



Freq range: 3.15 Hz to 20 kHz
Dyn range: 15 dB(A) to 148 dB
Sensitivity: 50 mV/Pa

The GRAS 40AE is a 1/2" Prepolarized free-field microphone for measuring medium sound pressure levels at medium frequencies. The equivalent externally polarized 200 V type is [GRAS 40AF](#).

Introduction

GRAS 40AE is a high-precision electret condenser microphone made according to IEC 61094-4 requirements. The electret technology for microphones was introduced in the beginning of the 1960's and has been continuously improved over the years. At GRAS, we have developed and refined our own techniques. This guarantees that our prepolarized microphones are as stable and robust as our traditional, externally polarized versions in daily use scenarios.

The 40AE's design is based on the original reference 1/2" 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.

40AE is the perfect free-field complement to the [GRAS 40AD](#) 1/2" Ext. Polarized Pressure Microphone.

40AE 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 40AE 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 40AE the preferred measurement microphone for sound level meters/analyzers with CCP-option and, as such, enables IEC 61672 Class 1 measurements.

Compatibility

The 40AE requires a standardized 1/2" or 1/4" CCP preamplifier and an input module that supports this

technology with a BNC, SMB, or Microdot connector.

System verification

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

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.

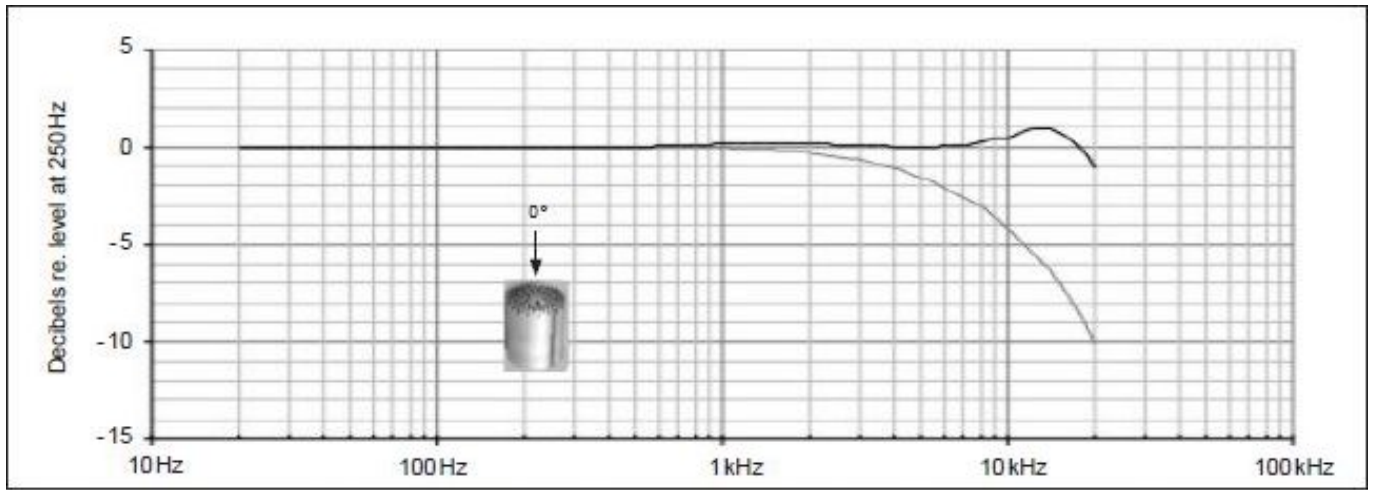
The microphone diaphragm, body, and improved protection grid are made of high-grade stainless steel, which makes the microphone resistant to physical damage, as well as corrosion caused by aggressive air or gasses.

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.

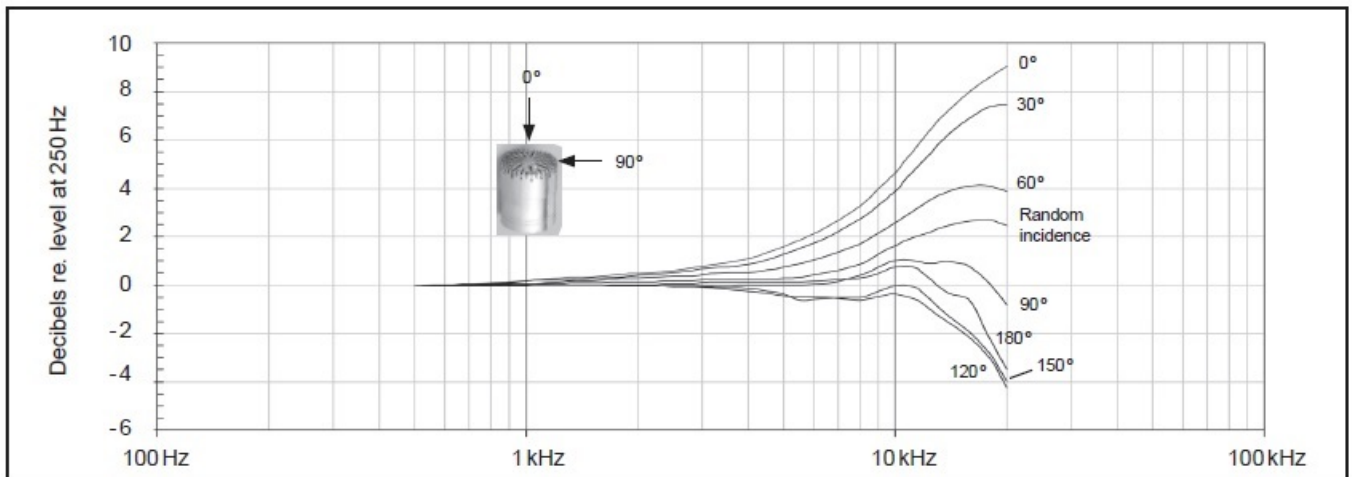
Service

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.

