



OPERATING INSTRUCTIONS

SUB-WOOFER SYSTEM

FB-100

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

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1. SAFETY PRECAUTIONS

- Be sure to read the instructions in this section carefully before use.
- Make sure to observe the instructions in this manual as the conventions of safety symbols and messages regarded as very important precautions are included.
- We also recommend you keep this instruction 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

When Installing the Unit

- 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.
- 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.
- Use proper nuts and bolts when hanging the speaker. If improper nuts and bolts are used, the speaker could fall off, resulting in personal injury.
- Tighten each nut and bolt securely. Ensure that the bracket has no loose joints after installation to prevent accidents that could result in personal injury.



CAUTION

When the Unit is in Use

- Do not operate the unit for an extended period of time with the sound distorting. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.

2. GENERAL DESCRIPTION

The TOA FB-100 is a high-power sub-woofer system employing a 25 cm speaker unit designed to withstand large, low-frequency voice-coil movement. Although small in size, the FB-100 provides clear super-low frequency sound reproduction thanks to its Acoustic Super Woofer enclosure construction.

3. FEATURES

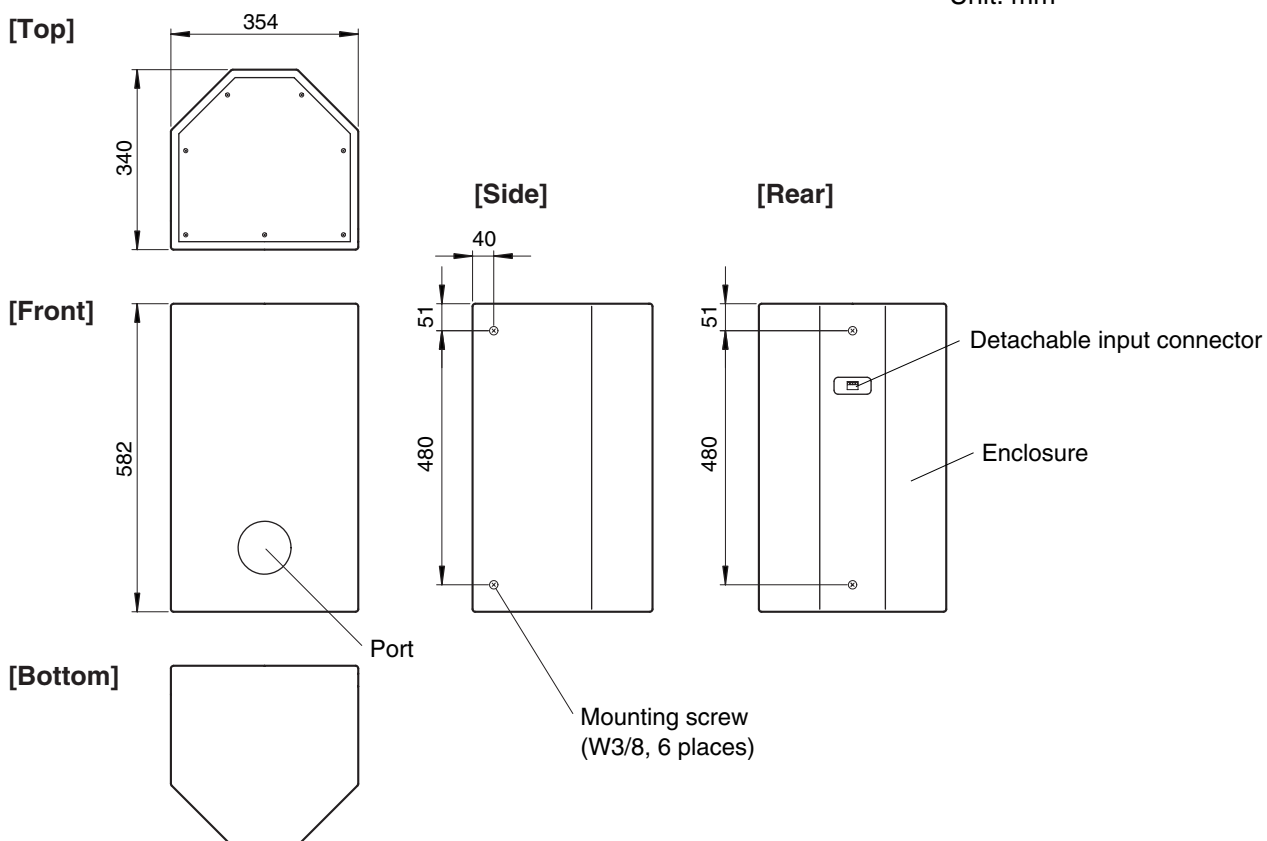
- A large, 120 mm-diameter ferrite magnet, a long, 50 mm-diameter voice coil, an aluminum bobbin, a non-pressed paper cone, and a large-diameter damper combine to permit large voice coil movement at high power input.
- The Acoustic Super Woofer system enclosure creates an acoustic band-pass filter that reproduces super-low frequencies down to 35 Hz and realizes slow-slope phase characteristics.
- The speaker can be converted to high-impedance applications with the addition of the optional MT-S0610 matching transformer.
- The urethane-painted enclosure is made of Medium Density Fiberboard (MDF) and can be easily repainted.
- Six external mounting screws are positioned along the sides of the enclosure to facilitate cable-suspended installations.
- The unit's removable top panel facilitates maintenance work after installation.

