

# CEILING SPEAKER



CEILING  
SPEAKER

**interM**





Inter-M provides various range of speakers to cover a wide area of regions for broadcasting, installed in a building or outdoor facility with type of Ceiling, Column, or Wall Mounted, etc. In order to reproduce clear sound even in an emergency, the speaker output power is 10W or higher, and the installation distance recommendation between speakers is to be set within 10m in a building of school or a government office.

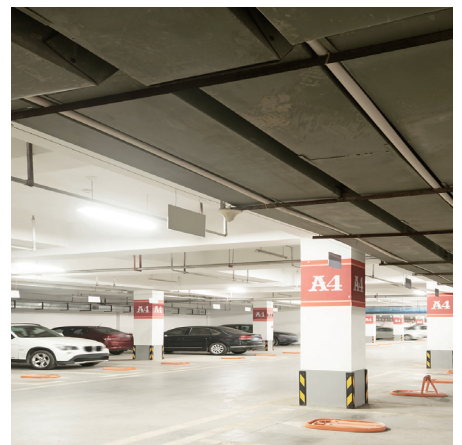
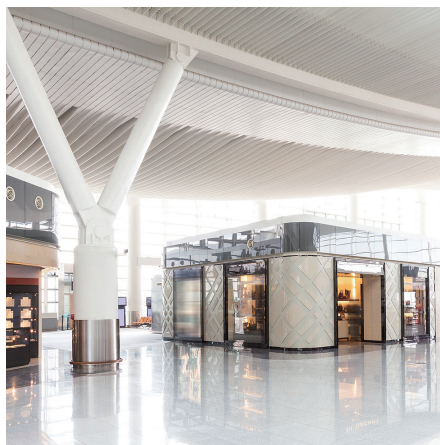
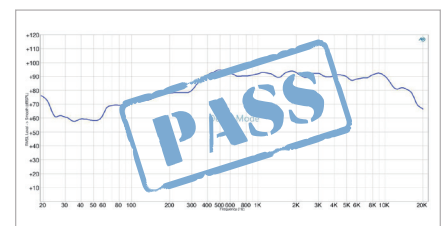
To play background music with clean, vivid sound for customers using in commercial facilities as in restaurants, hotels or department stores, the BGM Ceiling Speaker is required. Using a 2Way coaxial driver, Inter-M's BGM speaker provides high quality sound over a wide band, and it offers various output models from 15W to 80W to reproduce the rich sound pressure for a variety of places.

It is recommended to use the Column Speaker to deliver a voice with clarity in a wide area of park, playground or for an outdoor space. It is recommend a Wall Mounted speaker to play announcements or high quality BGM with the same tone and sound pressure at any location.



## ◆ Thorough quality control

The products passing a variety test including a 100 hours full power noise, high temperature, low temperature, humidity are assigned with 'PASS' to provide a stable and equal quality in the market. The relevant test is proceeded through the automated equipment and support the exact verification about the products.





# Recommended usage of ceiling speakers

Ceiling Speakers are used in a wide variety of applications such as Emergency/Announcement, BGM in various facilities. Intelligibility is an important factor when delivering information with voice, including BGM. The intelligibility of the voice, which is a combination of vowels and consonants, is determined by the clarity of consonants. The vowels that occupy most of the voice energy are concentrated in the frequency band below about 1 to 2kHz, but the consonants that influence intelligibility are concentrated in the frequency band above 2kHz.

Because human hearing is most sensitive in the band from 2kHz to 4kHz, in order to communicate with intelligible voice, a good playback of 3kHz~4kHz frequency band is required. As the frequency increases, dispersion angle gets narrower for a Ceiling Speaker with conical dispersion. For example, for a speaker with a dispersion angle of 100 ° in a midrange of frequencies above 2 to 4kHz, which dominate the intelligibility, the dispersion angle narrows down to around 50 to 60 degrees.

Therefore, it is recommended to determine the Ceiling Speaker installation interval based on the narrow range of dispersion characteristics.

## ◆ Ceiling speaker selection and location for Information/Emergency broadcasting

When choosing Ceiling Speaker, it needs to be careful about sound pressure, output, and directivity in high and mid-range, and frequency reponse. When using in a full range speaker unit, the Ceiling Speakers generally have a narrower directivity as the frequency gets higher.

Figure 1 is a simulation of the EASE sound pressure distribution when a 10 W Ceiling Speaker for universal announcement is installed at an installation distance of 10 meters. (Speaker height: 3m, listening position: 1.2m, frequency band: 2kHz)

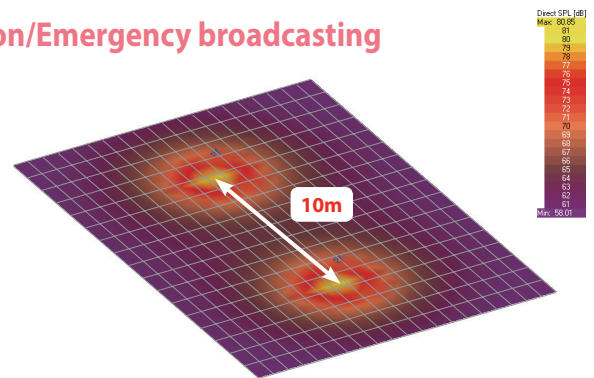
The sound pressure is sufficient just below the speaker, but the dispersion characteristic (directivity) of sound over 2kHz that influences intelligibility is narrow and the sound pressure level is attenuated at the point between the speakers.

Also, the overall sound pressure level is lower by 20dB SPL than the sound pressure level just Below the speaker.

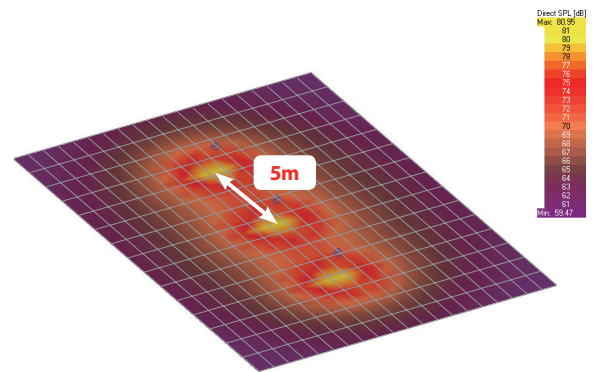
Therefore in emergency broadcasting, an accurate information delivery and guidance alerts are supported only to a limited range for 10m interval installation.

Just below the speaker, a sound pressure is 81dB SPL, but the range of 2kHz sound can cover a radius of 2.5m, and the attenuation occurs more and the Intelligibility decreases over that distance.

Based on a 2kHz simulation, it is recommended to narrow the spacing of speakers to minimize difference between direct SPL and SPL at midpoint of speakers. Figure 2 shows the EASE sound pressure distribution simulation with a speaker placed at 5m intervals. Anywhere in the region, it is possible to broadcast a voice to deliver information with the same intelligibility.



[Figure 1] Typical installation (2kHz, 10m spacing)



[Figure 2] Ideal installation (2kHz, 5m spacing)

Space	Average noise level (dB)	Broadcast sound pressure level	
		BGM (music)	Announcement
Factory, train platform	80~90	93	96
waiting room, shopping mall	75~85	88	91
general store	70~80	83	86
hotel, office, etc.	60~70	73	76

< Sound pressure standard table >

## # Adequate sound pressure level by noise

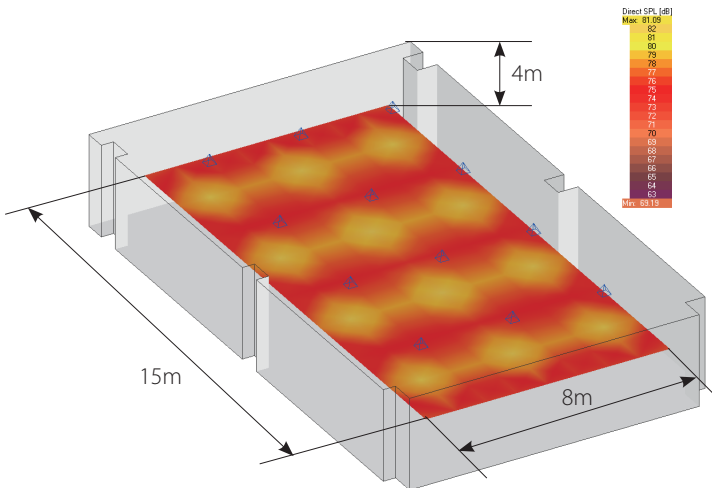
The table on the left shows the noise level and the adequate sound pressure level of each space. The optimal and clear playback that is not masked with noise is possible when broadcasted with sound pressure of 6dB that is higher than the noise level of the used space. The EASE simulation can visually represent the speaker's coverage, sound pressure level, and intelligibility, etc. in installing a speaker including architectural sound.

Because of the exact simulation capability at the design level, EASE is commonly used in the professional market as a simulation software.

**When installing a speaker, EASE is simulation software that is commonly used in professional markets for speaker cover range, sound pressure level, articulation and including architectural sound. An accurate simulation is applied at the design level.**



## ◆ Ceiling Speaker selection and location for music playback/BGM



[Figure 3] Ideal installation (2kHz, 3m interval)

Ceiling Speakers for playing music (BGM) are used in all places such as restaurant, lobby, airport, banquet hall, cafe, etc. to cover the entire area of a facility uniformly that does not require sound image fixing.

Unlike the speaker for information or emergency broadcasting, selecting a speaker for pleasant listening for music and placing good position for the speaker are more important. The Ceiling Speaker is capable of broadband playback and the 2Way speaker is good for wide spreading sound in medium high frequency range.

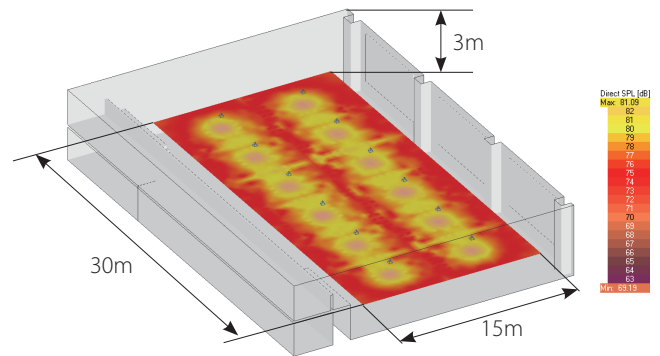
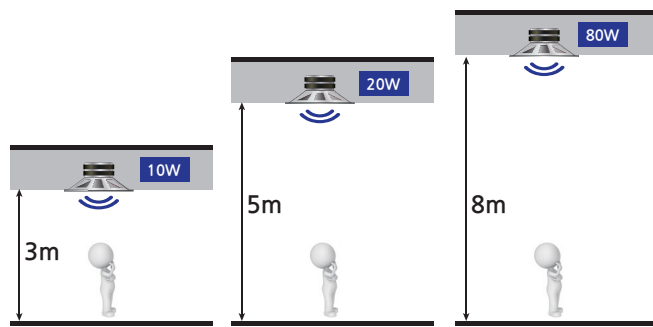
Based on 2kHz, Ideal Ceiling Speaker interval should be set so that the sound pressure of the whole area is within -3dB for the sound pressure just below the speaker.

