SHURE®

Model SM86 User Guide

SM86

CARDIOID CONDENSER MICROPHONE

The Shure SM86 is a unidirectional (cardioid) condenser vocal microphone for professional use in live performance. An extremely rugged microphone, the SM86 withstands the rigors of touring while delivering studio-quality sound. The tailored frequency response of the SM86 reproduces vocals with clarity. A cardioid pickup pattern isolates the main sound source while minimizing unwanted background noise. The built-in three-point shock mount minimizes handling noise, and a two-stage pop filter reduces wind and breath "pop" noise. The SM86 is an excellent selection For use with both stage monitors and personal in-ear monitors.

Features:

- *Condenser cartridge for studio quality sound*
- *Tailored frequency response for a clear reproduction of vocals*
- *Rugged construction withstands the rigors of touring sound*
- *Cardioid polar pattern minimizes unwanted background noise*
- *Excellent choice for stage monitors and personal in-ear*
- *monitors*
- *Built-in three-point shock mount minimizes handling noise*
- *Two-stage "pop" filter reduces wind and breath noise*

PROXIMITY EFFECT

Unidirectional microphones, like the SM86, progressively boost bass frequencies up to 15 dB as the microphone gets closer to the sound source. This phenomenon, known as proximity effect, can be used to create a warmer, more powerful sound. To prevent excessive or "boomy" low frequency sound during close-up use, the SM86 bass response gradually rolls off. This provides greater control and helps the user take advantage of proximity effect.

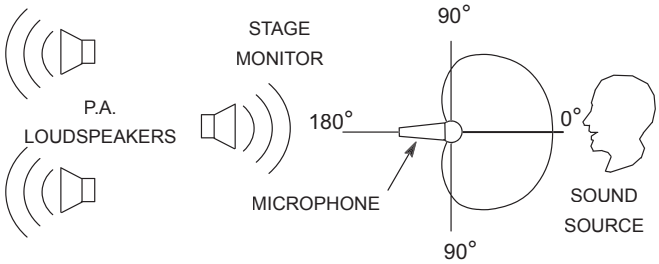
APPLICATIONS AND PLACEMENT

The SM86 is ideal for close-up vocals and can be held in the hand or mounted on a stand. Some of the most common applications and placement techniques are listed in the following table. Keep in mind that microphone technique is largely a matter of personal taste—there is no one "correct" microphone position.

SUGGESTED MICROPHONE PLACEMENT	TONE QUALITY
Lips less than 15 cm (6 in.) away or touching the windscreen, on axis to microphone.	Robust sound, emphasized bass, maximum isolation from other sources.
15 to 60 cm (6 in. to 2 ft.) away from mouth, just above nose Height.	Reduced bass.
More than 60 cm (2 ft.) away.	Thinner, more distant sound; noticeable levels of ambient noise.

STAGE MONITOR & P.A. LOUDSPEAKERS PLACEMENT

Place the stage monitor directly behind the microphone (see Figure 1). Locate the P.A. loudspeakers so that they point away from the rear of the microphone. With the speakers located in these positions, the possibility of feedback is greatly reduced. Always check the stage setup before a performance to ensure optimum placement of microphone and monitors.



CARDIOID MICROPHONE POSITIONING

FIGURE 1

GENERAL RULES FOR MICROPHONE USE

1. Aim the microphone toward the desired sound source and away from unwanted sources.
2. Locate the microphone as close as practical to the desired sound source.
3. Work close to the microphone for extra bass response.
4. Use only one microphone per sound source.
5. Locate microphones at least three times as far from other microphones as from the sound source.
6. Use as few microphones as practical.
7. Place microphones far from sound-reflecting surfaces.
8. Add a windscreen when using the microphone outdoors.
9. Avoid excessive handling to minimize mechanical noise.

27B3143 (Rev. 2)

Printed in U.S.A.

OPERATION

Power

The SM86 requires phantom power. This may be supplied to the microphone from an external power supply (such as the Shure model PS1A) or directly from preamplifiers, mixers, or consoles with built-in phantom power. Suitable sources should provide 11 to 52 Vdc phantom voltage.

Impedance

A load impedance of at least 600 Ohms is recommended. The load may be as low as 150 Ohms, but a reduction in output level and output clipping level will result.

