



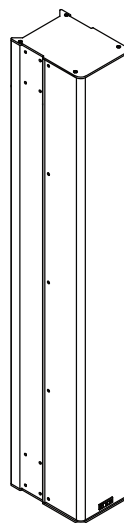
OPERATING INSTRUCTIONS

MECHANICALLY STEERABLE LINE ARRAY SPEAKER SYSTEM

SR-MF1B
SR-MF1W
SR-ML1B
SR-ML1W



SR-MF1B
SR-MF1W



SR-ML1B
SR-ML1W

Thank you for purchasing TOA's Mechanically Steerable Line Array Speaker System.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

TABLE OF CONTENTS

- 1. SAFETY PRECAUTIONS** 3
- 2. GENERAL DESCRIPTION** 5
- 3. FEATURES** 5
- 4. ANGLE ADJUSTMENT** 6
- 5. COVERAGE AREA** 7
- 6. AMPLIFIER CONFIGURATIONS** 8
- 7. JOINING SPEAKERS** 10
- 8. INSTALLATIONS**
 - 8.1. Wall mounting (using the SR-WB1(B/W)) 12
 - 8.2. Mounting dimensions of bracket bases 13
 - 8.3. Wall mounting (using the SR-PB1(B/W)) 14
 - 8.4. Ceiling-suspended mounting (using the SR-HB1(B/W)) 15
- 9. DIGITAL PROCESSOR FILTERING**
 - 9.1. Single-Amplifier Drive with 1 SR-MF1(B/W) and 1 SR-ML1(B/W) 16
 - 9.2. Single-Amplifier Drive with 1 SR-MF1(B/W) and 2 SR-ML1(B/W)s 16
 - 9.3. Bi-Amplifier Drive with 1 SR-MF1(B/W) and 1 SR-ML1(B/W) 16
 - 9.4. Bi-Amplifier Drive with 1 SR-MF1(B/W) and 2 SR-ML1(B/W)s 16
- 10. DIMENSIONAL DIAGRAM**
 - 10.1. SR-MF1(B/W) 17
 - 10.2. SR-ML1(B/W) 17
- 11. SPECIFICATIONS** 18

1. SAFETY PRECAUTIONS

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety hazards.



WARNING

Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

When Installing the Unit

- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down and causing personal injury and/or property damage.
- Since the unit is designed for in-door use, do not install it outdoors. If installed outdoors, the aging of parts causes the unit to fall off, resulting in personal injury. Also, when it gets wet with rain, there is a danger of electric shock.
- Refer all installation work to the dealer from whom the speaker was purchased. Installation requires extensive technical knowledge and experience. The speaker may fall off if incorrectly installed, resulting in possible personal injury.
- Flying Precautions
Be sure to follow the instructions below. Otherwise, the suspension wires or belts may be off or snap and the speaker may fall off, causing personal injury.
 - Check to confirm that the suspension wires and belts are strong enough to withstand the speaker load.
 - The connectors of the suspension wires and belts must be securely linked with those of the speaker.
 - All parts and components (such as enclosures, metal pieces, and screws) must be free from any deformation, crack, and corrosion.
 - Be sure to use screws supplied with the optional flying hardware when installing the speaker using such hardware.
- Install the unit only in a location that can structurally support the weight of the unit and the mounting bracket. Doing otherwise may result in the unit falling down and causing personal injury and/or property damage.
- Owing to the unit's size and weight, be sure that at least two persons are available to install the unit. Failure to do so could result in personal injury.
- Do not use other methods than specified to install the speaker. Extreme force is applied to the unit and the unit could fall off, possibly resulting in personal injuries.
- Use nuts and bolts that are appropriate for the ceiling's or wall's structure and composition. Failure to do so may cause the speaker to fall, resulting in material damage and possible personal injury.
- Tighten each nut and bolt securely. Ensure that the bracket has no loose joints after installation to prevent accidents that could result in personal injury.
- Use the specified mounting bracket in combination. Doing otherwise may cause the unit or component to fall off, resulting in personal injury.
- Do not mount the unit in locations exposed to constant vibration. The mounting bracket can be damaged by excessive vibration, potentially causing the unit to fall, which could result in personal injury.



CAUTION

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

When Installing the Unit

- Avoid placing the unit in a doorway or other high traffic area as people may trip on the equipment and cords, or be injured by falling objects.
- Avoid touching the unit's sharp metal edge to prevent injury.
- When installing the speaker, be sure to handle it with two or more persons. Falling or dropping the unit may cause personal injury and/or property damage.

When the Unit is in Use

- Do not operate the unit for an extended period of time with the sound distorting. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.
- Do not stand or sit on, nor hang down from the unit as this may cause it to fall down or drop, resulting in personal injury and/or property damage.
- Have the unit checked periodically by the shop from where it was purchased. Failure to do so may result in corrosion or damage to the unit or its mounting bracket that could cause the unit to fall, possibly causing personal injury.

2. GENERAL DESCRIPTION

The Mechanically Steerable Line Array Speaker System consists of the SR-MF1(B/W) [Mechanically Steerable Array Speaker] and the SR-ML1(B/W) [Low Frequency Expand Speaker]. A single SR-MF1(B/W) or combination systems with SR-ML1(B/W) can be used. The key feature is that the tilt and dispersion angles of the SR-MF1(B/W) are mechanically and manually adjustable. This provides a valuable solution for the spaces where the speakers need to aim at downward seating/audience areas while they are mounted perpendicularly to the wall.

3. FEATURES

- The SR-MF1(B/W) mounts the angle adjustment component with eight 2" drivers on its cabinet, which allows manual adjustment of the tilt angle from 0° or -3°, and the dispersion angle from 10°, 15°, 20°, 25°, or 30°.
- Adding the SR-ML1(B/W) equipped with four 3.5" drivers to the system, achieves a more powerful low-frequency sound.
- Multiple system configurations can be established with the SR-MF1(B/W) as a full-range speaker and the SR-ML1(B/W) as an expansion low frequency speaker; from a single SR-MF1(B/W), to the combination of 1 SR-MF1(B/W) and 2 SR-ML1(B/W)s.
- Since the linear sound source effect prevents acoustical energy from attenuating even at longer distances, the line array speaker provides advantages compared with normal types of speakers in its ability to project sound long distances. The difference in sound volume between the distance from the speaker provides a more uniform sound field.
- Since the speaker's vertical sound dispersion is focused, sound is only directed at the target area. The line array speaker (when correctly positioned) is not influenced by sound reflection from ceiling or floor surfaces, and can provide clear sounds even in spaces affected by long reverberation, or other poor acoustic conditions.
- If the attenuation of sound pressure is low even far away from the speaker, the volume is not excessively loud in the area near the speaker. This helps suppress feedback (improving microphone amplification gain).
- A variety of optional mounting brackets are available for several applications.

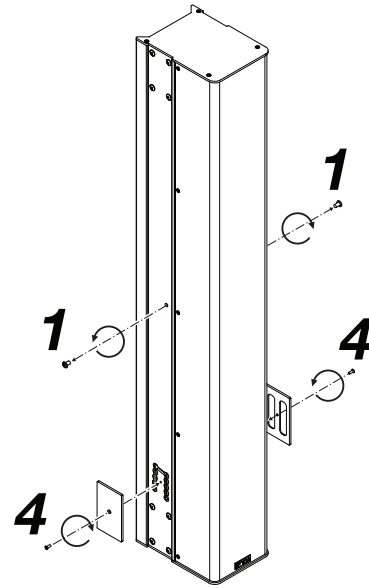
4. ANGLE ADJUSTMENT

Shifting the angle adjustment bolts mounted on both side of SR-MF1(B/W) allows adjusting its tilt and dispersion angle by multiple steps.

