CEMB STUDIO MICROPHONES
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AKG acoustics

C414EB
C414EB-P48

Bedienungshinweise
User Instructions
Mode d’emploi
Description:
The design of this large diaphragm condenser microphone is based on experience gained in long-term and worldwide operation of the previous models C 12A, C 12B and C 414 comb. Modern technology and reliable components now enable us to offer additional features in the same space. The microphone meets the highest professional standards and will withstand normal rough handling in studio applications. The main features are as follows: A twin-diaphragm system enables the selection of different microphone polar patterns. The diaphragm is manufactured from a special gold-flashed plastic foil. The gold layer is deposited onto the diaphragm only on the outer side to prevent short circuiting to the main electrode when extremely high sound pressure levels are applied to the microphone. Pre-attenuation before the output stage is incorporated to permit the increase of undistorted maximum sound pressure levels by 10 or 20 dB for close-up recordings. This technique inhibits distortion in the small transformers used in the microphone output or sound mixer inputs. The incorporated bass-cut circuitry reduces the risk of distortion at low frequencies. This feature is especially useful in combatting wind noise and stage floor vibration.

The slope of the bass-cut filter is more than 12 dB/octave, the cut-off frequency may be set to 75 Hz or 150 Hz. The all-metal housing adds to the rejection of r.f. interference when the microphone is used in close proximity to transmitter stations or in conjunction with wireless microphones or other communication equipment. In addition to extremely wide-range low-distortion performance and temperature/humidity-resistant construction, the microphone offers remarkable operational flexibility. A recessed switch on the front enables the user to select any one of four different polar patterns to adjust for different recording situations. Four different types of microphones are thus combined in only one C 414 EB. The chosen polar patterns are highly uniform and frequency independent to guarantee the same sound character for all angles of incidence.
Technical Data of C 414 EB:

Transducer Type: Pressure gradient transducer with twin-condenser diaphragm and FET-preamplifier
Directional Characteristic: Cardioid, omni-directional, figure-eight and hypercardioid (selectable directly on the microphone)
Sensitivity at 1000 Hz: 6 mV/Pa ≈ 0.6 mV/µb ≈ -64.4 dBV
Frequency Range: 20 to 20,000 Hz
Impedance: ≤ 150 ohms
Recommended Load Impedance: ≥ 500 ohms
Equivalent Noise Level: 20 dB SPL (measured with filter CCITT-C/DIN 45 405)
Unweighted Noise Level: ≤ 10 µV r.m.s.
Powering: Universal Phantom Powering according to DIN 45 596 with 9 to 52 volts
Current Consumption:
a) at 12 volts: ≤ 5.5 mA
b) at 48 volts: ≤ 3 mA (when circuit has been modified according the description in this leaflet)

Sound Pressure Level for 0.5% TDH:

\[ f = \begin{cases} 1 \text{ kHz} \\ 10 \text{ kHz} \end{cases} \left\{ \begin{array}{c} 1600 \mu \text{b} \triangleq 60 \mu \text{ Pa} \triangleq 138 \text{ dB SPL} \\ \end{array} \right. \]

Acceptable Climatic Conditions:

\begin{align*}
\text{Temperature Range:} & -10^\circ \text{C to } +60^\circ \text{C} \\
\text{Rel. Humidity:} & 90\% (+20^\circ \text{C}) \\
& 85\% (+60^\circ \text{C}) \\
\end{align*}

Connector: 3 pin XLR-type
pin 1 = ground, pin 2 = AF (in phase), pin 3 = AF
Dimensions: 5.6" x 1.8" x 1.4"
Net Weight: approx. 14 oz

Technical Data of C 414 EB – P 48:

Identical to C 414 EB except for:

Sensitivity at 1000 Hz (all patterns, 0 attenuation): 9 mV/Pa ≈ 0.9 mV/µb ≈ -61 dBV
Impedance: ≤ 200 ohms
Equivalent Noise Level: 18 dB SPL (measured with Filter CCITT-C acc. to DIN 45 405)
Power Requirement: 48 volts phantom acc. to DIN 45 596
Current Consumption: ≤ 1 mA
Sound Pressure Level for 0.5% TDH (all patterns, 10 dB-attenuation, 0-roll off):

at 1000 Hz = 6300 µb ≈ 630 Pa ≈ 150 dB SPL

Included Accessories:

W 26 foam windscreen
SA 18/3 all-metal stand adapter
Individual frequency curves
Protective case

Optional Accessories:

H 17 A Elastic shock mount/windscreen combination
N 62 E Power unit to feed two microphones
N 66 E Power unit to feed six microphones
MK 9/10 30 ft microphone cable incl. XLR-type connectors on both ends.
MK 9/20 60 ft. microphone cable incl. XLR-type connectors on both ends.
Frequency Response Curve:
Cardioid
Cardioïde Diagramme polaire

Polar Response:
Omni-directional
Facteur de directivité

Sound Power concentration factor:
Figure-eight
Omnidirectionnel En huit

Hyper-cardioid
Hyper-cardioïde
AKG acoustics

C451 E comb.
C451 EB comb.
C451 EB

Bedienungshinweise
User Instructions
Mode d’emploi
**Technical Data C 451 E comb.:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Principle</td>
<td>Pressure gradient receiver</td>
</tr>
<tr>
<td>Active Diaphragm Diameter</td>
<td>approx. 15 mm</td>
</tr>
<tr>
<td>Frequency Response</td>
<td>20 to 20,000 Hz ± 1 dB from standard curve</td>
</tr>
<tr>
<td>Sensitivity at 1000 Hz</td>
<td>9.5V/Pa = 0.95mV/µbar = -60.5dBV on open circuit re 1 µb</td>
</tr>
<tr>
<td>Nominal Impedance</td>
<td>≤ 200 ohms, transformer balanced</td>
</tr>
<tr>
<td>Recommended Load Impedance</td>
<td>≥ 500 ohms</td>
</tr>
<tr>
<td>Weighted Sound Pressure Level acc. to DIN 45 405 (CCIR 468-2):</td>
<td>≤ 28 dB</td>
</tr>
<tr>
<td>acc. to DIN 45 412 (A-weighted)</td>
<td>≤ 18 dB-A</td>
</tr>
<tr>
<td>Hum Sensitivity</td>
<td>5 µV/5 µT at 50 Hz</td>
</tr>
<tr>
<td>Max Sound Pressure for 0.5% THD</td>
<td>20 Pa = 120 dB SPL on 1000 ohms</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-20°C to +60°C</td>
</tr>
<tr>
<td>Permissible Humidity Level</td>
<td>99% at +20°C, 95% at +60°C</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18 mm Ø x 147 mm length (0.7 inch Ø x 5.8 inch)</td>
</tr>
<tr>
<td>Finish</td>
<td>all-metall housing</td>
</tr>
<tr>
<td>Connector</td>
<td>3 pin XLR-type</td>
</tr>
<tr>
<td>Weight</td>
<td>100 g net (3.5 oz.)</td>
</tr>
<tr>
<td>Shipping weight</td>
<td>425 g (15 oz.)</td>
</tr>
</tbody>
</table>

**Optional Accessories:**

SA 18/1 all-metal stand adapter
W17 A wire mesh windscreen
Information on cables, power supplies, elastic suspensions, microphone stands and other parts of the modular system may be found in our special Studio Catalogue
PROA 214/E
Frequency Response Curve:  

Polar Response:  

Sound Power Concentration Factor:

---

**C 451 E:**
Technical Data are identical to C 451 E comb, except that they are measured without the condenser capsule CK 1:

**C 451 EB:**
Identical to C 451 E with the exception of a built-in 3 position bass-cut switch.
The following switch positions are incorporated:
- linear frequency response down to 5 Hz
- 75 Hz: bass cut starts at 75 Hz with slope of about 14 dB/octave (−7 dB at 50 Hz)
- 150 Hz: bass cut starts at 150 Hz (−20 dB at 50 Hz)

**Technical Data C 451 E:**
- Frequency Range of Amplifier: 5 to 30,000 Hz
- No-Load Amplification: 0.47 ± 0.5 dB
- Dimensions: 18 mm Ø x 120 mm length (0.7 inch Ø x 4.7 inch)
- Weight: 80 g net (3 oz.)
- Shipping weight: 360 g (13 oz.)

**Technical Data C 451 EB:**
- Dimensions: 18 mm Ø x 140 mm (0.7 inch Ø x 5.5 inch)
- Weight: 85 g (3 oz.)
- Shipping weight: 360 g (13 oz.)
The heart of this "Ultra Linear Series" cardioid microphone is the C 460 B preamplifier. What sets it apart is the absolute linearity of all important parameters such as frequency response, directivity factor, electrical transfer characteristics, as well as low self-noise and a high overload margin. A specially designed output stage will drive all types of loads encountered in day-to-day work, including excessively long cables, without any noticeable signal degradation.

Switchable 70/150 Hz, 12 dB/octave bass-cut. Switchable 10 dB output level attenuation. This pad is post the input stage and thus ensures continued performance to specifications. For close-up miking of very loud instruments (snare and bass drums) the A 60 adapter allows a CK 1 capsule and A 50 pad to be screwed on the preamp.

The C 460 B comb-ULS sounds somewhat less bright than microphones with a CK 1 capsule. Therefore, CK 1's are often used for distant miking, CK 61's for close miking.

**PACKAGE**
- CK 61-ULS Condenser capsule
- C 460 B Preamplifier
- SA 40 Stand adapter
- W 32 Foam windsreen

**OPTIONAL ACCESSORIES**
- A 61 Swivel
- VR 61 30-cm (1-ft.) extension tube
- VR 62 90-cm (3-ft.) extension tube
- SA 18/2 B All metal stand adapter
- W 46 Wire mesh windsreen
- H 10 All metal stereo bar
- H 30 Shock-mount stand adapter
- H 38 Shock mount
- B 18 Battery power supply
- N 62, N 66 AC power supplies
- MK 9/10 Cable
- St 102 A Boom stand
- St 200 Floor stand

**SPECIFICATIONS**
- Polar Pattern: cardioid
- Frequency Range: 20 – 20,000 Hz
- Sensitivity: 8 mV/Pa
- Impedance: 120 ohms
- Equivalent Noise Level:
  - 25 dB (CCIR 468-2)
  - 14 dB-A (DIN 45412-A)
- S/N Ratio: 80 dB
- Max. SPL for 0.5% THD: 134 dB from 30 Hz to 20 kHz
- Size: 21 Ø x 173 mm (0.8 Ø x 6.8 in.)
- Net/Shipping Weight: 140/500 g (4.9 oz./1.1 lbs.)
CK 61-ULS
CARDIOID CAPSULE

Ultra Linear Series cardioid capsule for use with C 460 B. Diaphragm diameter about 15 mm (0.6 in.). Same applications as for CK 1, especially suited for difficult sources thanks to excellent response.

SPECIFICATIONS (with C 460 B)

<table>
<thead>
<tr>
<th>Polar Pattern</th>
<th>cardioid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>20 – 20,000 Hz</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>8 mV/Pa</td>
</tr>
<tr>
<td>Size</td>
<td>21 Ø x 28.5 mm (0.8 Ø x 1 in.)</td>
</tr>
<tr>
<td>Net/Shipping Weight</td>
<td>25/170 g (0.9/6 oz.)</td>
</tr>
</tbody>
</table>

Same as CK 61, except for omni-directional polar pattern. For more reverberant sounding recordings.

CK 62-ULS
OMNIDIRECTIONAL CAPSULE

Omnidirectional capsule with specially equalized frequency response. For far-field miking outside the room radius, where most of the sound arriving at the microphone is reflected, diffuse sound.

CK 62-DF
OMNIDIRECTIONAL CAPSULE

Same as CK 61, except for hyper-cardioid polar pattern. Better off-axis rejection provides better channel separation and in many cases higher gain-before-feedback.

CK 63-ULS
HYPERCARDIOID CAPSULE
Some consider the microphone the most important link in the recording chain, for some it is just an accessory. But everybody is after first-rate sound on stage, which means studio sound. The AKG C 3000 is also a performance mic for musicians and sound engineers striving for perfection and insisting on professional level, night-after-night reliability.

The C 3000's gold-coated capsule offers true large diaphragm technology. Instead of "warmed over" sound, you get the unmistakable clarity, character and warmth of an AKG studio standard mic.

Switches allow for multi-pattern use, bass rolloff, and -10 dB pre-attenuation for close miking of loud instruments.

