

# User's Manual

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Cardioid  
Microphones  
Type 4011  
Type 4012



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**DPA**   
MICROPHONES

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**Cardioid Microphones  
Type 4011, Type 4012**

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## The cartridge

Directional microphones Type 4011 and 4012 uses a 19mm diameter prepolarized pressure gradient condenser-microphone cartridge with a first order cardioid pick-up pattern. The diaphragm is of PVDF with a vaporized layer of aluminum. This material is non-hygroscopic, i.e. it does not absorb water, and is highly resistant to the most aggressive kinds of humidity. The microphone housing is German silver. The large spacing between the diaphragm and the back plate in this cartridge makes the microphone highly insensitive to temperature influence. The microphone cartridge is designed to have a linear on-axis response from 40Hz to 20kHz  $\pm 2$ dB measured in 30cm distance (see Fig. 4). Great attention has also been paid to the microphone's off-axis performance during the design process (see Fig. 4). The diaphragm is protected from dust by an acoustical transparent net behind the front protection grid and inside the back port of the cartridge. For optimum stability the microphone cartridges have undergone a special pre-aging process which releases all tensions in the materials and stabilizes the polarization voltage.

## The preamplifier

Types 4011 and 4012 are acoustically identical, but differ in their preamplifier powering system. The 4012 is powered with 130V via the HMA4000 High-Voltage Microphone Amplifier and has a modified 4-pin XLR-connector (see Fig. 1 for pin designation). This special powering system enables the microphone preamplifier to handle approximately 10dB higher sound pressure level than similar microphone types powered through conventional P48 systems (4012: 168dB SPL peak and 4011: 155dB SPL peak). Both the 4011 and the 4012 together with the HMA4000 are transformerless. The 4011 is powered via a standard P48 system and is equipped with standard 3-pin XLR-connector (see Fig. 2 for pin designation), but has an attenuator switch built into the

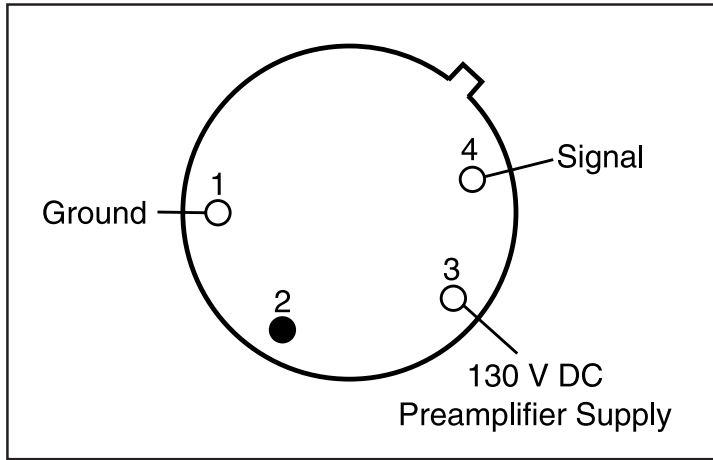
connector (see Fig. 3). The 0dB/20dB attenuation allows the 4011 to be used for close-miking high SPL sound sources without the output of the microphone overloading the console input amplifier. Types 4012 and 4011 use state of the art low-noise preamplifier technology and are driven with unity gain.

All microphones come with an individual calibration chart of the self noise, sensitivity and the individual frequency response.

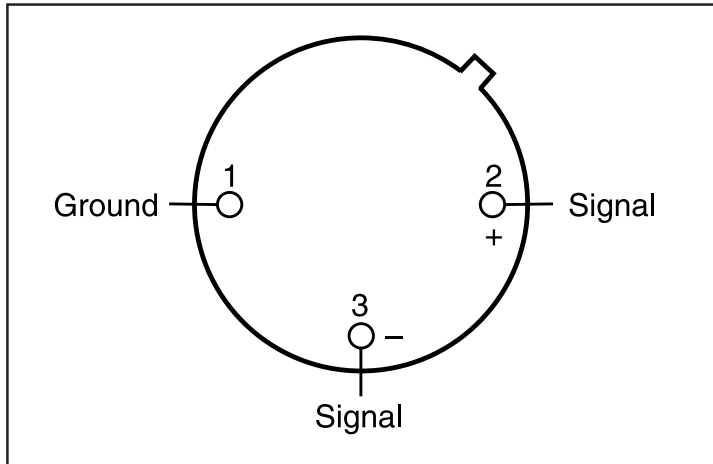
### **The Passive Connection Converter**

The PCC4000 Passive Connection Converter is an optional accessory, that makes it possible to run High-Voltage Microphones on standard 48V phantom power with reduced microphone specifications. The maximum reduction of the microphone SPL handling capability will be 13dB and it is possible to drive up to 100m of cable with the PCC4000 with the same specifications. Like the High-Voltage Microphones the PCC4000 is transformerless. The input connector is a modified 4-pin female XLR for connection directly to the microphone. The output is a standard 3-pin male XLR-connector for connection to standard cables.

