GRAS 40AU-1

1/2" Ext. Polarized Reference Pressure Microphone

Freq range: 3.15 Hz to 20 kHz
Dyn range: 20 dB(A) to 164 dB
Sensitivity: 12.5 mV/Pa

The 40AU-1 is an IEC 61094 LS2aP ½" externally polarized reference microphone that is rear-vented. It is a ½" laboratory-standard pressure microphone that is ideal for precision sound pressure measurements. It has a front cavity as specified in IEC 61094-1 and is supplied with a protective dust cap. 40AU-1 is factory calibrated and delivered with a calibration chart stating its specific open-circuit sensitivity and pressure frequency response.

GRAS Sound & Vibration
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Introduction

GRAS 40AU-1 is an IEC 61094 LS2aP ½" externally polarized reference microphone. The microphone is rear-vented and delivered with a dust and scratch protective cap.

The microphone has a front cavity according to IEC 61094-1 that makes it suitable for primary method calibration (reciprocity) and for precision sound pressure measurements in general.

The microphone is made of carefully selected high-grade metals and materials in combination with tight tolerances and dedicated workmanship to ensure a reliable and stable measurement.

GRAS 40AU-1 microphones are individually calibrated, and each is delivered with a calibration chart stating its specific open-circuit sensitivity pressure response (actuator response).

Typical applications and use

GRAS 40AU-1:

- Is intended for sound pressure measurements of the highest attainable accuracy.
- Can be used for reciprocity measurements according to the specifications in IEC 61094-2.
- Is suitable for measurements in couplers, ear simulators and enclosures where pressure measurements are to be performed.

Caution: To ensure optimal stability, stable conditions and special care must always be taken into account when handling a reference microphone.

Compatibility

The 40AU-1 requires a standardized ½" LEMO preamplifier and an input module that supports this technology with a 7-pin LEMO connector.

System verification

For frequency calibration the dedicated electrostatic actuator RA0014-S1 (optional) must be used. The RA0014-S1 actuator allows for frequency calibration without removing the front volume ring. The front cavity ring is fixed.

Be aware that any attempt to remove the front cavity ring will cause damage to the microphone.

RA0014-S1 can be ordered separately.

Calibration

40AU-1 is delivered with a traceable calibration, including calibration chart that documents the following:

- Specific open-circuit sensitivity
- Pressure frequency response (by actuator Type RA0014-S1)
- Temperature coefficient

All GRAS microphones leave the factory calibrated in our controlled laboratory environment using traceable calibration equipment.

Depending on use, measurment environment and internal quality control programs, we recommend that the microphone is recalibrated at least once a year.

For reference measurement purposes, we recommend make a *Primary calibration*, which ensures the highest precision 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.

Learn more at calibration-service.

