

Transformers vs. Autotransformers

Some Transformer Basics

A transformer converts audio from one voltage and impedance to a different voltage and impedance. Transformers are passive which means they do not require a power supply to operate.

As diagrammed in Figure 1, a conventional transformer consists of two coils of wire wound around an iron core. The two coils are known as the "primary" (input) and "secondary" (output).

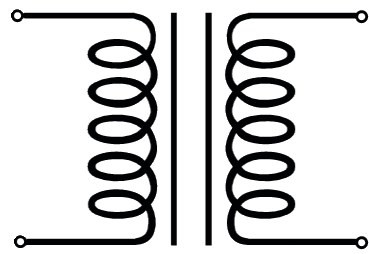


Figure 1: A Conventional Transformer

In audio, we use transformers in microphone preamplifiers and other audio electronics and to distribute amplifier power to the loudspeakers in 70V and 100V distributed systems.

Transformers provide several benefits to audio systems. They can electrically isolate one device from another and create balanced lines. Electrical isolation helps prevent shock hazards. Balanced lines help prevent hum and noise.

Transformers in 70V/100V Systems

In 70V and 100V distributed systems, each loudspeaker has its own transformer. This transformer, as diagrammed in Figure 2, can be "tapped" to apply a precise amount of power to each loudspeaker. A 70V or 100V distributed system allows a large number of loudspeakers to be connected in parallel to a single amplifier, simplifying installation. It also reduces power loss in the loudspeaker cable.

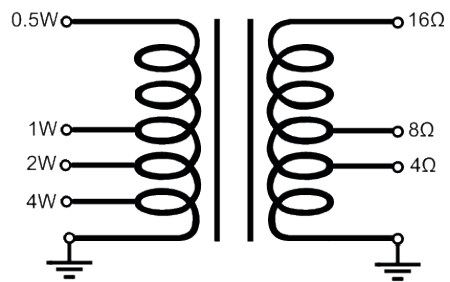


Figure 2: A Conventional 70V Transformer

Autotransformers ("Autoformers")

An autotransformer, as diagrammed in Figure 3, performs the same functions as a conventional transformer but there are several differences in design and performance. In particular, an autoformer has only one coil which performs the functions of both the primary and secondary windings.

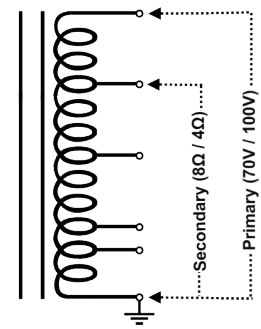


Figure 3: An Autotransformer

Because an autoformer requires fewer windings and has a smaller core, it is typically lighter and less costly than a conventional transformer with the same ratings.

Autoformers have performance advantages, too. They have increased power handling capability, flatter frequency response, lower insertion loss and lower distortion than conventional transformers of similar size and cost.

Autoformers do not provide electrical isolation or create balanced lines like conventional transformers but these are not requirements for 70V/100V distributed systems.

Community's Autoformers

Because of these advantages, Community uses autoformers in many of its 70V/100V models. For example, the 200-watt autoformer used in R SERIES and other models has a wide, flat frequency response and only a 1 dB core loss. This kind of performance is a significant improvement over a conventional 70V/100V transformer of similar size and cost.

Community's TAG Team Advantage

Contact Community's Technical Applications Group (TAG Team) at 610-876-3400 or by email for information on Community products, to discuss a current design or to request more information on any of the topics discussed in this Tech Note.