



Full Range Speaker



FE88-Sol

Thank you for purchasing our product.
Read this manual thoroughly before
using the product.

DNA inheritance
Pedigree of evolution

FE88-Sol is a newly developed special speaker driver succeeding the development philosophy and unique technology of FE108-Sol. It delivers delicate and expressive music reproduction with high-quality sound supported by Two-layer paper making and low distortion ferrite external magnetic circuit.

FE88-Sol Major Features

- ES cone diaphragm with Two-layer paper making

The newly designed ES cone diaphragm offers light in weight but higher stiffness and high internal loss by employing two-layer paper making. The base layer is mainly built with the long fiber pulp to offer high stiffness and internal loss, and the surface layer is built with short fiber pulp to enhance the propagation speed of cone paper surface. Due to this, while keeping bright and high tension mid-range sound as is, it has enabled sharp high frequency with good response and rich low frequency reproduction.

* Two-layer paper making is; making a piece of diaphragm in two steps process with our unique paper making technique that consists of base layer and surface layer.

- High rigidity aluminum die cast frame

To support the large ferrite magnetic circuit, a high rigidity aluminum die cast frame is employed to prevent transferring unnecessary vibration to the enclosure.

* Its physical aspect is same as FE88ES-R and MG850 (discontinued model), i.e., Frame outer diameter: Ø112 mm, Mounting hole pitch: Ø100 mm and Baffle opening diameter: Ø90 mm.

- High compliance corrugation damper

In order to improve linearity, it uses a superior corrugation damper; although being high compliance, it has consistency in hardness regardless of input level from small to large and offers excellent movement.

- Low distortion ferrite outer magnet circuit

The magnetic circuit uses two Ø85 mm ferrite magnets and ensures sufficient magnetic flux density. The magnetic circuit has achieved to reduce the current distortion by placing the copper cap to the pole piece, and has improved the clarity of the mid-high frequency by low distortion of the drive system.

- Mechanical 2 way center cap/high heat resistance glass composite voice coil bobbin

Center cap is located as directly mounted to the voice coil bobbin to offer wider high frequency reproduction and achieves over 20 kHz frequency range. Also, the voice coil bobbin ensures transmitting the vibrations to center cap by employing glass fiber and phenol resin sheet that has high Young modulus.

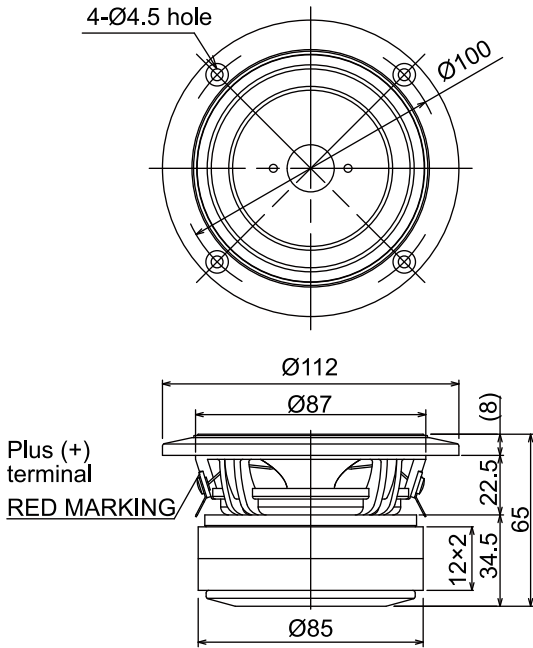
- Three-point bonding method

It uses a three-point bonding method, which adheres with the cone paper, the damper and the voice coil together at the same place. High frequency response is improved by increasing the strength of neck of cone.

- Fasten #205 gold plated terminal

It uses fasten #205 low loss gold plated speaker terminal. It ensures speaker cable connection and avoid sound quality deterioration.

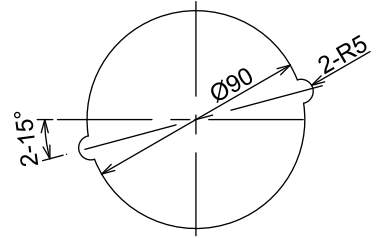
Dimensional Outline Drawing



Specifications

Type	: 8.5 cm cone full range
Impedance	: 8 Ω
f_0	: 100 Hz
Frequency response	: $f_0 \sim 30$ kHz
S.P.L.	: 87.5 dB/W(1 m)
Input (MUS.)	: 15 W (NOM. 10 W)
m_0	: 2.2 g
Q_0	: 0.45
Effective vibration radius	: 3.425 cm
Magnet weight	: 584 g (292 g × 2)
Weight	: 1145 g
Baffle opening dimensions	: Ø90 mm (Refer to the right drawing.)