4. HANDLING PRECAUTIONS

No anti-magnetic provisions have been made for the FB-100 speaker. Therefore, take care to keep the unit sufficiently away from televisions, monitors or computer-related equipment.

5. NOMENCLATURE

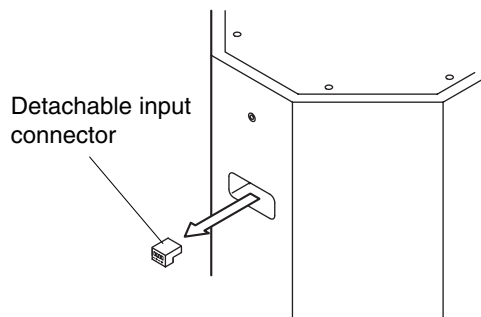
Unit: mm



6. CONNECTIONS

Note: The FB-100's input connector is of detachable type.

Step 1. Detach the input connector from the connector socket.

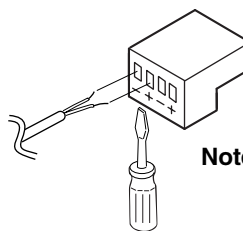


Step 2. Using a screwdriver, loosen the screws of the terminals to use. Connect stripped cable ends to the terminals, then retighten the terminal screws.

Tips

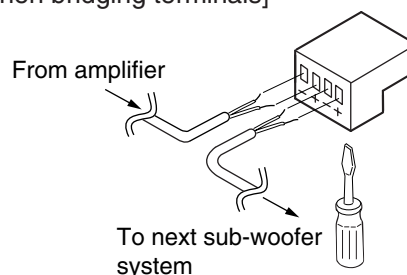
- Usable cable: Solid cable or stranded cable (0.2 mm² - 2.5 mm²) (Corresponding to AWG No. 24 - 14)
- Strip the insulation back about 5 mm from the cable ends.

[When bridging no terminals]

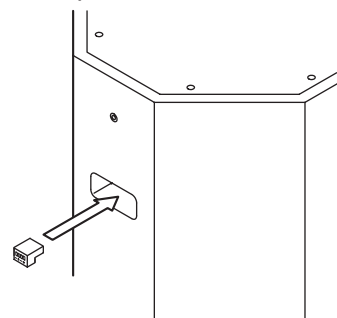


Note: Tighten the screws of idle terminals as well to prevent resonance noise.

[When bridging terminals]



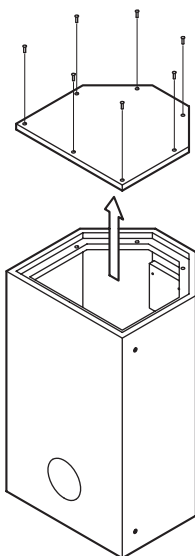
Step 3. Insert the input connector into the unit.



