



FEDERAL SIGNAL G-SPK Global Series Loudspeaker Instruction Manual

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FEDERAL SIGNAL G-SPK Global Series Loudspeaker Instruction 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 to Installers and Users



WARNING

It is important to follow all instructions shipped with this product. This loudspeaker is to be installed by a trained electrician who is thoroughly familiar with and will follow all applicable national and local codes in the country of use.

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

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

- Read and understand all instructions before installing or operating this equipment.
- Brass inserts have the potential to store charge when they are not plugged. Consideration should be taken to prevent these from becoming a sparking hazard.
- Never alter the unit in any manner. Safety in hazardous locations may be endangered if additional openings or other alterations are made in units specifically designed for use in these locations.
- Do not connect this loudspeaker to the system when power/audio system is on.
- All effective warning speakers produce loud sounds, which may cause, in certain situations, permanent hearing loss. Take appropriate precautions such as hearing protection. The device should be installed far enough away from potential listeners to limit their exposure while still maintaining its effectiveness.
- After installation, ensure that all threaded joints are properly tightened.
- Keep the unit tightly closed when in operation.
- After testing is complete, provide a copy of this instruction sheet to all personnel.
- Establish a procedure to routinely check the loudspeaker system for proper activation and operation.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D; Class II, Division 2, Groups F and G; Class III or non-hazardous locations only.
- **WARNING: EXPLOSION HAZARD** — Do not disconnect the equipment unless power has been switched off or unless the area is known to be nonhazardous.
- **WARNING: EXPLOSION HAZARD** — Do not remove or replace the fuse when energized.


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

With respect to 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 not generally in contact with people.

The risk of ignition is low. In addition, maintenance, cleaning, and extreme environmental factors (ex. 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. Cleaning of the devices should only be done with a damp cloth.

Certification

- **Certificate Nos.:** ATEX Cert No.: Baseefa15ATEX0155X
IECEx Cert No.: IECEx BAS 15.0104X

ATEX coding:  II 2 G D

- **Protection:** Ex db IIB T5 Gb or Ex db e IIB T5 Gb
Ex tb IIIC T100°C Db IP66 (Tamb = -55°C to + 49°C)
Ex db IIC T4 Gb or Ex db e IIC T4 Gb
Ex tb IIIC T135°C Db IP66 (Tamb = -55°C to + 70°C)
- **Standards:** EN60079-0: 2012 +A11: 2013, EN60079-1: 2014,
EN60079-7: 2007, EN60079-31: 2014, IEC60079-0: 7th Ed.,
IEC 60079-1:6th Ed., IEC 60079-7: 4th Ed.,
IEC 60079-31:2nd Ed.

Specific Conditions of Use:

1. The Modular Audible Device enclosure incorporates a sinter and the volume is greater than 100 cm³, therefore use of the Modular Audible Device in carbon disulphide gas atmospheres is not permitted.
2. The Modular Audible Device has external non-metallic surfaces which may provide electrostatic charging hazard. See the manufacturer's instructions for further information.
3. The Modular Audible Device has metallic components in the non-metallic walls of the enclosure which can store electrical charge and therefore may provide a potential electrostatic discharge. The metallic brass inserts have a capacitance of 24 pF. See the manufacturer's instructions for further information.

cULus Zone Certifications:

This equipment is for use in Class I, Zone 1 and Zone 21 hazardous (classified) locations. It has been investigated with reference to risks to life and property and for conformity to the installation and use in provisions of Articles 505 and 506 of NFPA 70 (NEC).

These models use protections:

Class I, Zone 1, AEx db IIC T4 Gb or AEx db eb IIC T4 Gb
Zone 21, AEx tb IIIC T135°C Db IP66 (Tamb= -55°C to+70°C)
Ex db IIC T4 Gb or Ex db eb IIC T4 Gb
Ex tb IIIC T135°C Db IP66 (Tamb= -55°C to+70°C)

