



1438

Seikaku Technical Group Ltd.  
Offshore Chambers, P. O. Box 217 Apia, Samoa

Manufacturing plant  
Dongguan Jingheng Electron Co. Ltd.  
No.15, Shenle 1st Road, Hengli Town  
Dongguan, Guang Dong, P.R. China

18  
1438-CPR-0606

EN54-24: 2008  
Loudspeaker for voice alarm systems for the detection and fire  
alarm systems for buildings

CSB-20T(EN54-24)  
CSB-20TW(EN54-24)  
CSB-40T(EN54-24)  
CSB-40TW(EN54-24)  
Type A

Technical information available in paragraphs 2, 3, 4, 5 and 6 of this manual



## INDOORS MINI SPEAKER INSTRUCTION MANUAL



**CSB-20T(EN54-24)**  
**CSB-20TW(EN54-24)**  
**CSB-40T(EN54-24)**  
**CSB-40TW(EN54-24)**

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Thank you for purchasing SHOW CEILING Speaker  
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.



## 1. SAFETY PRECAUTIONS

## INSTRUCTION MANUAL

- 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.

#### **CAUTION**

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

#### **WARNING**

- Use only the specified amplifier output voltage and impedance, as exceeding the specified limits could result in fire or other failures (high-impedance version).
- To avoid accidental air explosions, do not use the unit around gasoline, thinner or other combustibles.
- 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.
- Protect the unit from exposure in snowy areas, as the weight of snow build-up could cause the speaker to fall, resulting in personal injury.
- Do not use other methods than specified to mount the bracket. Extreme force is applied to the unit and the unit could fall off, possibly resulting in personal injuries.
- 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.
- Avoid mounting the unit in locations exposed to constant vibration. The mounting bracket can be damaged by excessive vibration, potentially causing the speaker to fall, which could result in personal injury.

#### **CAUTION**

- To avoid electric shocks, be sure to switch off the amplifier power when connecting the speaker.
- Avoid installing the unit in humid or dusty locations, or in locations exposed to heaters, solvents, acid, alkali, smoke, steam or direct sunlight (except outdoor-use versions), as excessive exposure to these factors could result in speaker failure, fire or electric shock.
- 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.

Model No.	CSB-40T	CSB-40TW
Standard	Certified to the European Standard EN 54-24:2008 Loudspeaker for voice alarm systems for fire detection and fire alarm system. Certification Cation NO.1438-CPR-xxxx	
Environmental Type	TYPE A (Indoor applications)	
Built-In speaker	4" full range paper speaker	4" full range paper speaker
Rated Noise Power and Voltage	40W	40W
	(100V line and 70V line)	
Rated Impedance	100V line: 250Ω (40W), 500Ω (20W), 1kΩ (10W)	100V line: 250Ω (40W), 500Ω (20W), 1kΩ (10W)
	70V line: 122Ω (40W), 250Ω (20W), 500Ω (10W), 1kΩ (5W)	70V line: 122Ω (40W), 250Ω (20W), 500Ω (10W), 1kΩ (5W)
	BYPASS-8Ω	BYPASS-8Ω
Sensitivity	86dB(1W, 1m) (500Hz - 5 kHz, pink noise)	
	74dB(1W, 4m) (100Hz - 10 kHz pink noise) according to EN54-24	
	86dB (1W,1m) (100Hz - 10 kHz, pink noise) converted based on EN54-24	
Frequency Response	100Hz - 20kHz	100Hz - 20kHz
Maximum Sound Pressure Level	90dB(40W, 4m) (100Hz - 10 kHz pink noise) according to EN54-24	
	102dB (40W,1m) (100Hz - 10 kHz, pink noise) converted based on EN54-24	
Coverage Angle(-6dB)	Horizontal: 360° (500Hz), 220° (1 kHz), 120° (2 kHz), 87° (4 kHz)	Horizontal: 360° (500Hz), 220° (1 kHz), 120° (2 kHz), 87° (4 kHz)
	Vertical: 360° (500Hz), 214° (1 kHz), 116° (2 kHz), 99° (4 kHz)	Vertical: 360° (500Hz), 214° (1 kHz), 116° (2 kHz), 99° (4 kHz)
Weight	2.5Kg	2.5Kg
Dimensions(mm)	136(W) x 140(D) x 206(H)	136(W) x 140(D) x 206(H)
Speaker Component	4" (106 x 106mm) paper cone speaker	4" (106 x 106mm) paper cone speaker
Operating Temperature	-10°C to +50°C	-10°C to +50°C
Applicable Cable	Solid wire: φ0.8mm (18AWG) UL2464	Solid wire: φ0.8mm (18AWG) UL2464
Cable Connection	Push-in terminals (steatite terminal x 2) speaker cable with a diameter of 6mm White(+)/ Black(-)	
Finish	Enclosure: ABS+PC, Black Mesh speaker grill: Surface-treated steel plate, black paint Speaker Wall bracket: Surface-treated steel plate, black paint Joint bracket, screws and Stainless steel cable	Enclosure: ABS+PC, White Mesh speaker grill: Surface-treated steel plate, white paint Speaker Wall bracket: Surface-treated steel plate, white paint Joint bracket, screws and Stainless steel cable

