



# NEUMANN M 49 V Large-Diaphragm Multi-Pattern Tube Condenser Microphone Instruction Manual

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Large-Diaphragm Multi-Pattern Tube Condenser Microphone  
Instruction Manual



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## Introduction

This manual contains essential information for the operation and care of the product you have purchased. Please read the instructions carefully and completely before using the equipment. Please keep this manual where it will be accessible at all times to all current and future users.

Additional information, in particular concerning available accessories and Neumann service partners, can always be found on our website: [www.neumann.com](http://www.neumann.com).

### Safety instructions

Before connecting the microphone please read the included Safety Guide and Quick Guide! Also available for download at [www.neumann.com](http://www.neumann.com).



**Connect the microphone only to the included NM V pattern control unit.**

Repairs and servicing are to be carried out only by experienced, authorized service personnel. Unauthorized opening or modification of the equipment shall void the warranty.

Use the equipment only under the conditions specified in the "Technical data" section. Allow the equipment to adjust to the ambient temperature before switching it on.

Do not operate the equipment if it has been damaged during transport. Always run cables in such a way that there is no risk of tripping over them. Unless required for operation, ensure that liquids and electrically conductive objects are kept at a safe distance from the equipment and its connections.

Do not use solvents or aggressive cleansers for cleaning purposes. Dispose of the equipment in accordance with the regulations applicable to the respective country.

## Description

The M 49 V condenser microphone is a re-edition of the legendary M 49 vacuum-tube microphone which was produced from 1951 to 1971.

The circuitry features a triode vacuum tube and the BV 11 transformer.

The re-edition was made possible by the fact that all critical components could be used in original form: The K 47/49 capsule, a pressure-gradient dualdiaphragm transducer with two gold-vaporized membrane foils, a triode vacuum tube, which needs to be carefully selected for use in a studio microphone, and the BV 11 transformer, wound to the original specifications.

The M 49 V microphone is delivered as a set in a transport case, containing the M 49 V microphone, the MZ 49 A elastic holder, the KC 5 microphone cable, and the NM V pattern control unit. Further, three mains cables are included, with EU, UK and US mains connectors.

The M 49 V is a switchable large diaphragm studio microphone with continuously variable polar patterns. Thus, all patterns between omni-directional, cardioid, and figure-8 can be chosen. The input stage is a vacuum tube (valve) with the sound properties unique to this type of device. The microphone has a transformer-balanced out-put and is controlled by the NM V pattern control unit.

When changing the directional characteristic, an elevated noise floor may be noticed for a few seconds. This is due to the reloading of the capsule to the appropriate polarization voltage. The front of the microphone is designated by the Neumann logo.

At the lower electrical cut-off frequency of 30 Hz (-3 dB), a fixed high-pass filter takes effect in order to attenuate very low frequency interferences. The cut-off frequency can be lowered to 12 Hz with an internal switch S4 in the

microphone.

Likewise, for applications where only the cardioid pattern is used, the internal switch S2 sets the microphone to cardioid-only mode. In this mode, the pattern selector is inactive. Sensitivity is raised by ~2 dB, and the equivalent noise level reduced by ~3 dB.

These switches inside the microphone are not accessible to the user from the outside. For selecting these options please contact our service [atwww.neumann.com](http://www.neumann.com).

## Delivery includes

### M 49 V set:

- Microphone M 49 V
- Pattern control unit NM V
- Microphone holder MZ 49 A
- Cable KC 5
- Mains cable
- Quick guide
- Safety guide

## Getting Started

Mounting the microphone Attach the microphone to a stable, sturdy stand. Use an elastic suspension, for the mechanical suppression of structure-borne noise. For this purpose set the microphone into the inner cage from above, and secure it to the inner cage with the latch. If required, use a windscreen or popscreen from our range of accessories in order to suppress wind or pop noise.

## Connecting the microphone



**Caution:** An incorrect supply can damage the microphone! Attach the microphone only to the included NM V pattern control unit with the KC 5 cable.

When hooking up the microphone, the order in which the cables are connected does not matter. Only then, the pattern control unit may be switched on. When connecting the cables, ensure that the connectors are locked correctly.

Within a few minutes, at the latest, the tube in the M 49 V reaches its stable operating condition and then evidences its low residual noise level. External phantom power, if present, does not detract from the performance of the M 49 V.



**Caution:** Very loud noise can damage loudspeakers or your hearing! Minimize the volume of connected playback and recording equipment before connecting the microphone.

Using a suitable cable, connect the pattern control unit to the microphone input of the audio equipment to be used for subsequent processing. Gradually increase the volume of the connected equipment Set the gain of the connected equipment so that no distortion occurs at the highest sound pressure level.