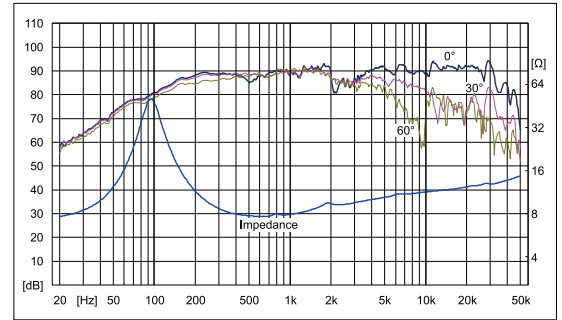
Baffle Opening Dimensions Drawing



Accessories

Screw x 4 pcs.
Washer x 4 pcs.
Packing x 1 pc.

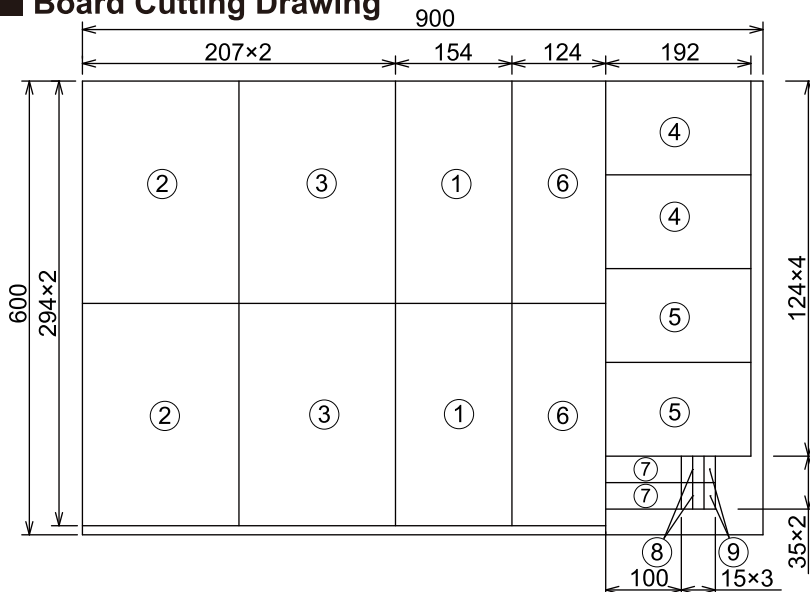
Frequency Response



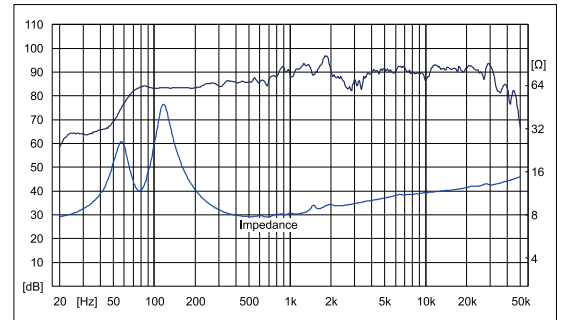
Standard Bass Reflex Enclosure

This is an example of installing FE88-Sol into the standard capacity bass reflex enclosure. Its design emphasizes full-body bass rather than being too ambitious on the lowest frequency. Caution to take when assembling the enclosure; adjust the mounting dimensions of duct with its actual size. As for the acoustic absorption material, attach coarse felt on the bottom board, wool on the ceiling board, rear board and lateral board.

Board Cutting Drawing



Frequency Response



Parts Used

Terminal: T150B × 2
Internal wire: SFC83, adequate length
Board: MDF (900 mm × 600 mm, t15) × 1
Duct: Ø40 VP PVC pipe, 55 mm × 2
Acoustic absorption material: wool, coarse felt, adequate dose

