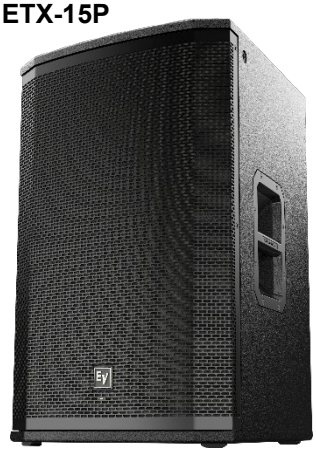
Types of PA Speaker Cabinets

With so many different Brands and Models of speaker cabinets to choose from – we will try to cover some of the more "important" technical information needed to understand the types and differences. First, there are two main categories – Active and Passive. Active speaker cabinets have the amplifier, crossover, and other processing built into the cabinet. Passive speaker cabinets will require an external amplifier, possibly a crossover, and other sound-processing gear in order to utilize the speaker cabinet. Active speaker cabinets have become very popular as they are easier and faster to set up (fewer cables, less connectivity, fewer processors, and less set-up time). Let's look at several types of Active and Passive speaker cabinets.

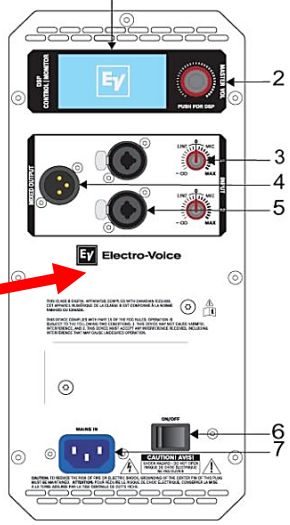
2-Way "Active" Speaker Cabinet

Electro-Voice ETX-15P



Courtesy of Electro-Voice

2000-Watt Amplifier



1. LCD
2. MASTER VOL/DSP
3. INPUT LEVEL
4. MIXED OUTPUT
5. INPUT
6. POWER
7. MAINS IN

For more information, see the ETX Powered Loudspeakers User Manual (F.01U.276.083).

The ETX-15P is a 15" powered 2-Way loudspeaker cabinet that utilizes a 15-inch LF woofer and a 1.25-inch HF titanium compression driver with coverage of 90° X 60° (H x V). It has a built-in 2000-Watt Class-D power amplifier, and DSP. The built-in crossover's frequency is 1500Hz. The Frequency Response rating is 48Hz-20kHz. A Diagram of the rear panel Power Module / DSP is shown right.

3-Way "Active" Speaker Cabinet

Electro-Voice ETX-35P

The Electro-Voice #ETX-35P is a 15" powered 3-way loudspeaker with a 15-inch LF woofer, a 6.5-inch MF driver, and a 1.25-inch HF titanium compression driver. It also uses a 2000-Watt, Class-D power amplifier as well. The single-knob DSP (same as the 2-Way cabinet) includes presets for multiple configurations, and top / sub combinations. The three high-sensitivity transducers (speakers) are built for high output sound and optimized for low distortion and precise coverage.

These "Active" powered speakers can be paired with a Subwoofer cabinet (see next page). These "top" cabinets can sit on top of a Subwoofer cabinet or be used with a "pole mount" to get more separation. Since the speakers, amplifier, crossover, and processors are all built-in to an Active speaker cabinet, it may be less expensive than Passive types. Passive speaker cabinets will require an amplifier and processing gear to function correctly, which could be more costly than purchasing Active speaker systems. Repairs may be easier with Passive systems due to more accessible access to the separate components.

"Active" 18" Subwoofer Speaker Cabinet

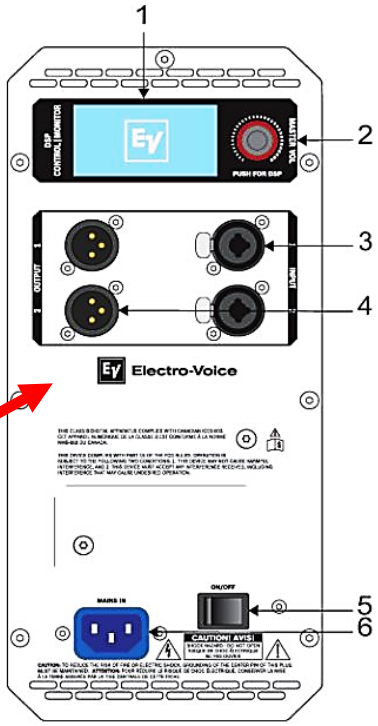
Electro-Voice
ETX-18SP

Let's take a look at a few of the specs for the Electro-Voice ETX-18SP Powered Subwoofer.

- 18-inch DVX subwoofer for extended low-frequency response 28 Hz-180 Hz
- 1800-Watt Class-D power amplifier with integrated DSP.

You've got a powerful system when used with the "top" cabinets (ETX-35P or ETX-15P). These subwoofers give you that extra "punch" needed to reproduce a full-sounding/quality performance. As mentioned before – Woofers and Subwoofers are not the same, and each has its specific purpose.