To avoid any electrical shocks, never touch any connector contacts when the pattern control unit is switched on.

In any case, the 120 V DC voltage at pin 5 is charge limited and thus not dangerous.



**Suppressing noise interference.**

The frequency response of the M 49 V extends to very low frequencies. The microphone is of course correspondingly sensitive to low-frequency interference such as structure-borne noise and wind or pop noise. Depending upon the situation, the use of an elastic suspension, a windscreen and/or a popscreen is therefore recommended.

## Function test

Simply speak into the microphone. Do not blow into the microphone or subject it to pop noise, since this can easily result in hazardous sound pressure levels.

Shutdown and Storage

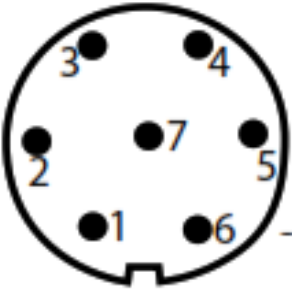
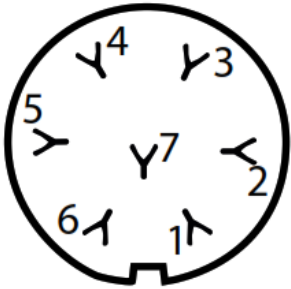
Before switching off the microphone or disconnecting the cables, reduce the volume of connected equipment. Disconnect the pattern control unit from themains voltage by switching the supply off. Disconnect the cables. When disconnecting a cable, always pull only on the connector and not on the cable itself. Microphones which are not in use should not beallowed to remain on the stand gathering dust. A microphone which is unused for a prolonged period should be stored under normal atmospheric conditions, and should be protected from dust.For this purpose, use a lint-free, air-permeabledust cover or the original packaging of the microphone.

Configuration of the MicrophoneOutputs

The 7 pin connector of the microphone and the corresponding connector of the pattern control unit have the following configuration:

Pin 1:	audio signal (+phase)
Pin 2:	audio signal (–phase)
Pin 3:	housing
Pin 4:	+6.3 V DC
Pin 5:	+120 V DC
Pin 6:	–
Pin 7:	ground

Anschlusseite Connector pin view

	
Stecker male	Buchse female

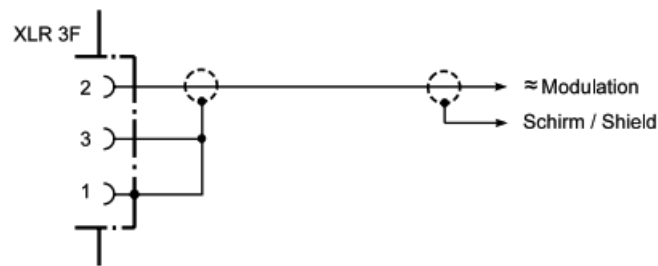
The included seven-core KC 5 cable connects themicrophone to the pattern control unit NM V. At the pattern control unit, the audio signal is available at a 3-pin XLR socket which requires an XLR 3 F connector. The microphone is wired as per IEC 60268-4. An increase in sound pressure at the microphone’s front diaphragm produces a positive voltage at pin 2.

Microphone Cables

The following cables are available for the M 49 V: KC 5 (10 m) .....blk ..... Cat.No. 008688 (included in the supply schedule) Cable for M 49 V, with double twist (double helix) braiding as shield. Ø 5 mm, length 10 m. Special 7-pin connectors (equivalent to types T3460-10 and T3461-10). IC 3 mt .....sw ..... Cat.No. 006543 Microphone cable with double twist (double helix) braiding as shield. Ø 5 mm, length 10 m. XLR 3 connectors, matte lack. Custom-made cables are available on request. The length of the 7-core microphone cable should not exceed 50 m. Otherwise the self noise level of the microphone would ise due to a too low heating voltage. The length of the complete signal path should notexceed 300 m. Otherwise the upper frequency range would be affected by the apacitance of thecable.

## Pattern Control Unit

The NM V pattern control unit is also available separately:



NM V .....gr ..... Cat.No. 008687 (included in the supply schedule)

This classical pattern control unit contains a mains transformer. It automatically switches between the 100-120 V and 220-240 V ac mains voltage ranges.

In the OFF position the NM V draws no current.

To ensure a long life, the tube is heated up gently, with current limiting. A very effective filter inside the NM V ensures very high-quality operating voltages, with a minimum of residual noise voltages.

**Note:** The new NM V is suitable in principle for operating all vintage Neumann microphones utilizing the AC 701 tube, such as the older M 49 and M 249. Older devices as N 52 (a, h) and NN 48 (a, b, h) are not suitable for operating the M 49 V, due to their current and voltage limitations.

