TOA

SPEAKER SYSTEMS H-2 H-2WP

Please follow the instructions in this manual to obtain the optimum results from this unit.
We also recommend that you keep this manual handy for future reference.

TABLE OF CONTENTS

TOA Corporation

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

⚠ WARNING

· 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.

· Use nuts and bolts that are appropriate for the ceiling's or wall's material and structure. 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.

· (Applicable to H-2 only)
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.

· Do not apply lubricant and rust inhibitor. If it contacts resin or rubber parts, they could deteriorate and cause the unit to fall, possibly resulting in personal injury.

· (Applicable to H-2WP only)
Avoid installing the unit in locations close to the seashore, or in indoor swimming pools or bathrooms. In such locations, the bracket may be vulnerable to corrosion, eventually allowing the unit to fall resulting in personal injury.

⚠ CAUTION

· Avoid touching the unit's sharp metal edge to prevent injury.

· 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 fire.

2. GENERAL DESCRIPTION

TOA's H-2 and H-2WP are small, dome-shaped 2-way speakers featuring high sound quality. The H-2 is designed for indoor use, and the H-2WP is designed for outdoor use.

Note: Protect the H-2WP from rain when installing. (Refer to P. 9 "6.1. Waterproofing".)

3. FEATURES

• The speaker's smooth curved surface allows it to blend in with the interiors of most modern buildings.

• A 10 cm woofer featuring high input capacity produces powerful low frequency sound despite its small size.

• The one-inch balanced dome tweeter features ferro-fluid to ensure superb transient response characteristics for clear, high frequency sound output and high power-handling capabilities.

• The speaker's built-in crossover network circuitry features sharp cut-off characteristics that realize uniform energy radiation while suppressing unwanted input signals to the woofer or tweeter.

• The speaker is designed with an emphasis on installation ease and safety, as well as easier conduit wiring when an electrical box is installed.

• The speaker's round mounting base frame allows the speaker to be installed at any mounting angle.
  Note: When mounting the H-2WP speaker to a wall, to ensure its watertightness it must not be tilted any more than 45 degrees up from its downward-facing position.

• A built-in matching transformer permits the speaker to be used for both high- and low-impedance applications. For low-impedance applications, either the 4 Ω or 16 Ω terminal can be selected. Impedance can be easily changed from outside the unit.

• Detachable screw terminals facilitate connection. Dual positive and negative terminals also facilitate bridge connections.

• The H-2's enclosure and front grille are made of fire-resistant ABS (UL Standard 94: V-0 Grade).

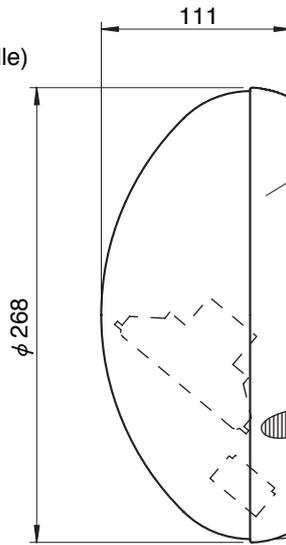• The structure of the speaker's front grille is specially designed for ease of refinishing and repainting.
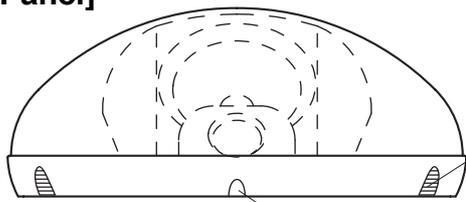
4. NOMENCLATURE

[Front Panel]   **[Side Panel]**

Unit: mm

Front grille (Grille)

111
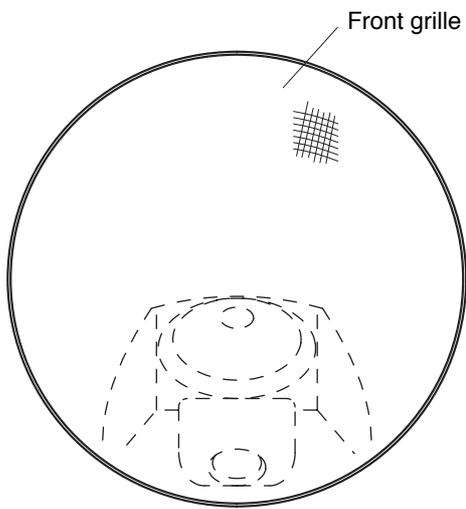
Front grille (grille frame)