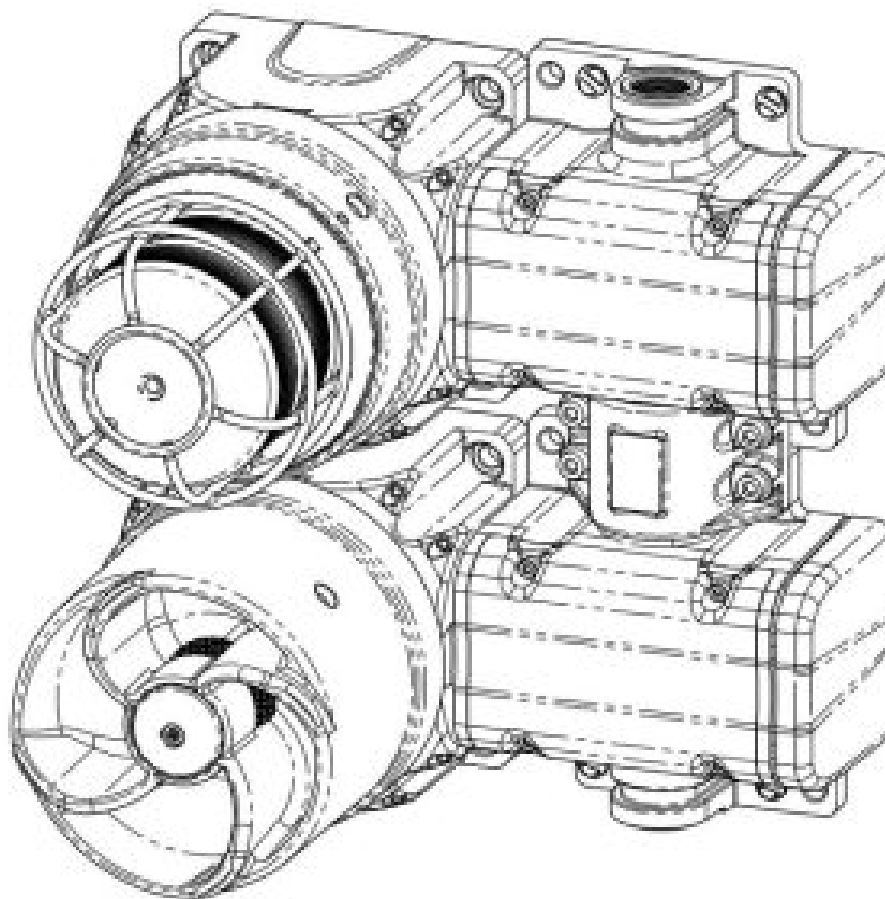
Unpacking the Loudspeaker

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

Creating Combination Fixtures in the Field

The Federal Signal Global Series Ex de products can be connected together in the field using interchangeable E-box end caps and a proprietary coupling system.

Figure 1: Beacon and loudspeaker combination fixture



The proprietary coupling system allows for simple and cost effective, wiring from product to product often eliminating the need for expensive Ex wiring practices and Ex rated glands. The E-box is available only when factory installed on an Ex d unit or when used as a E-box spacer adjoining an existing E-box. Please refer to the accessories listed on page 18 for available options. When creating certain fixture combinations, it is necessary to replace the end caps of E-box before mounting the product. If you are creating combination fixtures, refer to instruction manual 25500259 for specific instructions and details.

A note about combination fixtures: If the product is Ex db marked only, it is for use in gas atmospheres. If the product is Ex db e marked, it uses the increased safety terminal enclosures and is only for gas atmospheres. If the product is Ex tb marked, it is for installation in dust atmospheres.

