Neumann KMS 104 Plus Cardioid Microphone with Tripod Stand Operating Instructions

Contents

Neumann KMS 104 Plus Cardioid Microphone with Tripod Stand

A Short Description

The KMS 104/104 plus and KMS 105 are condenser vocal microphones of the “fet 100®” Series with cardioid and supercardioid polar patterns. Their most important features are

- a built-in very effective protection against pop sounds,
- a very high attenuation of handling and structure-borne noise,
- a high-load ability transformerless circuit,
- extraordinarily true sound transduction free of coloration. The microphones have a balanced, transformerless output.

The 3-pin XLR connector has the following pin assignments:

- Pin 1: 0 V/ground
- Pin 2: Modulation (+phase)
- Pin 3: Modulation (–phase)

The output sensitivity of the KMS 104/104 plus and KMS 105 is 4.5 mV/Pa –47 dBV re. 1 Pa. The microphones are phantom-powered at 48 V, 3.5 mA (IEC 1938). The direction of maximum sensitivity is axial. Due to the close-talking typical for vocal microphones, the low-frequency response is equalized corresponding to the proximity effect (see frequency response). Additionally installed is a high-pass filter; –3 dB point at 120 Hz in both microphones, measured in free-field. The microphones come with an SG 105 stand clamp. They are available in nickel matt and black finish.

- **KMS 104 …….. ni …… Cat. No. 008548**
- **KMS 104 bk …… blk ……. Cat. No. 008549**
- **KMS 104 plus …… ni …… Cat. No. 008624**
- **KMS 104 plus bk ….blk ……. Cat. No. 008625**
- **KMS 105 …….. ni …… Cat. No. 008454**

- **KMS 105 bk …… blk ……. Cat. No. 008455**

KMS 104/104 plus and KMS 105 Condenser Vocal Microphones

The vocal microphones KMS 104/104 plus and KMS 105 have been developed for the use of instrumental and vocal soloists at very close range. They can also be hand-held by the singer. The KMS 104/104 plus is provided with a capsule with cardioid characteristics, yielding the best rear sound rejection. The KMS 105 uses a capsule with supercardioid characteristics, yielding the best front-to-back rejection ratio. Both microphones use a carefully adjusted acoustic filter and a transformerless, high-loadability impedance converter to ensure that even loud plosive sounds do not cause overloading of the microphone. Pop stability is excellent and sibilants and S-sounds are reproduced with all their natural accentuation as only a condenser microphone can. Although the acoustic filters effectively suppressed interference by plosive sounds, the distinctive directional characteristic of the capsules is retained all the way down to the bass frequencies, lending the vocal microphone a very high degree of feedback rejection when used for stage work. The frequency responses and the in-built electrical high-pass filters have been optimized for very close miking. They compensate for the proximity effect, resulting in an even sound reproduction. The KMS 104 plus features, compared to KMS 104, a more extended bass frequency response. The thick-walled metal case of the soloist microphones is very robust, effectively attenuating handling noise. The acoustic filters consist of stable steel gauze or foam which, when necessary, can be easily unscrewed and cleaned.

Additional Hints for Operation
The DC-DC converter installed in the microphone supplies, in contrast to other circuit concepts, also the audio amplifier and not only the microphone capsule. Since this converter compensates for variation of the supply voltage it tries to do this also when the ac main is switched off. Therefore the internal supply voltage, in the limits of the phantom power supply, of the microphone is maintained for approximately 2 seconds before it collapses with an audible “blubb” followed by a short noise. Noises comparable to this can be recognized also when switching the supply on and it takes some seconds until the microphone is ready to operate.

Microphone Output Wiring
The microphone is wired as per 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 following cables are available:

IC 3 mt ……. blk ……. Cat. No. 06543
Microphone cable with a double twist (double helix)braiding as a shield. Ø 5 mm, length 10 m. XLR 3 connectors, matte black.

AC 22 (0.3 m) ……. Cat. No. 06598
Adapter cable with XLR 5 M connector and unbalanced 3.5 mm stereo jack. It is used to connect the 5-pin XLR output of the BS 48 i-2 power supply to units with a 3.5 mm stereo input.