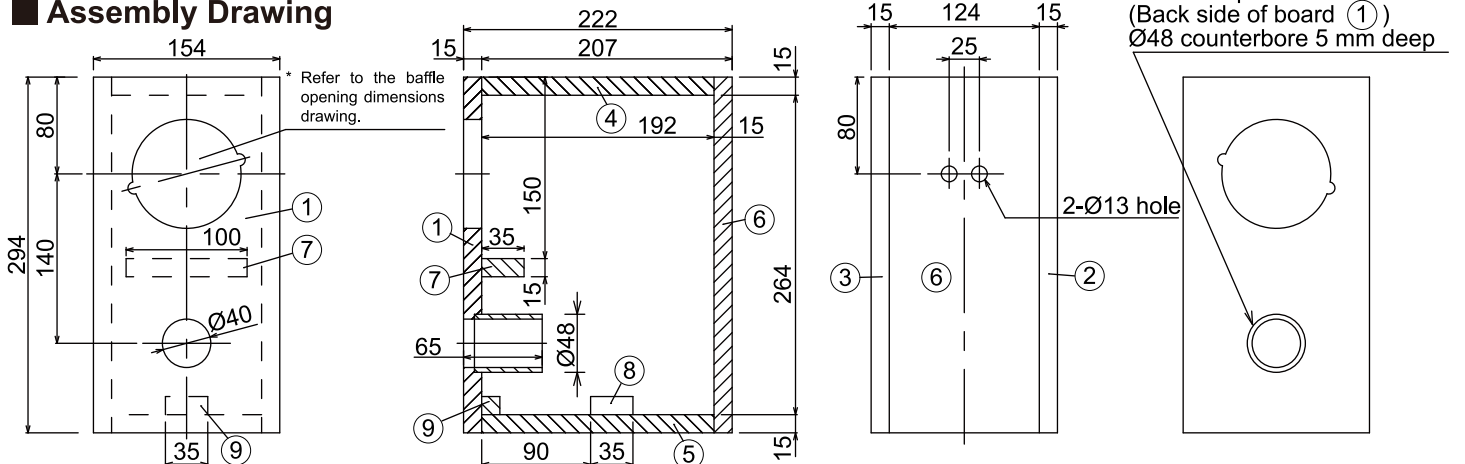
Design Value

Internal capacity : 6.2 liters
Tuning Freq. (fb) : 78 Hz
Duct diameter : Ø40
Duct length : 65 mm

Assembly Sequence

A: 4 + 6 + 5
B: A + 2 + 3
C: B + 8 + 8
* Attach No. 8 at both sides.
D: C + (1 + 7) + 9

Assembly Drawing



Back Loaded Horn Type Enclosure

This is an example of installing FE88-Sol into the back loaded horn type enclosure. It is a two-division structure of the body and the stand, and the stand bottom sides are horn opening. Follow the assembly order, but in advance, mark the guide line with pencil on the board #2 (lateral boards) for the position to adhere the board #8, #9 and #10. We recommend using generous portion of adhesive at the end face of the board #6 and #10 to fill the gap because they are bonded to the diagonal. The internal wire will go through the $\phi 8$ hole of board #8, but this should be done before adhering the board #3. After assembling the main body and the stand, place the body to the stand. For fall prevention, fix the board #11 and #17 with either adhesive or screws. As for acoustic absorption material, we recommend inserting thin wool inside the air compartment and attach coarse felt on the both sides of stand board #14.

Design Value

Internal capacity : 1.2 liters
 Throat area : 30 cm²
 Horn opening area : 206 cm²
 Horn length : 170 cm
 Horn cross-over Freq. : 250 Hz
 Cut-off freq. : 30 Hz
 Expansion factor : 1.12

Parts Used

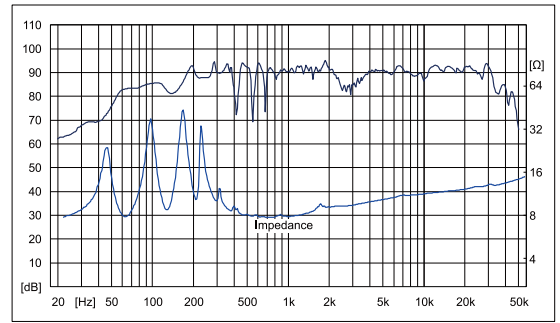
Terminal: T150B × 2
 Internal wire: SFC83, adequate length
 Board
 *Plywood : 910 mm × 1820 mm t15 × 1
 MDF : 900 mm × 600 mm t15 × 1
 Acoustic absorption material: wool, coarse felt, adequate dose
 *: Japanese lime tree

Assembly Sequence

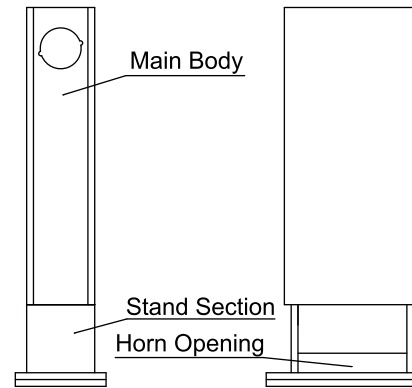
Main Body
 A : 5 + 22 + 4
 B : (6 + 22) + 1 + 21 + 7
 C : (8 + 22) + 9
 D : 10 + 23 + 23
 E : 2 + B + A
 F : E + C + D
 G : F + 3
 H : G + (11 + 12 + 13)

