



Neumann BCM-104 Broadcast Microphone Operating Manual

[Home](#) » [Support](#) » **Neumann BCM-104 Broadcast Microphone Operating Manual** 

Contents

- [1 Neumann BCM-104 Broadcast Microphone](#)
- [2 A Short Description](#)
- [3 The BCM 104 Broadcast Microphone](#)
- [4 Operation of the Switches](#)
- [5 Power Supply](#)
- [6 Technical Specifications](#)
- [7 Hints on Maintenance of the Microphone, Headgrille, and Pop Screen](#)
- [8 Accessories](#)
- [9 Limitation of Liability](#)
- [10 FREQUENTLY ASKED QUESTIONS](#)
- [11 Related Posts](#)



Neumann BCM-104 Broadcast Microphone



A Short Description

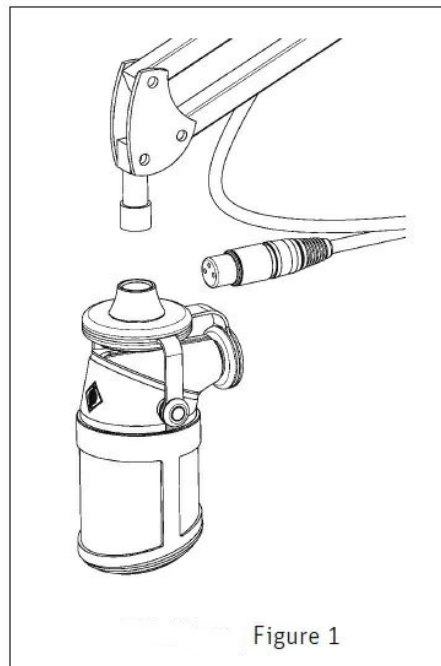
- The BCM 104 condenser microphone is a studio microphone with a cardioid directional characteristic.
- It features low self-noise with an impressive dynamic range, modern transformerless circuit technology, and extremely true, open sound reproduction free of coloration.
- The BCM 104 is specially designed for speech reproduction at close range and thus features an integrated pop screen, and a switchable high-pass filter to compensate for the proximity effect. A second switch allows the sensitivity to be reduced by 14 dB.
- The head grille and pop screen can be removed without the use of tools, permitting easy cleaning or replacement.
- The microphone has a balanced, transformerless output. The 3-pin XLR connector has the following pin assignments:

1. **Pin 1:** 0 V/ground
2. **Pin 2:** Modulation (+phase),
3. **Pin 3:** Modulation (–phase).

- The free-field sensitivity is $22 \text{ mV/Pa} = -33.1 \text{ dB re. } 1 \text{ V/Pa}$. The microphone is phantom powered from 48 V, 3.2 mA (IEC 1938). The BCM 104 is addressed from the front, marked with the Neumann logo.
- The preferred mode of operation is to suspend the BCM 104 from a standard studio boom arm. The amount provided for this purpose has an integrated elastic suspension in order to isolate the microphone from structure-borne noise. A thread adapter to fit different connector threads is included.

The BCM 104 Broadcast Microphone

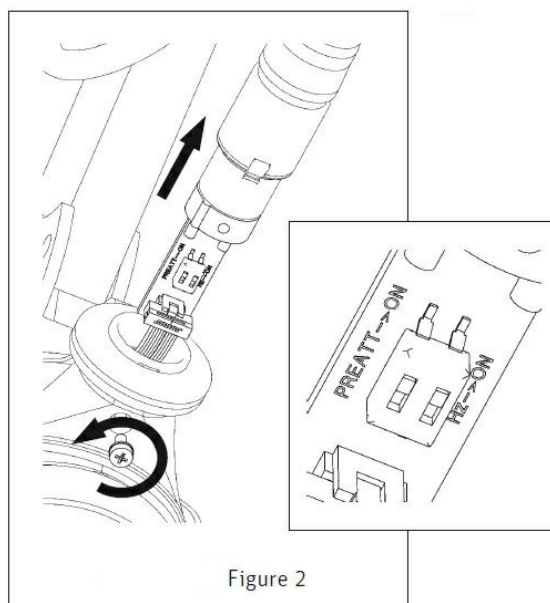
- The BCM 104 microphone is a condenser microphone in the broadcast series, with a cardioid directional characteristic.
- The letters “BCM” stand for “Broadcast Microphone”. The BCM 104 is a transformerless microphone. Instead of a transformer to couple the microphone output to the supply voltage, the BCM 104 has an electronic circuit that, like a transformer, provides for good common mode rejection. Interference induced in the balanced modulation line is thus suppressed as usual.
- With a very low self-noise of 7 dB(A), and an overload capability extending to 138 dB SPL, the BCM 104 has a dynamic range of 131 dB (DIN/IEC 651).
- The microphone is designed to be suspended from any standard studio boom arm (**see Fig. 1**). A thread adapter to fit different connector threads is included.