**STANDARD ACCESSORIES**
- SA 41/1 Stand adapter

**OPTIONAL ACCESSORIES**
- H 15/22 Elastic suspension
- W 414 Foam windscreens
- MK 9/10 Microphone cable
- B 18 Battery supply unit
- N 62E/N 66E Power supply unit for two/six microphones

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Type:</th>
<th>combination of large and small diaphragm condenser capsules</th>
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<tbody>
<tr>
<td>Polar pattern:</td>
<td>cardioid/hypercardioid</td>
</tr>
<tr>
<td>Sensitivity at 1 kHz:</td>
<td>cardioid: 20 mV/Pa @ -34 dBV re 1 V/Pa</td>
</tr>
<tr>
<td></td>
<td>hypercardioid: 15 mV/Pa @ -36.5 dBV re 1 V/Pa</td>
</tr>
<tr>
<td>Frequency range:</td>
<td>20 to 20,000 Hz ± 3 dB from published curve</td>
</tr>
<tr>
<td>Impedance:</td>
<td>200 Ω</td>
</tr>
<tr>
<td>Recommended load impedance:</td>
<td>≥ 2000 Ω</td>
</tr>
<tr>
<td>Max. SPL for 1%/3%</td>
<td>137/140 dB SPL</td>
</tr>
<tr>
<td>THD @ 1000 Hz:</td>
<td>28 dB</td>
</tr>
</tbody>
</table>

Equivalent noise level to DIN 45412 (A weighted): 18 dB-A

- S/N ratio re 1 Pa (A weighted): 76 dB
- Filter (switchable): 6 dB/octave, 300 Hz
- Preattenuation pad: 10 dB, switchable
- Power requirement: 9 to 52 V phantom power to DIN 45596
- Current consumption: ≤ 2 mA
- Environment temperature: -10°C to +60°C
- Rel. humidity: 90% (+20°C), 85% (+60°C)
- Connector: 3-pin XLR
- Size: 55 Ø x 160 mm (2.2 ¡Á x 6.3 in.)
- Net/shipping weight: 320/820 g (11.3 oz/1.8 lbs)
**Description**

The pop recording industry often prefers selected models of dynamic microphones for the pickup of closely spaced bass drums and bass guitar amplifiers. The reason is that the moving system of the dynamic can be designed to handle these high excursions with very high mechanical linearity. The AKG Model D 112 is a descendent of AKG’s earlier D 12 dynamic microphone, widely known for its ability to handle high level signals from bass drums and bass guitars in the studio. The microphone has been designed with a low resonance frequency and can handle very high transient signals with virtually unmeasurable distortion. High frequency response has been tailored to keep both bass drum and bass guitar clearly distinguishable in the mix. A built-in windscreen makes the D 112 also suitable for high SPL instruments (trombone and tuba).

**Specifications**

- **Transducer type:** Dynamic pressure gradient
- **Frequency response:** 20 Hz-17 kHz
- **Polar pattern:** Cardioid
- **Impedance:** 210 ohms
- **Output connector:** XLR-M
- **Sensitivity:** 1.8 mV/Pa; -55 dB (re 1 V)
- **Sound pressure level for 1% /3% THD:** virtually unmeasurable
- **Size:** 5.9” x 2.8” x 4.5” (150 mm x 70 mm x 115 mm)
- **Net weight:** 11.3 oz. (320 g)
- **Shipping weight:** 2.2 lb. (990 g)
- **Accessories included:** SA 40 Stand adapter
- **Optional accessories:** KM 259/1 Tripod floor stand - complete with boom
  KM 259 Height adjustable tripod floor stand - complete with boom

**Features**

- Response tailored for bass guitar and bass drum pickup, both in the studio and on-stage
- Response maintained down to 20 Hz
- THD virtually unmeasurable.
- Includes built-in windscreen and stand adapter
Architects and Engineers Specifications

The microphone shall be a dynamic type with a cardioid pickup pattern with response from 20 Hz - 20 kHz (+/- 10 dB), 40 Hz - 17 kHz (+/- 3 dB). Sensitivity shall be no less than 1.8 mV/Pa, and the maximum operating level for 1 and 3% THD shall be virtually unmeasurble. The microphone dimensions shall be no greater than 5.9 x 2.8 x 4.5 inches, and microphone net weight shall be no greater than 11.3 ounces. The microphone shall be the AKG Acoustics Model D 112.

Limited Warranty

Valid only in the United States. AKG Acoustics warrants AKG products against defects in material or workmanship for a period of two years from the date of original purchase for use, and agrees to repair or, at our option, replace any defective unit without charge for either parts or labor. Important: This warranty does not cover damage resulting from accident, misuse or abuse, lack of reasonable care, the affixing of any attachment not provided with the product, loss of parts or connecting the product to any but the specified receptacles. This warranty is void unless service or repairs are performed by an authorized service center. No responsibility is assumed for any special, incidental or consequential damages. However, the limitation of any right or remedy shall not be effective where such is prohibited or restricted by law. Simply take or ship your AKG product prepaid to our service department. Be sure to include your sales slip as proof of purchase date. (We will not repair transit damage under the no-charge terms of this warranty.) Note: No other warranty, written or oral is authorized by AKG Acoustics, Inc. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above exclusions and limitation may not apply to you.

Microphones · Headphones · Wireless Microphones · Wireless Headphones · Headsets · Electroacoustical Components

Specifications subject to change without notice.
Extremely high humidity should also be avoided. Temperatures exceed 110° F (43° C) for extended periods. Avoid leaving the microphone in the open sun or in areas where its mount.

In use, secure the cable to the mic stand or boom, leaving a slack loop at the mic. This will ensure the most effective shock isolation and reduce the possibility of accidentally pulling the microphone out of its mount.

Avoid leaving the microphone in the open sun or in areas where temperatures exceed 110° F (43° C) for extended periods. Extremely high humidity should also be avoided.

The AT4033/CL is intended for use in professional applications where remote power is available. It requires 48V DC phantom power, which may be provided by a mixer or console, or by a separate, in-line source such as the Audio-Technica AT8801 single-channel and CP8506 four-channel phantom power supplies.

Output from the microphone’s XLRM-type connector is low impedance (Lo-Z) balanced. The signal appears across Pins 2 and 3; Pin 1 is ground (shield). Output phase is “Pin 2 hot” – positive acoustic pressure produces positive voltage at Pin 2.

To avoid phase cancellation and poor sound, all mic cables must be wired consistently: Pin 1-to-Pin 1, etc.

An integral 80 Hz high-pass filter provides easy switching from a flat frequency response to a low-end roll-off. The high-pass position reduces the microphone’s sensitivity to popping in close vocal use. It also reduces the pickup of low-frequency ambient noise (such as traffic, air-handling systems, etc.), room reverberation and mechanically coupled vibrations.

In use, secure the cable to the mic stand or boom, leaving a slack loop at the mic. This will ensure the most effective shock isolation and reduce the possibility of accidentally pulling the microphone out of its mount.

Avoid leaving the microphone in the open sun or in areas where temperatures exceed 110° F (43° C) for extended periods. Extremely high humidity should also be avoided.

AT4033/CL SPECIFICATIONS

- Polar pattern: Cardioid
- Frequency response: 30-20,000 Hz
- Low frequency roll-off: 80 Hz, 12 dB/octave
- Open circuit sensitivity: −32 dB (25.1 mV) re 1 V at 1 Pa*
- Impedance: 100 ohms
- Maximum input sound level: 145 dB SPL, 1 kHz at 1% T.H.D.; 155 dB SPL, with 10 dB pad (nominal)
- Noise: 17 dB SPL
- Dynamic range (typical): 128 dB, 1 kHz at Max SPL
- Signal-to-noise ratio: 77 dB, 1 kHz at 1 Pa*
- Phantom power requirements: 48V DC, 3.2 mA typical
- Switches: Flat, roll-off;
- Weight (less accessories): 13.4 oz (380 g)
- Dimensions: 6.69” (170.0 mm) long, 2.10” (53.4 mm) maximum body diameter
- Output connector: Integral 3-pin XLRM-type
- Accessories furnished: AT8449 shock mount for 5/8”-27 threads; stands; microphone dust cover; protective carrying case

Specifications are subject to change without notice.

In the interest of standards development, Audio-Technica offers full details on its test methods to other industry professionals on request.

Typical A-weighted, using Audio Precision System One.

Audio-Technica Limited, Old Lane, Leeds LS11 8AG England

Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224.

For return approval and shipping information, contact the Service Department, Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224.

Audio-Technica brand products purchased in the U.S.A. are warranted for one year from date of purchase by Audio-Technica U.S., Inc. (A.T.U.S.) to be free of defects in materials and workmanship. In event of such defect, product will be repaired promptly without charge or, at our option, replaced with a new product of equal or superior value if delivered to A.T.U.S. or an Authorized Service Center, prepaid, together with the sales slip or other proof of purchase date. Prior approval from A.T.U.S. is required for return. This warranty excludes defects due to normal wear, abuse, shipping damage, or failure to use product in accordance with instructions. This warranty is void in the event of unauthorized repair or modification, or removal or defacing of the product labeling.

One-Year Limited Warranty

Audio-Technica Limited warrants its products to be free from defects in materials and workmanship. In event of such defect, product will be repaired promptly without charge or, at our option, replaced with a new product of equal or superior value.

For return approval and shipping information, contact the Service Department, Audio-Technica Limited, Old Lane, Leeds LS11 8AG England.

Outside the U.S.A., please contact your local dealer for warranty details.
The Crown® CM-700 is a cardioid condenser microphone for pro or semi-pro recording and high-quality sound reinforcement. Rugged enough for the road, the CM-700 is well suited for acoustic instruments, drum overheads and studio vocals. It works equally well for popular music (multi-miking) or classical music (stereo and spot miking). Small and inconspicuous, the CM-700 is also a good choice for miking a lectern. The microphone is also available in stereo matched pairs as the CM700MP.

The CM-700 has a very smooth, wide-range frequency response which gives it a natural sound. It preserves the delicate timbre of acoustic instruments, yet it can reproduce all the power of a pipe organ. The off-axis response is also smooth, so any leakage picked up has little coloration.

Because of its cardioid pickup pattern, the CM-700 reduces background noise, room reverb and feedback. The cardioid pattern is uniform with frequency.

Self-noise is very low, permitting clean, noise-free recordings. The mic can handle extremely loud sounds without distortion. It is protected against static and RFI. The output is balanced, low impedance, which allows long cable runs without hum pickup or high-frequency loss. Powering is by 12-48V phantom power.

Several audiophile touches enhance the mic’s pristine sound quality: an ultralight diaphragm, humbucking transformer, polycarbonate capacitors and a gold-plated 3-pin connector.

The CM-700 has a bass-tilt switch with three positions: flat, low-cut and rolloff. An included 2-stage foam pop filter softens breath pops and a foam windscreen reduces wind noise outdoors.

Operating Instructions
Plug the CM-700 into a phantom power supply or into a mic input that provides phantom power.

Features
- For pro or semi-pro recording
- Wide, smooth frequency response provides a natural, accurate sound quality
- Cardioid polar pattern reduces background noise, room reverb and feedback
- Small and inconspicuous
- Perfect for acoustic instruments and drums
- Rugged enough for the road
- Handles extremely loud sounds

Specifications
Type: Cardioid condenser.
Transducer: Back electret condenser.
Frequency response (typical): 30 Hz to 20,000 Hz (see Fig. 1).
Polar pattern: Cardioid (see Fig. 2).
Impedance: 190 ohms, balanced. Recommended minimum load impedance 1000 ohms.
Open-circuit sensitivity: 2.5 mV/Pa* (~52 dB re 1 V/Pa*).
Power sensitivity: ~52 dB re 1 mW/Pa*.
Equivalent noise level (self-noise): 21 dB SPL typical A-weighted (0 dB=8002 dyne/cm²).
S/N ratio: 73 dB at 94 dB SPL.
Maximum SPL for 3% THD: 151 dB with 48V phantom, 142 dB with 12V phantom.
Polarity: Positive pressure on the diaphragm produces a positive voltage on pin 2 with respect to pin 3 of the output connector.

Operating voltage: Phantom power, 12 to 48 volts DC, positive voltage on pins 2 and 3 with respect to pin 1 of output connector.
Current drain: 3.2 mA.
Materials: Rugged steel housing and steel mesh grille.
Finish: Satin black.
Dimensions: See Fig. 3.
Weight: 4 oz. (113 grams).
Cable: None supplied. Use 2-conductor shielded mic cable.

Included accessories: Carrying pouch, WS-12 foam pop filter, WS-11 foam windscreen, ASA-4 swivel mount.

Optional accessories: Crown PH-4B phantom power supply (4 channels, AC powered). Crown PH-1A phantom power supply (1 channel, battery or AC powered). CM-SM isolation shock mount, CM-SB stereo bar.

*1 pascal = 10 microbars = 10 dynes/cm² = 94 dB SPL.
The Crown® PZM®-30D is a Pressure Zone Microphone® designed for professional recording, sound reinforcement and broadcasting. It has many applications, from miking full orchestras or individual musical instruments to security or teleconferencing.

The PZM-30D has a switchable dual frequency response: rising (R) or flat (F). The "rising" position adds brilliance. This makes it useful wherever a crisp attack is desired, such as on percussion, drums, or piano. The user can get a bright sound without boosting high frequencies on the recording console; the result is lower noise. The "flat" position provides a smooth, flat, high-frequency response for natural sound reproduction.

These sturdy microphones are especially reliable because they can be used with a rugged detachable cable. The output is a male 3-pin XLR-type, balanced and low impedance, which permits long cable runs without hum pickup or high-frequency loss.

Like other Pressure Zone Microphones, the PZM-30D™ utilizes the Pressure Recording Process in which a miniature condenser microphone capsule is positioned very close to a sound-reflecting plate or boundary. The capsule is mounted in the “Pressure Zone” just above the boundary, a region where sound coming directly from the sound source combines in phase with sound reflected off the boundary. The benefits are excellent clarity and "reach," a hemispherical polar pattern, uncolored off-axis response, and a wide smooth frequency response free of phase interference.

Operating Instructions
The PZM-30D features self-contained electronics which allows it to plug directly into a standard 12-48 VDC phantom power supply.

Crown makes an AC-powered model PH-4B supply for powering up to four PZMs. Also available is a single-channel AC/battery supply, Crown model PH-1A. For special applications, you can make your own battery supply as suggested in Fig. 3 on the reverse side.

Using two-conductor shielded microphone cable, plug the microphone into a phantom power supply. Connect the power supply output to a mixer mic input, or if your mixer has phantom power built in, simply plug the PZM directly into a mixer mic input.

