

# ¼" Preamplifier Type 26TC, Built-in TEDS

## Product Data

### Typical Applications

- General-purpose preamplifier
- High-frequency measurements
- High-pressure measurements
- Multi-channel measurements

### Special Properties

- Wide Frequency Range
- Low Noise Level
- Very Small
- Built-in TEDS<sup>1</sup>

### Description

The G.R.A.S. ¼" Preamplifier Type 26TC is a small robust unit optimised for acoustic measurements using condenser microphones. It has a very low inherent noise level, a wide dynamic range and a frequency response from below 2 Hz to above 200 kHz.

The Type 26TC is delivered with a built-in TEDS<sup>1</sup> chip and can be programmed as a single unit with a microphone fitted.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of this preamplifier ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

### Dynamic Range

Type 26TC can handle both single and dual-sided power supplies. The supply can vary between 28 V<sub>DC</sub> and 120 V<sub>DC</sub> single-sided or ±14V<sub>DC</sub> and ±60 V<sub>DC</sub> dual-sided. When using the high supply voltage (120V<sub>DC</sub> or ±60V<sub>DC</sub>), the dynamic range exceeds 140 dB.

### Noise

The electrical circuit in Type 26TC is built on a ceramic substrate using selected low-noise com-



Fig. 1 ¼" Preamplifier Type 26TC, Built-in TEDS

ponents to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.

### Frequency response

The low-frequency cut-off of the Type 26TC preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of ½", ¼" and ⅛" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26TC for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

### Connector

Preamplifier Type 26TC (Fig. 1) is provided with a 3-m lightweight cable terminating in a 7-pin LEMO series 1B plug (Fig. 2). The cable is only 2.5 mm in diameter and will withstand temperatures from -40°C to +150°C. An adapter (GR0010) for G.R.A.S. ½" microphones is included.

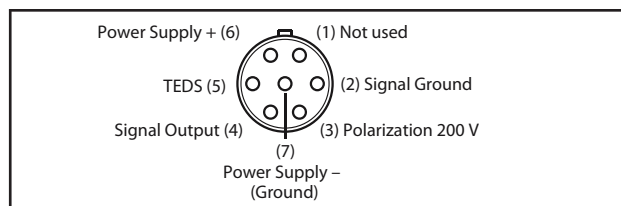


Fig. 2 7-pin LEMO plug 1B male (ext. view)

<sup>1</sup> Transducer Electronic Data Sheet - as specified by IEEE-P1451.4

## Specifications

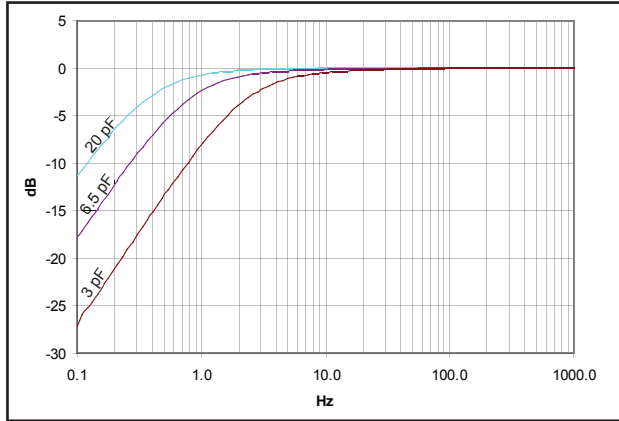


Fig. 3 Typical low-frequency response of Type 26TC for 1/2" (20 pF), 1/4" (6.5 pF) and 1/8" (3 pF) microphones

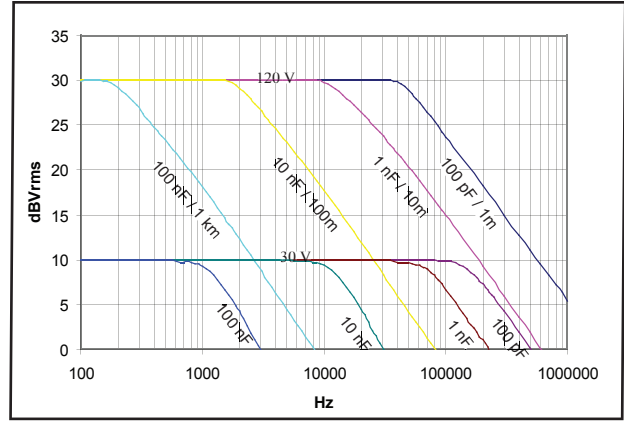


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

<b>Frequency response (18pF/small signal):</b>	
2 Hz - 200 kHz	±0.2 dB
<b>Slew rate:</b>	
	20 V/μs
<b>Input impedance:</b>	
	20 GΩ, 0.4 pF
<b>Output impedance (Cs = 20 pF, f = 1000Hz):</b>	
Typical	55 Ω
<b>Noise (measured with 20 pF 1/2" dummy mic.):</b>	
A-weighted:	≤2.5 μV rms (typically 1.8 μV rms)
Linear (20 Hz - 20 kHz):	≤6 μV rms (typically 3.5 μV rms)
<b>Gain:</b>	
Typical:	-0.25 dB
<b>Power supply:</b>	
Single:	28 V (0.7 mA) to 120 V (2.5 mA)
Dual:	±14 V (0.7 mA) to ±60 V (2.5 mA)
<b>Maximum signal-output voltage (peak):</b>	
	from ±10 V to ±50 V
<b>Temperature:</b>	
Operation:	-30 °C to +70 °C
Storage:	-40 °C to +85 °C
<b>Relative humidity:</b>	
Operation:	0 to 95 %
Storage:	0 to 95 %
<b>Dimensions and Weight:</b>	
Diameter:	6.35 mm (1/4")
Length:	43 mm (1.7")
Weight (without cable):	6 g (0.2 oz)
Weight (with cable + LEMO conn.):	50 g (1.8 oz)

## Accessories

<b>Included</b>	
GR0010:	1/4" to 1/2" adapter for use with G.R.A.S. 1/2" microphones
<b>Optional</b>	
RA0001:	Right-angled (90°) Adapter for 1/2" microphone and 1/4" preamplifier
RA0003:	Adapter for 1/2" microphone and 1/4" preamplifier
RA0006:	Angled (90°) Adapter 1/4" to 1/4".
AA0008:	Extension cable, 3 metres
AA0009:	Extension cable, 10 metres
AA0012:	Extension cable, 30 metres
AA0014:	Extension cable, 100 metres
AA0020_XX:	Extension cable, XX metres (customer-specified length)
AA0013:	Tripod adapter for 1/4" preamplifier
RA0096:	Tripod adapter for 1/4" preamplifier with angular adjustment
Type 90TP:	TEDS Editor Kit <sup>2</sup>

<sup>2</sup> For further information, refer to Product Data sheet for 1/4" TEDS microphones.