[Adjustment Procedure]

- Step 1.** Remove the hex head bolts on both side of the cabinet for releasing the angle adjustment component.
The removed screws are used only when shipping.
- Step 2.** Loosen the hex head bolts mounted on the adjustment component with a hex wrench, and shift them into the desired position.
- Step 3.** Replace the hex head bolts with the supplied smaller-head bolts one by one and tighten them.
- Step 4.** Attach the cover plates on with the supplied screws.

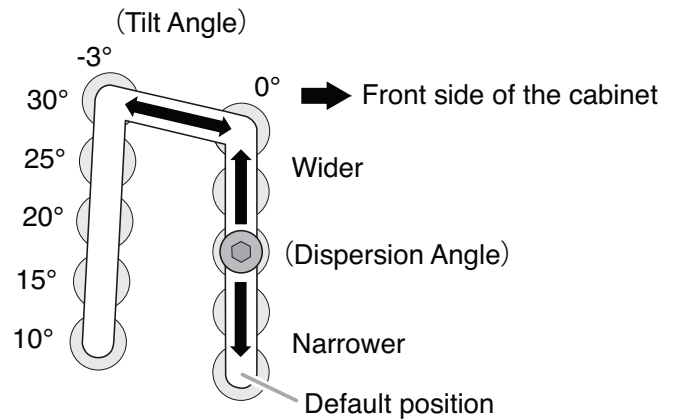
Note: When shipping the SR-MF1(B/W), the original hex head bolts must be attached while the angle adjustment bolts being set at the default position for protecting the component.



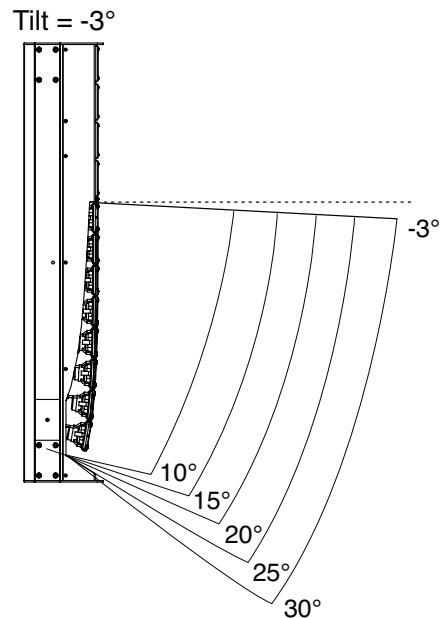
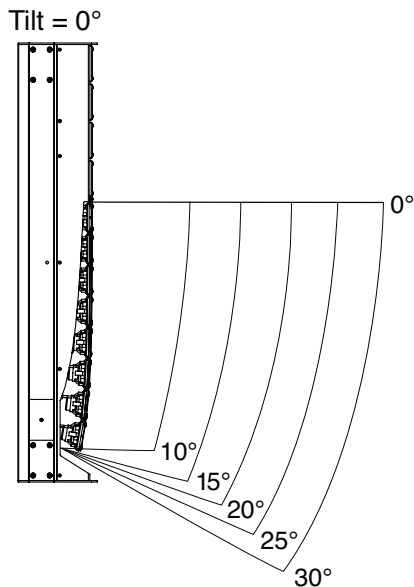
[Adjustment Patterns]

Adjustment component allows selecting the tilt angle from 2 steps and dispersion angle by 5 steps.

• Bolt positions and angles



[Coverage images]



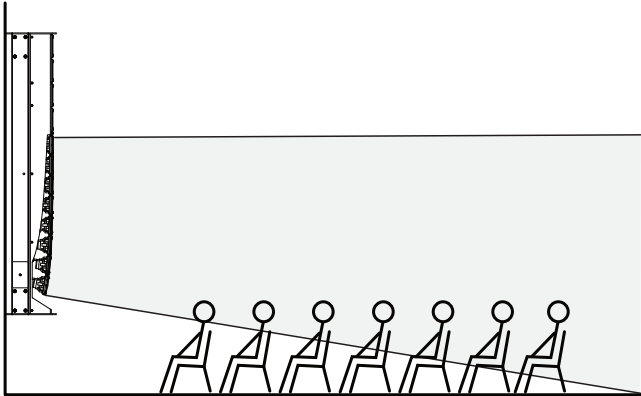
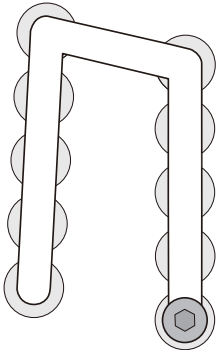
5. COVERAGE AREA

The line array speaker radiates a sound only within a limited range. Since sound is reduced in areas that are outside the range, take care that the listening area is sufficiently covered when installing the speaker.

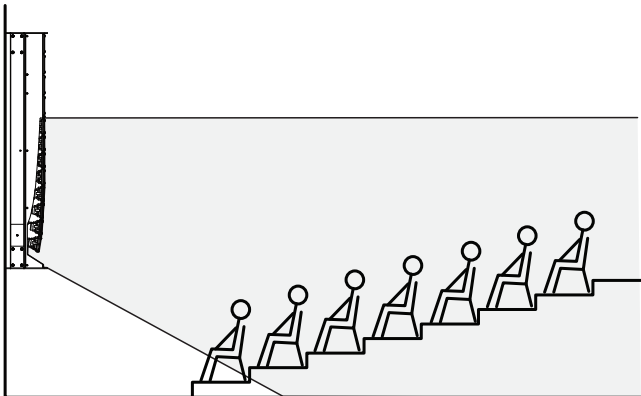
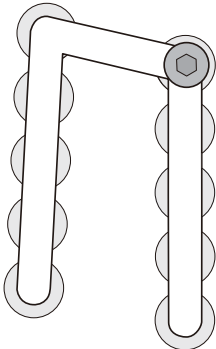
• Installation example

Coverage of 2”(5cm) drivers

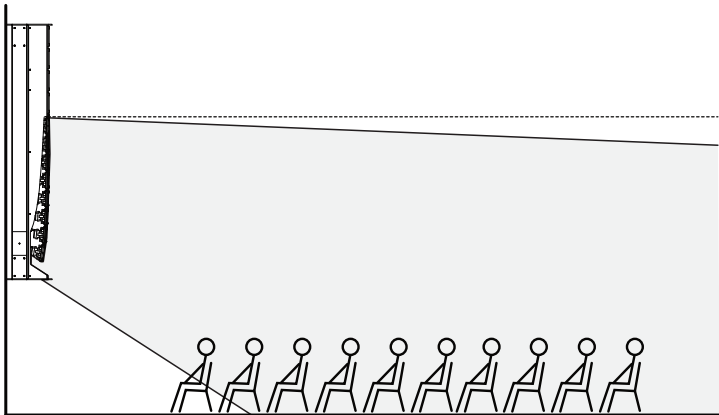
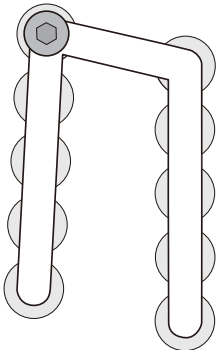
Tilt: 0°
Dispersion: 10°
Bolt position:



Tilt: 0°
Dispersion: 30°
Bolt position:



