

# OPERATING INSTRUCTIONS FOR NEUMANN MINIATURE CONDENSER MICROPHONES KM 53 a / KM 54 a / KM 56 AND ACCESSORIES

Jan. 1964

## A. TECHNICAL DATA

### Microphone KM 53 a

Range of Frequencies 40 to 15,000 cps  
Directional Characteristic omni-directional  
Sensitivity 1.2 mV/dyne/cm<sup>2</sup>  
Total Harmonic Distortion less than 0.8% (40-15,000 cps) up to a sound pressure level of 110 db  
Source Impedance 200 or 50 ohms  
Tube Complement 1 Telefunken AC 701 (k); selected

### Microphone KM 54 a

Range of Frequencies 40 to 15,000 cps  
Directional Characteristic cardioid  
Sensitivity 1.0 mV/dyne/cm<sup>2</sup>  
Total Harmonic Distortion less than 0.6% (40-15,000 cps) up to a sound pressure level of 110 db  
Source Impedance 200 or 50 ohms  
Tube Complement 1 Telefunken AC 701 (k); selected

### Microphone KM 56

Range of Frequencies 40 to 15,000 cps  
Directional Characteristics omni-directional, cardioid, bi-directional (figure 8)  
Sensitivity 0.8 mV/dyne/cm<sup>2</sup>  
Total Harmonic Distortion less than 0.6% (40-15,000 cps) up to a sound pressure level of 110 db  
Source Impedance 200 or 50 ohms  
Tube Complement 1 Telefunken AC 701 (k); selected

### Power Supply NKM (NN 48 b)

Line Voltage Input 110/220 volts, 50-60 cps  
Operating Voltages 4 volts DC filament, 120 volts DC plate  
Operating Currents 100 ma filament, 0.5 ma plate  
Fuse 80 ma for 110 volts, 50 ma for 220 volts  
Pilot Lamp 6 volts, 180 ma

### Interconnecting Cable KC 2

Standard Length 33 ft. (other lengths on request)  
Stand Mount ½" right-hand thread (¾-27 thread on request)

## B. GENERAL

The miniature-size type KM 53 a, KM 54 a and KM 56 condenser microphones contain, besides the capsule assembly, a complete amplifier with tube and output transformer. Their individual features are:

Type KM 53 a is a pressure-type condenser microphone with omni-directional characteristic. Its frequency response shows a purposeful slight rise at higher frequencies when exposed to direct sound, but remains virtually flat in a diffused sound field.

Type KM 54 a is a pressure-gradient condenser microphone with cardioid characteristic. Its extra-high directionality produces a 25 db front-to-back attenuation, enabling the microphone to be used with extraordinarily good results in relatively poor acoustical surroundings.

Type KM 56 is a pressure-gradient condenser microphone with three fixed directional characteristics, conveniently electronically selectable by a switching ring on the microphone itself. Unlike the KM 53 a and KM 54 a, it must be set at right angles to the direction of incident sound for optimum response.

## C. PLACING IN OPERATION

1. The KM 53 a, KM 54 a and KM 56 miniature microphones are equipped with special 6-pin miniature plugs which should be plugged into the mating receptacle of the KC 1 extension cable or the KC 2 interconnecting cable with microphone stand mount.

