



# SM81

## Instrument Microphone

The Shure high-quality, unidirectional condenser microphone, SM81, user guide.  
Version: 3.1 (2022-E)

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# SM81

## Instrument Microphone

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### General Description

The Shure Model SM81 is a high-quality, unidirectional condenser microphone designed for studio recording, broadcasting, and sound reinforcement. Its wide frequency response, low noise characteristics, and low RF susceptibility have made it a standard for applications involving acoustic instruments, especially guitar, piano, and cymbals. The SM81 is ruggedly constructed. It operates on phantom power and performs over a wide range of temperatures and humidity conditions. It is furnished with a swivel adapter, attenuator-switch lock, foam windscreen, and case for carrying and storage. Other accessories are available.

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### 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.

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### Selecting Low-Frequency Response

A three-position switch allows you to adjust the low-frequency response of the microphone. Use these settings to reduce wind noise, room noise or proximity effect.

 **Flat response** provides the most natural sound in most applications.

 **Low-frequency cutoff** attenuates 18 dB-per-octave below 80 Hz. Helps eliminate floor rumble and low-frequency room noise from heating and air conditioning systems. This setting may also be used to compensate for proximity effect or to reduce low frequencies that make an instrument sound dull or muddy.

 **Low-frequency rolloff** attenuates 6 dB-per-octave below 100 Hz. Compensates for proximity effect or to reduce low frequencies that could make an instrument sound dull or muddy.

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### Setting Attenuation

The attenuation switch reduces the signal level from the cartridge by 10 dB without altering the frequency response. This can prevent extremely high SPLs (e.g., close-miked drums and guitar cabinets) from overloading the microphone. To activate attenuation, rotate the switch to the “-10 dB” position.

NOTE: Turning the ring part way does not produce incremental levels of attenuation.

The attenuation switch may be locked in place. Use the following steps:

1. Unscrew the grille and cartridge assembly.
2. Rotate the attenuation switch to the desired position (0 or -10).

3. Insert the ring lock (small, clear piece of plastic) in the area behind the ring between the pin and slot.
4. Replace the grille and cartridge assembly.

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## Proximity Effect

Unidirectional (cardioid) microphones progressively boost bass frequencies by 6 to 10 dB below 100 Hz when the microphone is at a distance of about 6 mm (1/4 in.) from the sound source. This phenomenon, known as proximity effect, can be used to create a warmer, more powerful sound. To prevent explosive low frequency sound during close-up use, the bass response gradually rolls off. This provides greater control and helps the user take advantage of proximity effect.

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## Specifications

### Type

Electret Condenser

### Frequency Response

20 to 20,000 Hz

### Polar Pattern

Cardioid

### Output Impedance

EIA rated at 150  $\Omega$  (85  $\Omega$  actual)

### Sensitivity

*at 1 kHz, open circuit voltage*

-45 dBV/Pa[1] (5.6 mV)

### Maximum SPL

*1 kHz at 1% THD, 1 k $\Omega$  load*

136 dB SPL

### Signal-To-Noise Ratio

*Ref. 94 dB SPL at 1 kHz*

78 dB[2]

### Clipping Level

*1 kHz at 0.25% THD, 1 k $\Omega$  load*

-4 dBV (0.63 V)

### Hum Pickup

*typical, at 60 Hz, equivalent SPL/mOe*

-3 dB

## Polarity

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

## Weight

<b>Net</b>	0.230 kg (0.5 lbs)
<b>Packaged</b>	0.740 kg (1.625 lbs)

## Attenuator Switch

0 or -10 dB, lockable

## Connector

Three-pin professional audio (XLR), male

## Housing

Steel construction with vinyl metallic paint finish and stainless steel screens

## Environmental Conditions

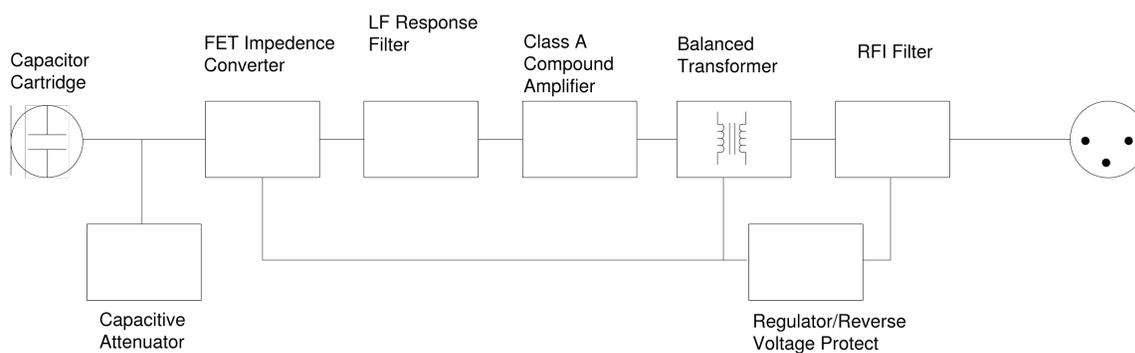
<b>Operating Temperature</b>	-6.7° to 49° C (20° to 120° F)
<b>Storage Temperature</b>	-29° to 74° C (-20° to 165° F)
<b>Relative Humidity</b>	0 to 95%

