

GFM 132

▶ **Boundary Layer
Microphone**



www.neumann.com



The GFM 132 is a boundary layer microphone. Through computer simulation Neumann optimized the design to be free of any comb filter effects due to reflections, typical of other such microphones.

The smooth frequency response for all angles of incidence exhibits a rise in the upper frequency range. This assures that all sound sources, even distant ones, will be recorded with clarity and presence.

Therefore, typical applications are for live recordings, such as in the orchestra pit of opera houses, theaters, and on stage.

The back of the microphone has non-slip pads for its use in a horizontal or inclined position, and holes for wall suspension. It is supplied with a wooden case and a wind screen.



Features

- Boundary layer microphone
- Pressure transducer
- Frequency independent hemispherical directional characteristic
- Identical diffuse- and free-field response
- No angle dependent coloration through patented triangular form
- No comb filter effects
- Insensitive to structure-borne noise

Background

Boundary-layer microphones are generally characterized by the following features:

They have an identical flat frequency response in the diffuse-field and free-field;

They have a hemispherical polar pattern, independent of the frequency;

They have a 6 dB higher output level through pressure doubling at the boundary surface.

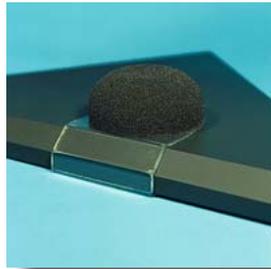
Until recently, neither the potential of identical diffuse- and free-field response, nor the ideal hemispherical polar patterns throughout the entire frequency range have been achieved by any known boundary-layer microphone. Circular, square, or rectangular plates were used to mount the acoustic transducer and to provide the "live" sound reflecting surface for pressure doubling at high frequencies.

However, such shapes have disadvantages: The sound pressure level at the position of the transducer depends on the frequency and the incidence angle. The incoming primary sound field is superimposed upon the secondary sound field resulting from diffraction at the edges of the plate. As a result, boundary-layer microphones using circular, square or rectangular shaped plates generate linear distortion, such as comb filter effects, of frequency and polar response.

The Neumann solution

The GFM 132 boundary-layer microphone has a unique, computer generated shape that totally avoids these disadvantages. The path lengths from each edge point to the center of the transducer are distributed evenly for all wavelengths within the frequency range.

This design eliminates any possible linear distortion of frequencies caused at the location of the electro-acoustic transducer by the interaction of the incoming primary sound field with the secondary sound field from diffraction at the edges of the plate.



The operating range of the plate reaches from the lowest frequency causing a pressure doubling in front of the plate to the upper limit of the audible range.

The microphone features a smooth frequency response for all angles of incidence, with a slight rise in amplitude in the upper frequency range. This assures that all sound sources, even distant ones, will be recorded with clarity and presence.

Acoustic features

- The microphone provides high output voltage through pressure doubling at the boundary surface.
- Identical diffuse- and free-field frequency response. Its advantage is that the apparent tonal balance of a moving sound source is independent of the distance and direction.
- The special geometric shape prevents angle-dependent coloration in the vertical and horizontal planes.
- There are no comb filter effects in typical applications, for example on a speaker's desk, as they would occur through reflections, using conventional microphones.
- The hemispherical polar pattern is independent of the frequency, producing a spatial sound with presence and excellent transparency.
- As is common for a pressure transducer, the microphone is insensitive to structure borne noise and air movements.

- The microphone reproduces with great accuracy very low frequencies if the boundary layer is adequately large.
- In surroundings with good acoustics the GFM 132 creates incredibly realistic AB-stereo recordings, taking advantage of delay and intensity differences in the audio signal.

Electrical features

The GFM 132 uses transformerless circuitry and operates on 48 V phantom power. The usual output transformer is replaced by an electronic circuit.

As with traditional transformers, this design ensures good common mode rejection and prevents RF interference that may influence the balanced audio signal. The microphone features high output capability and extremely low self noise. It provides exceptionally clean sound reproduction free of coloration.

Attenuation

The microphone has a 10 dB attenuation switch to prevent the input of the following unit from being overloaded.

