

# GRAS 40AN

1/2" Ext. Polarized Free-field  
Microphone, Low Frequency



Freq range: 0.5 Hz to 20 kHz  
Dyn range: 14 dBA to 149 dB  
Sensitivity: 50 mV/Pa

---

The 40AN is an IEC 61094 WS2F classified 1/2" externally polarized free-field, low-frequency microphone with rear-venting. The prepolarized equivalent is GRAS 40AZ.

## Introduction

GRAS 40AN is a high-precision condenser microphone made according to IEC 61094-4 requirements. The 40AN's design is based on the similar GRAS 40AF 1/2" free-field microphone, but optimized for low-frequency measurements. The cut-off frequency is as low as 0.5 Hz and obtained by modifying the equalization.

40AN is individually factory-calibrated and delivered with a calibration chart stating its specific open-circuit sensitivity, pressure, and corrected free-field frequency responses.

## Typical applications and use

The low-frequency property combined with its high sensitivity and robust design make 40AN the obvious choice for infra-sound measurements—a fast growing discipline following the need for monitoring and reducing low-frequency noise from, for example, power and production plants and the increasing number of wind turbines.

## Compatibility

The 40AN requires a standardized 1/2" or 1/4" LEMO preamplifier and an input module that supports this technology with a 7-pin LEMO connector.

Note that to benefit from 40AN's low frequency capabilities, it is important that the microphone preamplifier, analyzer input module, or sound level meter is designed to match 40AN.

## System verification

For daily verification and check of your measurement setup, we recommend using a calibrator like [GRAS 42AG](#) Sound Level Calibrator.

For proper sensitivity calibration, we recommend using a pistonphone like [GRAS 42AP](#).

## Calibration

When leaving the factory, all GRAS microphones have been calibrated in a controlled laboratory environment using traceable calibration equipment. Depending on the use, measurement environment and internal quality control programs we recommend that the microphone is recalibrated at least once a year.

We offer two kinds of calibration as an optional after-sales service: GRAS Traceable Calibration and GRAS Accredited Calibration.

GRAS Traceable Calibration is a traceable calibration performed by trained personnel under controlled conditions according to established procedures and standards. This is identical to the rigorous calibration that all GRAS microphones are subjected to as an integral part of our quality assurance.

GRAS Accredited Calibration is performed by the GRAS Accredited Calibration Laboratory that has been accredited in accordance with ISO 17025 by DANAK, the Danish Accreditation Fund.

If you want a new microphone set delivered with an accredited calibration in stead of the default factory calibration, specify this when ordering.

Learn more at [gras/calib](https://www.gras.com/calib).

## Quality and warranty

All GRAS microphones are made of high-quality materials that will ensure life-long stability and robustness. The microphones are all assembled in verified clean-room environments by skilled and dedicated operators with many years of expertise in this field.

The microphone diaphragm, body, and improved protection grid are made of high-grade stainless steel, which makes the microphone resistant to

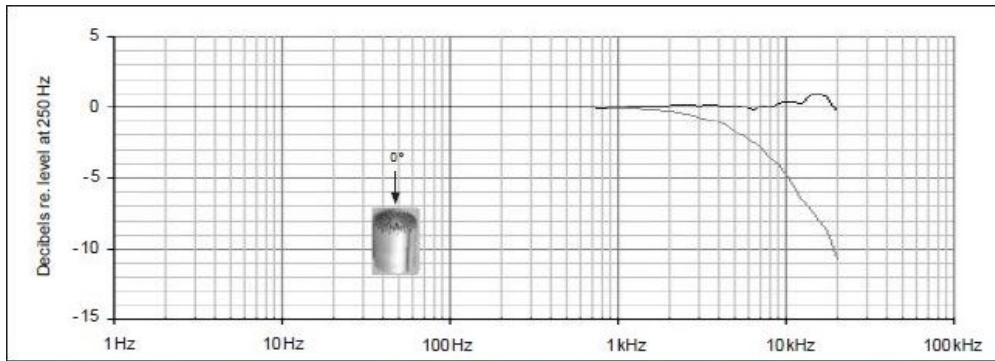
physical damage, as well as corrosion caused by aggressive air or gasses.