Quality and warranty

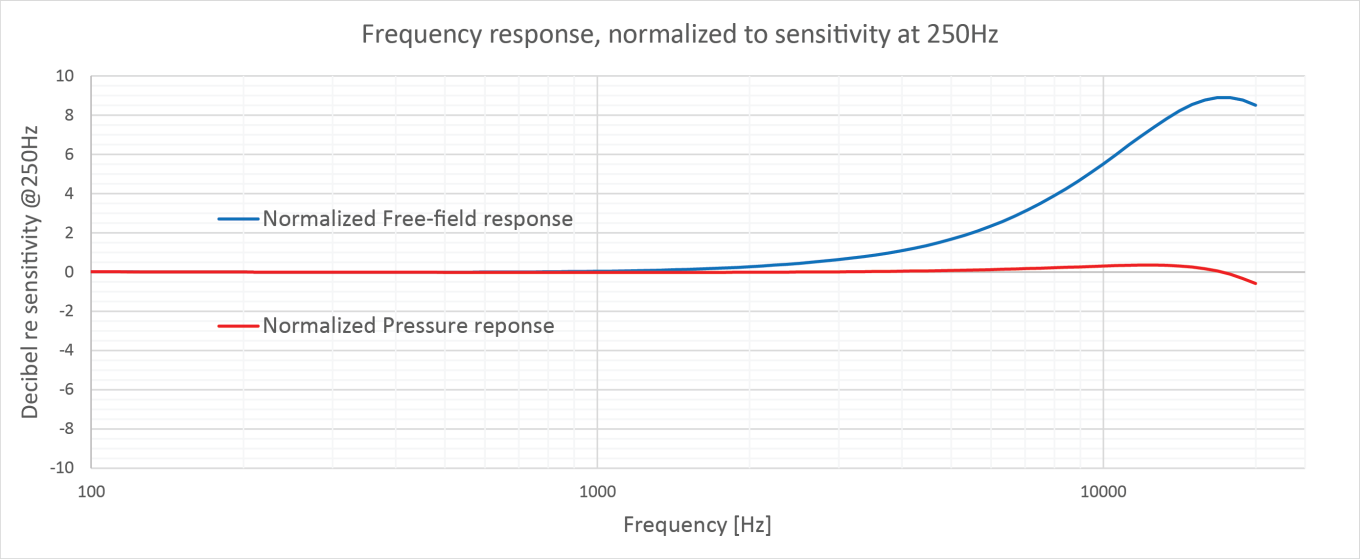
All GRAS microphones are made of high-quality materials that ensure life-long stability and robustness. The microphones are assembled in verified clean-room environments by skilled and dedicated operators with many years of expertise in this field.

The microphone diaphragm, body, and improved protection grid are made of carefully selected high-grade metals and materials. This makes the microphone resistant to physical damage, as well as corrosion caused by aggressive air or gasses.

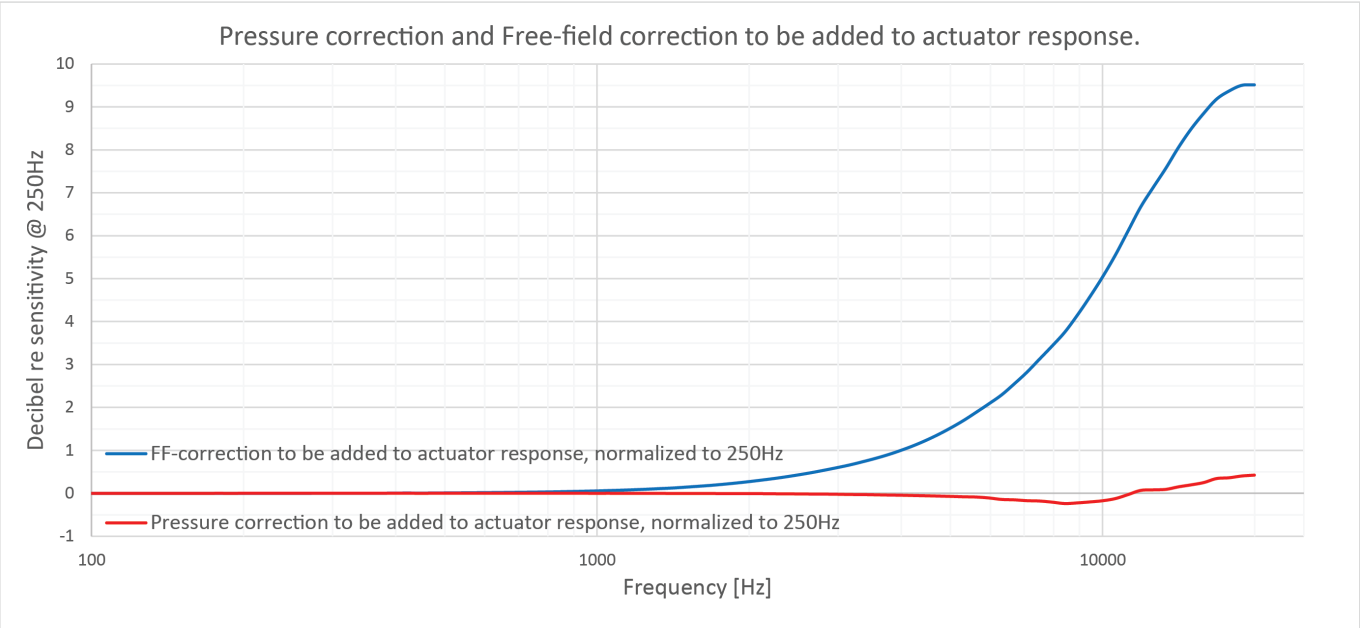
This, combined with the reinforced gold-plated microphone terminal, which guarantees a highly reliable connection, enables GRAS to offer a five-year warranty against defective materials and workmanship.

