaker driver is non-serviceable. If the driver fails, the entire loudspeaker must be replaced. If it does not operate, verify continuity of the driver voice coil before replacing the loudspeaker.

To check the continuity of the voice coil:

1. Turn off power to the loudspeaker.
2. Remove the six screws securing the rear cover to the loudspeaker, and remove the cover.
3. Disconnect the wire harness from J1 on the PCBA.
4. Connect an ohmmeter to the wire harness and confirm that there is continuity. The DC resistance should read approximately 6 to 7 ohms.
5. If there is not continuity, the entire loudspeaker must be replaced.

12.0 Ordering Replacement Parts

To order replacement parts, contact Federal Signal.

Table 5 Replacement parts

Description	Part Number
Standard Mounting Bracket Kit with Ratchets	K85952946A
Swivel Mounting Bracket Kit with Ratchets	K85952949A
Horn Kit	K859502995A
Rear Cover and Gasket Kit	K859502997A
Loudspeaker with ISMT PCBA	K20000432A
Loudspeaker PCBA	K20000433A

13.0 Getting Service

If you are experiencing any difficulties, contact Federal Signal Technical Support at 800-524-3021 or +1 708-534-4790 (International) or e-mail at techsupport@fedsig.com. For instruction manuals and information on related products, visit <http://www.fedsig.com>.



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