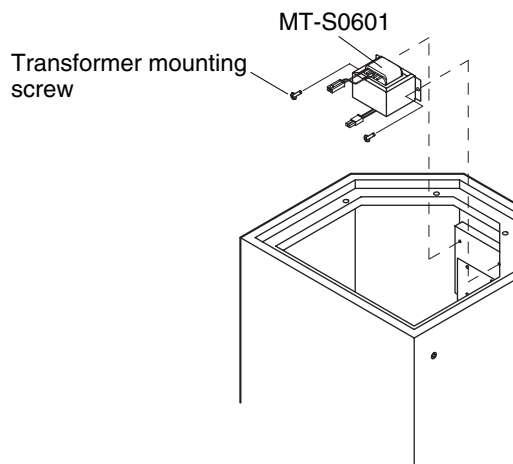
7. MATCHING TRANSFORMER INSTALLATION

An optional MT-S0601 matching transformer can be installed in the FB-100 speaker.

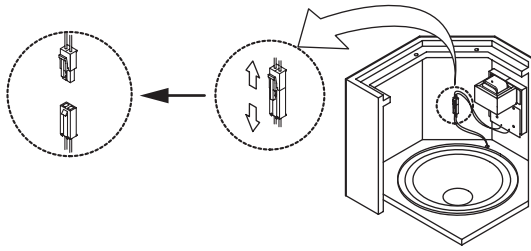
Step 1. Remove 7 screws to detach the enclosure top panel.



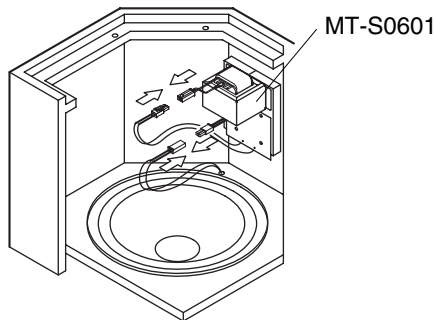
Step 2. Remove 2 transformer mounting screws located close to the connector circuit board. Using the 2 screws, mount the MT-S0601 transformer with its connection lug (impedance tap) side up.



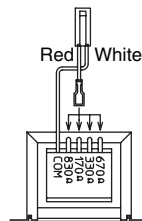
Step 3. Disconnect the junction connector of a lead wire coming from the connector circuit board. (Widen the lock tab to pull the connector.)



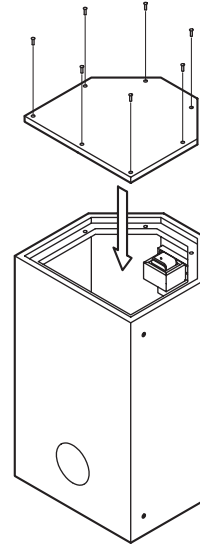
Step 4. Connect the MT-S0601's two connectors to the junction connectors disconnected in Step 3.



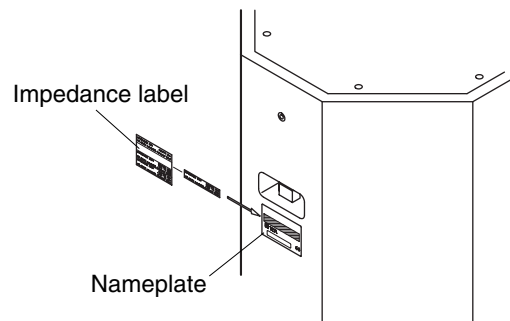
Step 5. Connect the speaker input cable to the desired transformer lug to set the impedance.



Step 6. Replace the top panel and retighten the 7 screws.



Step 7. Affix the impedance label supplied with the MT-S0601 to over the FB-100's nameplate as shown below to indicate the selected transformer impedance.

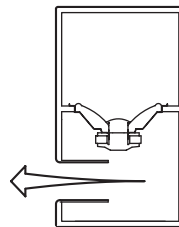


8. CROSSOVER CONNECTIONS WITH A FULL-RANGE SPEAKER

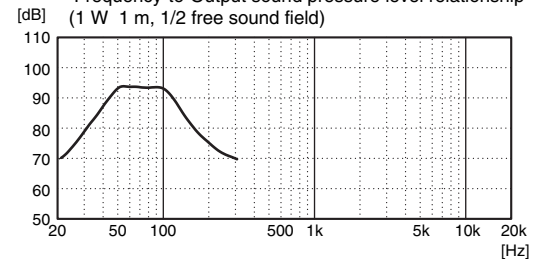
8.1. Recommended Filters for the FB-100

- Because the FB-100's enclosure construction is designed to create an acoustic band-pass filter, the mid and high frequency audio ranges are cut even if the input signal band is not limited with a low-pass filter. Therefore, the FB-100 functions as a sub-woofer with no filtering.
- The speaker driving efficiency can be increased by inserting a low-pass filter before the power amplifier to cut out the mid and high frequency components of the input signal to the sub-woofer.

