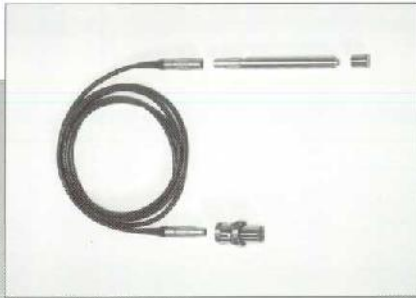


## MICROPHONE PREAMPLIFIER type 1201



### Uses:

- Precision sound measurements using precision microphone cartridges with UNS 60 threads
- General purpose high impedance input stage for measuring amplifiers and analysers

### Features:

- Small compact design
- Detachable preamplifier cable
- One-size connector system eliminates extension cable incompatibility
- Very high input impedance
- Low output impedance
- Excellent driving capabilities for long cables
- Wide dynamic range



The microphone preamplifier type 1201 has been designed for general use with most ½" condenser microphones—with or without permanent polarisation. Using mechanical adaptors, the preamplifier is well suited for other microphone sizes as well.

The amplifier has a high dynamic range to permit a large voltage swing and low noise. A broad frequency response lets you take full advantage of the capabilities of the microphone.

The frequency response covers a range from below 1Hz to above 200kHz. The capacitive influence of the various cartridges and cables has been minimised by the high input/low output impedance design. A push-pull output circuit ensures good driver capabilities.

The amplifier is equipped with a heater resistor to increase the temperature of the microphone/preamplifier assembly to minimise the risk of condensation under humid conditions.

### Introduction

The preamplifier type 1201 has been designed to match the needs of Norsonic ½" microphone cartridges, but may be used as a general purpose input stage for measuring amplifiers and analysers.

The signal cable is detachable and the same type and size of connector is used throughout the cabling system to ensure extension cable compatibility. There is no need to use a separate cable to connect the preamplifier to an extension cable.

The 1201 has a high input impedance and a low output impedance combined with excellent driver capabilities. This design ensures that the preamplifier presents virtually no load to the microphone cartridge and that long cables can be used without severe signal distortion.

### Frequency Response

The small signal frequency responses of the amplifier are shown in Fig. 1 (overleaf) for different source capacitances. The 18pF corresponds to most ½" cartridges and 50pF to most

1" cartridges, while the 6.4pF will be typical for ¼" size microphones.

The graphs apply when the polarisation voltage is on or the polarisation voltage is grounded in the case of prepolarised (electret) microphone cartridges.

Connecting the polarisation voltage terminal to the output of the 1201, increases input impedances thereby improving the low-frequency response for certain applications.

The frequency response must then be checked for low-frequency resonances by testing it out with real source impedances.

The input impedance of most sound level meters and analysers will be high enough not to influence the frequency response of the preamplifier. Long extension cables have a capacitance that may limit the slew rate of the output signal. This will reduce the upper frequency response for signals with large voltage swings. Such limiting will be a non-linear process and may therefore also disturb the low frequency contents of the signal. Cable effects should

always be considered when long cables are used.

To minimise such problems, the type 1201 has been designed with high efficiency driver capabilities. However, the power supply feeding the preamplifier will in most cases set the practical limit. The maximum upper frequency as a function of cable length has been tabulated in Table 1.

## Noise Considerations

Fig. 2 shows a typical frequency spectrum of the preamplifier's inherent noise in one-third octave bands for a transducer impedance of 18pF. Note that a real microphone cartridge has resistive impedance components in addition to its capacitance. As the classic theory describes, resistive components produce inherent noise which will increase the overall noise level. The low inherent noise of the preamplifier when used with a dummy microphone shows that the noise floor for the preamplifier/microphone assembly is mainly determined by the microphone cartridge.

## Preamplifier Gain

The voltage gain of the preamplifier is very close to 1. As the input impedance is 20GΩ, the attenuation due to loading of the source will mainly be determined by the input capacitance. By the use of a driven guard and bootstrapping technique, the input capacitance is reduced to approximately 0.15pF. If the source capacitance is 18pF—which will be the case for ½" cartridges—the attenuation will be less than 0.1dB.