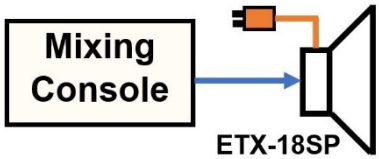
ETX-18SP
Power Module



1. LCD
2. MASTER VOL/DSP
3. INPUT
4. OUTPUT
5. POWER
6. MAINS IN

Courtesy of Electro-Voice

Basic Active Set Up



Quick Set Up – All that is needed is to provide AC power to the cabinet and run a shielded cable from a "Line Level" output of the mixing board to the Active cabinets input and set the levels.

Typical System Set-Up Example: For one of our outdoor sound system installs, we used two of the ETX-35P "tops" each sitting right on top of ETX-18SP subwoofer cabinets – It got very loud, but still maintained crystal clear audio! Excellent fidelity!

2-Way "Passive" Speaker Cabinet

The ELX115 is a compact 2-Way 15" passive loudspeaker that has the power handling capability of 400-Watt continuous, 1600-Watt peak to provide fuller sound for larger rooms. It utilizes an EVS-15K woofer, and a 1.5-inch DH-1K titanium HF compression driver with a 90° x 50° coverage-pattern waveguide. And also has a frequency range of 50 Hz–20 kHz.

Courtesy of Electro-Voice

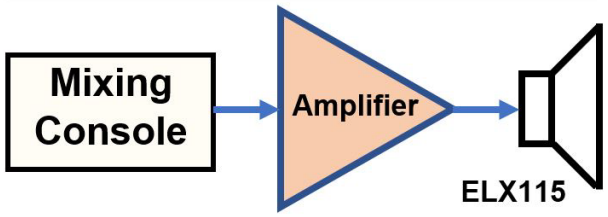
Electro-Voice
ELX115

3-Way "Passive" Speaker Cabinet

The QRx 153/75 is a 3-way 15" passive loudspeaker with high-level, high-fidelity sound. Has a 15" woofer, vented box for extended LF, a horn-loaded 8-inch MF8 midrange driver, and a 3-inch DH7 titanium HF compression driver with 75° H x 50° V coverage. Power handling is also 400W continuous, 1600 W peak. A great choice for a powerful, high quality sound system set up.

Electro-Voice
QRx 153/75

Typical Passive Set Up



Which is better for your application? Active or Passive?

[Passive Speaker Cabinets - Handout!]

Portable Column Systems

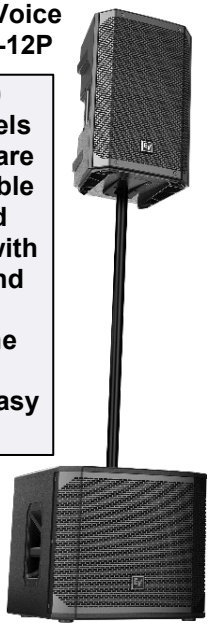
These portable systems are very popular with bands, DJs, and soloists as they are easy to set up and provide excellent coverage and performance. There are not many adjustments needed, and they sound incredible.

The EVOLVE 50M Portable column system features the Electro-Voice Quick Smart Link digital audio and control technology, an onboard mixer, DSP, and effects - all combined within the sleek EVOLVE 50. This system is the perfect choice for bands/musicians, AV rental companies, DJs, and applications requiring professional audio performance in a compact, portable system package.

Electro-Voice EVOLVE 50M

Electro-Voice ELX200-12P

The ELX200 powered models (shown right) are ideal for portable and installed applications, with lightweight and durable polypropylene enclosures designed for easy lifting.



Courtesy of Electro-Voice

Line Array Systems

Line Array systems come in many sizes – from the portable EVOLVE 50M system above to the sizeable arena-size system bottom right. Line Arrays are very efficient in how they "project" sound. They radiate sound in all directions but simultaneously reduce the sound energy that is projected vertically (which is usually a waste of useful energy). This allows for even sound distribution throughout the venue using less amplifier power.

The X12-128 (below) is a Dual 18" subwoofer system with High-impact dual 18" subwoofers using Super-High-Output DVF4180 woofers for low distortion at extremely high sound output. These subwoofers paired up with the top cabinets (X2-212/120) makes for a super-efficient large scale Array system.

The X2-212/120 is a High-performance 12" vertical line array loudspeaker system. The image shown to the right has 12 of the X2-212/120 stacked together to form the large Array system. This type of Array system is widely used for large indoor and outdoor concert venues, and large theaters.

Courtesy of Electro-Voice

Electro-Voice X12-128

Electro-Voice X2-212/120

Electro-Voice X2-212/120 Stacked Array.

Technically Speaking - As you get farther away from a conventional, spherically radiating loudspeaker, the level of the direct field (the sound from the loudspeaker itself without the sound reflected from the many room surfaces) will drop 6 dB every time the distance is doubled. This double-distance rule is called the "inverse-square law." Line arrays, appropriately configured, can reduce this drop-off in level to 3 dB for every doubling of distance. This is an attractive idea when the back of the room is much farther away than the front seats. Most line arrays are curved in some fashion, producing a drop-off between 3 and 6 dB per doubling of distance. "Courtesy of Electro-Voice White Paper."