**Important:** The microphones will only live up to their specifications if powered correctly.

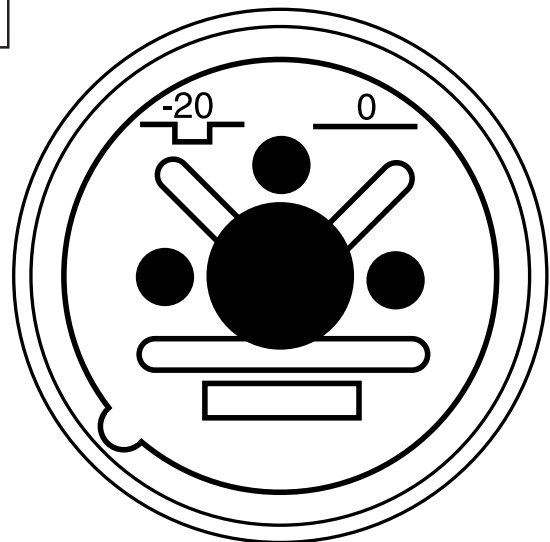


*Fig. 1.*  
*External view of the output socket of the Type 4012.*



*Fig. 2.*  
*External view of the output socket of the Type 4011.*

*Fig. 3*  
*The switch on the XLR-connector of Type 4011 is used to select between 0dB and 20dB attenuation. Switch pressed in results in maximum attenuation.*



**Cartridge type:** Pre-polarized condenser B&K Type MM0056

**Principle of operation:** Pressure gradient

**Power Supply:** 4011: Phantom P48

4012: HMA4000 Two-channel High-Voltage Microphone  
Amplifier - 130V or PCC4000 Passive Connection  
Converter for P48

**Frequency range:** On-axis: 40Hz - 20kHz  $\pm$ 2dB

**Phase response:** Phase matching between any two microphones:  $\pm$ 15°  
(100Hz to 20kHz)

**Directional characteristics:** Cardioid

**Sensitivity:** 4011: Nominally 10mV/Pa; -40dB re. 1V/Pa unloaded (at 1kHz)

4012: Nominally 9mV/Pa; -41dB re. 1V/Pa unloaded (at 1kHz)

**Equivalent noise level A-weighted:** Typ. 19dB(A) re. 20 $\mu$ Pa (max. 20dB(A))

**Equivalent noise level CCIR 468-1:** 4011: Typ. 25dB (correct with the attenuator  
in 0dB or -20dB setting)

4012: Typ. 25dB

**Max SPL:** 4011: 158dB SPL peak before clipping (attenuator set to either  
0dB or -20dB)

4012: 168dB SPL peak

4012: with PCC4000: 155dB peak

**Total Harmonic Distortion:** 110 dB SPL peak (<0.5% THD)

116 dB SPL peak (<1% THD)

**Preamplifier:**

**Frequency range:** 4012: 20Hz to 50kHz  $\pm$ 0,2dB, 5Hz to 150kHz -3dB

4011: 20Hz to 40kHz -3dB (loaded with 2x10 kOhm//  
10nF - equivalent to 100m cable)

**Output impedance:** <220 Ohm

**Cable drive capability:** 4011: Up to 100m

4012: With HMA4000: Up to 300m

4012: With PCC4000: <100m

**Polarity:** 4012: Positively increasing sound pressure produces positive-going voltage at pin 4. Pin 1: Ground, Pin 2: Not used, Pin 3: 130 V DC preamplifier supply, Pin 4: Signal. See Fig. 1.

