

## 50th Anniversary Full Range Speaker



(8 Ω Type)



(16 Ω Type)

### FE103-Sol (8) / (16)

Thanks for purchasing our product.  
Please read this manual carefully before use.

**It has been 50 years since the original model FE103 was released. Thank you for long time support given to the speaker driver.**

The FE103 celebrates the 50 year birthday since its release in 1964. It is the real beginning of Fostex high compliance full-range speaker driver and we appreciate many customers for supporting the product for long period of time even after various minor changes were applied by now.

#### Passion and originality handed over

While taking over the development concept of FE103, the FE103-Sol is a specially made driver unit that has the long cultivated Fostex speaker technology generously injected to achieve superb sound quality with delicate and articulate music reproduction. Passion to persistently pursuing sound is inherited from FE103. Symbolizing the originality tirelessly taken over, its frame is painted with copper orange color. We have named it "FE103-Sol" wishing it to be like the Sun beloved timelessly and been close to our heart.

#### FE103-Sol Main Features

- **ES cone and center cap with double layered paper making technique**

Using the shape of cone and center cap from FE103En as a base, high density ES cone made of fine and smooth fiber together with double layered paper making technique offers light weight but high rigidity and high internal loss. The FE103-Sol uses long fiber pulp for foundation layer to provide high rigidity and high internal loss and uses short fiber pulp for surface layer to provide high transmitting velocity. As a result, while it maintains bright and forceful mid frequency, it enables fast and sharp high frequency response and deep low frequency.

\* Double layered paper making technique is to build a cone using the original technique of making paper in 2 layers together as foundation and surface.

- **High compliance corrugation damper**

The FE103-Sol employs corrugation damper, because although its performance is high compliance, its hardness is constant from minimum input to maximum input and offers smooth movement.

- **Low distortion ferrite outer magnetic circuit**

The FE103-Sol uses 80 mm diameter ferrite magnet to provide sufficient magnetic density. To reduce current distortion, there is copper cap located at the pole piece and magnet inner perimeter. Painstaking process to reduce current distortion has resulted clearer mid to high frequency.

- **Mechanical 2 way center cap and heat resistance glass made composite voice coil bobbin**

The center cap is directly connected to the voice coil bobbin in order to extend the high frequency, and it accomplishes over 20 kHz frequencies. The material for voice coil bobbin uses a high Young ratio sheet made of mixture of glass fiber and phenol resin ensuring to transfer the pulsation to the center cap and achieving high durability at the same time.

- **Three-point bonding**

The FE103-Sol employs the three-point bonding method, which adheres the cone, damper and voice coil together at one point. Strengthening the cone neck brings better high frequency response.

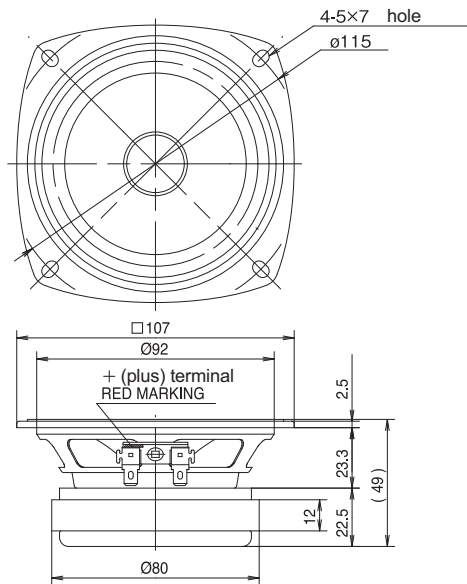
- **Gold plated fasten 205 speaker terminal**

The input terminal uses low loss gold plated fasten 205. It ensures steady speaker connection and eliminates sound deterioration.

- **2 types impedance specifications**

We offer 2 types impedance as 8 ohm and 16 ohm versions. Please choose either one depending on your enclosure design and multiple driver use.