Mounting the Loudspeaker



WARNING

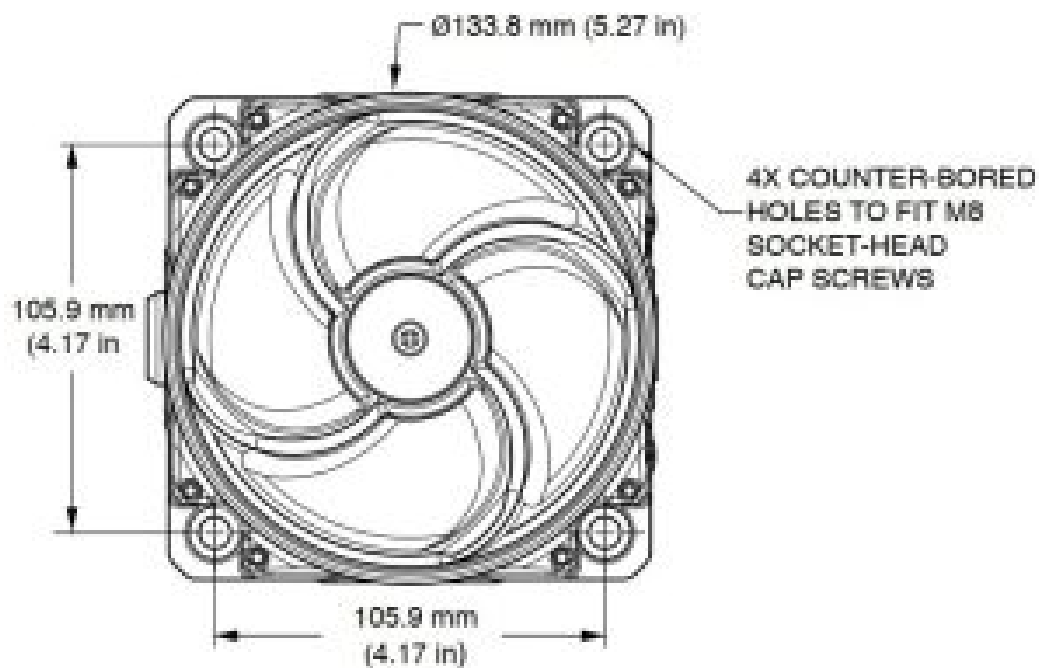
ATTACH THE LOUDSPEAKER SECURELY: To prevent injury, this apparatus must be securely attached to the mounting surface in accordance with the installation instructions. Use installer-supplied fasteners suitable for the mounting surface.

The mounting method and the installer-supplied mounting hardware depend on which of the two G-SPK models you are installing:

Mounting the Surface-Mount Ex d Loudspeaker

Mount the loudspeaker to a flat surface using the four 8.5 mm mounting holes. Use installer-supplied fasteners suitable for the surface to which the device will be mounted.

Figure 2: Front view of Ex d loudspeaker



Mounting the Ex de Surface-Mount Loudspeaker

Mount the loudspeaker to a flat surface using the six 8.5 mm mounting holes. Use installer-supplied fasteners suitable for the surface to which the device will be mounted.

