

S18

Subwoofer

- SG18 18-inch woofer for remarkable, extended low-frequency output
- 300-watt long-term rms power capacity
- Roadworthy enclosure with metal corners, a metal grille and a durable black carpet finish
- Dual 1/4-inch phone jack or dual Neutrik Speakon® inputs¹
- Compact design allows stacking with other S-series systems
- Subwoofer for augmenting the low-frequency performance of EV stage systems

¹ See Connections section.

Description

The Electro-Voice S18 is a 300-watt compact subwoofer loudspeaker system that has been designed specifically to complement the Electro-Voice S-Series stage systems. It provides solid low-frequency performance to 45 Hz for a variety of applications. The enclosure venting provides control of the woofer's excursion at the lowest frequencies of the subwoofer's output. Excursion is minimized at 48 Hz, with the majority of the output coming from the vents.

Use In Multiples

The S18 may be used in multiples to increase acoustic output. A 6-dB increase in maximum acoustic output occurs when two speaker systems are placed side by side and paralleled, yielding a 4-ohm load. For operation at very-low-frequencies, the woofer cones "mutually couple," acting as one system with twice the effective cone area at very-low frequencies to provide 3-dB more output, while the doubled power capacity provides the potential for an additional 3-dB gain in maximum acoustic output.

Mutual coupling occurs when the frequency is such that the center-to-center distance between the two woofers is less than about one-half wavelength. When the distance is greater than one-

half wavelength, as would occur if two S18's were widely spaced, the level increase is limited to the 3-dB power capacity increase.

Crossover

Although the S18 can be used without an active crossover to a full-range system, for optimum performance, an active crossover with a minimum slope of 12-dB-per-octave and a crossover frequency of 200 Hz or below is recommended.

Speaker Protection

The S18, like all other vented systems, experiences rapidly increasing cone excursion below the box-tuning frequency. The acoustic output also decreases rapidly. Therefore, it is necessary to protect the S18 and maximize the power output of the subwoofer by inserting an active high-pass filter. The filter should be in the 30- to 40-Hz range with a typical value of 32-Hz and a slope of at least 12 dB per octave. Such subpassband filters are found in many crossovers and equalizers manufactured by Electro-Voice, as well as other commercially available equipment.

Enclosure Construction

The S18 enclosure is constructed of Road-Wood™, a structural material that combines

the strength of high-quality plywood with the density and acoustic damping of particle board, without brittleness. Road-Wood™ uses the same principle of crossbanding veneers as in plywood, in order to achieve its very high rigidity. A tough liquid-phenolic resin is blended with long, narrow strands of hard-wood. Alternate layers are perpendicularly bonded under intense heat and pressure to form panels of superior uniformity. Unlike many grades of plywood, Road-Wood™ is dimensionally stable, water-resistant and free from voids.

A combination of dado cut joints and tough adhesives ensure a sonically dead enclosure free from panel resonances.

The densely-woven, industrial-grade, abuse-resistant carpeting provides a finish that is both attractive and highly durable. Heavy-duty metal corner protectors, firmly secured rubber feet, recessed handles and a protective metal grille complete the picture and ensure that the S18 speaker system is ideally suited to a long and reliable life on the road.

Frequency Response

The S18's axial frequency response is shown in Figure 1. This response was measured at 3.05 meters (10 feet), using a 4-volt swept sine-wave input in an anechoic chamber. No ex-

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ternal equalization was used. Figure 1 has been averaged and normalized to 1 watt at 1 meter.

Connections

The S18 is equipped with two parallel 1/4-inch phone jacks. (The S18-E has two parallel Neutrik Speakon® NL4MP connectors.) Another woofer can be connected in parallel by using the other connector. Care must be taken not to abuse the amplifier by connecting impedances which are too low. (See amplifier specifications supplied by the manufacturer.)

Power-Handling Capacity

Electro-Voice components and systems are manufactured to exacting standards, ensuring they will hold up, not only through the most rigorous of power tests, but also through continued use in arduous, real-life conditions. The EIA Loudspeaker Power Rating Full-Range (ANSI/EIA RS-426-A 1980) uses a noise spectrum which mimics typical music and tests the thermal and mechanical capabilities of the components. Electro-Voice will support relevant additional standards as and when they become available. Extreme, in-house power tests, which push the performance boundaries of the woofers, are also performed and passed to ensure years of trouble-free service.

Specifically, the S18 passes ANSI/EIA RS-426-A 1980 with the following values:

$$R_{SR} = 5.87 \text{ ohms (1.15} \times R_E)$$

$$P_{E(MAX)} = 300 \text{ watts}$$

$$\text{Test voltage} = 41.96 \text{ volts rms,}$$

$$83.93 \text{ volts peak (+6 dB)}$$

The "peak" power-handling capacity of a woofer is determined by the peak test voltage amount. For the S18, a 84.8-volt peak test voltage translates into 1,200-watts short-term peak power-handling capacity. This is the equivalent of four times the "average" power-handling capacity, and is a peak that can be sustained for only a few milliseconds. However, this sort of short-duration peak is very typical in speech and music. Provided the amplifier can reproduce the signal accurately, without clipping, the woofer will also perform accurately and reliably, even at these levels.

