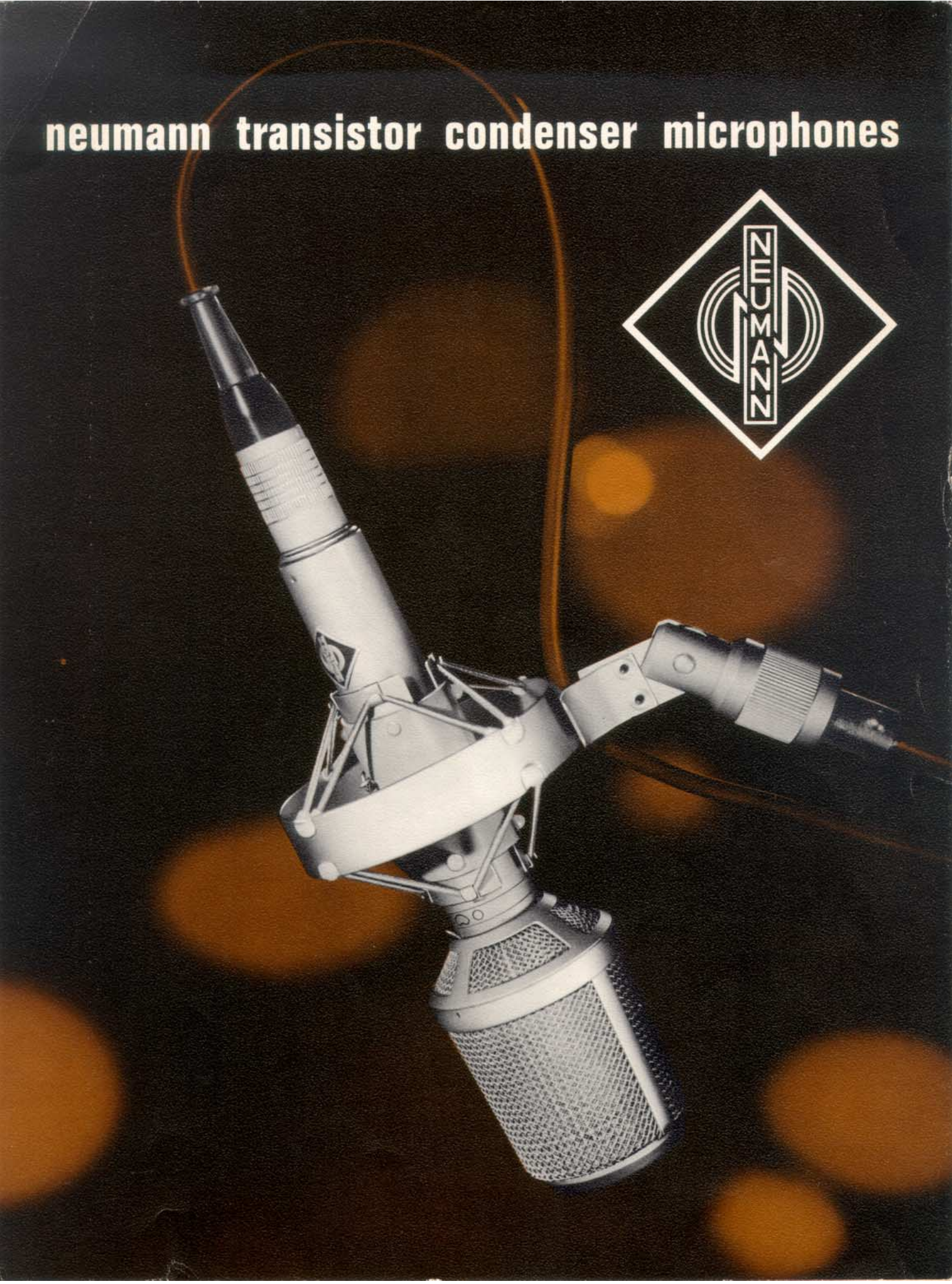
neumann transistor condenser microphones



Neumann condenser microphones using audio frequ

for modulation-lead powering

KM 73
KM 74

KM 76

U 77

KM 73 KM 83

The condenser microphones KM 73 and KM 83 are pressure transducers with a polyester diaphragm giving omni-directional response. The frequency response in the diffuse sound field is linear. The microphones are particularly suitable for capturing the overall effect of complex sound sources. The microphone KM 73 is provided for modulation-lead powering, the microphone KM 83 for phantom powering.

KM 74 KM 84

The condenser miniature microphones KM 74 and KM 84 have cardioid characteristic. The directional characteristic is almost independent from frequency. The frequency response curves for an angle of incidence of ± 135° run nearly parallel. A sound source that moves in a three quarters circle around the microphone will therefore be recorded with constant tone quality. The microphones KM 73 and KM 74 are similar to each other in circuitry and appearance and differ by their capsules only. The same applies to our microphones KM 83 and KM 84. The microphone KM 74 is provided for modulation-lead powering, the microphone KM 84 for phantom powering.