## ■ Dimensions



## ■ Specifications

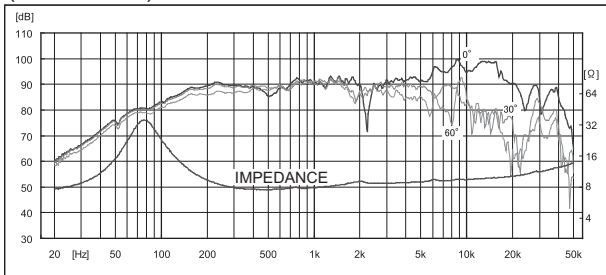
	< 8 Ω type >	< 16 Ω type >
Configuration:	10 cm cone shape full range speaker unit	←
Impedance:	8 Ω	16 Ω
f0:	85 Hz	←
Freq. response:	f0 ~ 40 kHz	←
SPL:	90 dB/W (1 m)	←
Input (MUS.):	15 W (NOM. 5 W)	←
m0:	2.5 g	2.4 g
Q0:	0.44	0.54
Effective vibration radius:	4.0 cm	←
Magnet weight:	226 g	←
Gross weight:	0.65 kg	←
Baffle open size:	Ø93	←
Recommended enclosure type:	Bass-reflex, Back loaded horn	Bass-reflex type

## ■ Accessories (8 Ω / 16 Ω)

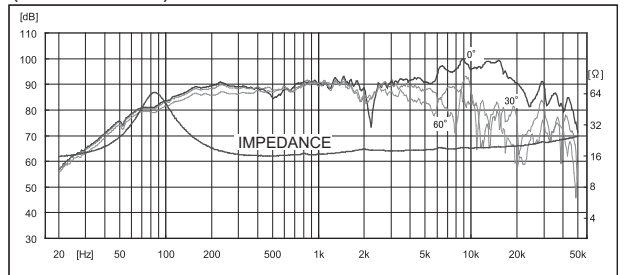
Wood screw x 4 pcs.  
Washer x 4 pcs.  
Gasket x 1 pc.

## ■ Freq. response (with JIS-specified enclosure)

(FE103-Sol 8)



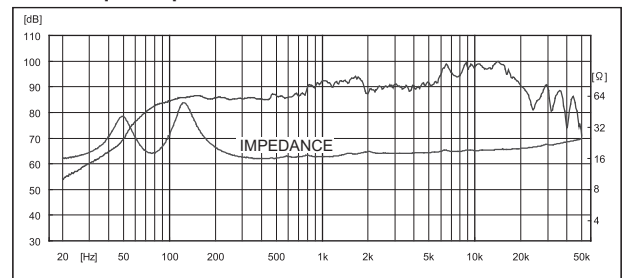
(FE103-Sol 16)



## Standard Bass Reflex Type Enclosure

It is an example of the FE103-Sol mounted into a standard bass reflex type enclosure. This can make a small system with well-balanced reproduction from low to high frequencies for both 8 Ω version and 16 Ω version. Following the assembly instruction, bond the top, bottom and back board first, then front baffle afterwards. As for the sound absorbing material, we recommend the use of felt for the bottom board and wool for the top and back board. We recommend to use a felt absorbing material on the bottom and wool absorbing material on the top/rear side.

## ■ Freq. response (FE103-Sol 16 w/bass reflex enclosure)



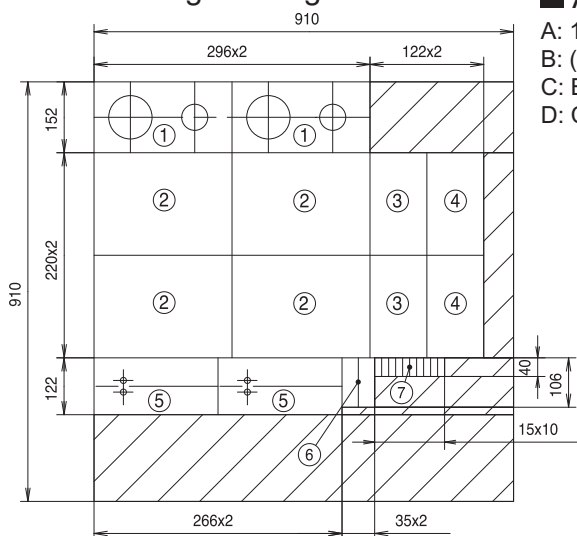
## ■ Enclosure design value

Internal volume 6.6 L  
Tuning freq. fb 73 Hz  
Duct diameter ø49  
Duct length 114 mm

