

OPERATING INSTRUCTIONS
for the NEUMANN MODEL M 269c CONDENSER MICROPHONE



M 269c - 920-02-01

A T e c h n i c a l D a t a

M 269c microphone

Frequency range.....	30 ... 16 000 cps
Directional characteristics	"omni-directional", "cardioid", "figure-of-eight"
Output levels, app.	"omni-directional" "F": 0.9 mV/ μ b "cardioid" "F" : 1.0 mV/ μ b "figure-of-eight" "F" : 1.1 mV/ μ b "cardioid" : 1.55 mV/ μ b
Electrical load resistance.	$\cong$ 1 000 Ω (250 Ω)
Electrical source resistance.....	200 Ω (50 Ω) $\pm$ 20 %
Total harmonic distortion..	$\cong$ 0.5 % up to 114 dB SPL.

NN 48h (hu) power supply unit

Mains voltages.....	117/127/220/240 V $\pm$ 10 % 50/60 cps
Fuses.....	80 mA for 117 / 127 V sl. bl. 50 mA for 220 / 240 V m. sl. bl.
DC output voltages.....	4 V, 120 V, 0 ... 120 V

B G e n e r a l

The microphone capsule of the M 269c microphone is a pressure gradient device. It is composed of two identical cardioid systems arranged back to back. By switching of the polarizing voltage these two cardioid patterns can so be combined as to produce the three directional characteristics "cardioid", "omni-directional" and "figure-of-eight". The switch for selection of the directional characteristics located at the capsule head has three positions marked by the symbols "F", "cardioid" and "F". Due to technical conditions the position "F" appears twice. Both positions are identical in function.

When the switch is set for one of the two positions "F" the directional characteristic can from the polarizing voltage potentiometer of the respective power supply be changed continuously variable from "omni-directional" over "cardioid" to the "figure-of-eight" characteristic. The adjustment, continuously variable, permits the selection of any intermediate position wanted between two characteristics.

When the "cardioid" symbol appears in the window of the selection switch the rear diaphragm of the capsule is switched off and the microphone works as "cardioid"-microphone only. Thus the rear diaphragm has in this position no polarizing voltage. The output level increases compared with the remote-controlled "cardioid" by about 4 dB. The equivalent sound pressure level improves by 3 phon. The absence of the polarizing voltage offers the possibility of feeding the microphone from a power supply unit for miniature microphones. For connection with the NKMa the adapter Z 51 is necessary, the NKMh can be connected directly.

Two additional switches are located at the rear of the microphone. One switch provides for a sensitivity reduction of appr. 10 dB ahead of the amplifier section permitting transmission of the highest sound pressure levels without danger of overloading the amplifier.

The second switch produces a roll-off at the low frequency end beginning at 200 cps. This permits the compensation of the normally occurring low frequency rise when a pressure gradient microphone is addressed at close range. This position further serves to suppress low frequency mechanical interference. These two switches likewise have windows in which their position is indicated. When the sensitivity reduction is effective, the window shows "-10 dB", and when the low frequencies are attenuated, the window shows a horizontal line with its left end bent downward. (These symbols are described as viewed, when the microphone is on a stand, with its connector end facing the floor.)

A special circuit within the amplifier distinctly attenuates all frequencies below 30 cps, while those above 40 cps are reproduced linearly. The microphone amplifier's response may be extended to below 20 cps flat by opening the jumper "S-2" in the amplifier itself.

C O p e r a t i n g I n s t r u c t i o n s

1. The microphone is equipped with a 7-pole plug NT 3470 which is to be connected by means of any of the KC 5, KC 7, KC 9 or C 228s cables with the corresponding 7-pole receptacle T 3471 on the NN 48 h (hu) power supply unit. The extension cables of the power supply unit carry the designation KC 5 or KC 7. The cables KC 9 and C 228s have a swivel stand mount permitting the microphone to be attached to floor stands and booms having either a 1/2" or 5/8"-27 thread.

The KC 7 and C 228s cables are double shielded and equipped with the RF-proof connectors T 3468 and T 3469. The KC 5 and KC 9 cables provide normal shielding and terminate in connectors T 3460 and T 3461.