Amplifier Power Recommendations

As noted in the Power-Handling section, above, the S18 has a random-noise power ca-

capacity of 300 watts long term (1,200 watts peak) per ANSI/EIA RS-426-A 1980. The following guidelines will help relate this to an appropriate power amplifier output rating.

1. To use the S18 to full capacity, skilled experts in sound system installation and operation will obtain the best results if the power amplifier is 2.0 to 4.0 times the long-term average noise power rating of the speaker system. For the S18 this is 600 to 1,200 watts.

The caution cannot be made strongly enough, however, that this arrangement is only for experts or those who can discipline themselves against "pushing" the system for ever-higher sound levels and who can avoid "accidents" such as catastrophic feedback or dropped microphones.

At these levels the system will fail if pushed beyond these limits even for a short time. It should be used by experts only or with a known signal source such as CD's which do not feedback or do not have unknown signals present.

2. A more conservative, "normal" amplifier size, which will produce audible results nearly equal to those of the "expert" recommendation, is 1.0 to 1.4 times the long-term average noise power rating of the speaker. For the S18 this is 300 to 420 watts.
3. To be very conservative, one can use an amplifier rated at 0.5 to 0.7 times the long-term average noise power rating of the loudspeaker. For the S18 this is 150 to 210 watts.

See Speaker Protection section.

Request P.A. Bible Addition No. Two ("Power Handling Capacity") for more background on these recommendations.

Service

In the unlikely event the S18 requires service, the woofer can be replaced or serviced from the front. A service data sheet is available from Electro-Voice.

Architects' and Engineers' Specifications

The loudspeaker shall be a compact vented-box type. The low frequencies shall be reproduced with one 300-watt (ANSI/EIA RS-426-A 1980) SG18 457-mm (18-in.) woofer. The system will reproduce the frequencies from 45 to 3,300 Hz. The system shall be capable of producing average sound levels in excess of 123 dB in the long term, and short-term peaks of 129 dB.

The enclosure shall be constructed of black-carpeted Road-Wood™ and have a metal grille which attaches with 7 screws. The dimensions shall be 778 mm (30.7 in.) tall, 505 mm (19.9 in.) wide, and 464 mm (18.3 in.) deep. The system shall weigh 27.7 kg (61 lb). Two 1/4-inch phone jack connections shall be provided. (Two Neutrik Speakon® connections shall be provided on the "E" version.)

The loudspeaker system shall be the Electro-Voice S18 (or S18-E).

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 Mark IV Audio Service or any of its authorized service representatives. **Obtaining Warranty**

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Service: To obtain warranty service, a customer must deliver the product, prepaid, to Mark IV Audio 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 Mark IV Audio 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—Axial Frequency Response, (anechoic environment, 4 volts/3.05 meters (10 feet), normalized to 1 watt/1 meter)

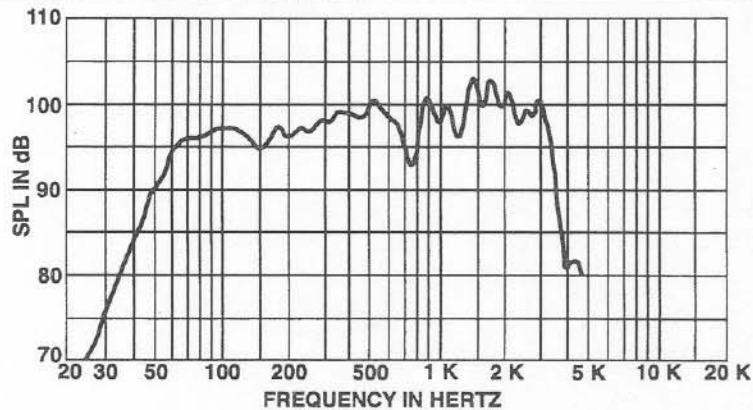
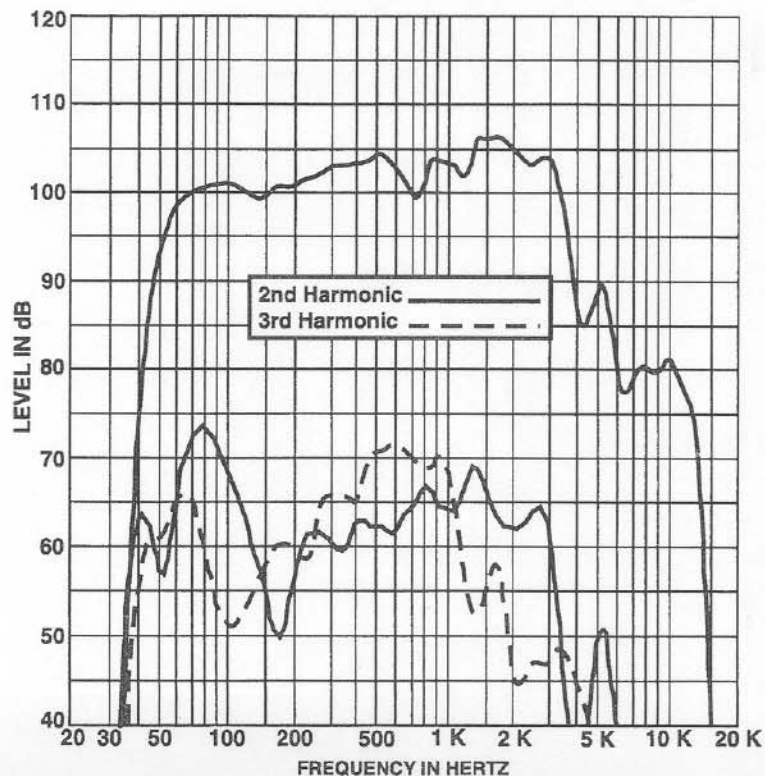