ϕ 268

[Side Panel]

Anti-slip piece

Aiming marker

[Rear Panel]   · **Accessory (Base frame)**

Lock tab

83.3 (3 $^9/_{32}$")

(For mounting to an electrical box)

(For mounting to a wall, ceiling or supporting rail)

ϕ 181

76.4 (3")

69.9 (2 $^3/_4$")

(For mounting to an electrical box)

5.6

ϕ 21.6
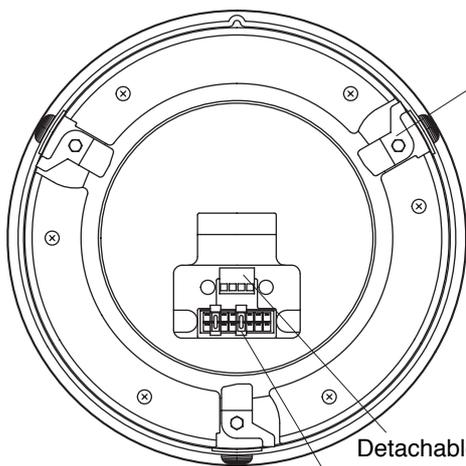
Detachable input connector

Connector for impedance selection

88.9 (3 $^1/_2$")

(For mounting to an electrical box)
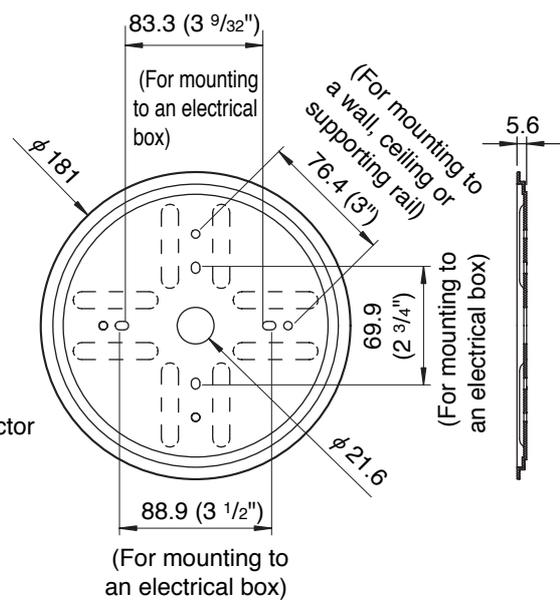
[Installation Example]

4
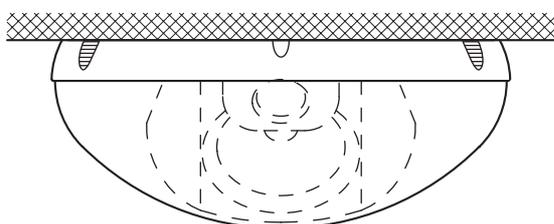
5. INSTALLATION

5.1. Direct Wall/Ceiling Mounting

Step 1. Base frame mounting

1-1. Pull the cables out of the wall or ceiling through the hole in the center of the base frame, then strip the insulation back about 5mm from the cable ends.

   Tip

   • Usable cable: Solid cable or stranded cable (0.2 mm² - 2.5 mm²) (Corresponding to AWG No. 24 - 14)

   • The base frame hole can also be used for 1/2″ EMT conduit fitting.