Figure 3: Front view of Ex de surface-mount loudspeaker

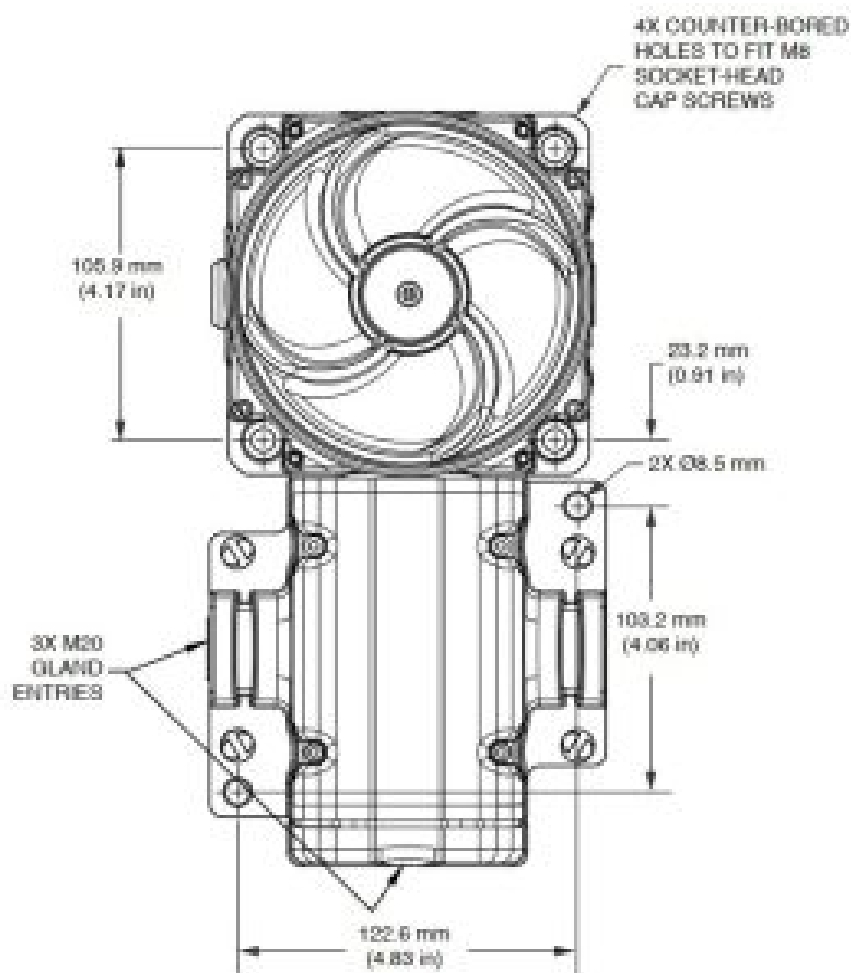
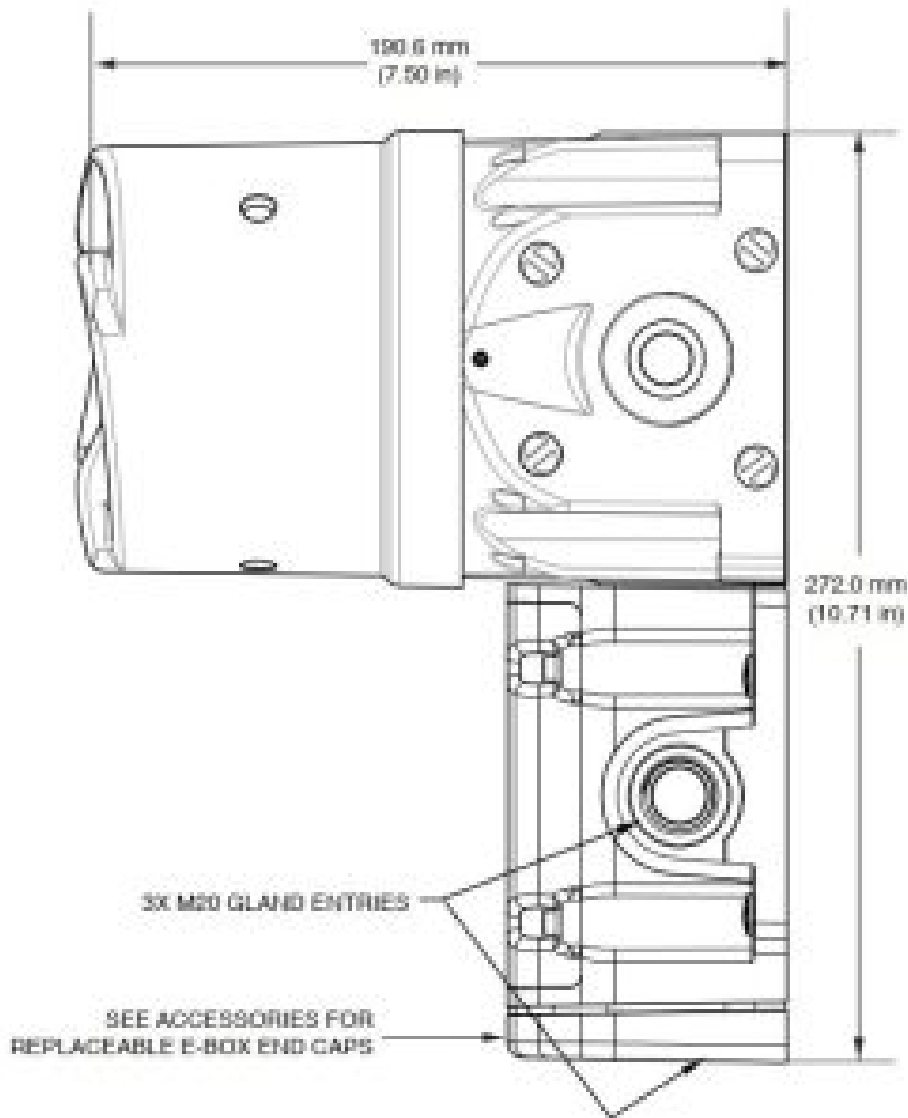


Figure 4: Side view of Ex de surface-mount loudspeaker



Safety Messages for Wiring

When installing and operating flame-proof electrical equipment, the relevant national regulations for installation and operation (e.g., EN60079-14, IEC Wiring Regulations and NEC/CEC) must be observed.