FB-100's cross section



Frequency-to-Output sound pressure level relationship
(1 W 1 m, 1/2 free sound field)



- The following filter settings are recommended when using a digital signal processor for the FB-100's signal system:

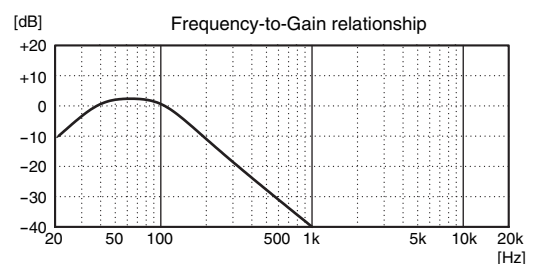
High-pass filter (−12 dB/oct):

Cut-off frequency = 40 Hz, $Q = 1.0$

Low-pass filter (−12 dB/oct):

Cut-off frequency = 100 Hz, $Q = 1.0$

Frequency-to-Gain relationship



8.2. Level Balance and Polarity

When using the FB-100 in combination with TOA's F or H Series Full-Range Speakers, adjust their level balance or polarity depending on the conditions of the installation location.

8.2.1. Level balance adjustment

Adjust the level of the sub-woofer or full-range speaker depending on the number of units to be installed or installation conditions.

8.2.2. Polarity adjustment

- Acoustic energy increases at the crossover band for the sub-woofer and full-range speaker if the two speakers are in phase with each other, and decreases if out of phase. Because the phase characteristics of both the sub-woofer and the full-range speaker vary continuously depending on frequency, simply matching the connector polarities of the sub-woofer is not always the best procedure.
- To confirm how much the acoustic energy increases or decreases, reverse the polarity of the sub-woofer's "+" and "-" connectors and select the connection polarity that results in the largest output of acoustic energy. (The use of a real-time spectrum analyzer to check the degree of energy increase is highly recommended.)

9. CAUTIONS CONCERNING HIGH-IMPEDANCE APPLICATIONS

To avoid damaging the FB-100 speaker in high-impedance applications (with the MT-S0601 matching transformer installed), be sure to observe the following conditions.

1. Do not limit the input signal band using such devices as a low-pass filter, but instead drive the speaker with the full-range signal.
2. Use a high-impedance amplifier with a power rating higher than the wattage tap selected on the matching transformer.

Tip

There is a low-frequency threshold for both the speaker matching transformer and the high-impedance amplifier output transformer.

[Matching transformer low-frequency threshold]

If a signal with the frequencies lower than the low-frequency threshold is applied at rated power, the transformer's primary impedance (input impedance) decreases abruptly due to core magnetic saturation. With the MT-S0601, the impedance begins to decrease at approximately 40 Hz for the rated input power of 60 W, and is almost halved at 30 Hz. If the speaker is used under this condition, an increased load is put on the power amplifier as well as the matching transformer, causing potential equipment damage.

The low-frequency threshold varies depending on the selected transformer tap, and the smaller the tap-selected wattage, the lower the threshold.