KM 76 KM 86

The condenser microphones KM 76 and KM 86 are provided with a plug-in head assembly which contains two single capsules. The directional characteristics "omni-directional", "cardioid" and "figure-of-eight" can be set. In the settings "omni-directional" and "figure-of-eight" the microphones distinguish themselves by an unadulterated recording also of the low frequencies which can be recorded undiminished even if the microphone is located at a larger distance from the sound source. The cardioid characteristic is almost independent from frequency showing the good properties of the KM 74. The microphone KM 76 is provided for modulation-lead powering, the KM 86 for phantom powering.

ıency circuitry equipped with field effect transistors

and for phantom powering

KM 83
KM 84

KM 86

U 87

U 77 **U 87**

The U 77 and U 87 condenser microphones are multipurpose studio microphones which fulfill all requirements which have been posed by the modern recording technique. By means of a switch at the microphone the directional characteristics omni-directional , cardioid and figure-of-eight can be set. For close talking in cardioid characteristic the resulting rise at the low frequency end can be switched to "linear". Extremely high sound pressures can be prevented from overloading the amplifier stage by reducing the capsule's sensitivity before the amplifier section. These possibilities permit completely natural and undistored sound reproduction even when the microphone is placed in close proximity to the sound source. The physical size of the microphones makes it possible to insert batteries if necessary.

In that case the microphones can be operated completely independent from external feeding. The microphone U 77 is provided for modulation-lead powering, the microphone U 87 for phantom powering.

The microphones KM 73, KM 74, KM 76 and KM 83, KM 84 and KM 86 are also available with Cannon connectors. They can same as microphones U 77 and U 87 be matched with amplifiers provided for a nominal output impedance of 150/250 Ω by means of a pad.

The microphone amplifiers of the NEUMANN transistor condenser microphones are using audio frequency circuitry and are equipped in the input with a fieldeffect transistor. All microphones of the 70-and 80-series are acoustically identical, they differ, however, with respect to the powering systems. The microphones of the 70-series are provided for modulation-lead powering with 7,5 . . .13 VDC, the microphones of the 80-series are provided for phantom powering with 48 VDC through the electrical center of the modulation pair and a third lead or the cable shield. The characteristical features of these powering systems are illustrated in the table next page.

Tech. data	KM 73	KM 74	KM 76	U 77	KM 83	KM 84	KM 86	U 87
Acoustical System	pressure microphone	pressure gradient microphone			pressure microphone	pressure gradient microphone		
Directional Characteristics	omni-directional	cardioid	omni-directional, cardioid, figure-of-eight		omni-directional	cardioid	omni-directional, cardioid, figure-of-eight	
Frequency Range	40 . . . . . 16 000 Hz				40 . . . . . 16 000 Hz			
Output Levels	appr. 3 mV / µb	appr. 3 mV / µb	appr. 2,6 mV/µb	appr. 5 mV / µb	appr. 0,5 mV / µb	appr. 0,5 mV / µb	appr. 0,7 mV / µb	appr. 0,8 mV / µb
Load Impedance	≧ 1000 Ω				≧ 1000 / 250 Ω			
Source Impedance	≦ 200 Ω				≦ 200 / 50 Ω			
Capacity of Capsule	appr. 43 pF	appr. 34 pF	2 x appr. 34 pF	2 x appr. 50 pF	appr. 43 pF	appr. 34 pF	2 x appr. 34 pF	2 x appr. 50 pF
Equivalent Self Noise Level (DIN 45 405) (dB re $2 \cdot 10^{-4}$ µb)	appr. 25 dB	appr. 25 dB	appr. 25 dB (cardioid)	appr. 22 dB (cardioid)	appr. 25 dB	appr. 25 dB	appr. 25 dB (cardioid)	appr. 26 dB
Maximum SPL for .5 % THD	≧ 200 µb ≙ 120 dB	≧ 200 µb ≙ 120 dB	≧ 200 µb ≙ 120 dB	≧ 400 µb ≙ 126 dB	≧ 300 µb ≙ 123,5 dB	≧ 300 µb ≙ 123,5 dB	≧ 250 µb ≙ 122 dB	≧ 400 µb ≙ 126 dB
Operating Voltage	7,5 . . . 13 VDC				48 $^{+6}_{-8}$ VDC			
Current Consumption	appr. 6 mA				appr. 0,4 mA			
Operating Time with Battery Supplies	appr. 20 hours				appr. 200 hours			
Weight	95 g	95 g	200 g	500 g	80 g	80 g	200 g	550 g
Dimensions	21 + 24 mm ⌀ 145 mm long	21 + 24 mm ⌀ 145 mm long	21 + 46 mm ⌀ 175 mm long	56 mm ⌀ 200 mm long	21 mm ⌀ 101 mm long	21 mm ⌀ 101 mm long	21 + 46 mm ⌀ 175 mm long	56 mm ⌀ 200 mm long