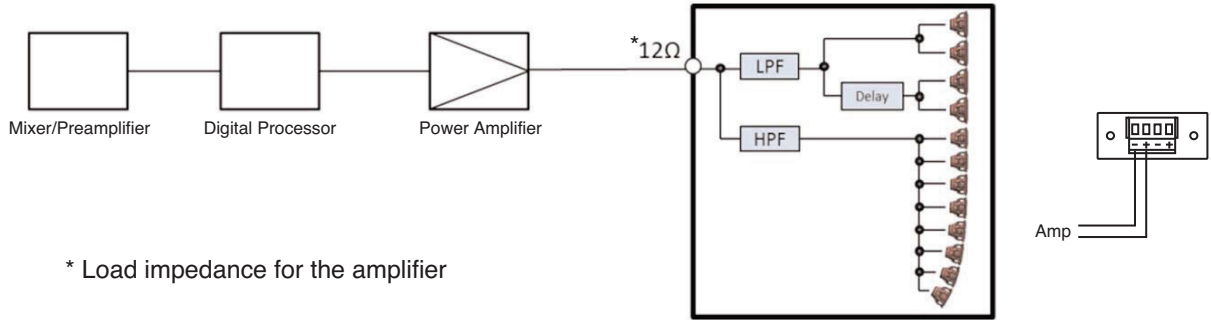
Tilt: -3°
Dispersion: 30°
Bolt position:



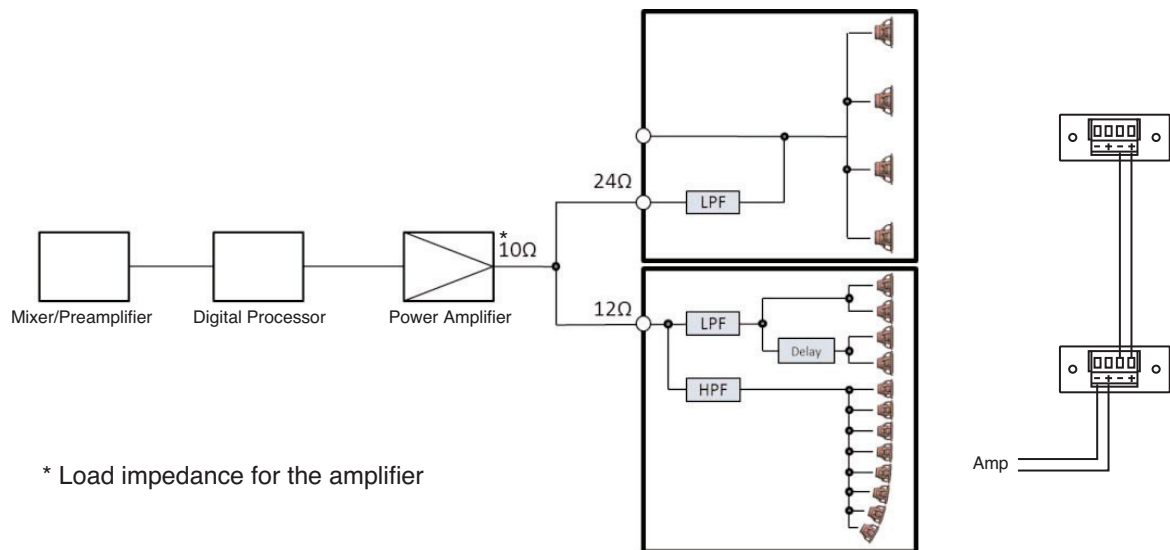
6. AMPLIFIER CONFIGURATIONS

The Mechanically Steerable Line Array Speaker System can be driven by multiple types of amplifier configurations.

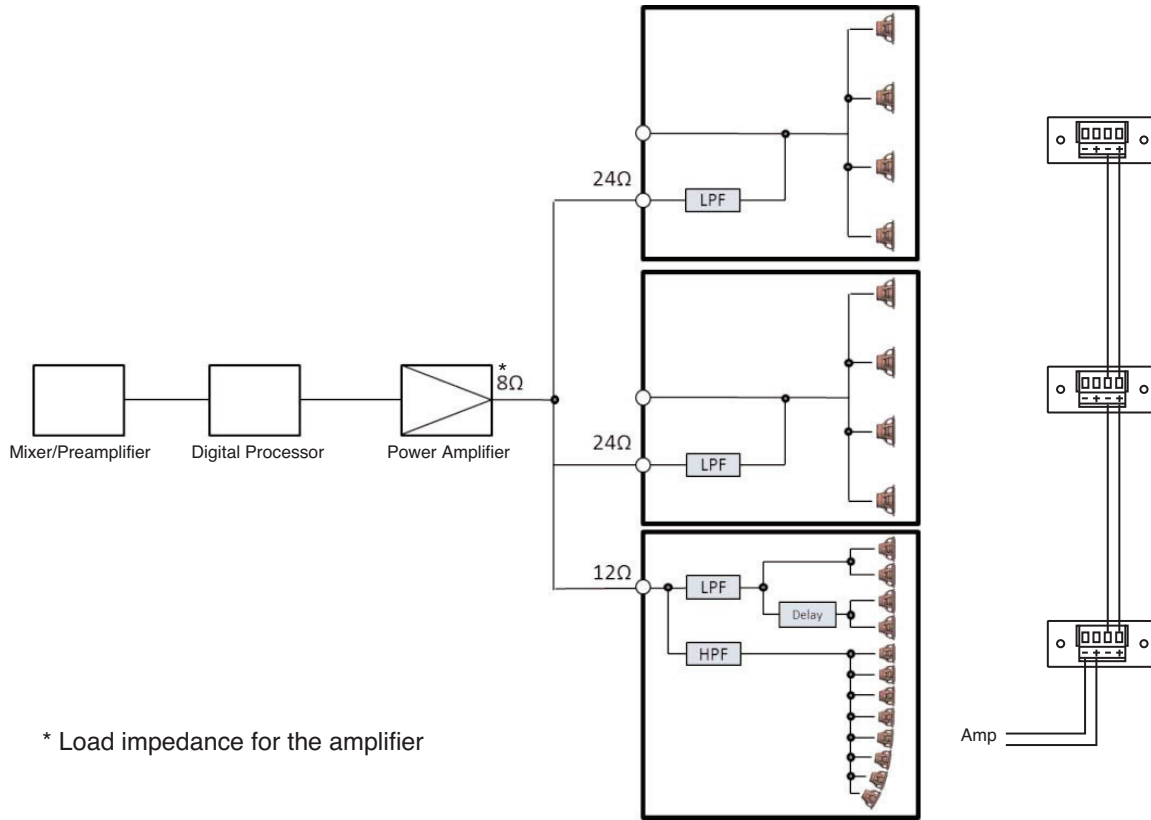
• Single-amplifier drive (1 SR-MF1(B/W))