## ■ Materials used

MDF: 910 x 910 mm t15 1 pc.  
Terminal: T150B 2 pcs.  
Duct: P49 2 pcs.  
Absorbing material: Adequate dose  
Felt, wool dose

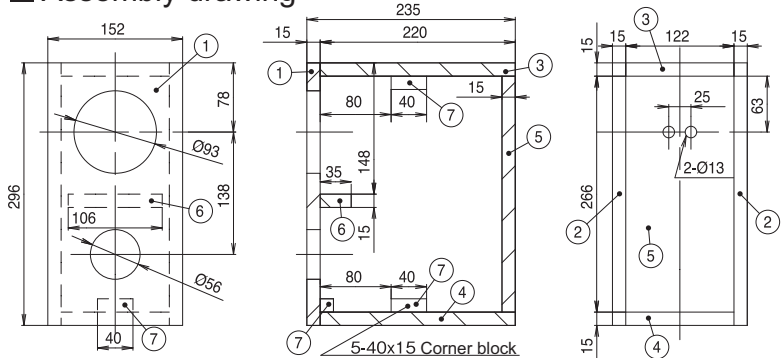
## ■ Board cutting drawing



## ■ Assembly sequence

A: 1 + 6  
B: (3 + 5 + 4) + 2 + 2  
C: B + 7 + 7 + 7 + 7  
D: C + A + 7

## ■ Assembly drawing



## ■ Board dimensions (1 pc.)

No.	Name	Dimensions	Qty.
1	Baffle board	152 x 296	1
2	Side board	220 x 296	2
3	Top board	122 x 220	1
4	Bottom board	122 x 220	1
5	Back board	122 x 266	1
6	Reinforcing board	106 x 35	1
7	Corner block	40 x 15	5

## Back Loaded Horn Type Enclosure

It is an example of the FE103-Sol mounted into a back loaded horn type enclosure. This consists of main body and stand part separated and the bottom lateral surface and back surface are horn open mouth. Follow the assembly instruction and add reinforcing beam to top, bottom and back board first. Before bonding them, draw the positioning line on the side board #2, so that you can place the board #9, #10 and #7, #11 on the appropriated positions. Use generous amount of adhesive in order not to create any gap or hollow at the joint area. Insert the sound absorbing material into the air compartment and horn open mouth above the stand board #18. The 8 Ω version driver is suited to use for this enclosure.

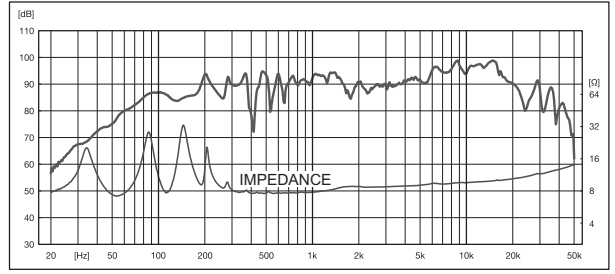
### Enclosure design value

Air chamber	2.5 L
Throat area	43 m <sup>2</sup>
Horn opening area	313 m <sup>2</sup>
Horn length	175 cm
Horn cross-over freq.	170 Hz
Cut-off freq.	30 Hz
Expansion factor	1.12

### Materials used

Japanese lime tree plywood: 910 x 1800 t12	1 pc.
MDF: 910 x 910 t12	1 pc.
Terminal: T150B	2 pcs.
Absorbing material: Felt, wool	Adequate dose