Specifications

Polarization/Connection		200 V / Traditional
Frequency range (±1 dB)	Hz	5 to 12.5 k
Frequency range (±2 dB)	Hz	3.15 to 20 k
Dynamic range lower limit (microphone thermal noise)	dB(A)	20
Dynamic range lower limit with GRAS preamplifier	dB(A)	25
Dynamic range upper limit	dB	160
Dynamic range upper limit with GRAS preamplifier @ +28 V / ±14 V power supply	dB	153
Dynamic range upper limit with GRAS preamplifier @ +120 V / ±60 V power supply	dB	160
Open-circuit sensitivity @ 250 Hz (±2 dB)	mV/Pa	12.5
Open-circuit sensitivity @ 250 Hz (±2 dB)	dB re 1V/Pa	-38
Resonance frequency	kHz	32
Microphone cartridge capacitance, typ.	pF	20
Microphone venting		Rear
IEC 61094 compliance		LS2aP
Temperature range, operation	°C / °F	5 to 50 / 41 to 122*
Temperature range, storage	°C / °F	5 to 50 / 41 to 122*
Temperature coefficient @250 Hz	dB/°C / dB/°F	0.009 / 0.005
Humidity range non condensing	% RH	0 to 90
Static pressure coefficient @250 Hz	dB/kPa	-0.0045
Humidity coefficient @250 Hz	dB/% RH	Negligible
Influence of axial vibration @1 m/s²	dB re 20 µPa	66
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes
Weight	g / oz	7 / 0.247
Equivalent volume	mm^3 / in^3	9.5 / 0.00058



Typical frequency response



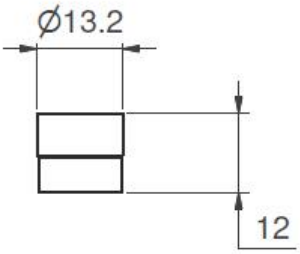
The corrections from actuator to the real pressure and free-field responses

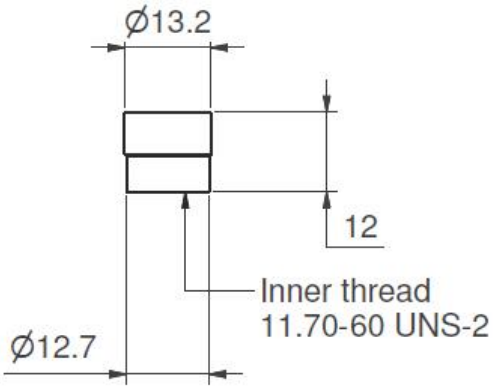
The actuator frequency response is normally assumed to be equal to the pressure response.
In practice, there is a minor deviation, which could be taken into account for this microphone.

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

Dimensions

Dimensions in mm





Ordering info

Included items

GRAS 40AU-1	1/2" Ext. Polarized Reference Pressure Microphone

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 RA0014-S1	Electrostatic Actuator for 40AU-1 only
GRAS RA0016	20 dB Attenuator for externally polarized ½" microphones
GRAS CA0001	Traceable Calibration of Microphone
GRAS CA2001	Accredited Calibration of Microphone

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GRAS Worldwide

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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 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 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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