## 2. GENERAL DESCRIPTION

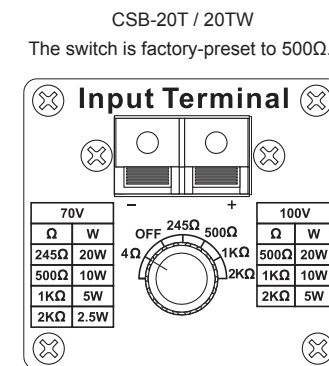
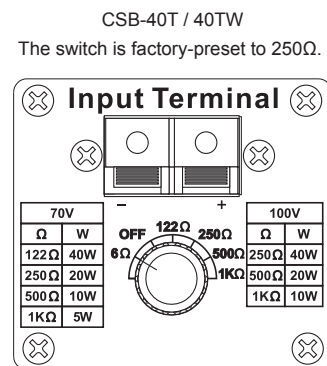
Speakers are compact two-way speaker systems designed for high efficiency, wide range, and high power input handling capability. These speaker systems can be installed in a manner ideal for the location and intended application. The speaker is certified to the European Standard EN 54 24:2008.

## 3. FEATURES

- Wide directivity high-frequency horn.
- Supplied bracket permits mounting to a wall.
- Impedance change available by a rotary switch located in rear side.
- Certified to EN 54-24:2008.

## 4. IMPEDANCE CHANGE

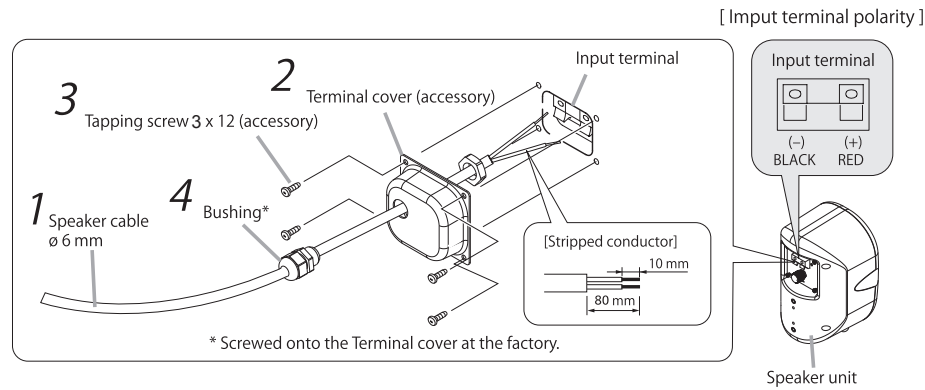
To change the impedance, Please rotate the rotary switch on the speaker's rear to select the desired input power.



## CAUTION

Never set this switch to the "250Ω" (CSB-20 series), "500Ω" (CSB-40 series) position when operating the speaker on 100 V line.  
Failure to follow this instruction could result in damage to the speaker or amplifier.

5. WIRING AND USING TERMINAL COVER



Notes

- For the speaker cable, use a cable with a diameter of 6mm, which will fit the cable bushing.
- To ensure waterproof capabilities, firmly mount the terminal cover to the speaker and tighten the bushing on the cover.

**Step 1:** Feed the speaker cable through the bushing and terminal cover, then connect the cable to the input terminal.

**Step 2:** Attach the terminal cover to the speaker.  
Attach the cover while pulling the cable so that it is not entangled inside the terminal cover.

