

DSA1X™ Speaker

High-Powered Indoor/Outdoor Speaker
For use in hazardous locations



Description, Specifications, and Installation 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.

Planning

- If suitable warning equipment is not selected, the installation site for the DSA1X Speaker is not selected properly or the DSA1X Speaker is not installed properly, it may not produce the intended optimum audible warning. Follow Federal Emergency Management Agency (FEMA) recommendations.
- If DSA1X Speakers 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 activation.
- When DSA1X Speakers 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 DSA1X Speaker is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan placement, post warnings, and restrict access to areas near sirens.
- Activating the DSA1X Speaker 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.

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. This DSA1X Speaker should be considered a part of the warning system and not the entire warning system.

The selection of the mounting location for this DSA1X Speaker, 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:

- 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

Safety Messages

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.

- Read and understand all instructions before installing, operating, or servicing this equipment.
- This product shall be mounted at the minimum hearing distance of ten feet in accordance with FEMA guidelines limiting sound level exposure to 123 dBc maximum sound level.
- All effective warning sounds may, in certain circumstances, cause permanent hearing loss. Take appropriate precautions such as wearing hearing protection. Maximum sound level exposure limits specified in OSHA 29 CFR 1910 should not be exceeded.
- These devices are intended for permanent installation and operation in accordance with Title 46, Code of Federal Regulations, Parts 110–113, or Title 33, Code of Federal Regulations, Part 183, Sub-part I, Section 183.410, and the applicable requirements of the American Boat and Yacht Council, Inc., and/or ANSI/NFPA 302, “Fire Protection Standard for Pleasure and Commercial Motor Craft.”
- For optimum sound distribution do not install this speaker where objects would block any portion of the front of the DSA1X Speaker.
- Do not paint the DSA1X Speaker. No finish or coating is required. Paint may obstruct the sound output, reducing the effectiveness of the horn.
- 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 initial system test, provide a copy of these instructions to all personnel responsible for 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.
- 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 nonhazardous locations only.
- Substitution of any components may impair suitability for Division 2.

⚠ WARNING

EXPLOSION HAZARD: Do not disconnect the equipment unless power has been switched off or unless the area is known to be non-hazardous.

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 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 DSA1X Speaker.
- 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 DSA1X Speaker before using after repairs have been made.

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

General Description

Introduction

The DSA1X Speaker is a 100-watt non-amplified speaker that can be powered from Federal Signal UltraVoice controllers or any 25 or 70 V amplifier system and can be used in hazardous locations. Use the DSA1X as a warning and alert device with audible signals (tone or voice).

The DSA1X is an addition to the DSA family, and can be combined with the DSA2, DSA4, and DSA6 for flexible mass notification designs. The DSA1X includes stainless steel mounting hardware for wall or ceiling mount. Optional mounting brackets include large or small mounts and a unique omnidirectional mounting bracket. The DSA1X enclosure has multiple access points to allow installation of strobes, sensors, or lights.

The DSA1X Speaker is an ideal solution for existing notification systems where lack of coverage exists, but the coverage area does not require the higher power levels of the larger DSA Speakers.

The DSA1X is designed for outdoor use and large indoor structures. All wiring interfaces are accessible through internal connectors and built-in NPT entrances for quick and easy installation. If the NEC or Local electrical codes allow for using a cable gland, the gland must be Listed. The DSA1X has $\frac{3}{4}$ inch and $\frac{1}{2}$ inch NPT entry sizes.

The DSA1X comes with an adjustable stainless-steel wall mount bracket that allows the angle of the speaker to be adjusted. Optional pole mount brackets are available for small and large diameter poles.

Features

The DSA1X has the following features:

- Indoor or Outdoor 100-watt tappable speaker with high powered voice and tone
- 25 V_{rms} and 70 V_{rms} audio input taps
- Speaker rated at 120 dBa for tones and 114.5 dBa for voice at 10 feet (at 100 W)
- 100 W, 55 W, 32 W, and 18 W output taps (See Table 2 for specifications.)
- Wall or pole mount available, wall mount standard
- NEMA 4X outdoor rated
- Multiple access points for mounting of optional equipment
- 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.

The following is a picture of the DSA1X Speaker with standard wall-mount bracket.

