Neumann TLM103 Cardioid Microphone Operating Instructions

Contents

Neumann TLM103 Cardioid Microphone

Short Description

- The TLM 103 is a studio condenser microphone with cardioid polar pattern.
- Its most important features are extraordinarily low self-noise level combined with highest output capability, transformerless circuit, extraordinarily true sound transduction, free of coloration. The microphone has 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 is 23 mV/Pa = –32.5 dB re. 1 V/Pa. The microphone is phantom powered from 48 V, 3 mA (IEC 61938).
- The TLM 103 is addressed from the front, marked with the Neumann logo.

The TLM 103 Condenser Microphone

- The TLM 103 condenser microphone is a studio microphone of the Fet 100 series with a cardioid polar pattern.
- The letters TLM stand for Transformerless Micro-phone.
- The transformer which used to couple a microphone’s output to the supply voltage was replaced in the TLM 103 by an electronic circuit which, like a transformer, maintains excellent common mode rejection (CMR). Interference induced in the balanced modulation line is therefore suppressed as usual.
- The self-noise level of the TLM 103 is much lower than that of comparable microphone models while its overload capability extends to 138 dB SPL, providing a dynamic range of 131 dB (A-weighted).
- The TLM 103 is addressed from the front, marked with the Neumann logo.

- Its grille houses the large diaphragm K 103 capsule. It has a linear frequency response up to some 5 kHz with a wide flat presence boost of 4 dB at the top end. The capsule is based on that of the U 87 microphone and uses its back electrode and diaphragm.
- No resonance effects are used to obtain the characteristics mentioned above. As a consequence, the microphone features excellent transient behavior and transmits all transient phenomena of music or voice without distortion.
  In order to protect the capsule from mechanical shock transmission it is elastically suspended.
- As the TLM 103‘s amplifier is linear also below 20 Hz, extremely low frequency signals can be transmitted without distortion as well.
- On the other hand, the microphone is, therefore, more sensitive to low-frequency noises like structure-borne or wind and pop disturbances. For specific applications it is therefore recommended to use protective accessories as the EA 1 (mt) elastic suspension, the PS 15 or PS 20 pop screens, or the WS 87 windscreen.

Microphone Versions and Output Wiring

- **TLM 103…….ni……. Cat. No. 008430**
  The TLM 103 microphone has a matt satin finish and is equipped with a 3-pole XLR connector. The microphone is wired as per DIN EN 60268-12 or IEC 60268-12:
- Modulation is connected to pins 2 and 3, the shield to pin 1. A sudden sound pressure rise in front of the diaphragm causes a positive voltage to appear at pin 2. The microphone comes in a wooden case including the SG 2 swivel mount.
  TLM 103 mt …….blk…….Cat. No. 008431
  As above, but with a matt black finish.

Microphone Cables

The electroacoustic properties of the microphones are not affected even by very long (Neumann) cables. However, if cables are well over 300 m, a fall-off in the upper-frequency range becomes apparent. Neumann offers a wide range of cables. Only a selection is presented here. Other cable lengths or cable materials without connectors are available on request.

The following cables are available for the TLM 103 microphone:

- **IC 3 mt ……..blk…….Cat. No. 006543**
  Microphone cable with double twist (double helix) braiding as a shield. Ø 5 mm, length 10 m. XLR 3 connectors, matte black.
- **IC 4 (10 m)……ni……..Cat. No. 006547**
  IC 4 mt (10m)……..blk…….Cat. No. 006557
  Microphone cable with rotatable swivel mount for microphones with a thread, and double twist braiding as shield. It has a 5/8″-27 female thread, plus a thread adapter to connect to 1/2″- and 3/8″ stands. Ø 5 mm, length 10 m. XLR 3 connectors.
- **AC 22 (0.3 m)……..Cat. No. 006598**
  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 or the MTX 191 A matrix amplifier to units with a 3.5 mm stereo input. It is designed for all microphones of the fet 80/100 series and KM 100 F, excluding the KM 100 and the GFM 132.