**Step 3:** Hold the terminal cover tightly to the speaker using the supplied screws.

**Step 4:** Tighten the bushing.  
**Note:** After tightening the bushing by hand, use a tool to further tighten it another 90° (1/4-turn) or so. Note that parts can be damaged by over-tightening.

6. INSTALLATION

Note: Commercial audio installation system must conform to local building laws. When install speaker on wall or ceiling, please consult a building constructor with a license or a professional engineer. The corporation won't be responsible for the improper installation or damage because of not conforming to installation description.

Installation procedure of CS-3 bracket is very simple and convenient, the appearance is pleasing to the eye.

**Step 1:** Fasten the CS-3 bracket(1) on the wall with screws. The wall material must support the weight of the cabinet.

**Step 2:** Place the body of cabinet in CS - 3 bracket(2) and lock the screws tightly.

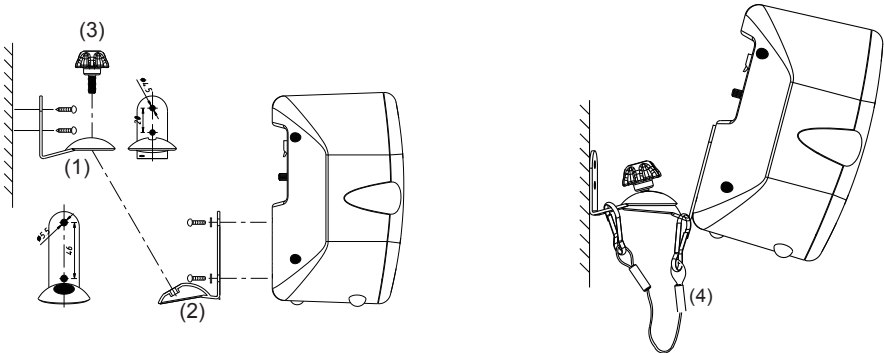
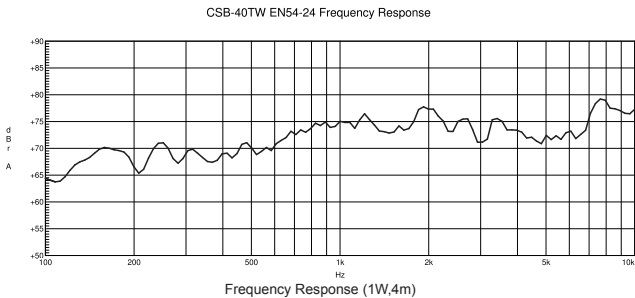
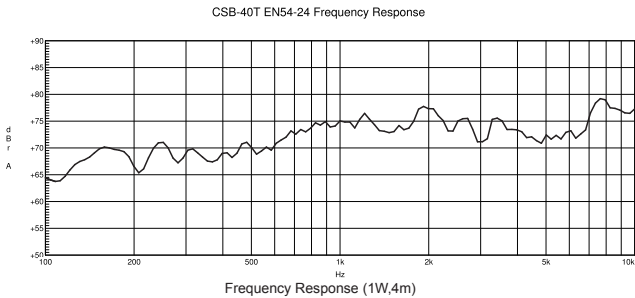
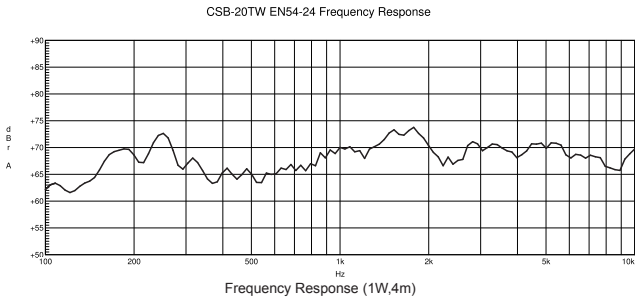
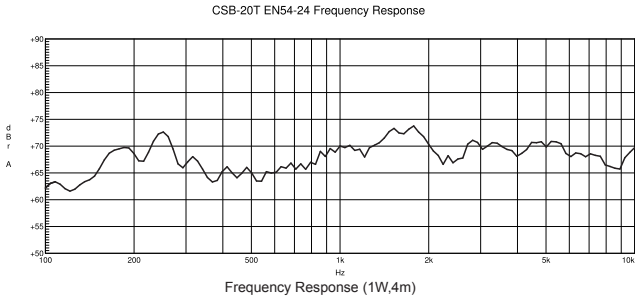
**Step 3:** Use screw (3) lock CS-3 bracket(1) and CS-3 bracket(2). Mand use steel rope (4) to connect two brackets.