- Do not connect this loudspeaker to the system when power/audio system is on.
- To maintain the flame-proof integrity of the enclosure, DO NOT damage the cover or threads while disassembling or reassembling the unit.
- Painting and surface finishes, other than those applied by Federal Signal Corporation, are not permitted.
- Cable termination should be in accordance with specifications applying to the application. Federal Signal recommends that all cables and cores should be fully identified.
- Ensure that only the correct equipment-certified glands are used and that the assembly is shrouded and correctly earthed. Gland entries are M20-1.5 6H with an option for the M25 entry on the end of the increased safety box models. See Table 4 on page 20 for choosing correct cable entry devices for Equipment in Potentially Explosive Atmospheres.
- Because of space limitations, ensure the cable cores within the unit are not too slack.

- In all countries, the wiring must comply with all national and local codes and standards.
- Ensure that all nuts, bolts, and fixings are secure.

Preparing to Wire the Ex d Flameproof Models



SHOCK HAZARD: To avoid electrical shock hazards, do not connect wires when power is applied. Failure to observe this warning may lead to serious injury or death.

Ex d units are supplied with a ten position PCB mounted screw terminal block. This section has wiring instructions for the flameproof models G-SPK 70 V and 100 V.

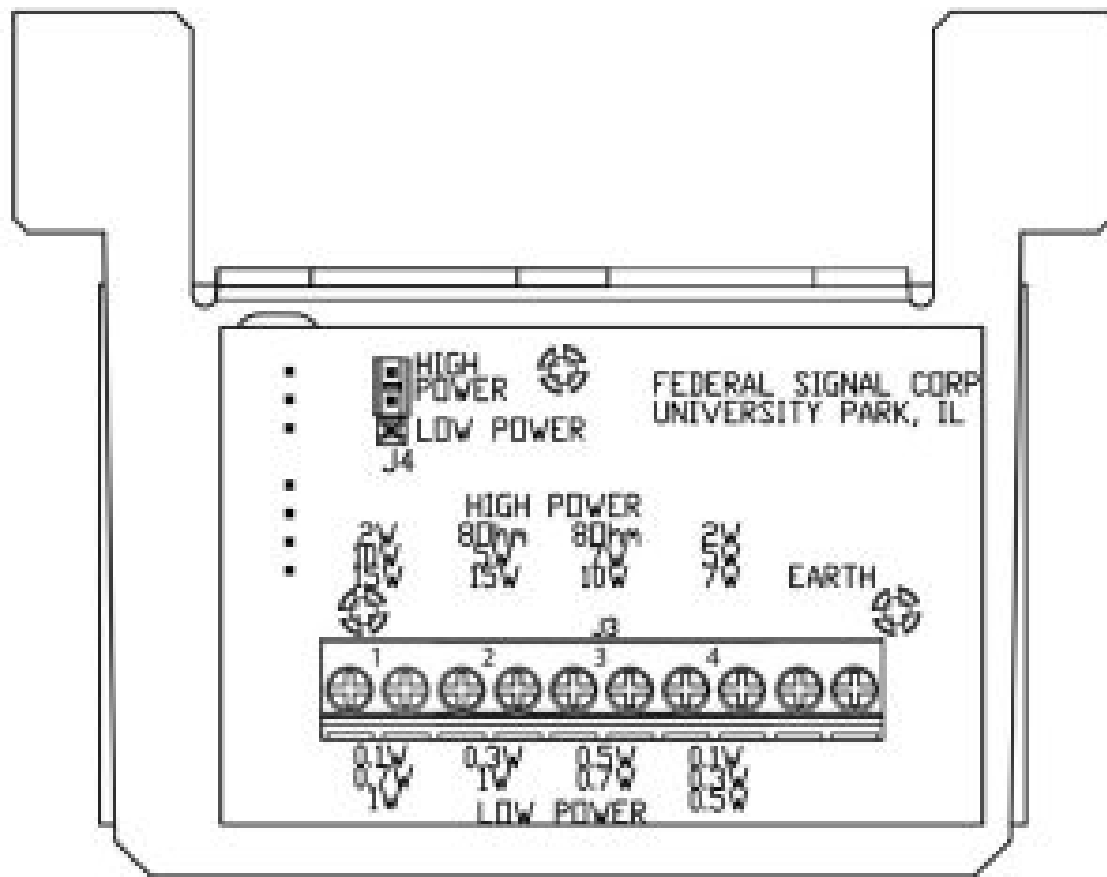
The maximum wire gauge is 4.0 mm² (12 AWG). The wire must be rated 85 °C or higher. Use only stranded cable to terminate the loudspeaker. The cross sectional area of the primary earth (ground) must equal the cross-sectional area of the phase conductor.