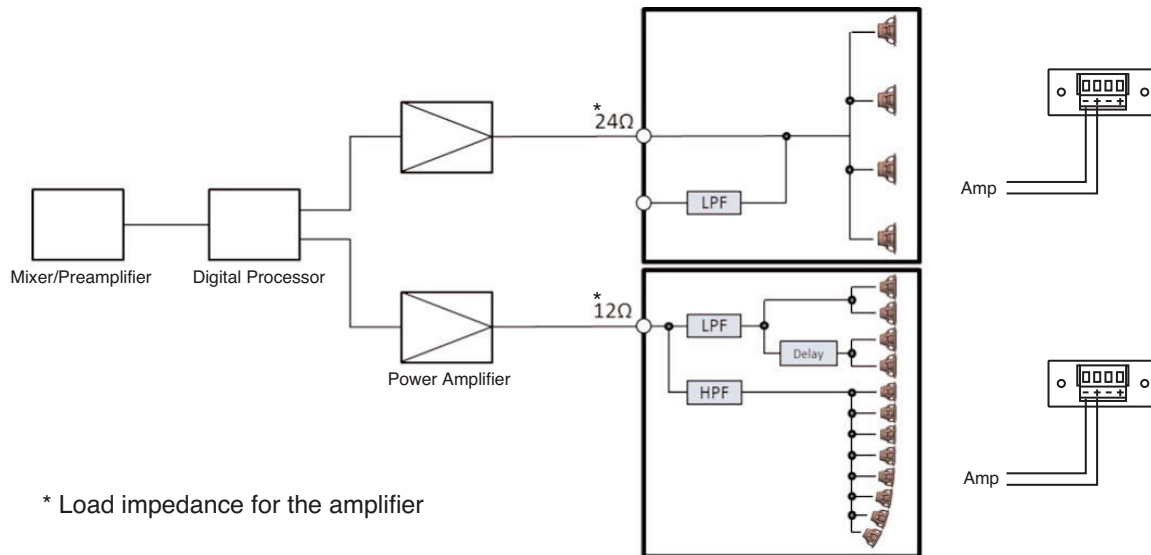
• Single-amplifier drive (1 SR-MF1(B/W) and 1 SR-ML1(B/W))



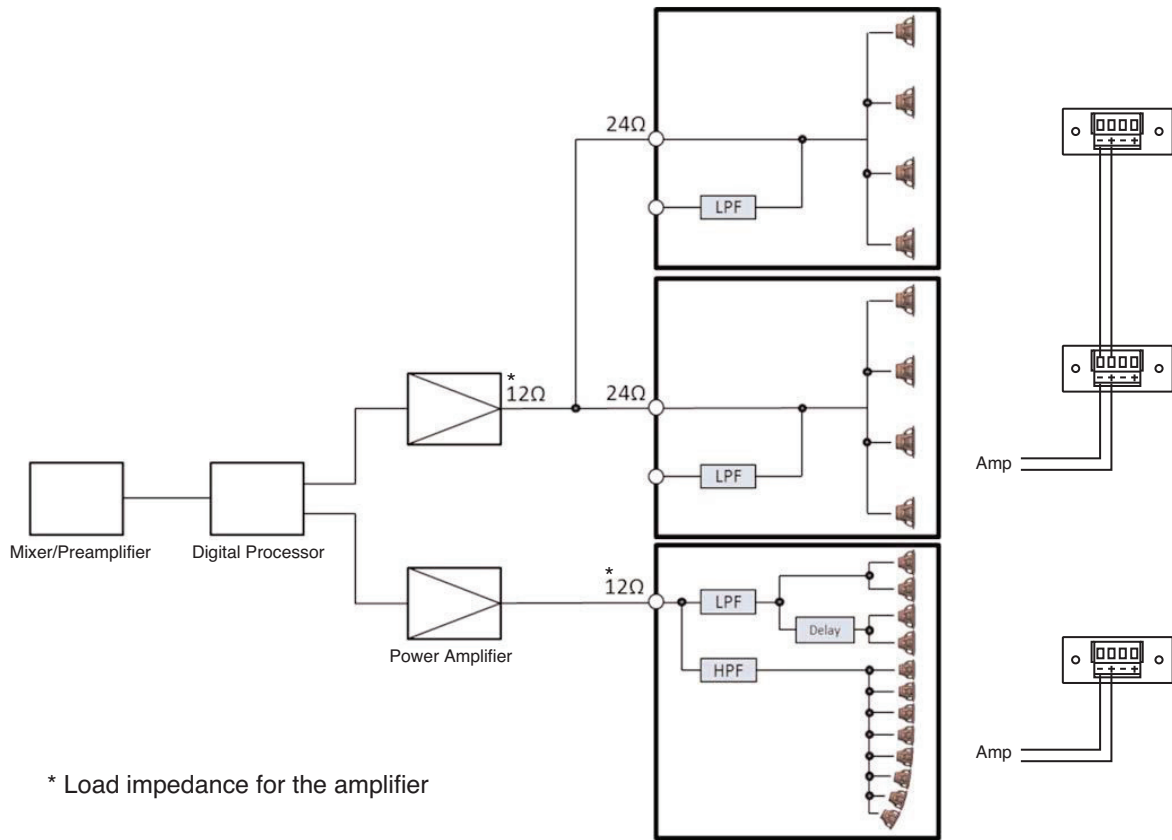
• Single-amplifier drive (1 SR-MF1(B/W) and 2 SR-ML1(B/W)s)



• Bi-amplifier drive (1 SR-MF1(B/W) and 1 SR-ML1(B/W))



• Bi-amplifier drive (1 SR-MF1(B/W) and 2 SR-ML1(B/W)s)



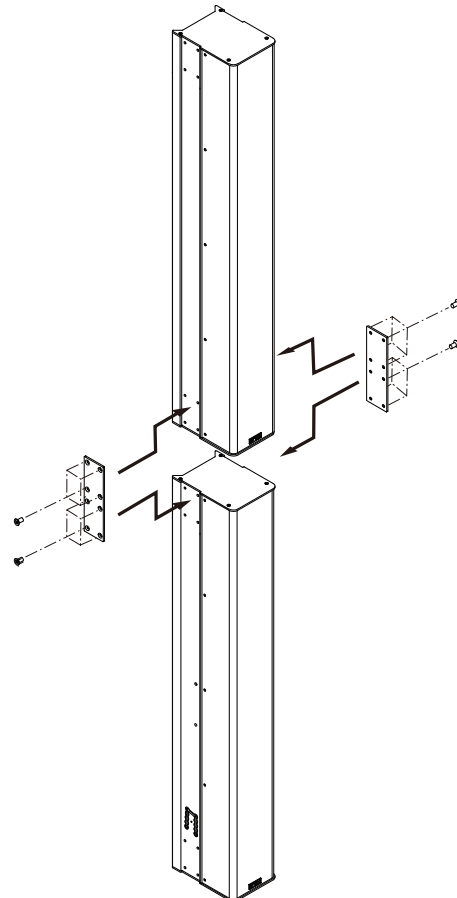
7. JOINING SPEAKERS

To join the speakers, use the expansion plates supplied with the SR-ML1(B/W).

[Joining procedure]

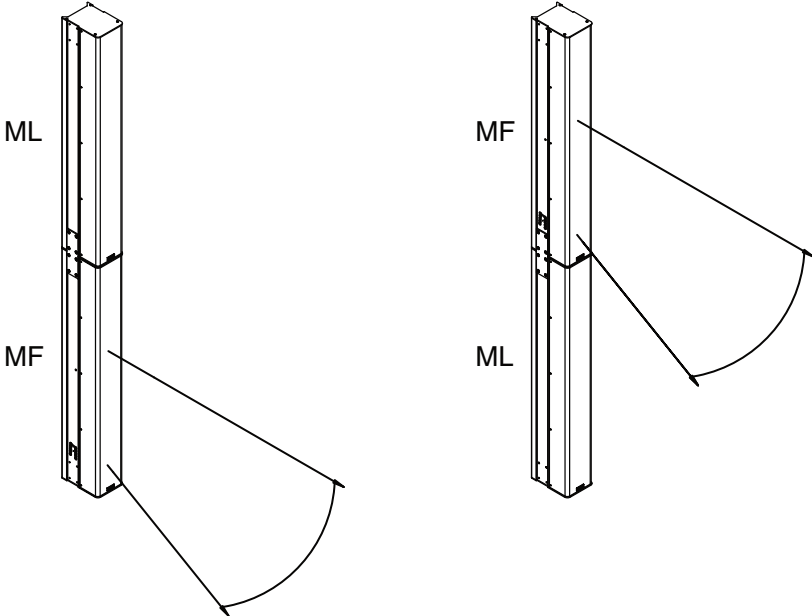
Step 1. Remove the truss head screws on both side of the cabinet. The removed screws are no longer used.