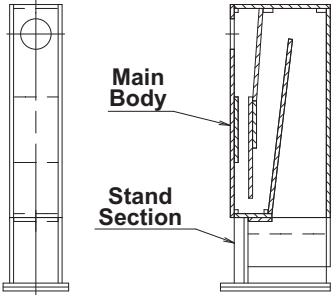
### Freq. response (FE103-Sol 8 w/back loaded horn enclosure)



### Board dimensions (1 pc.)

No.	Name	Dimensions	Material	Qty.
1	Baffle board	136 x 650	Plywood	1
2	Side board	305 x 50	Plywood	1
3	Top board	136 x 293	Plywood	1
4	Bottom board	136 x 115	Plywood	1
5	Back board	136 x 638	Plywood	1
6	Bottom Reinforcing board	135 x 72	MDF	1
7	Cavity Board	136 x 283	MDF	1
8	Road 1	136 x 200	MDF	1
9	Road 2	136 x 309	MDF	1
10	Road 3	136 x 144	MDF	1
11	Road 4	136 x 537	MDF	1
12	Reinforcing Bar 1	136 x 30	Plywood	2
13	Reinforcing Bar 2	136 x 12	MDF	2
14	Stand Baffle	160 x 200	Plywood	1
15	Stand Support Post	200 x 30	Plywood	2
16	Stand Side Board	239 x 150	Plywood	2
17	Stand Rear Board	160 x 150	Plywood	1
18	Stand Bottom Board	335 x 200	MDF	2
19	Partition Board	239 x 150	MDF	1
20	Reinforcing Bar 3	136 x Unused	Plywood	2