1/2" EMT conduit fitting

Base frame

About 5 mm
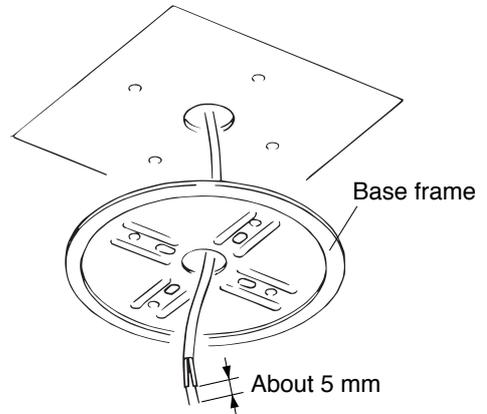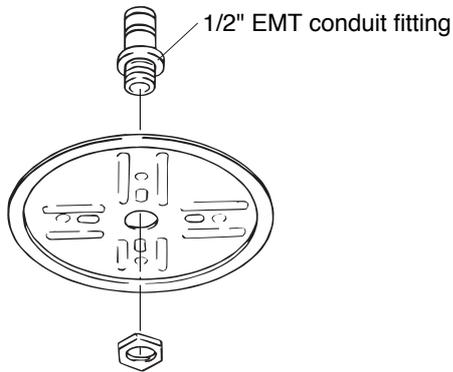
1-2. Secure the base frame to the wall or ceiling panel with screws at four places shown on the right.

   Notes

   • Use nuts and bolts (not supplied with the unit) that are appropriate for the structure and composition of the wall or ceiling.

   • Protect the H-2WP from rain when installing. (Refer to P. 9 "6.1. Waterproofing".)


76.4 (3")
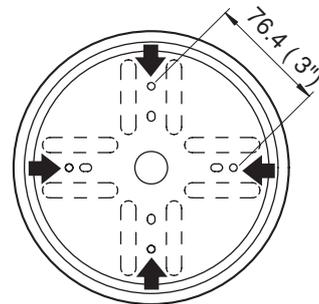
Step 2. Wiring and impedance changes

2-1. Unplug the detachable input connector from the speaker socket, and with a small slot screwdriver, loosen the screws of the terminals to use.
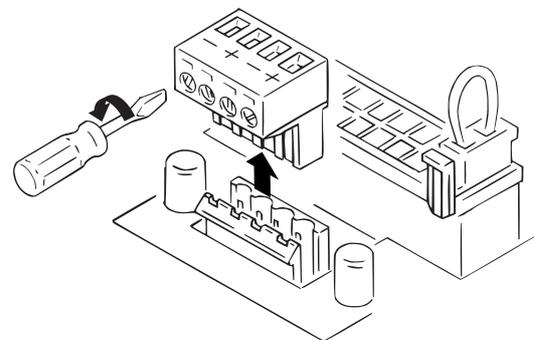
2-2. Insert the stripped cable ends into the input connector, and tighten the connector screws.

Note
When not bridging connections, be sure to also tighten the screws of the terminals not in use to avoid vibration or rattle noises.