Figure 1 Front and Back of DSA1X Speaker



Specifications

Table 1 Electrical

Operating Voltage	25 V _{rms} or 70 V _{rms}
Wire size for connectors	12 to 18 AWG
Wiring Entries	Three, 3/4-inch NPT and one, 1/2-inch NPT

Table 2 Sound Power Level (SPL)

Audio Frequency response	500 Hz to 4000 Hz
Power Tap	SPL (dBC) at 10 feet tone/voice
100 W	119 dBa/114.5 dBa
55 W	117 dBa/111.5 dBa
32 W	114 dBa/108.5 dBa
18 W	111 dBa/105.5 dBa

Table 3 Environmental and Physical

Operating temperature range	-40°F to +150°F / -40°C to +66°C
Humidity range	0-95%, non-condensing
Size	7 in height, 9 in width, 10 in length 178 mm x 229 mm x 254 mm
Weight	15.6 lb/7.08 kg

Table 4 Hazardous Location Ratings

T-CODE AT 66°C	
CLASS I, DIV 2, GRPS A,B,C,D	T4A
CLASS II, DIV 2, GRPS F,G	T4A
CLASS III	T4A

Installation

⚠ WARNING

Read and adhere to all safety warnings in this manual before installing the DSA1X Speaker.

⚠ 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 DSA1X can be mounted on any relatively flat surface with the supplied mounting brackets. The mounting surface must be capable of supporting the weight of the speaker. 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 nonhazardous locations only.

Wall Mounting

The DSA1X Speaker comes standard with a bracket for vertical wall or pole mount with optional pole accessories. The standard mount can be flipped to allow ceiling mount.

To wall mount the DSA1X Speaker, do the following:

1. Find suitable location to mount speaker. Use industry or company preferred practices when mounting hardware to structures.
2. Verify the mounting is adequate to hold the weight of speaker, cables and visual devices, if equipped.
3. Refer to Figure 3 or use the U-shaped wall bracket as a template to scribe the mounting hole locations.
4. Mount the DSA1X Speaker to the mounting surface with user-supplied hardware. Federal Signal recommends 3/8 in fasteners.
5. Loosen the pivot bolts to provide the direction of the speaker.

Attaching the Mounting Brackets to the Speaker Housing

Do the following to attach the brackets:

1. The mounting brackets are attached to the speaker as shown below using the six supplied 1/4-20 x 5/8 in screws.

Note the orientation of the curved slots on the L-shaped brackets, this orientation is important to allow the speaker to be pivoted downward.

2. Tighten the 1/4-20 x 5/8 in screws to approximately 80 in-lb.

- Attach the U-shaped wall bracket with four supplied sets of 3/8-16 x 1 in bolts, flat washers, lock washers, and nuts.