Accessories

for 70-series microphones

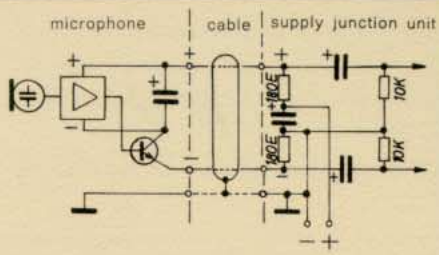
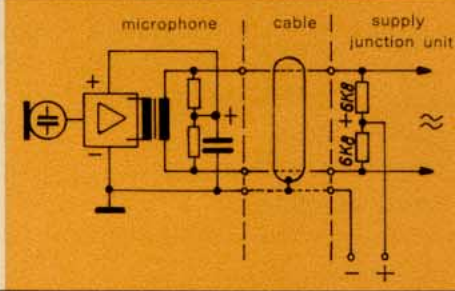
N 9	portable power supply
N 92	portable double power supply
NN 24	plug-in type power supply for 10 microphones in connection with 10 x SW 1224
SW 1224	supply junction unit
BS 9	battery supply (85x50x32 mm)
BS 9/200	battery supply (118x82x30 mm)
BA 9	Battery adapter
NB 96	portable combined mains-battery supply for 6 microphones
KT 1	interconnecting cable, 33 ft.
KT 2	interconnecting cable, 33 ft., with stand mount
UC 33	interconnecting cable, 33 ft., for U 77
KT 4	interconnecting cable, 33 ft., with stand mount, for U 77

Accessories

for 80-series microphones

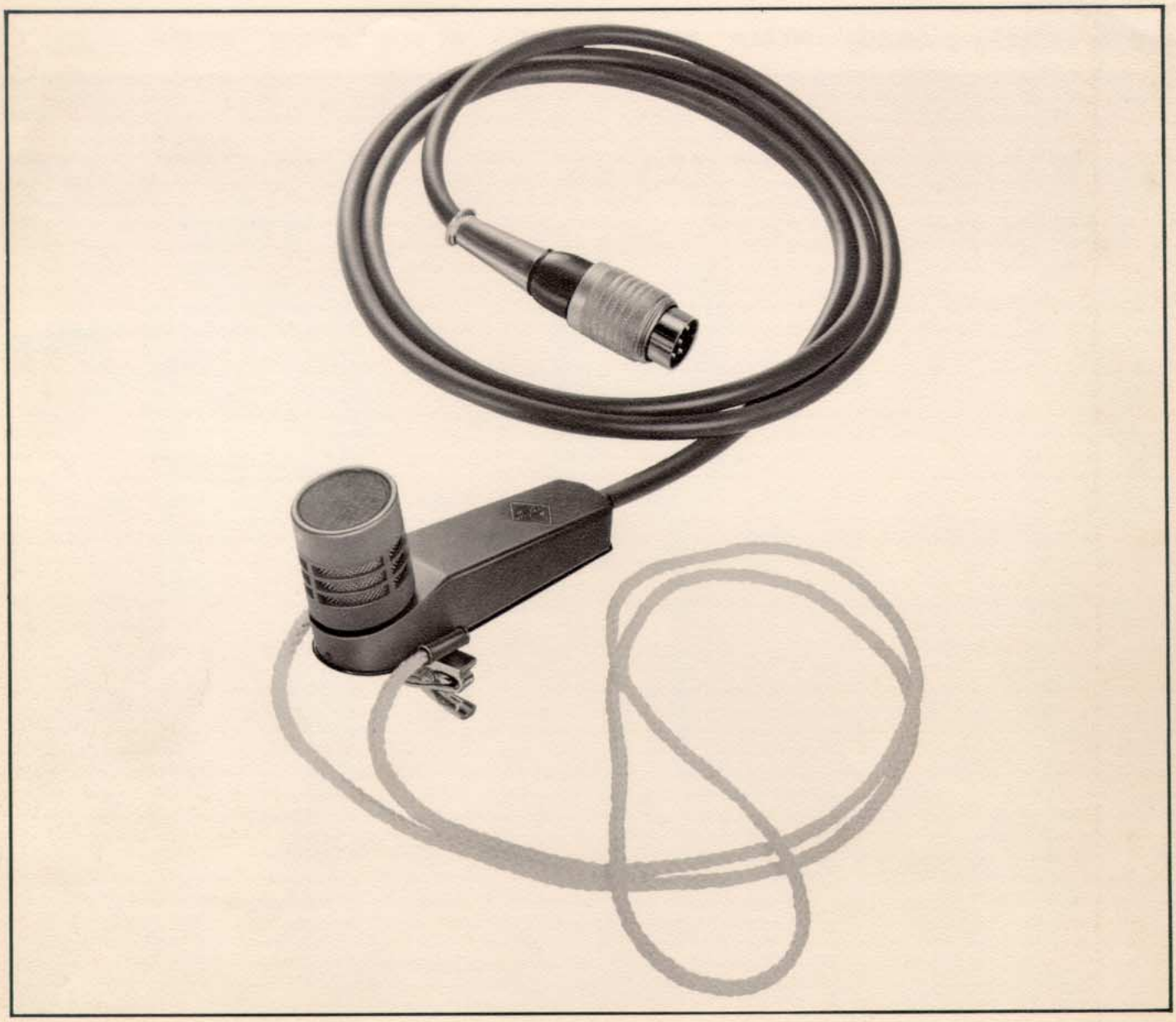
N 45	power supply
N 45k	plug-in type power supply for 10 microphones
BS 45	battery supply
NB 456	portable combined mains-battery supply for 6 microphones
SA 120	adapter for powering from 120 VDC power supplies
KT 1	interconnecting cable, 33 ft.
KT 2	interconnecting cable, 33 ft., with stand mount
UC 73	interconnecting cable, 33 ft., for U 87