- The BCM 104 is addressed from the front; the front of the microphone is designated by the Neumann logo.
- The microphone head grille houses the K 04 large-diaphragm capsule, which has a flat frequency response of up to 3 kHz. Higher frequencies have an increased presence of 2 dB maximum.
- Since the above-mentioned microphone characteristics are obtained without the use of resonance effects, the microphone features an excellent transient response and transmits all transient phenomena of music and speech without any coloration.
- In order to provide protection from structure-borne noise, both the capsule and the microphone in its mount are elastically suspended. The BCM 104 amplifier has a linear operation down to 20 Hz. An active filter efficiently suppresses signals below this frequency. In order to compensate for the proximity effect, a high-pass filter, electronically activated by a switch, is built into the microphone. This filter reduces frequencies below 100 Hz by 12 dB/octave.
- To adapt the sensitivity to signal chains designed for dynamic microphones, a -14 dB pre-attenuation switch is provided. But this will increase the self-noise by 14 dB.
- Both switches are located inside the microphone housing since they will normally be operated only once when the broadcasting facility is set up.

Operation of the Switches

In order to access the switches, remove the screw which secures the XLR connector, and pull out the connector insert (see **Figure 2**). The switches will then be accessible, and can be set as indicated: “ON” means that the relevant function, i.e. “-14 dB” or “100 Hz Low Cut”, is activated.



Microphone Version and Output Wiring

- **BCM 104 ni Cat. No. 08483**

The BCM 104 microphone has a satin nickel finish and a male 3-pin XLR connector. The microphone is wired as per DIN EN 60268-12 or IEC 60268-12.

- The modulation is connected to pins 2 and 3; the shield is connected to pin 1. A sudden increase in sound pressure in front of the microphone diaphragm causes a positive voltage to appear at pin 2.

Microphone Cables

The acoustic properties of the BCM 104 microphone are not affected even by very long (Neumann) cables. Not until cable lengths significantly exceed 300 m is a fall-off in the upper-frequency range apparent. Neumann offers a wide range of cables; a selection is presented here. Other cable lengths and cable materials without connectors are available upon request.

The following cables are available for the BCM 104 microphone:

- **IC 3 mt blk Cat. No. 06543**

10 m long microphone cable, 5 mm in diameter, with a double twist (double helix) braiding as a shield. Three-pin XLR connectors, matt black. For feeding the audio signal to mixing consoles, etc.

- **AC 25 (0.3 m) Cat. No. 06600**

The adapter cable with a 3-pin XLR connector and a 6.3 mm mono jack, is unbalanced. It is used to connect 3-pin XLR outputs of the BS 48 i or N 48 i-2 power supplies to units with a 6.3 mm mono jack input.

(**Note:** When connecting to an unbalanced input, care must be taken not to short-circuit the phantom powering for the microphone. The use of one of the above-mentioned Neumann devices will ensure that such a short circuit does not occur. For more information, please see section 3.3.)

Power Supply

Phantom Powering

The BCM 104 is phantom powered at 48 V (P48, IEC 1938).

