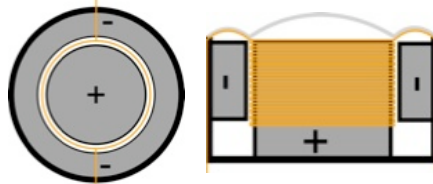


Dynamic Microphones

A dynamic microphone is a transducer which converts energy, by sensing acoustic energy (sound) and translating it into equivalent electrical energy (an electrical signal). Dynamic microphones have a diaphragm with a voice coil (a long coil of wire) attached near the apex and a magnetic system with the coil in its gap. The sound waves move the diaphragm connected to the coil which changes the magnetic field, causing an electrical current to flow.



Dynamic capsule



Top and side view of the coil and magnets



Inside a dynamic microphone with no electronics

Dynamic microphones are renowned for their ruggedness and reliability. They need no batteries or external power supplies and pick up sound within 6 inches, making them very useful for picking up a voice in a loud environment, like a singer in a band or a reporter at a football match.

Condenser Microphones

Condenser microphones are also transducers which convert acoustic energy into electrical signals. They use a lightweight membrane as a moving front plate, and have a fixed back plate that acts as opposite sides of a capacitor – part of an electrical circuit. Sound pressure against the membrane causes it to move and this changes the capacitance of the circuit, creating the electrical signal.



Condenser capsule



Lightweight front plate and fixed back plate



Inside a condenser microphone with internal electronics

There are two types of condenser microphones, externally polarized and permanently polarized. Externally polarized microphones use an external power supply to provide the polarizing voltage needed for the capacitive circuit to function.

A permanently polarized condenser (also known as “electrets”) has the polarizing voltage impressed during manufacture, which remains in place for the life of the microphone. Audio-Technica applies the polarizing voltage to the back plate and not the front diaphragm which provides considerable performance advantage. By using the back plate, it means our diaphragms can be made of much thinner material and many Audio-Technica microphone diaphragms are only 2 microns thick.

While externally polarized microphones do not need power for a polarizing voltage, the FET impedance matching circuit inside the microphone does require some power. This may be supplied by a battery or by an external “phantom power” supply.

Condenser microphones’ low mass membrane allows an extended high-frequency response and its design ensures outstanding low-frequency pickup. The resulting sound is natural, clean and clear, with excellent transparency and detail. They have inherently lower handling and mechanical noise than dynamic microphones, weigh much less than dynamic elements and can be much smaller. This makes them the logical choice for tie-clips, headset, shotguns and other miniature microphones.