Figure 2—Harmonic Distortion, 10% Rated Power Input (30 watts), (anechoic environment, 3.05 meters (10 feet) on axis)



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Figure 3—Impedance Curve

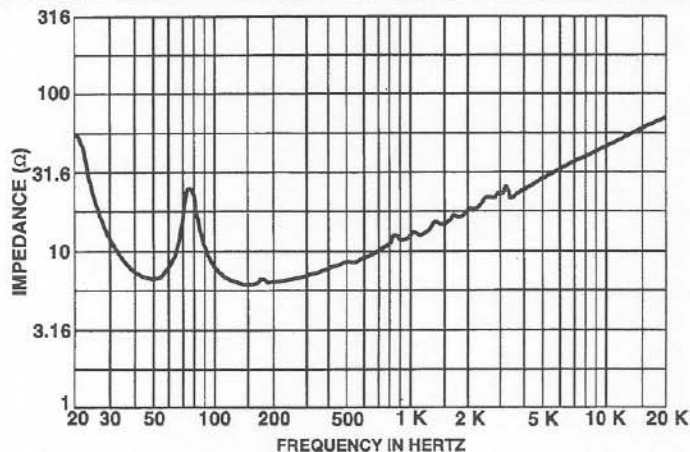
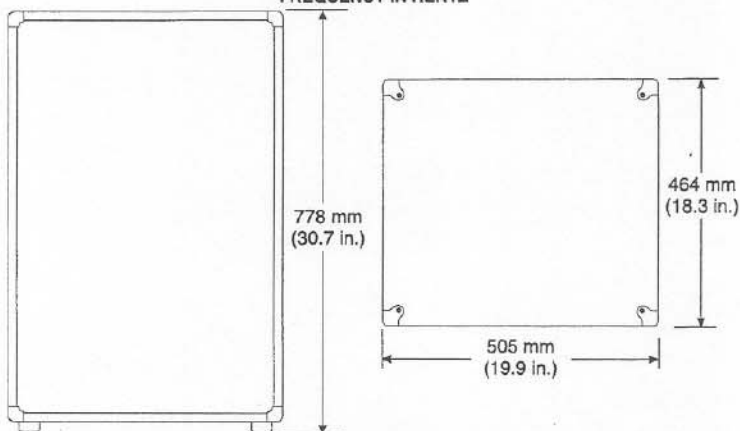


Figure 4—Dimension Line Drawing



Specifications

Typical Axial Frequency Response, Swept Sine Wave, 4 volts at 3.05 meters (10 feet), (anechoic environment, normalized for 1 watt at 1 meter; see Figure 1):

60-3,300 Hz

Low-Frequency 3-dB-Down Point:

60 Hz

Usable Low-Frequency Limit (10-dB-down point):

45 Hz

Half-Space Reference Efficiency:

2.9%

Long-Term Average Power-Handling Capacity per ANIS/EIA RS-426-A 1980 (see Power-Handling Capacity section):

300 watts

Maximum Woofer Acoustic Output:

9 watts

Sensitivity (SPL at 1 watt, 1 meter input, anechoic environment, swept sine wave, 50 to 200 Hz):

98 dB

Dispersion Angle Included by 6-dB-Down Points on Polar Responses:

Essentially omnidirectional

Distortion, 0.1 Full Power Input at 100 Hz (see Figure 2),

Second Harmonic:

-30 dB, 3%

Third Harmonic:

-49 dB, 0.4%

Transducer Complement,

SG18 18-inch woofer

Box Tuning Frequency:

48 Hz

Recommended Crossover Frequency:

200 Hz or below

Recommended Crossover Slope:

12 dB per octave, minimum

Impedance,

Nominal:

8.0 ohms

Minimum:

6.2 ohms

Input Connections:

Two parallel 1/4-inch phone jacks
(Two parallel Neutrik Speakon®
NL4MP connectors on S18-E)

Enclosure Materials and Colors:

Black-carpeted Road Wood™
Black perforated metal grille

Enclosure Dimensions (see Figure 4),

Height:

778 mm (30.7 in.)

Width:

505 mm (19.9 in.)

Depth:

464 mm (18.3 in.)

Net Weight:

27.7 kg (61 lb)

Shipping Weight:

31.8 kg (70 lb)

Electro-Voice®

a MARK IV company

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