With phantom powering the DC from the positive supply terminal is divided via two identical resistors, one-half of the DC flowing through each audio modulation conductor to the microphone, and returning to the voltage source via the cable shield. Phantom powering provides a fully compatible connecting system since no potential differences exist between the two audio conductors. Studio outlets so powered can thus also be used for dynamic microphones, ribbon microphones, or modulation conductors of tube-equipped condenser microphones, without switching off the DC supply voltage.

No harm is done even if a Neumann phantom power supply is connected to the inputs of microphones which are phantom-powered from another source.

ac Supply Operation

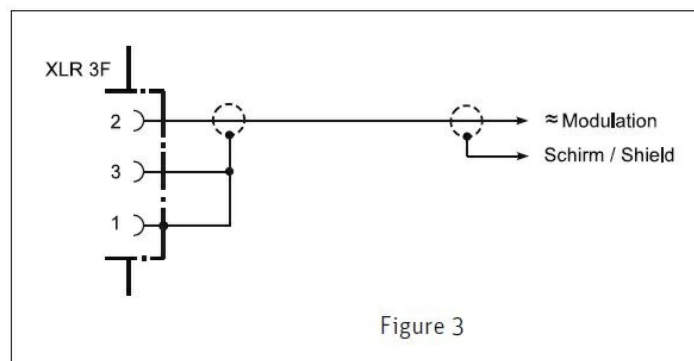
- All P48 power supplies in accordance with IEC 1938 which provide at least 3.2 mA per channel, are suitable for powering the microphones.
- The Neumann P48 power supply unit bears the designation N 248. It is designed to power two mono condenser microphones or one stereo microphone at $48\text{ V} \pm 1\text{ V}$, max. $2 \times 5\text{ mA}$ (see also Neumann bulletin no. 68832: "Phantom 48 VDC Power Supplies").
- The assignment of the microphone terminals and the modulation polarity at the power supply output are identical to those at the microphone.
- The N 248 supplies one stereo microphone, or two mono condenser microphones with 48 V phantom power (P48). All connectors are of XLR 3 type. The audio signal outputs are DC-free.

The following versions are available: N 248 blk Cat. No. 008537

Operation with Unbalanced or Center Tap Grounded Inputs

The BS 48 i, BS 48 i-2, and N 248 phantom 48 Vdc power supplies are DC-free so that no transformer is required for connection to unbalanced inputs.

Pin 2 of the BCM 104 is the "hot" phase, and pin 3 must be connected to the earth for unbalanced inputs (**see Fig. 3**).

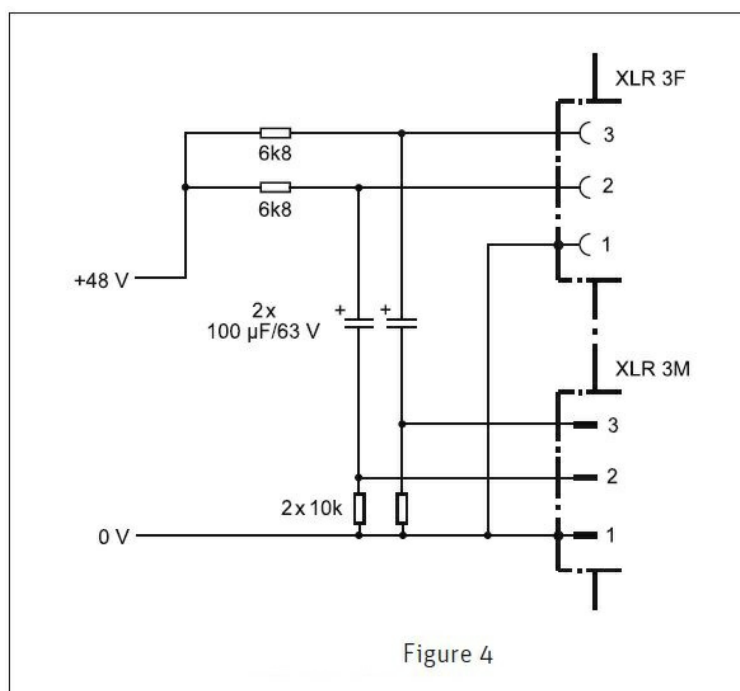


In the case of many phantom powering units other than those mentioned above, not only the modulation leads to the microphone but also the outgoing modulation leads from the powering unit are at the potential of the feed voltage (+48 V). This is unimportant for the balanced, floating amplifier and mixing console inputs which are in

general studio use. However, the feed voltage will be short-circuited if connected to unbalanced or center tap grounded amplifier inputs, making operation impossible.