Figure 2 Bracket attached to speaker

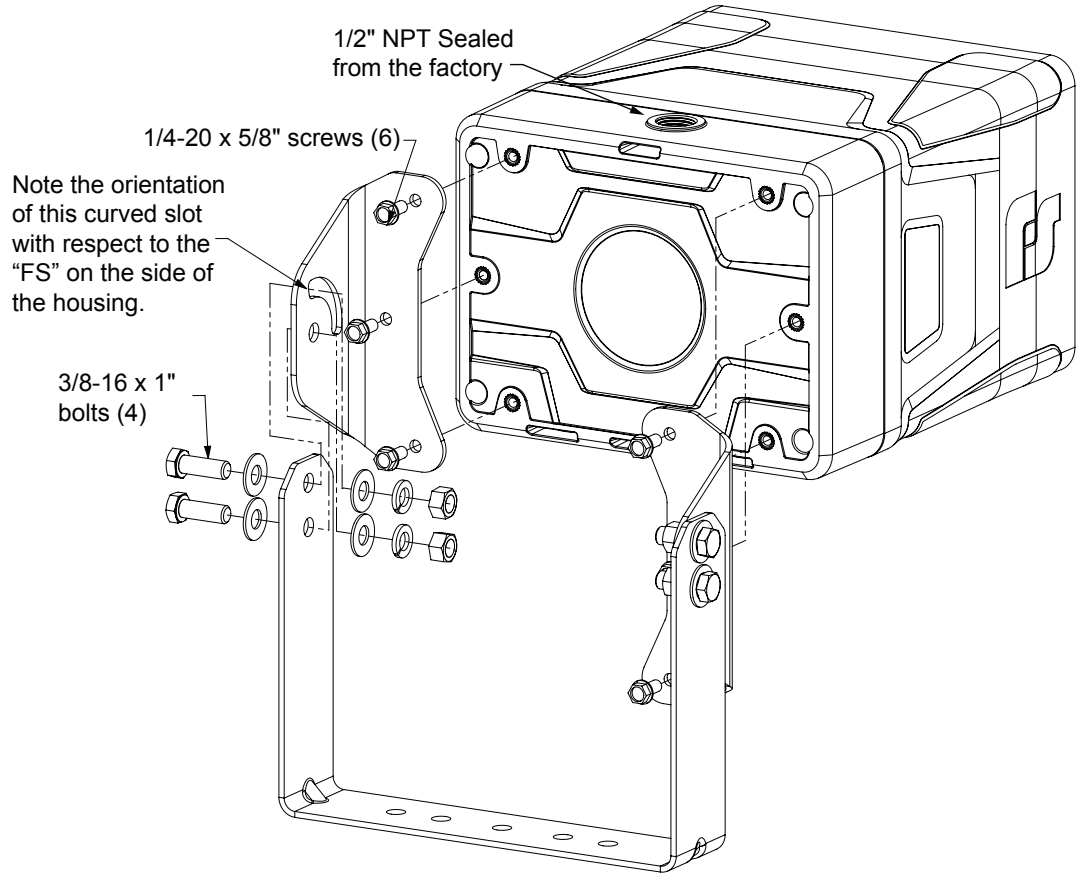


Figure 3 Width and height of bracket

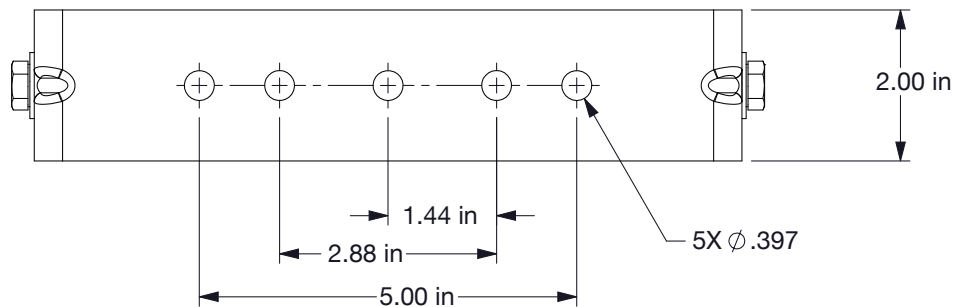


Figure 4 Depth and height with bracket