Specifications
Type: Pressure Zone Microphone.
Transducer: Electret condenser.
Frequency response: 20 Hz to 20 kHz. See Fig. 1.
Polar pattern: Hemispherical when used on a floor, wall or ceiling.
Open circuit sensitivity: 7 mV/Pa* (–43 dB re 1 volt/Pa).
Power sensitivity: –43 dB re 1 mW/Pa. EIA sensitivity –135 dBm.
Impedance: 240 ohms, balanced. Recommended minimum load impedance 1000 ohms.
Self-noise: 20 dB equivalent sound pressure level, A-weighted.
S/N ratio: 74 dB at 94 dB SPL.
Maximum Sound Pressure Level: 150 dB SPL at the microphone produces 3% THD.
Polarity: Positive pressure on the diaphragm produces positive voltage on pin 2 with respect to pin 3 of the output connector.
Operating voltage: Phantom power, 12 to 48 volts DC, positive voltage on pins 2 and 3 with respect to pin 1 of the output connector.
Current drain: 1.1 mA.
Connector: Male 3-pin XLR-type.
Cable: None supplied; use 2-conductor shielded microphone cable.
Switch: Frequency-response select switch for rising or flat response.
Color: Black.
Weight: 6.5 ounces (184 grams).
Dimensions: 6-in. x 5-in. x .75-in. (15.2 cm x 12.7 cm x 1.9 cm). See Fig. 2.
Included accessories: PZM windscreen, carrying pouch.
Optional accessories: PH-4B phantom power supply (4 channels, AC powered). PH-1A phantom power supply (1 channel, battery or AC-adapter powered).

*1 pascal = 10 dynes/cm² = 10 microbars = 94 dB SPL.
The published response curve is measured on an “infinite” boundary such as a floor, ceiling or wall. The microphone’s low-frequency response depends on the size of the boundary on which it is placed. Specifically, the response begins to shelf down at and below the frequency $F$, where $F = 750/D$ and $D$ = the boundary dimension in feet. At approximately $F = 188/D$, the output of the microphone is down 6 dB, becomes omnidirectional, and maintains a flat response down to approximately 30 Hz.

Several placement examples are described in the Crown Boundary Mic Application Guide. For specific microphone application guides please refer to our website at http://www.crownaudio.com/michtm/mic_pubs.htm.

Architects’ and Engineers’ Specifications

The microphone shall be the Crown PZM-30D or equivalent. The microphone shall have a hemispherical pattern (when used on an infinite boundary). The element shall be a subminiature electret type of rugged construction. A smooth frequency response from 20 Hz to 20 kHz shall be obtained. The response shall be switch-selectable between flat (F) or rising (R).

The microphone shall employ the patented PRP principle for maintaining phase coherency, thus eliminating comb filtering in the audible spectrum.

The PZM-30D shall have a sensitivity of $-43$ dBV/Pa. The microphone shall accept 150 dB SPL input while contributing no greater than 3% THD (open circuit termination). Equivalent noise shall be typically 20 dBA re .0002 dyne/cm². The microphone color shall be black. The microphone connector shall be a male 3-pin XLR-type. The Crown PZM-30D is specified.

Warranty

Crown professional microphones are guaranteed against malfunction for a period of three years from date of original purchase. Please refer to the enclosed full warranty statement for more detail.

Service

If the microphone does not function properly, replace or repair mic cables and check the power supply.

If you determine the microphone product(s) is defective, return the complete product in its original packaging to: Crown Factory Service, 1718 W. Mishawaka Road, Elkhart, IN 46517. For further assistance or technical support call 800-342-6939.

If your mixer or recorder requires an unbalanced phone plug connector, modify the cable leaving the power supply as follows: Solder the cable shield and the pin-3 lead to the phone-plug ground terminal. Solder the pin-2 lead to the phone plug “hot” or “tip” terminal.

Placement

PZMs are designed to operate on any stiff non-absorbent boundary (or surface). Typical boundaries are a floor, wall, ceiling, or table. This type of mounting improves the low-frequency response.
SPECIFICATIONS

Element: Dynamic

Frequency Response: 80-15,000 Hz

Polar Pattern: Super-cardioid

Impedance: Lo-Z (150 ohms nominal)

Output Level: -56 dB (0 dB = 1 mW/lO dynes/c㎡)

EIA Sensitivity Rating: -150 dB

Hum Pickup Level: -125 dBm (re: .001 gauss field)

Diaphragm: Electro-Voice Acoustalloy

Case Material: Steel

Dimensions: 187.3 mm (7.38 in.) long
45.2 mm (1.78 in.) diameter
19.1 mm (0.75 in.) shank diameter

Finish: Fawn beige micomatte

Net Weight: 227 g (8 oz), not including cable

Cable: 4.6 m (15 ft), two-conductor, shielded, broadcast-type cable, rubber-jacketed with Switchcraft A3F connector

Accessories Furnished: Model 310A stand adapter
Zippered vinyl pouch

Optional Accessories:
307 suspension shock mount
312A stand adapter
313A shock mount
340 security clamp
381 switch/connector assembly
400, 422 or 423A desk stand

DESCRIPTION AND APPLICATIONS

The Electro-Voice Model RE16 is a Variable-D dynamic supercardioid microphone designed for the most exacting professional use. It is like the RE15, except that it uses a unique blast filter. The blast filter, an integral part of the RE16, permits hand-held and outdoor use without “P-popping” or excessive wind noise. Utilizing the Variable-D design the RE16 features a directional characteristic independent of frequency. The result is a microphone that generates little off-axis coloration while providing the greatest rejection of unwanted sounds. A super-cardioid, the RE16 provides its greatest rejection at 150° off axis. (Typical cardioids provide greatest rejection in the horizontal plane when the microphone is tilted in its most natural position -30° from horizontal (as on a boom or floor stand). An easily operated “bass-tilt” switch corrects spectrum balance for boom use and other longer reach situations.

A “hum-buck” coil and screw-machined steel outer casing provide 25 dB of hum rejection. Hum pickup level is -125 dBm (re: .001 gauss field).

Using the mechanical nesting concept of design, by means of which the internal transducer parts are nested one within another, the RE16 transducer is a nearly solid mechanical structure that is highly resistant to damage from mechanical shock. The Memraflex grille screen resists deformation. The exclusive non-metallic Electro-Voice Acoustalloy diaphragms virtually unaffected by extremes of atmospheric conditions. A carefully designed steel outer case provides additional mechanical protection. Finish is non-reflecting fawn beige micomatte.

ARCHITECTS’ AND ENGINEERS’ SPECIFICATIONS

The microphone shall be a Variable-D(TM) super-cardioid dynamic type with integral blast filter and with wide range response uniform from 80.15,000 Hz. Proximity effect shall be 10 dB less at 100 Hz than with comparable Single-D designs. Response at any angular position away from the major axis shall be essentially similar to the response on the major axis, attenuated uniformly at all frequencies by an amount appropriate to that angular position. Attenuation at frequencies from 100 to 4,000 Hz (referred to major axis signal value) shall exceed 25 dB at 150° from major axis in any plane. Attenuation above 4,000 Hz shall exceed 20 dB. Attenuation at 180° from major axis at frequencies from 100 to 4,000 Hz shall exceed 15 dB. Attenuation above 4,000 Hz shall exceed 12 dB. Polar characteristics shall be sufficiently uniform in all planes so that it is, effectively, a super-cardioid of revolution.

A hum-buck coil shall be provided in series with the microphone element. Hum pickup level shall be -125 dBm (re: .001 gauss field). The hum-buck coil shall decrease hum pickup by at least 25 dB.
An Integral passive filter network shall be provided such that when filter switch is in “on” position, low-frequency response shall be so deviated from “flat” response that a fall of 6 dB from 1,000 to 100 Hz shall be effected. With switch in “off” position, microphone shall be essentially “flat” from 100 to 1,500 Hz. With a 6 dB rise in response from 50 to 100 Hz, and a 2 dB rise occurring at 2,000 Hz extending to 12,000 Hz. Output level shall be -56 dB (0 dB = 1 mW/10 dynes/cm²), and EIA sensitivity rating shall be -150 dB. The diaphragm shall be non-metallic Acoustalloy and shall have a shield to prevent dust particles from reaching the diaphragm.

The case shall be made of steel. The microphone shall have a maximum diameter of 45.2 mm (1.78 in.), with 19.1 mm (7.5 in.) diameter shank, and a maximum length of 187.3 mm (7.38 in.), not including cable connector. Finish shall be fawn beige matte. A 4.6 m (15 ft), 2-conductor shielded, broadcast-type, rubber-jacketed cable with Switchcraft A3F connector installed shall be provided. The microphone shall have a built-in connector similar or equivalent to the Switchcraft A3M.

Model 310A stand adapter and vinyl carrying pouch shall be supplied.

The Electro-Voice Model RE16 is specified as follows:

WARRANTY (Limited)
Electro-Voice Professional, PL5 BK Series Microphones are guaranteed against malfunction from any cause for a period of two years from date of original purchase. Also, these microphones are guaranteed without time limit against malfunction in the acoustic system due to defects in workmanship and material. Any active electronics incorporated in the microphone are guaranteed for three years from date of original purchase for parts and labor against such malfunction. If such malfunction occurs, microphone will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Warranty will be returned prepaid. Warranty does not extend tofinish, appearance, cables, connectors, switches, or malfunction due to abuse or operation under other than specified conditions. Nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized warranty service agencies will void this guarantee. A list of authorized warranty service centers is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-6956831), or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

Specifications subject to change without notice.
SPECIFICATIONS
Element: Dynamic
Frequency Response: 45-18,000 Hz
Polar Pattern: Cardioid
Impedance: 50, 150 and 250 ohms changed by solder connections
Sensitivity, Open Circuit Voltage: 1.5 mV/Pascal at 1,000 Hz
Power Level: –57 dB at 1,000 Hz (0 dB = 1 mW/Pascal)
Case Material: Steel
Dimensions: 216.7 mm (8.53 in.) long, 54.4 mm (2.14 in.) widest diameter, 49.2 mm (1.94 in.) body diameter
Finish: Fawn beige micomatte
Net Weight: 737 g (1 lb, 10 oz) without cable
Cable: 4.6 m (15 ft), 2-conductor shielded, rubber-jacketed, brown broadcast-type cable, supplied with Switchcraft A3F connector on microphone end
Accessories Furnished: 81715 stand adapter
Optional Accessories: Model 309 shock mounted stand adapter for use with floor stand or recording boom

DESCRIPTION AND APPLICATIONS
The Electro-Voice Model AE20 is a professional quality dynamic cardioid microphone created specially for recording, broadcast, and sound reinforcement applications requiring essentially flat response over a very wide frequency range. The wide frequency response, coupled with excellent transient response, makes the RE20 easily comparable to the finest condenser cardioid microphones, however, the RE20 is virtually free of bass-boosting "proximity effect" when used close, because in design it is a Continuously Variable-D microphone. An easily operated "bass tilt down" switch corrects spectrum balance for use in long-reach situations, or other applications where bass attenuation is needed.

An integral blast and wind filter covers each acoustic opening on the RE20. At recording sessions and on stage, singers can "close talk" the microphone, singing with their lips almost touching the grille screen with no worry of "p-pops" or excessive sibilance. Part of the filter also shock mounts the internal microphone element, reducing the transfer of vibrations from external sources.

Using the mechanical nesting concept of design — the internal transducer parts are nested one within another — the RE20 is able to withstand all rigors of professional use.

The RE20 is supplied wired for 150 ohms impedance. Fifty- and 250-ohm impedances are available through a simple wiring change (see "Changing Impedance Connections" section).

CHANGING IMPEDANCE CONNECTIONS
The RE20 is shipped wired for 150 ohms. Fifty or 250 ohms may be obtained, however, through the following procedure:

1. Refer to Figure 4. Insert a screwdriver in small hole "A" at the rear of the microphone. Turn counterclockwise until the captive screw "bottoms".
2. Gently remove insert "B" exposing rear cover hold down screw "C" (Allen head).
3. Disengage screw "C" from main microphone body with an Allen wrench.
4. Carefully remove rear cover "D" to expose several solder terminals as shown in Figure 5.
5. Impedance may now be changed by moving the red wire to one of the open solder terminals (marked 250 and 50).
6. Replace the rear cover by reversing Steps 1 through 4. Be sure that locating
pin "E" engages the rear cover "D" as the cover is re-installed. Be sure that no wires are pinched in the re-assembly process.

The RE20 is now ready for operation at the newly selected impedance.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS
The microphone shall be a cardioid type with integral blast filter protecting all acoustic openings. The blast filter shall also serve as a shock mount for the internal microphone element. The microphone shall have a wide-range uniform frequency response from 45 to 18,000 Hz.

An integral passive network shall be provided so that when the filter switch is in the "on" position, low frequency response shall tilt down 4.5 dB from 400 to 100 Hz. With switch in "off" position, microphone shall be essentially "flat" from 80 to 6,000 Hz, with a broad 2.5 dB rise in response from 6,000 to 14,000 Hz, and nominally down 3 dB at 18,000 Hz. Response below 80 Hz shall be nominally down 3 dB at 45 Hz. Output level shall be ~57 dB (0 dB = 1 mW/Pascal). Nominal impedances of 50, 150, and 250 ohms shall be selectable by changing an internal solder connection.

Response at any angular position away from the major axis shall be essentially similar to the response on the major axis, but attenuated uniformly at all frequencies by an amount appropriate to that angular position. Attenuation at frequencies from 45 to 10,000 Hz (refer to major axis signal value) shall exceed 15 dB at 180° from major axis in any plane. Attenuation above 10,000 Hz shall exceed 13 dB. Polar characteristics shall be sufficiently uniform in all planes so that it is, effectively, a cardioid of revolution.