• When not bridging connections

• When bridging connections

From amplifier

To next speaker
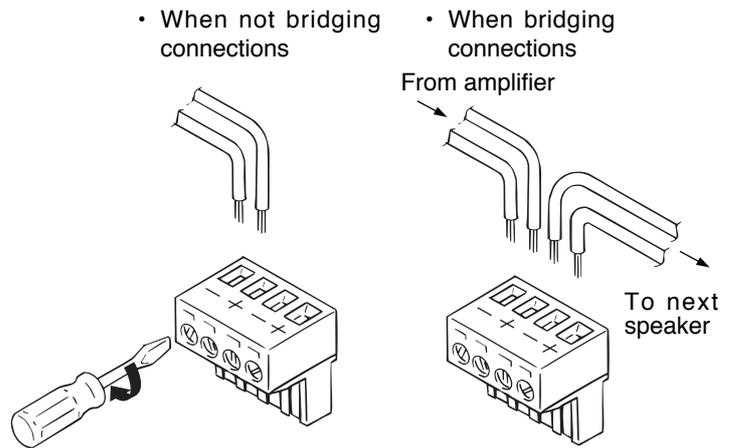
2-3. Attach two impedance selector sockets to the 16-pin connector to select the desired impedance. (Preset to 12 W for 100 V line and 6 W for 70 V line.)
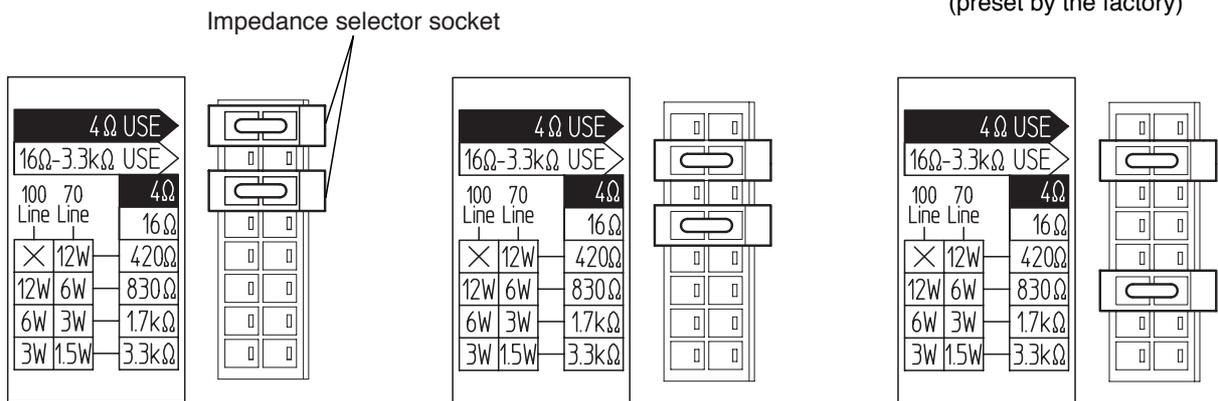
Note
The speakers are designed to be used for both 70 V and 100 V line applications. When using the 100 V line, do not select the "420 Ω" impedance, since the speaker itself or power amplifier may be damaged.
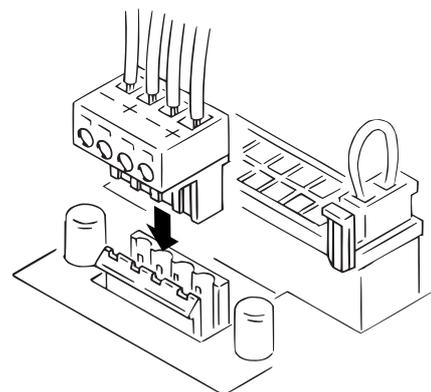
• When selecting 4 Ω

Impedance selector socket

• When selecting 16 Ω

• When selecting 830 Ω
(preset by the factory)

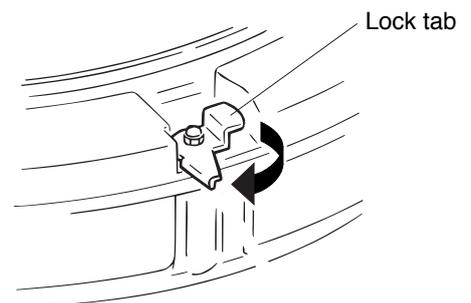| 4Ω USE		
16Ω–3.3kΩ USE		
100 Line	70 Line	4Ω
		16Ω
✕	12W	420Ω
12W	6W	830Ω
6W	3W	1.7kΩ
3W	1.5W	3.3kΩ

2-4. Insert the detachable input connector into the speaker socket.

Step 3. Speaker and grille mounting

3-1. Rotate the three speaker lock tabs away from their locking position on the edge of speaker.

Lock tab

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3-2. After aligning the speaker with the base frame, rotate the three lock tabs back into position to clamp the speaker to the base frame. (Temporary fixing state.)

Note
When mounting the speaker, do not touch its paper cone, as permanent damage to the speaker may result.

Base frame

Base frame

Speaker system
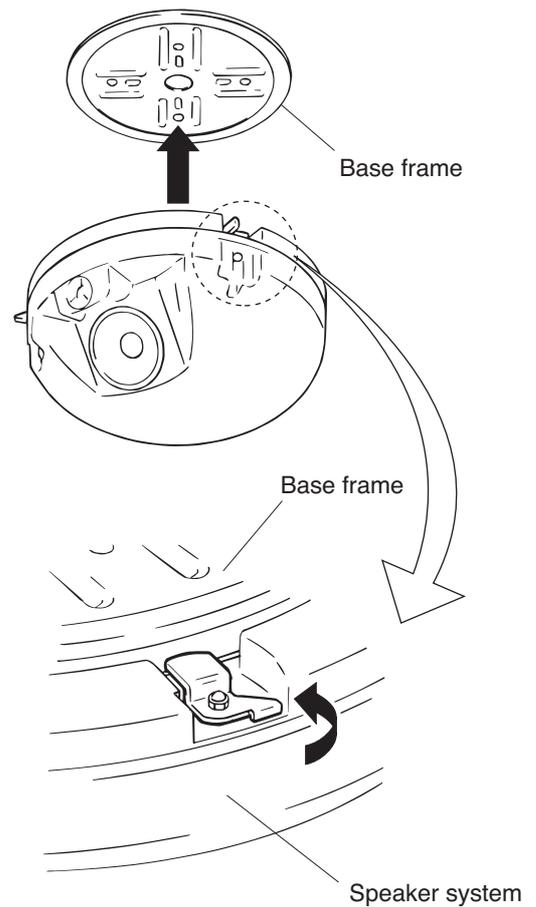
3-3. Position the speaker and tighten the three locking screws.