EASE sound pressure distribution simulation is at Figure 3, when the speaker is installed for 3m intervals at 2kHz.

Because it is possible to play with the same sound quality and sound pressure throughout the space, clear announcements and music playback(BGM) is delivered without the need to be aware of the location of the listener or speaker.

If the ceiling height is different or speakers are in a different noise level space, it is needed to change the Ceiling Speaker's output (Power tab) for each region, and to adjust the sound pressure level for each room.

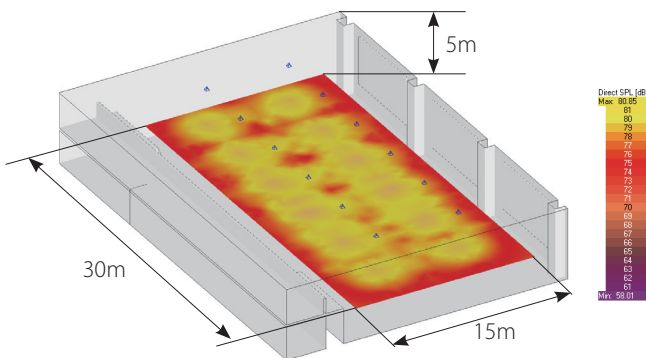
## ◆ Speaker selection and location by ceiling height



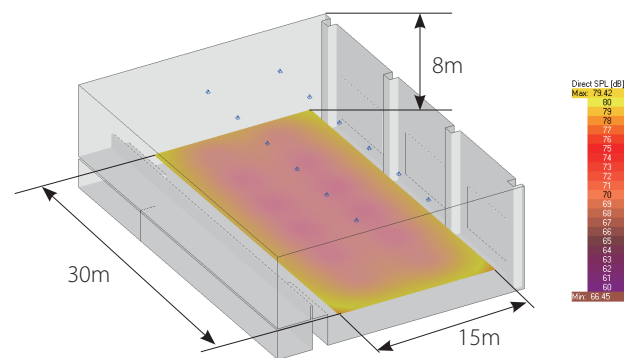
[Figure 4] Ceiling 3m, 10W speaker 2kHz

### # 3m the ceiling height

Assuming the ear height is 1.2m from the floor, the distance from the speaker to the listener's ears is 1.8m. In general, choose speakers such as 10W, 20W, 30W depending on the maximum sound pressure required at the listening position. However, if there is a place with 10W speakers installed, to acquire a high sound quality with no distortion and intelligibility, it is suggested to select a speaker of 20W, considering the power margin. Although the distance from the speaker to the ear position is short and the sound pressure attenuation is relatively low at high frequencies, it is recommended to set the speaker interval to make the middle point between the speakers overlap as the reference to the figure on the right.



[Figure 5] Ceiling 5m, 20W speaker 2kHz



[Figure 6] Ceiling 8m, 80W speaker 2kHz

### # 5m/8m ceiling height

The higher the ceiling height, the farther will be the distance to the listener's ears from the speaker. Therefore, it is recommended to use the 2Way Ceiling Speaker, which supports excellent directivity and reachability at high frequencies rather than a full range speaker. When the ceiling height is increased, the coverage of the speaker is increased, it is recommended for the speaker to be installed with narrow intervals because of the sound image fixing.



# Inter-M

## Ceiling Speaker Line-up

Usage	Environment		Model	Unit	Input power	Impedance	Maximum SPL	Cut-out Diameter (mm)
BGM (Music Playback)	Hotel, Lobby Gallery Auditorium etc.		CS-880MH	8" 2Way Coaxial	80/40/20W	125/250/500Ω	108dB	Ø270
			CS-660MH	6.5" 2Way Coaxial	60/30/15W	160/330/660Ω	104dB	Ø220
	Department Store Restaurant etc.		CS-620FH	6.5" 2Way Coaxial	20/10/5W	500/1k/2kΩ	99dB	Ø200~205
			CS-630FH	6.5" 2Way Coaxial	30/20/10W	330/500/1kΩ	101dB	Ø200~205
			CS-680FH	6.5" 2Way Coaxial	80/40/20W	125/250/500Ω	107dB	Ø200~205
	Cafe Conference room etc.		CS-815FH	8" 2Way Coaxial	15/10/5W	660/1k/2kΩ	106dB	Ø220~230
			CS-830FH	8" 2Way Coaxial	30/20/10W	330/500/1kΩ	105dB	Ø220~230
	Emergency (Announcement)	General Environment	Residential facilities	CS-301FC	3"	1W	10kΩ	80dB
CS-303FC				3"	3W	3.3kΩ	88dB	Ø110 ~ 115
CS-301FQ				3"	1W	10kΩ	79dB	-
CS-303FQ				3"	3W	3.3kΩ	87dB	-
Office Public, Building Complex, Building			CS-610	6.5"	10/5/3W	1k/2k/3.3kΩ	100dB	Ø195~200
			CS-610M	6.5"	10/5/3W	1k/2k/3.3kΩ	100dB	Ø195~200
			CS-610F	6.5"	10/5/3W	1k/2k/3.3kΩ	99dB	Ø200~210
			CS-615F	6.5"	15/7.5/3.75W	660/1.3k/2.6kΩ	101dB	Ø200~210
Special Environment		Exposed	CS-503FE	5"	3/1W	3.3k/10kΩ	94dB	Ø210
		Lighting	CS-503F	5"	3/2/1W	3.3k/5k/10kΩ	91dB	Ø150
			CS-510F	5"	10/5/3W	1k/2k/3.3kΩ	98dB	Ø150



# SPEAKERS for BGM



8" 2Way Coaxial Music Ceiling Speaker

## CS-880MH

The CS-880MH is a 2way coaxial ceiling speaker for high quality music playback. Adopted a metal enclosure, it has flame retardancy and excellent durability, and thin bezel shaped grill shows a beautiful design to match the interior. It can be easily used for BGM broadcasting in places such as hotels, banquet halls, fine restaurants, etc. where space partition is used.



Unit



Rear



Side

### FEATURES

#### ● 8" Coaxial 2Way speaker

#### ● High / low impedance input

It provides LOW impedance ( $16\Omega$ ) for high quality music playback and high impedance input using high quality matching transformer. The output can be easily selected by using the rotary switch.

#### ● Suitable for music playing

It is suitable for playing music with a wide band bandwidth ranging from 89Hz~19.5kHz.

#### ● Easy installation

It can be easily installed by securing it through a screw mounted on the speaker enclosure.

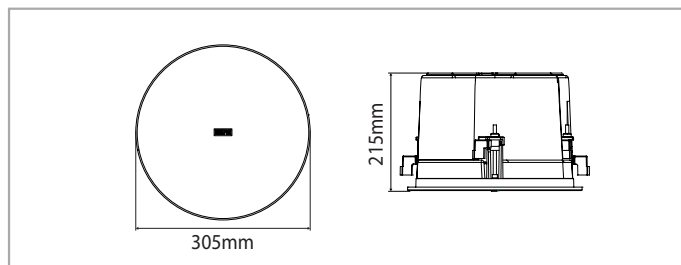
#### ● How to install

Refer to no.2 of the SPEAKER INSTALLATION GUIDE on pages 36-39.

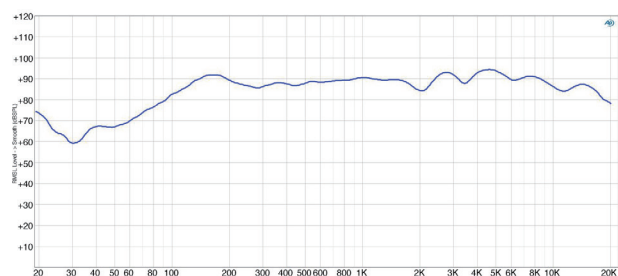




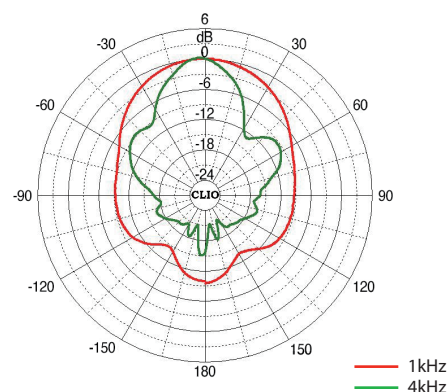
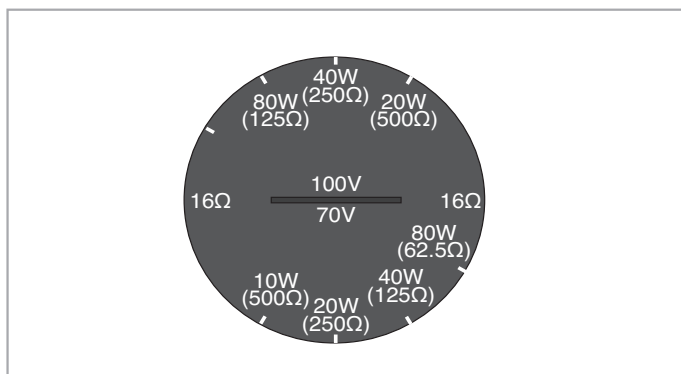
## DIMENSION



## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## POWER SELECTION



## SPECIFICATION

Model	CS-880MH	
Type	8" 2Way Coaxial Music Ceiling Speaker	
Unit	LF : 8", HF : 2"	
Power Handling(AES)	80W	
Input Power	100V	80/40/20W
	70V	80/40/20/10W
Impedance	100V	125Ω/250Ω/500Ω
	70V	62.5Ω/125Ω/250Ω/500Ω
	LOW	16Ω
Power Selection	Rotary Type	
Frequency Range(-10dB)	89Hz ~ 19.5kHz	
Frequency Range(-20%)	63Hz ~ 20kHz	
Sensitivity (1W/1m, 1kHz)	89dB	
Maximum SPL[Cont]	108dB	
Nominal Dispersion (Conical)	1kHz	105°
	4kHz	47°
Input Connection	4P EuroBlock	
Enclosure Material	Metal	
Enclosure Color(Front)	Black	
Grill Material	Metal	
Grill Color	White	
Cut-Out Diameter(Ø, mm)	Φ270mm	
Weight (Net)	4.85kg	
Dimensions (Ø(WxH)xD, mm)	Φ305 x 215mm	
Weather Resistant	-	
Flame resistant	-	
Certification	-	
Included Accessories	-	

# SPEAKERS for BGM



6.5" 2Way Coaxial Music Ceiling Speaker

## CS-660MH

The CS-660MH is a speaker suitable for hotels, banquet halls and fine restaurants where space is divided into partitions. Using a 2way coaxial driver, high-quality music playback over a wide band is possible. It adopts a metallic material enclosure and is excellent in durability, and the design of the front grill minimizes the bezel, so it blends well with the interior.