There shall be a shield to prevent dust and iron particles from reaching the diaphragm. The case shall be made of steel. The microphone shall have a maximum diameter of 54.4 mm (2.14 in.), a body diameter of 49.2 mm (1.94 in.), and a length of 216.7 mm (8.53 in.). Finish shall be non-reflecting fawn beige micomatte. A 15 ft., two-conductor shielded, broadcast-type, synthetic rubber-jacketed cable with Switchcraft A3F connector installed, shall be provided. The
**SPECIFICATIONS**

Generating Element: Dynamic

Frequency Response: Model 666: 40 to 15,000 Hz
Model 666R: 40 to 15,000 Hz
(rising 4-1/2 db 100 to 1,000 Hz)

**Output Level:**

<table>
<thead>
<tr>
<th>Model 666</th>
<th>Impedance</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 ohm:</td>
<td>-58 db*</td>
<td>EIA sensitivity: -151 db</td>
</tr>
<tr>
<td>150 ohm:</td>
<td>-58 db*</td>
<td>EIA sensitivity: -152 db</td>
</tr>
<tr>
<td>250 ohm:</td>
<td>-58 db*</td>
<td>EIA sensitivity: -150 db</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 666R</th>
<th>Impedance</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 ohm:</td>
<td>-56 db*</td>
<td>EIA sensitivity: -149 db</td>
</tr>
<tr>
<td>150 ohm:</td>
<td>-56 db*</td>
<td>EIA sensitivity: -150 db</td>
</tr>
<tr>
<td>250 ohm:</td>
<td>-56 db*</td>
<td>EIA sensitivity: -148 db</td>
</tr>
</tbody>
</table>

(*6 db=1 mw/10 dynes/cm^2)

Polar Pattern: Cardioid

Impedance: 50, 150, 250 ohms, connected for 150 ohms when shipped.

Hum Pickup Level: -125 dbm ref: relative to 0.001 gauss field. Shielded transformer with special hum bucking coil almost totally eliminates hum pickup when in vicinity of AC fields.

Diaphragm: Electro-Voice Acoustalloy®

Case Material: Die Cast Aluminum

Dimensions: 1-11/16 inch maximum diameter, 7-11/16 inches long

Net Weight: 11 ounces, without cable

Cable: 20-foot, three conductor, shielded, neoprene jacketed broadcast type, with UA-3-11 connector.

Cable Connector: Cannon UA-3-12

Accessories: Model 300 detachable stand clamp, deluxe carrying case.
Supercardioid Dynamic Instrument Microphone

The Electro-Voice N/D408A is a supercardioid dynamic microphone utilizing a revolutionary neodymium alloy to form the EV-exclusive N/DYM® magnet with four times the power potential of conventional microphone magnets. With a computer-optimized design, the N/DYM magnetic structure is maximized in the N/D408A to provide 6-dB more output sensitivity over conventional designs while the more uniform magnetic field lowers distortion during peak sound pressure levels.

The large diaphragm contains 50 percent more surface area than conventional designs and is reinforced to prevent “breakup.” The result is an extended high-frequency response with an open, transparent sound quality.

The exceptional sensitivity of the N/D408A combined with the inherently low noise of a dynamic transducer insures a superior signal-to-noise ratio ready for digital recording and sampling. To further reduce noise, a highly effective hum-bucking coil is used to cancel hum from lighting and other sources.

N/DYM® Series II microphones feature DynaDamp™, an advanced vibration-isolation material. DynaDamp™ is a unique foamed elastomer, specifically formulated for vibration control. DynaDamp™ forms an advanced-technology vibration-isolation system which dramatically reduces all forms of vibration transmitted noise for the most demanding situations.

The N/DYM® Series II pop filter incorporated a special molded retainer which insures optimum placement of the Acoustifoam™ filter material, for maximum rejection of both wind noise and vocal P-pops. The retainer makes the pop filter an integral part of the microphone’s removable upper grille assembly, allowing easy cleaning for continued top performance.

The uniform supercardioid polar pattern of the N/D408A insures superior gain-before-feedback in live applications and better isolation in the studio—at all frequencies—compared with other directional microphones with widely varying polar characteristics.

**FREQUENCY RESPONSE**

![Frequency Response Chart](chart.png)
OPERATION

The N/D408A represents a radical departure from conventional instrument microphone designs. The unique pivoting yoke configuration allows maximum flexibility in positioning the microphone near a sound source.

The low-frequency response of the N/D408A can be extended by positioning the microphone closer to the sound source as documented in the specification section. This proximity effect occurs when the microphone is placed within 12 inches of the sound source and increases as the working distance is reduced. The low-frequency response is tailored to provide bass boost without the "boominess" of many directional microphones. Thus, closer working distances can be used with N/D408A to reduce the risk of sound system feedback (rinking) while preserving instrument tonality.

The dynamic element of the N/D408A will provide reliable operation in humidity and temperature extremes—adverse conditions that would render condenser microphones useless. For years of trouble-free operation "on-the-road," the N/D408A utilizes an all-metal-core construction, from the hardened windscreen to the yoke-mounting system.

CERTIFIED PERFORMANCE

Every N/D408A is inspected by a quality-control tester and subjected to a computer-controlled test system that verifies many different performance parameters. After the performance meets or exceeds our rigorous standards, the actual measured frequency response of the unit tested is plotted on a "Certificate of Performance" and included with the microphone. This certificate guarantees that each N/D408A will perform to the exacting standards established by Electro-Voice design engineers—100% quality-assurance testing.

WARRANTY (LIMITED)

Electro-Voice N/D® Series II Microphones are guaranteed against malfunction from any cause for a period of two years from date of original purchase. Also, these microphones are guaranteed without time limit against malfunction in the acoustic system due to defects in workmanship and material. Any active electronics incorporated in the microphone are guaranteed for three years from date of original purchase for parts and labor against such malfunction. If such malfunction occurs, microphone will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not extend to finish, appearance items, cables, cable connectors, switches, or malfunction due to abuse or operation under other than specified conditions, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee. A list of authorized service centers is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831) (FAX: 616-695-1304); or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777) (FAX: 209-651-0164). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.
**General Product Description**

Designed specifically for horns, drums, acoustical and electric guitars, the N/D468 provides a smooth, natural sound, capturing the excitement of the instrument. The supercardioid pattern provides superior rejection and acoustic isolation in any application. An innovative EV design harnesses the increased power of a neodymium based magnet design, allowing a large-diameter voice coil (up to 50% larger than other mics) for dynamic, efficient microphone performance. N/DYM® offers the power and clarity to “cut through the mix.” Whatever your instrument application the N/D468 is sure to be a top performer.

- Designed specifically for musical instruments
- Flexible mechanical design for optimum positioning
- Supercardioid pattern for exceptional acoustic isolation and feedback rejection
- Accurate response, even in high sound pressure levels (SPL)
- Rugged steel construction for exceptional durability

**Operation**

The low frequency response of the N/D468 microphone varies with the distance from the sound source. Known as “proximity effect,” maximum bass response is produced in “close-up” use with the microphone 1/4 inch from the sound source. Normal bass response is experienced with working distances greater than 24 inches. Working close to the microphone will produce a more robust sound. Close up positioning of the microphone will also reduce the potential for feedback from the sound reinforcement system. When close-miced, the bass-boost provides an increase in overall microphone output level. The mixer gain may be proportionately reduced, resulting in a reduction of the system’s sensitivity to feedback caused by sound entering the microphone from the loudspeakers.

**Microphone Use and Placement**

Please note that micing techniques are a matter of personal preference. These are merely guidelines to assist in the placement of the microphone to gain optimal performance.

<table>
<thead>
<tr>
<th>Usage</th>
<th>Optimal Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Guitar and Bass Guitar Amplifier</td>
<td>Place microphone approximately 1-2” from and at a 90° degree angle to the speaker cone. To reduce boominess, move the microphone off axis to the cone from 90° to 45°, or move mic from center of cone to either edge.</td>
</tr>
<tr>
<td>Tom-Toms</td>
<td>On double headed Toms place mic over the top of drum 1-3” and at a 45° angle to the drum surface and 1-2” in from the drum edge. On single headed Toms use above method or place mic inside Tom from underneath at a 90° angle from the center of head, 3-5”, away.</td>
</tr>
<tr>
<td>Snare Drum</td>
<td>Place mic 1-3” above the heads, 1-2” in from the rim. Aim each mic at the top heads angled down about 45°. If the drum rings, tape deadening material to the head or use damping rings. For more “snare” sound place a 2nd mic underneath aimed up at the bottom of head.</td>
</tr>
<tr>
<td>Cymbals</td>
<td>Place microphone one to two feet above the top of cymbals.</td>
</tr>
<tr>
<td>High-Hat</td>
<td>Place 5 inches above outside edge at a 45° down angle.</td>
</tr>
<tr>
<td>Brass</td>
<td>6-24” away, and on axis with the bell of the instrument.</td>
</tr>
<tr>
<td>Acoustic Guitar</td>
<td>Place mic 6-12” from where finger board joins the body.</td>
</tr>
</tbody>
</table>
# Specifications

<table>
<thead>
<tr>
<th>Element</th>
<th>Dynamic N/DYM® magnet structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency Response</strong></td>
<td></td>
</tr>
<tr>
<td>Close Response</td>
<td>30 Hz to 22 kHz</td>
</tr>
<tr>
<td>Far Response</td>
<td>60 Hz to 22 kHz</td>
</tr>
<tr>
<td><strong>Polar Pattern</strong></td>
<td>Supercardioid</td>
</tr>
<tr>
<td><strong>Impedance</strong></td>
<td>Low-Z balanced (150 Ohms)</td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td></td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>3.1 mV/Pascal @ 1.0 kHz</td>
</tr>
<tr>
<td>Power Level</td>
<td>(0 dB=1mW/pascal) -51dB @ 1.0 kHz</td>
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<tr>
<td><strong>Microphone Connector</strong></td>
<td>3-pin, XLR-type</td>
</tr>
<tr>
<td><strong>Equivalent Output Noise</strong></td>
<td>14 dB A weighted (0 dB=0.00002 Pascal)</td>
</tr>
<tr>
<td><strong>Polarity</strong></td>
<td>Positive pressure on diaphragm causes Positive voltage on pin 2 ref. Pin 3</td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>Non-reflecting black</td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td>Memraflex™ grille screen</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>@ 4.5 in. (115 mm)</td>
</tr>
<tr>
<td>Diameter</td>
<td>@ 2.05 in. (52 mm)</td>
</tr>
<tr>
<td>Shank</td>
<td>@ 0.80 in. (20 mm)</td>
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<tr>
<td><strong>Weight</strong></td>
<td></td>
</tr>
<tr>
<td>Net</td>
<td>@ 6.7oz (190 g)</td>
</tr>
<tr>
<td>Shipping</td>
<td>@ 16 oz (453 g)</td>
</tr>
<tr>
<td><strong>Accessories included</strong></td>
<td>311 stand clamp</td>
</tr>
<tr>
<td></td>
<td>Soft zippered “gig” bag</td>
</tr>
</tbody>
</table>

## Warranty

This product is guaranteed against malfunction from any cause for two (2) years from the date of original purchase. In addition, the Limited Warranty for the acoustic system contained in the microphone shall apply for the life of this product, defines as a period of ten (10) years from the date that the manufacture of this microphone model has been discontinued. Any and all active electronics incorporated in this microphone are guaranteed against malfunction due to material workmanship for a period of three (3) years from the date of original purchase. This Limited Warranty does not extend to cables, connectors, or switches.

For warranty service please call us at: 616-695-6831 or 1-800-234-6831

---

**Standard Placement & Use Guidelines**

1. Always point the microphone at the desired source of sound, and away from any unwanted sources.
2. The microphone should be located close to the sound source to minimize interference from other potential sound sources.
3. Use the 3-to-1 rule when using multiple microphones. Place each microphone three times farther from other microphones as from the desired sound source.
4. Minimize over-handling of the microphone to reduce unwanted mechanical noise.
5. Working close to the microphone will increase the bass tone and also provide increased gain-before-feedback.
The MXL 993 uses transformer-less FET circuitry and has a 20mm. gold diaphragm capsule design. The 993 has a silky, open sound with a wide dynamic range essential for accurate, instrument recording. With a 20Hz-20kHz frequency range; 10dB switchable attenuation; selectable -10dB low-frequency roll-off; and large brass enclosure; the MXL 993 is perfect for guitar and overhead drum miking. Includes Deluxe carrying case and mounting clip.

$299 inc Case.

<table>
<thead>
<tr>
<th>Frequency Range:</th>
<th>30-20 KHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polar Pattern:</td>
<td>Cardioid</td>
</tr>
<tr>
<td>Sensitivity:</td>
<td>10mV/Pa</td>
</tr>
<tr>
<td>Output Impedance:</td>
<td>200Ω</td>
</tr>
<tr>
<td>Max SPL:</td>
<td>134 dB</td>
</tr>
<tr>
<td>S/N Ratio:</td>
<td>80dB (Ref. 1 PA, A weighted)</td>
</tr>
<tr>
<td>Equivalent Noise Level:</td>
<td>18dB (A weighted IEC 268-4)</td>
</tr>
<tr>
<td>High Pass Filter:</td>
<td>6dB/octave, 80Hz. (switchable)</td>
</tr>
<tr>
<td>Pre-attenuation Switch:</td>
<td>6dB/octave, 150HZ</td>
</tr>
<tr>
<td>Metal Finish:</td>
<td>Silver</td>
</tr>
<tr>
<td>Power Requirements:</td>
<td>48V phantom power (+- 4V)</td>
</tr>
</tbody>
</table>

**Frequency Response Curve (at 0 and 180 degrees)**

![Frequency Response Curve](image)
The TCM1050 has a classic vintage look and the performance of a legendary vacuum tube microphone at low cost. It has 1" 3 micron diaphragm a 6072 (12AT7) tube selected for low distortion and noise. Nine polar patterns are available, switched remotely at the power supply.