Step 2. Join the speakers using the extension plates and fix them with the flat head screws supplied with the plates.

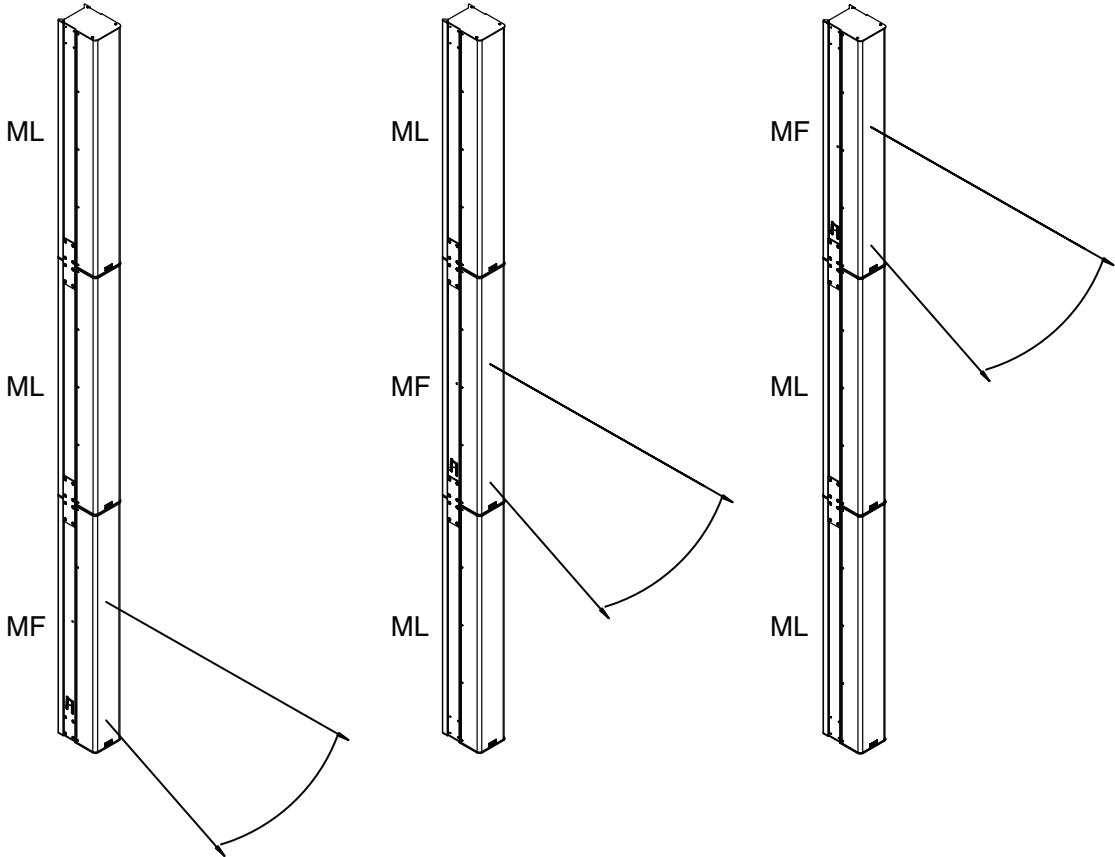


[Installation examples]

1 SR-MF1(B/W) and 1 SR-ML1(B/W)



1 SR-MF1(B/W) and 2 SR-ML1(B/W)

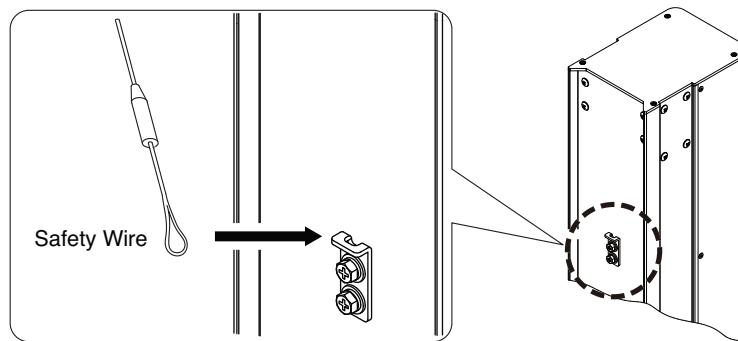


8. INSTALLATIONS

The optional mounting brackets are intended exclusively for the Mechanically Steerable Line Array Speaker System and permits installations suited to the installation location or applications.

Installation Location	Application	Bracket
Wall	Flat against the wall	SR-WB1(B/W)
	When adjusting horizontal angle up to 90 °	SR-PB1(B/W)
Ceiling	When suspending from a ceiling	SR-HB1(B/W)

Note: Attach a safety wire to the bracket mounted on the rear of the cabinet when required. The installation method and type of wire should follow the local requirements.



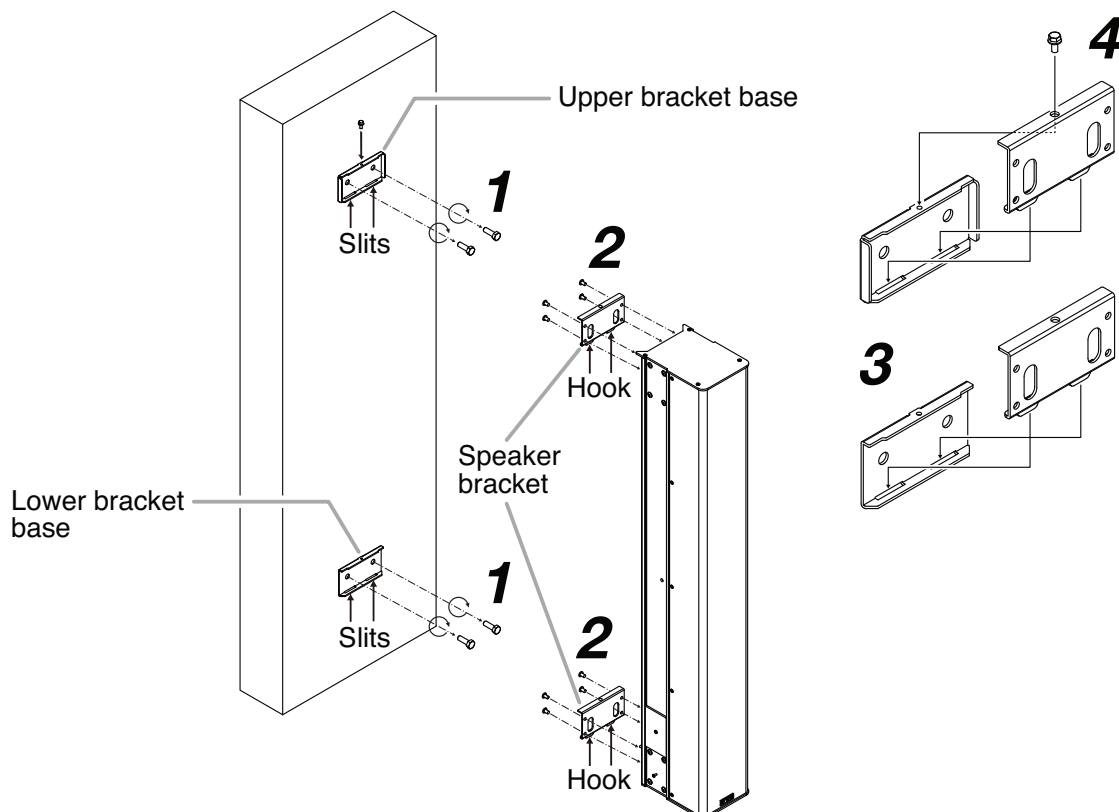
8.1. Wall mounting (using the SR-WB1(B/W))

Step 1. Install the bracket bases at the desired positions on the wall.