Locking screw   Stud screw
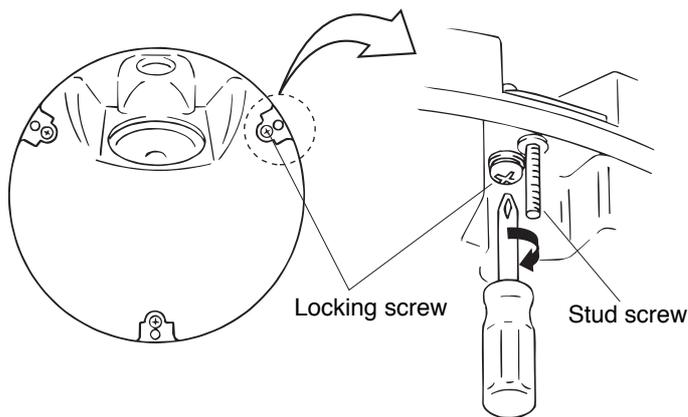
3-4. Set the front grille's aiming marker to the speaker front (i.e. speaker orientation) so that the three stud screws align with the corresponding stud receptacles, then push the grille onto the speaker.

Speaker front   Stud screw

Stud receptacle

Aiming marker
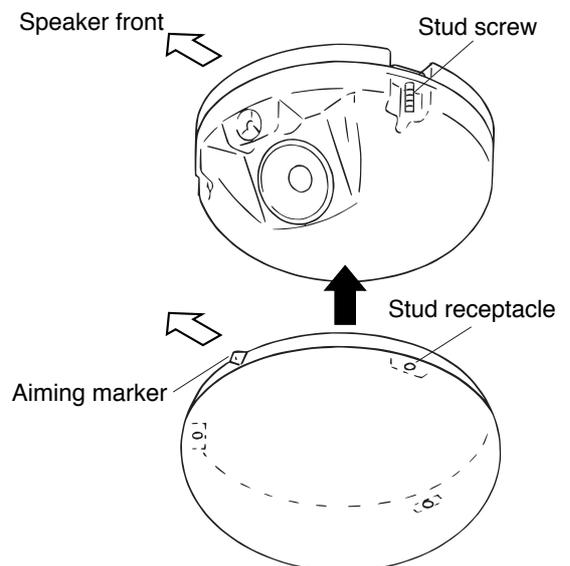
5.2. Mounting the Speaker Using a Electrical Box

The speaker system can be mounted to walls or ceilings using a electrical box*. Mount the base frame to the electrical box using two holes shown in the figure below. Further mounting procedures are the same as detailed in Steps 2 and 3 on pages 5 – 7.
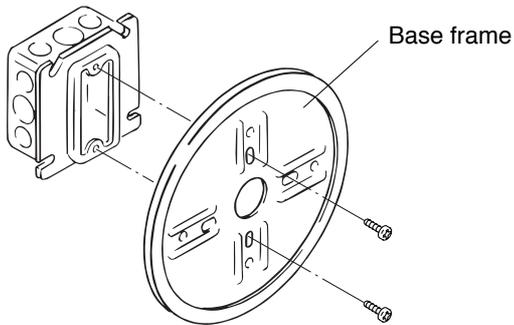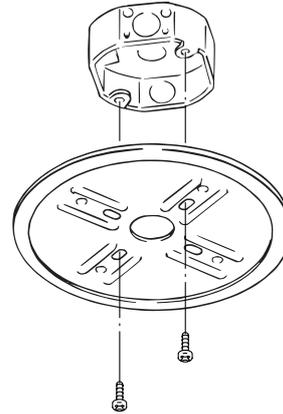
* Distance between mounting holes: 69.9 mm (2 $^3/_4$″), 83.3 mm (3 $^9/_{32}$″) or 88.9 mm (3 $^1/_2$″)

・ Mounting example 1

Base frame

・ Mounting example 2

Memo
Electrical box mounting screws are attached to the speaker.