Cable termination for these models should be in accordance with specifications applying to the application. It is recommended that all cables and cores should be fully identified. Use the appropriate cable gland for the application. Gland entry threads are M20-1.5 x 6H.

Tools needed:

- 1.5 mm A/F hexagon key
- No. 1 Phillips screwdriver
- Wire stripper

Figure 5: Ex d in/out PCB connections



Wiring the Ex d Models

To wire the Ex d flameproof loudspeaker:

1. Unscrew the M3 hex set screw on the side of the housing one full turn.
2. Remove the cover from the housing by turning the cover counterclockwise. Three 120 degree spaced reliefs are provided for a 3/8 inch spanner wrench if needed. If the cover will not unscrew, back out the set screw a few additional turns.
3. Loosen the captive Phillips screw retaining the driver/printed circuit board (PCB).
4. Slide out the PCB until the terminals clear the housing. Strip the wire insulation 6.5 mm (.25"). Maximum screw tightening torque is 0.5Nm (4.5in-lb)
5. The Model G-SPK has five selectable wattage tap settings on the high power setting and five selectable wattage tap settings on the low power setting. See Table 1 for options and terminal block wiring connections. To choose either a high power or low power tap setting, set the PCB jumper J4 to either the HIGH POWER or LOW POWER position.

Each terminal block position has in/out connection points.

Table 1: Selectable wattage tap settings

Terminal 1	Terminal 2	Terminal 3	Terminal 4	J4 Setting	Watts
Audio +	Audio -			High	15 W
Audio +		Audio -		High	10 W
		Audio +	Audio -	High	7 W
	Audio +		Audio -	High	5 W
Audio +			Audio -	High	2 W
Audio +	Audio -			Low	1 W
Audio +		Audio -		Low	0.7 W
		Audio +	Audio -	Low	0.5 W
	Audio +		Audio -	Low	0.3 W
Audio +			Audio -	Low	0.1 W

*Connect the ground wire the terminal block position marked EARTH.

6. Insert the PCB into the enclosure and fully tighten the PCB captive screw.
7. Place the cover on the housing and tighten it by turning it clockwise.
8. To ensure O-ring compression, the cover must be fully seated against the housing when the threads are tightened. Turn the M3 set screw on the side of the housing until the screw contacts the housing.
9. Ensure that the unused wire entry is sealed with the provided brass M20-1.5 x 6 g stopping plug (equipment-certified).

Preparing to Wire the Ex de Increased Safety Models



WARNING

SHOCK HAZARD: To avoid electrical shock hazards, do not connect wires when power/ audio source is applied. Failure to observe this warning may lead to serious injury or death.

This section has wiring instructions for the increased safety models G-SPK 70 V and 100 V.

Ex de units are supplied with a six pole spring tension clamp style terminal block. The maximum wire gauge is 4.0 mm² (12 AWG). The wire must be rated 85 °C or higher. Use only stranded cable to terminate the loudspeaker. The cross-sectional area of the primary earth (ground) must equal the cross-sectional area of the phase conductor.

Cable termination should be in accordance with specifications applying to the application. It is recommended that all cables and cores should be fully identified. Use the appropriate cable gland for the application. Gland entry threads are M20-1.5 6H.

Conductive metalwork, including cable glands, must be a minimum of 5 mm away from the terminals.

Leads connected to the terminals shall be insulated for the appropriate voltage and this insulation shall extend to within 1 mm of the metal of the terminal throat.

The G-SPK terminal block is supplied with two conductors per pole. The terminal block allows for easy supply-in and loop-out wiring to connect the loudspeakers in series.

