# GRAS 40AF

## 1/2" Ext. Polarized Free-field Microphone



Freq range: 3.15 Hz to 20 kHz
Dyn range: 14 dBA to 149 dB
Sensitivity: 50 mV/Pa

The GRAS 40AF is a 1/2" Externally Polarized free-field microphone for measuring medium sound pressure levels at medium frequencies. The equivalent prepolarized 0 V type is GRAS 40AE.

GRAS Sound & Vibration
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## Introduction

GRAS 40AF is a high-precision condenser microphone made according to IEC 61094-4 requirements. The 40AF's design is based on the original reference ½" pressure microphone, but optimized for free-field measurements with a 12 dB increase of the sensitivity. The result is a nominal sensitivity of 50 mV/Pa, slightly longer microphone housing, and a natural reduced dynamic range.

It can be used for Type 0 and Type 1 measurements.

40AF is the perfect free-field complement to the GRAS 40AP ½" Ext. Polarized Pressure Microphone.

40AF 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 properties and robust design make 40AF the natural choice for an all-round free-field, high sensitive microphone suitable for both field-work and laboratory measurements.

The high sensitivity and reliability has made 40AF the preferred measurement microphone for sound level meters/analyzers with 200 V polarization voltage option and, as such, enables IEC 61672 Class 1 measurements.

## Compatibility

The 40AF requires a standardized ½" or ¼" LEMO preamplifier and an input module that supports this technology with a 7-pin LEMO connector.

## 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 Intelligent Pistonphone.

## 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 calibration.

## 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.

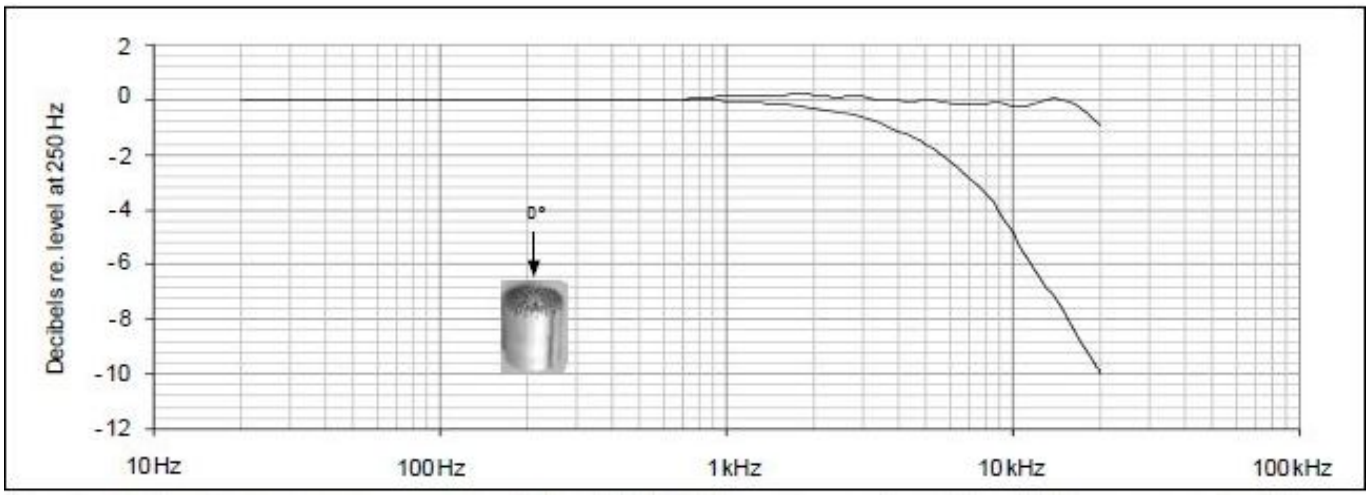
## Service

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.