- **AC 25 (0.3 m)…….Cat. No. 006600**
  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. Designed for all microphones, excluding KM 100 System and GFM 132.
- **AC 27 (0.3 m)……. Cat. No. 006602**
  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 or the MTX 191 A matrix amplifier to units with 6.3 mm mono jack inputs. Designed for all microphones, excluding KM 100 System and GFM 132.

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 provides at least 3 mA per channel, is 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.
- 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.
  N 248 ……..blk…… Cat. No. 008537

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. 006494 (for one microphone)
  BS 48 i-2…… Cat. No. 006496 (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 and 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 TLM 103 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 Earth **(see Fig. 1**).

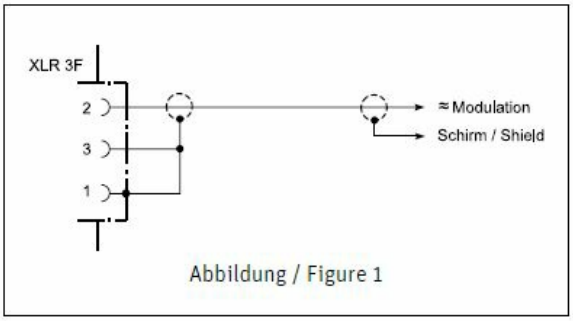


Abbildung / Figure 1

- 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:

1. 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.
2. 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).

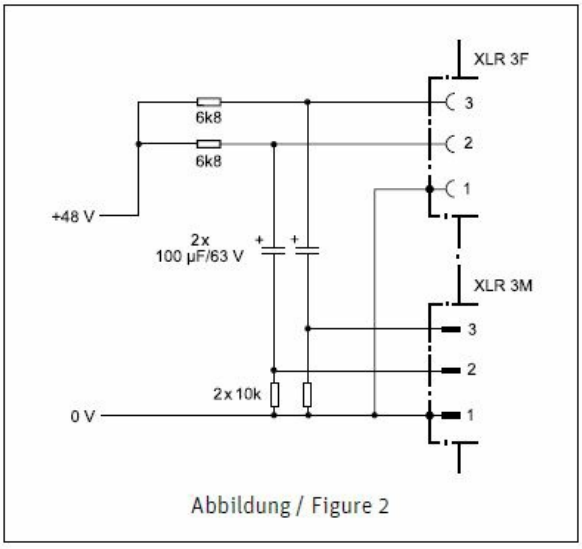


Abbildung / Figure 2

Technical Specifications

- **Acoustical op. principle**…….Pressure gradient transducer
- **Polar pattern.**……..Cardioid
- **Frequency range.**……. 20 Hz…20 kHz
- **Sensitivity1)**……..23 mV/Pa = –32.5 dBV ± 1 dB
- **Rated impedance**……. 50 ohms
- **Rated load impedance**…….1000 ohms
- **Signal-to-noise ratio2), CCIR3)** ……76.5 dB
- **Signal-to-noise ratio2), A-weighted3)** ……87 dB
- **Equivalent noise level, CCIR3)** ……17.5 dB
- **Equivalent noise level, A-weighted3**) ……7 dB-A
- **Maximum SPL for less than 0.5 % THD4)** …….. 138 dB
- **Max. output voltage.**…….. 13 dBu
- **Supply voltage5)**…….48 V ± 4 V
- **Current consumption5)**…… 3 mA
- **Weight**……..450 g
- **Diameter**……60 mm
- **Length**……132 mm

94 dB SPL 1 Pa = 10 µbar
0 dB 20 µPa

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 61938).

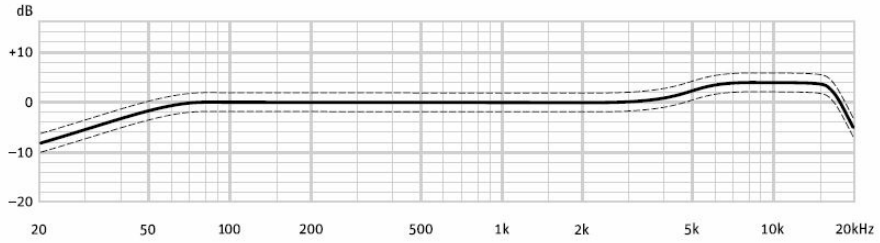
Hints on Microphone Maintenance

- **Use a dust cover:** Microphones not in use should not be left on the stand gathering dust. This can be prevented by the use of a non-fluffy dust cover. When not in use for a longer period, the microphone should be sealed against dust and stored under standard climatic conditions.
- **Use a 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 to food remnants, from settling on the diaphragm.
- **Avoid the use of old windshields:** As the foam material of a windshield ages, it can become brittle and