For further information please contact our service at [www.neumann.com](http://www.neumann.com).

### Operation with Unbalanced Inputs

At the pattern control unit, the audio signal is available at a balanced, floating XLR 3 output. The output is wired as per IEC 60268-12 and IEC 61938:

Pin 1: 0 V/Masse

Pin 2: audio signal (+phase)

Pin 3: audio signal (–phase)

So pin 2 is the “hot phase”, pin 3 must be connected to ground when used with unbalanced inputs (see figure 1).

## Technical Specifications

Permissible atmospheric conditions:1)

Operating temperature range ..... 0 °C ... +40 °C

Humidity range ..... 0 %...75 % rel. hum

Humidity range ..... 0 %...75 % rel. hum

Storage temperature range ..... –20 °C ... +70 °C

Humidity range ..... 0 %...95 % rel. hum

Acoustical op. principle ..... Pressure gradient transducer

Polar pattern ..... variable

..... (Omni ... cardioid ... figure-8)

Frequency response ..... 40 Hz...16

kHz Sensitivity2)..... 6.5/8/10 mV/Pa<sup>4</sup>

.....  $\approx -43.5 / -42 / -40$  dBV<sup>4</sup>)

Nominal impedance..... 200 ohms

Nominal load impedance ..... 1000 ohms

Signal-to-noise ratio 4 ), CCIR5) ..... 62/64/64 dB<sup>3</sup>)

Signal-to-noise ratio 4 ), A-weighted 5) ..... 73/74/75 dB<sup>3</sup>)

Equivalent noise level, CCIR5) ..... 32/30/30 dB<sup>3</sup>)

Equivalent noise level, A-weighted 5)..... 21/20/19 dB-A<sup>3</sup>)

Max. SPL6) for THD < 0.5 % ..... 125 dB

### Dynamic range of the amplifier (cardioid)

A-weighted 6) for THD < 0.5 % ..... 105 dB

Max. output voltage ..... –8 dBu

Pattern control unit ..... NM V

Vacuum tube type ..... select. triode

Plate voltage ..... 120 V  
Plate current .....  $\leq 1$  mA  
Heater voltage.....+6,3 V  
Heater current ..... $\leq 200$  mA  
Tube warm up time .....approx. 1 minute

**Required connectors:**

Microphone .....KC 5 cable  
Pattern control unit ..... XLR 3 F  
Weight approx. ....800 g  
Diameter .....80 mm  
Length .....163 mm  
94 dB SPL  $\triangleq$  1 Pa = 10  $\mu$ bar 0 dB  $\triangleq$  20  $\mu$ Pa

1. All values are for non-condensing humidity. The values are valid for clean and well-looked-after microphones or microphone capsules, respectively. Any kind of pollution of capsules and membranes may restrict the said values
2. at 1 kHz into 1 k ohms rated load impedance, tolerance  $\pm 1$  dB
3. Polar patterns: Omni/cardiod/figure-8
4. re 94 dB SPL
5. according to IEC 60268-1; CCIR-weighting according to CCIR 468-3, quasi peak; A-weighting to IEC 61672-1, RMS
6. THD of microphone amplifier at an input voltage equivalent to the capsule output at the specified SPL.

**Selected Accessories\* (see photos in appendix)**

Elastic Suspension

MZ 49 A .....ni ..... Cat.No. 008689

**(included in the supply schedule)**

**Table and Floor Stands**

MF 3 .....blk ..... Cat.No. 007321

MF 4 .....blk ..... Cat.No. 007337

MF 5 .....gr ..... Cat.No. 008489

**Stand Extensions**

STV 4 .....blk ..... Cat.No. 006190

STV 20 .....blk ..... Cat.No. 006187

STV 40 .....blk ..... Cat.No. 006188

STV 60 .....blk ..... Cat.No. 006189

**Popscreen**

PS 15 .....blk ..... Cat.No. 008472

PS 20a .....blk ..... Cat.No. 008488

Foam Windscreen

WS 49 .....blk ..... Cat.No. 008690

**Pattern control unit**

NM V .....gr ..... Cat.No. 008687

(included in the supply schedule)

**Connecting Cables**

IC 3 mt (10 m) .....blk ..... Cat.No. 006543

KC 5 (10 m) .....blk ..... Cat.No. 008688

(included in the supply schedule)

**Meaning of color codes:**

ni = nickel, blk = black, gr = grey

\*Detailed descriptions and additional articles

can be found in our accessories catalog or at: [www.neumann.com](http://www.neumann.com)