4011: Positively increasing sound pressure produces positive-going voltage at pin 2. Pin 1: Ground, Pin 2: Signal +, Pin 3: Signal return. See Fig. 2

**Difference frequency distortion:** (DF2, DF3, Df = 70Hz) <0.5% at 110dB SPL peak

**Influence of vibration:** <71dB equivalent SPL for 1m/s<sup>2</sup> in direction of greatest sensitivity

**Influence of magnetic field:** 45dB equivalent SPL for 80A/m, 50Hz in direction of greatest sensitivity

**Operating temperature range:** -10 to +55°C (+14 to 131°F)

**Dimensions:**

**Microphone length:** 175mm

**Microphone diameter:** 19mm

**Capsule diameter:** 19mm

**Weight:** 165g

**For use with Microphone Amplifier:**

HMA4000 Hi-Voltage Microphone Amplifier, 2 ch.

**Accessories included:**

**Microphone Holders & Suspension Mounts**

UA0961 Microphone Holder

**Windscreens**

UA0896 Windscreen for Ø19mm Microphone

**Accessories Available**

**Shock Mounts**

RSM4000 Shock Mount for Windjammer

UA0897 Shock Mount

**Shock Mount Rubbers**

DDS0731 Rubber Mount 19mm, Medium Soft

**Microphone Holders & Suspension Mounts**

UA0639 Microphone Clip

**Stereo Accessories**

DUA0019 Spacer for Stereo Boom, 19mm

UA0836 Stereo Boom with Holders

UA0837 Stereo Boom excluding Holders

**Floor & Table Stands**

MB4000 Magnet Base

TB4000 Table Base

**Connection Adapters**

HTP4000 Converter: 130V to P48

PCC4000 Passive Connection Converter: P48 to 130V

**Cables**

AO0182 P48 Microphone Cable, 5m

AO0261 130V Microphone Cable, 5m (Type 2812)

DA00130 130V Microphone Cable, 5m (Type HMA4000)

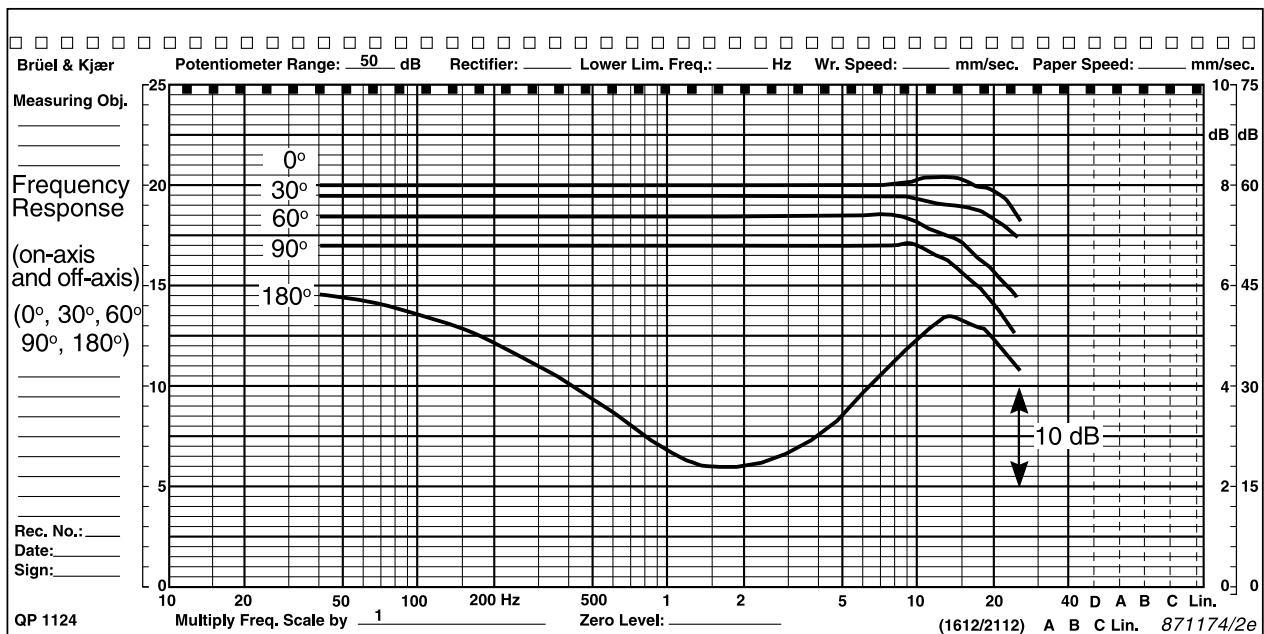


Fig. 4. On-and off-axis responses of Types 4011 and 4012 measured in 30cm.



