

EVX-180B

18 Inch Low-Frequency Reproducer



General Product Description

The EVX-180B low-frequency transducer is designed for professional sound reinforcement or studio monitoring applications that require maximum output with low distortion.

The EVX-180B woofer provides unprecedented power capacity, linearity and excursion, made possible by the HeatWick® total-thermal-engineering design. The proprietary HeatWick design actually “wicks” heat away from the voice coil, significantly increasing power handling and long-term reliability. A special frame extension and elongated pole piece provide a metal surface with close proximity to the entire length of the voice coil, providing a major heat-transfer path. Also, the 100-mm (4-in.) diameter voice coil is longer than conventional medium efficiency woofers to give additional power handling and virtually eliminate dynamic-range power compression.

Additionally, a Flux Demodulation Device (FDD™) reduces distortion in the critical mid-band by providing a “short circuit” effect to prevent amplifier-signal modulation of the static magnetic field.

A ribbed, Kevlar® fiber composite cone with an extremely high stiffness-to-weight ratio and exceptional strength gives the EVX-180B increased resistance to cone collapse and deformation, without sacrificing efficiency.

Architects’ and Engineers’ Specifications

The low-frequency transducer shall have a nominal diameter of 460 mm (18 in.), overall depth not greater than 198 mm (7.92 in.), and weigh no more than 11 kg (25 lb). The frame shall be made of die-cast aluminum to resist deformation. The magnetic assembly shall have an extended pole piece to reduce inductive variances with excursion, and provide a symmetrical magnetic field at the voice-coil gap. Two aluminum rings shall encircle the pole piece above and below the magnetic gap, and shall have internal diameters concentric with the internal diameter of the steel top plate. The upper ring shall be part of the loudspeaker frame. Both rings act to reduce flux modulation and provide a heat transfer path from the outer diameter of the voice coil.

The voice coil shall be 100 mm (4 in.) in diameter and 20 mm (0.8 in.) in winding length, and shall be made of edge-wound aluminum ribbon. When centered in the magnetic gap, the voice coil shall produce a force of not less than 21.9 newtons (tesla-ampere-meters) with a dc current of 1 ampere. Performance specifications of a typical production unit shall be as follows: measured sensitivity (SPL at 1 m (3.3 ft) with 1-watt input, 100 to 800 Hz pink noise) shall be at least 96 dB. The half-space reference efficiency shall be at least 3.0%. The usable frequency response shall be 20 Hz to 2,000 Hz, and the nominal impedance shall be 8 ohms. The rated power for the loudspeaker shall be 1,000 watts continuous power.

The low-frequency transducer shall be the Electro-Voice® EVX-180B.

Directional Characteristics

The directional characteristics of the EVX-180B in the TL3512 256-liter (9-ft³) vented enclosure were measured by running a set of polar responses in EV’s large anechoic chamber. The test signal was octave-band-limited pseudo-random pink noise centered at the ISO standard frequencies.



The curves show horizontal (side-to-side) dispersion when the enclosure’s long axis is vertical. The vertical (up-and-down) polar responses deviate only slightly from the horizontal responses due to box geometry. Typical data is provided in Figures 1 and 2, which indicate 6-dB-down beamwidth versus frequency and directivity factor, respectively, for an EVX-180B in the TL3512 enclosure.

Electrical Connections

The EVX-180B is fitted with a pair of chrome-plated, frame-mounted connectors with color-coded ends. Electrical connection is made by pushing down, inserting wire completely through the rectangular slot and releasing pressure. One conductor of #9 AWG stranded, #8 AWG solid, a pair of twisted #15 AWG stranded or a pair of #14 AWG solid conductors will fit. A positive electrical signal applied to the red (+) terminal will displace the cone away from the magnet, thus producing a positive acoustic pressure.

Recommended Enclosures

The most extended bass, lowest distortion and best control is usually realized in properly designed vented enclosures. In such designs, the vent, or port, actually provides the lowest octave of output. The vent is driven to full acoustic output by a relatively small motion of the speaker cone itself, acting through the air contained within the enclosure. The excursion of the EVX-180B at these frequencies is much reduced compared to sealed or open-back enclosures, directly reducing harmonic distortion and the possibility of speaker “bottoming.” The maximum output is limited by either: (1) the long-term thermal power-handling capacity or (2) the speaker’s maximum cone-excursion capability, whichever occurs first.-excursion capability, whichever occurs first.