This can be circumvented as follows:

- In center tap grounded equipment with input transformer (e.g. some NAGRA units), the earth lead can almost always be disconnected without affecting the function of the equipment.
- In every outgoing modulation lead, an RC network can be incorporated to block the 48 Vdc voltage (**See Fig. 4** and Neumann-Information no. 84 222).



Technical Specifications

- **Acoustical operating principle**Pressure gradient transducer
- **Polar pattern** Cardioid
- **Frequency range** 20 Hz...20 kHz
- **Sensitivity1)** 22 mV/Pa = -33.1 dBV ± 1 dB
- **-14 dB attenuation**4.4 mV/Pa
- **Rated impedance** 50 ohms
- **Rated load impedance** 1000 ohms
- **S/N ratio2)**
- **CCIR 468-33)** 76 dB
- **S/N ratio2)**
- **DIN/IEC 6513)**..... 87 dB
- **Equivalent SPL**
- **CCIR 468-33)** 18 dB
- **Equivalent SPL**
- **IEC/DIN 6513)** 7 dB-A
- **Maximum SPL**
- **for 0.5 % THD4)**138 dB

for 0.5 % THD with preattenuation⁴)152 dB

- Max. output voltage 10 dBu
- Supply voltage⁵)48 V \pm 4 V
- Current consumption⁵) 3.2 mA
- Weight 500 g
- Diameter64 mm
- Length85 mm
- Height (without suspension)110 mm

94 dB SPL 1 Pa = 10 μ bar

0 dB 20 μ Pa

1. at 1 kHz into 1 ohm rated load impedance.
2. re 94 dB SPL
3. according to IEC 60268-1; CCIR-weighting according to CCIR 468-3, quasi-peak; A-weighting according to IEC 61672-1, RMS
4. THD of the microphone amplifier at an input voltage equivalent to the capsule output at the specified SPL.
5. Phantom powering (P48, IEC 1938).

Hints on Maintenance of the Microphone, Headgrille, and Pop Screen

Do not operate the microphone without the head grille and pop screen! Operation without the head grille or without the pop screen could damage the sensitive capsule and electronics. Moreover, the acoustic properties of the microphone are attuned to the combined effects of the capsule, pop screen, and head grille.

The Microphone Headgrille

- For cleaning, the head grille can be unscrewed from the microphone housing without the use of tools (see Fig. 5).