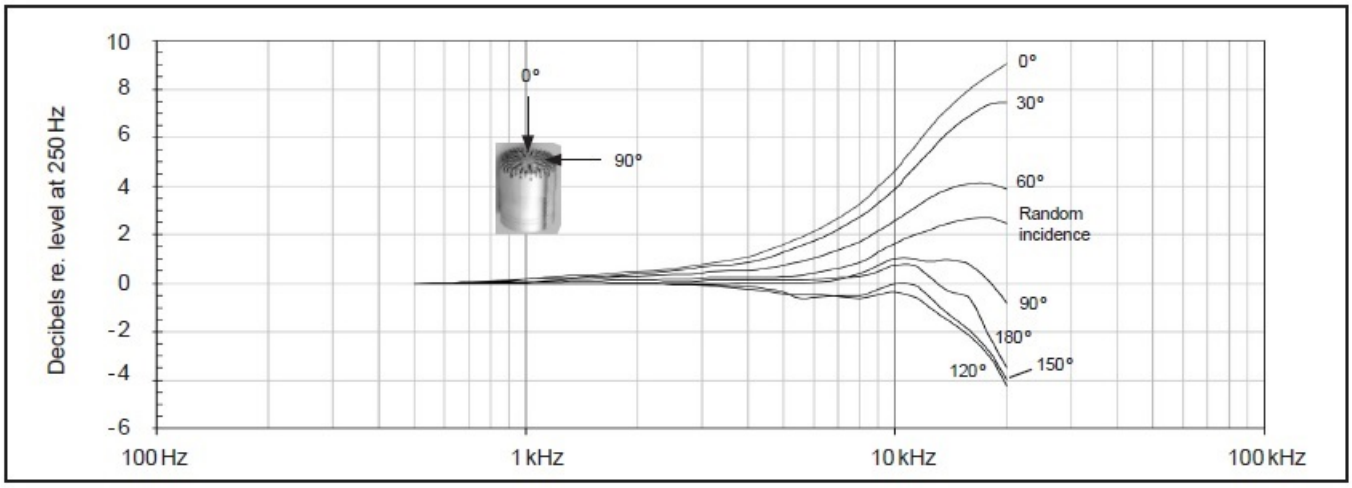
# Specifications



| | | |
|---|---|---|
| Polarization/Connection | | 200 V / Traditional |
| Frequency range (±1 dB) | Hz | 5 to 10 k |
| Frequency range (±2 dB) | Hz | 3.15 to 20 k |
| Dynamic range lower limit (microphone thermal noise) | dB(A) | 14 |
| Dynamic range lower limit with GRAS preamplifier | dB(A) | 17.0 |
| Dynamic range upper limit | dB | 149 |
| Dynamic range upper limit with GRAS preamplifier @ +28 V / ±14 V power supply | dB | 142 |
| Dynamic range upper limit with GRAS preamplifier @ +120 V / ±60 V power supply | dB | 149 |
| Open-circuit sensitivity @ 250 Hz (±2 dB) | mV/Pa | 50 |
| Open-circuit sensitivity @ 250 Hz (±2 dB) | dB re 1V/Pa | -26 |
| Resonance frequency | kHz | 14 |
| Microphone cartridge capacitance, typ. | pF | 18 |
| Microphone venting | | Rear |
| Temperature range, operation | °C / °F | -40 to 150 / -40 to 302 |
| IEC 61094-4 Designation | | WS2F |
| Temperature range, storage | °C / °F | -40 to 85 / -40 to 185 |
| Humidity range non condensing | % RH | 0 to 90 |
| Temperature coefficient @250 Hz | dB/°C / dB/°F | -0.01 / -0.006 |
| Humidity coefficient @250 Hz | dB/% RH | -0.001 |
| Static pressure coefficient @250 Hz | dB/kPa | -0.011 |
| Influence of axial vibration @1 m/s² | dB re 20 µPa | 62 |
| CE/RoHS compliant/WEEE registered | | Yes / Yes, Yes |
| Weight | g / oz | 6.5 / 0.229 |




*Typical frequency response. Upper curve shows free-field response for 0°, lower curve shows pressure response.*

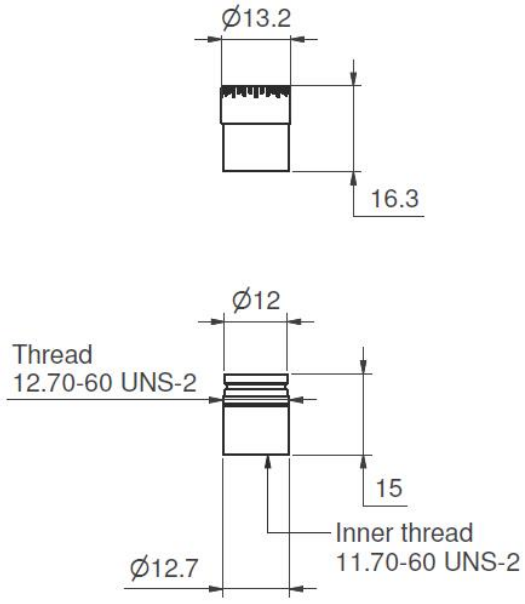



*Free-field corrections for different angles of incidence*

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

# Dimensions

Dimensions in mm



## Optional items

| | |
|---|---|
| GRAS AF0008 | Adapter for ¼" preamplifier and ½" microphone |
| GRAS GR0010 | Adapter for ¼" preamplifier and ½" microphone |
| GRAS RA0001 | Right-angled (90°) adapter for ½" microphone and ¼" preamplifier |
| GRAS RA0003 | Adapter for ¼" preamplifier and ½" microphone |
| GRAS RA0016 | 20 dB Attenuator for externally polarized ½" microphones |
| 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


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**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 and related equipment for industries where acoustic measuring accuracy and repeatability are of the utmost importance. This includes applications and solutions for customers within the fields of aerospace, automotive, audiology, consumer electronics and other highly demanding industries. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect, trust and require.
GRAS Sound & Vibration is represented through subsidiaries and distributors in more than 40 countries and is part of Axiometrix Solutions, a leading test solutions provider comprised of globally recognized measurement brands. Read more at www.grasacoustics.com

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