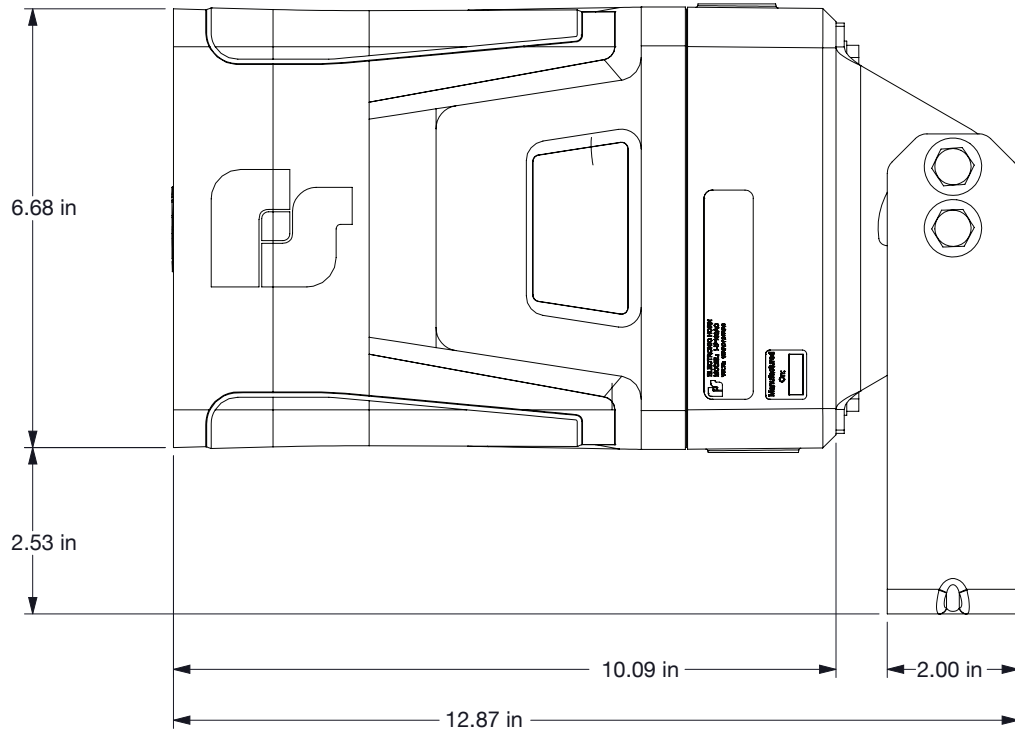


Figure 5 Top view of speaker

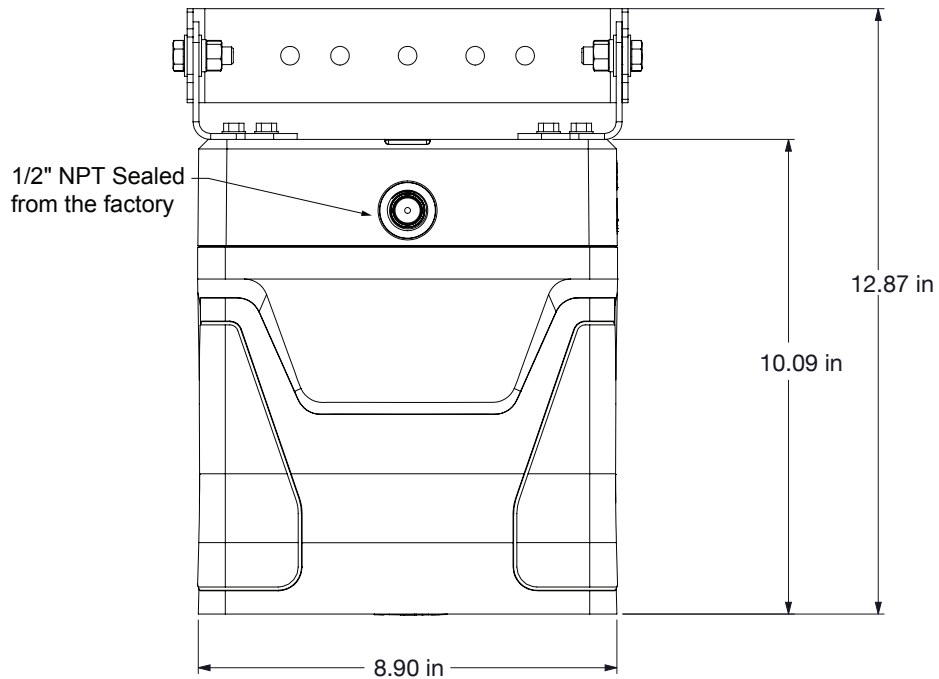
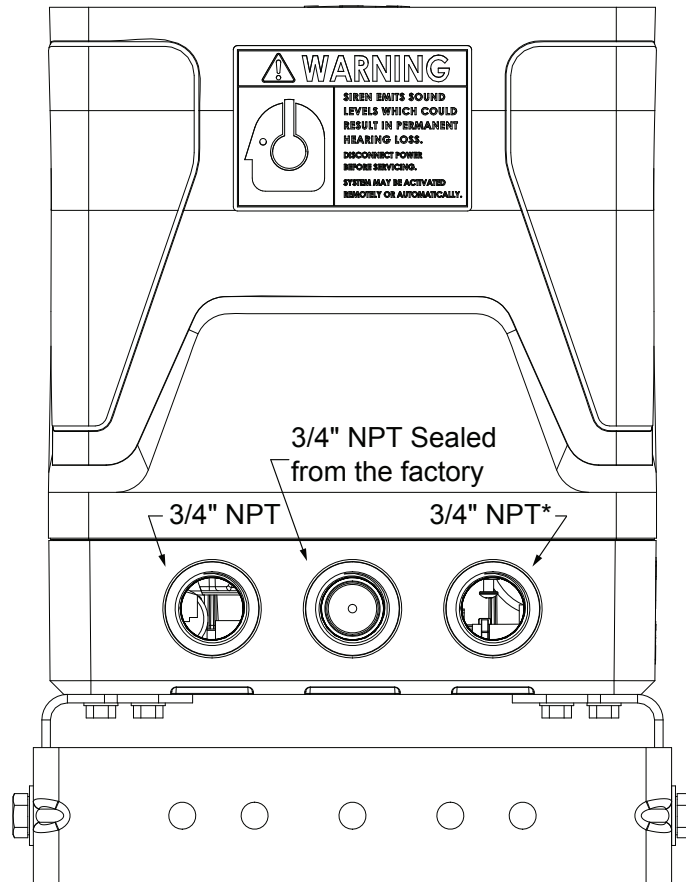
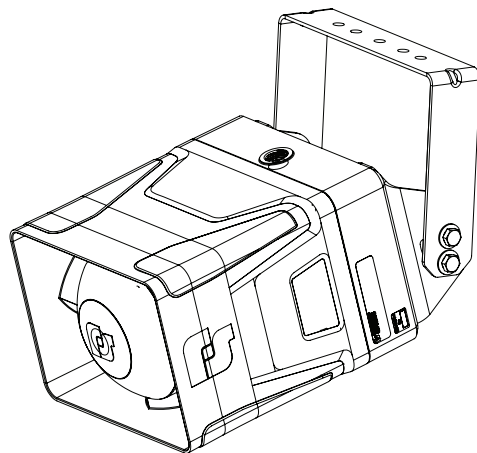