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

# ¼" Preamplifier Type 26AA, for Intensity Measurements

## Product Data

### Typical Applications

- High-frequency measurements
- High-pressure measurements
- Sound intensity measurements (using Intensity Probe Type 50AI)
- Near-field measurements

### Special Properties

- Wide Frequency Range
- Low Noise Level
- Very Small

### Description

The G.R.A.S. ¼" Preamplifier Type 26AA is a small robust unit optimised for acoustic measurements using condenser microphones. It has a very low inherent noise level, a wide dynamic range and a frequency response from below 2Hz to above 200 kHz.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of this preamplifier ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

### Dynamic Range

Type 26AA can handle both single and dual-sided power supplies. The supply can vary between 28 V<sub>DC</sub> and 120 V<sub>DC</sub> single-sided or ±14V<sub>DC</sub> and ±60 V<sub>DC</sub> dual-sided. When using the high supply voltage (120V<sub>DC</sub> or ±60V<sub>DC</sub>), the dynamic range exceeds 140 dB.

### Noise

The electrical circuit in Type 26AA is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly



Fig. 1 ¼" Preamplifier Type 26AA

determined by the microphone capsule's thermal noise.

### Frequency response

The low-frequency cut-off of the Type 26AA preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of ½", ¼" and ⅛" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26AA for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

### Connector

Preamplifier Type 26AA is supplied with 30 cm cable terminating in a 4-pin LEMO plug (Fig. 2). It is for use with the G.R.A.S Intensity Probe Type 50 AI. An extension cable, AA 0007, is available with a 4-pin LEMO connector at one end and a 7-pin LEMO series 1B plug at the other end.

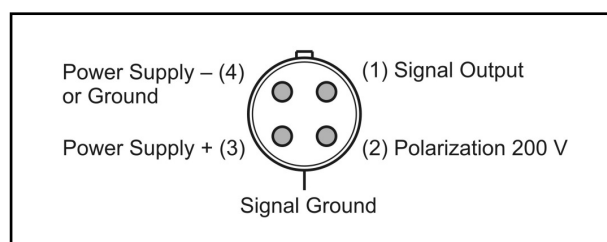


Fig.2 4-pin LEMO plug 0B male (ext. view)

## Specifications

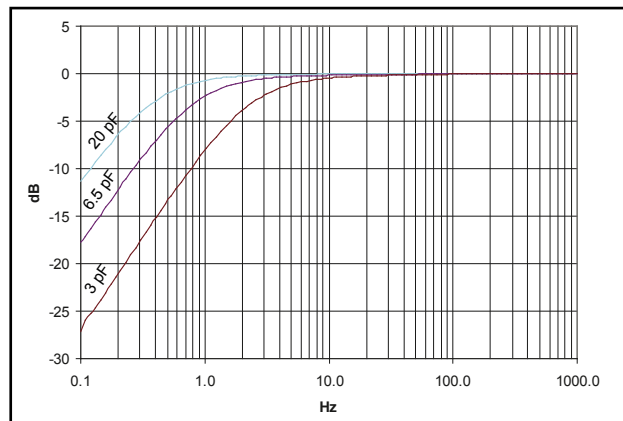


Fig. 3 Typical low-frequency response of Type 26AA for 1/2" (20 pF), 1/4" (6.5 pF) and 1/8" (3 pF) microphones

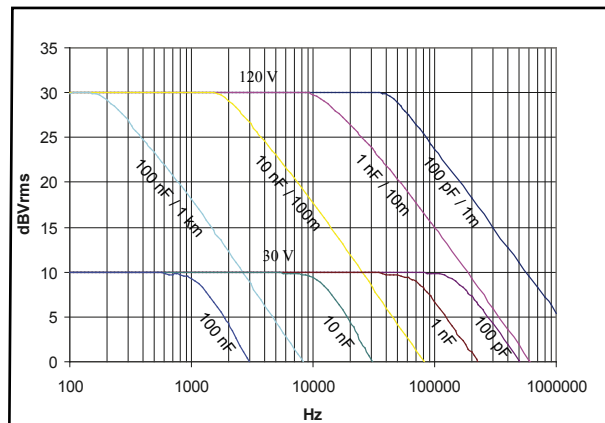


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

<b>Frequency response (18pF/small signal):</b>	
2.5 Hz - 200 kHz	±0.2 dB
<b>Slew rate:</b>	20 V/μs
<b>Input impedance:</b>	20 GΩ, 0.5 pF
<b>Output impedance (Cs = 20 pF, f = 1000Hz):</b>	
Typical	75 Ω
<b>Noise (measured with 20 pF 1/2" dummy mic.):</b>	
A-weighted:	≤2.5 μV rms (typically 1.8 μV rms)
Linear (20 Hz - 20 kHz):	≤6 μV rms (typically 3.5 μV rms)
<b>Gain*:</b>	
Typical	-0.27 dB
<b>Power supply:</b>	
Single:	28 V (0.7 mA) to 120 V (2.5 mA)
Dual:	±14 V (0.7 mA) to ±60 V (2.5 mA)
<b>Maximum signal-output voltage (peak):</b>	from ±10 V to ±50 V
<b>Temperature:</b>	
Operation:	-30°C to +70°C
Storage:	-40°C to +85°C
<b>Relative humidity:</b>	
Operation:	0 to 95 %
Storage:	0 to 95 %
<b>Dimensions and Weight:</b>	
Diameter:	6.35 mm (1/4")
Length:	43 mm (1.7")
Weight (without cable):	6 g (0.2 oz)
Weight (with cable + LEMO conn.):	20 g (0.7 oz)

\* Measured with 20 pF 1/2" dummy microphone

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

## Accessories

### Included

GR0010: 1/4" to 1/2" adapter for use with G.R.A.S. 1/2" microphones

### Optional

- RA0001: Right-angled (90°) Adapter for 1/2" microphone and 1/4" preamplifier
- RA0003: Adapter for 1/2" microphone and 1/4" preamplifier
- RA0006: Angled (90°) Adapter 1/4" to 1/4".
- AA0006: 2m extension cable 4-pin LEMO OB to 4-pin LEMO OB (for moving pre-amplifier array from probe-handle)
- AA0007: 2m extension cable 4-pin LEMO OB to 7-pin LEMO 1B (for connecting preamplifier directly to a power module with 7-pin LEMO input)
- AA0013: Tripod adapter for 1/4" preamplifier
- RA0096: Tripod adapter for 1/4" preamplifier with angular adjustment
- Type 50AI Intensity Probe
- Type 12AB Intensity Power Module

# 1/4" Preamplifier Type 26AB

## Product Data

### Typical Applications

- Precision measurements
- Low-pressure measurements
- General-purpose preamplifiers

### Special Features

- Wide frequency range
- Wide dynamic range

### Description

The G.R.A.S. 1/4" Preamplifiers Type 26AB is a small robust unit optimised for acoustic measurements using condenser microphones. It has a very low inherent noise level, a wide dynamic range and a frequency response from below 2Hz to above 200 kHz.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of these preamplifiers ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

These preamplifiers are compatible with 1/2" microphones as defined in international standard IEC 1094 *Measurement Microphones, Part 4: Specifications for working standard microphones*. The mounting thread (11.7mm - 60 UNS-2) is compatible with other available makes of similar microphone preamplifiers.