### Accessories
**Included**
- TMPS-2 PSU, 10m cable, SSM-1050 suspension

**Optional**

---

© Rycote 2004
Perfect for studio vocals, acoustic instruments, ambient instrument audio, and many live sound applications. Powerful and versatile, the SCM Series microphones meet the stringent requirements of even the most demanding digital recording and live broadcasting applications.

**Accessories**

- **Included**: Plastic carrying case (SMCC-1)
- **Optional**: SMPS1 48V PSU, SSM3 shockmount, FW1 w/scrn-1

© Rycote 2004
Congratulations on purchasing a Nady SCM Series FET Condenser Microphone. These superior microphones are perfect for recording studio vocals, acoustic instruments, orchestras and choral groups, ambient instrument audio, and many live sound applications. Powerful and versatile, the SCM Series microphones meet the stringent requirements of even the most demanding digital recording and live broadcasting applications.

This manual covers the operation of the SCM 900/910/920 microphones and the available optional accessories. To take full advantage of the superb features of your microphone, and to enjoy long and trouble-free use, please read this user’s guide carefully. Since these 3 models, the SCM 900, the SCM 910 and the SCM 920 share most features, this guide will refer to all three collectively as the SCM Series, and their differences will be noted as applicable.

UNPACKING, INSPECTION, STORAGE AND TRANSPORT

Your SCM Series microphone was carefully packed at the factory, and the shipping carton (or carrying case) was designed to protect the unit during shipping. Please retain this container for subsequent transport and in the highly unlikely event that you ever need to return your microphone for servicing. The optional SMCC-2 aluminum carrying case is highly recommended for the most convenient and safe transport or permanent storage. It has roomy compartments for your SCM Series microphone and all available accessories, plus XLR cables.

STANDARD ITEMS SUPPLIED

SCM900/910/920 microphone
User guide
Warranty card
Leatherette Pouch

OPTIONAL ACCESSORIES

48V phantom power supply (SMPS-1)
Aluminum flight case (SMCC-2)
Shockmount (SSM-3)
Foam windscreen (FW-2)

FEATURES

The SCM Series microphones offer transformer-coupled balanced outputs and true condenser design (elements constantly biased by the pre-amp) for exceptionally low self noise and increased dynamic range, enhanced low and high end response with improved linearity across the frequency range and maximum SPL capacity.

The SCM Series microphones are available in a choice of 3 configurations: the SCM 900 (cardioid pattern only), The SCM910 (cardioid pattern, with selectable 10 dB attenuation pads and low-cut filter), and the SCM 920 (with selectable low-cut filter and omni or cardioid polar patterns).

Each of the three SCM Series microphones features a large diaphragm capsule (1.0 inch), hand tooled from brass and featuring an ultra-thin (3-micron) gold-evaporated on Mylar diaphragm for maximum sensitivity, transient response, long life, detail and tone. The SCM Series microphones use carefully selected Field Effect Transistors (FET), specially chosen for their low distortion and superior signal-to-noise ratio. (Note: For optimum performance, it is best to let your microphone warm up for 5 to 10 minutes)

Each SCM 900/910/920 is manufactured with the finest materials and features a machined housing with advanced internal shock mount construction for the highest structural integrity and rugged reliability. It requires 48V phantom power to operate, typically supplied by the microphone pre-amplifier or mixing console. The optional Nady SMPS-1 phantom power supply can also be used.
Your SCM Series microphone can be used with the optional Nady SSM-3 spider shock mount (or equivalent), which uses an elastic suspension to isolate the microphone from vibration, thereby lowering noise transmitted to the microphone from the stand. This is a useful tool in many situations, such as when the performer is tapping his or her feet, or when there is noise pickup from the rumbling of traffic outside of the building. The disadvantage of using the shock mount is that the weight of the microphone may make it drift in the elastic suspension, so mic placement may take a little longer.

To insert your SCM Series microphone into the SSM-3 shock mount, pinch close the levers on the sides of the mount to the open position, then slide the microphone into place.

**USING THE FOAM WINDSCREEN**

The FW-2 optional foam windscreen can also be used with your SCM 900/910/920. This windscreen fits over the grill portion of the microphone and is designed primarily to decrease bass rumble (from wind noise pickup during outdoor live or recording use. It is also useful in keeping mouth spray out of the microphone head. The FW-2 or some other windscreen should be used whenever someone is close miked to both protect the microphone and to also eliminate "popping" from percussive breath sounds.

(Note: Be aware that the foam windscreen will slightly attenuate the high frequency response of the microphone.)

**CONNECTING THE SCM 900/910/920**

The SCM 900/910/920 can be used in live sound reinforcement and broadcasting and in studio or live recording. It must be powered by 48V phantom power (such as supplied by the optional Nady SMPS-1 phantom power supply or a mixing console with phantom powering), and amplified by a microphone pre-amp (such as built into a mixer, or a stand-alone unit). (Note: Make sure to set the pre-amp to the proper gain level—too much gain may distort subsequent amplifiers and too little may result in a noisy signal)

The SCM 900/910/920 can be connected to your mixer or phantom power supply using a standard balanced 3-pin XLR microphone cable. Before connecting to a mixer directly, turn the channel to which you’re connecting to its lowest gain setting. If you are using the Nady SMPS-1 Phantom Power Supply, connect in the following order:

1. Connect the SCM 900/910/920 to the SMPS-1
2. Connect the SMPS-1 Signal Output to your mixer
3. Connect the SMPS-1 to the AC power supply (115—230VAC)
4. Turn on the SMPS-1 Power ON/OFF switch
5. Slowly turn up the channel gain in your mixer to the desired level

**SERVICE**

(U.S.) Should your Nady microphone require service, please contact the Nady Service Department via phone at (510) 652-2411 or e-mail at service@nadywireless.com

(INTERNATIONAL) For service, please contact the Nady distributor in your country through the dealer from whom you purchased this product.

Do not attempt to service this unit yourself as it will void your warranty

---

**SCM 900/910/920 SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>True condenser pressure-gradient microphone with 1.0 inch diaphragm (SCM 920: dual diaphragm) and FET pre-amplifier.</th>
</tr>
</thead>
</table>
| Polar pattern         | SCM 900/910: Cardioid  
                       | SCM 920: Selectable cardioid, & omnidirectional  
                       | Controls: SCM 910: Selectable low-cut filter and 10 dB pad  
                       | Sensitivity: SCM 900/910: 12mV/Pa=138dB (0dB=1V/Pa)  
                       | SCM 910: -10att. (External)  
                       | SCM 920: 10mV/Pa =-40dBV (0dBV=1V/Pa)  
                       | Frequency range: 30 to 16,000Hz  
                       | Low cut: 100Hz, -6dB  
                       | Impedance: < 200 Ohms  
                       | Recommended load impedance: ≥1000 Ohms  
                       | Max. SPL (1% THD @ 1000Hz): 125dB  
                       | Equivalent noise level to IEC 268-4(A weighted): 20dB-A  
                       | S/N ratio re 1Pa: 76dB  
                       | Power requirement: +48VDC phantom power  
                       | Current consumption: <3mA  
                       | Connector: 3-pin XLR (gold plated)  
                       | Mic cable: 3-pin XLR standard cable (not supplied)  
                       | Size: Diameter: 2.0" (50.5mm), Length: 7.5" (190mm)  
                       | Net weight: 17.8oz (500g)  

Specifications subject to change for improvement purposes

12/22/00
7. Technical Specifications

Acoustical operating principle Pressure gradient transducer
Polar pattern Omni-cardioid/figure-8
Frequency range 20 Hz...20 kHz

Sensitivity at 1 kHz¹) 20/28/22 mV/Pa ± 1 dB
Rated impedance 200 ohms
Rated load impedance 1000 ohms
S/N ratio CCIR 468-3 68/71/69 dB
S/N ratio DIN/IEC 651 79/82/80 dB
Equivalent SPL CCIR 468-3 26/23/25 dB
Equivalent SPL IEC/DIN 651 15/12/14 dB-A
Max. SPL for 0.5 % THD²) at 1 kHz (cardioid) 117 dB
with sensitivity reduction 127 dB
Max. output voltage -6 dBu
Supply voltage 48 V ± 4 V
Current consumption 0.8 mA

Mindestbetriebszeit mit BS 48 l ca. 20 Std.
Erforderliche Kabelkupplung XLR 3 F
Gewicht 500 g
Durchmesser 56 mm
Länge 200 mm

¹) bei 1 kHz an 1 kOhm Nennabschlußimpedanz.
²) Klirrfaktor des Mikrophonverstärkers bei einer Eingangsspannung, die der von der Kapelle beim entsprechenden Schalldruck abgegebene Spannung entspricht.
³) Phantom speisung (P48, IEC 1938).

8. Some Remarks on Microphone Maintenance

Use the dust cover: Microphones not in operation should not be left on the floor stand unprotected. With a non-fluffy dust cover the microphone can be protected from dust settling on the capsule. When not in use for a longer spell, the microphone should be stored in a closet at standard climatic conditions.

Use a pop screen: The pop screen not only eliminates the plosive pop noises in vocal recordings. In close-miked vocal applications it also efficiently protects the diaphragm from almost anything, including breath humidity down to food particles.

Do not use averaged wind shields: Even the foam material of wind shields ages. With very old wind shields, the material decays and becomes brittle. The particles can then settle on the diaphragm. So, please dispose of aged wind shields.

Function testing: Modern condenser microphones cannot be harmed by very high sound pressure levels. Still, there is no need for pop-testing to see if a microphone is working and pulled up on the console. Normal speech is good enough, and pop-testing can produce sound pressure levels exceeding 140 dB!

Do-it-yourself can be expensive: Do-it-yourself repairs can sometimes be more harmful than beneficial. Especially cleaning soiled capsules does take a skilled hand and quite some experience. Furthermore, the protective lacquer shows the parts of the printed circuit boards where e.g. soldering should be avoided. Other parts may be specifically selected and cannot be replaced by standard components. To avoid unnecessary cost, we recommend sending in defective microphones to our distributors, or to us directly, for servicing.

Regular servicing: As some theaters and broadcasters do on a regular basis, sending in microphones for servicing can help in early recognition of damages. Slight soiling can be removed much easier than some nicotine layer firmly embedded in the diaphragm. Especially with microphones on loan and in dustier/smokier environments regular checking proves beneficial, as the cost is rather small compared to a major overhaul.
9. Frequency Responses and Polar Pattern

Frequency Responses and Polar Pattern measured in free-field conditions (IEC 60268-4)
NT4
Instruction Guide

RØDE MICROPHONES

RØDE STUDIO CONDENSER MICROPHONES

✓

(EMC, LVD)
SPECIFICATIONS:

- Capsule: 2 x 1/2" (13mm) externally polarised condenser transducers in stereo XY placement.
- Active Electronics: J-FET Impedance convertor with bipolar output buffer.
- Pickup Pattern: Cardioid per capsule (see graph).
- Output Impedence: 200 Ohms
- Frequency Response: 20Hz – 20kHz (see graph)
- Sensitivity: -38dB re 1v/Pa +/-2dB equivalent to 12mV/Pa where 1Pa = 94dB SPL
- Maximum Output: +13.9dBu @ 1% THD into 1k
- Dynamic Range: >128dB
- Maximum SPL: 143dB @ 1% THD into 1k
- Signal / Noise Ratio: 78dB
- Power Requirements: P48, P24, P12 phantom or 9V Battery
- Packed Weight: 2.3Kg (Microphone only 480g)
- Dimensions: Diameter: 32mm Length: 232mm

FREQUENCY RESPONSE

POLAR PATTERN
FEATURES:
- Stereo XY condenser microphone.
- 2 x Externally biased 1/2" Capsules with gold sputtered diaphragm.
- Capsules closely matched with full frequency response.
- Phantom power or 9V battery operation.
- Durable satin-nickel finish.
- Custom stereo cables (included) dual XLR and mini Stereo Jack.
- Custom WS4 twin-head Wind Shield.
- Surface-mount transformerless circuitry.
- Complete with Custom Carry Case and Stand Mount.

ACCESSORIES INCLUDED:
- WS4 Wind Shield
- Custom Carry Case
- RM3 Stand Mount plus 3/8" – 5/8" Thread Adaptor
- Custom Stereo Cables (dual XLR and mini stereo jack)
The NT4 is an easy to use, precision stereo condenser microphone. Choirs, orchestras, drum over-heads, solo or ensemble instruments, may all be recorded with the ‘ambience’ and ‘space’ only a true stereo microphone like the NT4 can capture.

The two capsules used in the NT4 measure 1/2” in diameter and have a cardioid polar pattern. The cardioid patterns pick-up sound from in front of the microphone and reject sound from the rear. This helps with reducing unwanted sound such as reverberation and audience sound from the rear of the capsules. It is crucial when stereo recording to have the capsules closely matched, as in the NT4. The polar frequency response of each capsule must be matched because much of the sound in an XY stereo arrangement is picked up off-axis by each capsule. The tone can be varied by rotating the NT4 on its axis, so that the capsules are pointing towards different areas of the sound source. It is recommended that you experiment with subtle position changes to help you achieve your desired results. The matched capsules of the NT4 allow for an accurate response when recording a wide variety of sources in various locations.

