Product Information

U 87 Ai

Large Diaphragm Microphone

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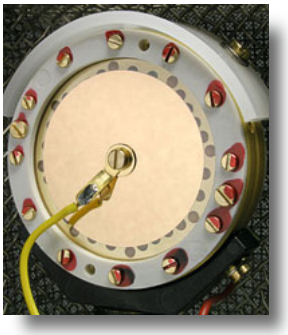
Features

- *Variable large diaphragm microphone*
- *Pressure-gradient transducer with double membrane capsule*
- *The studio microphone classic*
- *Three directional characteristics: omni, cardioid, figure-8*
- *Switchable low frequency roll-off*
- *Switchable 10 dB pre-attenuation*
- *Ideal as main and as support microphone in the most differing recording situations*

The U 87 is probably the best known and most widely used Neumann studio microphone. It is equipped with a large dual-diaphragm capsule with three directional patterns: omnidirectional, cardioid and figure-8. These are selectable with a switch below the headgrille.



A 10 dB attenuation switch is located on the rear. It enables the microphone to handle sound pressure levels up to 127 dB without distortion.

Furthermore, the low frequency response can be reduced to compensate for proximity effect.

Applications

The U 87 Ai condenser microphone is a large diaphragm microphone with three polar patterns and a unique frequency and transient response characteristic.

Users recognize the microphone immediately by its distinctive design. It is a good choice for most general purpose applications in studios, for broadcasting, film and television.

The U 87 Ai is used as a main microphone for orchestra recordings, as a spot mic for single instruments, and extensively as a vocal microphone for all types of music and speech.

Acoustic features

The U 87 Ai is addressed from the front, marked with the Neumann logo.

The frequency response of the cardioid and figure-8 directional characteristics are very flat for frontal sound incidence, even in the upper frequency range.

The microphone can be used very close to a sound source without the sound becoming unnaturally harsh.

By means of a high-pass filter interferences through subsonic and low frequencies are reduced remarkably.

Polar patterns

The dual-diaphragm capsule is elastically mounted and protected by a large headgrille.

A switch below the headgrille selects the three directional patterns: omnidirectional, cardioid and figure-8.

A window above this switch shows the symbol of the selected characteristic.

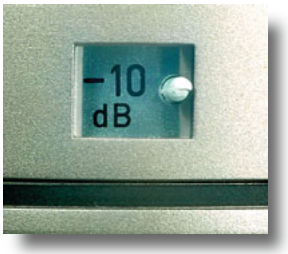
Electrical features

The letter A in the name indicates a more recent generation, as compared to the U 87 i microphones that were built from 1967 to 1986. Modifications apply to the electronic components of the microphone only; the capsule remained unchanged.

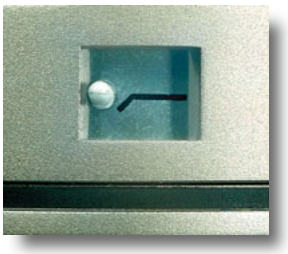
The present-day circuitry increases the operational headroom of the U 87 Ai by supplying the bias voltages for the capsule through a reduced resistance. The result is a higher sensitivity of 10 dB for identical sound pressure levels, and an improved S/N ratio of 3 dB.

Filter and attenuation

A switch located at the rear attenuates the sensitivity by 10 dB. When this switch is activated, the microphone accepts sound pressure levels up to 127 dB (equivalent to a sound pressure of 45 Pa) without distortion.



An additional switch at the rear allows to change the microphone's cutoff frequency. This reduces low frequency interference directly at the input of the microphone amplifier.



This setting also compensates for the unavoidable bass boost that occurs with all pressure gradient transducers when they are used at close distance (proximity effect).

The cardioid characteristic maintains a smooth frequency response at a distance of 30 to 40 cm, the figure-8 characteristic even at a distance of 15 to 20 cm.

Application Hints

- *For universal use*
- *The classical studio mic for vocalists (soloists and background vocalists)*
- *Announcer's mic for broadcasting, dubbing, voice-over*
- *Overhead*
- *Spot mic for*
  - *wind instruments*
  - *strings (especially cello and double bass)*
  - *piano*
  - *percussion*
- *Note: To record instruments with very high sound pressure levels we recommend our mics with TLM circuitry*

These are just some of the most common applications. We recommend additional experimentation to gain maximum use from this microphone.

Delivery Range

Microphone U 87 Ai (mt) in Wooden box

Studio set: *U 87 Ai (mt) Microphone, EA 87 (mt) Elastic suspension, Wooden box*

Stereo set: *2x U 87 Ai (mt) Microphone, 2x EA 87 (mt) Elastic suspension, 2x Dust cover, Aluminium case*

Catalog No.

