

# User's Manual

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## Two-Channel Hi-Voltage Microphone Amplifier Type HMA4000



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# Two-Channel Hi-Voltage Microphone Amplifier Type HMA4000

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The DPA Microphones High-Voltage Microphones Types 4003, 4004 and 4012 are powered via the Two-Channel High-Voltage Microphone Amplifier HMA4000, which supplies 130V to their build-in preamplifiers giving the microphones excellent SPL handling capability. But the HMA4000 is not only a power supply unit, it is also a microphone amplifier with outstanding specifications:

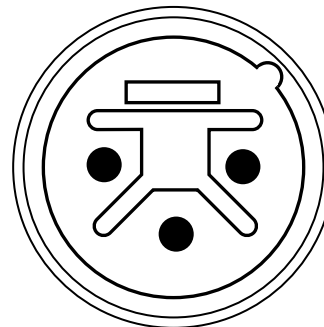
### The Microphone Amplifier

The HMA4000 uses state-of-the-art, low-noise operational amplifiers from Analog Devices, in the input stages. Each channel input features independently switchable amplification or attenuation by +20 dB; 0 dB or -20 dB corresponding to a maximum input voltage of 1,6 V; 16 V or 160 V peak. The dynamic ranges in the three attenuator settings are: 126 dB(A)THD=0,5% in setting +20 dB; 134 dB(A)THD=0,5% in setting -20 dB and 140 dB(A)THD=0,5% in setting 0 dB. The HMA4000 is completely transformerless, which gives the microphone amplifier an excellent frequency range from 10 Hz to 200 kHz (-1 dB). Furthermore, there is only one capacitor (a high quality polycarbonate condenser) in the signal path in the HMA4000. The HMA4000 has a channel separation better than -90 dB measured in worst case with the attenuator setting. Featuring both electronically balanced and single ended line-level outputs, the HMA4000's impedance converters can drive up to 300m of cable. Both input channels are single ended and it is recommended to use DPA Microphone cables such as DA00130 to keep noise rejection at its optimum.

### Absolute phase

During the design process attention has been paid to the absolute phase of the system. Positive going voltage at pin 4 on the modified 6 pin female XLR input socket will produce positive-going voltage at pin 2 on the standard 3-pin male XLR output socket. (Pin 1: Ground; Pin 2: Signal +; Pin 3: Signal return). See Fig. 1 and Fig 2 for pin designation of the input and output sockets).

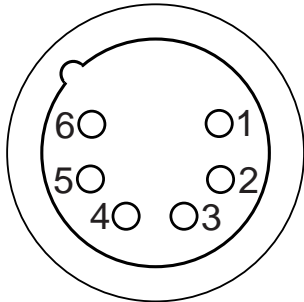
*Fig. 1. External view of the output socket of the HMA4000.*



## The power supplies

The HMA4000 supplies 130 VDC to the built-in preamplifiers of the High-Voltage Microphones Types 4003, 4004 and 4012 via pin 2 on the modified 6 pin input socket on the HMA4000, giving the microphones an extended SPL handling capability. Furthermore the HMA4000 is prepared for powering future microphones from DPA Microphones: 200 VDC on pin 5 and 6,3 VDC on pin 6. See Fig. 2.

*Fig. 2. External view of the modified 6 pin input socket of the HMA4000.*



## Mains Supply

The HMA4000 can be run from either 110 V/ 60 Hz or 230 V/ 50 Hz external powering, and automatically switches to the appropriate power setting when connected. The AC mains supply for the HMA4000 is connected via the 3 pin IEC 320 socket which accepts cable DAN0010 (supplied). Maximum power

consumption is 15 W. The mains fuse needs only to be checked if the power indicator on the front of the HMA4000 fails to light. See Fig. 7 and Fig. 8 for how to change mains fuse.

## Optional accessories - Cables

Special high-voltage microphone cables can be obtained as optional accessories for the HMA4000. The standard DA00130 High-Voltage Microphone Cable is 5m long and is equipped with a modified 4 pin female XLR-connector in the microphone end and a modified 7 pin male XLR-connector in the output end, where it connects to the HMA4000. The microphone cable used in the DA00130 uses oxygen free copper in both conductors and screen. The tightly woven screen has 98% coverage and therefore has an extremely efficient noise rejection. Special lengths of high-voltage microphone cable up to 20m can be ordered. Please contact your local DPA Microphones representative if you require special cable lengths.