Powering systems for transistor condenser microphones

Principle	Modulation-lead powering	Phantom powering
	Through R-C supply junction units the positive pole of the supply voltage is connected to one modulation lead and the negative pole to the other. The 180 Ω resistors in the supply junction unit are at the same time the working resistance of the last stage of the microphone amplifier which is connected in series with the complete circuit concerning DC supply.	The positive pole of the supply voltage is applied through two protective resistors to both modulation leads. The negative pole is applied through a third lead or the cable shield. Filtering is accomplished in the microphone.
Schematic Diagramm		
Features Supply Voltage	7,5 . . . 13 VDC ; 5 . . . 10 mA	48 $^{+6}_{-8}$ VDC ; 0,4 mA
Power Consumption	50 . . . 80 mW	19 mW
Operation with Battery Supply	1 battery 9 V IEC 6 F 22 (≧ 20 hours) or 12 V battery	2 batteries 22,5 V IEC 15 F 20 (≧ 200 hours)
Microphone Cables	2 wires	2 wires or, if desired, 3 wires
Supply Voltage and Audio Frequency Output Voltage	parallel	decoupled
Maximum allowable Noise Voltage	0,004 mV	10 mV
Power Supplies require	extremely good filtering	simple filtering circuits
Central Powering requires	decoupling of all supply leads	no decoupling
Every Supply Junction Unit contains	4 resistors and 3 electrolytical condensers	2 miniature resistors
Operating Voltages are obtained	through a built-in DC converter	directly from the supply voltage
Changing of Output Polarity	not allowable	allowable
Changing of the Output Impedance	possible with pad after the supply junction unit	possible through output transformer switching
Other Types of Microphones	can be connected after disconnection of the supply voltage and the two 180 Ω resistors*	can be connected directly
Operation on Receptacles for Tube-equipped Condenser Microphones	not possible	possible when using an adapter with 4 miniature resistors

*) After installation of an automatically interrupting circuit equipped with several transistors for every microphone which diminishes the current to about .5 mA, moving coil microphones can also be operated without disconnection of the supply voltage with somewhat deteriorated signal to noise ratio. The maximum allowable noise voltage must then, however, be smaller than .3 μV. For microphones with transformer output, for instance, ribbon microphones and tube equipped condenser microphones also with the small remaining current of .5 mA a reduction of quality can be observed.

Lavalier microphone model KML



The condenser microphone KML was developed in order to improve pickup conditions of reporters in interview situations, masters of ceremonies, quizmasters, and all situations in which a speaker wearing a lavalier would also like to pick up the person standing directly accross from him. But even in applications where it is used as an ordinary lavalier microphone, its quality is far superior to non-condenser units of this type.

Beyond that, however, its very small and unobtrusive size makes it a favorite in TV studios and fish-pole use where an extremely small and light weight high quality microphone is required. The microphone is equipped with a cardioid capsule whose axis of incidence is not directed directly up at the speakers's mouth, but rather straight ahead. The person wearing the unit therefore addresses the unit at a 90 degree angle resulting in a 6 dB sensitivity reduction but this without any frequency discrimination as compared with on-axis address. The person being interviewed, on the other hand, will speak on axis and for the usual distance from a reporter will be reproduced at the same level as the interviewer. This makes it unnecessary for a microphone to be continually passed back and forth between the two speakers.

GEORG NEUMANN GMBH ELECTROACUSTIC · 1 BERLIN 61, CHARLOTTENSTRASSE 3 · TELEFON (0311) 61 48 92 · TELEX 01 84 595