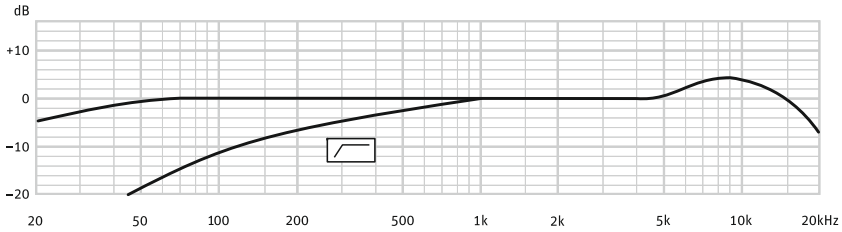
U 87 Ai	*ni*	*007022*
U 87 Ai mt	*blk*	*007023*
U 87 Ai Studio set	*ni*	*008660*
U 87 Ai mt Studio set	*blk*	*008661*
U 87 Ai Stereo set	*ni*	*008505*
U 87 Ai mt Stereo set	*blk*	*008506*

Selection of Accessories

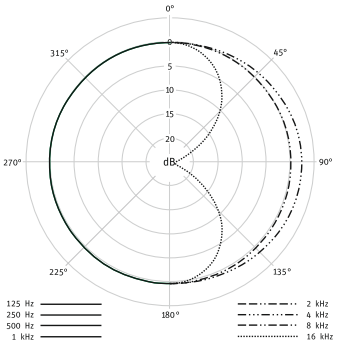
Battery supply, BS 48 i	*blk*	*006494*
Power supply, N 248	*blk*	*008537*
Auditorium hanger, MNV 87	*ni*	*006804*
Auditorium hanger, MNV 87 mt	*blk*	*006806*
Elastic suspension, EA 87	*ni*	*007297*
Elastic suspension, EA 87 mt	*blk*	*007298*
Stand mount swivel, SG 287	*blk*	*008658*
Popscreen, PS 20 a	*blk*	*008488*
Windscreen, WS 87	*blk*	*006753*
Microphone cable, IC 4 mt	*blk*	*006557*

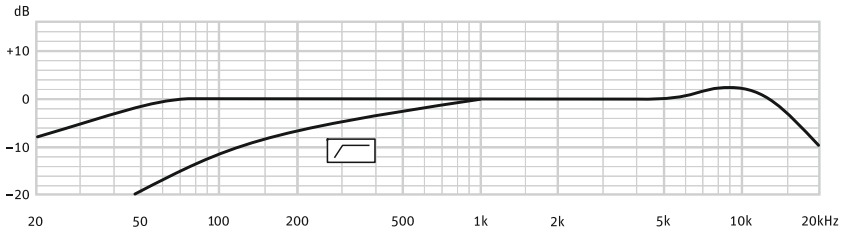
A complete survey and detailed descriptions of all accessories are contained in the accessories catalog.

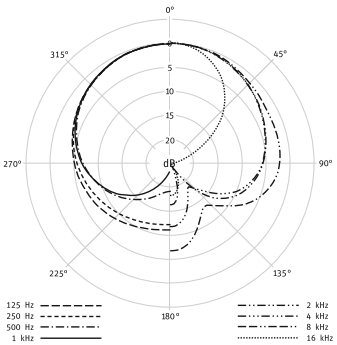
Meaning of color codes:
blk = black, ni = nickel

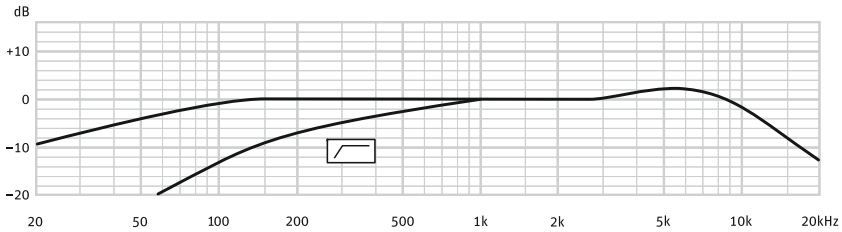


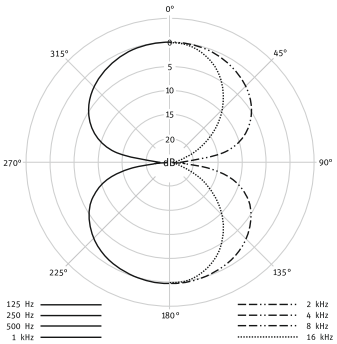
measured in free-field conditions (IEC 60268-4), tolerance ±2 dB











Technical Data

Acoustical operating principle	*Pressure gradient transducer*
Directional pattern	*Omnidirectional, cardioid, figure-8*
Frequency range	*20 Hz...20 kHz*
Sensitivity at 1 kHz into 1 kohm	*20/28/22 mV/Pa[1)]*
Rated impedance	*200 ohms*
Rated load impedance	*1000 ohms*
Signal-to-noise ratio, CCIR[2)] (rel. 94 dB SPL)	*68/71/69 dB[1)]*
Signal-to-noise ratio, A-weighted[2)] (rel. 94 dB SPL)	*79/82/80 dB[1)]*
Equivalent noise level, CCIR[2)]	*26/23/25 dB[1)]*
Equivalent noise level, A-weighted[2)]	*15/12/14 dB-A[1)]*
Maximum SPL for THD 0.5%[3)]	*117 dB (cardioid)*
Maximum SPL for THD 0.5% with preattenuation[3)]	*127 dB*
Maximum output voltage	*390 mV*
Dynamic range of the microphone amplifier, A-weighted	*105 dB*
Supply voltage (P48, IEC 61938)	*48 V ± 4 V*
Current consumption (P48, IEC 61938)	*0.8 mA*
Matching connector	*XLR3F*
Weight	*500 g*
Diameter	*56 mm*
Length	*200 mm*

[1)] Omnidirectional / cardioid / figure-8 [2)] according to IEC 60268-1; CCIR-weighting acccording to CCIR 468-3, quasi peak; A-weighting according to IEC 61672-1, RMS [3)] measured as equivalent el. input signal

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