Step 2. Attach the speaker brackets on the rear of the cabinet with the pre-mounted truss head screws.

Step 3. Hook the speaker on the bracket bases. Slide down the speaker body so that each speaker bracket's hook fits in the bracket base's slit.

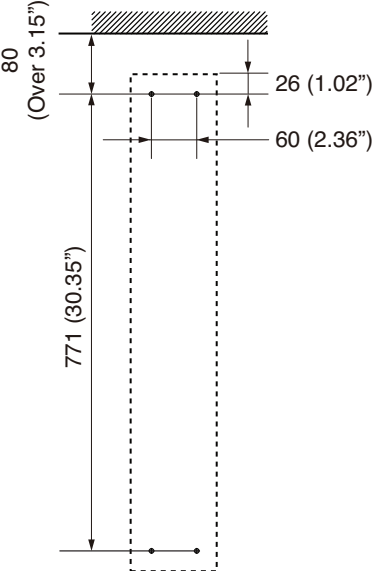
Step 4. Fix the upper bracket base and the speaker bracket with the supplied M4 upset bolt. (Upper bracket only)



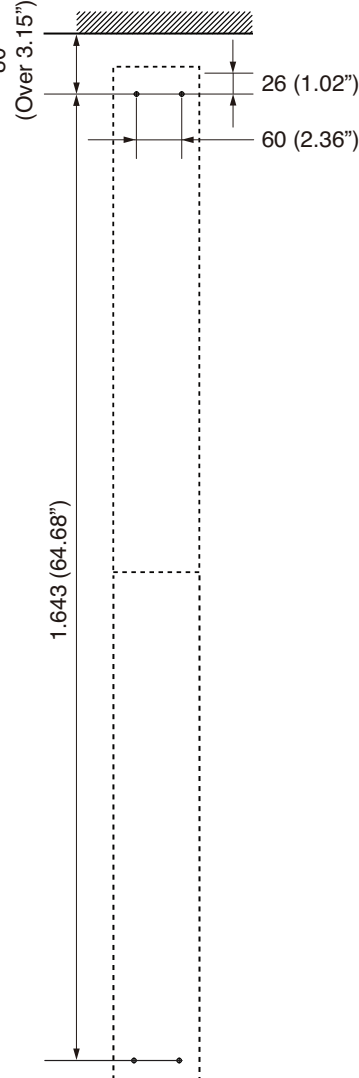
8.2. Mounting dimensions of bracket bases

Unit: mm (inches)

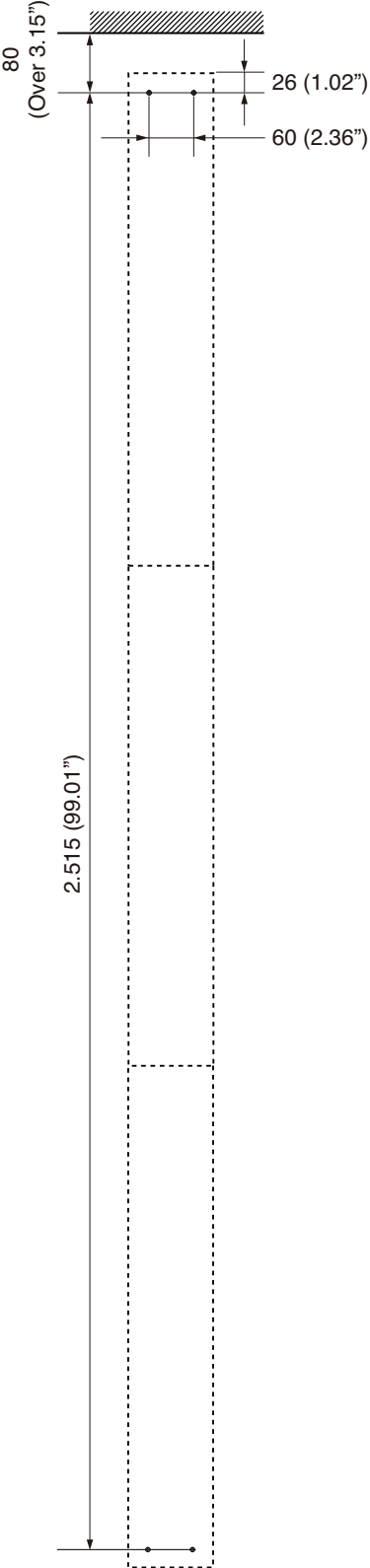
Installing one speaker



Installing two speakers



Installing three speakers



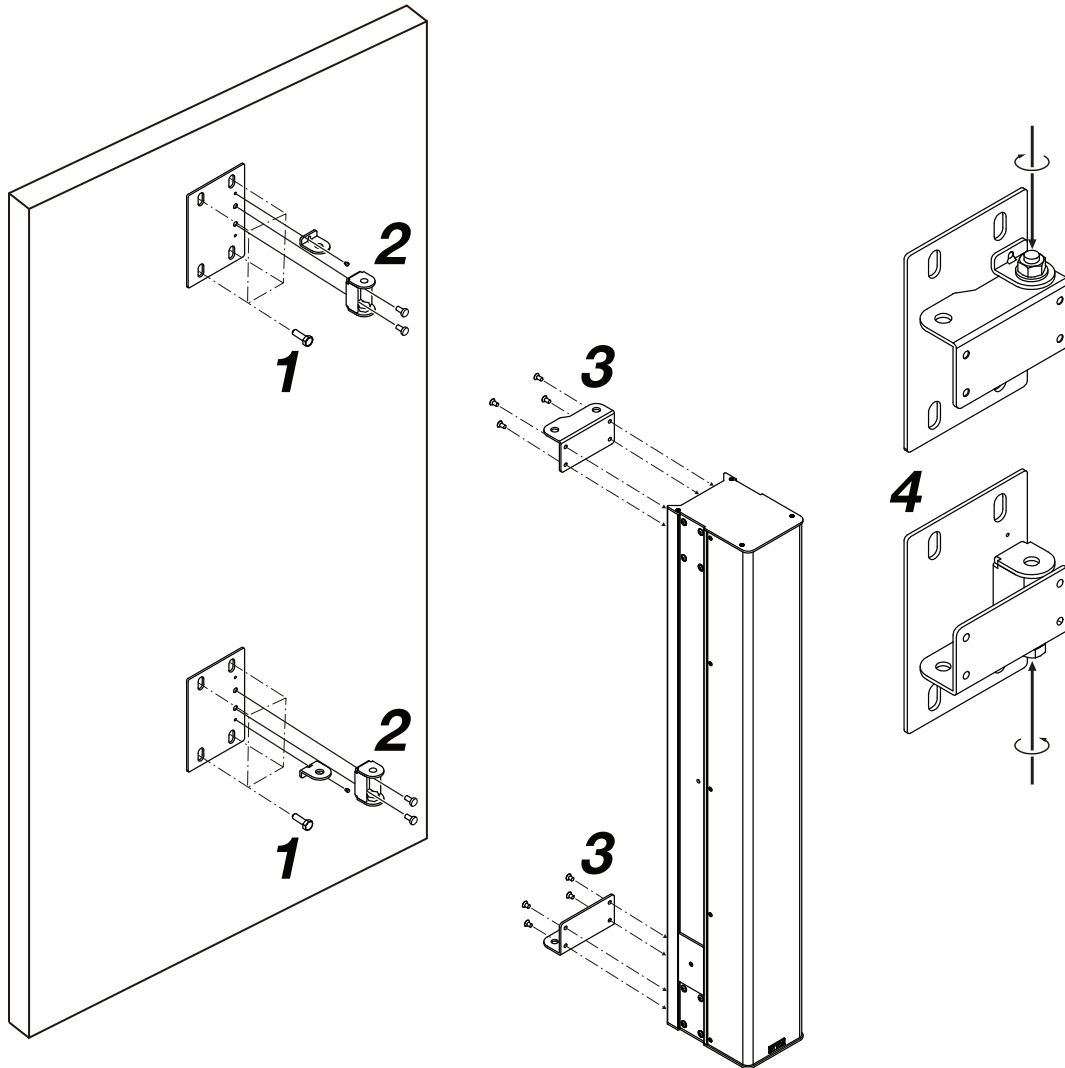
8.3. Wall mounting (using the SR-PB1(B/W))