Figure 6 Bottom view of speaker



*DSA1X Speaker includes a Threaded Plug kit.

Figure 7 Ceiling mount



Pole Mounting

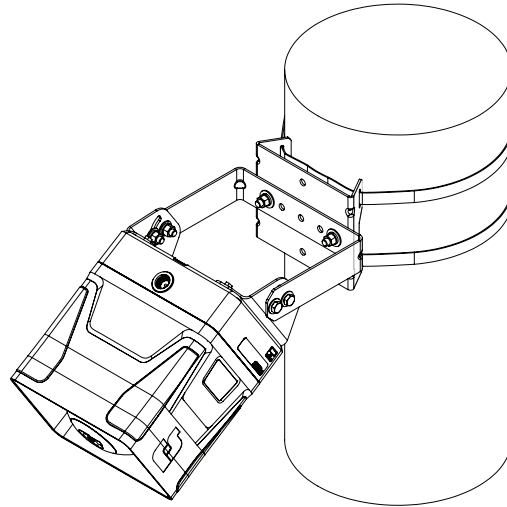
The DSA1X comes standard with a bracket for vertical wall or ceiling mount. The optional I-IP100-PMW kit or I-IP100-PM kit is required for pole mounting.

Large Pole Mounting (6 in diameter or larger)

Use the following procedure if mounting the speaker with the optional I-IP100-PMW bracket:

1. Find suitable location to mount speaker. Use industry or company preferred practices when mounting hardware to poles or other structures.
2. Attach the I-IP100-PMW bracket to the pole using banding or use the pre-drilled holes to bolt the bracket to the pole or structure.
3. Using the supplied flat washers, lock washers, and 3/8 in nuts, mount the speaker to the I-IP100-PMW bracket as shown in Figure 2.
4. Use the side pivot bolts to allow adjustment of the speaker up and down to optimize speaker effectiveness.