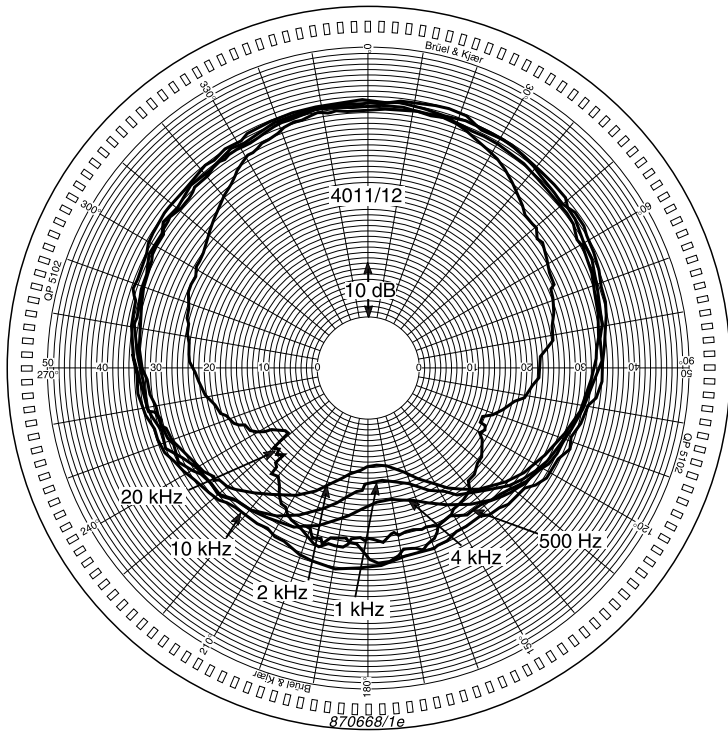


Fig. 5.  
Directional characteristics  
of Types 4011 and 4012.

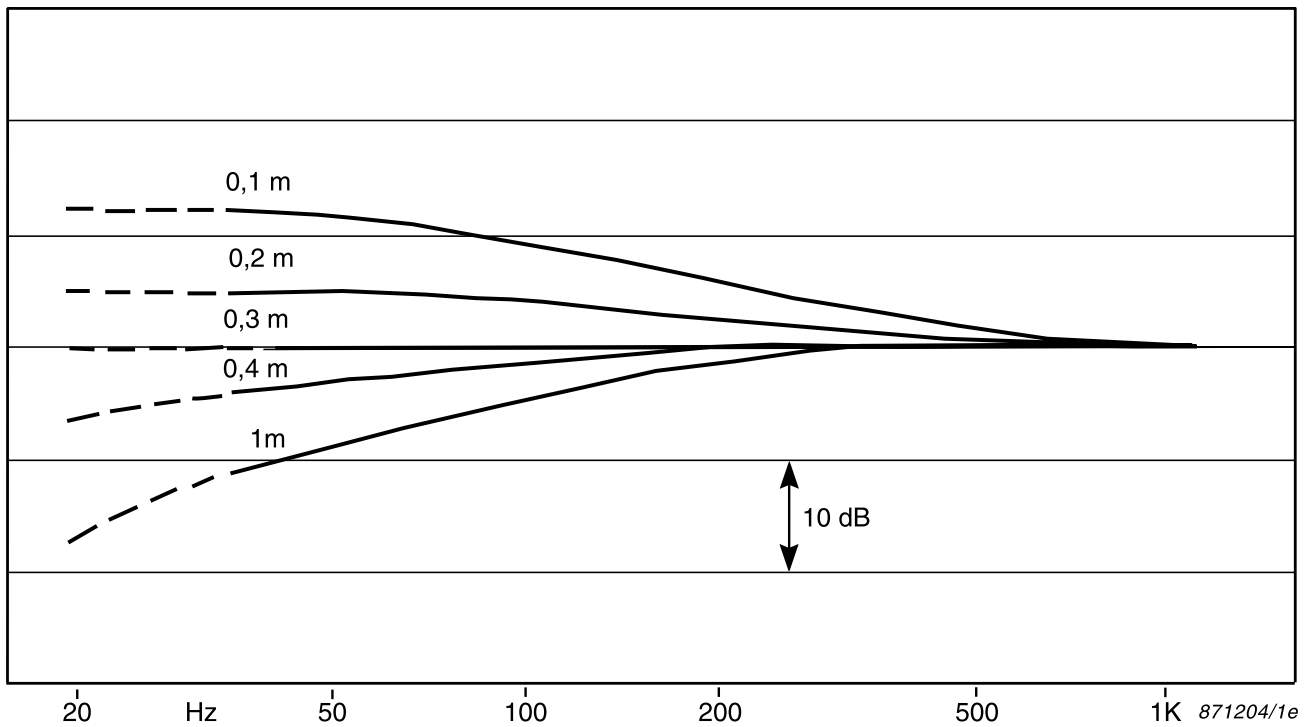


Fig. 6. The proximity effect exhibited by the 4011 and the 4012.