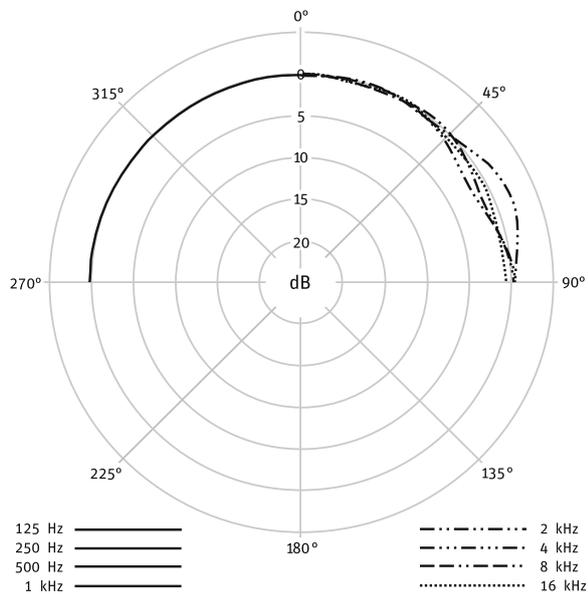
The switch is located next to the cable connector at the side of the GFM 132 boundary layer microphone.



Application Hints

- An ideal stereo pair for AB technique
- For round table discussions
- Quick and easy installation for the "fast interview"
- Invisible spot mic for
 - harp,
 - cello,
 - double bass,
 - acoustic guitar
- Excellent bass response when used as main mic for drums

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



Delivery Range

Microphone GFM 132
 Plug-on Windscreen
 Microphone cable
 Wooden box

Catalog No.

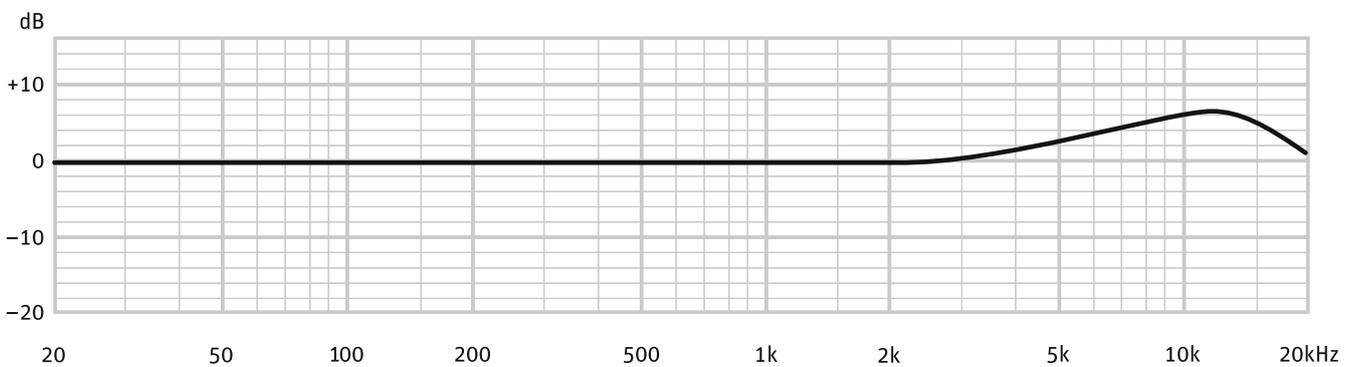
GFM 132blk 007100

Selection of Accessories

Battery supply, BS 48 iblk 006494
 Power supply, N 248 EUblk 008537
 Power supply, N 248 USblk 008538
 Power supply, N 248 UKblk 008539
 Microphone cable, IC 3 mtblk 006543

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

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



Technical Data

Acoustical operating principle	Pressure transducer	Maximum SPL for THD 0.5% ²⁾	137 dB
Directional pattern	Hemispherical	Maximum SPL for THD 0.5% with preattenuation ²⁾	147 dB
Frequency range	20 Hz...20 kHz	Maximum output voltage	10 dBu
Sensitivity at 1 kHz into 1 kohm	18 mV/Pa	Dynamic range of the microphone amplifier (A-weighted)	123 dB
Rated impedance	50 ohms	Supply voltage (P48, IEC 61938)	48 V ± 4 V
Rated load impedance	1000 ohms	Current consumption (P48, IEC 61938)	2 mA
Signal-to-noise ratio, CCIR ¹⁾ (rel. 94 dB SPL)	70 dB	Matching connector	XLR3F
Signal-to-noise ratio, A-weighted ¹⁾ (rel. 94 dB SPL)	80 dB	Weight	460 g
Equivalent noise level, CCIR ¹⁾	24 dB	Width	213 mm
Equivalent noise level, A-weighted ¹⁾	14 dB-A	Depth	168 mm

¹⁾ according to IEC 60268-1; CCIR-weighting according to CCIR 468-3, quasi peak; A-weighting according to IEC 61672-1, RMS ²⁾ measured as equivalent el. input signal