### Dynamic Range

Type 26AB can handle both single and dual-sided power supplies. The supply can vary between 28 VDC and 120 VDC single-sided or  $\pm 14$ VDC and  $\pm 60$  VDC dual-sided. When using the high supply voltage (120VDC or  $\pm 60$ VDC), the dynamic range exceeds 140 dB.



Fig. 1 1/4" Preamplifier Type 26AB incl. adapter for 1/2" microphones

### Noise

The electrical circuit in Type 26AB is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.

### Frequency response

The low-frequency cut-off of the Type 26AB preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of 1/2", 1/4" and 1/8" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26AB for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

### Connector

Preamplifier Type 26AB (Fig. 1) is provided with an integrated 7-pin LEMO connector. For use with G.R.A.S. 1/2" microphones, 1/4"-to-1/2" Adapter AF0008 is supplied. AF0008 is an inline barrel adapter ensuring minimum influence on the sound field.

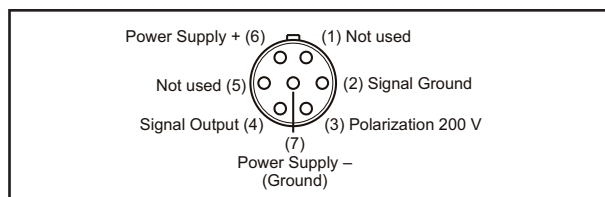


Fig. 2 7-pin LEMO plug 1B male (ext. view)

# ¼" Preamplifier Type 26AB

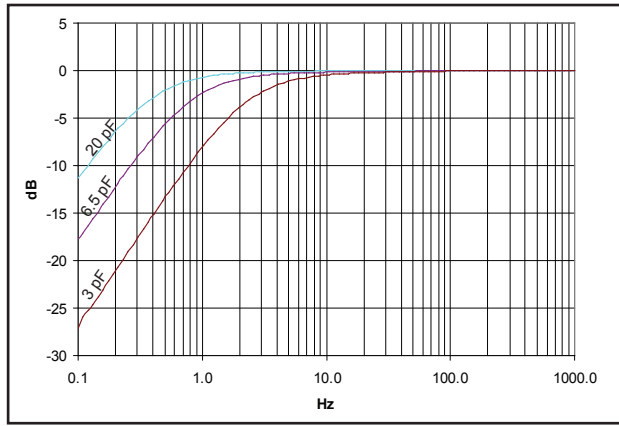


Fig. 3 Typical low-frequency response of Type 26AB for ½" (20 pF), ¼" (6.5 pF) and ⅛" (3 pF) microphones

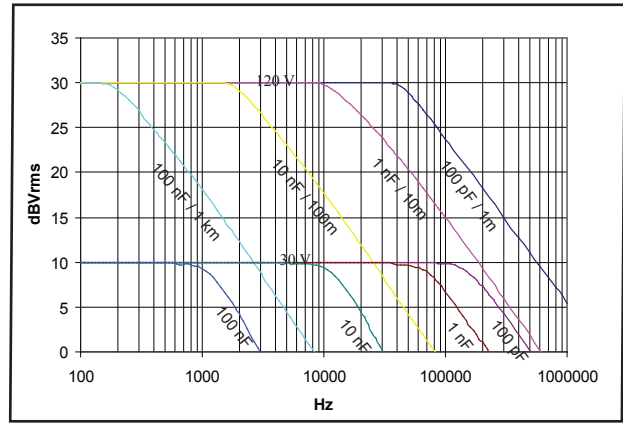


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

### Frequency response\*:

2.5 Hz - 200 kHz ..... ±0.2 dB

### Input impedance:

20 GΩ, 0.5 pF

### Output impedance (Cs = 20 pF, f=1000Hz):

Typical ..... 75 Ω

### Noise\*:

A-weighted: ..... ≤2.5 μV rms  
(typically 1.8 μV rms)

Linear (20 Hz - 20 kHz): ..... ≤6 μV rms  
(typically 3.5 μV rms)

### Gain\*:

Typical: ..... -0.27 dB

### Power supply:

Single: ..... 28 V (0.7 mA) to 120 V (2.5 mA)

Dual: ..... ±14 V (0.7 mA) to ±60 V (2.5 mA)

### Maximum signal-output voltage (peak):

from ±10 V to ±50 V

### Temperature:

Operation: ..... -30°C to +70°C

Storage: ..... -40°C to +85°C

### Relative humidity:

Operation: ..... 0 to 95%

Storage: ..... 0 to 95%

### Dimensions (ex. cable):

Diameter: ..... 12 mm (¼")

Length: ..... 67.5 mm (3.05")

Weight: ..... 21 g (1.1 oz)

\* Measured with 20 pF ½" dummy microphone

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

## Accessories

### Included

AF0008 ¼" to ½" Adapter for use with G.R.A.S. ½" microphones

### Optional

RA0017: 1" to ½" adaptor for use with G.R.A.S. 1" microphones

RA0019: ¼" to ½" adaptor for use with G.R.A.S. ¼" microphones

RA0001: Right-angled (90°) Adapter for ½" microphone and ¼" preamplifier

RA0003: Adapter for ½" microphone and ¼" preamplifier

RA0006: Angled (90°) Adapter ¼" to ¼".

AA0008: Extension cable, 3 metres

AA0009: Extension cable, 10 metres

AA0012: Extension cable, 30 metres

AA0014: Extension cable, 100 metres

AA0020\_XX: Extension cable, XX metres (customer-specified length)

AL0013: Tripod adapter for ¼" preamplifier

RA0096: Tripod adapter for ¼" preamplifier with angular adjustment

# ¼" Preamplifier Type 26AC, General-purpose

## Product Data

### Typical Applications

- General-purpose preamplifier
- High-frequency measurements
- High-pressure measurements

### Special Properties

- Wide Frequency Range
- Low Noise Level
- Very Small

### Description

The G.R.A.S. ¼" Preamplifier Type 26AC is a small robust unit optimised for acoustic measurements using condenser microphones. It has a very low inherent noise level, a wide dynamic range and a frequency response from below 2 Hz to above 200 kHz.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of this preamplifier ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

### Dynamic Range

Type 26AC can handle both single and dual-sided power supplies. The supply can vary between 28 V<sub>DC</sub> and 120 V<sub>DC</sub> single-sided or ±14V<sub>DC</sub> and ±60 V<sub>DC</sub> dual-sided. When using the high supply voltage (120V<sub>DC</sub> or ±60V<sub>DC</sub>), the dynamic range exceeds 140 dB.