Step 1. Install the bracket bases at the desired positions on the wall.

Step 2. Attach the panning brackets on the bracket bases with the supplied screws.

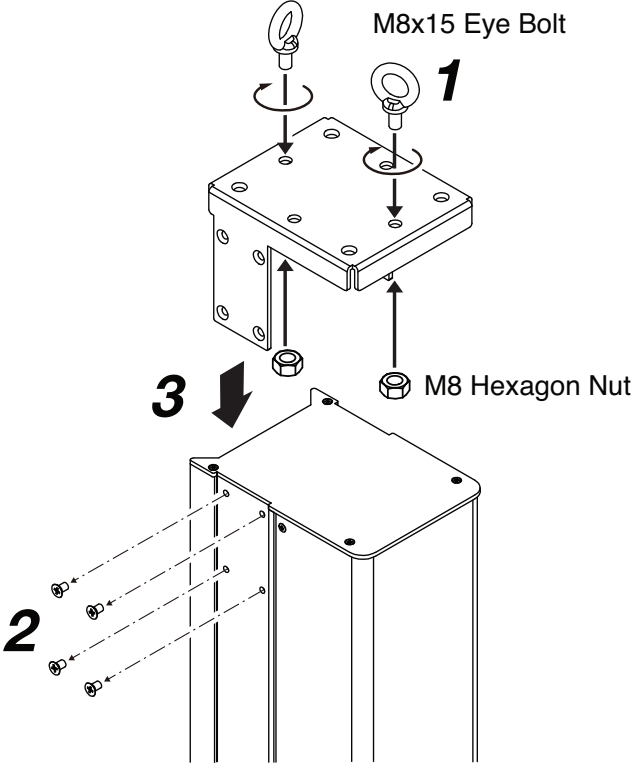
Step 3. Hook the speaker on the bracket bases. Slide down the speaker body so that each speaker bracket's hook fits in the bracket base's slit.

Step 4. Slide the speaker brackets between the panning brackets and tight them with bolts.



8.4. Ceiling-suspended mounting (using the SR-HB1(B/W))

- Step 1.** Attach the supplied eyebolts and nuts on two screw holes of the bracket as shown below.
- Step 2.** Remove the truss head screws on both side of the cabinet.
- Step 3.** Slide the SR-HB1(B/W) hoisting bracket down on the top of the cabinet, and fix the bracket with the supplied M5 machine screws.



9. DIGITAL PROCESSOR FILTERING

Although the speaker can be operated without a digital processor, it is recommended that the speaker be used in conjunction with a digital processor for better sound reproduction. Recommended setting parameters are as follows.

9.1. Single-Amplifier Drive with 1 SR-MF1(B/W) and 1 SR-ML1(B/W)

Model	Gain	Filter			
		Type	Frequency	Gain	Q
SR-MF1(B/W) + SR-ML1(B/W)	0 dB	HPF (12 dB)	50	—	0.707
		PEQ	90	+ 3.0	2.016
		PEQ	350	- 6.0	0.490
		PEQ	4,500	- 3.5	2.871
		PEQ	9,000	+ 7.0	1.512
		PEQ	250	(*) 0 ~ - 6	0.500

9.2. Single-Amplifier Drive with 1 SR-MF1(B/W) and 2 SR-ML1(B/W)s

Model	Gain	Filter			
		Type	Frequency	Gain	Q
SR-MF1(B/W) + SR-ML1(B/W)	0 dB	HPF (12 dB)	50	—	0.707
		PEQ	90	+ 3.0	2.016
		PEQ	350	- 6.0	0.490
		PEQ	4,500	- 3.5	2.871
		PEQ	9,000	+ 7.0	1.512
		PEQ	250	(*) 0 ~ - 6	0.500

9.3. Bi-Amplifier Drive with 1 SR-MF1(B/W) and 1 SR-ML1(B/W)

Model	Gain	Filter				Delay
		Type	Frequency	Gain	Q	
SR-MF1(B/W)	0 dB	PEQ	350	- 4.0	0.490	0.396 ms
		PEQ	4,500	- 3.5	2.871	
		PEQ	9,000	+ 7.0	1.512	
		PEQ	250	(*) 0 ~ - 6	0.500	
SR-ML1(B/W)	+ 7.0 dB	HPF (12 dB)	50	—	0.707	0 ms
		PEQ	350	- 6.0	0.490	
		LPF (12 dB)	400	—	0.500	
		APF	1,600	—	0.920	
		APF	250	(*) 0 ~ - 6	0.500	