Tools needed:

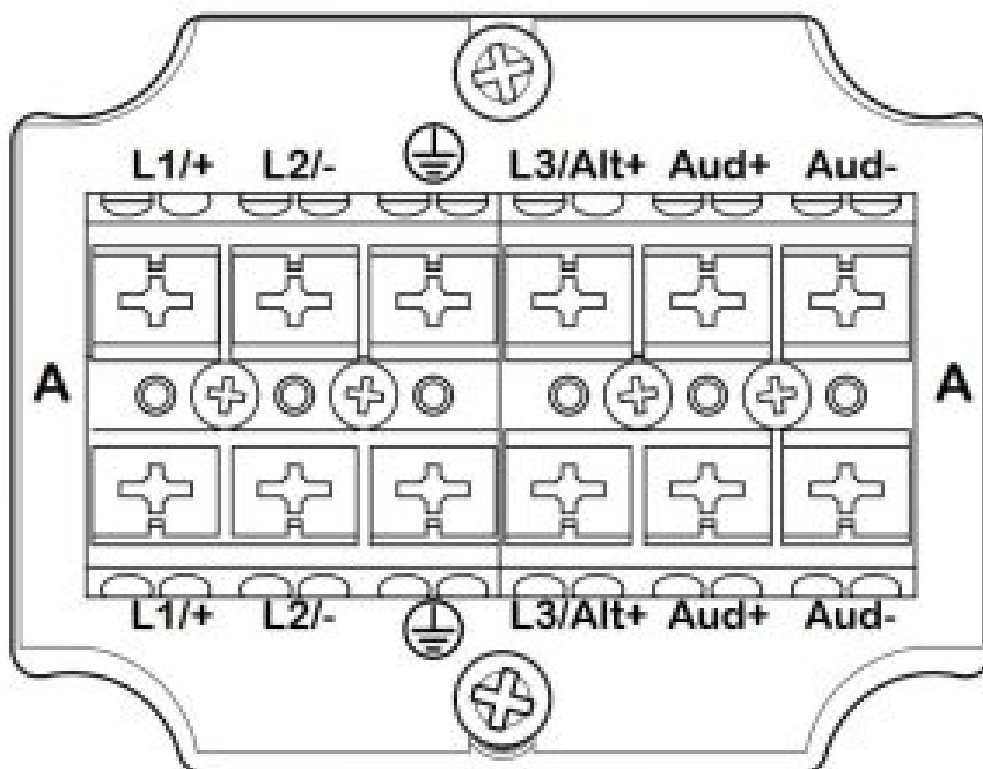
- 3.0 mm A/F hexagon key
- No. 1 Phillips screwdriver
- Wire stripper

Wiring the Ex de Models

To wire the Ex de models:

1. Unscrew the four M4 socket-head cap screws and remove the terminal box cover.
2. Strip the wire insulation 8 mm to 9 mm (0.33 in).
NOTE: When using more than one single or multiple strand lead, the connection into either side of any terminal must be joined in a suitable manner, e.g. two conductors into a single insulated crimped bootlace ferrule.
3. The loudspeaker is factory-wired as 15 W. To change the wattage tap setting it is necessary to modify the factory wiring on the printed circuit board located inside the main housing. Refer to “Wiring the Ex d Models” on page 14 for information on changing the tap settings. The line bushing is wired as follows: (1) Audio +, (2) Audio -, (3) Earth.
4. To connect wires, depress the push button on the terminal block with a Phillips screwdriver and insert the wire into the round opening. Release push button to make connection.
5. Connect the audio + wire from the audio source to the position marked Aud + on the terminal block.

Figure 6: Connections for DC or AC Ex de loudspeaker



6. Connect the audio – wire from the audio source to the position marked Aud- on the terminal block.

7. Connect the ground wire to the position marked  on the terminal block.
8. Secure the cover on the terminal box with the four M4 screws. Ensure that the gasket is properly seated to maintain IP rating. Do not over tighten the screws

Safety Messages to Maintenance Personnel



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

- Read and understand all instructions before operating this system.
- Repair of flamepaths is not recommended.
- If you acquired a significant quantity of units, it is recommended that spares are also made available.
- Any maintenance to the loudspeaker system must be performed by a trained electrician who is thoroughly familiar with all applicable national and local codes in the country of use.
- Any maintenance to the loudspeaker system must be done with power/ audio source turned off.
- Check the loudspeaker periodically that to ensure that the effectiveness of the device has not been reduced because it has been clogged with a foreign substance or because objects have been placed in front of it.
- Never alter the unit in any manner. Safety of the unit may be affected if additional openings or other alterations are made to the internal components or housing.
- The nameplate, which may contain cautionary or other information of importance to maintenance personnel, should NOT be obscured in any way. Ensure that the nameplate remains readable.
- After performing any maintenance, test the loudspeaker system to ensure that it is operating properly.