Stand Section
 I : 17 + 15 + 16 + 14 + 18
 J : I + 19 + 20

Frequency Response

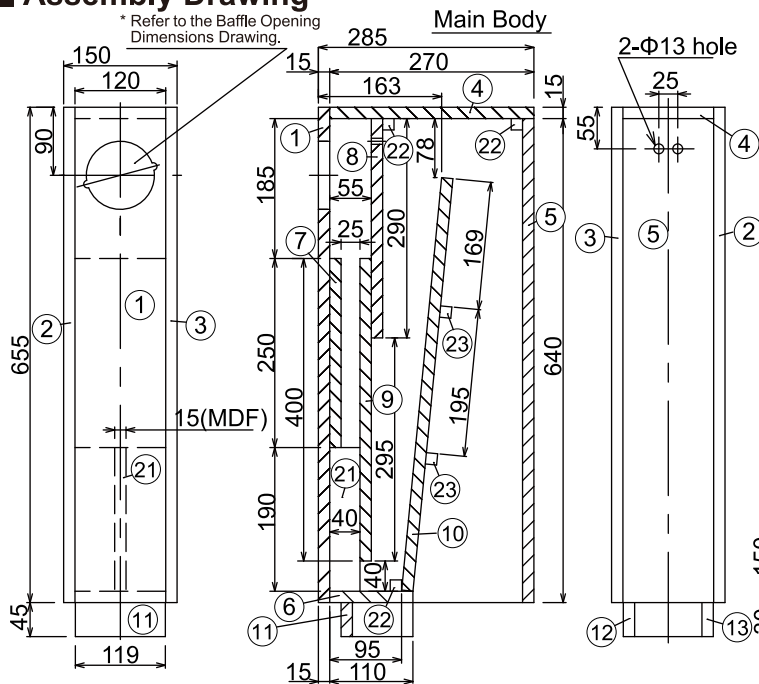


Completion Drawing

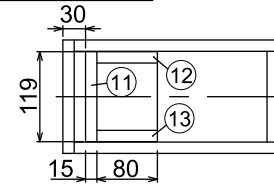


Assembly Drawing

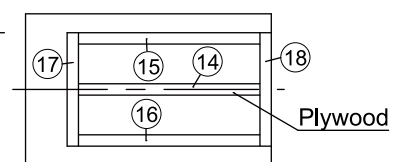
* Refer to the Baffle Opening Dimensions Drawing.