9.4. Bi-Amplifier Drive with 1 SR-MF1(B/W) and 2 SR-ML1(B/W)s

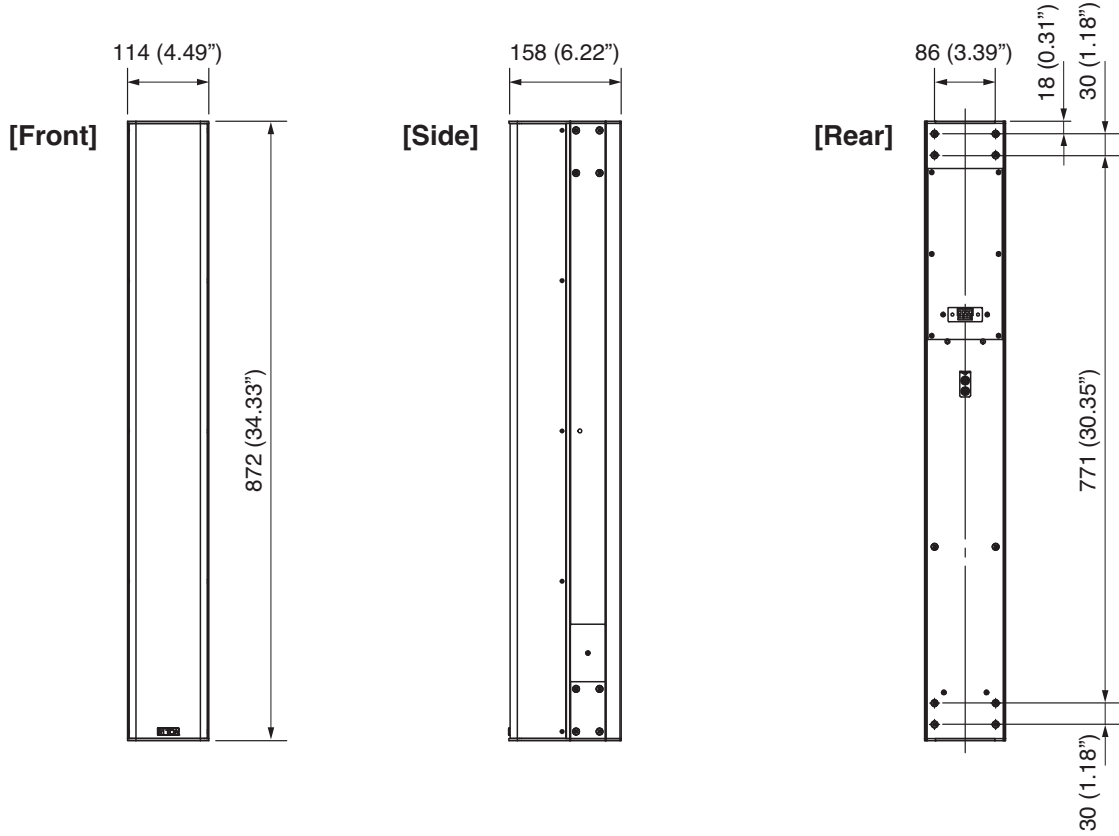
Model	Gain	Filter				Delay
		Type	Frequency	Gain	Q	
SR-MF1(B/W)	0 dB	PEQ	350	- 4.0	0.490	0.396 ms
		PEQ	4,500	- 3.5	2.871	
		PEQ	9,000	+ 7.0	1.512	
		PEQ	250	(*) 0 ~ - 6	0.500	
SR-ML1(B/W)	+ 2.0 dB	HPF (12 dB)	50	—	0.707	0 ms
		PEQ	350	- 6.0	0.490	
		LPF (12 dB)	400	—	0.500	
		APF	1,600	—	0.920	
		APF	250	(*) 0 ~ - 6	0.500	

(*)It is recommended to adjust low frequency response according to the acoustic condition and installation environments as needed. The recommended gains are in the range between 0 dB and -6 dB.

10. DIMENSIONAL DIAGRAM

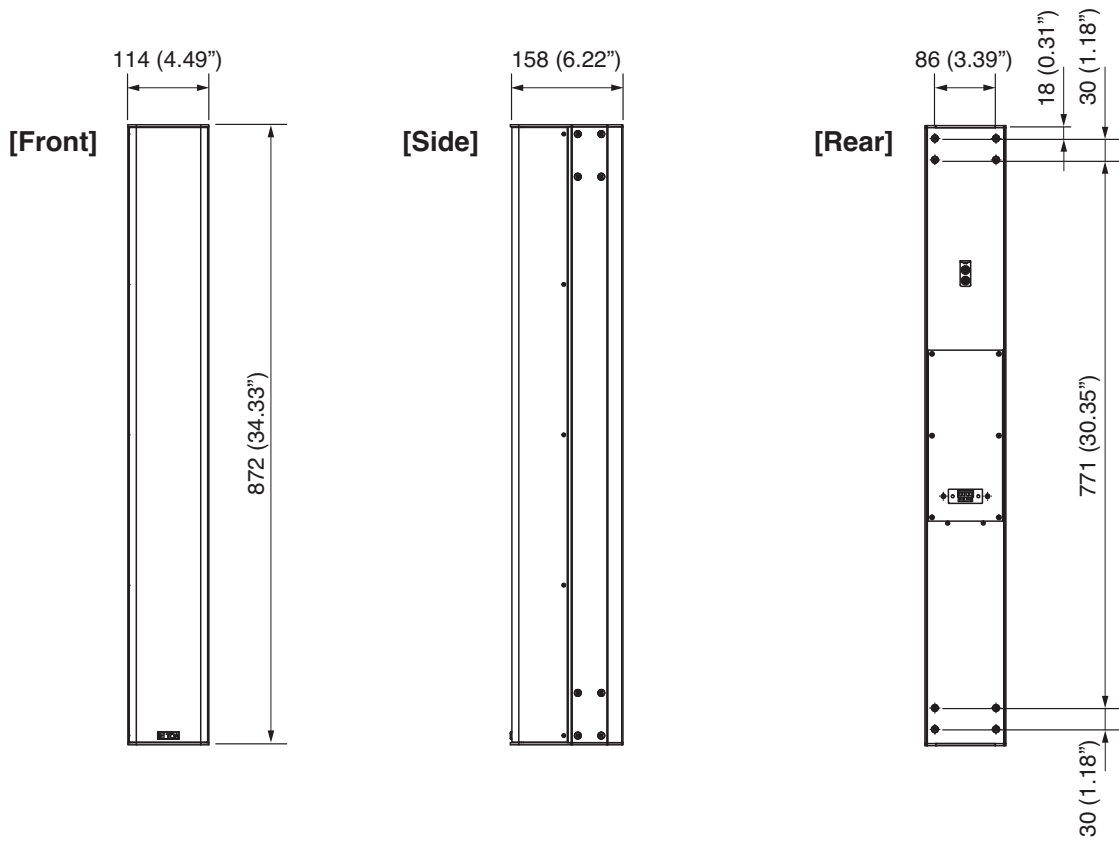
10.1. SR-MF1(B/W)

Unit: mm (inches)



10.2. SR-ML1(B/W)

Unit: mm (inches)



11. SPECIFICATIONS

Model	SR-MF1B / SR-MF1W	SR-ML1B / SR-ML1W
Enclosure	Sealed type	Bass-reflex type
Power Handling Capacity	Continuous program: 240 W	
Rated Impedance	12 Ω	24 Ω
Sensitivity	89 dB (1W, 1m equivalent, measured at 8m)	84 dB (1W, 1m equivalent, measured at 8m)
Frequency Response	130 - 18,000 Hz (when using an optional processor)	60 - 700 Hz (when using an optional processor)
Speaker Component	2.8" (7 cm) cone-type x 4 2" (5 cm) cone-type x 8	3.5" (9 cm) cone-type x 4
Directivity Angle	Horizontal : 100° Vertical : Tilt 0 or 3° Dispersion 10, 15, 20, 25 or 30°	—
Input Terminal	Removable screw terminal	
Finish	Enclosure : Aluminium Front Grille : Punched steel plate *SR-MF1B : Black paint *SR-MF1W : White paint	Enclosure : Aluminium Front Grille : Punched steel plate *SR-ML1B : Black paint *SR-ML1W : White paint
Dimensions	44.9" (W) x 343.3" (H) x 62.2" (D) 114 (W) x 872 (H) x 158 (D) mm	
Weight	18.5 lb (8.4 kg)	16.1 lb (7.3 kg)

Note: The design and specifications are subject to change without notice for improvement.

• Reference of Load Impedance and Output Wattage of Power Amplifiers

Load Impedance	8 Ω	10 Ω	12 Ω	24 Ω
Amplifier Condition				
Impedance : 8 Ω Output Wattage : 1,100W (8 Ω bridge mode of DA-550F)	1,100 [W]	880 [W]	733 [W]	367 [W]
Impedance : 8 Ω Output Wattage : PW	P [W]	P x 8/10 [W]	P x 8/12 [W]	P x 8/24 [W]

This chart is a reference for calculating the amplifier's output wattage. Please refer to the load impedance for the amplifier shown in " 6. AMPLIFIER CONFIGURATIONS ".