Polarization/Connection		0 V / CCP
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)	15
Dynamic range lower limit with GRAS preamplifier	dB(A)	17
Dynamic range upper limit	dB	148
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	148
Dynamic range upper limit with GRAS CCP preamplifier	dB	138
Open-circuit sensitivity @ 250 Hz (± 2 dB)	mV/Pa	50
Open-circuit sensitivity @ 250 Hz (± 2 dB)	dB re 1V/Pa	-26,0
Resonance frequency	kHz	14
Microphone cartridge capacitance, typ.	pF	14
Microphone venting		Rear
Temperature range, operation	$^{\circ}\text{C} / ^{\circ}\text{F}$	-40 to 120 / -40 to 248
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	-0,014
Humidity range non condensing	% RH	0 to 90
Humidity coefficient @250 Hz	dB/% RH	-0,001
Influence of axial vibration @1 m/s ²	dB re 20 μPa	62
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes
Weight	g / oz	6.50 / 0.229



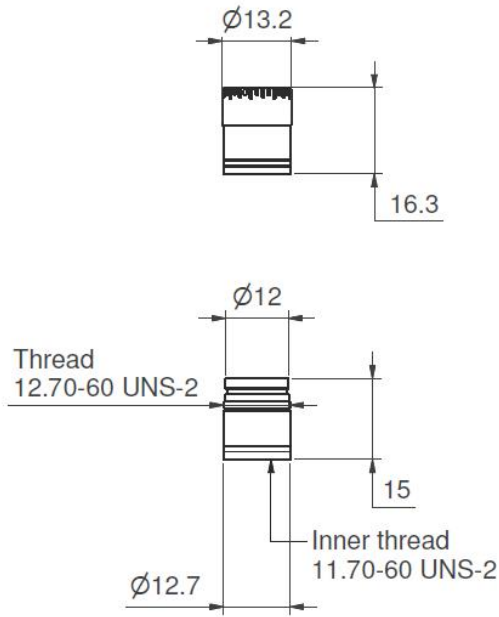
Typical frequency response. Upper curve shows free-field response for 0°, lower curve shows pressure response.



Free-field corrections for different angles of incidence

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

Dimensions in mm





Freq range: 2.5 Hz - 200 kHz
Noise: 1.8 μ V Gain: -0.30 dB
Special feature: General purpose

The GRAS 1/2" Preamplifier GRAS 26CA is a general purpose preamplifier optimized for use with prepolarized condenser microphones. It is a small, robust unit and uses a GRAS CCP power supply (ICP ®), e.g. GRAS 12AL. It has a very low inherent noise level, and a large dynamic range and a frequency response from below 2 Hz to above 200 kHz.

Typical applications and use

CCP inputs (ICP ®)

Prepolarized microphones

1/2" precision microphones

High levels and high frequencies

Design

The GRAS 26CA 1/2" CCP Standard Preamplifier is a small, robust unit and uses a CCP power supply (ICP ®), e.g. GRAS 12AL. It has a very low inherent noise level, a large dynamic range and a frequency response from below 2 Hz to above 200 kHz.

Its small ceramic thick-film substrate has a very high input impedance, and is shielded by a guard ring to minimise the influence of stray capacitance and microphonic interference.

The 26CA is delivered with Generation II TEDS. The calibration data is programmed into the built-in TEDS according to IEEE 1451.4 using UDID I27-0-0-0U. If your measurement platform supports Transducer Electronic Data Sheets you will be able to read and write data like properties and calibration data.

Generation II TEDS chip (DS2431) may require updated system software.

It can be used with all GRAS prepolarized microphones, namely: 1/2" microphones: GRAS 40AE, 40AD and 40AQ 1/4-inch microphones: GRAS 40BE and 40BD, using the optional 1/2"-inch to 1/4-inch adaptor RA0019.

It has an integrated BNC output connector. The casing is made of stainless steel for maximum strength and durability.

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* Transducer Electronic Data Sheet - IEEE-P1451.4

Frequency range (± 0.2 dB) with 18 pF microphone dummy	Hz	2.5 to 200 k
Slew rate	V/ μ s	20
Input impedance	G Ω // pF	20 // 0.4
Output impedance	Ω	< 50
Output Voltage Swing, min. @ 24-28 V CCP voltage supply	V _p	8
Noise (A-Weighted) max.	μ V	2.5
Noise (A-Weighted) typ.	μ V	1.8
Noise (Linear 20 Hz – 20 kHz) max.	μ V	6
Noise (Linear 20 Hz – 20 kHz) typ.	μ V	3.5
Gain	dB	-0.30
Power supply (Constant Current Power)	mA	2 to 20 (typical 4)
DC bias voltage, typ.	V	12
Temperature range, operation	$^{\circ}$ C / $^{\circ}$ F	-30 to 70 / -22 to 158
Temperature range, storage	$^{\circ}$ C / $^{\circ}$ F	-40 to 85 / -40 to 185
Humidity range non condensing	% RH	0 - 95
TEDS UDID (IEEE 1451.4)		I27-0-0-0U
Connector type		BNC
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes
Weight	g / oz	26.0 / 0.92

Conditions: 23 $^{\circ}$ C Ambient temperature, 4 mA / 24 V open loop CCP voltage, 18 pF dummy microphone, 3 m output coax-cable.

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Dimensions in mm