**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.

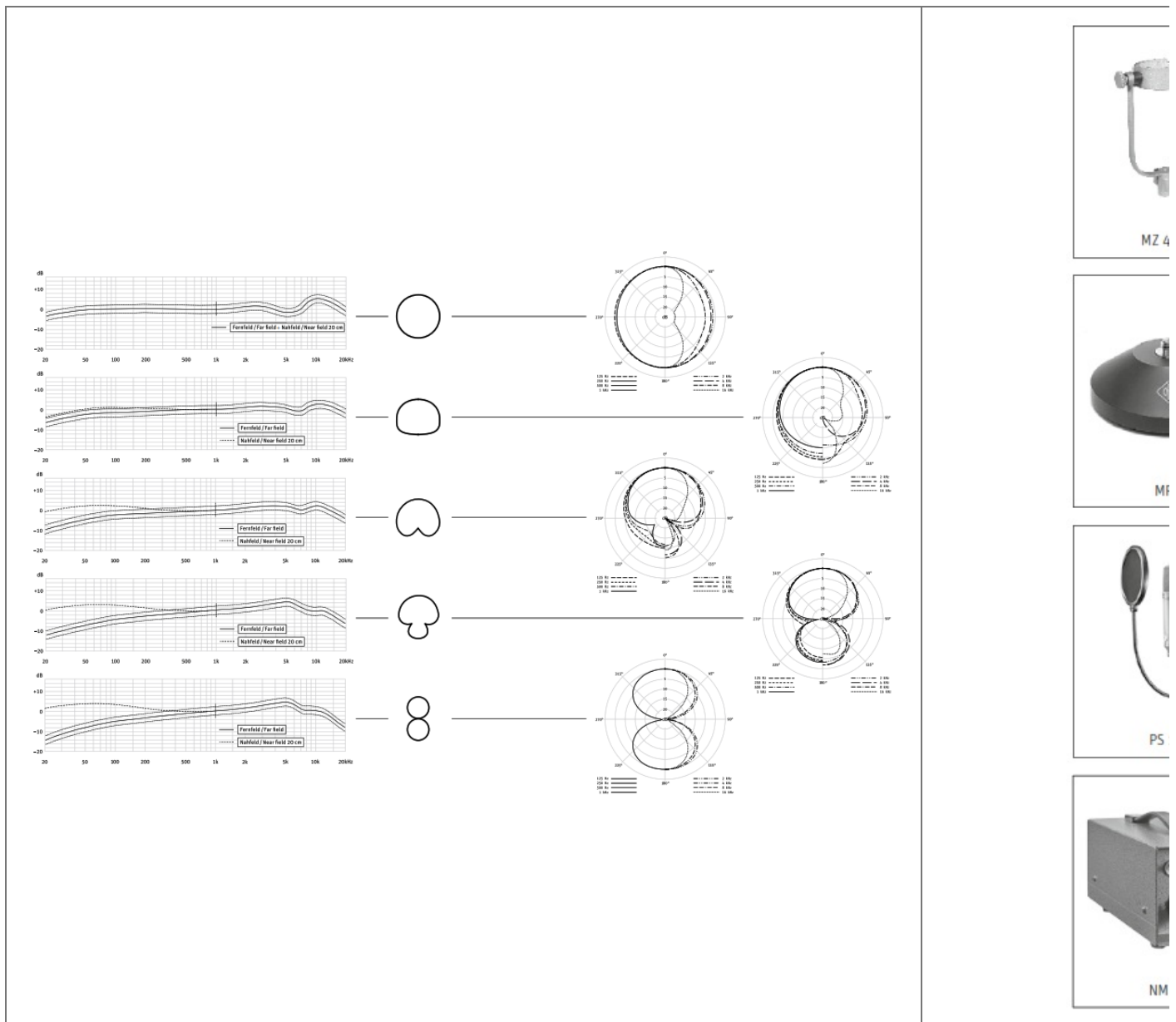
**Avoid the use of old wind shields:**

As the foam material of a wind shield ages it can become brittle and crumbly. Instead of protecting the microphone, an old wind shield can thus lead to soiling 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 which 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 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 to be recommended for microphones which 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 Responses and Polar Patterns**



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## Documents / Resources



**[NEUMANN M 49 V Large-Diaphragm Multi-Pattern Tube Condenser Microphone](#)** [pdf] Instr  
 uction Manual  
 M 49 V Large-Diaphragm Multi-Pattern Tube Condenser Microphone, M 49 V, Large-Diaphragm  
 Multi-Pattern Tube Condenser Microphone, Multi-Pattern Tube Condenser Microphone, Tube C  
 ondenser Microphone, Microphone

## References



- [A Aksjetips](#)
- [Neumann - Highest sound quality since 1928](#)

Manuals+.