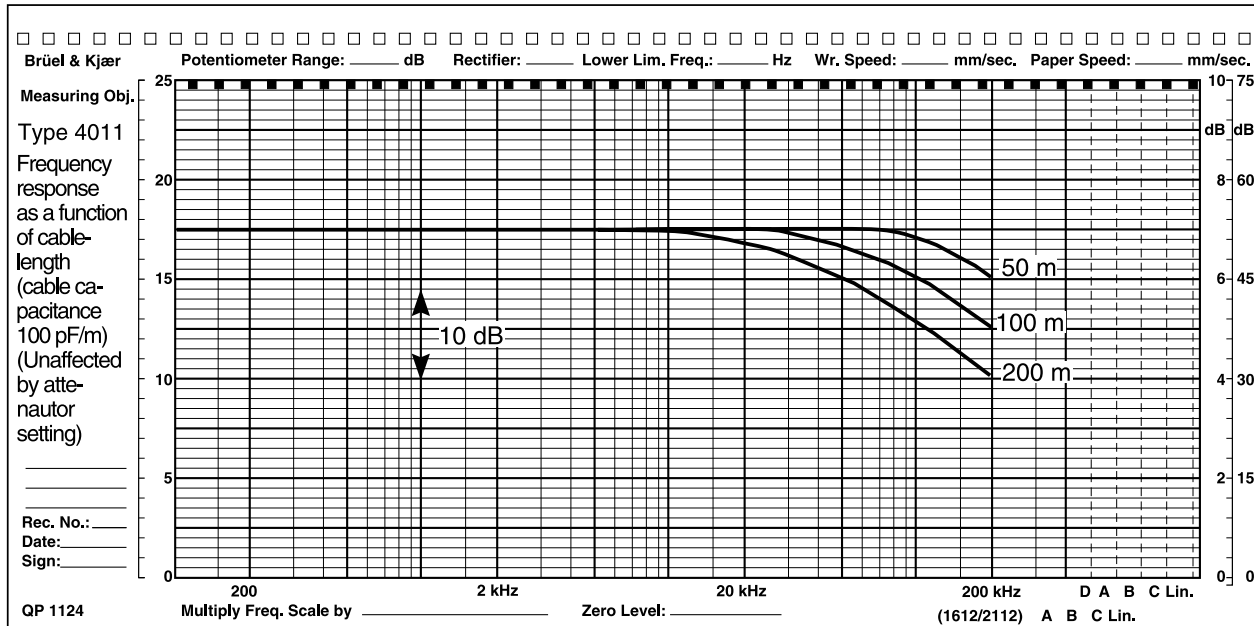


Fig. 9. The effect of various cable lengths (loading capacitance) on the frequency response of the Type 4011 (based on nominal sensitivity). For the Type 4012 with the HMA4000 the curve shapes are the same, but the cable lengths are three times greater.