10. SPECIFICATIONS

Model No.	CSB-20T	CSB-20TW
Standard	Certified to the European Standard EN 54-24:2008 Loudspeaker for voice alarm systems for fire detection and fire alarm system. Certification Cation NO.1438-CPR-xxxx	
Environmental Type	TYPE A (Indoor applications)	
Built-In speaker	3" full range paper speaker	3" full range paper speaker
Rated Noise Power and Voltage	20W	20W
	(100V line and 70V line)	
Rated Impedance	100V line: 500Ω (20W), 1kΩ (10W), 2kΩ (5W)	100V line: 500Ω (20W), 1kΩ (10W), 2kΩ (5W)
	70V line: 245Ω (20W), 500Ω (10W), 1kΩ (5W), 2kΩ (2.5W)	70V line: 245Ω (20W), 500Ω (10W), 1kΩ (5W), 2kΩ (2.5W)
	BYPASS-4Ω	BYPASS-4Ω
Sensitivity	82dB(1W, 1m) (500Hz - 5 kHz, pink noise)	
	70dB(1W, 4m) (100Hz - 10 kHz pink noise) according to EN54-24	
	82dB (1W,1m) (100Hz - 10 kHz, pink noise) converted based on EN54-24	
Frequency Response	132Hz - 20kHz	132Hz - 20kHz
Maximum Sound Pressure Level	83dB(20W, 4m) (100Hz - 10 kHz pink noise) according to EN54-24	
	95dB (20W,1m) (100Hz - 10 kHz, pink noise) converted based on EN54-24	
Coverage Angle(-6dB)	Horizontal: 360° (500Hz), 220° (1 kHz), 127° (2 kHz), 96° (4 kHz)	Horizontal: 360° (500Hz), 220° (1 kHz), 127° (2 kHz), 96° (4 kHz)
	Vertical: 360° (500Hz), 214° (1 kHz), 149° (2 kHz), 126° (4 kHz)	Vertical: 360° (500Hz), 214° (1 kHz), 149° (2 kHz), 126° (4 kHz)
Weight	1.4Kg	1.4Kg
Dimensions(mm)	115(W) x 107(D) x 175(H)	115(W) x 107(D) x 175(H)
Speaker Component	3" (77 x 77mm) paper cone speaker	3" (77 x 77mm) paper cone speaker
Operating Temperature	-10°C to +50°C	-10°C to +50°C
Applcable Cable	Solid wire: $\phi$ 0.8mm (18AWG) UL2464	Solid wire: $\phi$ 0.8mm (18AWG) UL2464
Cable Connection	Push-in terminals (steatile terminal x 2) speaker cable with a diameter of 6mm White(+)/ Black(-)	
Finish	Enclosure: ABS+PC, Black Mesh speaker grill: Surface-treated steel plate, black paint Speaker Wall bracket: Surface-treated steel plate, black paint Joint bracket, screws and Stainless steel cable	Enclosure: ABS+PC, White Mesh speaker grill: Surface-treated steel plate, white paint Speaker Wall bracket: Surface-treated steel plate, white paint Joint bracket, screws and Stainless steel cable

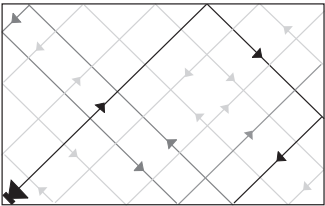


9. FREQUENCY RESPONSE

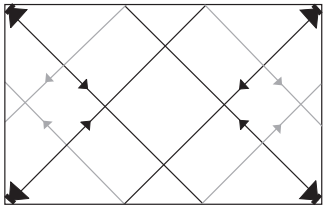


**INDOOR INSTALLATION DESCRIPTION:**

CSB series speakers are designed specially for fixing and using in different circumstances. The property of speakers may be different due to different circumstances. There is an acoustic surface (wall, floor and ceiling) in a closed room, so the acoustic indoor will turn complex. When acoustic wave hits the surface, a part of acoustic energy is reflected, and others are absorbed. Reflection and absorption are depending on the frequencies of acoustic wave and angle of hitting surface. When operate the cabinet, both man and furniture can absorb the acoustic energy. Please note the position of man and furniture when installing. Reverberation is the results of the reflected acoustic wave continue bouncing between the surfaces. Every reflection will loss the energy. When the acoustic hit the reflection surface, the room will be filled with random reflected acoustic wave. The music and address will be complex. It is recommended that install more speakers and make the volume of speakers lower to reduce the reverberation in high reverberating room. (Please see figure 5B)