### Completion drawing

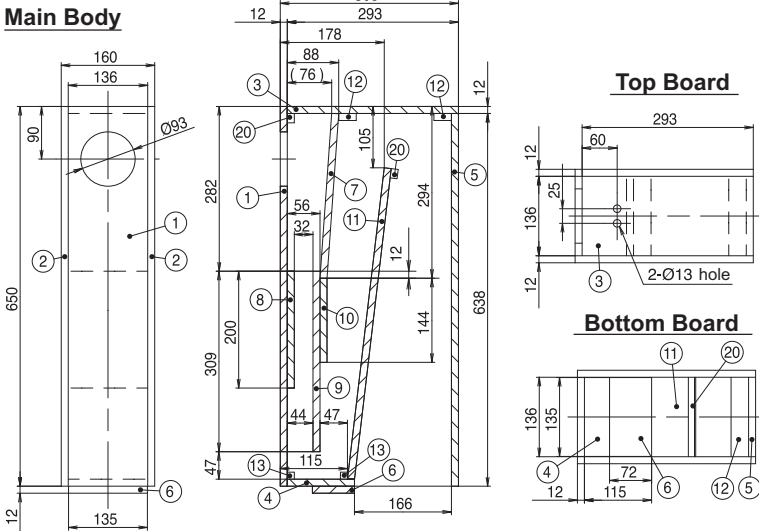


### Assembly sequence

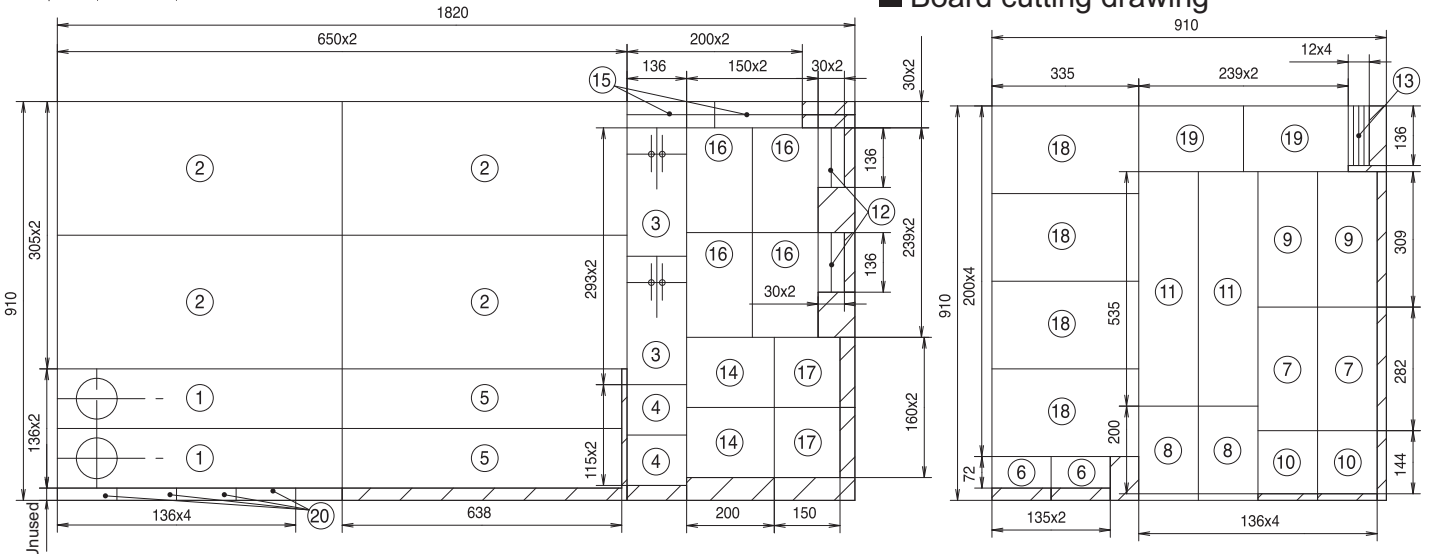
**Main Body**  
 A: (1 + 8) + (4 + 13 + 13) + 2  
 B: A + (3 + 20 + 12) + (5 + 12)  
 C: B + (9 + 10) + 7 + (11 + 20)  
 D: (C + 2) + 6

**Stand Section**  
 E: 18 + 18  
 F: (14 + 15 + 15) + 19  
 G: 17 + 16 + 16  
 H: (F + G) + E

### Assembly drawing



### Board cutting drawing





## FE103-Sol (8) / (16) Thiele/Small Parameters

Size	100 mm	4.0 in	Surface Area of Cone	Sd	0.005 m <sup>2</sup>
Overall Diameter	107 mm	4.3 in	Nominal Impedance	Zn	8 / 16 ohm
Baffle Hole Diameter	93 mm	3.7 in	Resonance Frequency	Fs	85 / 88 Hz
Depth	49 mm	2.0 in	DC Resistance	Re	6.5 / 14.2 ohm
Voice Coil Diameter	20 mm	0.8 in	Coil Inductance	Le	0.035 / 0.078 mH
Cast / Stamped	Stamped		Mechanical Q	Qms	2.755 / 2.947
Impedance	8 / 16 ohm		Electromagnetic Q	Qes	0.525 / 0.666
Reproduction Frequency Response	Fs - 40 kHz		Total Q	Qts	0.44 / 0.54
Sound Pressure Level	90 dB/W (1m)		Equivalent Mass	Mms	2.5 / 2.4 g
Rated Input	5 W		BL Product (Factor Force)	BL	4.15 / 5.47 Tesla/m
Music Power	15 W		Compliance Equivalent Volume	Vas	4.29 / 4.27 L
Magnet Weight	226 g	0.498 lb	Voice Coil Overhang	Xmax	0.9 / 0.95 mm
Net Weight	650 g	1.433 lb	Reference Efficiency n0	Eff/n0	0.59 / 0.528 %
Equivalent Diaphragm Radius	a	40 mm	Mechanical Compliance of Suspension	Cms	1.243 / 1.184 m/N
Effective Cone Diameter	D	80 mm	Efficiency Bandwidth Product	EBP	161.9 / 132.13

### 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.

 <b>WARNING</b>	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.
 <b>CAUTION</b>	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**

**FOSTEX CO.**

1-1-109, TSUTSUJIGAOKA, Akishima-shi, Tokyo Japan, 196-8550