**Accessories included:** Tripod adaptor, plastic case.

**Accessories available:** Cable system (see separate catalogue), microphone cartridges, power supplies, adjustable tripod adaptor (1262), BNC input adaptor (1447), dummy microphone (1448), windscreen Ø60mm (1451), windscreen Ø90mm (1434)

Specifications subject to change without notice

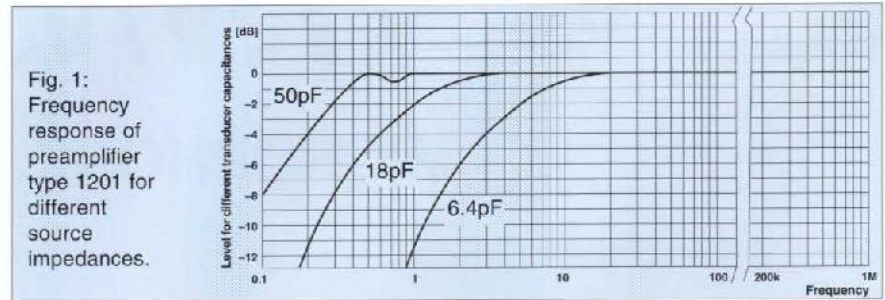


Fig. 1: Frequency response of preamplifier type 1201 for different source impedances.

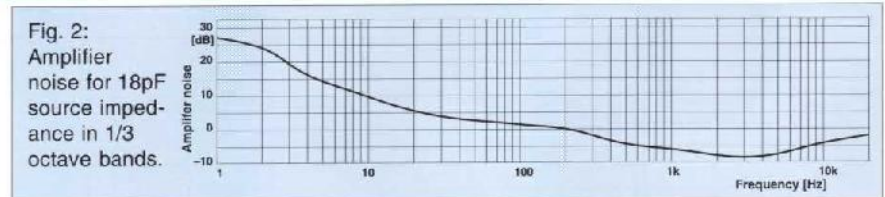


Fig. 2: Amplifier noise for 18pF source impedance in 1/3 octave bands.

Supply voltage: 120V & 50mV/Pa sens.				
	10m	20m	50m	100m
150dB	8	5	2	1
140dB	35	20	12	5
130dB	>100	70	40	15
120dB	>100	>100	>100	60
110dB	>100	>100	>100	>100

Supply voltage: 28V & 50mV/Pa sens.				
	10m	20m	50m	100m
136dB	15	8	5	2
130dB	40	23	12	7
120dB	>100	70	33	16
110dB	>100	>100	>100	25
100dB	>100	>100	>100	>100

Table 1: Maximum upper frequency as a function of cable length in metres. THD < 1%. All figures are approximate and in kHz unless indicated otherwise. Values apply to Norsonic 1201 only. Other preamplifiers may give other results. Probably less favourable.

## Specifications

**Gain:** 0 ±0.05dB @ 1kHz  
(-0.01dB typical)

**Frequency range:** 1Hz to 1MHz ±0.5dB  
0.8Hz to 4.5MHz ±3dB. Both ranges small signal values measured with 18pF transducer capacitance.

**Input impedance:** 20GΩ, 0.2pF

**Phase response:** 30Hz to 80kHz (2°)  
3Hz to 500kHz (15°)

**Output impedance:** 55Ω @ 1kHz with  $C_s = 20pF$

**Output voltage swing (Peak):**  
min. ±50V @ 120V supply voltage  
min. ±10V @ 64V supply voltage

**Max RMS output (Capacitive load):**  
33V/3mA @ 120V supply voltage  
7V/0.9mA @ 28V supply voltage

**Current consumption:**  
2.3mA @ 120V supply voltage  
0.7mA @ 28V supply voltage

**Power supply voltage range:** 25–130V

### Noise (A-weighted):<sup>1)</sup>

50pF (1" mic.): 0.9μV typ. max 1.3μV  
20pF (½" mic.): 1.7μV typ. max 2.2μV  
6pF (¼" mic.): 4.4μV typ. max 6μV

### Noise (linear):<sup>1)</sup>

50pF (1" mic.): typ. 3.1μV  
20pF (½" mic.): typ. 5.7μV  
6pF (¼" mic.): typ. 13.8μV

**Heater impedance:** 225W ±20%

**Heater voltage:** 0–15V

**Temperature operation range:**  
-10 to +50°C

**Temperature storage range:**  
-25 to +70°C

**Relative humidity operation range:**  
0 to 90%

**Relative humidity storage range:**  
0 to 95%

### Physical dimensions:

**Diameter:** 12.7 mm

**Length:** 127 mm

**Weight:** 58 g

**Connector type:** 7 pin LEMO type FGGIB307CNAD62

All values are typical

<sup>1)</sup> Measured with dummy microphone