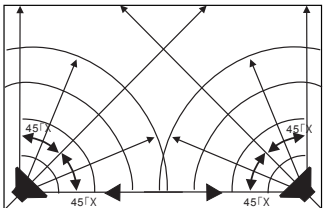


ONE LOUD SPEAKER  
(figure5A)

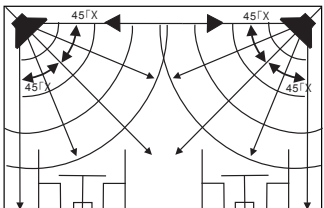


MULTIPLE QUIET SPEAKERS  
(figure5B)

Speaker coverage range - Direct the center axile of the speaker to the flat surface of receiving area. The speakers of 90°x 90° series can spread the speaker tone to all the directions at the axile of 45° . If you use the speakers in large room, you can divide the room to some zones. Then decide the installing location of the speakers . (Please see figure 6)



HORIZONTAL

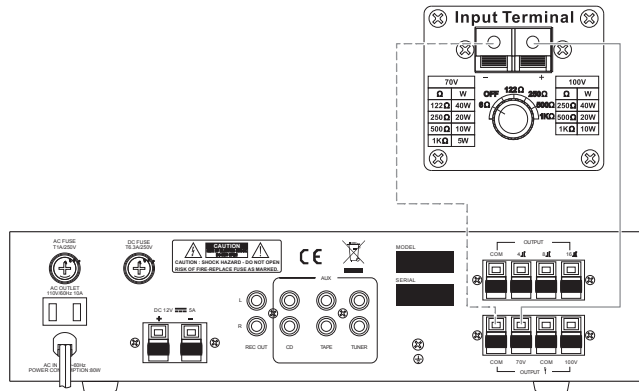


VERTICAL

## 7. CONNECTION DESCRIPTION

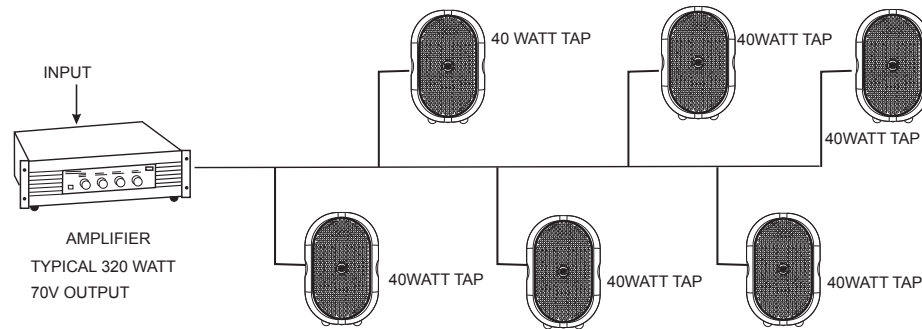
### LEVEL DISTRIBUTION SYSTEM CONNECTION DESCRIPTION:

CSB-20T and CSB-40T have built-in transformer of 70/100V, can connect many speakers to one channel, and only need one amplifier. The amplifier output terminal "com/-" stands for negative polar, terminal "70V /100V/+ " stands for positive. The red speaker terminal stands for positive, black stands for negative. Please connect amplifier to speaker right, incorrect connection may cause damage to amplifier and speaker. Finally set your desired output power, see picture 3A to adjust the band switch to meet your need, in this case, the total power of all the speakers can't exceed the nominal power of amplifier. One 320W amplifier channel can drive 8 speakers of 40W, i.e.  $40 \times 8 = 320 \leq 320W$ . For safety, the total power of all the speakers should be less than 3/4 nominal power of amplifier (One 320W amplifier channel can drive 6 speakers of 40W, i.e.  $40 \times 6 = 240W \leq 320W$ ).



(figure3A)

6 x 40 WATT=240 WATT TOTAL LOAD ON AMPLIFIER



(figure3B)

## 8. DIMENSIONAL DIAGRAM