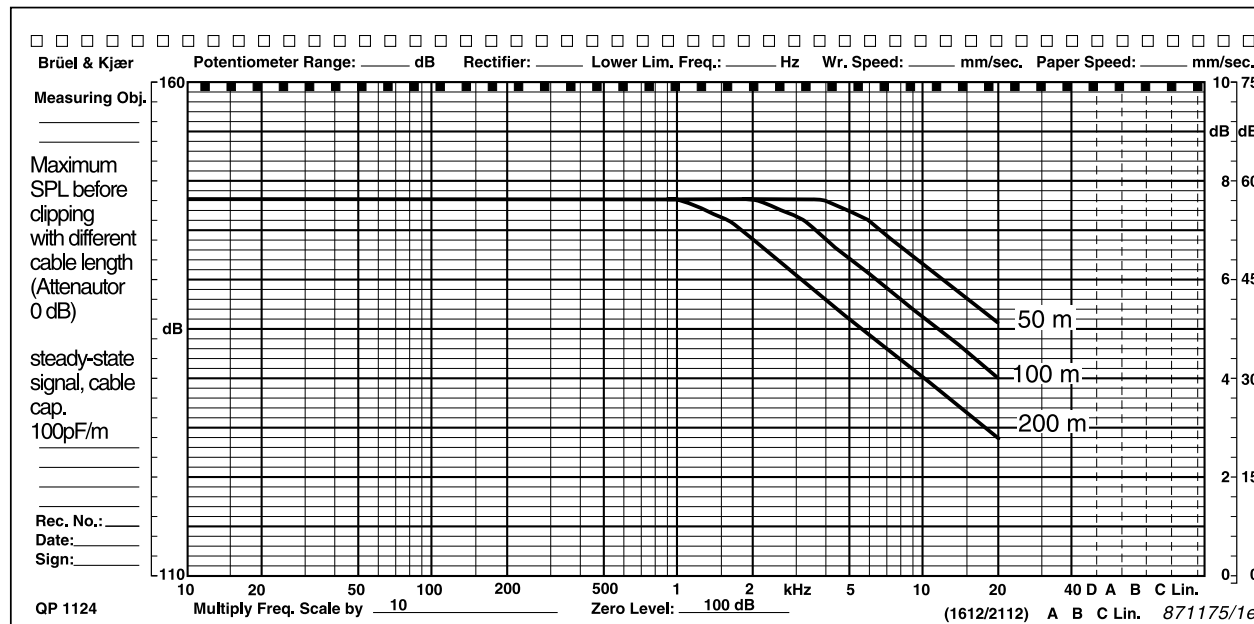


Fig. 10. SPL-handling capability (before clipping occurs) of Type 4011 with various cable lengths (based on nominal sensitivity).

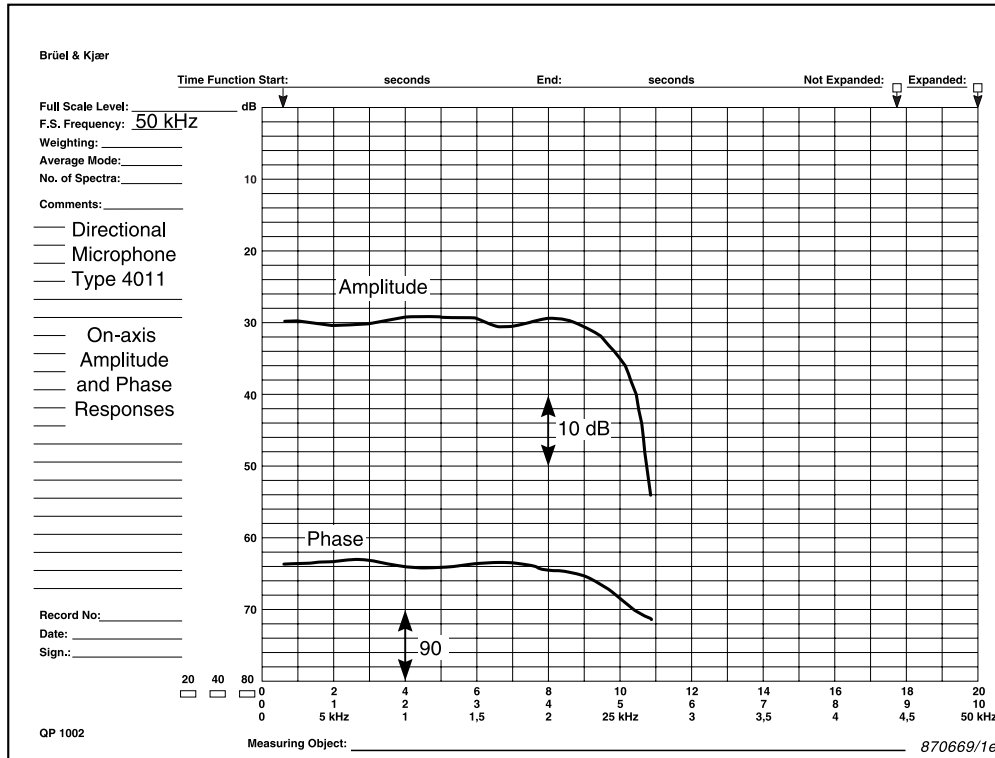


Fig. 7. On-axis amplitude and phase responses of Types 4011 and 4012 plotted using a linear frequency axis for evaluation of the phase response.