Figure 8 Bracket I-IP100-PMW

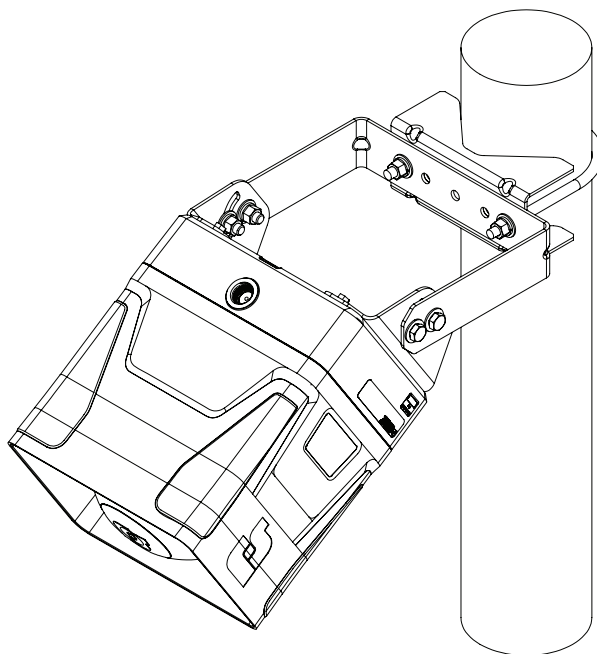
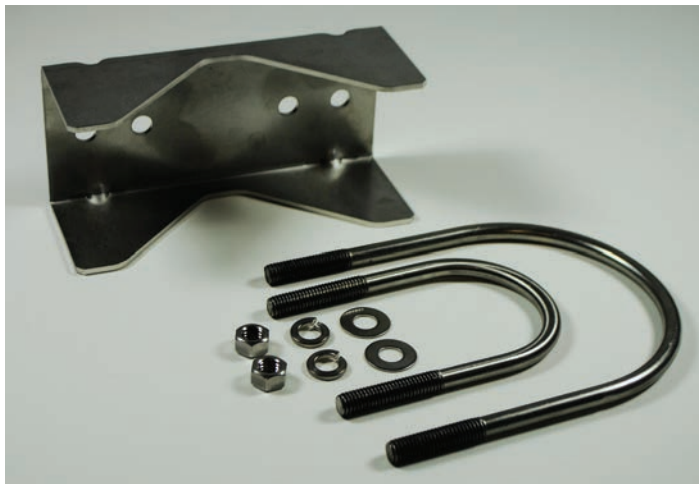


Small Pole Mounting (2-3/8 in or 4-1/2 in diameter poles)

Use the following procedure if mounting the speaker with the optional I-IP100-PM bracket:

1. Find suitable location to mount speaker. Use industry or company preferred practices when mounting hardware to poles or other structures.
2. Remove the speaker U shaped bracket, store the pivot/lock bolts.
3. Select the proper I-IP100-PM U-bolt for the pole.
4. Attach the U-shaped bracket from the speaker to the pole using the I-IP100-PM U-bolt, bracket, nuts and washers.
5. Attach the speaker and set direction using the pivot and lock bolts.