### Noise

The electrical circuit in Type 26AC is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.



Fig. 1 ¼" Preamplifier Type 26AC

### Frequency response

The low-frequency cut-off of the Type 26AC preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of ½", ¼" and ⅛" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26AC for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

### Connector

Preamplifier Type 26AC (Fig. 1) is provided with a 3-m lightweight cable terminating in a 7-pin LEMO series 1B plug (Fig. 2). The cable is only 2.5 mm in diameter and will withstand temperatures from -40 °C to +150 °C. An adaptor (GR0010) for G.R.A.S. ½" microphones is included.

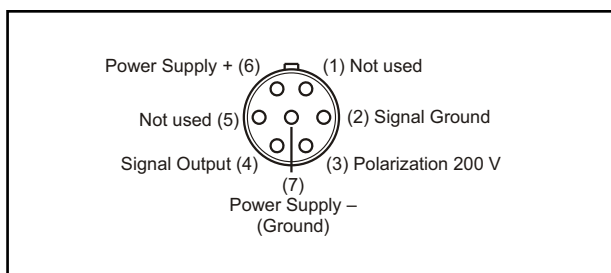


Fig. 2 7-pin LEMO plug 1B male (ext. view)

## Specifications

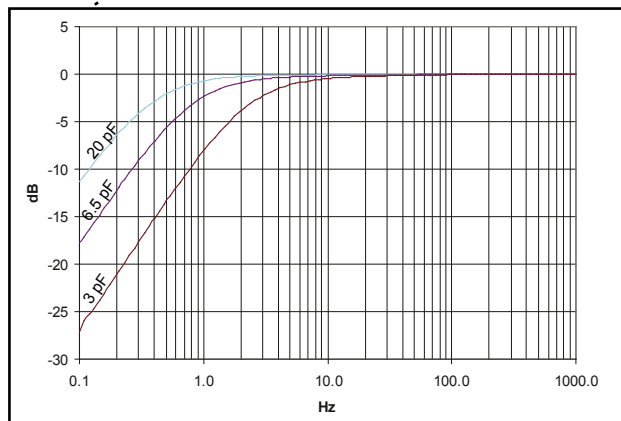


Fig. 3 Typical low-frequency response of Type 26AC for ½" (20 pF), ¼" (6.5 pF) and ⅛" (3 pF) microphones

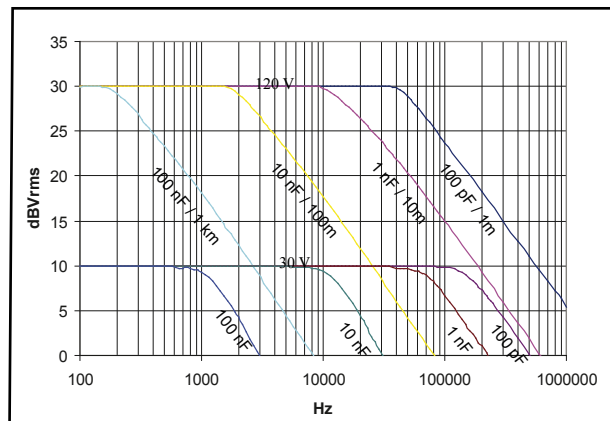


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

### Frequency response (18pF/small signal):

2.5 Hz - 200 kHz ..... ±0.2 dB

### Slew rate:

20 V/μs

### Input impedance:

20 GΩ, 0.5 pF

### Output impedance (Cs = 20 pF, f = 1000Hz):

Typical ..... 75 Ω

### Noise (measured with 20 pF ½" dummy mic.):

A-weighted: ..... ≤2.5 μV rms  
(typically 1.8 μV rms)

Linear (20 Hz - 20 kHz): ..... ≤6 μV rms  
(typically 3.5 μV rms)

### Gain\*:

Typical: ..... -0.27 dB

### Power supply:

Single: ..... 28 V (0.7 mA) to 120 V (2.5 mA)

Dual: ..... ±14 V (0.7 mA) to ±60 V (2.5 mA)

### Maximum signal-output voltage (peak):

from ±10 V to ±50 V

### Temperature:

Operation: ..... -30°C to +70°C

Storage: ..... -40°C to +85°C

### Relative humidity:

Operation: ..... 0 to 95%

Storage: ..... 0 to 95%

### Dimensions and Weight:

Diameter: ..... 6.35 mm (¼")

Length: ..... 43 mm (1.7")

Weight (without cable): ..... 6 g (0.2 oz)

Weight (with cable + LEMO conn.): 50 g (1.8 oz)

\* Measured with 20 pF ½" dummy microphone

## Accessories

### Included

GR0010: ¼" to ½" adapter for use with G.R.A.S. ½" microphones

### Optional

RA0001: Right-angled (90°) Adapter for ½" microphone and ¼" preamplifier

RA0003: Adapter for ½" microphone and ¼" preamplifier

RA0006: Angled (90°) Adapter ¼" to ¼".

AA0008: Extension cable, 3 metres

AA0009: Extension cable, 10 metres

AA0012: Extension cable, 30 metres

AA0014: Extension cable, 100 metres

AA0020\_XX: Extension cable, XX metres (customer-specified length)

AA0013: Tripod adapter for ¼" preamplifier

RA0096: Tripod adapter for ¼" preamplifier with angular adjustment

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.



# ¼" Preamplifier Type 26AL, Built-in SysCheck

## Product Data

### Typical Applications

- General-purpose preamplifier
- High-frequency measurements
- High-pressure measurements
- In-situ check of complete measurement chains

### Special Properties

- Wide Frequency Range
- Low Noise Level
- Very Small
- Built-in SysCheck for easy validation of the measurement chains

### Description

The G.R.A.S. ¼" Preamplifier Type 26AL is a small robust unit optimised for acoustic measurements using condenser microphones. Type 26AL has a very low inherent noise level, a wide dynamic range and a frequency response from below 2 Hz to above 200 kHz. It is similar to Type 26AC, but has a built-in SysCheck capability. This enables in-situ checks of the complete measurement chain from microphone to analyser. The SysCheck technique works by modulating the microphone polarisation voltage.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of this preamplifier ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

### Dynamic Range

Type 26AL can handle both single and dual-sided power supplies. The supply can vary between 28 V<sub>DC</sub> and 120 V<sub>DC</sub> single-sided or ±14V<sub>DC</sub> and ±60 V<sub>DC</sub> dual-sided. When using the high supply voltage (120V<sub>DC</sub> or ±60V<sub>DC</sub>), the dynamic range exceeds 140 dB.



Fig. 1 ¼" Preamplifier Type 26AL, Built-in SysCheck

### Noise

The electrical circuit in Type 26AL is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.