Unit



Rear



Side

### FEATURES

#### ● 6.5" Coaxial 2Way speaker

#### ● High/low impedance input

It provides LOW impedance (16Ω) for high quality music playback and high impedance input using high quality matching transformer. The output can be easily selected by using the rotary switch.

#### ● Suitable for music playing

It is suitable for playing music with a wide band bandwidth ranging from 100Hz~20kHz.

#### ● Easy installation

It can be easily installed by securing it through a screw mounted on the speaker enclosure.

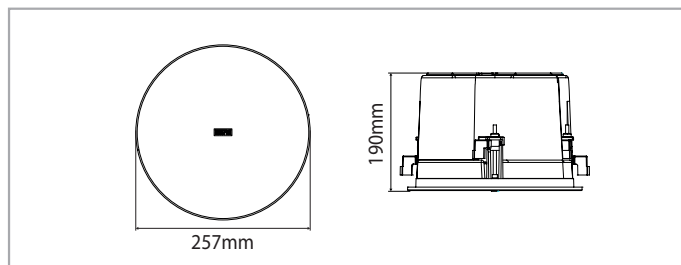
#### ● How to install

Refer to no.2 of the SPEAKER INSTALLATION GUIDE on pages 36-39.

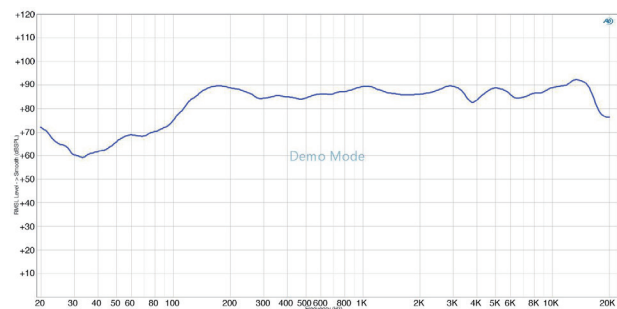




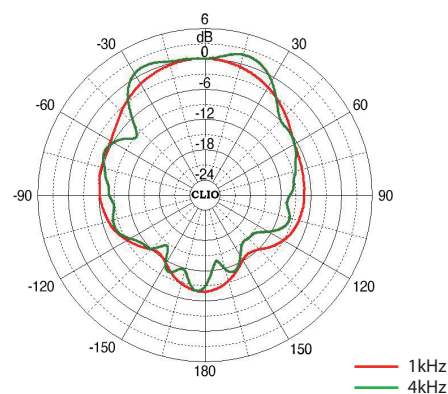
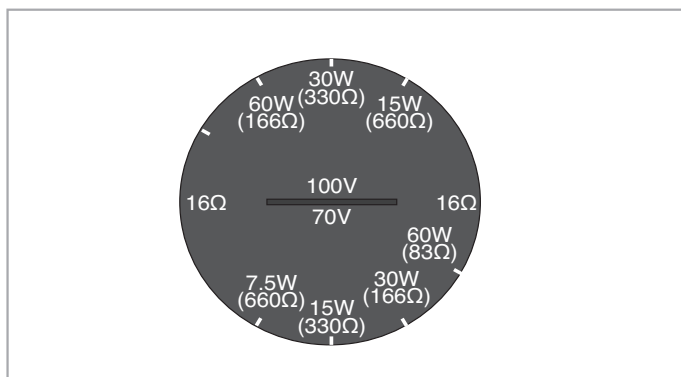
## DIMENSION



## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## POWER SELECTION



## SPECIFICATION

Model	CS-660MH	
Type	6.5" 2Way Coaxial Music Ceiling Speaker	
Unit	LF : 6.5", HF : 2"	
Power Handling(AES)	60W	
Input Power	100V	60/30/15W
	70V	60/30/15/7.5W
Impedance	100V	160/330/660Ω
	70V	83Ω/166Ω/330Ω/660Ω
	LOW	16Ω
Power Selection	Rotary Type	
Frequency Range(-10dB)	100Hz ~ 20kHz	
Frequency Range(-20%)	70Hz ~ 20kHz	
Sensitivity (1W/1m, 1kHz)	86dB	
Maximum SPL[Cont]	104dB	
Nominal Dispersion (Conical)	1kHz	136°
	4kHz	88°
Input Connection	4P EuroBlock	
Enclosure Material	Metal	
Enclosure Color(Front)	Black	
Grill Material	Metal	
Grill Color	White	
Cut-Out Diameter(Ø, mm)	Φ220mm	
Weight (Net)	3.65kg	
Dimensions (Ø(WxH)xD, mm)	Φ257 x 190mm	
Weather Resistant	-	
Flame resistant	-	
Certification	-	
Included Accessories	-	

# SPEAKERS for BGM



6.5" 2Way Coaxial Ceiling Speaker

## CS-620FH/630FH/680FH

CS-620FH/630FH/680FH is a Ceiling Speaker that can be used versatile in restaurants, stores, hotels, meeting rooms, etc. where both music playback and announcement are required. The exposure is so small that it blends naturally in with the interior design, and provides wide-band sound from 2Way coaxial drivers.



Unit



Rear



Side

### FEATURES

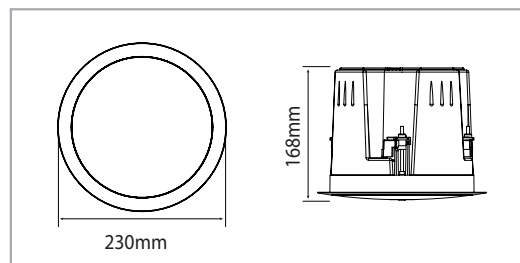
- **6.5" Coaxial 2Way speaker**
- **Using High quality matching transformer (100V)**
- **Low impedance input terminal**  
Provides a connection terminal for low impedance (8Ω) to play high quality music.
- **In compliance with international standards(CS-620FH)**  
It is a high quality speaker with high reliability, durability and flame retardancy guaranteed by development and production according to international standards.

- **Suitable for music playing**  
It is suitable for playing music with a wide band bandwidth ranging from 400Hz~4kHz.
- **Offering an installation bracket**  
It ensures a safe installation of speaker by providing High-quality speaker installation tools made up with bracket-ring and bracket-rail.
- **How to install**  
Refer to no.2 or no.3 of the SPEAKER INSTALLATION GUIDE on pages 36-39.





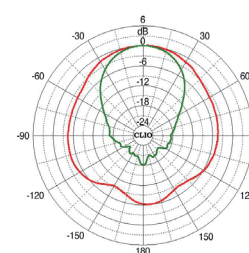
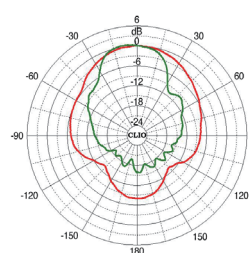
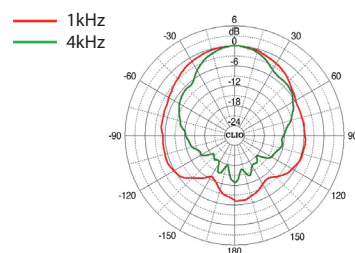
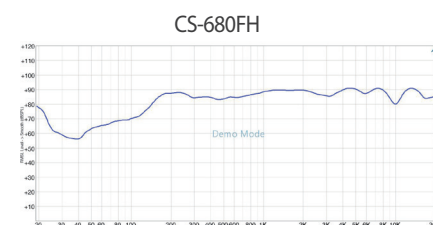
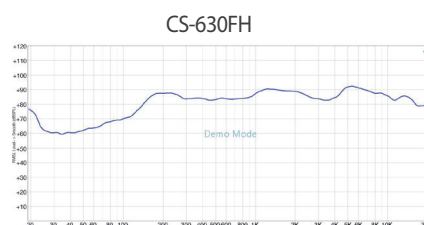
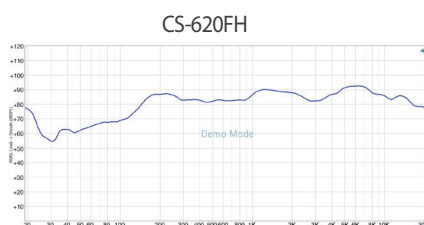
## DIMENSION



## POWER SELECTION

<b>CS-620FH</b>	5W(2kΩ)	10W(1kΩ)	20W(500Ω)
<b>CS-630FH</b>	10W(1kΩ)	20W(500Ω)	30W(330Ω)
<b>CS-680FH</b>	20W(500Ω)	40W(250Ω)	80W(125Ω)

## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## SPECIFICATION

Model		CS-620FH	CS-630FH	CS-680FH
Type		6.5" 2Way Coaxial Ceiling Speaker	6.5" 2Way Coaxial Ceiling Speaker	6.5" 2Way Coaxial Ceiling Speaker
Unit		LF : 6.5", HF : 1"	LF : 6.5", HF : 1"	LF : 6.5", HF : 1"
Power Handling(AES)		20W	30W	80W
Input Power	100V	20/10/5W	30/20/10W	80/40/20W
	100V	8Ω / 500Ω / 1kΩ / 2kΩ	8Ω / 330Ω / 500Ω / 1kΩ	8Ω / 125Ω / 250Ω / 500Ω
Impedance	LOW	8Ω	8Ω	8Ω
Power Selection		Toggle Switch	Toggle Switch	Toggle Switch
Frequency Range(-10dB)		130Hz ~ 20kHz	130Hz ~ 20kHz	140Hz ~ 20kHz
Frequency Range(-20%)		100Hz ~ 20kHz	85Hz ~ 20kHz	100Hz ~ 20kHz
Sensitivity (1W/1m, 1kHz)		86dB	86dB	88dB
Maximum SPL[Cont]		99dB	101dB	107dB
Nominal Dispersion (Conical)	1kHz	180° <sup>*1</sup>	126°	180° <sup>*1</sup>
	4kHz	92°	59°	72°
Input Connection		3P Euroblock	3P Euroblock	3P Euroblock
Enclosure Material		ABS (V0)	ABS (V0)	ABS (V0)
Enclosure Color(Front)		Light Gray	Light Gray	Light Gray
Grill Material		Metal Grill	Metal Grill	Metal Grill
Grill Color		Light Gray	Light Gray	Light Gray
Cut-Out Diameter(Ø, mm)		Ø200~205	Ø200~205	Ø200~205
Weight (Net)		2.03kg	2.52kg	3.35kg
Dimensions (Ø(WxH)xD, mm)		Ø230 x 168	Ø230 x 168	Ø230 x 168
Weather Resistant		IP34	IP34	IP34
Flame resistant		O	O	O
Certification		KS	-	-
Included Accessories		-	-	-

\*1 : 1/2 Half Size

# SPEAKERS for BGM



8" 2Way Ceiling Speaker

## CS-815FH/830FH

The CS-815FH/830FH is suitable for the space of department stores, complex shopping malls where high quality background music reproduction is required. A 2way driver configuration using an 8-inch woofer enables high-quality audio playback over a wide frequency range.