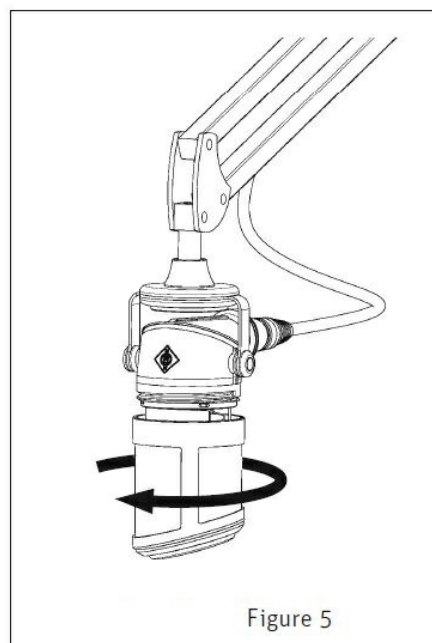


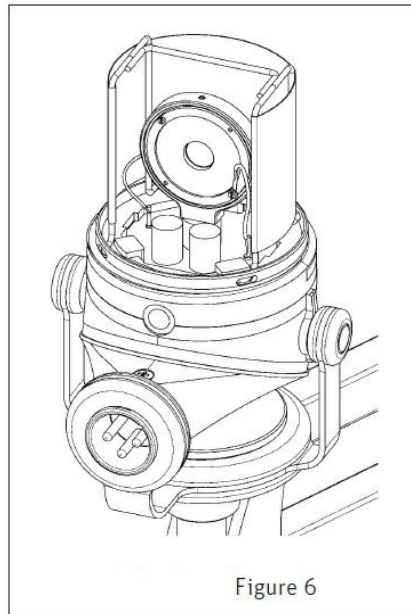
Figure 5

- Cleaning is best done using lukewarm water with a little detergent. In the case of soiling which is difficult to remove, the head grille may be scrubbed gently with a brush.

- After washing, rinse the head grille thoroughly with clean water and allow it to air dry, or dry with a cloth.
- Under no circumstances should a blow drier or heat be used. After cleaning, screw the dry head grille back onto the microphone housing, until it can be clearly heard meeting the stop.
- Headgrilles are available separately as accessories; please see the Accessory section. Each user can thus operate the microphone using his or her own individual head grille.

The Integrated Pop Screen

- A pop screen not only prevents the occurrence of plosive pop noises in vocal recordings, but also efficiently prevents unwanted particles, from respiratory moisture, and nicotine, to food remnants, from settling on the diaphragm.
- The pop screen can also be removed for cleaning without the use of tools. First, the microphone must be rotated so that the head grille is uppermost, in an approximately vertical position (**see Fig. 6**). Then unscrew the head grille, as described above.



- Next carefully squeeze the frame of the pop screen simultaneously on both sides, so as to disengage the corners of the wireframe from the openings in the microphone housing (**see Fig. 7**). Then remove the pop screen with extreme care, without touching the capsule. In order to protect the capsule, the head grille should be temporarily screwed back in place. However, the microphone must without fail remain upright, with the head grille uppermost, since it is the pop screen that mechanically holds the electronics, together with the capsule, so that they are attached to the housing. If the microphone is positioned upside down when the pop screen is not in place, the electronics and capsule will both fall out and be damaged!

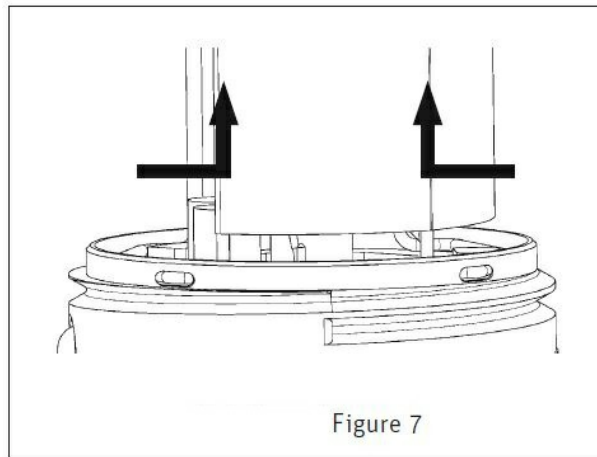


Figure 7

- The pop screen can be washed using warm water and a little detergent. In the case of soiling which is difficult to remove, let the pop screen soak for a while. If necessary, use alcohol as a solvent to remove soiling.
- Then rinse in clean water and allow to dry thoroughly.
- To speed drying, the pop screen may be patted carefully with a soft cloth. Under no circumstances should a blow drier or heat be used. Attention: The pop screen and head grille must be completely dry before being reassembled on the microphone.
- Humidity can lead to malfunctions and can cause damage to the electronics and the capsule.
- When replacing the pop screen, take care that the wire gauze is positioned in front of the diaphragm side of the capsule. Squeeze the sides of the pop screen frame together, positioning the bottom of the frame inside the rim of the housing so that the corners of the wire frame slide into the four openings in the housing.
- Finally, screw the head grille back onto the microphone housing and rotate the microphone downwards into its operating position.