## Optional accessories - HTP4000 Phantom Converter

The HTP4000 High-Voltage To Phantom Converter connects to the input socket of the HMA4000 and converts the high-voltage microphone input channel to a P48 microphone input channel of extremely high quality. The HTP4000 uses a standard 3 pin female XLR-connector on the audio input (see Fig 1 for pin configuration), and a modified 7 pin male XLR-connector where it connects to the HMA4000. It is transformerless and accepts both electronically and transformer balanced microphone signals. Using standard DPA microphones 4006, 4007 or 4011 with the HMA4000 and the HTP4000 the absolute phase is preserved (see "Absolute Phase").

**Frequency range:** 10Hz to 200kHz (+0dB / -1dB)

**Dynamic range:**

Attenuator Setting	HMA4000	HTP4000
+20 dB	126dB(A)	114dB(A)
0 dB	140dB(A)	128dB(A)
-20 dB	134dB(A)	122dB(A)

**No channels:** 2

**Channel crosstalk:** <-90dB (0Hz to 20kHz)

**Attenuation:** +20dB, 0dB, -20dB

**Equivalent noise level A-weighted:** Pin 2-1: <0.4 $\mu$ V, Pin 2-3: <0.6 $\mu$ V  
(measured in setting: +20dB)

**Equivalent noise level CCIR 468-1:** Pin 2-1: <1.8 $\mu$ V, Pin 2-3: <3.0 $\mu$ V  
(measured in setting: +20dB)

**Cable drive capability:** <300m

**Max input voltage:** 1.6V (+20dB); 16V (0dB); 160V (-20dB)

**Max output voltage:** 32V peak (16V peak for single ended operation)

**Input impedance:** 30 kOhm

**Output impedance:** 2 x 50 Ohm

**THD:** <-75dB (0Hz to 40kHz)

**Min output current:** 2 x 55mA

**Max output DC offset:**  $\pm$ 20mV

**Min load impedance:** 600 Ohm

**Input connector:** Via modified 6 pin female XLR-socket. Accepts cable DA00130.  
Switchable +20dB; 0dB or -20dB  $\pm$ 0.5dB

**Output connector:** Via standard 3 pin male XLR-socket

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

**Mains voltage:** 100Vac - 127Vac and 200Vac - 240Vac, 50Hz and 60Hz Mains Supply

**Power consumption:** Maximum 15W

**Dimensions:** 200mm x 133mm x 52mm

**Weight:** 1.85kg

**Spareparts Included:**

DAN0010 Power Cable

2 x DVF0250 250mA Slow-Blow Fuse

**For use with:**

**Standard Microphones**

3529 A-B Stereo Kit, 130V

4003 Omnidirectional Microphone, 130V

4004 Hi-SPL Omnidirectional Microphone, 130V

4012 Cardioid Microphone, 130V

**Accessories Available:**

**Connection Adapters**

HTP4000 Converter: 130V to P48

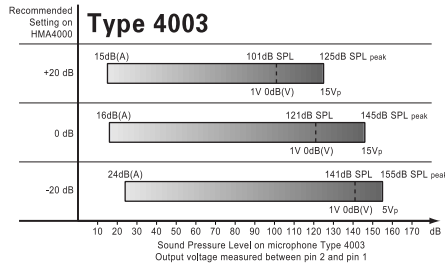
PCC4000 Passive Converter: P48 to 130V

**Cables**

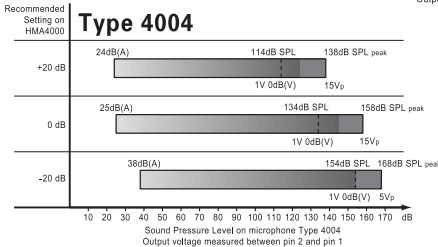
DA00130 130V Microphone Cable, 5m (Type HMA4000)

To choose a suitable setting of the input attenuator on the HMA4000 it is recommended to estimate the peak and average sound pressure levels encountered by the microphone during the recording.

