



BETA91A

Half-Cardioid Condenser Microphone

The Shure half-cardioid electret condenser microphone, BETA91A, user guide.
Version: 3.1 (2021-B)

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Half-Cardioid Condenser Microphone

General Description

The Shure Beta 91A is designed for use with kick drums, piano and other traditional low frequency applications. Tailored for bass-heavy environments, this microphone features a powerful low frequency response and integrated preamplifier and XLR connection for easy setup and minimal stage clutter. The Beta 91A combines superior attack and punch for studio-quality sound, even at extremely high sound pressure levels (SPLs).

Features

- Premier live performance microphone with Shure quality, ruggedness, and reliability
- Uniform half-cardioid polar pattern (in the hemisphere above mounting surface) for maximum gain before feedback and rejection of off-axis sound
- Tailored frequency response for kick drums and bass-heavy instruments
- Wide dynamic range for use in high SPL environments
- Two-position contour switch enhances attack and clarity
- Integrated preamp and XLR connector reduce stage clutter and provide a quick, secure setup
- Low profile design requires no external mounting hardware
- Steel grille and die-cast metal construction resist wear and abuse

Applications

General Rules for Use

This table lists the most common applications and placement techniques. Keep in mind that microphone technique is largely a matter of personal taste; there is no one "correct" microphone position.

- Aim the microphone toward the desired sound source; angle unwanted sounds toward its *null* point.
- Use the fewest amount of microphones as practical to increase the *Potential Acoustic Gain* and prevent feedback.
- Follow the *3 to 1 Rule* by spacing each microphone by at least three times the distance to its source to reduce *Phase Cancellation*.
- Place microphones as far as possible from reflective surfaces to reduce *Comb Filtering*.
- When using directional microphones, work closely to the microphone for extra bass response to take advantage of *Proximity Effect*.
- Avoid excessive handling to minimize pickup of mechanical noise and vibration.
- Do not cover any part of the microphone grille, as this will adversely affect microphone performance.

Applications and Placement

Location and room acoustics strongly affect the sound quality of microphones. To achieve the best overall sound for a particular application, it may be necessary to experiment with microphone placement and room treatments.

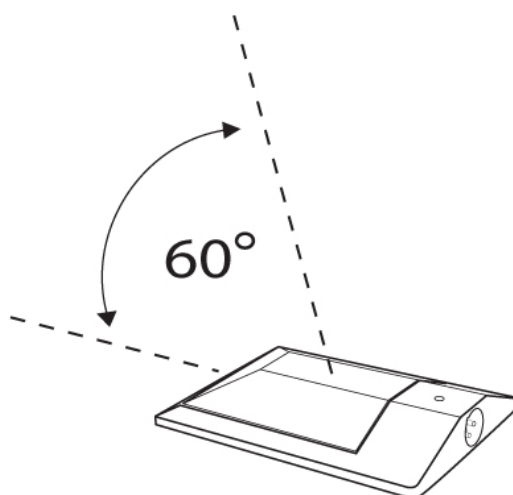
Application	Suggested Microphone Placement	Tone Quality
Kick Drum	Inside drum, on a pillow or other cushioning surface, 25 to 152 mm (1 to 6 in.) from beater head.	Full, natural sound.
	Contour switch activated; 25 to 152 mm (1 to 6 in.) from beater head.	Sharp attack; maximum bass "punch."
Piano	Mount microphone on underside of lid over lower treble strings. Experiment with lid height and placement to hammers for desired sound.	Bright, well-balanced, strong attack; excellent isolation.
	Mount microphone vertically on the inside of the piano frame, near the apex of the piano's curved wall.	Full, natural; excellent isolation and minimal hammer and damper noise.

Mounting the Microphone

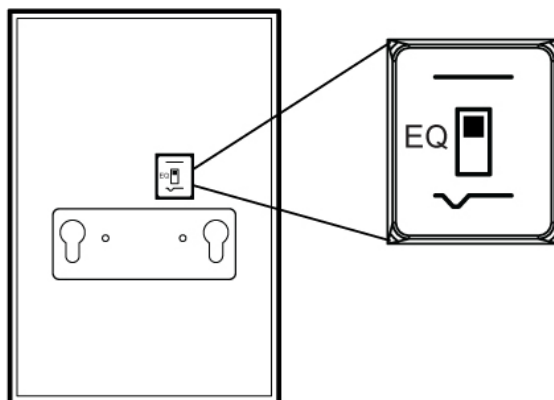
If desired, attach the microphone to a prepared surface using the mounting holes on the bottom of the microphone.

Half-cardioid Polar Pattern

This boundary microphone has a cardioid polar pattern in the hemisphere above the mounting surface. Keep sound sources within a 60° range above this surface.



Contour Switch



A two-position switch on the bottom of the microphone lets you selectively filter the low-mid frequency response without additional tools. Use this filter to enhance the attack and clarity of bass-heavy instruments.

Flat response: Provides the most natural sound in most applications.

Low-Mid Scoop: This setting tailors the microphone's frequency response to provide a strong 'punch' in the low frequencies, and plenty of attack in the higher frequencies.

Load Impedance

Maximum SPL capability, output clipping level, and dynamic range vary with the input load impedance of the preamplifier to which you connect the microphone. Shure recommends a minimum input load impedance of 1000 Ω . Most modern microphone preamplifiers meet this requirement. Higher impedance results in better performance for these specifications.

Power Requirements

This microphone requires phantom power and performs best with a 48 Vdc supply (IEC-61938). However, it will operate with slightly decreased headroom and sensitivity with supplies as low as 11 Vdc.