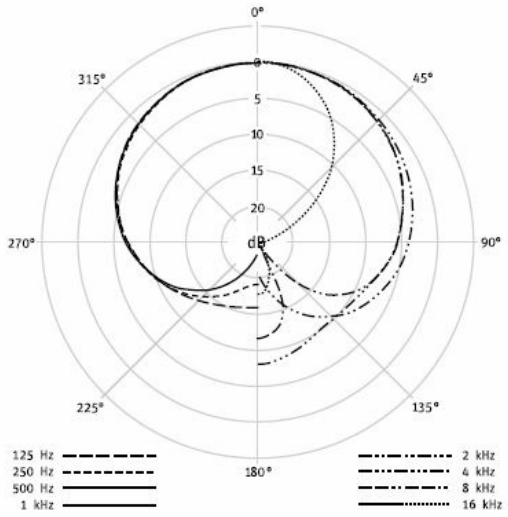
crumbly. Instead of protecting the microphone, an old windshield can thus lead to the soil-ing of the microphone capsule. Therefore please dispose of worn-out wind shields.

- **Function testing:** Although modern condenser microphones are not harmed by high sound pressure levels, one should under no circumstances use a pop-test to check whether the microphone is connected and the channel on the mixing console is pulled up since this can result in sound pressure levels of over 140 dB! Normal speech is quite sufficient for function testing.
  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 microphones regularly for inspection, as practiced by some theaters 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. Regular inspections are particularly recommended for microphones that are rented or used in dusty or smoky environments since the costs are low in comparison with the cost of a major overhaul.

Frequency Responses and Polar Pattern



measured in free-field conditions (IEC 60268-4)



Accessories

- **Elastic Suspension**
  The use of an elastic suspension is recommended to prevent the microphone from being exposed to strong

mechanical vibrations caused by the structure-borne shock waves.

EA 1……ni……. Cat. No. 008449

EA 1 mt……..blk…… Cat. No. 008450

It has a swivel mount with a 5/8″-27 female thread, plus a thread adapter to connect to 1/2″- and 3/8″ stands.

- **Stand Mounts and Mechanical Adapter**

  DS 120…….blk……. Cat. No. 007343

  The DS 120 has a 150 mm long support bar with two movable 1/2″ threaded studs. Two microphones in their mounts can be attached. Any space or angle between the microphones is freely adjustable. The DS 120 has a 5/8″-27 female thread, plus a thread adapter to connect to 1/2″- and 3/8″ stands.

  SG 2…….blk…….Cat. No. 008636

  The microphone mount of the SG 2 is made of metal. The SG 2 has a 5/8″-27 female thread, plus a thread adapter to connect to 1/2″- and 3/8″ stands.

- **Auditorium Hanger**

  MNV 87……..ni……. Cat. No. 006804

  MNV 87 mt…….blk…… Cat. No. 006806

  The auditorium hanger consists of a cable suspension and a rotating 1/2″ threaded stud, to connect to e.g. swivel mounts. The stud is screwed into the threaded coupling of the swivel mount. Then the microphone can be tilted while it is suspended from its own cable.

- **Table and Floor Stands**

  MF 3…….blk……. Cat. No. 007321

  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. 007337

  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. 008489

  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.

  STV 4……..blk…….Cat. No. 006190

  STV 20…….blk……. Cat. No. 006187

  STV 40…….blk…….Cat. No. 006188

  STV 60…….blk…….Cat. No. 006189

  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.

- **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. 008472 The frame is 15 cm in diameter.

  PS 20 a ……..blk…… Cat. No. 008488 The frame is 20 cm in diameter.