### Frequency response

The low-frequency cut-off of the Type 26AL preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of ½", ¼" and ⅛" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26AL for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

### Connector

Preamplifier Type 26AL (Fig. 1) is provided with a 3-m lightweight cable terminating in a 7-pin LEMO series 1B plug (Fig. 2). The cable is only 2.5 mm in diameter and will withstand temperatures from -40°C to +150°C. An adapter (GR0010) for G.R.A.S. ½" microphones is included.

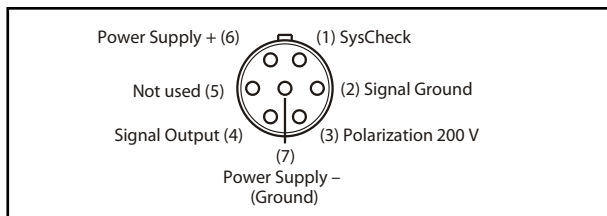


Fig. 2 7-pin LEMO plug 1B male (ext. view)

## Specifications

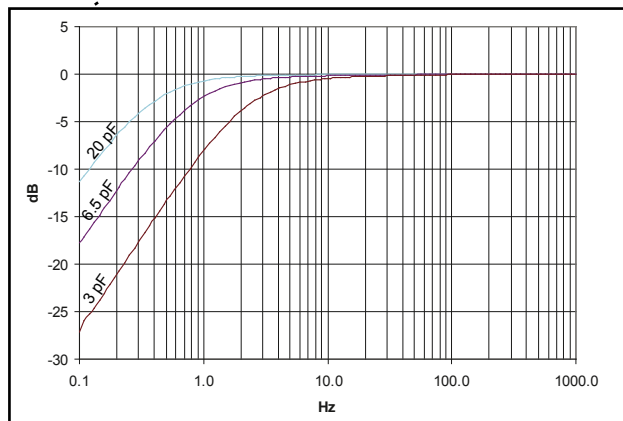


Fig. 3 Typical low-frequency response of Type 26AL for ½(20 pF), ¼" (6.5 pF) and ⅛" (3 pF) microphones

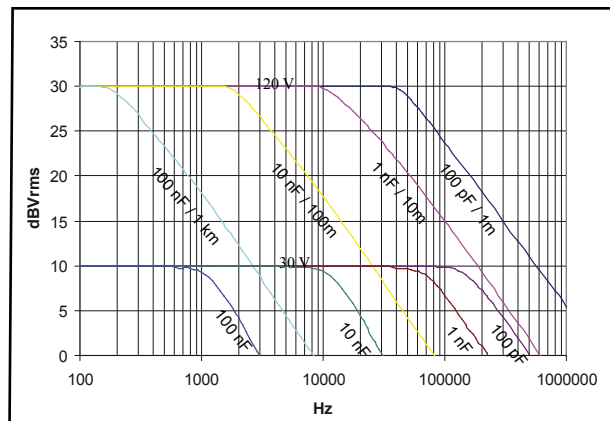


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

<b>Frequency response (18pF/small signal):</b>	
2.5 Hz - 200 kHz	..... ±0.2 dB
<b>Slew rate:</b>	
	20 V/μs
<b>Input impedance:</b>	
	20 GΩ, 0.65 pF
<b>Output impedance (Cs = 20 pF, f = 1000Hz):</b>	
Typical	..... 75 Ω
<b>Noise (measured with 20 pF ½" dummy mic.):</b>	
A-weighted:	..... ≤2.5 μV rms (typically 1.8 μV rms)
Linear (20 Hz - 20 kHz):	..... ≤6 μV rms (typically 3.5 μV rms)
<b>Gain*:</b>	
Typical:	..... -0.35 dB
<b>Power supply:</b>	
Single:	..... 28 V (0.7 mA) to 120 V (2.5 mA)
Dual:	..... ±14 V (0.7 mA) to ±60 V (2.5 mA)
<b>Maximum signal-output voltage (peak):</b>	
	from ±10 V to ±50 V
<b>Temperature:</b>	
Operation:	..... -30°C to +70°C
Storage:	..... -40°C to +85°C
<b>Relative humidity:</b>	
Operation:	..... 0 to 95%
Storage:	..... 0 to 95%
<b>Dimensions and Weight:</b>	
Diameter:	..... 6.35 mm (¼")
Length:	..... 43 mm (1.7")
Weight (without cable):	..... 6 g (0.2 oz)
Weight (with cable + LEMO conn.):	..... 50 g (1.8 oz)

## Accessories

<b>Included</b>	
GR0010:	¼" to ½" adapter for use with G.R.A.S. ½" microphones
<b>Optional</b>	
RA0001:	Right-angled (90°) Adapter for ½" microphone and ¼" preamplifier
RA0003:	Adapter for ½" microphone and ¼" preamplifier
RA0006:	Angled (90°) Adapter ¼" to ¼".
AA0008:	Extension cable, 3 metres
AA0009:	Extension cable, 10 metres
AA0012:	Extension cable, 30 metres
AA0014:	Extension cable, 100 metres
AA0020_XX:	Extension cable, XX metres (customer-specified length)
AA0013:	Tripod adapter for ¼" preamplifier
RA0096:	Tripod adapter for ¼" preamplifier with angular adjustment
Type 12AK:	1-Channel Power Module incl. SysCheck Generator
Type 12AA:	2-Channel Power Module incl. SysCheck Generator
Type 12AP:	8-Channel Power Module incl. SysCheck Generator
Type 12AQ:	Computer-controlled Power Module incl. SysCheck Generator

\* Measured with 20 pF ½" dummy microphone

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

# 1/4" Preamplifier Type 26AN, Insert-voltage

## Product Data

### Typical Applications

- Insert-voltage calibration\*
- Precision measurements
- Low-pressure measurements
- General-purpose preamplifiers

### Special Features

- Wide frequency range
- Wide dynamic range

### Description

The G.R.A.S. 1/4" Preamplifiers Type 26AN is a small robust unit optimised for acoustic measurements using condenser microphones. It has a very low inherent noise level, a wide dynamic range and a frequency response from below 2 Hz to above 200 kHz.

Type 26AN is configured to permit use of the insert-voltage-technique\* for determining the open-circuit sensitivity of a microphone.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of these preamplifiers ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

These preamplifiers are compatible with 1/2" microphones as defined in international standard IEC 1094 *Measurement Microphones, Part 4: Specifications for working standard microphones*. The mounting thread (11.7 mm - 60 UNS-2) is compatible with other available makes of similar microphone preamplifiers.

### Dynamic Range

Type 26AN can handle both single and dual-sided power supplies. The supply can vary between 28 VDC and 120 VDC single-sided or  $\pm 14$ VDC and  $\pm 60$  VDC dual-sided. When using the high supply voltage (120VDC or  $\pm 60$ VDC), the dynamic range exceeds 140 dB.