Figure 9 Bracket I-IP100-PM

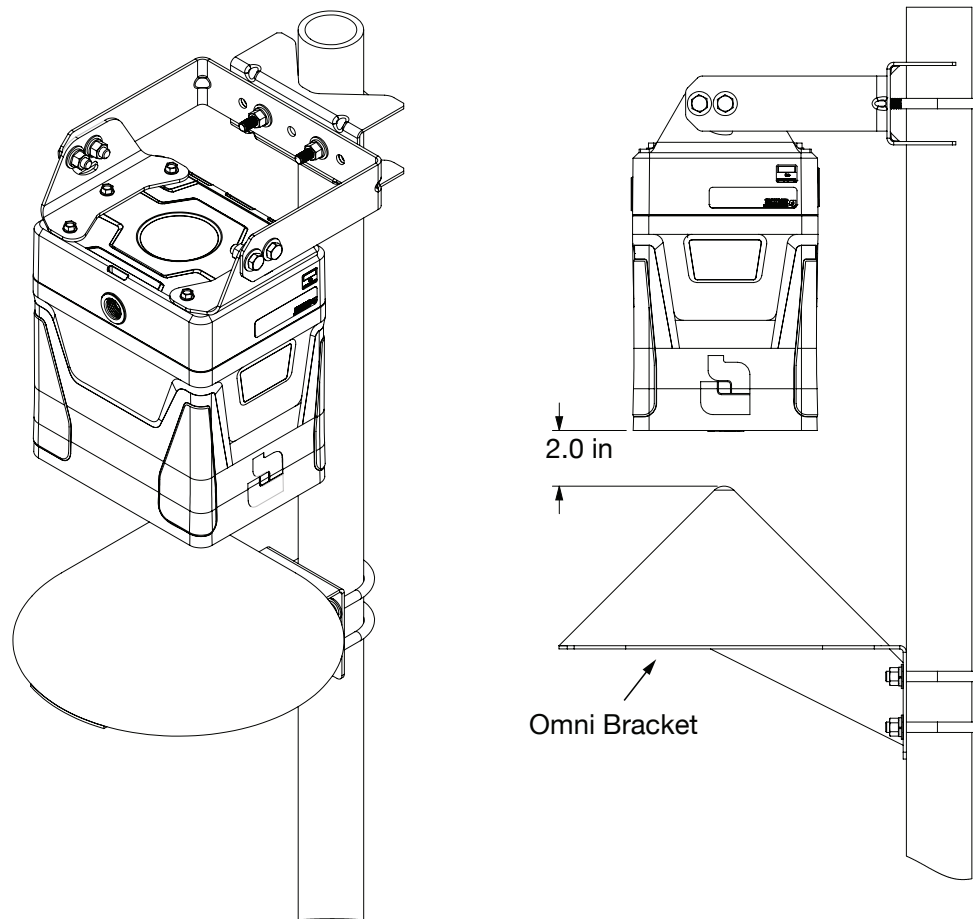


Mounting with Omni Direction Bracket (2-3/8 in diameter pole)

Use the optional I-IP100-OMNI bracket to create an omni-directional speaker. The speaker is mounted as described in the Small Pole Mount section with the omni bracket mounted at a distance of 2.0 inches from the speaker.

1. Identify location for bracket.
2. Attach bracket using supplied U-bolts and hardware.

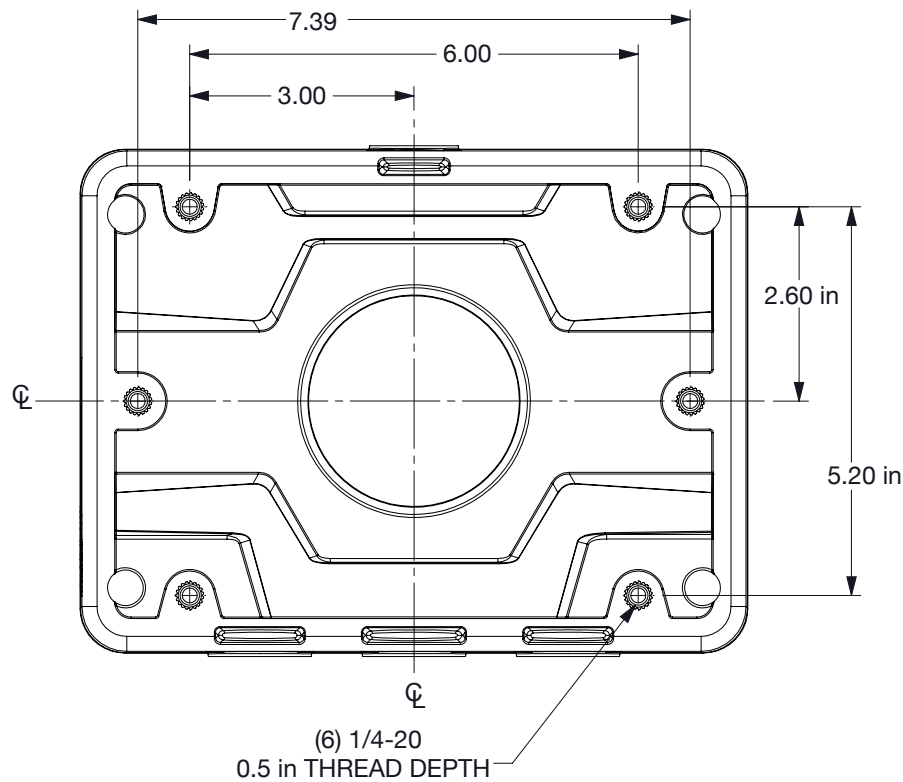
Figure 10 Bracket I-IP100-OMNI



Mounting without Bracket

You can mount the speaker directly to the mounting surface without the bracket. Use installer-supplied 1/4-20 fasteners that are suitable for the mounting surface. Use Figure 10 for the hole center dimensions.