AC 25 (0.3 m) ……. Cat. No. 06600
Adapter cable with XLR 3 M connector and unbalanced 6.3 mm mono jack. It is used to connect 3-pin XLR outputs of power supplies to units with a 6.3 mm mono jack input.

AC 27 (0.3 m) ……. Cat. No. 06602
Y-cable with XLR 5 M connector and two unbalanced 6.3 mm mono jacks. It is used to connect XLR 5 outputs of the BS 48 i-2 power supply to units with 6.3 mm mono jack inputs.

Power Supply

Phantom Powering
The “fet 100®” Series microphones are 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 will therefore also accept dynamic microphones and ribbon microphones as well as the modulation conductors of tube-equipped condenser microphones without the need to switch 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 3.5 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 V ± 1 V, max. 2 x 6 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. All connectors are of XLR 3 type. The audio signal outputs are DC-free.

Three versions are available:

- N 248 EU …… blk ……. Cat. No. 08537
- N 248 US …… blk ……. Cat. No. 08538
- N 248 UK …… blk ……. Cat. No. 08539

Battery Powering
If a mains power source is not available, power can be supplied by one of the battery units

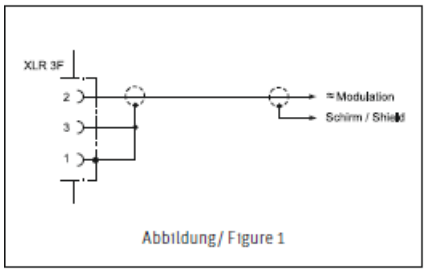
- BS 48 i …… Cat. No. 06494 (for one microphone)
- BS 48 i-2 …… Cat. No. 06496 (for two microphones)

Both units deliver 48 V ± 1 V, at 5 mA maximum, and are powered by a 9-volt monobloc battery Type IEC 6 F 22. The BS 48 i-2 is equipped with 5-pin XLR connectors, the BS 48 i with 3-pin XLR connectors. (See Neumann bulletin 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.

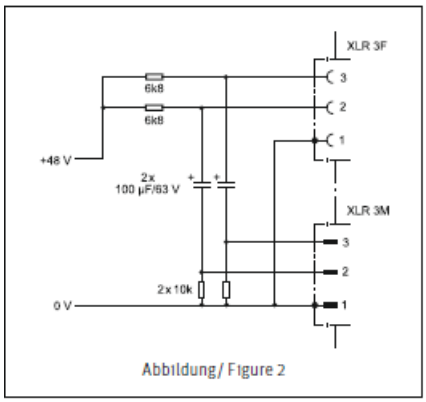
Operation with Unbalanced or Center Tap Grounded inputs
The BS 48 i, BS 48 i-2 and N 248 phantom 48 Vdc power supplies are DC-free so that no transformer is required for connection to unbalanced inputs. In the case of the KMS 104/105 condenser microphone pin 2 is the “hot phase“, in accordance with the standard, and pin 3 of the output of the power supply must be connected to the earth (see Fig. 1). In the case of many other phantom powering units (except 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 of no significance for the balanced, floating amplifier and mixing console inputs in general studio use. On the other hand, the feed voltage will be short-circuited when connected to single-ended or center-tap grounded amplifier inputs, and no operation will be possible.

This can be circumvented as follows:

- In center tap grounded equipment with input transformer (e.g. some NAGRA units), the earthlead can almost always be disconnected without affecting the function of the equipment.
- In every outgoing modulation lead, an RC net-work can be incorporated to block the 48 Vdc voltage (See Figure 2 and Neumann-Information no. 84 222).



Abbildung/ Figure 1



Abbildung/ Figure 2

Operation with Wireless Transmitters
Both microphones can be operated with plug-on or pocket transmitters fulfilling these specifications:

- P48 Phantom power, 3.5 mA min.,
- Signal on pin 2 (“hot”),
- sufficient dynamic range of the transmitter.