Unit



Rear



Side

### FEATURES

- **8" Coaxial 2Way speaker**

- **Using High quality matching transformer (100V)**

- **3 level output selection with push terminals**

Push terminals are applied to the front of the speaker to easily select and connect the desired output.

- **High sound pressure and wide frequency response**

High sound pressure over 90dB SPL can be achieved over a wide frequency range.

- **Anti-vibration rubber pad**

A rubber pad is applied to minimize the noise that is likely to occur in the speaker installation when playing in a loud volume.

- **Easy installation**

The removable grill is adopted and it is easy to remove and attach. In addition, safety is improved by connecting the unit and cover with wire.

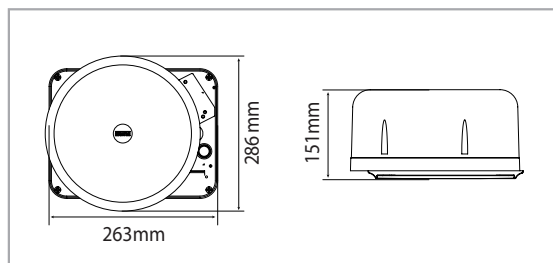
- **How to install**

Refer to no.1 of the SPEAKER INSTALLATION GUIDE on pages 36-39.

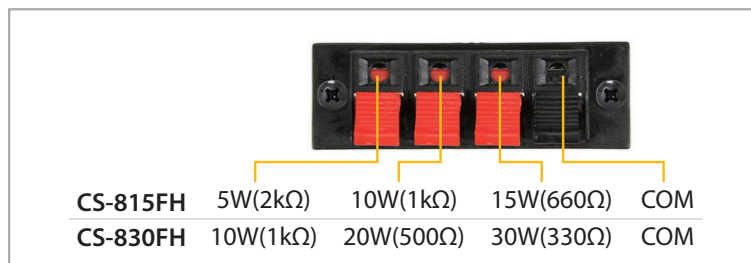




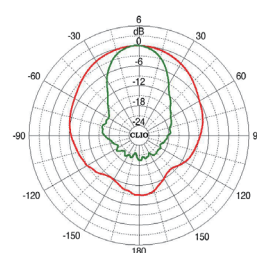
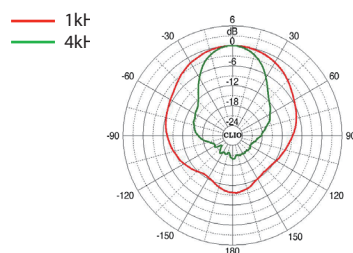
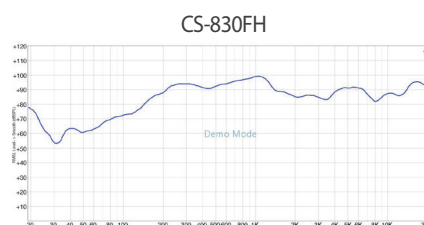
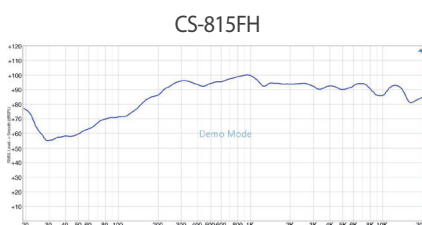
## DIMENSION



## POWER SELECTION



## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## SPECIFICATION

Model		CS-815FH	CS-830FH
Type		8" 2Way Coaxial Ceiling Speaker	8" 2Way Coaxial Ceiling Speaker
Unit		LF : 8", HF : 3" cone	LF : 8", HF : 3" cone
Power Handling(AES)		15W	30W
Input Power	100V	15/10/5W	30/20/10W
Impedance	100V	660/1k/2kΩ	330/500/1kΩ
Power Selection		Push Terminal	Push Terminal
Frequency Range(-10dB)		170Hz ~ 15kHz	140Hz ~ 20kHz
Frequency Range(-20%)		130Hz ~ 20kHz	100Hz ~ 20kHz
Sensitivity (1W/1m, 1kHz)		94dB	90dB
Maximum SPL[Cont]		106dB	105dB
Nominal Dispersion (Conical)	1kHz	133°	141°
	4kHz	55°	50°
Input Connection		4P Push Terminal	4P Push Terminal
Enclosure Material		ABS (V0)	ABS (V0)
Enclosure Color(Front)		White	White
Grill Material		Metal Grill	Metal Grill
Grill Color		White	White
Cut-Out Diameter(Ø, mm)		Ø220~230	Ø220~230
Weight (Net)		2.47kg	3.2kg
Dimensions (Ø(WxH)xD, mm)		Ø286 x 263 x 151	Ø286 x 263 x 151
Weather Resistant		-	-
Flame resistant		O	O
Certification		-	-
Included Accessories		-	-



# SPEAKERS for ANNOUNCEMENT



6.5" Full-range Ceiling Speaker

## CS-610F/615F

The CS-610F/615F is a ceiling speaker suitable for emergency broadcasting, for preventing the fire from occurring due to the speaker, V-0 grade flame retardant material is used in compliance with international standards. It is recommended for the public construction, firefighting compliance.



Unit



Rear



Side

### FEATURES

- **6.5" Full-range speaker**

- **Using High quality matching transformer (100V)**

- **Suitable for music playing**

It is suitable for playing music with a wide band bandwidth ranging from 400Hz~4kHz.

- **In compliance with international standards**

It is a high quality speaker with high reliability, durability and flame retardancy guaranteed by development and production according to international standards.

- **Dust filter**

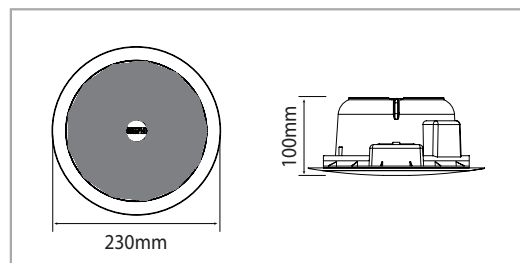
Use a dust filter inside the grill to block dust ingress and maintain a clean grill.

- **How to install**

Refer to no.1 of the SPEAKER INSTALLATION GUIDE on pages 36-39.



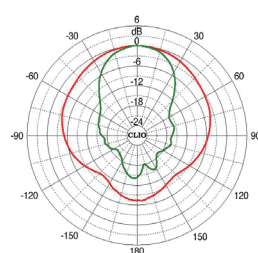
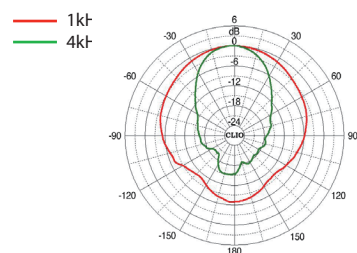
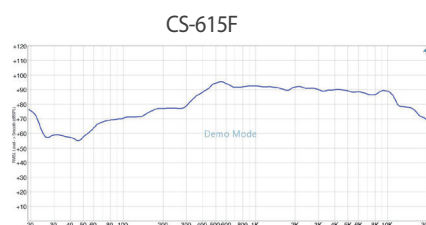
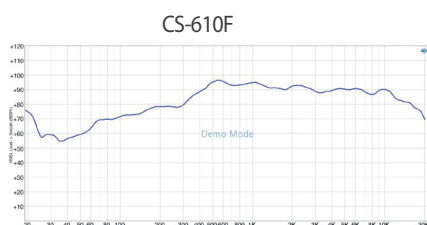
## DIMENSION



## POWER SELECTION

CS-610F	10W(1k $\Omega$ )	5W(2k $\Omega$ )	3W(3.3k $\Omega$ )
CS-615F	15W(660 $\Omega$ )	7.5W(1.3k $\Omega$ )	3.8W(2.6k $\Omega$ )

## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## SPECIFICATION

Model		CS-610F	CS-615F
Type		6.5" Full-range Ceiling Speaker	6.5" Full-range Ceiling Speaker
Unit		6.5"	6.5"
Power Handling(AES)		10W	15W
Input Power	100V	10/5/3W	15/7.5/3.75W
Impedance	100V	1k/2k/3.3k $\Omega$	660/1.3k/2.6k $\Omega$
Power Selection		Slide Switch	Slide Switch
Frequency Range(-10dB)		300Hz ~ 15.8kHz	300Hz ~ 12kHz
Frequency Range(-20%)		100Hz ~ 19.4kHz	105Hz ~ 18kHz
Sensitivity (1W/1m, 1kHz)		89dB	89dB
Maximum SPL[Cont]		99dB	101dB
Nominal Dispersion (Conical)	1kHz	180°	180°
	4kHz	62°	64°
Input Connection		Bi-Wired	Bi-Wired
Enclosure Material		HIPS (V0)	HIPS (V0)
Enclosure Color(Front)		Gray	Gray
Grill Material		Metal Grill	Metal Grill
Grill Color		Light Gray	Light Gray
Cut-Out Diameter( $\varnothing$ , mm)		$\varnothing$ 200~210	$\varnothing$ 200~210
Weight (Net)		860g	880g
Dimensions ( $\varnothing$ (WxH)xD, mm)		$\varnothing$ 230 x 100	$\varnothing$ 230 x 100
Weather Resistant		-	-
Flame resistant		O	O
Certification		KS	KS
Included Accessories		-	-

\*1 : 1/2 Half Size



# SPEAKERS for ANNOUNCEMENT



6.5" Full-range Ceiling Speaker

## CS-610

CS-610 is a Ceiling Speaker optimized for announcement and emergency broadcasting, and designed for high sound pressure. By adopting the method of fixing the grill by using the spring, it is possible to install easily, and 10W, 5W, and 3W output tabs are provided so that users can freely select and install them according to the installation environment.



Unit



Rear



Side

### FEATURES

- **6.5" Full-range speaker**

- **Using High quality matching transformer (100V)**

- **Suitable for music playing**

It is suitable for playing music with a wide band bandwidth ranging from 400Hz~4kHz.

- **Corrosion protection**

Apply corrosion protection coating to enable installation and operation in humid environments.

- **Dust filter**

Use a dust filter inside the grill to block dust ingress and maintain a clean grill.

