

## Force®

- 15-inch two-way high-output stage system
- 200-watts continuous, 800-watts short-term power handling
- Ring-Mode Decoupling (RMD™) for improved sound quality and dynamic integrity
- High-Q 60° x 40° Constant-directivity horn with DH2010A driver
- Integral 1 3/8-inch stand mount
- Ergonomically shaped handles for ease in lifting and transportation
- Choice of paralleled 1/4-inch or Neutrik Speakon® (Force E) connectors

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### Description

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The Electro-Voice Force® is high-peak output, high-efficiency two-way stage system. The 15-in. low-frequency/horn-loaded constant-directivity high-frequency system incorporates elements of Ring-Mode Decoupling (RMD™). RMD™ techniques substantially improve vocal fundamental intelligibility and produce an “up front” tonality capable of cutting through even difficult acoustic environments.

The Force® enclosure has a unique design that presents a very minimal frontal cross section while still maintaining substantial internal volume. A newly developed handle concept allows for extremely comfortable transportation from any orientation. The design is light weight, but very rugged and features a heavy metal grill and highly stylized corner protection.

The heart of the Force® high performance design is the combination of a high-exursion low-frequency suspension system with Electro-Voice’s unique Ring-Mode Decoupling. All loudspeaker drivers exhibit mechanical resonance modes that add their own time-domain or ringing-mode colorations. These colorations limit and reduce overall system intelligibility. The

Force® use of RMD™ will control several fundamental mechanical ringing modes. The result is substantially improved vocal range intelligibility and system “openness”.

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### Power Handling

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To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test closely related to real-life conditions. First, we use a random-noise input signal because it contains many frequencies simultaneously, just like real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than typical actual program, adding an extra measure of reliability. Third, the test signal includes not only the overall “long term average” or “continuous” level—which our ears interpret as loudness—but also short-duration peaks which are many times higher than the average, just like actual program. The long-term average level stresses the speaker thermally (heat). The instantaneous peaks test mechanical reliability (cone and diaphragm excursion). Note that the sine-wave test signals sometimes used have a much less demanding peak value relative to their average level. In actual use, long-term average levels exist from several seconds on up, but we apply the long-term average for several hours, adding another extra measure of reliability.

Specifically, the Force® is designed to withstand the power test described in the ANSI/EIA RS-426-A 1980. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white-noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage bandwidth analyzer (one-third-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1,200 Hz with a 3-dB-per-octave slope above 1,200 Hz.

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### Amplifier Recommendations

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The power-handling rating of the Force® is 200-watts (250 watts AES 1984) continuous. The specific tests used employ a crest factor (ratio of peak energy to continuous energy) of at least 6 dB. During extended testing, the Force™ is routinely subjected to peak levels far in excess of its continuous rating of 200 watts. Many amplifier designs are capable of producing peak power levels in excess of their ratings as well, so exact “pairing” of loudspeaker rating and amplifier ratings is not necessary. Amplifier continuous ratings of 150 watts to 300 watts are suggested. Larger amplifier ratings are recom-

mended for maximum dynamic range, but it should be recommended that amplifier continuous levels (as opposed to peak levels) be within the range quoted for the Force<sup>®</sup> long-term average power-handling rating.

#### Stand Mounting

The Force<sup>®</sup> is equipped with an internal stand-mount adapter that will accommodate standard 1 3/8-in. diameter speaker stands.

#### Architects' and Engineers' Specifications

The loudspeaker system shall consist of a 38.1-cm (15-inch) low-frequency transducer in a vented enclosure. The high-frequency section shall be a compression driver with a pure titanium diaphragm coupled to a 1-inch throat diameter to a constant-directivity horn having a horizontal included angle (as referenced to -6 dB) of 60° and a vertical included angle of 40° nominal. The loudspeaker shall have a rated frequency response of 60 Hz to 20 kHz  $\pm 3$  dB and a long-term rated average power handling of 200 watts (EIA RS-426-A) or 250 watts (AES 1984). The system sensitivity shall be 99 dB when measured in an anechoic environment with a 1-watt input with a calibrated measurement microphone located 1 meter from the system axis. The nominal impedance shall be 8 ohms. The system shall have either parallel 1/4-in. phone jacks or (parallel Neutrik NL4MP on specific E models). The system shall include a 1 3/8-in. standmount adapter.

Dimensions will be 76.8 cm (30.25-in.) high x 42.9 cm (16.9-in.) wide x 38.1 cm (15-in.) deep and have net weight of 27.5 kg (60.5 lbs).

#### Uniform Limited Warranty

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid.

**Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice Service or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice Service or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice Service at 600 Cecil Street, Buchanan, MI 49107 (800/234-6831 or FAX 616/695-4743).

**Incidental and Consequential Damages Excluded:** Product repair or replacement and

return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Electro-Voice Speakers and Speaker Systems** are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

**For warranty repair,** service information, or a listing of the repair facilities nearest you, contact the service repair department at: 616/695-6831 or 800/685-2606.