2. The microphone cables have a normal length of 33 feet. Other lengths

fier inputs having nominal input impedance of 150 ... 250 Ω (as shipped) or 30 ... 50 Ω when restrapped. The effective output level behind this pad is only a few dB higher than that of the usual high quality dynamic microphone. For a sound pressure of 10 μ b, this EFFECTIVE OUTPUT LEVEL is as follows:

"omni-directional" "F"....	- 45 dB
"cardioid" "F".....	- 44 dB
"figure-of-eight" "F".....	- 43 dB
"cardioid".....	- 40 dB

For a sound pressure of 1 dyn/cm² (1 μ b) these figures are lower by 20 dB.

11. After connection of the microphone with the power supply unit and the mains, the main switch can be switched on. The power is on at the power supply unit when the neon lamp lights.
12. Our power supply units are equipped with two latches which are to be screwed between 0 Volt and screen or between housing and screen. These latches can be separated in order to avoid ground circuits which can cause hum interferences. The following three alternatives are possible:
 - a) A mains cable connected with ground is used on the power supply unit and the following amplifier rack is connected with ground: both latches must be opened.
 - b) When the mains line is not connected with ground and the amplifier rack is connected with ground separate latches 0 Volt and screen and leave latch housing - screen connected.
 - c) When having a mains line connected with ground and an amplifier rack not connected with ground, connection as under b).

D T e s t i n g a n d M a i n t e n a n c e

Should your NEUMANN microphone require servicing, we recommend that you either return it to our factory or to our nearest representative for repair. Beyond that we offer the following helpful hints for the testing or repair of these microphones:

1. All work performed on the microphone should be done in a most careful and workmanlike manner. Only experienced personnel should be permitted to do such work.
2. To gain access to the microphone's preamplifier unscrew the bottom fastening ring after which the conical housing tube easily slides off.
3. The head assembly can be unplugged after the two latches which lie within the side struts have been pressed together at the top.

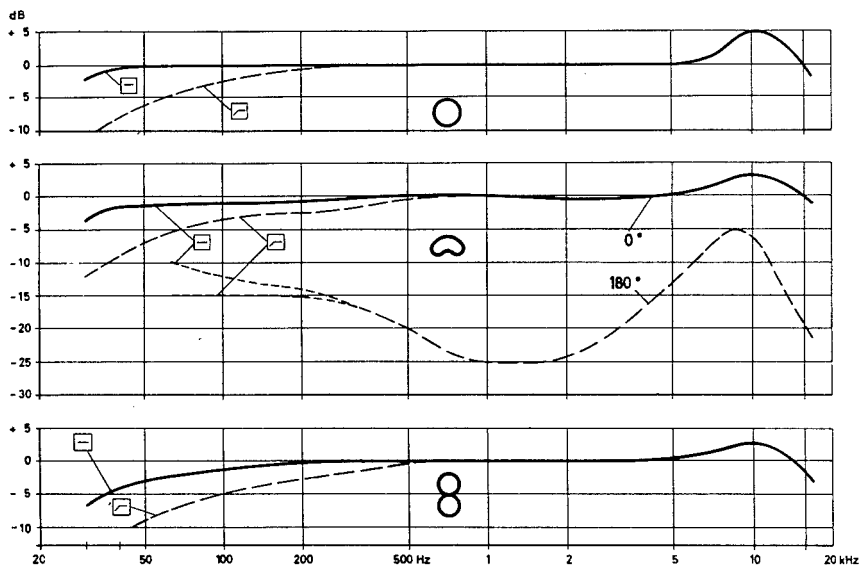
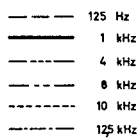
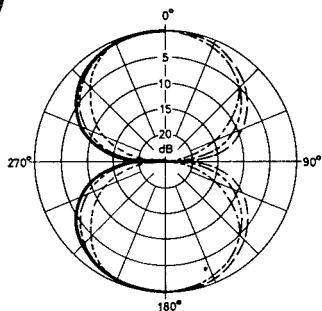
4. The amplifier is now accessible and the AC 701k tube may be easily changed.
5. Around the perimeter of the lucite base of the head assembly there are three screw heads visible, one of which is sealed. When these screws are taken out the entire capsule assembly can be removed from its cage. Should there be dust on the diaphragms it may easily be removed by gently brushing it off using a very soft paint brush. The use of either compressed air or vacuum can lead to destruction of the capsule.
6. The plexiglas dome below the capsule may be cleaned using a cleaner intended for such plastic.
7. The actual properties of the amplifier can be ascertained using the dummy head Z 69 and the test device M 273.
8. From the 50 Ω output of a signal generator, feed a 1000 cps tone at a level of - 18 dB to the input of the M 273. You may use the model Z 69 dummy head or can proceed with the regular head assembly plugged in. The three switches are set for "F", "full sensitivity" and "linear response". The following output levels are to be observed at the output across a 1 k Ω load resistance, using a vacuum tube voltmeter:

1000 cps	- 20 dB $\pm$ 1 dB
40 cps	- 24 dB $\pm$ 1 dB
1500 cps	- 26 dB $\pm$ 1 dB

9. When communicating with the factory or its representatives, or when ordering parts be sure to include the serial number of your microphone.

E A c c e s s o r i e s

1. The M 269c microphone may be suspended in a full elastic suspension Z 48 providing complete mechanical isolation and permitting any operating position desired.
2. A wind and close talking screen Z 67 is available for use outdoors or when speaking or singing into the microphone at close range.
3. For permanent installations of the M 269c microphone we recommend the use of the rackmounted plug-in power supply unit N 52t. Up to ten units can be fitted - side by side - into one plug-in shelf S 167/10.
4. Instead of the power supply units NN 48h and N 52t the battery supply unit BB 50h may be used as well, making the operation independent from the mains. The operating time is approximately 50 hours.



may be ordered special.

Cable lengths between microphone and power supply unit up to 100 feet are permissible. If the microphone shall be operated with a cable longer than 65 feet, the resistance R-10 in the filament circuit of the power supply unit must be bridged.

3. When using the table stand M 270 or the floor stand M 272 the extension cable is to be mated with the connector of the stand.
4. The power supply unit is equipped with a 2-pole power connector.
5. The proper mains voltage strapping is readily controlled through the lucite window at the side of the power supply unit.
6. A coin operated latching screw is located under the power supply unit's carrying handle. When the slot is in its length-wise position, the power supply unit's cover may be removed upward while the carrying handle remains on the power supply unit chassis.
7. Make certain that the proper fuse has been inserted in the fuse holder. 80 mA for 117/127 V, and 50 mA for 220/240 V.
8. The connection between the audio output socket (for NN 48h:T 3081, for NN 48hu: Cannon XLR-3-32) and the console is to be made using any suitable two conductor shielded microphone cable of any length.
9. For purposes of phasing of the M 269c microphone the following is of importance:
For increasing sound pressure on the front diaphragm the following are the polarities at the various connectors: microphone connector and power supply unit receptacle - pin 1 positive, pin 2 negative; at the NN 48hu - pin 2 positive, pin 3 negative, pin 1 ground.
10. The M 269c has an internal resistance of 200 Ω which can be re-strapped to 50 Ω . The connections are clearly shown on a connection board. The input impedance of the following amplifier should be 5 times as big or bigger, i.e. $\geq 1000 \Omega$ or $\geq 250 \Omega$. The microphone is usually supplied strapped for a 200 Ω internal resistance. The 50 Ω strapped microphones may be identified by a red dot located near the serial number of the microphone.

Most of the American preamplifiers and consoles are designed for operation with dynamic microphones. For proper matching of the M 269c microphone to such amplifiers the power supply unit NN 48hu has a special pad built-in which permits such direct connection. The microphone itself remains strapped for 50 Ω . The output impedance behind this pad is 150 ... 250 Ω . It may be re-strapped for an output impedance of 30 ... 50 Ω . (See schematic diagram NN 48hu)

This pad permits the connection of the M 269c microphone to ampli-