Figure 11 Surface mount hole center dimensions



Opening the Housing

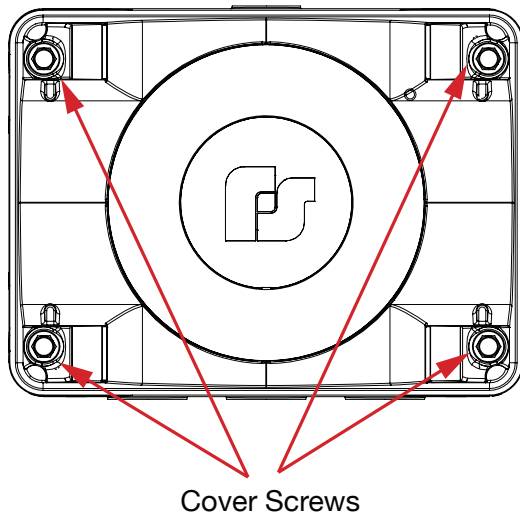
Tools required:

3/8 in socket

6 in extension

To open the housing, loosen the four cover screws while supporting the housing so it does not fall. (The cover screws are retained in the housing.) The front of the unit is heavy, but it is attached to the rear housing with a pivot hinge to allow ease of service. If the unit requires service, replace the front housing, amplifier, and power supply (if equipped) as an entire unit.

Figure 12 Opening the speaker

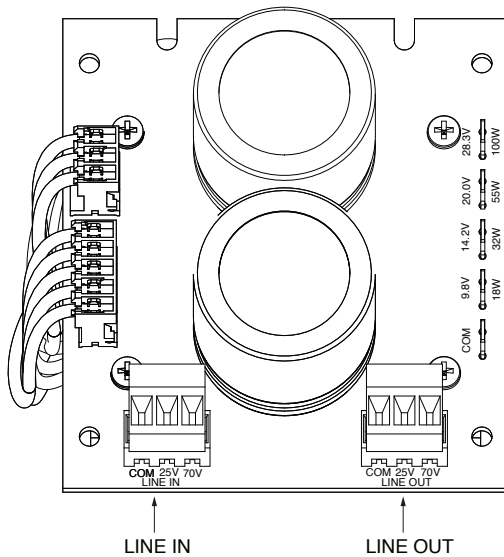


Wiring the Speaker

To wire the speaker:

1. Open the speaker.
2. Route the leads from the audio amplifier to the terminal marked LINE IN. Use Common and 25 V or Common and 70 V.
3. Use the LINE OUT terminals to connect to an additional speaker or an end-of-line resistor, if required. Speakers in close proximity must be connected in phase.

Figure 13 Wiring the Speaker Drawing



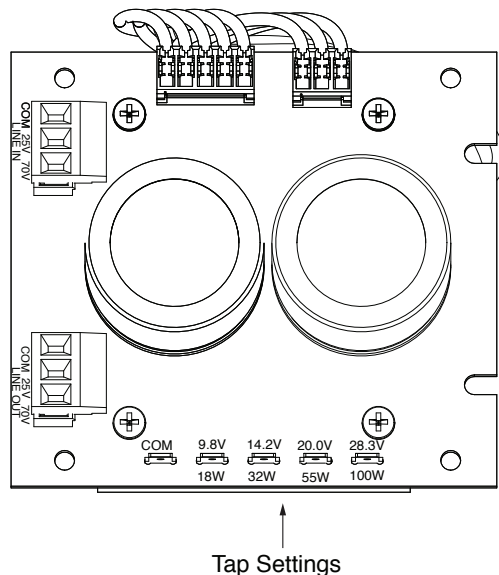
Tapping the Speaker

The DSA1X can be tapped for lower power levels.

To tap the speaker:

1. Open the speaker.
2. Use the quick connect connectors to tap to the desired power level. Leave one quick connect connected to COM and connect the speaker lead to one of the following taps: 18 W, 32 W, 55 W, or 100 W.

Figure 14 Tapping the Speaker Drawing



Closing the Housing

To close the housing, do the following:

1. Verify that the cover gasket is in the groove around the perimeter of the rear cover.
2. If the front of the unit was removed, lift the front of the DSA1X to allow the hinge pin to be installed, align the front unit with the rear cover and attach the hinge pin with retaining clip.
3. Verify that the wires are not strained and are not impeding ability to close unit.
4. Lift front of unit and seat the front cover against the rear enclosure.
5. Tighten the cover screws hand tight, and then torque them in alternate pattern to 60 in-lb +/- 10 in-lb.

Getting 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@fedsig.com. For instruction manuals and information on related products, visit: <http://www.fedsig.com/>



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