- **Easy installation**

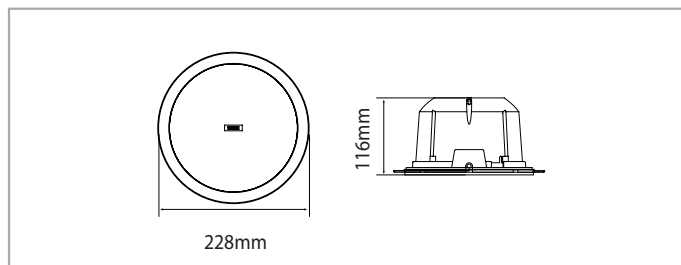
The removable grill is adopted and it is easy to remove and attach. In addition, safety is improved by connecting the unit and cover with wire.

- **How to install**

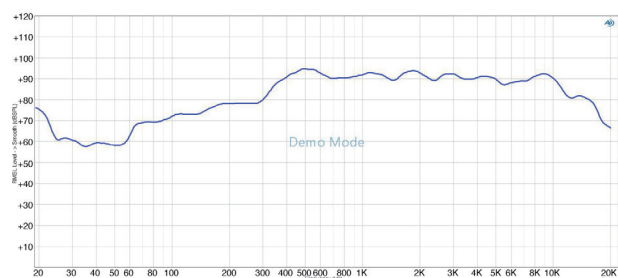
Refer to no.1 of the SPEAKER INSTALLATION GUIDE on pages 36-39.



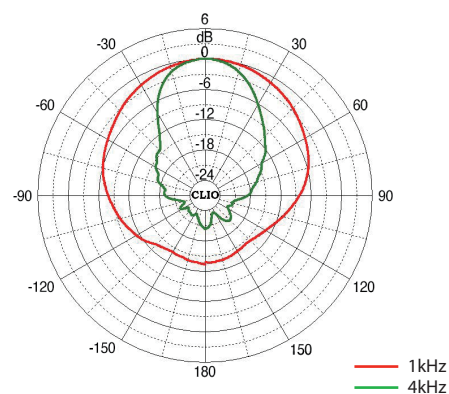
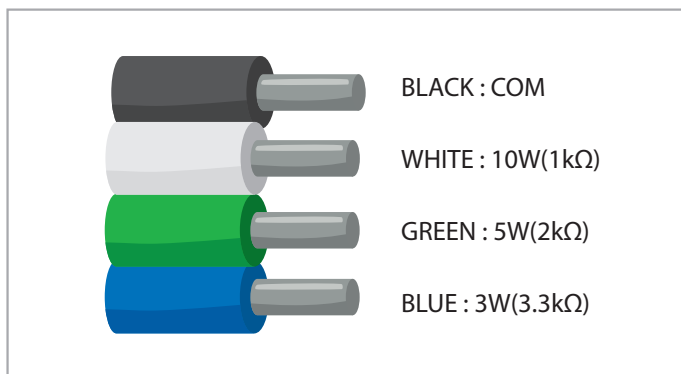
## DIMENSION



## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## POWER SELECTION



## SPECIFICATION

Model		CS-610
Type		6.5" Full-range Ceiling Speaker
Unit		6.5"
Power Handling(AES)		10W
Input Power	100V	10/5/3W
Impedance	100V	1k/2k/3.3kΩ
Power Selection		By Wiring
Frequency Range(-10dB)		300Hz ~ 15.4kHz
Frequency Range(-20%)		100Hz ~ 17.4kHz
Sensitivity (1W/1m, 1kHz)		90dB
Maximum SPL[Cont]		100dB
Nominal Dispersion (Conical)	1kHz	167°
	4kHz	56°
Input Connection		Bi-Wired
Enclosure Material		HIPS (HB)
Enclosure Color(Front)		Light Gray
Grill Material		Metal Grill
Grill Color		Light Gray
Cut-Out Diameter(Ø, mm)		Ø195~200
Weight (Net)		880g
Dimensions (Ø(WxH)xD, mm)		Ø228 x 116
Weather Resistant		-
Flame resistant		-
Certification		-
Included Accessories		-



# SPEAKERS for ANNOUNCEMENT



6.5" Full-range Ceiling Speaker

## CS-610M

CS-610M is Ceiling Speaker supports output with high sound pressure for announcement and emergency broadcasting.

It is made of metal enclosure and has excellent durability. It is possible to install more rigidly by fixing method using separate grill and bracket. 10W, 5W, and 3W output tabs are provided so that users can freely select and install them according to the installation environment.



Unit



Rear



Side

### FEATURES

- **6.5" Full-range speaker**
- **Using High quality matching transformer (100V)**
- **Dust filter**  
Use a dust filter inside the grill to block dust ingress and maintain a clean grill.
- **Easy installation**  
The removable grill is adopted and it is easy to remove and attach. In addition, safety is improved by connecting the unit and cover with wire.

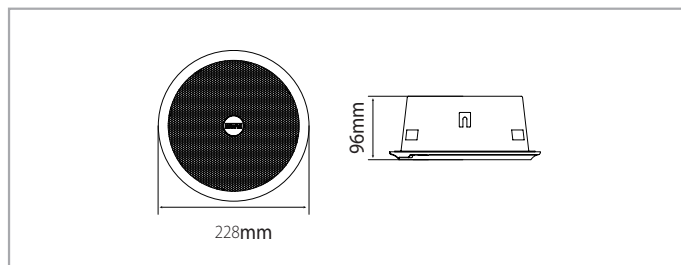
- **How to install**

Refer to no.1 of the SPEAKER INSTALLATION GUIDE on pages 36-39.

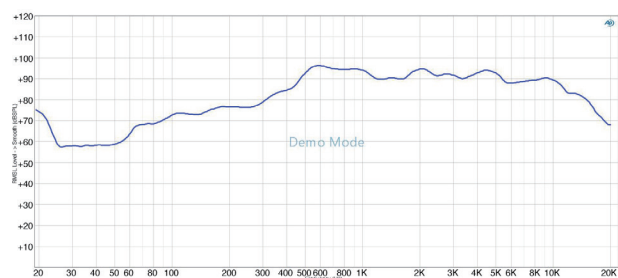




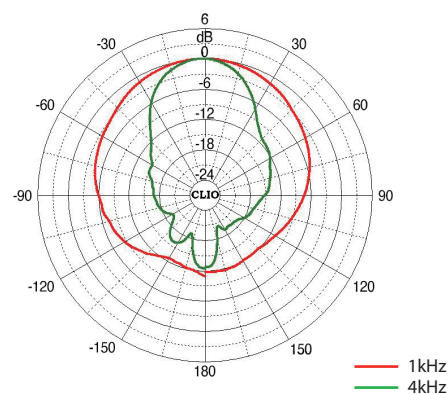
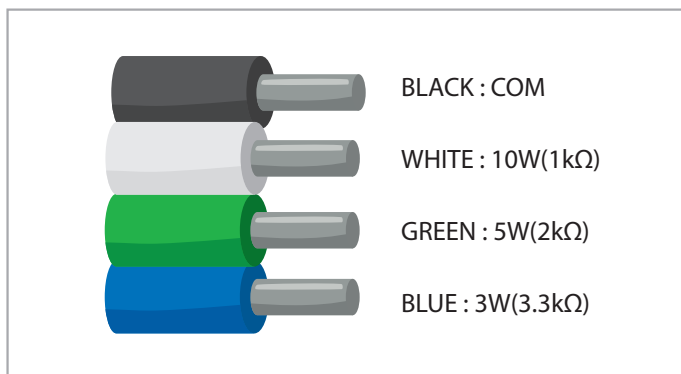
## DIMENSION



## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## POWER SELECTION



## SPECIFICATION

Model		CS-610M
Type		6.5" Full-range Ceiling Speaker
Unit		6.5"
Power Handling(AES)		10W
Input Power	100V	10/5/3W
Impedance	100V	1k/2k/3.3kΩ
Power Selection		By Wiring
Frequency Range(-10dB)		310Hz ~ 15kHz
Frequency Range(-20%)		100Hz ~ 17.4kHz
Sensitivity (1W/1m, 1kHz)		90dB
Maximum SPL[Cont]		100dB
Nominal Dispersion (Conical)	1kHz	168°
	4kHz	58°
Input Connection		Bi-Wired
Enclosure Material		Aluminum
Enclosure Color(Front)		White
Grill Material		Metal Grill
Grill Color		Gray
Cut-Out Diameter(Ø, mm)		Ø195~200
Weight (Net)		960g
Dimensions (Ø(WxH)xD, mm)		Ø228 x 96
Weather Resistant		-
Flame resistant		O
Certification		-
Included Accessories		-

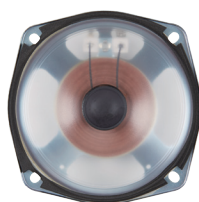
# SPEAKERS for EXPOSURE TYPE



5" Exposure Ceiling Speaker

## CS-503FE

CS-503FE is an exposed Ceiling Speaker that can be installed on a ceiling or a wall that has no textile finish. Using V-0 grade flame retardant material suitable for international standards, it is possible to broadcast for a long time under emergency such as fire.



Unit



Rear



Side

### FEATURES

- **5" Full-range speaker**

- **Using High quality matching transformer (100V)**

- **Easy to installation**

It is possible to install on the wall surface without the need for a cut-out hole.

- **Water-resistant cone of the speaker**

CS-503FE adopts PP made water-resistant cone of the speaker that prevents the unit from corrosion. So, the speaker even maximizes its strength in high humidity environments.

- **V0 rated flame resistant material**

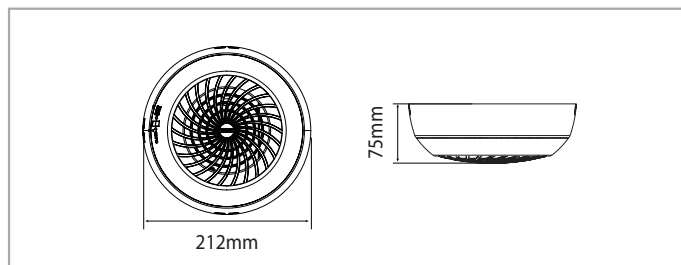
By made up of HIPS V0 rated flame resistant material, it is safe to conduct a long-hour operation even in emergency situations such as sudden disasters and fire.

- **How to install**

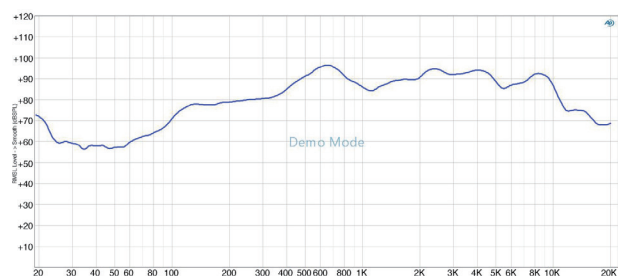
Refer to no.5 of the SPEAKER INSTALLATION GUIDE on pages 36-39.