This, combined with the reinforced gold-plated microphone terminal which guarantees a highly reliable connection, enables GRAS to offer 5 years warranty against defective materials and workmanship.

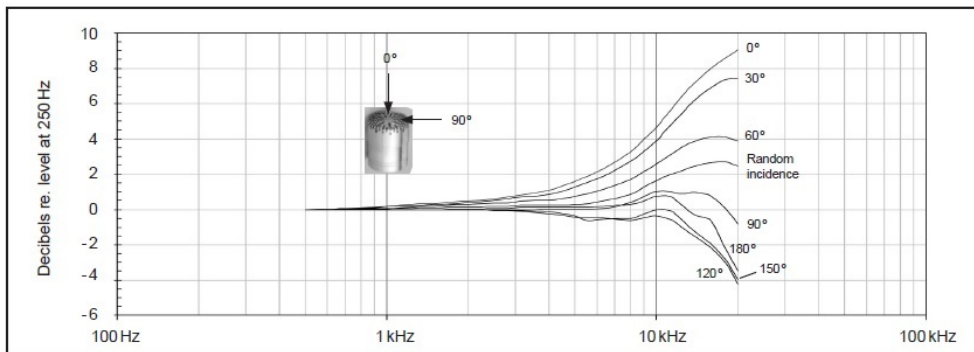
## **Service**

If you accidentally damage the diaphragm on a GRAS microphone, we can—in most cases—replace it at a very reasonable cost and with a short turn-around time. This not only protects your investment, but also pleases your quality assurance department because you don't have to worry about new serial numbers, etc.

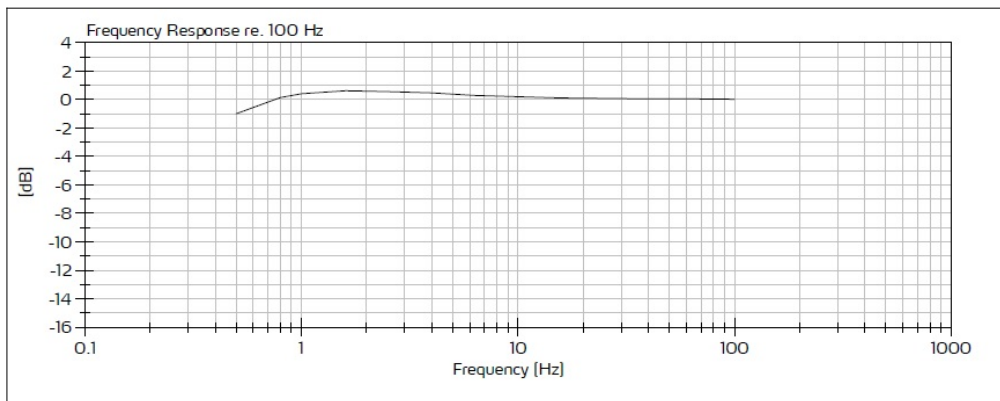
Polarization/Connection		200 V / Traditional
Frequency range ( $\pm 1$ dB)	Hz	1 to 10 k
Frequency range ( $\pm 2$ dB)	Hz	0.5 to 20 k
Dynamic range lower limit (microphone thermal noise)	dB(A)	14
Dynamic range lower limit with GRAS preamplifier	dB(A)	17
Dynamic range upper limit	dB	149
Dynamic range upper limit with GRAS preamplifier @ +28 V / $\pm 14$ V power supply	dB	142
Dynamic range upper limit with GRAS preamplifier @ +120 V / $\pm 60$ V power supply	dB	149
Open-circuit sensitivity @ 250 Hz ( $\pm 1$ dB)	mV/Pa	50
Open-circuit sensitivity @ 250 Hz ( $\pm 1$ dB)	dB re 1V/Pa	-26
Resonance frequency	kHz	14
Microphone cartridge capacitance, typ.	pF	16.5
Microphone venting		Rear
Temperature range, operation	$^{\circ}\text{C}$ / $^{\circ}\text{F}$	-40 to 150 / -40 to 302
IEC 61094-4 Designation		WS2F
Temperature range, storage	$^{\circ}\text{C}$ / $^{\circ}\text{F}$	-40 to 85 / -40 to 185
Temperature coefficient @250 Hz	dB/ $^{\circ}\text{C}$ / dB/ $^{\circ}\text{F}$	-0.01 / -0.006
Static pressure coefficient @250 Hz	dB/kPa	-0.011
Humidity range non condensing	% RH	0 to 90
Humidity coefficient @250 Hz	dB/% RH	-0.001
Influence of axial vibration @1 m/s <sup>2</sup>	dB re 20 $\mu\text{Pa}$	62
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes
Weight	g / oz	6.5 / 0.229