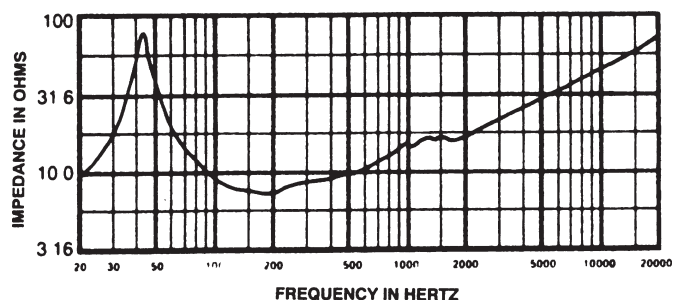


Figure 1. Beamwidth vs. Frequency

Specifications:

Power Handling: 1000 watts continuous

Per AES2-1984/ANSI S4.26-1984,

50-500 Hz: 600 watts

Sensitivity (SPL at 1 W/1 m), 100-800-Hz average: 98 dB

Impedance Response:

Minimum (Zmin): 7 ohms

Nominal: 8 ohms

Distortion Response (on axis in standard baffle, 10% rated input power):

Second Harmonic:

100 Hz: -45 dB (0.6%)

1,000 Hz: -41 dB (0.9%)

Third Harmonic:

100 Hz: -41 dB (0.9%)

1,000 Hz: -38 dB (1.3%)

Beamwidth (angle included by 6-dB-down points on polar responses for octave bands of pink noise):

500 Hz: 90°

1,000 Hz: 70°

2,000 Hz: 45°

Physical Constants,

Effective Piston Diameter: 406.0 mm (16.0 in.)

Moving Mass (M_{Mo}): 0.151 kg (0.333 lb)

Voice-Coil Winding Depth: 20.3 mm (0.8 in.)

Voice-Coil Diameter: 63.5 mm (2.5 in.)

Voice-Coil Winding Length: 26.9 m (88.4 ft)

Top Plate Thickness at Voice Coil: 10.9 mm (0.43 in.)

BL Factor: 22.5 tesla meter

Thiele-Small Parameters (broken in),

f_s : 29 Hz

V_{AS} : 416 liters (14.7 ft³)

Q_{ES} : 0.29

Q_{MS} : 4.00

Q_{TS} : 0.27

R_E : 5.0 ohms

η_{lo} : 3.4%

S_D : 0.122 m² (189 in.²)

M_{MD} : 0.127 kg (0.280 lb)

L_E : 1.6 mH

C_{MS} : 0.200 mm/N

R_{MS} : 6.86 mechanical ohms

$P_{E(max)}$: 600 watts

X_{MAX}^1 : 6.4 mm (0.25 in.)

X_{lim}^2 : 25 mm (0.98 in.)

Connector Type:

Push Terminals for bare wires.

Polarity:

A positive voltage applies to the positive (red) terminal produces a positive pressure at the front of the cone.

Additional Descriptive Information,

Magnet Weight: 3.2 kg (7.0 lb)

Magnet Material: Barium ferrite

Frame: Cast aluminum

Frame Finish: Textured black epoxy

Plating of Steel Parts: E-coat

Voice-Coil Material: Aluminum

Voice-Coil Insulation: Polyimide 220°C rating

Voice-Coil Form: Polyimide

Back Cover: Black, advanced synthetic elastomer

Net Weight: 11.3 kg (25 lb)

Optional Accessories:

SMH-1 mounting hardware kit

- X_{max} is the one-way peak excursion which produces 10% THD of the current waveform when driven at f_s .
- Displacement limit is the one-way peak excursion which, when exceeded, will cause physical damage to the drive mechanism.

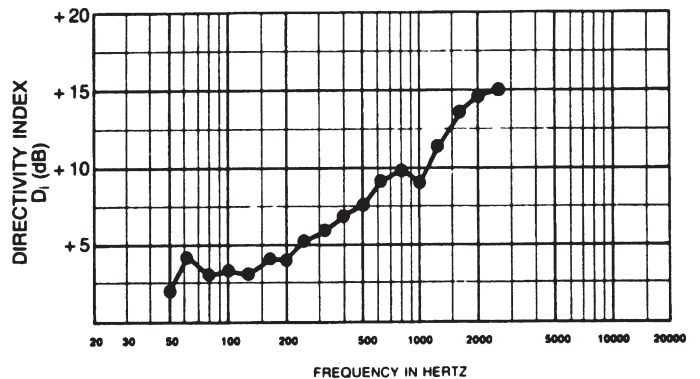
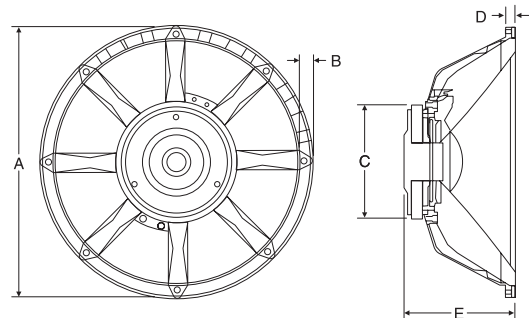


Figure 2. Directivity Index vs. Frequency

Dimensions: (in)	
A	18.2
B	0.782
C	8.188
D	0.50
E	7.42
F	17.38
G	0.281 x 8



F = Bolt Center
G = Bolt Hole Dia.

Dimensions

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Germany	Hirschberger Ring 45, D94315, Straubing, Germany, Phone: 49 9421-706 0, FAX: 49 9421-706 287
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Electro-Voice®

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For customer orders, contact the Customer Service department at
800/392-3497 Fax: 800/955-6831

For warranty repair or service information, contact the Service
Repair department at 800/685-2606

For technical assistance, contact Technical Support at 866/78AUDIO

Please refer to the Engineering Data Sheet for warranty information.
Specifications subject to change without notice.