**For technical assistance,** contact Technical Support at 800/234-6831 or 616/695-6831, M-F, 8:00 a.m. to 5:00 p.m. Eastern Standard time.

Specifications subject to change without notice.

Figure 1—Frequency

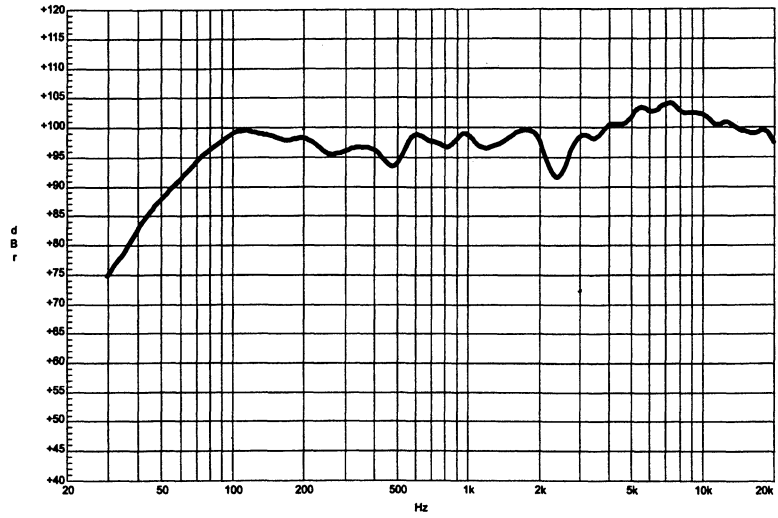
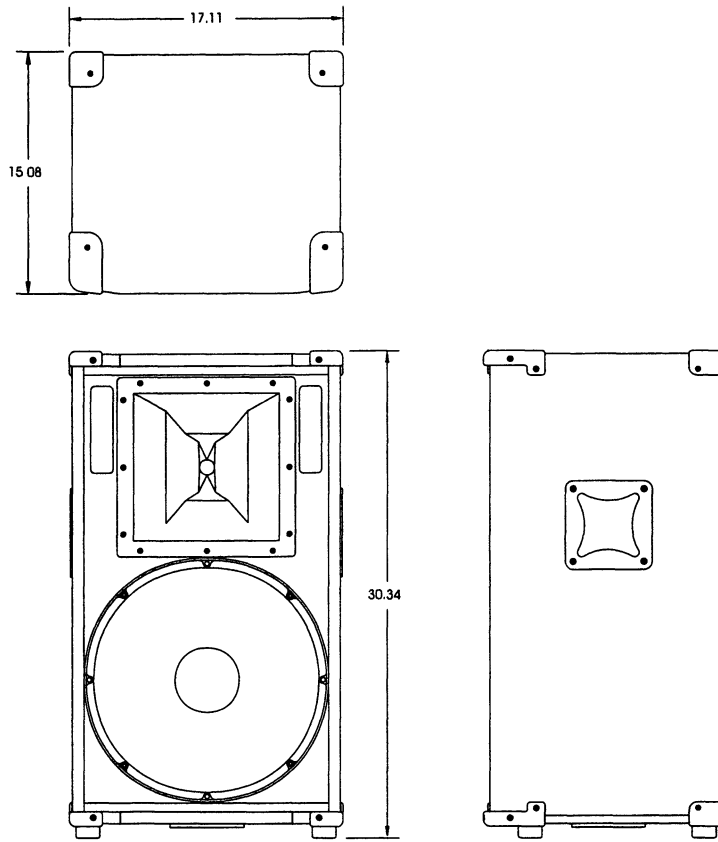


Figure 2—Dimension



**Specifications**

**Frequency Response, Measured at 10 feet on axis (normalized to 1 watt/1 meter):**

60 Hz-20 kHz  $\pm 3$  dB

**Long-Term Average Power Handling, EIA Standard RS-426-A:**

200 watts

**AES (1984):**

250 watts

**Sound Pressure level, 1 w/1 m:**

99 dB

**Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Indicate One-Third-Octave Bands of Pink Noise,**

**2,500-20,000 Hz, Horizontal:**

60° (+14°, -25°)

**2,500-20,000 Hz, Vertical:**

40° (+12°, -0°)

**Transducer Compliment,****High Frequency**

DH2010A

HP64M constant directivity

**Low Frequency:**

15"-RMD

**Enclosure Tuning:**

60 Hz

**Crossover frequency:**

1600 Hz

**Impedance:**

Nominal 8 ohms

Minimum 5.3 ohms

**Input connectors:**

Parallel 1/4-inch phone jacks

Parallel Neutrik model NL4MP

(E-version only)

**Dimensions,****Height:**

76.8 cm (30.25 in.)

**Wide:**

42.9 cm (16.9 in.)

**Depth:**

38.1 cm (15 in.)

**Net Weight**

27.5 kg (60.5 lbs)

**Shipping Weight**

31.1 kg (68.5 lbs)

**Supporting Products**

100BK speaker stand

# Electro-Voice<sup>®</sup>

600 Cecil Street, Buchanan, MI 49107

616/695-6831, 616/695-1304 Fax