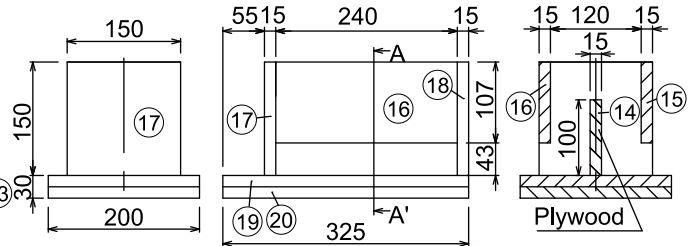
Bottom Side of Main Body



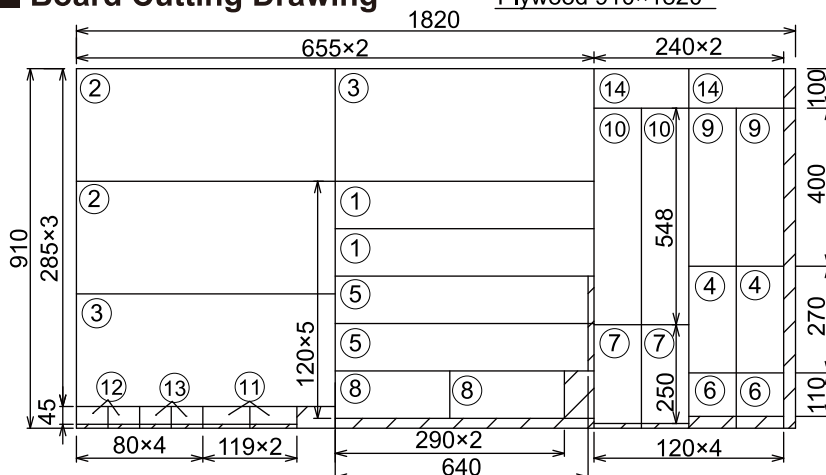
Stand Section



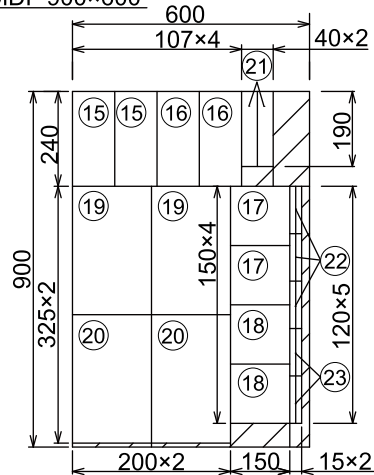
A-A' Cutaway Drawing



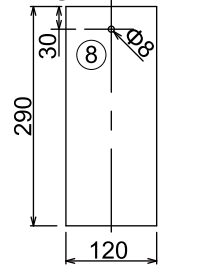
Board Cutting Drawing



MDF 900x600



Board Processing Dimensions



* Adjust the size of the hole ($\phi 8$) depending on a cable size.

FE88-Sol Thiele/Small Parameters

Size	85 mm	3.4 in	Surface Area of Cone	Sd	0.0037 m ²
Overall Diameter	112 mm	4.5 in	Nominal Impedance	Zn	8 ohm
Baffle Hole Diameter	90 mm	3.6 in	Resonance Frequency	Fs	105.5 Hz
Depth	57 mm	2.25 in	DC Resistance	Re	7 ohm
Voice Coil Diameter	16.4 mm	0.65 in	Coil Inductance	Le	0.06 mH
Cast / Stamped	Cast		Mechanical Q	Qms	3.91
Impedance	8 ohm		Electromagnetic Q	Qes	0.51
Reproduction Frequency Response	Fs - 30 kHz		Total Q	Qts	0.45
Sound Pressure Level	87.5 dB/W(1m)		Equivalent Mass	Mms	2.2 g
Rated Input	10 W		BL Product (Factor Force)	BL	4.47 Tesla/m
Music Power	15 W		Compliance Equivalent Volume	Vas	2 L
Magnet Weight	584 g	1.287 lb	Voice Coil Overhang	Xmax	1.1 mm
Net Weight	1145 g	2.524 lb	Reference Efficiency n0	Eff/n0	0.45 %
Equivalent Diaphragm Radius	a	34.25 mm	Mechanical Compliance of Suspension	Cms	1.04 mm/N
Effective Cone Diameter	D	68.5 mm	Efficiency Bandwidth Product	EBP	206.863

IMPORTANT SAFETY INSTRUCTIONS

- Read this manual carefully before starting operation and use this product safely. We cannot be responsible for problems resulting from failure to observe the instructions in this manual.
- This manual uses various pictorial displays to show how to use this product and to avoid harm to yourself and others and damage to your property. Here is what these pictorial displays mean.

⚠ WARNING	This label is intended to alert the user to the presence of important operating instructions. Failure to heed the instructions will result in severe injury or death.
⚠ CAUTION	This label is intended to alert the user to the presence of important operating instructions. Failure to heed the instructions can result in injury or material damage.

⚠ WARNING

- Do not disassemble or alter. Doing so may lead to accident, fire or electric shock.
- Do not place the speaker cabinet (enclosure) on an unstable cart, stand or tripod, bracket, or table. It may fall, causing serious injury and / or serious damage.
- Do not expose the product to rain or moisture, never wet the inside with any liquid and never pour or spill liquids directly onto this product. Please do not put any objects filled with liquids (e.g. vases, etc.) onto the speaker cabinet.

- After taking the product out of the plastic bag, be sure to dispose of it out of the reach of children. Otherwise, they may play with the bag, which could cause hazard of suffocation. Also keep small articles out of reach of children. If swallowed, consult a physician immediately.
- Halt use immediately if a problem appears. When problems occur such as a lack of sound, foreign objects inside the unit, smoke coming out, or noxious odors, stop use immediately and contact the dealer where you bought the product. Failure to do so may result in an accident or injury.
- Never expose this product to extremely high or low temperatures.
- High SPL's may damage your hearing! Please do not get close to the loudspeakers when using them at high volumes.
- Please note that the diaphragm build up a magnetic field. Do not play with magnetic items at close range to the diaphragms.

⚠ CAUTION

- Use specified accessory parts and install them securely. Use of other than designated parts may damage the product internally or may not securely install the product in place as parts that come loose may create hazards.
- Avoid touching the speaker membranes and do not block the woofer's ventilation ports.
- Always use fully checked cables. Defective cables can harm your speakers. They are a common source for any kind of noise, hum, crackling, etc.

Fostex

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