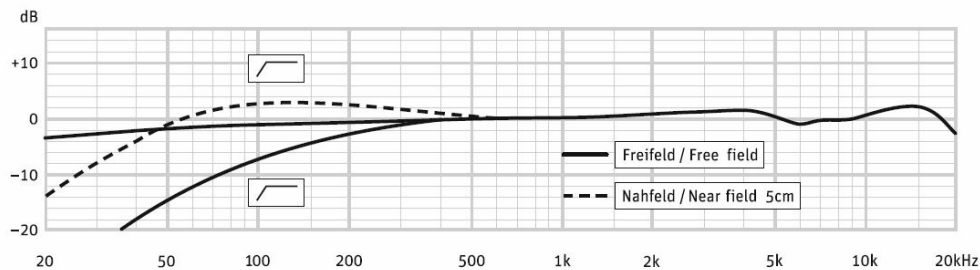
Function Test

After assembly, to check that the microphone is once again functioning properly, a short function test at normal speaking volume should be carried out.

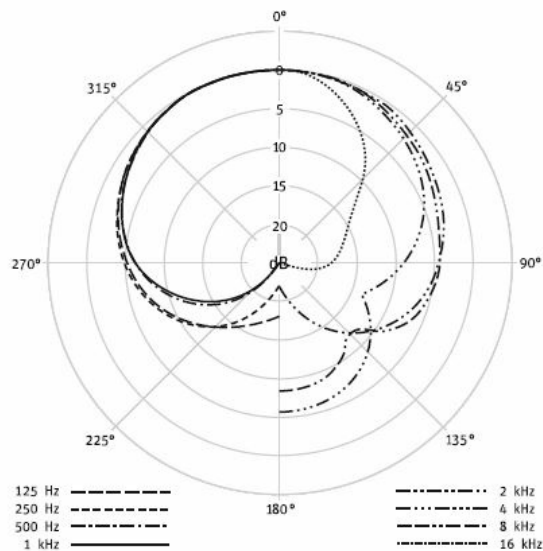
If Servicing is Required

- Do-it-yourself repairs can be expensive! Unfortunately, do-it-yourself repairs sometimes do more harm than good.
- Cleaning soiled capsules in particular requires considerable experience and an expert touch.
- The protective lacquer on circuit boards indicates, among other things, places that must not be soldered. Certain components are specially selected and cannot be replaced by standard parts. To avoid unnecessary expense, we recommend sending defective microphones to us or our representatives for servicing.
- **Regular inspections:** Sending in microphones regularly for inspection, as practiced by some theatres and broadcasting corporations can aid in the early detection of damage. Slight soiling can be removed much more easily than a nicotine layer inextricably bonded to the diaphragm, etc. Regular inspections are particularly recommended for microphones that are rented or are used in dusty or smoky environments since the costs are low in comparison with the cost of a major overhaul.

Frequency Response and Polar Pattern



measured in free-field conditions (IEC 60268-4), tolerance ± 2 dB



Accessories

• Stand Mounts

SG 5 08529

Swivel mount for microphones. On the microphone side, it has a 3/8" male thread, on the stand side a 5/8"-27 female thread, plus a thread adapter to connect to 1/2" and 3/8" stands.

• Headgrille

BCK ni Cat. No. 08520

Replacement Headgrille with 5 rings of different colors. Additional head grilles enable each microphone user at the broadcasting facility to use his or her own individual head grille. The improved hygiene ensures a more comfortable working environment at the studio.

• Popscreen

Pop screens provide excellent suppression of so-called pop noise. They consist of a round, thin frame covered with black gauze on both sides. A gooseneck of about 30 cm (12") in length is mounted at the popshield. It will be attached to microphone stands by means of a clamp with a knurled screw.

PS 15 blk Cat. No. 08472 The frame is 15 cm in diameter.

PS 20 a blk Cat. No. 08488 The frame is 20 cm in diameter.

• Windshields

To protect against noise caused by wind, close talking, and rapid movement on a boom, open-cell polyurethane foam windshields are available. These windshields have no disturbing resonances and do not affect the microphone's directional characteristics. The frequency response is only slightly attenuated in the higher

frequency range.

