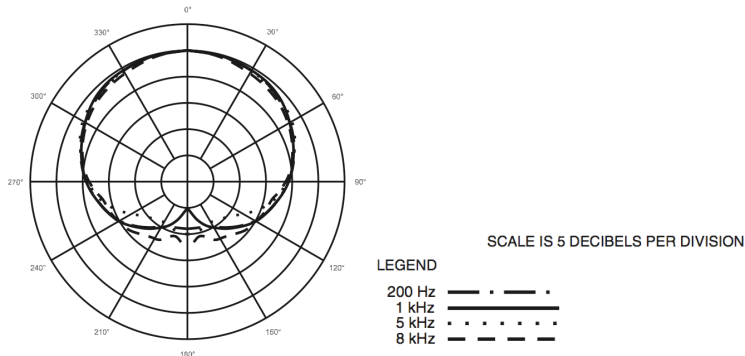


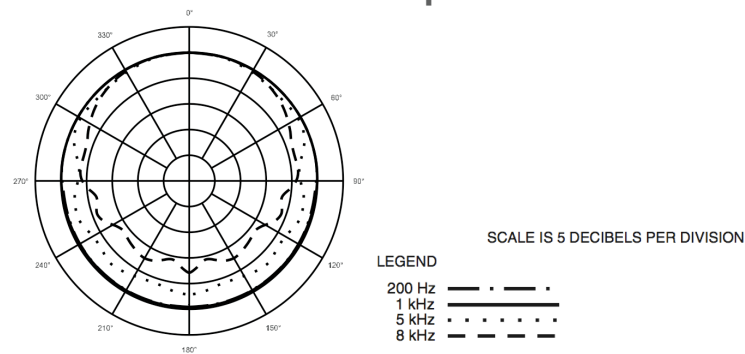
A polar pattern is a circular graph that shows how sensitive a microphone is in different directions. Each “circular” division represents 5dB of sensitivity, so you can see where the microphone picks up the strongest to the weakest sounds at different points. On the graph below, 0 degrees shows the direction the microphone is facing. 90 and 270 degrees are the sides of the microphone and 180 degrees the microphone’s back. The polar pattern below shows the solid line as a 1KHz signal. From 0 degrees the sensitivity drops more than 1 division (or more than 5dB) by the time it reaches 90 degrees. This means the side of the microphone is more than 5dBs less sensitive than the front of the microphone. Note - 6dB is equal to half the microphone’s volume, so sound from the side will be half the volume of sound from the front of the microphone.



The helpful guide below explains the different types of polar patterns you can find in the Audio-Technica microphone range.

- **Omnidirectional** - 360 degrees pick-up
- **Figure of Eight** - front and back pick-up
- **Cardioid** - 120 degrees pick-up
- **Hypercardioid** - 100 degrees pick-up
- **Line and Gradient (Shotgun)** - extremely tight pick-up for long distances

➤ Omnidirectional Microphones



An omnidirectional polar pattern covers all directions and picks up all sound in a 360 degree radius. These are ideal for natural, ambient recordings and for tie clip microphones - as moving your head to one side will not change the volume. They also make ideal headset microphones, as they sound very natural when close to the mouth.

Omnidirectional microphones are pressure sensitive so they are not as affected by wind noise or by the “proximity” effect (the bass boost when you are close to a directional microphone). They are also less susceptible to popping caused by “plosives” (when you say “P” or “B” close to the microphone).

Omnidirectional capsules exist independently of any special housing or cavities to alter the polar pattern. This makes a very neutral sounding microphone with very little colouration. The physical body of the microphone can block some high frequencies, making sound ‘duller’ from the back.

▶ Figure of Eight Microphones

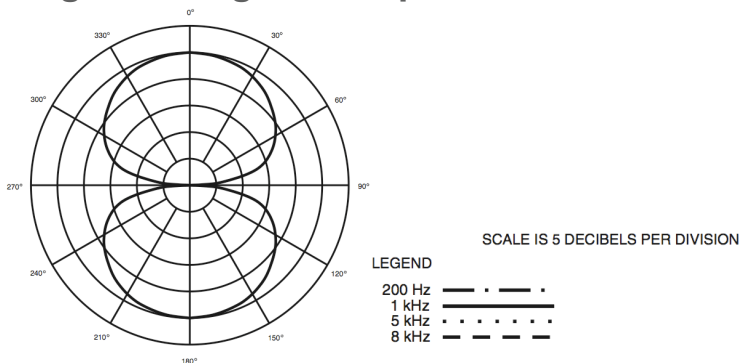
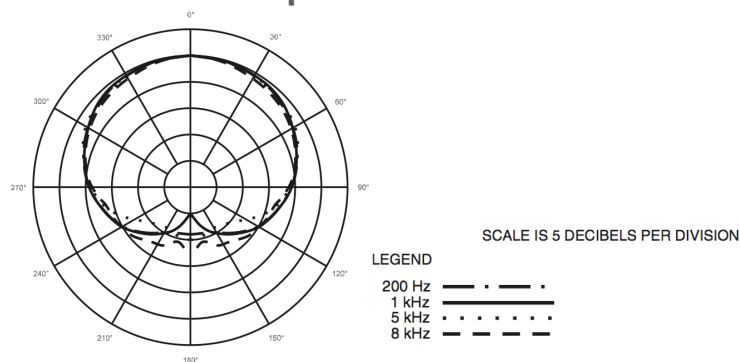