Some of the (many) potential applications of the NT4 might be:

As an XY stereo overhead for the recording of drum kits. Simply positioned at the rear of the kit, in the centre behind the drummer and angled down towards the drums, the NT4 produces a
‘real’ sounding kit. This method is very quick and easy. There is no need to worry about the angles of two individual microphones, or testing to see if they are two of the same model which sound a little different to each other.

Miking groups of vocalists in the studio or live on stage. Placement can be in front of the vocalists with the microphone pointing towards the middle of the group. The distance between the vocalists and the microphone depends on the acoustics of the environment, level of the vocalists and the sound that you are trying to achieve. More bass frequencies are evident when the microphone and vocalists are closer together.
Placed strategically above a grand piano, the NT4 easily and clearly produces the true, stereo image of that instrument. **Acoustic guitar** performances (duo or ensembles) are captured in true spatial stereo simply by positioning the NT4 centrally between or among them, and finely adjusting the position for the ultimately desired responses. A solo acoustic guitar will also benefit from the ambient sound captured by the NT4. (The closer the microphone is to the instrument, the less ambience and more guitar. For more ambience, gradually move the microphone away from the guitar).

**Bands:** like most applications, adjustments and trials of the microphones’ position will quickly and easily show that most effective position.
1. You may use either phantom power (see Specifications) or 9V battery to operate your NT4.
2. Most professional mixing consoles include a 48-volt phantom power supply; if yours does not, a separate one may of course be used. Ensure that whichever power supply you use, it is a professional unit and is working correctly.
3. If you choose to use battery power, a 9 Volt (PP3) battery should be fitted into the cavity within the microphone body ensuring correct polarity (+ to + and – to –). We recommend that you use a high quality alkaline battery. To fit the battery, simply un-screw the lower
section of the body and insert the battery into the cavity (terminals first). Secure the battery in place with the flexible spring clip and reassemble the body, screwing the sections firmly together.

4. The ON/OFF switch turns the microphone ON or OFF when powered by either phantom or battery. When using battery power, the switch should be switched to OFF when the microphone is not in use. If left ON, the battery power will be unnecessarily depleted. We recommend that during long periods of non-use, the battery should be removed, as it may leak, and that could damage your NT4. When the NT4 is switched ON, the red battery status L.E.D. (light-emitting-diode) gives an indication of battery power and should always be carefully observed. When the L.E.D. flashes (illuminates for about 1 second), the battery power is ‘good’. If the L.E.D. remains illuminated significantly longer, the battery should be replaced. Tests have shown a life expectancy for a high quality alkaline battery used in the NT4 to be in excess of 400 hours.

5. The NT4 may be connected directly to 2 channels of a mixer using the twin XLR cable (marked L and R) supplied, with each channel panned left and right as required. Battery power will only be necessary if the mixer does not have an in-built phantom P48 supply. Connection may also be made direct to a
**e 604 Evolution Drum Microphone**

The e 604 is a cardioid microphone especially suitable for use with drums and brass instruments. Sound inlet basket: refined steel.

**Features—Benefits**

- Metal construction—rugged and reliable
- Shock mounted capsule—Low sensitivity to impact and handling noise
- Very high sound pressure handling capability
- Hum compensating coil—reduces electrical interference
- Compact design—easy to position
- Integral stand mount—easy positioning
- Neodynum ferrous magnet with boron—keeps mic stable regardless of climate
- Falcon ring—consistent sound over time

**Technical Data**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardioid instrument microphone, hum compensating coil</td>
<td></td>
</tr>
<tr>
<td>Coil, frequency response</td>
<td>40 Hz–18 kHz</td>
</tr>
<tr>
<td>Sensitivity (free field, no load)</td>
<td>1.8 mV/Pa at 1 kHz, nominal</td>
</tr>
<tr>
<td>Impedance</td>
<td>350 Ω, min.</td>
</tr>
<tr>
<td>Terminating impedance</td>
<td>1 k</td>
</tr>
<tr>
<td>Dimensions in inches</td>
<td>1.3 x 2.32</td>
</tr>
<tr>
<td>Weight</td>
<td>2.17 oz</td>
</tr>
</tbody>
</table>

**Product Variants**

- Threepack 604 (3 x e604)

**Supplied Accessories**

- 1 Protective pouch
- 1 Drum clip

**Optional Accessories**

- Quick mount drum clamp: MZH 504
- Swivel Joint: MZJ 504
- 21’ XLR Microphone cable: MC 21N

**Architect’s Specifications**

The unit shall be a cardioid instrument microphone with a hum compensating coil. The frequency response shall be 40 Hz–18 kHz, with a sensitivity (free field, no load) of 1.8 mV/Pa at 1 kHz. The nominal impedance shall be 350 Ω; the min. terminating impedance shall be 1 k. The unit shall be 1.3 x 2.32 inches, and weight 2.17 oz. The unit shall be a Sennheiser e604 microphone.

Sennheiser Electronic Corporation, 1 Enterprise Drive, Old Lyme, CT 06371
Telephone: 860-434-9190 • Fax: 860-434-1759 • Web: http://www.sennheiserusa.com
Sennheiser Mexico: Av. Xola 613, PH 6, Col. Del Valle 03100, Mexico DF. Telephone: (52) 639-0956. Fax: (52) 639-9482
Sennheiser Canada: 221 Labrosse Ave, Pte-Claire, PQ H9R 1A3. Telephone: 514-426-3013. Fax: 514-426-3953
Manufacturing Plant: Am Labor 1, 39000 Wedemark, Germany
e609 Silver Dynamic Microphone

The e609 Silver is based on the legendary MD 409 microphone. Able to withstand high SPLs without distorting, the e609 Silver’s large flat-profile capsule facilitates extremely close miking of guitar cabinets and is also suitable for drum miking, particularly toms. The e609 Silver’s super-cardioid design improves isolation in live sound reinforcement and recording applications while its increased output and wider frequency response improves performance. Its sound inlet basket, made of refined steel, is distinguished by a unique silver address side.

Features - Benefits

- Metal construction—rugged and reliable
- Super-cardioid pick-up pattern provides isolation from other on-stage signals
- Hum compensating coil reduces electrical interference
- Neodynum ferrous magnet with boron keeps mic stable regardless of climate
- Falcon ring produces consistent sound over time

Technical Data

Pick-up pattern: super-cardioid
Frequency response: 40 - 18,000 Hz
Sensitivity: 1.5 mV/Pa at 1 kHz, nominal
Nominal impedance: 350 Ohms
Min. terminating impedance: 1 k
Dimensions in inches: 2.17 x 1.34 x 5.28
Weight: 6.43oz

Supplied Accessories

1 protective pouch
1 MZQ 100 microphone clip

Optional Accessories

21' XLR Microphone cable MC21N
GEBRAUCHSANLEITUNG
INSTRUCTIONS FOR USE
NOTICE D’EMPLOI
ISTRUZIONI PER L’USO
INSTRUCCIONES PARA EL USO
GEBRUIKSAANWIJZING

MD 421-II
MD 421-II
Dynamic microphone with cardioid-shaped directional characteristic. Suitable for vocal transmission and miking up instruments in all fields of live sound transmission.

ITS FEATURES
• Good feedback and handling noise rejection
• Transparent sound reproduction
• Pronounced directional characteristic
• Robust
• 5 step roll-off filter
• Lockable stand holder

RECOMMENDED ACCESSORIES
Desk stands: MZT 441, (art.-no. 00799); MZT 100 (art.-no. 01883).
Windscreens: MZW 40 (art.-no. 01794); MZW 421: grey (art.-no. 00536); blue (art.-no. 01527); red (art.-no. 01530)

TECHNICAL DATA
Frequency response 30 - 17,000 Hz
Acoustical mode of operation pressure gradient transducer
Directional characteristic cardioid
Max. rejection at 180° 18 dB - 2 dB
Open circuit output level 2 mV / Pa (= -54 dBV) ± 2,5 dB
Electrical impedance 200 Ω
Minimum load impedance 200 Ω
Insensitivity to magnetic field at 50 Hz < 5 µV / 5 µT
Dimensions in mm 215 x 46 x 49
Weight approx. 385 g
Delivery 1 microphone, 1 stand holder, 1 adaptor 3/8" → 5/8"

Subject to alterations.
Wirkung des Baßeinstellers
Effect of the roll-off filter
Effet du filtre roll-off
Effetto del filtro roll-off
Efecto del filtro roll-off
Werking van de basinstelling

Frequenzkurve
Frequency response
Réponse en fréquence
Risposta in frequenza
Respuesta en frecuencia
Frequentiekromme

Anschluß
Connecting the microphone
Connexion
Collegamento
Conexiòn
Aansluiting
MODEL SM81
UNIDIRECTIONAL CONDENSER MICROPHONE

OVERVIEW

The Shure Model SM81 is a high-quality, unidirectional con-
denser 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, espe-
cially 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, attenua-
tor-switch lock, foam windscreen, and case for carrying and storage. Other accessories are available.

FEATURES

- 20 Hz to 20 kHz frequency response
- Flat response curve for accurate reproduction of sound sources
- Low noise and high output clipping level
- Low distortion over a wide range of load impedances
- Cardioid polar pattern, uniform with frequency and symme-
tric about axis, providing maximum rejection and minimum coloration of off-axis sounds
- Low RF susceptibility
- Selectable low-frequency response: flat, 6 or 18 dB/octave rolloff
- 0 dB/10 dB lockable attenuator switch
- Phantom powering (DIN 45 596 voltages of 12 to 48 Vdc)
- Rugged steel construction for durability
- Field usable over wide range of temperature and humidity conditions

SPECIFICATIONS

Type
Condenser (electret bias)
Frequency Response
20 to 20,000 Hz

![Typical Frequency Response](image1)

TYPICAL FREQUENCY RESPONSE

![Typical Polar Patterns](image2)

TYPICAL POLAR PATTERNS

Polar Pattern
Cardioid (unidirectional) response—uniform with frequen-
cy, symmetrical about axis (see Figure NO TAG)
MODEL SM81 CONDENSER MICROPHONE  

Specifications:

Output Impedance
- Rated at 150 ohms (85 Ω actual)
- Recommended minimum load impedance: 800 Ω (May be used with loads as low as 150 Ω with reduced clipping level)

Output Configuration and Connector
- Balanced, transformer-coupled output; male XLR connector

Sensitivity (at 1,000 Hz)
- Open Circuit Voltage: –45 dBV/Pascal (5.6 mV)
- (1 Pascal = 94 dB SPL)

Clipping Level (at 1,000 Hz)
- 800 Ω Load: –4 dBV (0.63 V)
- 150 Ω Load: –15 dBV (0.18 V)

Total Harmonic Distortion
- Less than 0.5% (131 dB SPL at 250 Hz into 800 Ω load)

Maximum SPL (at 1,000 Hz)
- 800 Ω load: 136 dB (attenuator at 0)
- 146 dB (attenuator at –10)
- 150 Ω load: 128 dB (attenuator at 0)
- 138 dB (attenuator at –10)

Hum Pickup
- –3 dB equivalent SPL in a 1 mOe field (60 Hz)

Self-Noise (equivalent sound pressure levels; measured with true rms voltmeter)
- 16 dB typical, A-weighted
- 19 dB typical, weighted per DIN 45 405

Signal-to-Noise Ratio
- 78 dB (IEC 651)* at 94 dB SPL
- *S/N ratio is difference between microphone output at 94 dB SPL and microphone self-noise A-weighted.

Overvoltage and Reverse Polarity Protection
- Max. external voltage applied to pins 2 and 3 with respect to pin 1: +52 Vdc

Polarity
- Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3

Cartridge Capacitance
- 54 pF

Low Frequency Response Switch Positions
- Flat: –6 dB/octave below 100 Hz; –18 dB/octave below 80 Hz

Attenuator Switch Positions (Lockable)
- 0 or –10 dB

Power
- Supply Voltage: 11 to 52 Vdc, positive, pins 2 and 3
- Current Drain: 1.2 mA max.

Environmental Conditions
- Temperature:
  - Storage: –29°C to 74°C (–20°F to 165°F)
  - Operating: –6.7°C to 49°C (20°F to 120°F)
- Humidity:
  - Storage: 0–95% relative humidity at room temperature (72°F to 80°F, 22°C to 27°C)

Case
- Steel construction with vinyl metallic paint finish and stainless steel screens

Dimensions
- See Figure NO TAG

Weight
- Net: 230 grams (8 oz)
- Packaged: 740 grams (1 lb 10 oz)

Furnished Accessories
- Swivel Adapter: A57F
- 10 dB Attenuator Lock: 34A830

Replacement Parts
- Cartridge and Grille Assembly: R104

Optional Accessories
- Pop-Filter Grille: A81G
- Heavy-Duty Windscreen: A81WS
- Tripod Microphone Stand (4.3 m [14 ft]): S15A
- Stereo Microphone Adapter: A27M
- Cable (7.6m [25ft]): C25F
- Phantom Power Supply: PS1A
MODEL SM58®
UNIDIRECTIONAL DYNAMIC MICROPHONE

OVERVIEW

The Shure SM58® is a unidirectional (cardioid) dynamic vocal microphone designed for professional vocal use in sound reinforcement and studio recording. A highly effective, built-in, spherical filter minimizes wind and breath “pop” noise. A cardioid pickup pattern isolates the main sound source while minimizing unwanted background noise. The SM58 has a tailored vocal response for a sound which is a world standard. Rugged construction, a proven shock mount system, and a steel mesh grille ensure that even with rough handling, the SM58 will perform consistently. Outdoors or indoors, singing or speech—the SM58 is the overwhelming choice of professionals worldwide.