Technical Specifications

KMS 104/KMS 104 plus/KMS 105

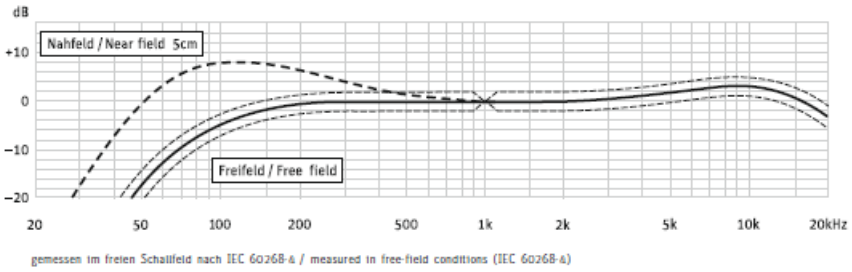
- Acoustical op. principle ……. Pressure gradient transducer
- Directional pattern …….. cardioid/cardioid/ supercardioid
- Frequency range …….. 20 Hz…20 kHz
- Sensitivity 1) ……. 4.5 mV/Pa ± 1 dB –47 dBV
- Rated impedance …….. 50 ohms
- Rated load impedance …….. 1000 ohms Signal-to-noise ratio2),
- CCIR3) …… 66 dB Signal-to-noise ratio2),
- A-weighted3) …… 76 dB Equivalent noise level,
- CCIR3) ……. 28 dB Equivalent noise level,
- A-weighted3) …… 18 dB-A Maximum SPL
- for less than 0.5 % THD4) …… 150 dB
- Max. output voltage …… 12 dBu
- Supply voltage5) …….. 48 V ± 4 V
- Current consumption5) …… 3.5 mA
- Matching connector …….. XLR3F
- Weight …….. approx. 300 g
- Diameter …….. 48 mm
- Length …….. 180 mm

- 94 dB SPL 1 Pa = 10 µbar
- 0 dB 20 µPa

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

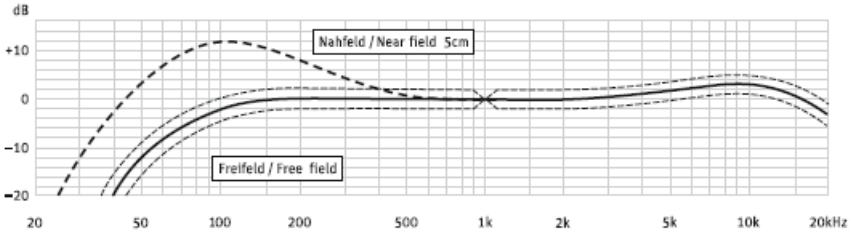
Frequency Responses and Polar Patterns

KMS 104

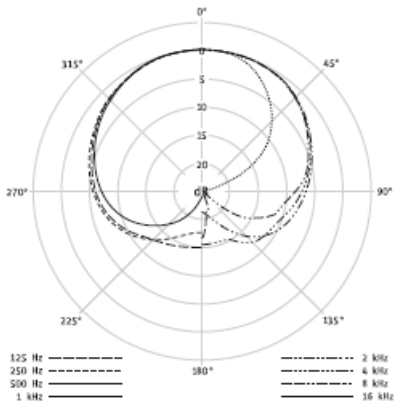


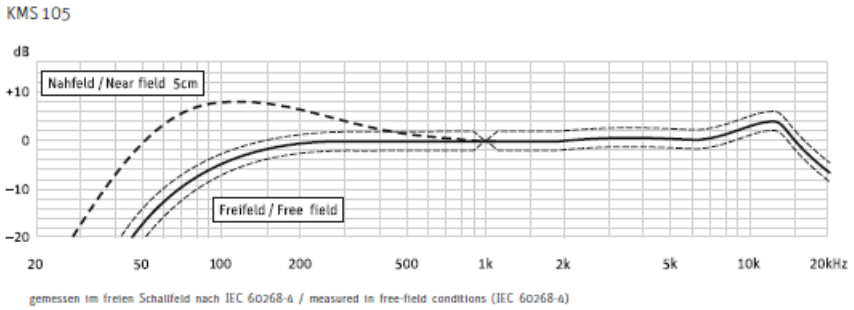
gemessen im freien Schallfeld nach IEC 60268-6 / measured in free-field conditions (IEC 60268-6)