5.3. Mounting the Speaker Using Supporting Rails

The speaker system can also be mounted to walls or ceilings using supporting rails. Mount the base frame to the rails using four holes shown in the figure at right. Follow Steps 2 and 3 on pages 5 – 7.
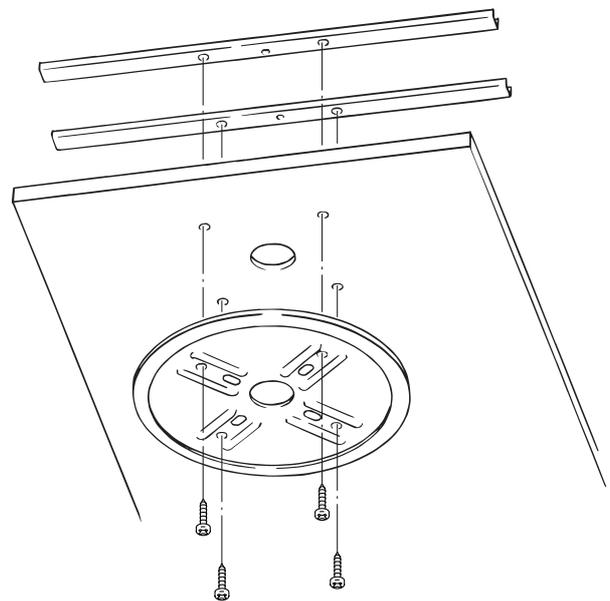
5.4. Removing the Front Grille

Be sure to use the front grille's three anti-slip pieces when detaching the grille from the speaker. First carefully pull the grille by hand from two positions, and then detach from the one remaining position.

Caution
If you raise only one or two of the three anti-slip pieces, the front grille may be broken. Be sure to pull its three pieces out evenly and gradually.

Anti-slip piece

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6. OUTDOOR USE (H-2WP ONLY)

6.1. Waterproofing

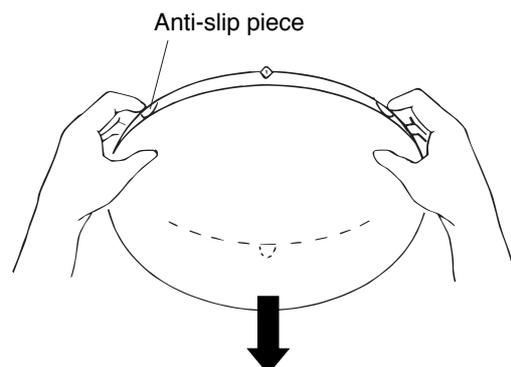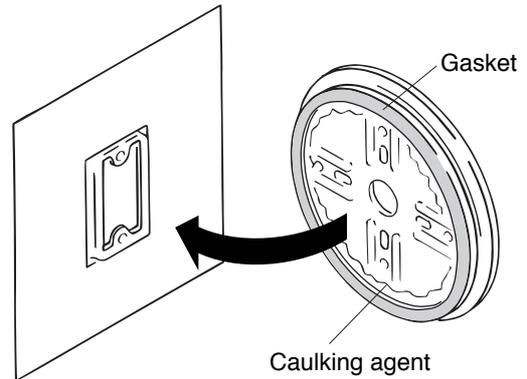The H-2WP's base frame has a gasket for watertightness. To completely prevent water from getting into a gap between the base frame and wall or ceiling panel, apply caulking agent over the inside of the gasket before mounting the base frame.


Gasket

Caulking agent

6.2. Speaker Mounting Angle

When mounting the H-2WP speaker on a wall, to ensure its watertightness it must not be tilted any more than 45 degrees up from its downward-facing position.