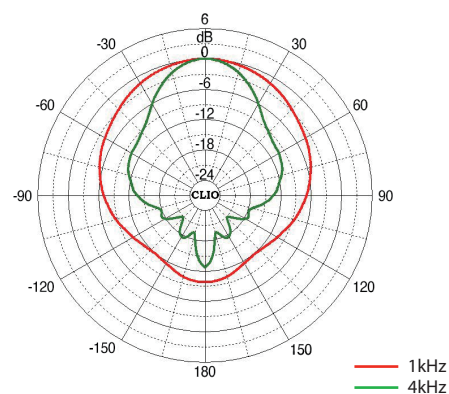
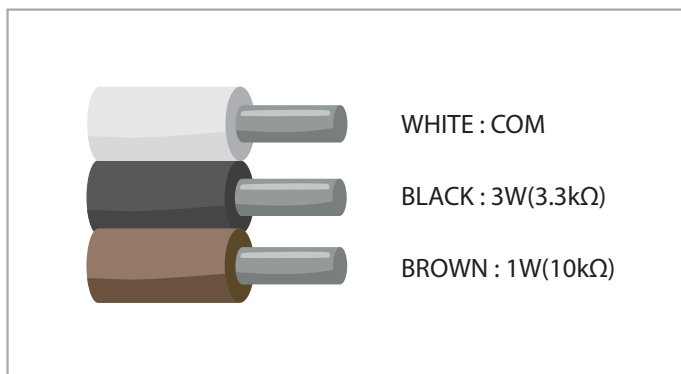
## DIMENSION



## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## POWER SELECTION



## SPECIFICATION

Model		CS-503FE
Type		5" Exposure Ceiling Speaker
Unit		5"
Power Handling(AES)		3W
Input Power	100V	3/1W
Impedance	100V	3.3k/10k $\Omega$
Power Selection		By Wiring
Frequency Range(-10dB)		200Hz ~ 11kHz
Frequency Range(-20%)		100Hz ~ 15.5kHz
Sensitivity (1W/1m, 1kHz)		89dB
Maximum SPL[Cont]		94dB
Nominal Dispersion (Conical)	1kHz	180°
	4kHz	60°
Input Connection		Bi-Wired
Enclosure Material		HIPS (V0)
Enclosure Color(Front)		White
Grill Material		HIPS (V0)
Grill Color		White
Cut-Out Diameter(Ø, mm)		Ø210
Weight (Net)		650g
Dimensions (Ø(WxH)xD, mm)		Ø212 x 75
Weather Resistant		-
Flame resistant		O
Certification		KS
Included Accessories		-



# SPEAKERS for SPECIAL ENVIRONMENT



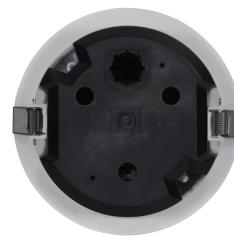
5" Full-range Ceiling Speaker

## CS-503F/510F

The CS-503F/510F is designed with a circular-sized footprint and is suitable for use in spaces where interior design is important, such as commercial facilities and residential facilities. It is a multi-purpose speaker that can be used continuously without any interruption in the fire by using flame retardant material suitable for international standards. It adopts the clip type fixing method and is designed with the same perforation size as circular light, so it is very convenient to construct.



Unit



Rear



Side

### FEATURES

- **5" Full-range speaker**

- **Using High quality matching transformer (100V)**

- **150mm cut-out dimension**

With the same size of the ordinary cut-out dimension of lighting equipment, it is easy to conduct field installation.

- **Rich bass**

It uses the advanced voice coil to provide a low-frequency range despite its compact size.

- **In compliance with international standards**

It is a high quality speaker with high reliability, durability and flame retardancy guaranteed by development and production according to international standards.

- **Dust filter**

Use a dust filter inside the grill to block dust ingress and maintain a clean grill.

- **Easy installation**

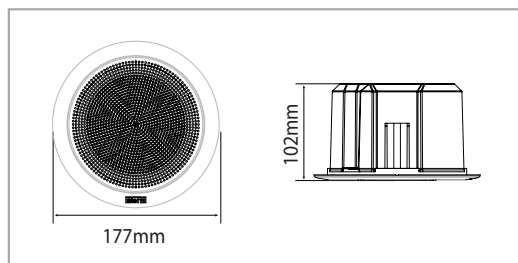
It is easy to install as ceiling clip type without additional tools.

- **How to install**

Refer to no.6 of the SPEAKER INSTALLATION GUIDE on pages 36-39.



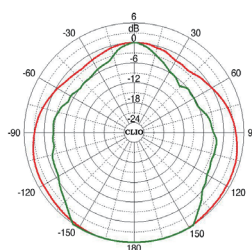
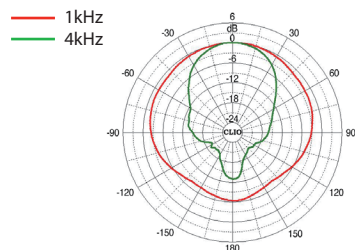
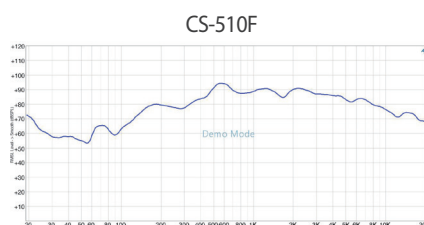
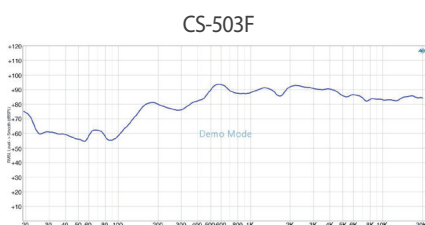
## DIMENSION



## POWER SELECTION

	CS-503F	CS-510F
	COM	COM
BLACK	3W(3.3kΩ)	10W(1kΩ)
WHITE	2W(5kΩ)	5W(2kΩ)
GREEN	1W(10kΩ)	3W(3.3kΩ)
BLUE		

## FREQUENCY RANGE/POLAR PATTERN (1kHz/4kHz)



## SPECIFICATION

Model		CS-503F	CS-510F
Type		5" Full-range Ceiling Speaker	5" Full-range Ceiling Speaker
Unit		5"	5"
Power Handling(AES)		3W	10W
Input Power	100V	3/2/1W	10/5/3W
Impedance	100V	3.3k/5k/10kΩ	1k/2k/3.3kΩ
Power Selection		By Wiring	By Wiring
Frequency Range(-10dB)		150Hz ~ 20kHz	145Hz ~ 10kHz
Frequency Range(-20%)		130Hz ~ 20kHz	120Hz ~ 18kHz
Sensitivity (1W/1m, 1kHz)		87dB	86dB
Maximum SPL[Cont]		91dB	98dB
Nominal Dispersion (Conical)	1kHz	180°	180°
	4kHz	76°	83°
Input Connection		INPUT Line Direct Connection	INPUT Line Direct Connection
Enclosure Material		ABS AF-303 V0	ABS AF-303 V0
Enclosure Color(Front)		White	White
Grill Material		ABS AF-303 V0	ABS AF-303 V0
Grill Color		White	White
Cut-Out Diameter(Ø, mm)		Ø150	Ø150
Weight (Net)		490g	690g
Dimensions (Ø(WxH)xH, mm)		Ø177 x 102	Ø177 x 102
Weather Resistant		-	-
Flame resistant		O	O
Certification		KS	KS
Included Accessories		-	-

\*1 : 1/2 Half Size

# SPEAKERS for APT TYPE



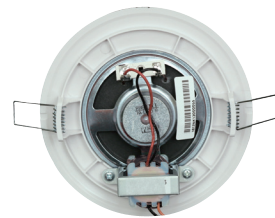
3" Full-range Ceiling Type Apart Speaker

## CS-301FC/303FC

The CS-301FC/303FC is a round speaker optimized for announcements in apartments and multi-family homes. Compact design using a 3-inch driver does not affect the aesthetics of the interior, and it is very convenient to use the clip type fixing system. In compliance with international standards, it is recommended to use it as a speaker for emergency broadcasting in general apartment and public housing.



Unit



Rear



Side

### FEATURES

- 1Way speaker system
- High quality trans version
- Aesthetic design

- **In compliance with international standards**

It is a high quality speaker with high reliability, durability and flame retardancy guaranteed by development and production according to international standards.

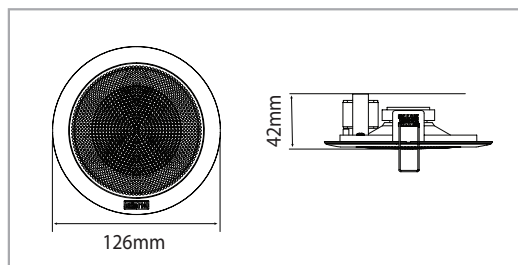
- Nonflammable material
- Easy installation (Clip type)
- How to install

Refer to no.6 of the SPEAKER INSTALLATION GUIDE on pages 36-39.



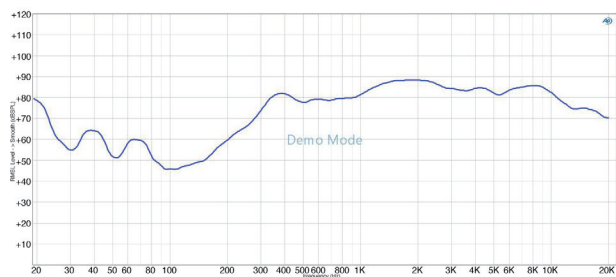


## DIMENSION

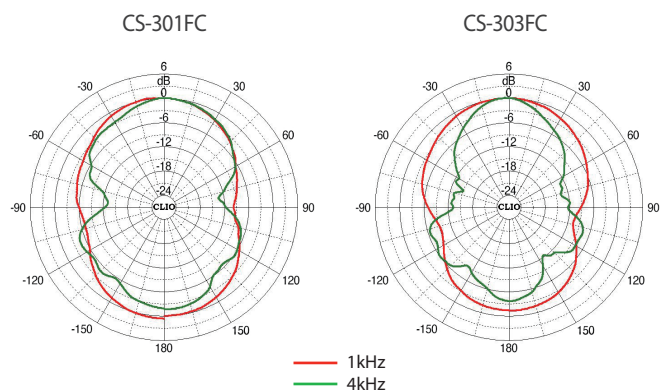


## FREQUENCY RANGE

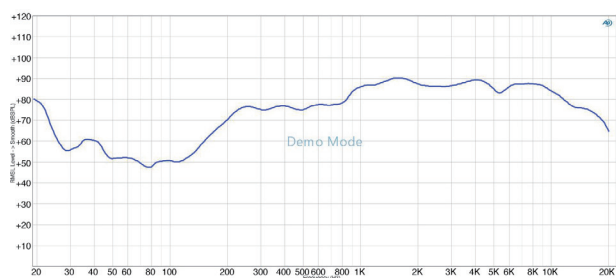
CS-301FC



## POLAR PATTERN (1kHz/4kHz)



CS-303FC



## SPECIFICATION

Model		CS-301FC	CS-303FC
Type		3" Full-range Ceiling Type Apart Speaker	3" Full-range Ceiling Type Apart Speaker
Unit		3"	3"
Power Handling(AES)		1W	3W
Input Power	100V	1W	3W
Impedance	100V	10kΩ	3.3kΩ
Power Selection		By Wiring	By Wiring
Frequency Range(-10dB)		285Hz ~ 18.4kHz	210Hz ~ 17kHz
Frequency Range(-20%)		230Hz ~ 20kHz	180Hz ~ 19.5kHz
Sensitivity (1W/1m, 1kHz)		80dB	83dB
Maximum SPL[Cont]		80dB	88dB
Nominal Dispersion (Conical)	1kHz	147°	151°
	4kHz	114°	74°
Input Connection		Bi-Wired	Bi-Wired
Enclosure Material		ABS+PC (V0)	ABS+PC (V0)
Enclosure Color(Front)		White	White
Grill Material		ABS+PC (V0)	ABS+PC (V0)
Grill Color		White	White
Cut-Out Diameter(Ø, mm)		Ø110 ~ 115	Ø110 ~ 115
Weight (Net)		170g	200g
Dimensions (Ø(WxH)xD, mm)		Ø126 x 42	Ø126 x 42
Weather Resistant		-	-
Flame resistant		O	O
Certification		KS	KS
Included Accessories		-	-

# SPEAKERS for APT TYPE



3" Full-range Square Wall Type Apart Speaker

## CS-301FQ/303FQ

The CS-301FQ/303FQ is a square speaker optimized for announcements in apartments and multi-family homes.