Most modern mixers provide phantom power. You must use a **balanced** microphone cable: XLR-to-XLR.

Accessories

Furnished Accessories

Zippered Carrying Bag	95A2314
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Optional Accessories

25 foot (7.5m) Triple-Flex® Microphone XLR Cable with Switchcraft connectors	C25E
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Replacement Parts

Cardioid Cartridge	RPM98A/C
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Specifications

Type

Electret Condenser

Frequency Response

20 to 20,000 Hz

Polar Pattern

Half-cardioid (cardioid in hemisphere above mounting surface)

Output Impedance

150 Ω

Sensitivity

at 1kHz, open circuit voltage

-48.5 dBV/Pa(3.8 mV) ^[1]

Maximum SPL

1 kHz at 1% THD ^[2]

2500 Ω load	155 dB
1000 Ω load	151 dB

Signal-To-Noise Ratio ^[3]

64.5 dB

Dynamic Range

at 1kHz

2500 Ω load	125.5 dB
1000 Ω load	121.5 dB

Clipping Level

20 Hz to 20 kHz, at 1% THD

2500 Ω load	12.5 dB
1000 Ω load	7.5 dB

Self Noise

equivalent SPL, A-weighted, typical

29.5 dB SPL-A

Common Mode Rejection

(20 Hz to 200 kHz)

≥55 dB

Frequency Contour Switch

7 dB of attenuation centered at 400 Hz

Power Requirements

11–52 V DC phantom power ^[4], 5.4 mA

Polarity

Positive pressure on diaphragm produces positive voltage on pin 2 with respect to pin 3

Weight

470 g(16.6 oz.)

Connector

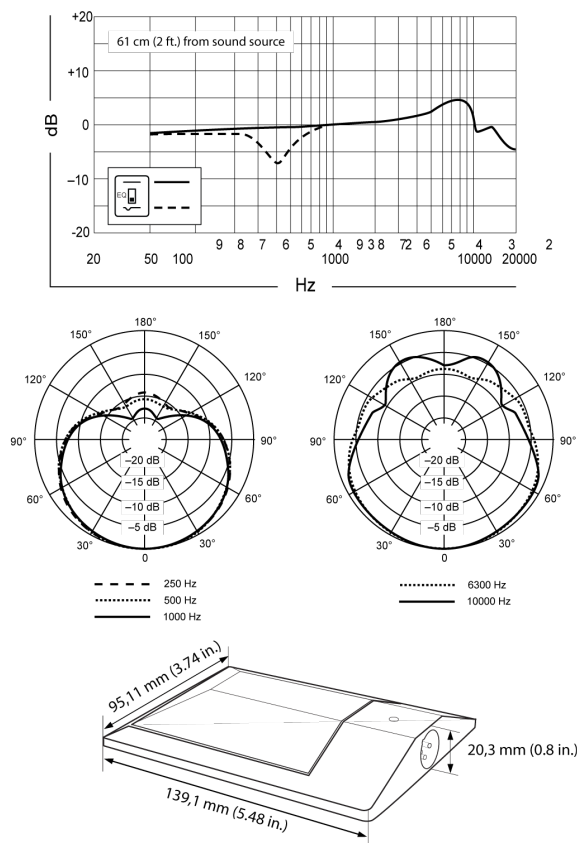
Three-pin professional audio (XLR), male, balanced

^[1] 1 Pa=94 dB SPL ^[1] 1 Pa=94 dB SPL ^[1] 1 Pa=94 dB SPL ^[1] 1 Pa=94 dB SPL ^[1] 1 Pa=94 dB SPL

^[2] THD of microphone preamplifier when applied input signal level is equivalent to cartridge output at specified SPL ^[2] THD of microphone preamplifier when applied input signal level is equivalent to cartridge output at specified SPL ^[2] THD of microphone preamplifier when applied input signal level is equivalent to cartridge output at specified SPL ^[2] THD of microphone preamplifier when applied input signal level is equivalent to cartridge output at specified SPL ^[2] THD of microphone preamplifier when applied input signal level is equivalent to cartridge output at specified SPL

^[3] S/N ratio is the difference between 94 dB SPL and equivalent SPL of self-noise, A-weighted ^[3] S/N ratio is the difference between 94 dB SPL and equivalent SPL of self-noise, A-weighted ^[3] S/N ratio is the difference between 94 dB SPL and equivalent SPL of self-noise, A-weighted ^[3] S/N ratio is the difference between 94 dB SPL and equivalent SPL of self-noise, A-weighted ^[3] S/N ratio is the difference between 94 dB SPL and equivalent SPL of self-noise, A-weighted

^[4] All specifications measured with a 48 Vdc phantom power supply. The microphone operates at lower voltages, but with slightly decreased headroom and sensitivity ^[4] All specifications measured with a 48 Vdc phantom power supply. The microphone operates at lower voltages, but with slightly decreased headroom and sensitivity ^[4] All specifications measured with a 48 Vdc phantom power supply. The microphone operates at lower voltages, but with slightly decreased headroom and sensitivity ^[4] All specifications measured with a 48 Vdc phantom power supply. The microphone operates at lower voltages, but with slightly decreased headroom and sensitivity ^[4] All specifications measured with a 48 Vdc phantom power supply. The microphone operates at lower voltages, but with slightly decreased headroom and sensitivity



Certifications

This product meets the Essential Requirements of all relevant European directives and is eligible for CE marking.

The CE Declaration of Conformity can be obtained from: www.shure.com/europe/compliance

Authorized European representative:

Shure Europe GmbH

Headquarters Europe, Middle East & Africa

Department: EMEA Approval

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