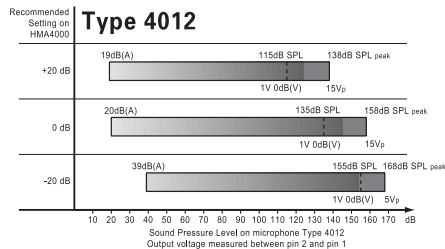
*Fig. 3. Recommended HMA4000 setting with Type 4003.*



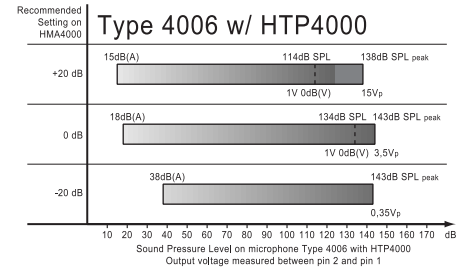
*Fig. 4. Recommended HMA4000 setting with Type 4004.*



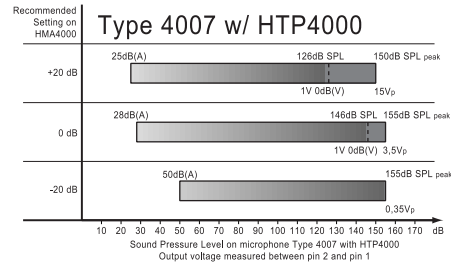
*Fig. 6. Recommended HMA4000 setting with Type 4012.*



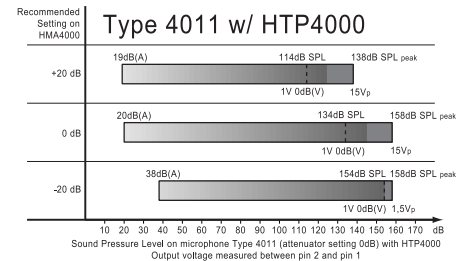
*Fig. 7. Recommended HMA4000 setting with Type 4006 and HTP4000.*



*Fig. 8. Recommended HMA4000 setting with Type 4007 and HTP4000.*



*Fig. 9. Recommended HMA4000 setting with Type 4011 and HTP4000.*

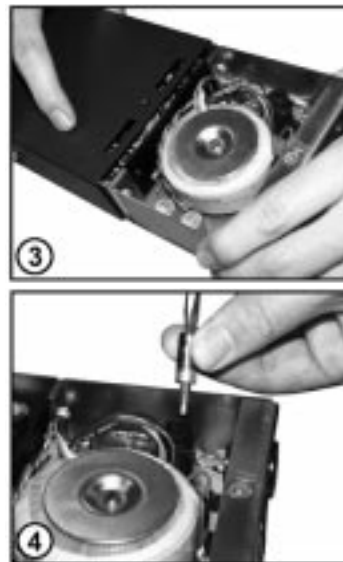
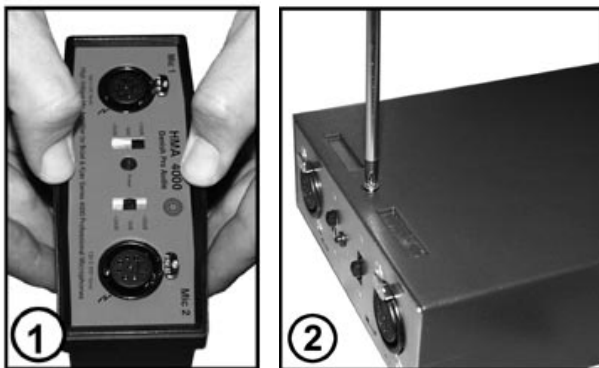


The Type HMA4000 is fitted with a 250 mA slow blow fuse (DVF0250). The fuse is rated to give adequate protection at both 110 VAC and 230 VAC. Only the correct replacement must be fitted.

**WARNING!** Disconnect the HMA4000 from the mains supply before removing the instrument casing.

1. The mains fuse holder is located on the printed circuit board of the HMA4000. To gain access to it, the front and rear face panels of the HMA4000 should be removed by pulling the top and bottom edges of the clip on frame outwards (as shown in Fig. 7).
2. Unscrew the two retaining screws on the metal casing of the HMA4000
3. Gently pull out circuit board.
4. Remove the Mains Fuse with a screwdriver and insert a new Mains Fuse likewise.

Fig. 7.



**Care of the HMA4000**

The operating temperature range of Type HMA4000 Two-Channel High-Voltage Microphone Amplifier is from -10 °C to +55 °C (+14 °F to +131 °F). The instrument is protected against internal overheating by a self-resetting thermal switch which operates at 125 °C ±5 °C.

The HMA4000 is extremely robust. It is insensitive to vibration and will withstand mechanical shock. Therefore the HMA4000 is well suited for placement on the stage or the studio floor.

## **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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