GRAS 40AK

1/2" Ext. Polarized Intensity Microphone Kit

Freq response: IEC 61043
Dyn range: 20 dB(A) to 157 dB
Sensitivity: 25 mV/Pa

The 40AK is an IEC 61094-compliant, WS2F ½" externally polarized sound-intensity microphone set. The microphones in the set are two 40AI microphones - two phase-matched free-field condenser microphones with extremely well-controlled phase characteristics for use in sound-intensity probes. This microphone pair has a free-field frequency response that complies with IEC 61043 1993 Class 1 and IEC 60651 Type 1 in the range from 20 Hz to 10 kHz.

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Introduction

The 40AK is an IEC 61043-complian ½" externally polarized sound-intensity microphone pair. Read about the prepolarized equivalent 40GK.

The microphones in the kit are two 40AI microphones – two phase-matched free-field measurement microphones with extremely well-controlled phase characteristics for use in sound-intensity probes. This microphone pair has a free-field frequency response that complies with IEC 61043 1993 Class 1 and IEC 60651 Type 1 in the range from 20 Hz to 10 kHz.

The 40AK kit also includes solid spacers for 12 mm, 25 mm, 50 mm, and 100 mm intensity-probe configurations, as well as adapters for the 26AA ¼" LEMO preamplifier set. The 40AK is a part of the GRAS 50AI LEMO Sound Intensity Probe.

40AK is individually factory-calibrated and delivered with a calibration chart, stating its specific open-circuit sensitivity and pressure frequency response.

Typical applications and use

The 40AI is designed for sound-intensity and sound-power measurements, as well as sound-source localization, which is why it is included in the 50AI probe in the 40AK kit. Each 40AI microphone pair is phase matched according to the phase specifications for a Class 1 Sound Intensity Probe in accordance with international IEC 61043, Electroacoustics - Instruments for the Measurement of Sound Intensity - Measurements with Pairs of Pressure Sensing Microphones, 1993.

The quality of a sound intensity probe microphone is its ability to measure the real part of a complex sound intensity in highly reactive sound fields as well as in sound fields exposed to high levels of background noise. This ability depends largely on the phase responses of the microphone pair. The individual phase matching of each 40AI ensures that any differences in phase responses are extremely small.

The 40AI is also used for ranking of sound sources. When mounted in the 50AI sound-intensity probe, the microphones can pinpoint the area generating the most noise, which may then require additional measurements, depending on the measurement procedures and processes used. The sound-intensity microphones reveal the weak and strong points when identifying noise sources. Sound-source ranking is useful as long as the background noise doesn't exceed the noise source.

Compatibility

The 40AK includes straight and right-angled adapters for ¼" LEMO preamplifiers, which require an input module that supports this technology with a 7-pin LEMO connector.

In the 50AI Sound-Intensity Probe, the 40AK pair is combined with the 26AA ¼" LEMO preamplifier set.

System verification

For daily verification and check of your measurement setup, we recommend using a calibrator like GRAS Sound Level Calibrator 42AB.

For proper sensitivity calibration, we recommend using a pistonphone like GRAS Intelligent Pistonphone 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.

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	IEC 61043 Class 1
Dynamic range lower limit (microphone thermal noise)	dB(A)	20
Dynamic range upper limit with GRAS preamplifier @ +28 V / ±14 V power supply	dB	145
Dynamic range upper limit with GRAS preamplifier @ +120 V / ±60 V power supply	dB	157
Set sensitivity @ 250 Hz (±2 dB)	mV/Pa	25
Set sensitivity @ 250 Hz (±2 dB)	dB re 1V/Pa	-32
IEC 61094-4 Compliance		WS2F
Temperature range, operation	°C / °F	-40 to 150 / -40 to 320
Temperature range, storage	°C / °F	-40 to 85 / -40 to 185
Temperature coefficient @250 Hz	dB/°C / dB/°F	-0.01 / -0.006
Static pressure coefficient @250 Hz	dB/kPa	-0.01
Humidity range non condensing	% RH	0 to 100
Humidity coefficient @250 Hz	dB/% RH	-0.001
Influence of magnetic field @80 A/m, 50 Hz	dB re 20 µPa	34
Influence of axial vibration @1 m/s²	dB re 20 µPa	62
CE/RoHS compliant/WEEE registered		Yes / Yes / Yes
Weight	g / oz	10 / 0.353

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

Optional items

GRAS 26AA Set	1/4" Preamplifier with Integrated Cable for Intensity Probes
GRAS 42AG	Multifunction Sound Calibrator
GRAS 42AP	Intelligent Pistonphone, Class 0
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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