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

Maintaining the Loudspeaker



EXPLOSION HAZARD: To prevent ignition of hazardous atmosphere, disconnect the loudspeaker from the audio supply circuit before opening it. Do not open the loudspeaker in the presence of explosive gases in the atmosphere. Failure to follow this warning may result in serious injury or death.

During the working life of the loudspeaker, it should require little or no maintenance. The non-metallic housing will resist attack by most acids, alkalis, and chemicals and is as resistant to concentrated acids and alkalis as most metal products. However, if abnormal or unusual environment conditions occur due to plant damage or accident, etc., visual inspection of the loudspeaker is recommended.

Cleaning the Enclosure

The enclosure should be cleaned periodically with a damp cloth to maintain maximum sound output. Periodic checks should be made to ensure the effectiveness of this device has not been reduced because the loudspeaker

has become clogged with a foreign substance or because objects have been placed in front of the loudspeaker.

Lubricating the Threaded Joints

A silicone based, non-hardening, chemically compatible grease can be applied if required.

Ordering Replacement Parts and Accessories

Replacement parts and accessories are listed in Table 2 and 3.

Due to certification, certain component parts are not available for field replacement. Loudspeakers with this type of damage must be either replaced entirely or returned to Federal Signal for service. Refer to instruction manual 25500259 for accessory and replacement part assembly and operating instructions. To order, call Federal Signal Customer Support at 708-534-4756 or 877-289-3246.

Table 2: G-SPK Replacement Parts

Description	Part Number
70 Vrms, Loudspeaker Kit (Includes PCBAs, Bracket, Driver, & Mounting Screws)	K859501405-070
100 Vrms Loudspeaker Kit (Includes PCBAs, Bracket, Driver, & Mounting Screws)	K859501405-100

Table 3: Accessories

Description	Part Number
Indicator Ring/Legend Kit, Black	G-KIT-RP-BK
Indicator Ring/Legend Kit, Blue	G-KIT-RP-B
Indicator Ring/Legend Kit, Green	G-KIT-RP-G
Indicator Ring/Legend Kit, Magenta	G-KIT-RP-M
Indicator Ring/Legend Kit, Red	G-KIT-RP-R
Indicator Ring/Legend Kit, Yellow	G-KIT-RP-Y
E-Box Endcap with M20 Opening	K859500805-02
E-Box Endcap with M25 Opening	K859500805-01
E-Box Cover Assembly (Includes two terminal blocks, mounting plate, retention hardware)	K859501414
In-Line E-Box Coupler Kit	G-KIT-EC180

90-Degree E-Box Coupler Kit	G-KIT-EC90
Extension Box Spacer Kit	G-KIT-EXTB
Single Trunnion Kit	G-KIT-ST
Dual Trunnion Kit	G-KIT-DT
Adapter, M20 Male to 1/2" Female NPT	K231246A
Adapter, M20 Male to 3/4" Female NPT	K231247

Getting Repair Service or Technical Assistance

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

For instruction manuals and information on related products, visit: signaling.fedsig.com.

Returning the Product for Credit

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

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

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

All returns are subject to a re-stock fee.

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

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

Table 4: Choosing cable-entry devices for Equipment in Potentially Explosive Atmospheres

Models	Ex Atmospheres	Cable Entry Devices (cable glands, stopping plugs, etc.)
G-SPK-XXX-D (Ex db surface mount)	Gas	Cable entry devices shall be equipment certified as flameproof. To maintain the ingress protection of the flameproof loudspeaker enclosure, we recommend the cable entry device be IP66 certified.

G-SPK-XXX-E (Ex db e surface mount)	Gas	For the flameproof loudspeaker enclosure, cable entry devices shall be equipment certified as flameproof. To maintain the ingress protection of the flameproof loudspeaker enclosure we recommend the cable entry device be IP66 certified. For the increased safety terminal enclosures (terminal boxes), cable entry devices shall be equipment certified as increased safety and shall maintain an IP rating of IP54.
G-SPK-XXX-D (Ex db surface mount) G-SPK-XXX-E (Ex db e surface mount)	Dust	Cable entry devices for the and terminal enclosures shall be equipment certified as dust protected. To maintain the ingress protection of the loudspeaker and terminal enclosures the cable entry devices shall be IP6X certified.



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