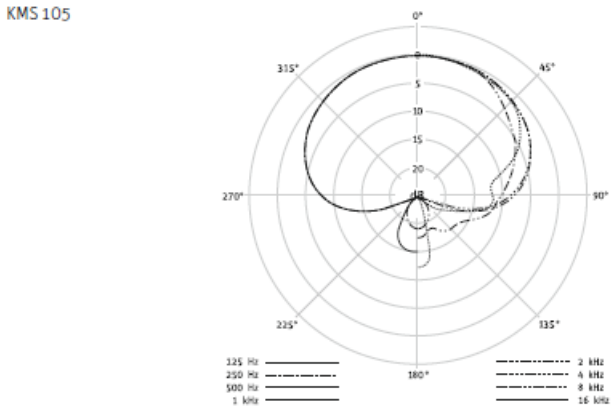
KMS 104 plus



KMS 104 / 104 plus







Cleaning and Maintenance

The KMS 104/104 plus and KMS 105 vocal microphones are designed for stage use and are very resistant to adverse environments. Still, some remarks are helpful in guaranteeing the unlimited operating life of the microphone.

Cleaning
After prolonged use, the head grille of the microphones can be cleaned very simply. Just unscrew the head grille and take out the included gauze cylinder or foam. The head grille and gauze cylinder/ foam can then be cleaned in water or mild solvents. After drying, just reassemble the microphone. Please take care not to damage the gauze on the gauze cylinder, as it represents an important factor for pop protection. Attention: Without the head grille, the microphone capsule is relatively unprotected. Please make sure not to damage the capsule. The microphone housing including the amplifier holds no further serviceable parts and is furthermore protected by some special lacquers.

Further Maintenance
Use a dust cover: Microphones not in use should generally not be left on the 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. Do not use overaged windshields: Even the foam material of windshields ages. With very old windshields, the material decays and becomes brittle. The particles can then settle on the diaphragm. Please dispose of overaged windshields.

Accessories

Further articles are described in the catalog “Accessories”.

Stand Mounts
SG 105 …… blk ……. Cat. No. 08460 (included in the supply schedule)
Stand clamp for KMS vocal microphones. The clamp can be swiveled and has a 5/8″-27 thread, plus a thread adapter to connect to 1/2″- and 3/8″ stands.

Goosenecks

SMK 8 i …… blk ……. Cat. No. 06181
The SMK 8 i gooseneck is 360 mm long and serves as the electrical and mechanical connection of a microphone with an XLR 3 connector. A counter nut secures the microphone against rattle and – to a certain extent – against theft. The cable comes out at the side, just above the bottom thread. Cable length 4.5 m, cable connector XLR 3 M. The gooseneck has a 5/8″-27 female thread, plus a thread adapter to connect to 1/2″ and 3/8″ stands. Table and Floor Stands

MF 3 …… blk ……. Cat. No. 07321
The MF 3 is a table stand with an iron base, 1.6 kg in weight, and 110 mm in diameter. It has a black matte finish. The bottom is fitted with a non-slip rubber disk. The stand comes with a reversible stud and an adapter for 1/2″ and 3/8″ threads.

MF 4 …… blk ……. Cat. No. 07337
Floor stand with grey cast iron base. The floor stand has a matt black finish and rests on a nonskid rubber disk attached to the bottom. A reversible stud and a reducer for 1/2″ and 3/8″ threads are also supplied. Weight 2.6 kg, Ø 160 mm.

MF 5 …… gr …… Cat. No. 08489
Floor stand with grey soft-touch powder coating. It has a non-skid sound-absorbing rubber disk attached to the bottom. The stand connection has a 3/8″ thread. Weight 2.7 kg, Ø 250 mm.

Stand Extensions

- **STV 4 …… blk ……. Cat. No. 06190**
- **STV 20 …… blk ……. Cat. No. 06187**
- **STV 40 …… blk ……. Cat. No. 06188**
- **STV 60 …… blk ……. Cat. No. 06189**

The STV… stand extensions are screwed between microphone stands (for example MF 4, MF 5) and swivel mounts (for example SG 21/17 mt). Length 40, 200, 400 or 600 mm. Ø 19 mm.