## Power Requirements

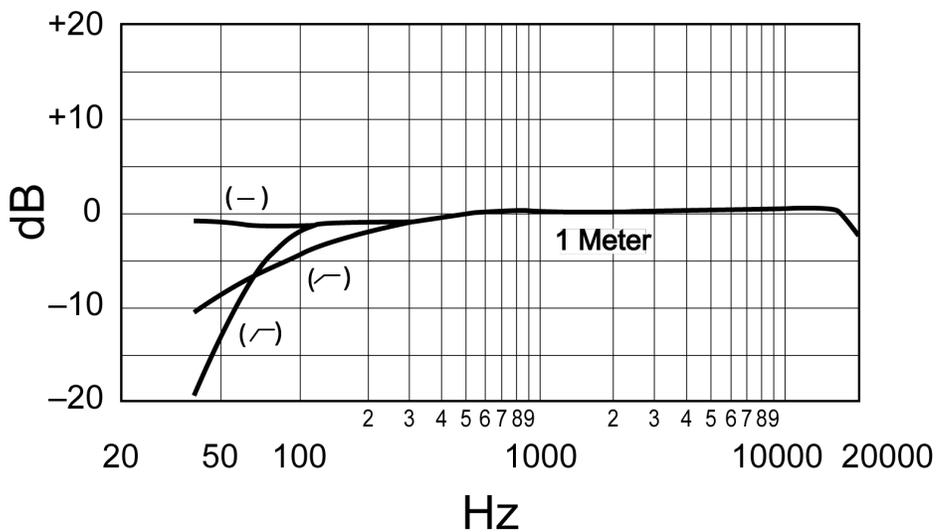
11 to 52 V DC phantom power (1.2 mA)

[1] 1 Pa=94 dB SPL

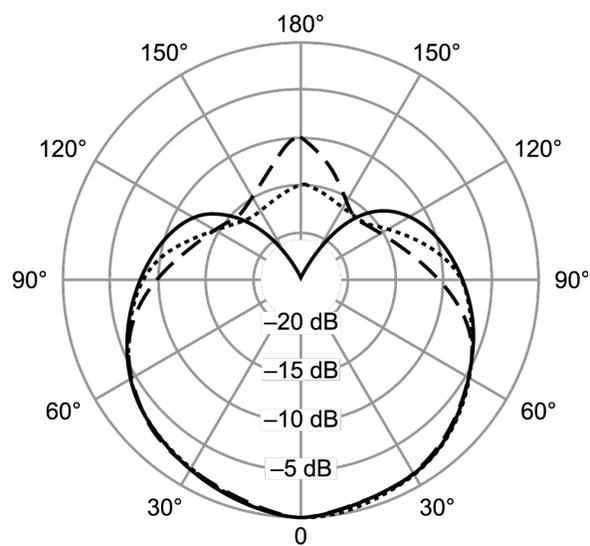
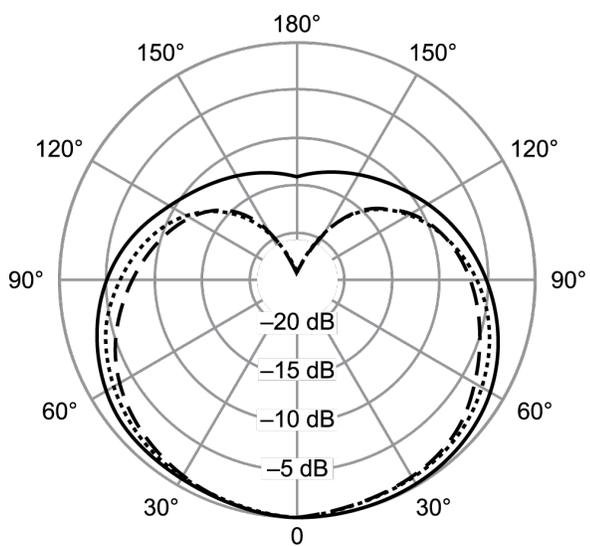
[2] S/N ratio is difference between 94 dB SPL and equivalent SPL of self noise, A-weighted



**Block Diagram**



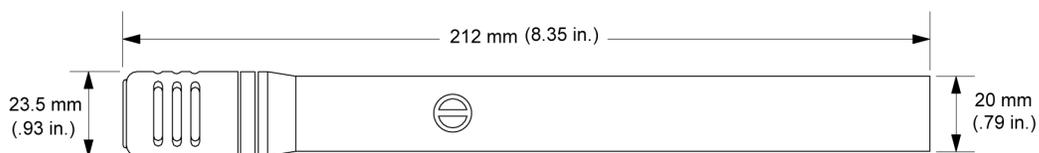
Typical Frequency Response



- 100 Hz
- ..... 500 Hz
- - - 1000 Hz

- 2000 Hz
- ..... 5000 Hz
- - - 10000 Hz

Typical Polar Patterns



Overall Dimensions

## Accessories

### Furnished Accessories

Microphone Clip for AMS26, BETA181, KSM137, KSM141, MX412, MX418, MX412S, MX418S, MX412SE, MX418SE, SM62, SM63, SM63L, SM63LB, SM81, VP64, VP64A, VP64AL and standard microphone stands	A57F
10 dB Attenuator Lock	34A830
Carrying/Storage Bag	95A2313
Windscreen	49A111

### Optional Accessories

Pop-Filter Grille	A81G
Gray Large Foam Windscreen for SM81 and SM57	A81WS
Telescoping Tripod Microphone Floor Stand up to 14 ft (4.3 m) with carrying case	S15A
Stereo Microphone Adapter	A27M
Shock Stopper® Isolation Mount	A55HM
25 foot (7.5m) Triple-Flex® Microphone XLR Cable with chrome connectors	C25F

### Replacement Parts

Cartridge and Grille Assembly for SM81	R104
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## 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](http://www.shure.com/europe/compliance)

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