2. The KC 2 stand mount, incorporating a swivel joint, normally comes equipped with a 1/2" right-hand thread (on request with 5/8"-27 thread) for the purpose of mounting the microphones on stands or booms.
3. The five-conductor shielded cable normally comes 33 ft. long, but lengths up to 100 ft. are admissible between microphone and power supply, and can be supplied on order.  
Should the microphone be located more than 70 ft. from the power supply, it is advisable that the filament voltage series resistor in the power supply (part 10), which is accessible after removal of the power supply cover, be bridged. (See diagram.)
4. The M 31 b floor stand and the MF 1 desk stand are intended for most suitable mounting of miniature-type microphones.  
The floor stand M 31 b is fitted with a goose neck extension incorporating a mating receptacle for connection of the microphone. Electrical connection to the power supply is made through a 33 ft. long cable inseparably belonging to the stand itself.  
The desk stand MF 1 is equipped with a 1/2"-threaded stud for fastening the interconnecting cable KC 2 or the goose neck extension Z 13.
5. All connectors on microphones, cables and power supplies are equipped with screw-type couplings. Make sure that these are properly fastened.
6. The NKM or NN 48 a power supply delivers the required operating voltages to the microphone. (4 volts DC filament voltage and 120 volts DC plate voltage.)
7. The power supply is equipped with a two-pole AC plug to which the power cord has to be connected. A mating AC connector for this plug is supplied with the power supply on special request.
8. First, make certain that the power supply is properly strapped for the AC line voltage required (110 or 220 volts). The correct setting of this strap is visible through a small window at one side of the power supply cover. The strapping board is accessible after removal of the cover.
9. Also make sure that the proper value fuse for the voltage used has been inserted in the fuse holder. 80 ma for 110 volts; 50 ma for 220 volts.
10. The output signal from the microphone is fed to a three-prong chassis-mounted plug on the power supply. The mating cable connector for this plug is supplied with each unit. Connection to the microphone input of the console or recorder is accomplished by means of a two-conductor shielded cable of any desired length.
11. The three fixed directional characteristics of the KM 56 microphone can be selected conveniently by means of a switching ring located at its base.
12. Because of the orientation of the condenser capsule, KM 53 a and KM 54 a are positioned pointing toward the sound source, while the KM 56 is placed with its body at right angle to the incident sound.
13. The KM 53 a, KM 54 a and KM 56 microphones are designed to work into a load impedance (input impedance of console preamplifier) of 250 respectively 1000 ohms, or even higher. To provide a sufficiently low source impedance from the microphones, they have been designed for a source impedance one-fifth the load impedance. For a 250 ohm load impedance, the source impedance of the microphone preamplifier is set for 50 ohms, and for a 1000 ohm load impedance, it is set for 200 ohms. This prevents overloading of the preamplifier in the microphone itself.  
The microphones are usually supplied strapped for a 1000 ohm load impedance, but on request will be delivered for 250 ohms. The 250 ohm adjusted microphones may be identified by a red dot located near the serial number at the base of the microphone.
14. This series of microphones can be exposed safely to heat commonly found in high density lighting for film and TV, but should not be exposed to excess humidity.
15. After interconnection of the microphone, power supply and AC line, the main switch may be switched on. Operating condition will be indicated by a pilot lamp. It is not harmful to the power supply if it is operated, even for longer periods of time, without connection of a microphone.

## D. TESTING AND MAINTENANCE

NEUMANN Miniature Condenser Microphones are made with extreme care and accuracy, and most careful handling is required if consistently excellent results are expected.

### Warning

Should the Miniature Microphones need servicing, it is imperative that they be repaired at our factory or at our authorized service centers, otherwise the guarantee will be void!

The following instructions are given with the understanding that all manipulations performed on NEUMANN Miniature Condenser Microphones are undertaken at your own risk.

1. Work performed on the miniature microphones should be approached with extreme care and dry hands. Such repair should only be attempted by a skilled technician.
2. Under no circumstances should one blow into the capsule itself, and the capsule diaphragm should remain untouched.
3. The capsule head is of the plug-in type and may be removed by advancing the three set screws at its base.
4. Capsules in need of repair must be returned to us or our authorized service centers.
5. After the capsule has been unplugged, you can remove the amplifier cover by advancing the set screw (in the case of the KM 56 there are two set screws) at its base.
6. After withdrawing the amplifier cover, remove the plastic protective cover to gain access to the amplifier itself.
7. Extreme care must be exercised in changing the tube. To do so, grip the helically spiralled tube leads, in turn, with a small pair of long-nose pliers, and apply a minimum of heat from a miniature soldering iron to the soldering joint. The spiral as well as the pliers serve as heat conductors to prevent cracking of the tube's glass envelope by the expanding wire.  
The AC 701 (k) tube is especially selected for low noise and its connecting leads are properly curled at our factory for quick installation. It is imperative for proper operation that replacement tubes be obtained through us or our representatives.
8. To gain access to the output transformer, widen the upper edge of the mu-metal shielding sleeve and slide it gently upwards.
9. The characteristics of the amplifiers of the miniature microphones can be measured by means of the M 73 k test stand, the M 74 test cage and the Z 53, Z 54 or Z 56 test capsule. (Instructions for test procedure are included with the test equipment.)
10. It is advisable to check the power supply for proper operating voltages every six months.
11. An impedance change, should it become necessary, can only be performed by our authorized service centers.
12. When ordering spare parts, it is imperative that you include the serial number, so that the proper parts for your particular model can be supplied.

## E. RECOMMENDATIONS

1. The KM 53 a, KM 54 a and KM 56 miniature microphones can be suspended from film and television booms by means of special full-elastic suspensions, type Z 38, which help reduce mechanical shock interference carried through the floor, and which permit rapid turning at the end of the boom. When using this suspension, use the KC 1 extension cable.
2. Where miniature microphones are installed permanently in studios or other locations, we recommend the installation of microphone outlets (6-pole T 3403) into which the microphone interconnecting cables can be plugged. Concealed lines should lead from these wall sockets to the equipment rack or console where a type N 52 † plug-in power supply may be installed in a suitable plug-in frame.
3. A self-contained battery supply, type BB 9 k, may be used in place of the NKM or NN 48 b power supply, where AC power is not available.
4. To suppress interference caused by wind or by "popping" resulting from close speaking, we recommend the Z 118 wind and close-talking screen.

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