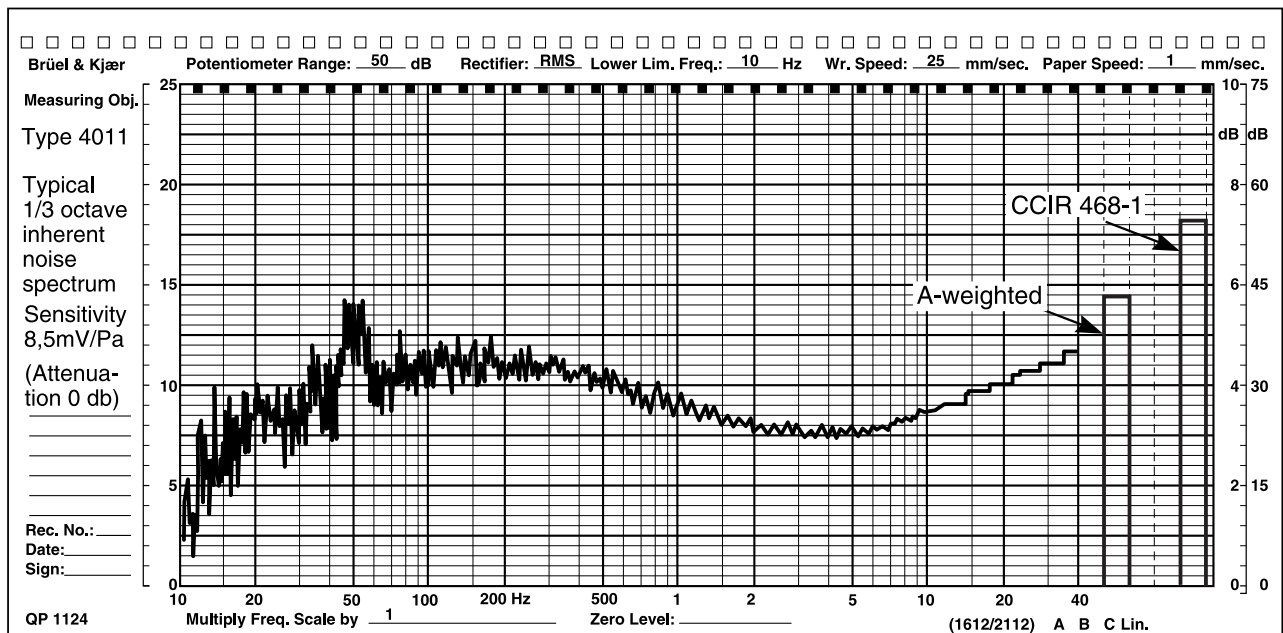


Fig. 8. Typical third-octave inherent-noise spectrum of Types 4011 and 4012.

It is important to bear in mind the following points with regards to mounting, microphone care and the use of accessories:

- The microphone cartridge is tightly secured to the main body housing, and no attempt should be made to remove it. If a replacement cartridge is required, contact your local DPA Microphones representative.
- Use of windscreen is recommended when microphones are used in dirty or dusty environments.
- When not in use, the microphone should be disconnected and kept in the case supplied.

## Service & Repair

Products from DPA Microphones are extremely stable and there should not be any significant change in the specifications with time and use. If, however, you are not totally satisfied with the characteristics exhibited by these products, then contact your nearest DPA Microphones representative for further details of service and the repair facilities that are available. DPA Microphones has a maximum seven working days in-house service policy, guaranteeing that no more than seven working days will elapse from the day we receive the item for service to the day we are ready to return it to you. Your satisfaction is our satisfaction.

Please contact DPA Microphones for your nearest representative on tel. +45 48 14 28 28 or fax +45 48 14 27 00.

## Warranty

All products from DPA Microphones are covered by a limited warranty on both their mechanical functionality and their documented specifications. We are so confident of the quality of these products, that this warranty is valid for one year from the date of purchase, as long as the items are not directly mistreated or abused. In case of a warranty claim, your invoice is your warranty registration.

## CE Standard

The CE-mark guarantees all products conform with relevant standards approved by the European Community. The products described in this User's Manual comply with current relevant standards when used with cables from DPA Microphones.

EMC Directive: 89/336/EEC, amended by 92/31/EEC and 93/68/EEC

Low Voltage Directive: 73/23/EEC, amended by 93/68/EEC



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