Fig. 1 1/4" Preamplifier Type 26AB incl. adapter for 1/2" microphones

### Noise

The electrical circuit in Type 26AN is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.

### Frequency response

The low-frequency cut-off of the Type 26AN preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of 1/2", 1/4" and 1/8" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26AN for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

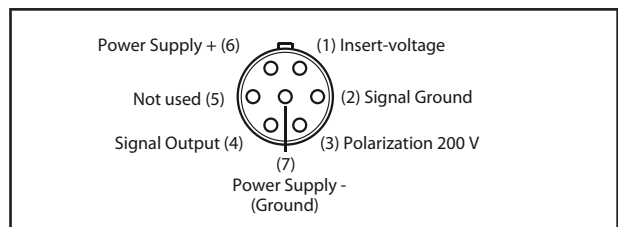


Fig. 2 7-pin LEMO plug 1B male (ext. view)

\* A normal microphone calibration involves the determination of the open-circuit sensitivity, which is defined as the microphone output for a given input signal when the microphone's output terminal is unloaded. The closed-circuit sensitivity, however, depends on the type of amplifier. As the load from the preamplifier reduces the output signal from the microphone, the closed-circuit sensitivity will be lower than the open-circuit sensitivity. The open-circuit sensitivity is determined with the Insert-Voltage technique using a preamplifier such as Type 26AN, where a test signal can be injected directly onto the preamplifier input terminal.

# ¼" Preamplifier Type 26AN, Insert-voltage

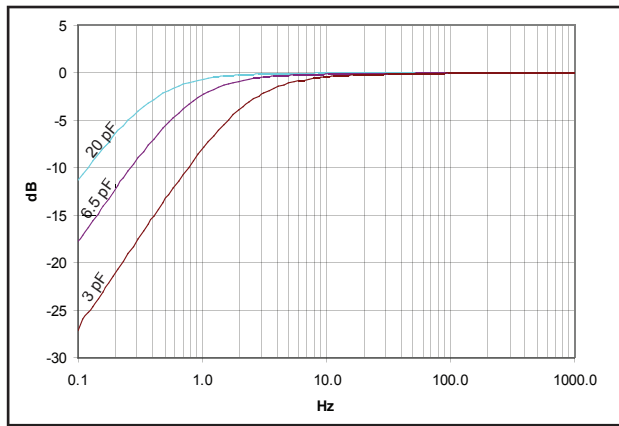


Fig. 3 Typical low-frequency response of Type 26AN for ½" (20 pF), ¼" (6.5 pF) and ⅛" (3 pF) microphones

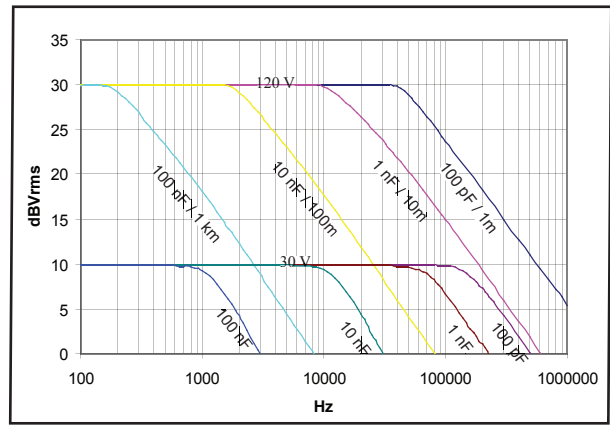


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

### Frequency response (18pF/small signal):

2 Hz - 200 kHz ..... ±0.2 dB

### Input impedance:

20 GΩ, 0.4 pF

### Output impedance (Cs = 20 pF, f=1000Hz):

Typical ..... 55 Ω

### Noise (measured with 20 pF ½" dummy mic.):

A-weighted: ..... ≤2.2 μV rms  
(typically 1.8 μV rms)

Linear (20 Hz - 20 kHz): ..... ≤6 μV rms  
(typically 3.5 μV rms)

### Gain:

Typical: ..... -0.25 dB

### Power supply:

Single: ..... 28 V (0.7 mA) to 120 V (2.5 mA)

Dual: ..... ±14 V (0.7 mA) to ±60 V (2.5 mA)

### Maximum signal-output voltage (peak):

from ±10 V to ±50 V

### Temperature:

Operation: ..... -30°C to +70°C

Storage: ..... -40°C to +85°C

### Relative humidity:

Operation: ..... 0 to 95%

Storage: ..... 0 to 95%

### Dimensions (ex. cable):

Diameter: ..... 12.7 mm (½")

Length: ..... 77.5 mm (3.05")

Weight: ..... 33g (1.1 oz)

## Accessories

### Included

AA0008: ¼" to ½" Adapter for use with G.R.A.S. ½" microphones

### Optional

RA0017: 1" to ½" adaptor for use with G.R.A.S. 1" microphones

RA0019: ¼" to ½" adaptor for use with G.R.A.S. ¼" microphones

RA0001: Right-angled (90°) Adapter for ½" microphone and ¼" preamplifier

RA0003: Adapter for ½" microphone and ¼" preamplifier

RA0006: Angled (90°) Adapter ¼" to ¼".

AA0008: Extension cable, 3 metres

AA0009: Extension cable, 10 metres

AA0012: Extension cable, 30 metres

AA0014: Extension cable, 100 metres

AA0020\_XX: Extension cable, XX metres (customer-specified length)

AA0013: Tripod adapter for ¼" preamplifier

RA0096: Tripod adapter for ¼" preamplifier with angular adjustment

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

**G.R.A.S.**  
SOUND & VIBRATION

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# ¼" Preamplifier Type 26AS, Short

## Product Data

### Typical Applications

- For use in confined spaces
- High frequency measurements
- High pressure measurements
- Sound intensity measurements
- Near-field measurements
- Anechoic boxes
- Hearing-aid measurements

### Special Properties

- Wide frequency range
- Low noise level
- Very small dimensions
- 7-pin LEMO connector

### Description

The G.R.A.S. ¼" Preamplifier Type 26AS is a small robust unit short enough (see Fig. 5) for use in confined spaces, e.g. for binaural measurements with the KEMAR Manikin (Type 45BM or Type 45BA) or Hearing-protector Test Fixture Type 45CA. It has a very low inherent-noise level, a wide dynamic range and a frequency response from below 2Hz to above 200kHz.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of this preamplifier ensures reliable operation under humid conditions owing to the heat generated by internal power dissipation.

### Dynamic Range

Type 26AS can handle both single and dual-sided power supplies. The supply can vary between 28V<sub>DC</sub> and 120V<sub>DC</sub> single-sided or ±14V<sub>DC</sub> and ±60V<sub>DC</sub> dual-sided. When using the high supply voltage (120V<sub>DC</sub> or ±60V<sub>DC</sub>), the dynamic range exceeds 140 dB.