Compact design with 3-inch drivers, does not affect the aesthetics of the interior. In compliance with international standards, it is recommended to use it as a speaker for emergency broadcasting in general apartment and public housing.



Unit



Rear



Side

### FEATURES

- 1Way speaker system

- High quality trans version

- Aesthetic design

- In compliance with international standards

It is a high quality speaker with high reliability, durability and flame retardancy guaranteed by development and production according to international standards.

- Nonflammable material

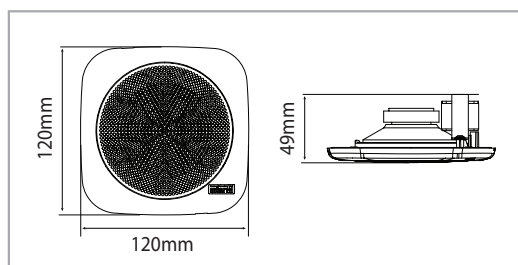
- Easy installation

- How to install

Refer to no.7 of the SPEAKER INSTALLATION GUIDE on pages 36-39.

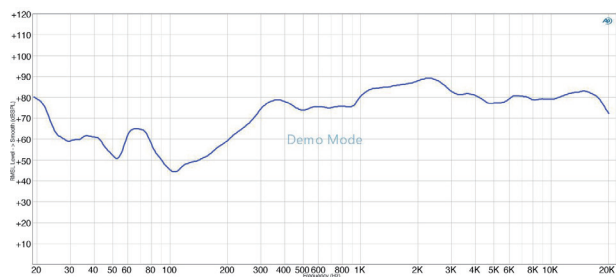


## DIMENSION

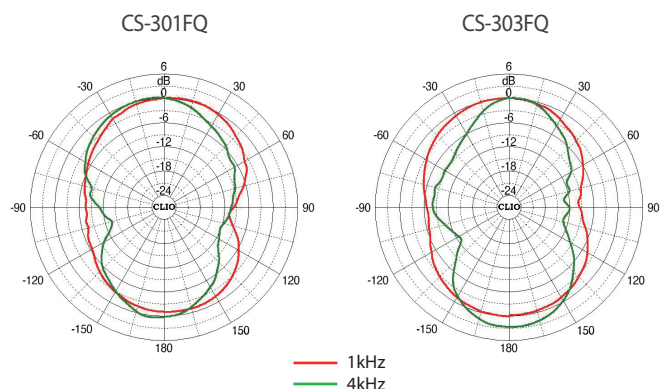


## FREQUENCY RANGE

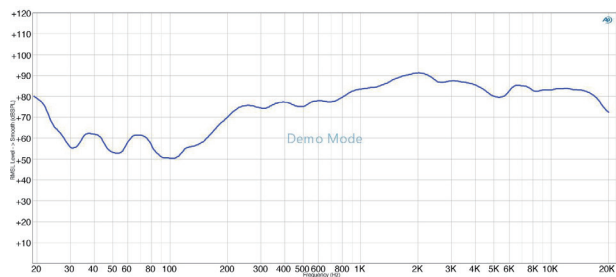
CS-301FQ



## POLAR PATTERN (1kHz/4kHz)



CS-303FQ



## SPECIFICATION

Model		CS-301FQ	CS-303FQ
Type		3" Full-range Square Wall Type Apart Speaker	3" Full-range Square Wall Type Apart Speaker
Unit		3"	3"
Power Handling(AES)		1W	3W
Input Power	100V	1W	3W
Impedance	100V	10kΩ	3.3kΩ
Power Selection		By Wiring	By Wiring
Frequency Range(-10dB)		270Hz ~ 20kHz	210Hz ~ 20kHz
Frequency Range(-20%)		220Hz ~ 20kHz	180Hz ~ 20kHz
Sensitivity (1W/1m, 1kHz)		79dB	82dB
Maximum SPL[Cont]		79dB	87dB
Nominal Dispersion (Conical)	1kHz	137°	142°
	4kHz	115°	73°
Input Connection		Bi-Wired	Bi-Wired
Enclosure Material		ABS+PC (V0)	ABS+PC (V0)
Enclosure Color(Front)		White	White
Grill Material		ABS+PC (V0)	ABS+PC (V0)
Grill Color		White	White
Cut-Out Diameter(Ø, mm)		-	-
Weight (Net)		190g	210g
Dimensions (Ø(WxH)xD, mm)		120 x 120 x 49	120 x 120 x 49
Weather Resistant		-	-
Flame resistant		O	O
Certification		KS	KS
Included Accessories		M4 SCREW 4EA	M4 SCREW 4EA

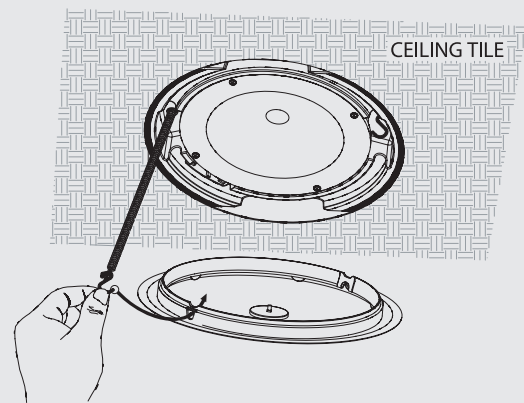
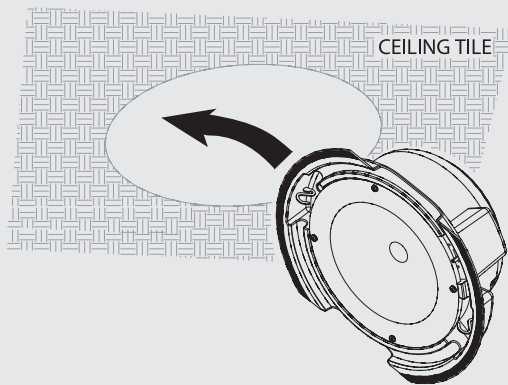


# SPEAKER

## INSTALLATION GUIDE

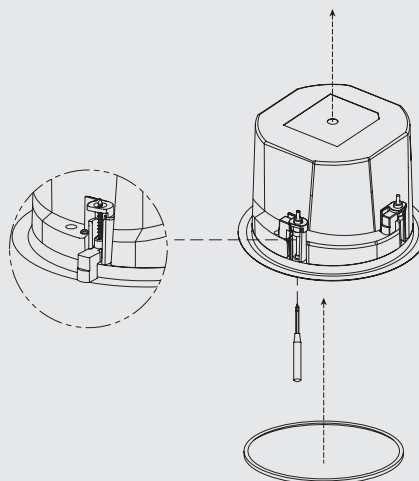
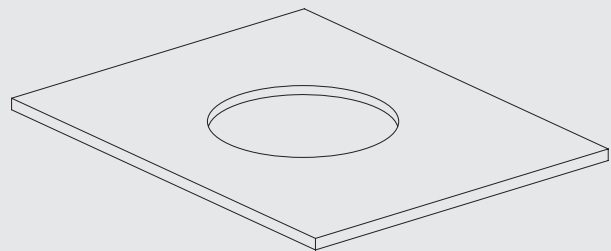
### 1. Hook type \_ CS-610, CS-610F/615F, CS-815FH/830FH

1. Insert the body unit (front grille cover removed) into the hole on the ceiling.
2. Align the center of the unit with the hole and position it so that it does not come out through both wings.
3. Pull forward the hooks connected to the spring into the grooves on both sides and hook them on the side holes of the front grill cover.
4. Repeat the same procedure for the other side and place it on the ceiling in line with the center.
5. If the holes on the ceiling are assembled invisibly, check whether they are in close contact.



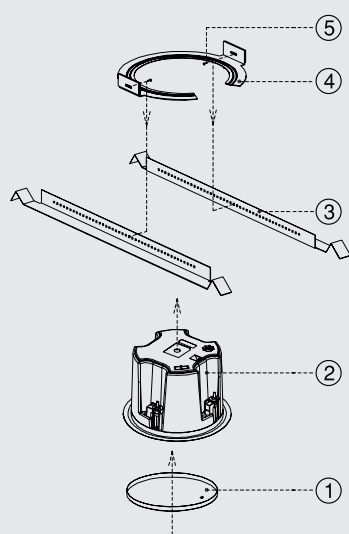
### 2. Screw lever type \_ CS-620FH/630FH/680FH, CS-660MH/880MH

1. After removing the grille cover, insert the set into the hole on the ceiling.
2. Tighten the screws inside the holes located in the four directions with a screwdriver.  
(Do not tighten one at a time, but tighten only loosely enough to allow the set to move.) Tighten the sequence in diagonal order, not clockwise / counterclockwise.
3. Align the approximate center and position the holes on the ceiling so that the gap is hidden from view.
4. Tighten all four screws until tight.
5. Insert the grill into the groove and push it all the way into the palm of your hand.