Typical frequency response



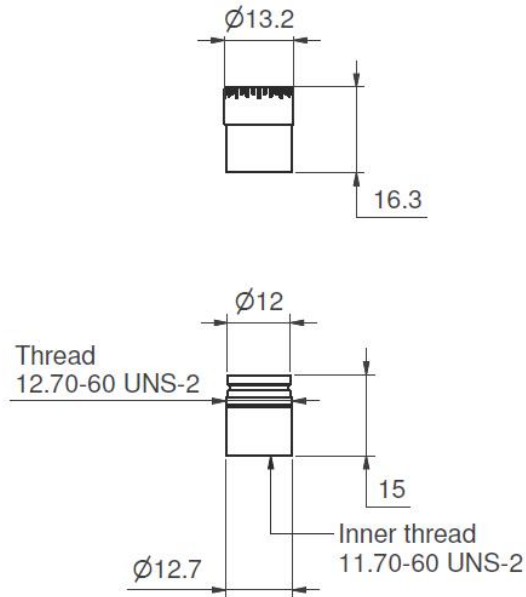
Free-field corrections for different angles of incidence



Low-frequency response

GRAS Sound & Vibration reserves the right to change specifications without notice.

Dimensions in mm



## Optional items

<a href="#">GRAS AF0008</a>	Adapter for ¼" preamplifier and ½" microphone
<a href="#">GRAS GR0010</a>	Adapter for ¼" preamplifier and ½" microphone
<a href="#">GRAS RA0001</a>	Right-angled (90°) adapter for ½" microphone and ¼" preamplifier
<a href="#">GRAS RA0003</a>	Adapter for ¼" preamplifier and ½" microphone
<a href="#">GRAS RA0016</a>	20 dB Attenuator for externally polarized ½" microphones
GRAS RA0122	Random Incidence Corrector
GRAS CA0001	Traceable Calibration of Microphone
GRAS CA2001	Accredited Calibration of Microphone

GRAS Sound & Vibration reserves the right to change accessories without notice.

# GRAS Worldwide

Subsidiaries and distributors in more  
than 40 countries

**HEAD OFFICE, DENMARK**  
**GRAS SOUND & VIBRATION**  
Skovlytoften 33  
2840 Holte  
Denmark  
Tel: +45 4566 4046  
[www.gras.dk](http://www.gras.dk)  
[gras@gras.dk](mailto:gras@gras.dk)

**USA**  
**GRAS SOUND & VIBRATION**  
5750 S.W. Arctic Drive  
Beaverton, OR 97005  
Tel: 503-627-0832  
Toll Free: 800-231-7350  
[www.gras.us](http://www.gras.us)  
[sales@gras.us](mailto:sales@gras.us)

**CHINA**  
**GRAS SOUND & VIBRATION**  
Room 303, Building T6  
Hongqiaohui, 990, Shenchang Road  
Minhang District, Shanghai  
China, 201106  
Tel: +86 21 64203370  
[www.gras.com.cn](http://www.gras.com.cn)  
[cnsales@gras.dk](mailto:cnsales@gras.dk)



## ABOUT GRAS SOUND & VIBRATION

GRAS is a worldwide leader in the sound and vibration industry. We develop and manufacture state-of-the-art measurement microphones to industries where acoustic measuring accuracy and repeatability is of utmost importance in R&D, QA and production. This includes applications and solutions for customers within the fields of aerospace, automotive, audiology, and consumer electronics. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect and trust.

**GRAS** Sound  
& Vibration