WS 47 blk Cat. No. 06826

Wind noise attenuation is 22 dB. Attenuation at 15 kHz 3 dB. Ø 120 mm. Color black. Further articles are described in the catalog "Accessories".



Limitation of Liability

Georg Neumann GmbH shall not be liable for the consequences of an inappropriate use of the product not being in compliance with the technical allowance in the user manual such as handling errors, mechanical spoiling, falls voltage, and using other than the recommended correspondence devices. Any liability of Georg Neumann GmbH for any damages including indirect, consequential, special, incidental, and punitive damages based on the user's non-compliance with the user manual or unreasonable utilization of the product is hereby excluded as to the extent permitted by law. This limitation of liability on damages is not applicable to the liability under European product liability codes or for users in a state or country where such damages cannot be limited.

Declaration of Conformity

Georg Neumann GmbH hereby declares that this device conforms to the applicable CE standards and regulations. ® Neumann is a registered trademark of the Georg Neumann GmbH in certain countries.

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FREQUENTLY ASKED QUESTIONS

What is the Neumann BCM-104 Broadcast Microphone?

The Neumann BCM-104 is a high-quality broadcast microphone designed for professional audio recording and broadcasting applications, known for its exceptional audio performance and durability.

What are the key features of the Neumann BCM-104 microphone?

The Neumann BCM-104 microphone typically features a cardioid pickup pattern, a large diaphragm capsule, low self-noise, and a wide frequency response, making it ideal for broadcast, voice-over, and studio work.

Is the Neumann BCM-104 suitable for broadcast and voice-over?

Yes, the Neumann BCM-104 is specifically designed for broadcast and voice-over applications, delivering clear and professional-quality audio.

Can I use it for musical instrument recording?

While it's primarily designed for broadcast and voice applications, the Neumann BCM-104 can also be used for musical instrument recording, capturing acoustic instruments and guitar amps with precision.

Does the Neumann BCM-104 microphone require additional audio interfaces or drivers?

No, the Neumann BCM-104 is typically a plug-and-play microphone and does not require additional audio interfaces or drivers; simply connect it to your recording device and start recording.

Is there a headphone monitoring feature?

No, the Neumann BCM-104 microphone itself does not include a headphone monitoring feature. You would need a separate audio interface or mixer with headphone monitoring capabilities for this.

What is the frequency response of the Neumann BCM-104 microphone?

The microphone typically has a frequency response of 4 kHz, capturing a wide range of audio frequencies with exceptional accuracy.

Is there an adjustable gain control on the microphone?

No, the Neumann BCM-104 microphone does not typically have an adjustable gain control. Gain control is usually handled by the connected audio interface or mixer.

What is the weight and dimensions of the Neumann BCM-104 microphone?

The 1.8 Pounds weight and 8.1 x 4.8 x 4.7 inches dimensions of the microphone.

Is it suitable for live broadcast and streaming?

Yes, the Neumann BCM-104 microphone is suitable for live broadcast and streaming applications, providing professional-grade audio quality.

Can I use it with recording software and DAWs?

Yes, the Neumann BCM-104 is compatible with various recording software and digital audio workstations (DAWs) on both Windows and Mac platforms, provided you have the necessary audio interface and setup.

Is there a carrying case included for transport and storage?

The Neumann BCM-104 microphone package may include a protective carrying case for convenient transport and safe storage.

What type of connector does it use?

The Neumann BCM-104 typically uses an XLR connector, which is a common standard for professional microphones and audio equipment.

Is there a warranty for the Neumann BCM-104 Broadcast Microphone?

Neumann often provides a limited warranty for the Neumann BCM-104 Broadcast Microphone; warranties often range from 6 months to 1 year or more.

Where can I purchase the Neumann BCM-104 Broadcast Microphone?

You can typically purchase the Neumann BCM-104 Broadcast Microphone from authorized Neumann dealers, professional audio stores, or reputable online marketplaces to ensure you receive a genuine product.

Is it suitable for professional broadcast studios?

Yes, the Neumann BCM-104 microphone is often chosen for professional broadcast studios and delivers exceptional audio quality for demanding broadcasting and recording tasks.

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