Notes

- The H-2WP features drip-proof construction. However, do not dash water over it when cleaning as this may cause damage to the speaker components.
- When installing the H-2WP outdoors in a snowy area, protect the speaker so that it is not covered with snow.

45°   45°
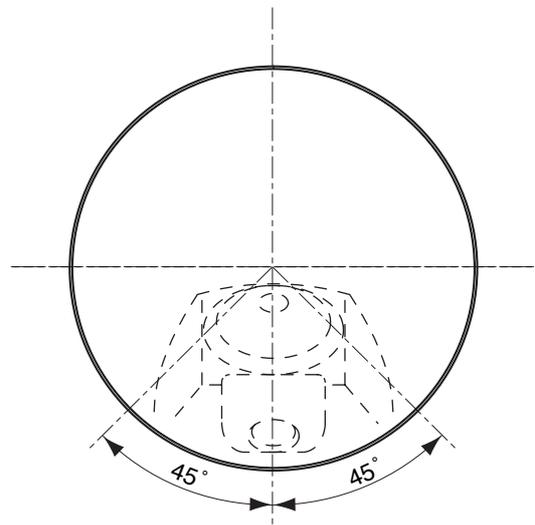
7. REPAINTING THE FRONT GRILLE

Follow the procedures below to change the color of the grille.

1. Wipe dirt off the front grille with a soft cloth moistened with a detergent before painting. Do not use volatile liquids such as thinner.

2. Uniformly spray a thin coating of paint over the grille changing the spraying positions gradually.

   Notes

   - Do not use a roller or brush to paint because the meshes of the grille could be clogged with paint.
   - Use paint that is appropriate for the composition of the front grille (grille and frame).
       [H-2]   Grille: Rolled steel plate
                    Frame: Fire-resistant ABS resin
       [H-2WP]   Grille: Rolled steel plate (zinc plating)
                    Frame: Fire-resistant ABS resin
   - Follow the instructions on the paint when painting.

3. After the paint dries, repeat Step 2 once or twice to repaint.

   Note: Be sure to repeat Step 2 at least twice.

8. PROTECTION CIRCUITRY INFORMATION

・ The speaker has built-in overload protection circuitry.
  If there is an extremely high level input signal to the speaker, the overload protection circuitry is activated and cuts off the signal input to the speaker component.

・ A sudden drop of the sound volume level during speaker operation indicates that the overload protection circuitry has been activated. In such a case, reduce the amplifier volume and wait. The protection circuitry is automatically reset after approximately 10 seconds. After the circuitry is reset, set the volume at a lower level than before.

Important Note
This overload protection circuitry does not completely protect the speaker component. Depending on the nature of the excessive signal applied to the loudspeaker, there may be damage to the loudspeaker components before the protection circuitry can operate. Also, depending on the duration of the excessive input signal, the protection circuitry may be damaged and will not recover. Take special care that the excessive input is not applied to the speaker during use.

9. EQUALIZATION

・ The H-2 and H-2WP are designed to provide good quality sound without additional equalization. However, by equalizing them as shown below, sounds can be made more powerful and intelligible.

・ Using a digital signal processor, make the following equalization setting.

[When not using a subwoofer]

Filter	Frequency	Gain	Q
HPF	63 Hz	—	Q 0.707
PEQ	100 Hz	+10 dB	Q 1.871
PEQ	200 Hz	− 5 dB	Q 1.414
PEQ	5 kHz	+ 1.5 dB	Q 0.305
LPF	15.8 kHz	—	Q 0.500
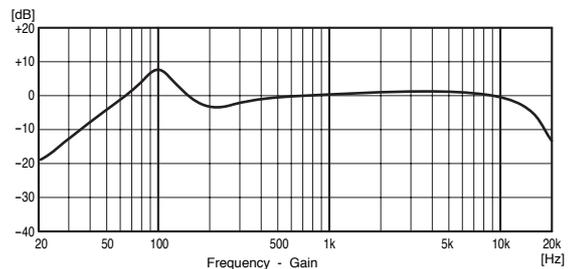
[When using a subwoofer]