FEATURES

- Frequency response tailored for vocals, with brightened midrange and bass rolloff
- Uniform cardioid pickup pattern isolates the main sound source and minimizes background noise
- Pneumatic shock-mount system cuts down handling noise
- Effective, built-in spherical wind and pop filter
- Supplied with break-resistant stand adapter which rotates 180°
- Legendary Shure quality, ruggedness, and reliability

Models

- SM58
- SM58S (With On/Off Switch)

SPECIFICATIONS

Type

Dynamic (moving coil)

Frequency Response

50 to 15,000 Hz

Sensitivity (at 1,000 Hz Open Circuit Voltage)

$-54.5 \text{ dBV/Pa (1.85 mV)}$

1 Pa = 94 dB SPL

Impedance

Rated impedance is 150 Ω (300 Ω actual) for connection to microphone inputs rated low impedance

Polarity

Positive pressure on diaphragm produces positive voltage on pin 2 with respect to pin 3
MODEL SM57
UNIDIRECTIONAL DYNAMIC MICROPHONE

OVERVIEW
The Shure SM57 unidirectional dynamic microphone is exceptional for musical instrument pickup or for vocals. With its bright, clean sound and carefully contoured presence rise, the SM57 is ideal for live sound reinforcement and recording. It has an extremely effective cardioid pickup pattern which isolates the main sound source while minimizing background noise. In the studio, it is excellent for recording drums, guitar, and woodwinds. For musical instruments or vocals, the SM57 is a consistent choice of professional performers.

FEATURES
- Frequency response tailored for drums, guitars, and vocals
- Uniform cardioid pickup pattern isolates the main sound source while reducing background noise
- Pneumatic shock-mount system cuts down handling noise
- Extremely durable under the heaviest use
- Supplied break-resistant swivel adapter that rotates 180°
- Legendary Shure quality, ruggedness, and reliability
**SPECIFICATIONS**

**Type**
Dynamic

**Frequency Response**
40 to 15,000 Hz

![Frequency Response Graph]

**Polar Pattern**
Unidirectional (cardioid), rotationally symmetrical about microphone axis, uniform with frequency.

![Polar Patterns]

**Sensitivity** (at 1,000 Hz)
Open Circuit Voltage: –54.5 dBV/Pa* (1.9 mV)

*(1 Pa = 94 dB SPL)*

**Impedance**
Rated impedance is 150Ω (310Ω actual) for connection to microphone inputs rated low impedance.

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

![Polarity Diagram]

**Connector**
Three-pin professional audio connector (male XLR type)

**Case**
Dark gray, enamel-painted, die-cast steel with a polycarbonate grille and a stainless steel screen.

![Case Image]

**Swivel Adapter**
Positive-action, break-resistant, adjustable through 180°, with standard 5/8 in.-27 thread

**Net Weight (without cable)**
284 grams (10 oz)

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**FURNISHED ACCESSORIES**

Swivel Adapter .................... A25D
Storage Bag ....................... 26A13

**REPLACEMENT PARTS**

Cartridge .......................... R57
Screen and Grille Assembly ........ RPM210

**OPTIONAL ACCESSORIES**

Windscreen .......................... A2WS
Desk Stand ......................... S37A, S39A
Isolation Mount ..................... A55M
Dual Mount ......................... A25M, A26M
Cable (7.6 m [25 ft]) ............. C25E, C25F
GENERAL

The Shure Model SM85 is a professional-quality, hand-held, unidirectional condenser microphone designed for the most demanding applications in sound reinforcement, broadcasting and studio recording. It is especially suitable for applications requiring wide frequency response, low distortion characteristics, very low RF susceptibility, and reliable operation over a wide range of temperature and humidity extremes. The SM85 makes optimum use of proximity effect to give the performer control of low-frequency sound, from the warm intimacy of close miking to the natural sounds of normal-to-distant miking. The SM85 also features an integral wind and pop filter, a high-frequency presence peak, a controlled low-frequency rolloff, and an effective shock mount for reduced stand and handling noise. The case is constructed of aluminum for light weight and ruggedness, with a steel grille and durable black finish.

The SM85 is designed for simplex (phantom) powering from an external supply or directly from sound reinforcement, broadcast, or recording equipment. The SM85 operates over an extremely wide voltage range of 11 to 52 Vdc, covering both DIN Standard 45 596 simplex voltages of 12 and 48 volts, and the proposed 24-volt standard.

The microphone is supplied with an accessory swivel adapter. Model SM85-LC is supplied without a cable, and Model SM85-CN is supplied with a 7.6m (25 ft) TRIPLE-FLEX® microphone cable with professional audio connectors. Two dual-channel power supplies (Models PS1 and PS1E2) are available for providing simplex power to the SM85.

Model SM85 Features:

- Wide-range frequency response tailored for professional vocal applications
- Built-in wind and pop filter minimizes undesirable wind and breath sounds
- Controlled low-frequency rolloff to reduce low-frequency handling noise and compensate for proximity effect
- Transducer element shock-mounted for reduced stand and handling noise
- Low distortion output and wide dynamic range characteristics for a variety of load impedances
- Cardioid polar pattern, uniform with frequency and symmetrical about axis, to provide maximum rejection and minimum coloration of off-axis sounds
- Very low RF and magnetic hum susceptibility
- Wide-range simplex powering includes DIN 45 596 voltages of 12 and 48 Vdc
- Rugged construction for outstanding reliability
- Field-usable over wide range of temperature and humidity conditions

SPECIFICATIONS

Type
Cardioid condenser (electret bias)

Frequency Response
50 to 15,000 Hz (see Figure 1)

TYPICAL FREQUENCY RESPONSE

Polar Pattern
Cardioid (unidirectional) response — uniform with frequency, symmetrical about axis (see Figure 2)

Output Impedance
Rated at 150 ohms (85 ohms actual)
Recommended minimum load impedance: 800 ohms
(May be used with loads as low as 150 ohms with reduced clipping level)

Output Level (at 1,000 Hz)
Open Circuit Voltage .................. −74 dB (0.2 mV)
(0 dB = 1 volt per microbar)

Clipping Level (at 1,000 Hz)
800-ohm Load .................. − 4 dBV (0.63V)
150-ohm Load .................. − 15 dBV (0.18V)
Total Harmonic Distortion
Less than 0.25% (130 dB SPL at 250 Hz into 800-ohm load)

Maximum SPL
142 dB with 800-ohm load
134 dB with 150-ohm load

Hum Pickup
- 7.5 dB equivalent SPL in a 1 million ohms field (60 Hz)

Output Noise (equivalent sound pressure levels; measured with true rms voltmeter)
- 29 dB typical, A-weighted
- 32 dB typical, weighted per DIN 45 405

Dynamic Range
113 dB (maximum SPL to A-weighted noise level)

Signal-to-Noise Ratio
65 dB (IEC 179)* at 94 dB SPL

Overvoltage and Reverse Polarity Protection
Max. External Voltage Applied to
Pin 2 and 3 with Respect to Pin 1 ........ + 52 Vdc
Reverse Polarity Protection ............. 200 mA max. (diode-clamped)

Phasing
Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3

Cartridge Capacitance
27 pF

Power Supply Voltage ... 11 to 52 Vdc, positive pins 2 and 3
Current Drain ................... 1.0 mA to 1.2 mA

Environmental Conditions
Relative Humidity 0 - 50% .............. -29° to 74°C
(-20° to 165°F)
Relative Humidity 0 - 95% .............. -29° to 57°C
(-20° to 135°F)

Connector
Three-pin professional audio**

Case
Aluminum construction with black finish and black steel grille

Dimensions
See Figure 3

OVERALL DIMENSIONS
FIGURE 3

Weight
Net .................................... 180 grams (6.3 oz)
Packaged ............. SM85-LC: 887 grams (1 lb 15 oz)
SM85-CN: 1.47 kilograms (3 lb 4 oz)

Cable (Model SM85-CN)
7.6 m (25 ft), two-conductor, shielded, TRIPLE-FLEX®
with three-pin and three-socket professional audio
connectors (microphone connector is black finish)**

OPERATION
The SM85 is designed for simplex powering by a Shure Model PS1 or PS1E2 Power Supply, or by virtually any microphone power supply providing 12 to 48 Vdc simplex voltage, or by any microphone mixer (such as the Shure M267 and M268) with a simplex supply.

Use only high-quality cables, as intermittent shorts between broken shield wires and balanced conductors will cause objectionable noise transients in the system. Paralleling or “Y-ing” the SM85 with another microphone (two microphones on the same input) is not recommended; separate inputs are preferable. However, paralleling two SM85’s may be accomplished with either a reduction in maximum SPL and output level, or a reduction only in output level if the microphones are electrically isolated. With the microphones paralleled either before or after a PS1 or PS1E2 Power Supply, the maximum SPL is reduced by approximately 10 dB and the output level by 6 dB. The reduction in maximum SPL can be avoided by using either two Shure A15AS Attenuators and a Switchcraft 391Q43 Y-Adapter to isolate the microphones, or an isolation network as shown in Figure 4. The network reduces each microphone output level by 8 dB, while the A15AS reduces the output level by 5 dB plus the attenuator’s 15, 20, or 25 dB (switch-selectable). The network or attenuators can be inserted between the power supply outputs and mixer input. Note that a PS1 or PS1E2 Power Supply can power two SM85’s on each input; other power supplies should be checked to see if they can supply a minimum of 11 Vdc at each microphone when both microphones are connected.

A minimum load impedance of 600 ohms or greater should be used for maximum signal handling and minimum distortion. The load may be as low as 150 ohms, but a reduction in output clipping will result. It should be noted that the power supply itself may add loading (3300 ohms in the Shure PS1 or PS1E2 power supplies) to the microphone.

PS1 and PS1E2 POWER SUPPLIES
Connect the microphone cable to the SM85 and the power supply MICROPHONE connector. The power supply uses the balanced audio cable pair to carry the supply current to the microphone, and the cable shield as a ground return.

*SN ratio is difference between microphone output at 94 dB SPL and microphone self-noise A-weighted.
**Designed to mate with Cannon XL series, Switchcraft A3 (G.G.) series or equivalent connectors.
MODEL BETA 52®
SUPERCARDIOD DYNAMIC INSTRUMENT MICROPHONE

GENERAL

The Shure BETA 52 is a high output dynamic microphone with a tailored frequency response designed specifically for kick drums and other bass instruments. It provides superb attack and “punch,” and delivers studio quality sound even at extremely high sound pressure levels.

The BETA 52 features a modified supercardioid pattern throughout its frequency range to insure high gain before feedback and excellent rejection of unwanted sound. A built-in dynamic locking stand adapter with an integral XLR connector simplifies installation, particularly if the microphone is to be placed inside a kick drum. The stand adapter keeps the microphone position fixed and resists slipping, even when subjected to sharp blows and strong vibrations. A hardened steel mesh grille protects the BETA 52 from the abuse and wear associated with touring.

FEATURES

- Frequency response shaped specifically for kick drums and bass instruments
- Built-in dynamic locking stand adapter with integral XLR connector simplifies setup, especially inside a kick drum
- Studio quality performance, even at extremely high sound pressure levels
- Supercardioid pattern for high gain before feedback and superior rejection of unwanted noise
- Hardened steel mesh grille that resists wear and abuse
- Advanced pneumatic shock mount system that minimizes transmission of mechanical noise and vibration
- Neodymium magnet for high signal-to-noise ratio output
- Low sensitivity to varying load impedance
- Legendary Shure quality and reliability

APPLICATIONS AND PLACEMENT

The most common BETA 52 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.

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>SUGGESTED MICROPHONE PLACEMENT</th>
<th>TONE QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kick Drum</td>
<td>5 to 7.5 cm (2 to 3 in.) from beater head, slightly off-center from beater. 20 to 30 cm (8 to 12 in.) from beater head, on-axis with beater. 20 to 30 cm (8 to 12 in.) from beater head, 15 to 20 cm (6 to 8 in.) from edge of head. 5 to 7.5 cm (2 to 3 in.) from outside head, on-axis with beater (double head kickdrum only).</td>
<td>Sharp attack; maximum bass sound, highest sound pressure level. Medium attack; balanced sound. Medium attack; thin, reduced bass sound. Softer attack; balanced, resonant sound.</td>
</tr>
<tr>
<td>Electric Bass Amplifier</td>
<td>2.5 cm (1 in.) from speaker, on-axis with center of speaker cone. 2.5 cm (1 in.) from speaker, at edge of speaker cone. 10 to 15 cm (4 to 6 in.) from speaker, on-axis with center of speaker cone. 60 to 90 cm (2 to 3 ft.) from speaker, on-axis with center of speaker cone.</td>
<td>Sharp attack; emphasized bass. Sharp attack; higher frequency sound. Sharp attack; full, balanced sound. Soft attack; mellow, higher frequency sound.</td>
</tr>
</tbody>
</table>

NOTE: To “tighten” the beat, place a pillow or blanket on bottom of drum against beater head.

MOUNTING THE BETA 52 ON A MICROPHONE STAND

The built-in stand adapter features a dynamic locking system that permits adjustments to the microphone’s position, but resists slipping when struck or bumped. To mount the BETA 52 on a stand and adjust its position, proceed as follows:

1. Screw the integral stand adapter onto the end of a microphone stand (see Figure 3). Adjust the stand height and position as necessary.
2. Pivot the BETA 52 until it is in the desired position relative to the drum head or loudspeaker.
3. Lock the BETA 52 in place by rotating the adjustment knob on the stand adapter clockwise until it is tight. Do NOT overtighten the knob with tools.
4. If necessary, make minor adjustments to the microphone position without loosening the adjustment knob.
5. Connect an audio cable to the integral XLR connector.
SPECIFICATIONS

Type
Dynamic (moving coil)

Frequency Response
20 to 10,000 Hz (see Figure 1)

NOTE: The curve below shows on–axis response at a distance of 2 feet from a uniform sound source. Your response may vary, depending on microphone position.