Figure of Eight or bi-directional microphones pick up sound from the front and rear while rejecting sound from the sides. You can see on the diagram above that it does not change for different frequencies. This is due to the fact that the capsule exists naturally without any alteration - like omnidirectional microphones which are very neutral sounding.

Figure of Eight microphones are used for their natural sound quality in some headsets, studio and broadcast microphones. There are also used in “Mid/Side” stereo recording techniques and in stereo microphones like the BP4027 and the BP4029. All ribbon microphones are naturally Figure of Eight.

▶ Cardioid Microphones

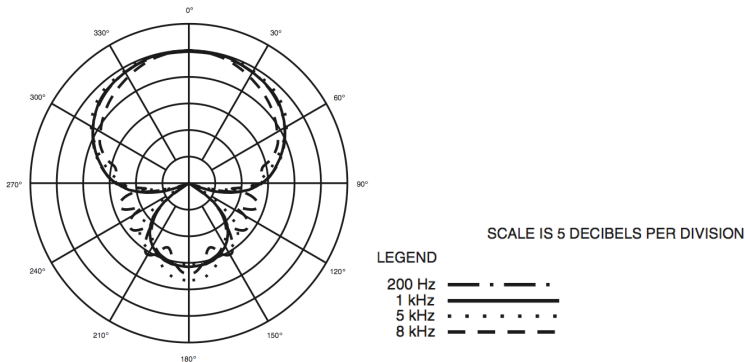


Cardioid microphones pick up sound within 120 degrees of the direction they are facing and take their name from the heart shape of their polar pattern. They help to reduce feedback and can be used to capture a particular sound in a loud environment. They are affected by wind noise, “proximity” effect and are susceptible to popping caused by “plosives”.

The original cardioid design uses a combination of an omnidirectional and a figure of eight element working together in harmony. Sound coming to the front of the microphone is added together from both the omnidirectional element and the figure of eight element. Sound from the sides will only be picked up by the omnidirectional element which will be half the volume of the front sound as only one capsule ‘hears’ the sound. Sound from the rear will have a positive signal on the omnidirectional element which is cancelled out by a negative signal from the figure of eight making the sound for the rear inaudible.

Most current cardioid microphones use external openings and internal passages in the microphone housing that allows sound arriving from the front of the microphone to aid diaphragm motion, while sound arriving from the side or rear will cancel diaphragm motion.

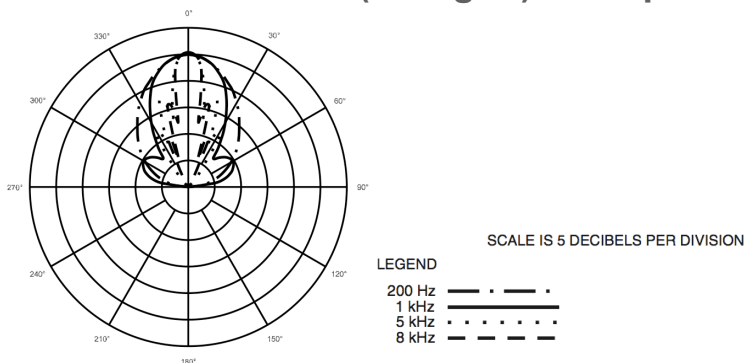
► Hypercardioid Microphones



Hypercardioid microphones are very similar to cardioids but have a tighter 100 degree pick-up. They have better side rejection than cardioid microphones but also pick-up a little sound from the rear.

Hypercardioids are even better than cardioid microphones for reducing feedback and therefore are the best choice for a quiet singer, or to capture a particular sound in a loud environment.

► Line and Gradient (Shotgun) Microphones



Line and Gradient or Shotgun microphones use a complex design that makes their polar pattern highly directional. The capsule is placed behind an interference tube with small slits along the side. The tube eliminates sound from the sides due to phase cancellation. The longer the interference tube, the tighter the polar pattern, making the microphone better at rejecting sound from the side and more focused in the direction it is pointing.

Shotgun microphones are excellent for film and theatre work to pick up sound while keeping the microphone out of the camera's view. As well as the standard broadcast shotgun microphones, Audio-Technica also makes miniature shotgun capsules for gooseneck and hanging applications. The Unipoint range uses the UniLine capsule and the Engineered Sound range uses the Microline capsule.

You can find the polar pattern of your microphone on the product page under resources or on the microphone's specification sheet.