Fig. 1 ¼" Preamplifier Type 26AS

### Noise

The electrical circuit in Type 26AS is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.

### Frequency response

The low-frequency cut-off of the Type 26AS preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.4 pF and 3 pF equal the typical capacitances of ½", ¼" and ⅛" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26AS for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100pF/m (30pF/foot).

### Connector

The Type 26AS (Fig. 1) is provided with a 3-m lightweight lightweight cable terminating in a 7-pin LEMO series 1B plug (Fig. 2). The cable is only 2.5 mm in diameter and will withstand temperatures from -40°C to +150°C. An adaptor GR0010 for G.R.A.S. ½" microphones is included.

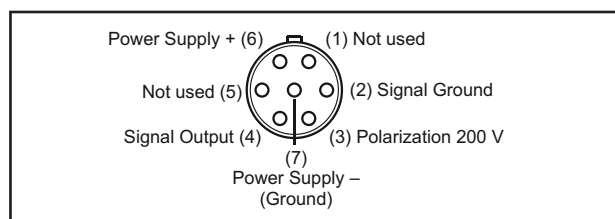


Fig. 2 7-pin LEMO plug 1B male (ext. view)

# 1/4" Preamp Type 26AS, Short

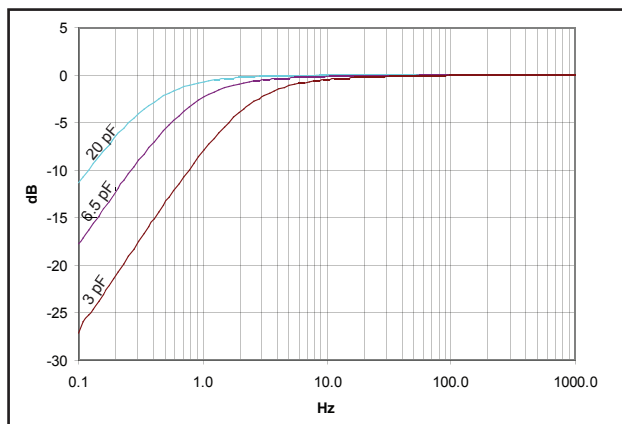


Fig. 3 Typical low-frequency response of Type 26AS for 1/2" (20 pF), 1/4" (6.5 pF) and 1/8" (3 pF) microphones

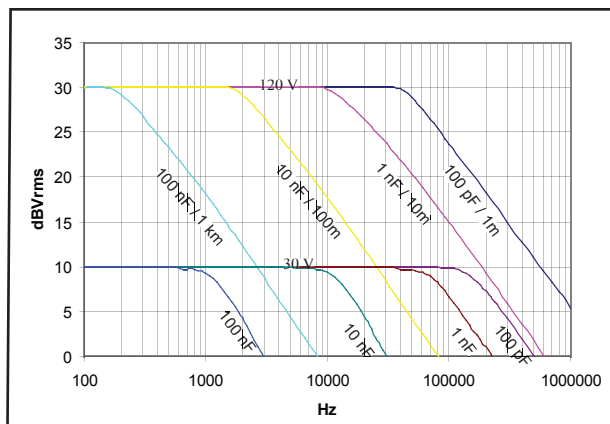


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Specifications

**Frequency response (18pF/small signal):**  
2 Hz - 200 kHz: ..... ±0.2 dB

**Input impedance:**  
20 GΩ, 0.4 pF

**Output impedance (Cs = 20 pF, f=1000Hz):**  
Typical ..... 55 Ω

**Noise (measured with 20 pF 1/2" dummy mic.):**  
A-weighted: ..... ≤ 4 μV rms  
Linear (20 Hz - 20 kHz): ..... ≤ 10 μV rms

**Gain:**  
Typical: ..... -0.25 dB

**Power supply:**  
Single: ..... 28 V (0.7 mA) to 120 V (2.5 mA)  
Dual: ..... ±14 V (0.7 mA) to ±60 V (2.5 mA)

**Maximum signal-output voltage (peak):**  
from ±10 V to ±50 V

**Temperature:**  
Operation: ..... -30 °C to +70 °C  
Storage: ..... -40 °C to +85 °C

**Relative humidity:**  
Operation: ..... 0 to 95 %  
Storage: ..... 0 to 95 %

**Dimensions:**  
Diameter: ..... See Fig. 5  
Length: ..... See Fig. 5  
Weight (without cable): ..... 3 g (0.4 oz)  
Weight (with cable + LEMO conn.): ..... 47 g (1.7 oz)

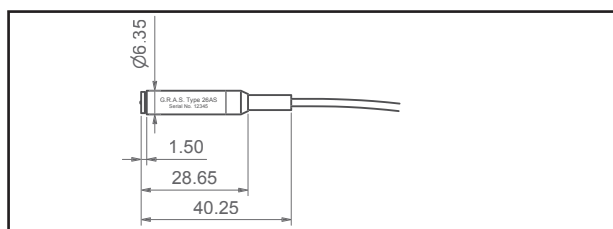


Fig. 5 Main dimensions given in millimetres

## Accessories

**Included**

GR0010: 1/4" to 1/2" adapter for use with G.R.A.S. 1/2" microphones

**Optional**

RA0001: Right-angled (90°) Adapter for 1/2" microphone and 1/4" preamplifier

RA0003: Adapter for 1/2" microphone and 1/4" preamplifier

RA0006: Angled (90°) Adapter 1/4" to 1/4".

AA0008: Extension cable, 3 metres

AA0009: Extension cable, 10 metres

AA0012: Extension cable, 30 metres

AA0014: Extension cable, 100 metres

AA0020\_XX: Extension cable, XX metres (customer-specified length)

AA0013: Tripod adapter for 1/4" preamplifier

RA0096: Tripod adapter for 1/4" preamplifier with angular adjustment

Type 12AK: 1-Channel Power Module incl. SysCheck Generator

Type 12AA: 2-Channel Power Module incl. SysCheck Generator

Type 12AQ: Computer-controlled Power Module incl. SysCheck Generator

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

# 1/4" Preamplifier Type 26HG, Infra-sound

## Product Data

### Typical Applications

- Infra-sound measurements
- Low-level measurements
- General-purpose preamplifier
- Use with 1/2" Free-field Microphone, Low-frequency Type 40AN

### Special Properties

- Wide Frequency Range
- Low Cut-off Frequency
- Low Noise Level
- Very Small

### Description

The G.R.A.S. 1/4" Preamplifier Type 26HG is a small robust unit optimised for acoustic measurements using condenser microphones. It has a very low inherent noise level, a wide dynamic range and a wide frequency response from below 1 Hz to above 200 kHz.

### Design

All G.R.A.S. microphone preamplifiers are based on a small ceramic thick-film substrate with a very high input impedance. The ceramic substrate is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference. The casing is made of stainless steel for maximum strength and durability. The small dimensions of this preamplifier ensure reliable operation under humid conditions owing to the heat generated by internal power dissipation.