Filter	Frequency	Gain	Q
HPF	63 Hz	—	Q 0.707
PEQ	100 Hz	+ 2.5 dB	Q 1.871
PEQ	200 Hz	− 5 dB	Q 1.414
PEQ	5 kHz	+ 1.5 dB	Q 0.305
LPF	15.8 kHz	—	Q 0.500

10
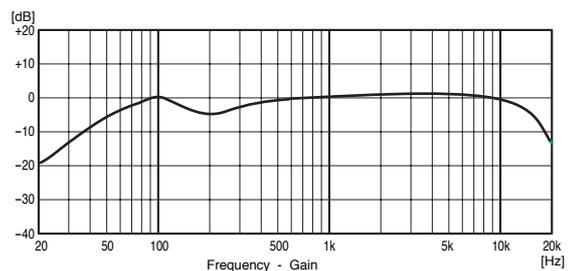
10. SPECIFICATIONS

Model No.	H-2
Enclosure Type	Sealed type
Power Handling	120 W (continuous program input, 4 Ω loaded) 40 W (continuous pink noise input, 4 Ω loaded)*1
Rated Input	12 W (16 Ω or high impedance)
Rated Impedance	4 Ω, 16 Ω 70 V line: 420 Ω (12 W), 830 Ω (6 W), 1.7 kΩ (3 W), 3.3 kΩ (1.5 W) 100 V line: 830 Ω (12 W), 1.7 kΩ (6 W), 3.3 kΩ (3 W)
Sensitivity	88 dB (1 W, 1 m, 2 π loading)*2
Frequency Response	100 Hz to 20 kHz (−10 dB, 2 π loading)
Crossover Frequency	5 kHz
Speaker Component	Low frequency: 10 cm cone woofer High frequency: Balanced dome tweeter
Input Terminal	Detachable screw terminal, (+)/(-) 2 each (for bridging connection)
Usable Cable	Solid cable or stranded cable: 0.2 mm^2 – 2.5 mm^2 (Corresponding to AWG No. 24 – 14)
Finish	Enclosure: Fire-resistant ABS resin (UL 94V-0), black Grille frame: Fire-resistant ABS resin (UL 94V-0), white, paint Grille: Rolled steel plate, white, paint Base frame: Rolled steel plate, pre-coating
Dimensions	ø268 x 111 mm
Weight	2.1 kg (including base frame)

Model No.	H-2WP
Enclosure Type	Sealed type
Power Handling	120 W (continuous program input, 4 Ω loaded) 40 W (continuous pink noise input, 4 Ω loaded)*1
Rated Input	12 W (16 Ω or high impedance)
Rated Impedance	4 Ω, 16 Ω 70 V line: 420 Ω (12 W), 830 Ω (6 W), 1.7 kΩ (3 W), 3.3 k Ω (1.5 W) 100 V line: 830 Ω (12 W), 1.7 kΩ (6 W), 3.3 kΩ (3 W)
Sensitivity	88 dB (1 W, 1 m, 2 π loading)*2
Frequency Response	100 Hz to 20 kHz (−10 dB, 2 π loading)
Crossover Frequency	5 kHz
Speaker Component	Low frequency: 10 cm cone woofer High frequency: Balanced dome tweeter
Input Terminal	Detachable screw terminal, (+)/(-) 2 each (for bridging connection)
Dust/Water Protection	IP64
Usable Cable	Solid cable or stranded cable: 0.2 mm^2 – 2.5 mm^2 (Corresponding to AWG No. 24 – 14)
Finish	Enclosure: Fire-resistant ABS resin (UL 94V-0), black Grille frame: Fire-resistant ABS resin (UL 94V-0), white, paint Grille: Rolled steel plate (zinc plating), white, powder coating Base frame: Stainless steel
Dimensions	ø268 x 111 mm
Weight	2.1 kg (including base frame)

*1 Continuous 24 hours, band-limited pink noise (50 to 20,000 Hz)
*2 Pink noise (1,000 Hz to 10,000 Hz)

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

- **Accessories**

Base frame 1
Electrical box mounting screw
   M4 x 25 2
   UNC No. 8-32 x 32 mm 2

UNC No. 6-32 x 32 mm 2
Spring washer 2
Plain washer 2

TOA Corporation

URL: http://www.toa.jp/

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