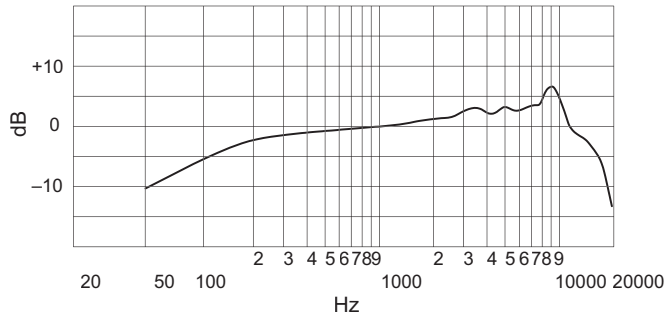
SPECIFICATIONS

Transducer Type

Condenser (electret bias)

Frequency Response

50 to 18,000 Hz (see Figure 2)

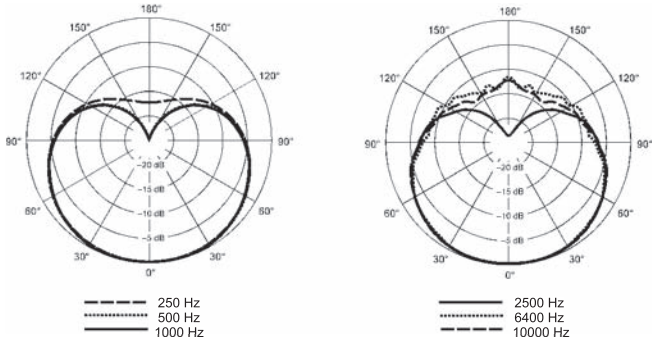


TYPICAL FREQUENCY RESPONSE

FIGURE 2

Polar Pattern

Cardioid (see Figure 3)



TYPICAL POLAR PATTERN

FIGURE 3

Output Impedance

150 Ohms at 1 kHz

Recommended minimum load impedance: 600 Ohms

Sensitivity (at 1,000 Hz)

Open Circuit Voltage . . . . . –50 dBV/Pa (3.15 mV)
(1 Pa = 94 dB SPL)

Output Clipping Level

1000 Ohm Load at 1,000 Hz . . . . . .+3 dBV (1.41 V)

Maximum SPL (at 1,000 Hz)

1000 Ω load (1% THD). . . . . 147 dB

Self-Noise

23 dB typical, A-weighted

Dynamic Range (1000 Ω)

124 dB (maximum SPL to A-weighted noise level)

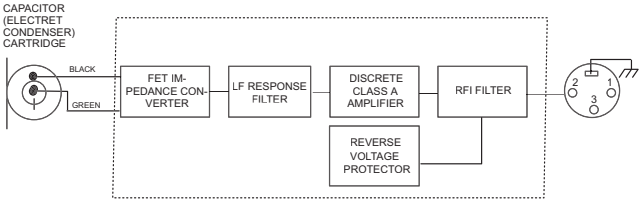
Signal-to-Noise Ratio

71 dB at 94 dB SPL (IEC 651)*

*S/N ratio is difference between 94 dB SPL and equivalent SPL of self-noise A-weighted.

Polarity

Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of the output connector. See Figure 4.



SM86 BLOCK DIAGRAM

FIGURE 4

Power

Phantom Supply Requirement . . . . . 11 to 52 Vdc, positive at both pins 2 and 3

Current Drain . . . . . 5.2 mA

Connector

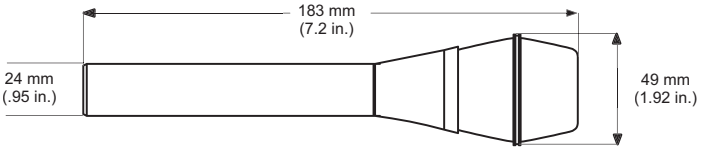
Three–pin (XLR) professional audio

Case

Dark gray enamel-painted steel with matte-finished silver colored steel grille

Dimensions

See Figure 5



OVERALL DIMENSIONS

FIGURE 5

Net Weight

Net: 278 grams (9.8 oz)

Environmental Conditions

Operating: –18° to 60° C (0° to 135° F) (relative humidity <90%)

Storage: –29° to 74° C (–20° to 165° F) (relative humidity <80%)

CERTIFICATION

Eligible to bear CE Marking. Conforms to European EMC Directive 89/336/EEC. Meets applicable tests and performance criteria in European Standard EN55103 (1996) parts 1 and 2, for residential (E1) and light industrial (E2) environments.

FURNISHED ACCESSORIES

Break Resistant Microphone Clip A25D
Microphone Bag 26A13
5/8" to 3/8" Thread Adapter 31A1856

OPTIONAL ACCESSORIES

Phantom Power Supply PS1A
Shock Stopper. Isolation Mount A55M, A55HM
Popper Stopper...Windscreen A85WS
7.6 m (25 ft.) Cable C25