### Dynamic Range

Type 26HG can handle both single and dual-sided power supplies. The supply can vary between 28 V<sub>DC</sub> and 120 V<sub>DC</sub> single-sided or ±14V<sub>DC</sub> and ±60 V<sub>DC</sub> dual-sided. When using the high supply voltage (120V<sub>DC</sub> or ±60V<sub>DC</sub>), the dynamic range exceeds 140 dB.

### Noise

The electrical circuit in Type 26HG preamplifier is built on a ceramic substrate using selected low-noise components to gain very low self-noise. The electrical self-noise is so low that system noise is mainly determined by the microphone capsule's thermal noise.



Fig. 1 Type 26HG with cable and LEMO connector

### Frequency response

The low-frequency cut-off of the Type 26HG preamplifier is mainly determined by the input impedance of the preamplifier and the capacitance of the microphone capsule (see Fig. 3). The capacities 20 pF, 6.5 pF and 3 pF equal the typical capacitances of 1/2", 1/4" and 1/8" microphone capsules respectively.

The high-frequency cut-off is determined by the preamplifier's ability to drive capacitive loads (slew rate), caused by the cable. For large-signals, the effects of these parameters must be accounted for when measurements are performed. Fig. 4 shows the large-signal response for Type 26HG for various capacitive loads corresponding to different cable lengths. The output level is in decibels relative to 1 Volt. Typical capacitance for the cable is 100 pF/m (30 pF/foot).

Type 26HG is typically used with a Type 40AN low-frequency microphone capsule to reach a -3-dB cut-off frequency around 0.25 Hz.

### Connector

Preamplifier Type 26HG (Fig. 1) is provided with a 3-m lightweight cable terminating in a 7-pin LEMO series 1B plug (Fig. 2). The cable is only 2.5 mm in diameter and will withstand temperatures from -40°C to +150°C. An adaptor (GR0010) for G.R.A.S. 1/2" microphones is included.

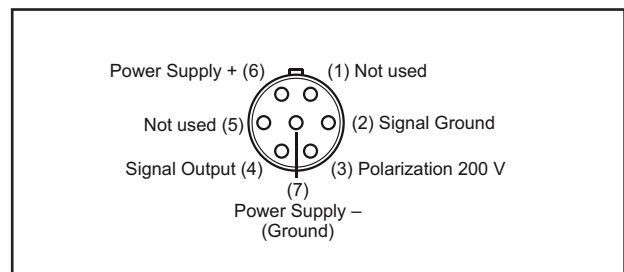


Fig. 2 7-pin LEMO plug 1B male (ext. view)

## Specifications

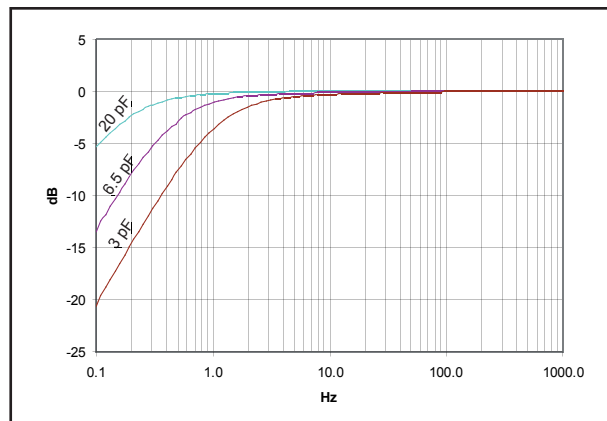


Fig. 3 Typical low-frequency response of Type 26HG for ½" (20 pF), ¼" (6.5 pF) and ⅛" (3 pF) microphones

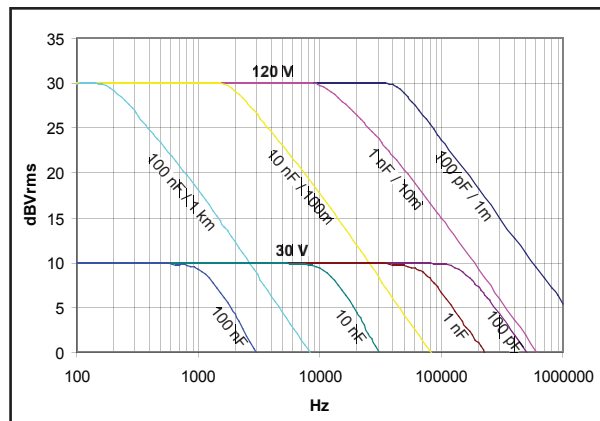


Fig. 4 Typical max. rms output signal with 120 V and 30 V supply

## Technical Data

<b>Frequency response (18pF/small signal):</b>	1 Hz - 200 kHz	±0.2 dB
<b>Slew rate:</b>		20 V/μs
<b>Input impedance:</b>		40 GΩ, 0.4 pF
<b>Output impedance (Cs = 20 pF, f = 1000Hz):</b>	Typical.....	55 Ω
<b>Noise (measured with 20 pF ½" dummy mic.):</b>	A-weighted:.....	≤2.3 μV rms (typically 1.5 μV rms)
	Linear (20 Hz - 20 kHz):.....	≤6 μV rms (typically 3.2 μV rms)
<b>Gain:</b>	Typical:.....	-0.25 dB
<b>Power supply:</b>	Single:.....	28 V (0.7 mA) to 120 V (2.5 mA)
	Dual:.....	±14 V (0.7 mA) to ±60 V (2.5 mA)
<b>Maximum signal-output voltage (peak):</b>		from ±10 V to ±50 V
<b>Temperature:</b>	Operation:.....	-30°C to +70°C
	Storage:.....	-40°C to +85°C
<b>Relative humidity:</b>	Operation:.....	0 to 95 %
	Storage:.....	0 to 95 %
<b>Dimensions:</b>	Diameter:.....	6.35 mm (¼")
	Length:.....	43 mm (1.7")
	Weight (without cable):.....	6 g (0.2 oz)
	Weight (with cable + LEMO conn.):.....	50 g (1.76 oz)

## Accessories

### Included

GR0010: ¼" to ½" adapter for use with G.R.A.S. ½" microphones

### Optional

RA0001: Right-angled (90°) Adapter for ½" microphone and ¼" preamplifier

RA0003: Adapter for ½" microphone and ¼" preamplifier

RA0006: Angled (90°) Adapter ¼" to ¼".

AA0008: Extension cable, 3 metres

AA0009: Extension cable, 10 metres

AA0012: Extension cable, 30 metres

AA0014: Extension cable, 100 metres

AA0020\_XX: Extension cable, XX metres (customer-specified length)

AA0013: Tripod adapter for ¼" preamplifier

RA0096: Tripod adapter for ¼" preamplifier with angular adjustment

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.