- **Foam Windscreen**

  WS 87 …….blk……. Cat. No. 006753

Wind noise attenuation 26 dB. Attenuation at 15 kHz 3 dB. Ø 90 mm. Color black. Further articles are described in the catalog “Accessories”.


IC 3 mt


IC 4 (mt)


AC 22

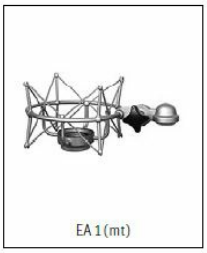

AC 25


AC 27


N 248


BS 48 i


BS 48 i-2


EA 1 (mt)


DS 120

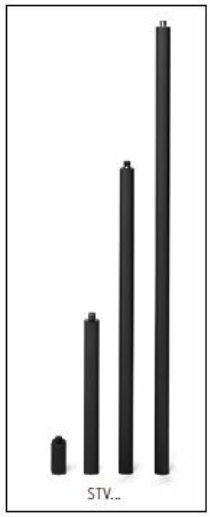

SG 2


MNV 87 (mt)


MF 3


MF 4


MF 5


STV...


PS 15


PS 20 a


WS 87

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FREQUENTLY ASKED QUESTIONS

What is the Neumann TLM 103 Cardioid Microphone?

The Neumann TLM 103 is a high-quality cardioid condenser microphone designed for professional audio recording. It is known for its exceptional audio performance and is widely used in studios and broadcasting.

What are the key features of the Neumann TLM 103 microphone?

The Neumann TLM 103 microphone typically features a cardioid pickup pattern, a large diaphragm capsule, a wide frequency response, high sensitivity, and is designed for capturing vocals, instruments, and studio recordings with precision and clarity.

Is the Neumann TLM 103 suitable for recording vocals?

Yes, the Neumann TLM 103 is highly suitable for recording vocals, providing clear and detailed sound reproduction, making it a top choice for professional singers, voice-over artists, and podcasters.

Can I use it for instrument recording?

Absolutely, the Neumann TLM 103 is versatile for instrument recording, capturing acoustic instruments, guitar amps, pianos, and more with exceptional quality.

Does the Neumann TLM 103 microphone require additional audio interfaces or drivers?

The Neumann TLM 103 typically uses an XLR connection and requires an audio interface or mixer with XLR inputs. It does not require additional drivers; it's compatible with standard audio equipment.

Is there a headphone monitoring feature?

No, the Neumann TLM 103 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 TLM 103 microphone?

The microphone typically has 20 kHz frequency response, capturing a wide range of audio frequencies with exceptional accuracy.

Is there an adjustable gain control on the microphone?

No, the Neumann TLM 103 microphone does not typically have an adjustable gain control. Gain control is usually handled by the connected audio interface or mixer.

What are the weight and dimensions of the Neumann TLM 103 microphone?

The Neumann TLM 103 microphone is typically compact and lightweight, 11.42 x 9.65 x 4.06 inches dimensions and 1352 Grams weight may vary slightly. Refer to the product documentation or the manufacturer's website for precise measurements.

Is it suitable for live performances?

While primarily designed for studio use, some users may use the Neumann TLM 103 for live performances in controlled sound environments.

Can I use it with recording software and DAWs?

Yes, the Neumann TLM 103 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 TLM 103 microphone package may include a protective carrying case for convenient transport and safe storage.

What type of connector does it use?

The Neumann TLM 103 microphone typically uses an XLR connector, which is a standard for professional microphones and audio equipment.

Is there a warranty for the Neumann TLM 103 Cardioid Microphone?

Warranties for the Neumann TLM 103 microphone can vary, but they often range from 1 year to 10 years or more.

Where can I purchase the Neumann TLM 103 Cardioid Microphone?

You can typically purchase the Neumann TLM 103 Cardioid Microphone from authorized Neumann dealers, music stores, or reputable online marketplaces to ensure you receive genuine products.

Does it come with a shock mount or pop filter?

Some packages of the Neumann TLM 103 microphone may include a shock mount, but it's important to check the product listing or package contents to confirm if these accessories are included. A pop filter may be purchased separately.

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