![TYPICAL FREQUENCY RESPONSE](image)

Polar Pattern
Supercardioid, rotationally symmetrical about microphone axis (see Figure 2)

![TYPICAL POLAR PATTERNS](image)

Output Level (at 1,000 Hz)
Open Circuit Voltage: –64 dBV/Pa* (0.6 mV)

*1 Pa = 94 dB SPL

Impedance
Rated impedance is 150 Ω (45 Ω actual) for connection to microphone inputs rated low Z

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

Maximum SPL
174 dB at 1000 Hz (calculated)

Connector
Three–pin professional audio connector (male XLR type)

Case
Silver blue enamel–painted die cast metal with hardened, matte-finished steel grille

Adjustable, Locking Stand Adapter
Integral, dynamic locking, adjustable through 180°, with standard 5/8"-27 thread (see Figure 3)

![STAND ADAPTER](image)

Net Weight
605 grams (21.6 oz)

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
Storage Bag .......................... 26A25
5/8" to 3/8" (Euro) Thread Adapter .......... 95A2050

OPTIONAL ACCESSORIES
7.6 m (25 ft) Cable .................... C25E, C25F

REPLACEMENT PARTS
Cartridge .......................... R175
Screen and Grille Assembly ............ RK321
Plug (connector) Assembly .......... 90F1984

NOTE: Use care when removing the cartridge holder from the base to prevent breakage of the lead wires.

For additional Service or parts information, please contact Shure’s Service department at 1–800–516–2525. Outside the United States, please contact your authorized Shure Service Center.
**GENERAL**

The Model SM7B dynamic microphone has a smooth, flat, wide-range frequency response appropriate for music and speech in all professional audio applications. It features excellent shielding against electromagnetic hum generated by computer monitors, neon lights, and other electrical devices. The SM7B has been updated from earlier models with an improved bracket design that offers greater stability. In addition to its standard windscreen, it also includes the A7WS windscreen for close-talk applications.

**Features**

- Flat, wide-range frequency response for clean and natural reproduction of both music and speech
- Switchable bass rolloff and mid-range emphasis (presence boost) settings
- Shielded against broadband interference from computer monitors and other electrical devices—excellent rejection of electromagnetic hum
- Internal “air suspension” shock isolation virtually eliminates mechanical noise transmission
- A7WS windscreen included for close-up vocals or narration
- Swiveling bracket with integrated stand adapter for easy mounting and precise microphone positioning
- Cardioid polar pattern, uniform with frequency and symmetrical about axis, to provide maximum rejection and minimum coloration of off-axis sound
- Rugged construction and excellent cartridge protection for outstanding reliability

**APPLICATIONS**

The exceptional performance and unique features of the SM7B make it the outstanding choice for such applications as:

- Recording Studio—Instrumental and Vocal
- Location Recording
- Motion Picture and Television Scoring
- Television Talk Shows and News Desks
- Radio Announcing and Production
- Narration

**WINDSCREEN**

Use the standard windscreen for general voice and instrumental applications. Use the supplied A7WS windscreen for close-talk applications, such as voice overs or radio announcements, as it offers maximum protection from plosive breath noise and creates a warmer, more intimate sound.

To install the A7WS, follow these instructions:

1. To avoid tearing the windscreen during removal, grip it from the plastic ring and the base and remove by gently pulling and twisting.

2. If desired, adhere the supplied velcro strips around the microphone grille, approximately one inch from the base of the grille (as shown above) to hold new windscreen in place.

3. Install the A7WS windscreen by stretching over the velcro strips, then squeezing at the base of the windscreen to adhere to the velcro. No velcro strip inside the windscreen is needed, as the windscreen itself adheres to the velcro. To remove, grip at the base of the windscreen and pull while twisting.

**MOUNTING INSTRUCTIONS**

The SM7B can be mounted on a microphone stand or hung from a boom. It is shipped in the boom mounting configuration (see Figure 1). To set up the SM7B in the microphone stand mounting configuration (see Figure 2), proceed as follows:

1. Remove tightening nuts on the sides (see Figure 7).
2. Remove the fitted washers, the lock washers, the outer brass washers, and the brass sleeves.
3. Slide the bracket off the microphone. Be careful not to lose the washers still on the microphone.
4. Invert and rotate the bracket. Slide it back onto the bolts over the brass and plastic washers still on the microphone. The bracket should fit so the XLR connector faces the rear of the microphone, and the Shure logo on the back of the microphone is right-side up.
5. Replace the brass sleeves. Be sure they are seated properly within the inner washers.
6. Replace the outer brass washers, the lock washers and the fitted washers.
7. Replace the tightening nuts and tighten the microphone at the desired angle.

**NOTE:** If the tightening nuts do not hold the microphone in position, one or both of the brass sleeves may not be properly seated within all the washers.
RESPONSE SELECTOR SWITCH COVER
Use the supplied cover plate to prevent accidental change of response setting.

SPECIFICATIONS

Type
Dynamic

Frequency Response
50 to 20,000 Hz (see Figure 3)

Polar Pattern
Cardioid (unidirectional). See Figure 4.

Impedance
Microphone impedance rating is 150 Ω (150 Ω actual) for connection to microphone inputs rated at 19 to 300 ohms.

Polarity
Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3.

Output Level (at 1,000 Hz)
Open Circuit Voltage* = 59.0 dB (1.12 mV) 0 dB = 1 volt per Pascal

Electromagnetic Hum Sensitivity
(Typical, Equivalent SPL/milliOersted)
60 Hz: 11 dB
500 Hz: 24 dB
1 kHz: 33 dB

Switches
Bass rolloff and mid-range emphasis: Slotted response selector switches. See Figure 3 for bass rolloff and mid-range emphasis (presence boost) response.

Cartridge Shock Mount
Internal air-suspension shock and vibration isolator.

Microphone Connector
Three-pin professional audio (XLR)

Swivel Assembly
Integrated, captive nut for ease of attachment to stand, fits 5/8 in.–27 thread.

Case
Dark gray enamel aluminum and steel case with dark gray foam windscreen.

Dimensions
See Figure 5.

Net Weight
765.4 grams (1 lb, 11 oz)
MODEL BETA 57A®
SUPERCARDIOID DYNAMIC
PERFORMANCE MICROPHONE

GENERAL
The Shure BETA 57A is a high output supercardioid dynamic microphone designed for professional sound reinforcement and project studio recording. It maintains a true supercardioid pattern throughout its frequency range. This insures high gain before feedback, maximum isolation from other sound sources, and minimum off–axis tone coloration. A completely new grille design lets you take better advantage of proximity effect. The BETA 57A is an exceptionally versatile microphone. Typical applications include drums, guitar amplifiers, brass, woodwinds and vocals.

FEATURES
• Tailored frequency response provides drums, guitars, vocals, and horns with studio quality sound
• Uniform supercardioid pattern for high gain before feedback and superior rejection of off–axis sound
• Hardened steel mesh grille that facilitates use of proximity effect and resists wear and abuse
• Neodymium magnet for high signal–to–noise ratio output
• Minimally affected by varying load impedance
• Advanced pneumatic shock mount system that minimizes transmission of mechanical noise and vibration
• Legendary Shure quality and reliability

GENERAL RULES FOR MICROPHONE USE
1. Aim the microphone toward the desired sound source and away from unwanted sources. Since supercardioid microphones such as the BETA 57A have narrow pickup patterns and can pick up sounds from the rear, this may not be obvious or intuitive. Refer to Figure 1.
2. Place a microphone as close as practical to the desired sound source (refer to the table in the facing column).
3. Work close to the microphone for extra bass response.
4. Use only one microphone to pick up one sound source.
5. Keep the distance between microphones at least three times the distance from a microphone to a sound source.
6. Use the fewest number of microphones as is practical.
7. Place mics as far as possible from reflective surfaces.

8. Add a windscreen when using the microphone outdoors.
9. Avoid excessive handling to minimize pick up of mechanical noise.

APPLICATIONS AND PLACEMENT
The most common applications and placement techniques for the BETA 57A 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.

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>SUGGESTED MICROPHONE PLACEMENT</th>
<th>TONE QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom–Toms</td>
<td>One BETA 57A on each tom, or between each pair of toms, 2.5 to 7.5 cm (1 to 3 in.) above drum heads. Aim each mic at top drum heads. On double head toms, you can also remove bottom head and place a mic inside, pointing up toward top head.</td>
<td>Medium attack, balanced sound.</td>
</tr>
<tr>
<td>Snare Drum</td>
<td>2.5 to 7.5 cm (1 to 3 in.) above the rim of the top drum head. Aim the mic at the drum head. If desired, place a second mic just below rim of bottom head.</td>
<td>Most “snap” from drumstick impact More “snare” sound.</td>
</tr>
<tr>
<td>Guitar &amp; Bass Amplifiers</td>
<td>2.5 cm (1 in.) from speaker, on–axis with speaker cone. 2.5 cm (1 in.) from speaker, at edge of speaker cone. 15 to 30 cm (6 to 12 in.) away from speaker and on–axis with speaker cone. 2 to 3 ft. (60 to 90 cm) back from speaker, on–axis with speaker cone.</td>
<td>Sharp attack; emphasized bass. Sharp attack; higher frequency sound. Medium attack; full, balanced sound. Softer attack; thin, reduced bass sound.</td>
</tr>
<tr>
<td>Vocals</td>
<td>2.5 to 15 cm (1 to 6 in.) from the vocalist’s mouth.</td>
<td>Rich, warm sound.</td>
</tr>
<tr>
<td>Brass &amp; Woodwinds</td>
<td>Brass: 30 to 90 cm (1 to 3 ft.) away, on–axis with bell of instrument. Woodwinds: 2.5 to 15 cm (1 to 6 in.) away, on–axis with bell of instrument. Bell of the instrument 90° off–axis from the front of the mic.</td>
<td>Bright, clear sound. Bright, clear sound. Softer, mellow sound.</td>
</tr>
</tbody>
</table>

PROXIMITY EFFECT
Unidirectional microphones such as the BETA 57A progressively boost bass frequencies by 6 to 10 dB at 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 BETA 57A bass response gradually rolls off. This provides greater control and helps the user take advantage of proximity effect.
For maximum rejection of unwanted sound, place the stage monitor or P.A. system loudspeaker at a 60° angle from the rear of the Beta 57A, not directly behind it (see Figure 1). Always check out the stage setup before a performance to ensure that placement of microphone and monitors is optimum.

**SPECIFICATIONS**

**Type**
Dynamic (moving coil)

**Frequency Response**
50 to 16,000 Hz (see Figure 2)

**NOTE:** The curve below shows on-axis response at a distance of 2 feet from a uniform sound source. Your response may vary, depending on microphone position.

**Polar Pattern**
Supercardioid, rotationally symmetrical about microphone axis, uniform with frequency (see Figure 3)

**Output Level** (at 1,000 Hz)
Open Circuit Voltage –51 dBV/Pa* (2.8 mV)

*1 Pa = 94 dB SPL

**Impedance**
Rated impedance is 150 Ω (290 Ω actual) for connection to microphone inputs rated low Z

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

**Connector**
Three-pin professional audio connector (male XLR type)

**Case**
Silver blue enamel–painted die cast metal with hardened, matte-finished steel mesh grille

**Adjustable Stand Adapter**
Slip-in, adjustable through 180°, with standard 5/8”-27 thread

**Net Weight**
275 grams (9.6 oz)

**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**
Adjustable Stand Adapter ......................... A25D
5/8” to 3/8” (Euro) Thread Adapter .............. 95A2050
Storage Bag ............................................. 26A21

**OPTIONAL ACCESSORIES**
Locking Magnetic Windscreen ..................... A57AWS
Isolation Stand Mount .............................. A55M, A55HM
7.6 m (25 ft.) Cable ................................. C25E, C25F

**REPLACEMENT PARTS**
Cartridge .............................................. R174
Grille Assembly ...................................... RK320
Plug (Connector) Assembly ...................... 90F1984
Common Name
Range: B series
Retail Price Band: Under $500
Requires: DJ8 power supply

The TB1 is a vacuum tube (valve) microphone incorporating the philosophy that the best microphones use. The circuit design of the TB1 uses as few components as necessary to prevent added noise and coloration. A special hand selected 6072 "dual triode" vacuum tube is used to ensure consistency. The output is transformer balanced. The TB1 is powered by a dedicated AC power supply (DJ8) and provides the warm transparent sound associated with an expensive quality vacuum tube preamplifier. This perceived sound characteristic has been very popular and sought after for vocals and instrumentation soloists.

Accessories
Included: Foam windscreen, mic clip, power supply and cable, Al case
Optional

Electrical Characteristics
Frequency Response
Output Sensitivity
Max SPL
Self Noise (CCIR)
Self Noise (DIN/IEC)
Output Impedance
Recommended Load
Powering
Supply Current
Alternative Powering

Switchable Options
Pad
Filter/EQ

Physical Characteristics
Connector: XLR-3M
Connector Notes: (7-pin on microphone)
Available Colours
Weight
Length
Min Diameter/Width
Max Diameter/Width: 54mm (2.12")
Depth

© Rycote 2004
Frequency curve: Omni

Polar curve: Omni

Frequency curve: Cardioid
Polar curve: Cardioid

Frequency curve: Figure of 8

Polar curve: Figure of 8

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