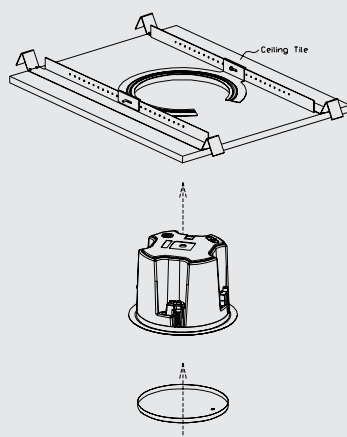


### 3. Screw Lever (Rail Bracket) Type \_ CS-620FH/630FH/680FH

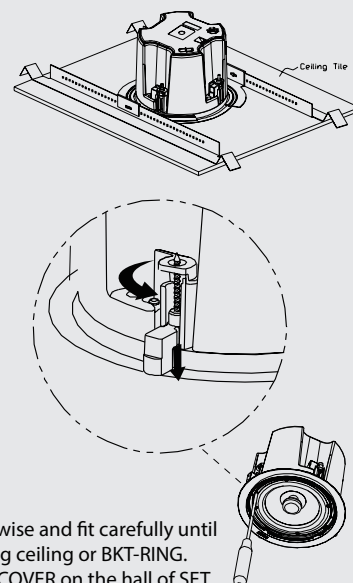
1. Position the rail brackets side by side in the ceiling.
2. Fit the socket of the ring bracket to No. 1 rail bracket, and fix the screws securely.
3. After inserting the body that the grill removed, tighten the screws in 4 directions until they come into close contact with the ceiling using a screwdriver. (Do not tighten one at a time, but tighten only loosely enough to allow the set to move.)  
Tighten the sequence in diagonal order, not clockwise/counterclockwise.
4. Align the approximate center and position the holes on the ceiling so that the gaps are hidden from view.
5. Tighten all four screws until they are tight.
6. Insert the grill into the groove and push it all the way into the palm of your hand.



5	SCREW 1WPTC 4 x 12B	2
4	BKT-RING	1
3	BKT-RAIL	2
2	SET	1
1	GRILL COVER	1
NO	NAME	QTY



※ Ceiling Hole Size :  $\varnothing 200 \sim \varnothing 205$

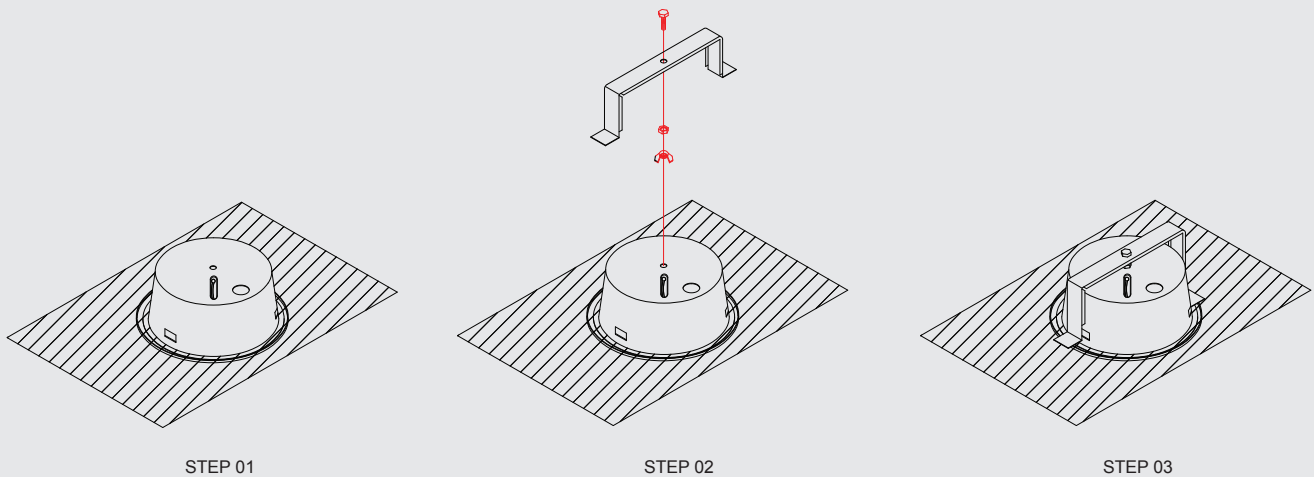


1. Turn clockwise and fit carefully until approaching ceiling or BKT-RING.
2. Put GRILL-COVER on the hall of SET and press to be combined.

# SPEAKER INSTALLATION GUIDE

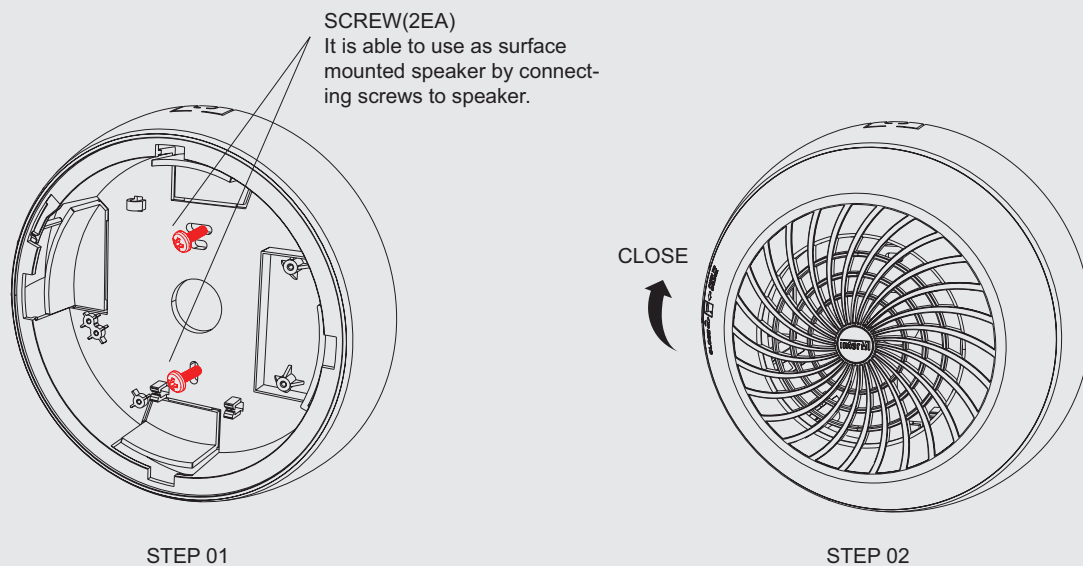
## 4. Bracket type \_ CS-610M

1. Assemble the cylinder cover and 'C' bracket so that they cannot be separated using screws and nuts. (Do not fix completely.)
2. Put the work set in step 1 into the hole in the ceiling and place the 'C' bracket on both sides of the ceiling so that it does not come out.
3. Turn the butterfly nut loosely fastened in 1. clockwise to tighten it completely.
4. Align the clip cover on the groove on both sides of the cylinder cover.
5. Slide it in until it is in close contact with the ceiling, and check that the hole in the ceiling is not visible after completion.



## 5. 2 points Built-in Screw Type \_ CS-503FE

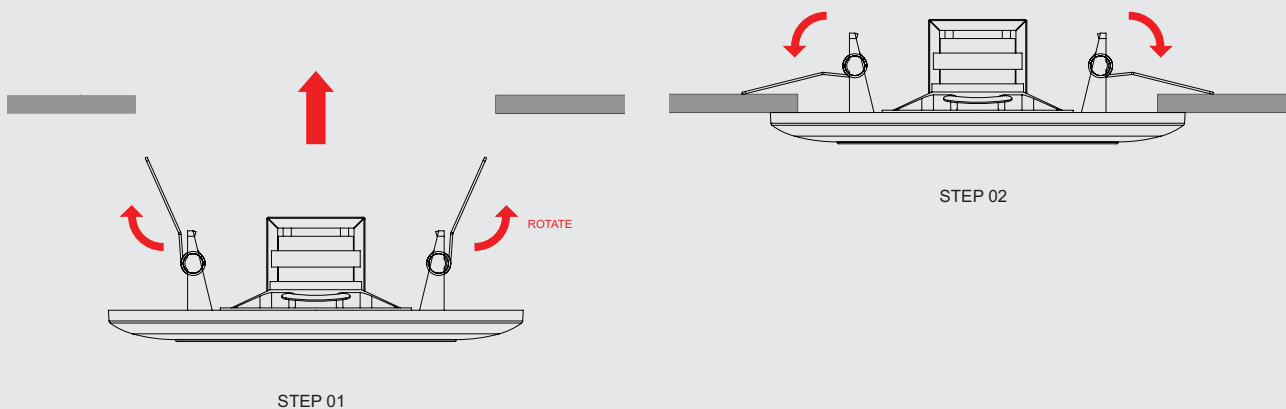
1. Mount the screws to the wall in the inner hole of the set with cover removed.
2. Turn the cover clockwise to assemble it.





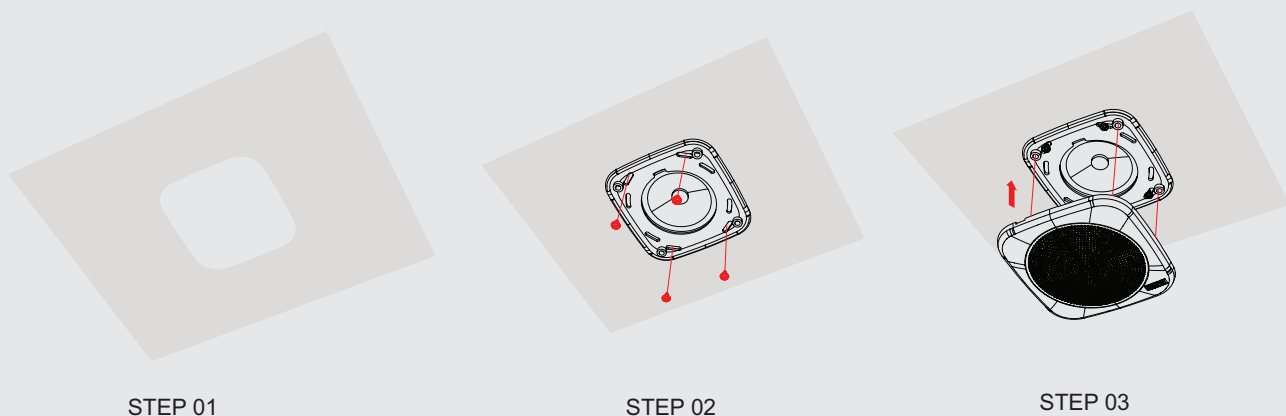
## 6. Clip spring type \_ CS-503F/510F, CS-301FC/303FC

1. Press both clip-type springs and turn enough to get inside the hole on the ceiling
2. Insert the spring into the hole to the extent for stretching and leave it from your hand, and slowly place the main unit on the ceiling.
3. Make sure that the gap between the product and the center of the hole is not visible.



## 7. 4 points Built-in Screw Type \_ CS-301FQ / 303FQ

1. Insert the UNIT of the body uncovered into the wall or the hole on the ceiling and fix it with screws
2. Insert the cover into the groove of the fixed body and press it until it comes in close contact with the wall or ceiling.



# CEILING SPEAKER



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※ Design and specification are subject to be changed for the improvement of product quality without pre notice.

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