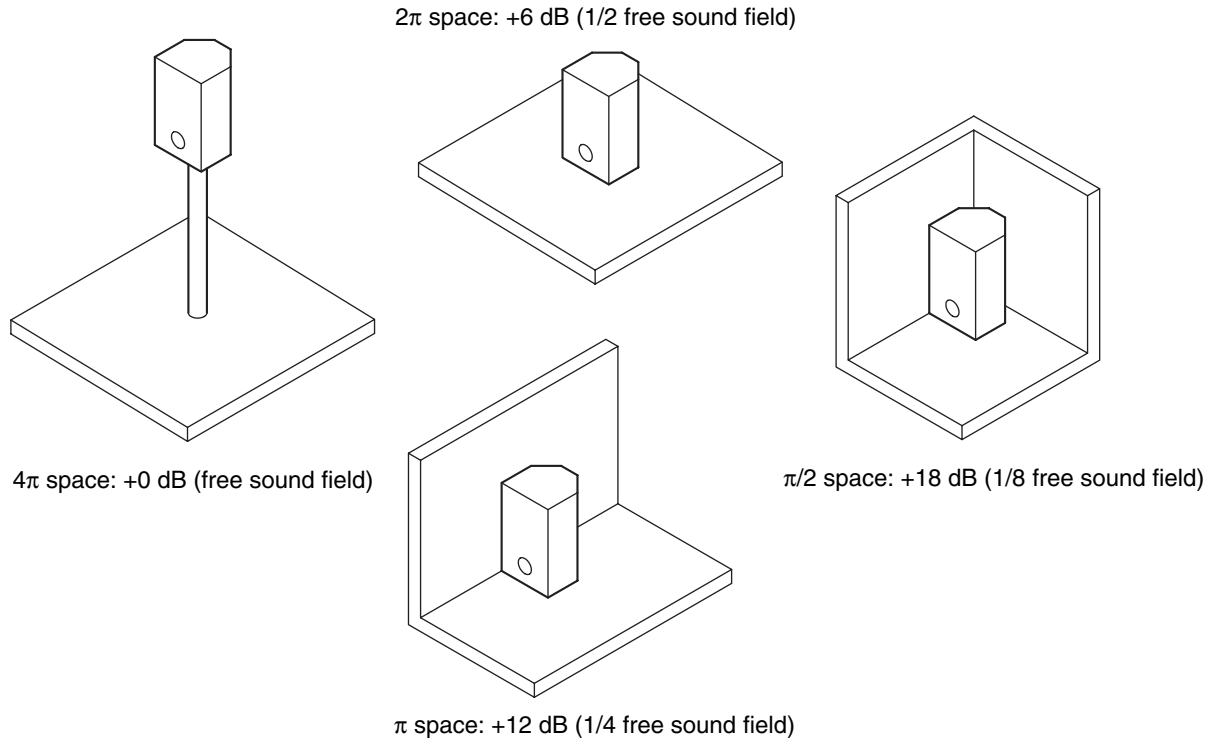
[High-impedance amplifier low-frequency threshold]

When a full-range signal (not band-limited) is applied, the amplifier is not adversely affected. However, if the signal is band-limited with a low-pass filter and driven with rated power, an increased load is put on the output stage, causing potential amplifier damage.

10. INSTALLATION

10.1. Installation Locations

By installing the FB-100 speaker close to the ceiling, wall or floor, the speaker's sound energy radiation efficiency can be increased.



Note

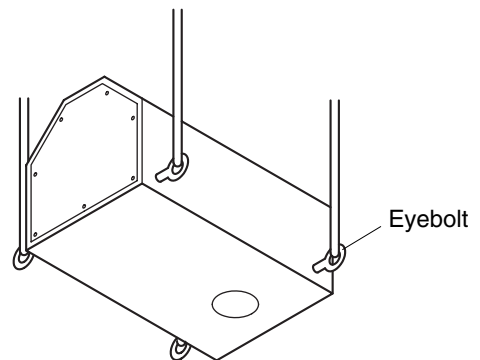
Do not block the opening of a port.

10.2. Unit Suspension

Using six mounting screws provided on the FB-100 in conjunction with eyebolts, the FB-100 can be hung as illustrated.

Note

Ensure that the speaker is fixed or hung at 4 places or more when using the mounting screws to fix or hang the unit.



11. SPECIFICATIONS

Enclosure	Acoustic Super Woofer system
Power Handling Capacity	Continuous program: 450 W Continuous pink noise: 150 W (40 – 200 Hz, 24 hours)
Rated Impedance	8 Ω
Output Sound Pressure Level	94 dB (1 W, 1 m), installation in 1/2 free sound field 88 dB (1 W, 1 m), installation in free sound field
Frequency Response	35 – 160 Hz (–10 dB, installation in 1/2 free sound field)
Internal Speaker	25 cm cone type
Input Terminals	Detachable screw terminals, (+)/(–): 2 each (for bridge connection)
Usable Cable	Solid or twisted cable: 0.2 - 2.5 mm ² (corresponding to AWG24-14)
Finish	Urethane-painted Medium Density Fiberboard (MDF), black
Dimensions	345 (w) x 582 (h) x 340 (d) mm (projections excluded)
Weight	16 kg

Note: The unit's specifications and external design are subject to change without notice for improvement.

• Optional equipment

Matching transformer MT-S0601 (rated at 60 W)

Traceability Information for Europe (EMC directive 2004/108/EC)

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Japan

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TOA Corporation

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