Foam Windscreens

- **WSS 100 ……. black ……. Cat. No. 07352**
- **WSS 100 ……. red ……. Cat. No. 07353**
- **WSS 100 ……. green …… Cat. No. 07354**
- **WSS 100 ……. yellow …….. Cat. No. 07355**
- **WSS 100 ……. blue …….. Cat. No. 07356**
- **WSS 100 ……. white ……. Cat. No. 07357**

In addition to the wire mesh cage protecting the microphone against wind and pop noises an open-cell polyurethane foam windscreen is available in the colors black, ivory, red, green, blue, and yellow. Ø 90 mm. These windscreens have no disturbing resonances and only slightly affect the frequency response (i.e. approx. –3 dB at 15 kHz). Wind noise attenuation 27 dB was measured (without an electrical filter) in pulsating air currents produced by a noiseless wind machine at 20 km/h.


IC 3 mt


AC 22


AC 25

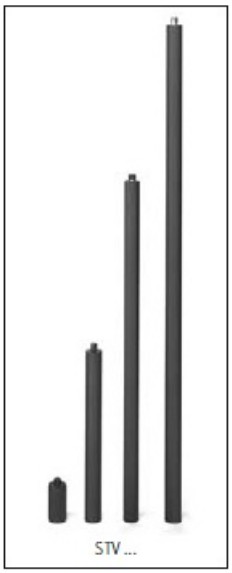

AC 27


N 248


BS 48 I


BS 48 I-2


SG 105


STV ...


SMK 8 I


MF 3


MF 4


MF 5


WSS 100

Declaration of Conformity
Georg Neumann GmbH hereby declares that these devices conform to the applicable CE standards and regulations.

FAQs

What is the Neumann KMS 104 Plus Cardioid Microphone?

The Neumann KMS 104 Plus is a high-quality cardioid condenser microphone designed for capturing vocals with exceptional clarity and precision.

Is a tripod stand included with the Neumann KMS 104 Plus microphone?

Yes, the Neumann KMS 104 Plus comes with a tripod stand for convenient setup and positioning.

What type of microphone is the Neumann KMS 104 Plus?

The Neumann KMS 104 Plus is a condenser microphone with a cardioid polar pattern, making it ideal for live vocal performances and studio recording.

What is the frequency response of the Neumann KMS 104 Plus microphone?

The Neumann KMS 104 Plus typically has a wide frequency response ranging from 20Hz to 20kHz, ensuring accurate vocal reproduction.

Is phantom power required to operate the Neumann KMS 104 Plus microphone?

Yes, the Neumann KMS 104 Plus requires +48V phantom power for proper operation. Ensure your audio interface or mixer can supply this power.

Can the Neumann KMS 104 Plus be used for recording instruments?

While it's primarily designed for vocals, the Neumann KMS 104 Plus can also capture instruments with great precision, making it versatile for various applications.

Is there a shock mount included with the Neumann KMS 104 Plus microphone?

The Neumann KMS 104 Plus usually does not come with a shock mount, but it can be purchased separately to reduce handling noise during recording.

What are the dimensions and weight of the Neumann KMS 104 Plus microphone?

The Neumann KMS 104 Plus is compact, with dimensions of approximately 180mm x 48mm x 48mm and a weight of around 300 grams.

Does the Neumann KMS 104 Plus microphone require any special care or maintenance?

It's recommended to keep the microphone clean and protect it from moisture to maintain its performance. Regular cleaning with a soft, dry cloth is sufficient.

What is the warranty for the Neumann KMS 104 Plus microphone?

The Neumann KMS 104 Plus microphone typically comes with a manufacturer's warranty, providing assurance of its quality and performance.

Can the Neumann KMS 104 Plus be used for outdoor performances?

While it can be used outdoors, it's important to protect the microphone from environmental factors like wind and moisture, which can affect its performance.

What type of tripod stand is included with the Neumann KMS 104 Plus microphone?

The Neumann KMS 104 Plus usually comes with a sturdy and adjustable tripod stand for easy setup and positioning of the microphone.