GRAS 40BI

1/4" Ext. Polarized Intensity Microphone Kit

Freq response: IEC 61043
Dyn range: 35 dB(A) to 172 dB
Sensitivity: 4 mV/Pa

The 40BI is an IEC 61094-compliant, WS3F ¼" externally polarized sound-intensity microphone pair. The 40BI microphone pair consists of two phase-matched free-field condenser microphones with extremely well-controlled phase characteristics for use in sound-intensity probes. Their standard mounting threads make them compatible with all the usual available makes of measurement-microphone preamplifiers.

GRAS Sound & Vibration
Skovlytoften 33, 2840 Holte, Denmark
www.grasacoustics.com

Introduction

The 40BI is an IEC 61043-compliant ¼" externally polarized sound-intensity microphone pair.

The 40BI microphone pair consists of two phase-matched free-field condenser microphones with extremely well-controlled phase characteristics for use in sound-intensity probes. Their standard mounting threads make them compatible with all the usual available makes of measurement-microphone preamplifiers.

The 40BI can be used in the GRAS 50AI Sound-Intensity Probe for high frequency sound-intensity measurements. The 50AI is delivered with ½" microphones, and the 40BI can be ordered as accessories so that you can cover a large frequency range for your sound-intensity measurements. Because the 40BI measures higher frequencies, smaller spacers - 6 mm, 12 mm, and 25 mm – are included with the 40BI kit.

40BI 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 40BI is designed for sound-intensity and sound-power measurements, as well as sound-source localization. Each 40BI 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 40BI ensures that any differences in phase responses are extremely small.

The 40BI is also used for ranking of sound sources. When mounted in a sound-intensity probe such as the 50AI, 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 40BI requires a standardized ¼" LEMO preamplifier and an input module that supports this technology. We recommend GRAS 26AA preamplifier.

System verification

For daily verification and check of your measurement setup, we recommend using a calibrator like GRAS 42AG Multifunction Sound 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 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		0 V / CCP
Frequency range (±1 dB)	Hz	IEC 61043 Class 2
Dynamic range lower limit (microphone thermal noise)	dB(A)	30
Dynamic range lower limit with GRAS preamplifier	dB(A)	35
Dynamic range upper limit	dB	172
Dynamic range upper limit with GRAS preamplifier @ +28 V / ±14 V power supply	dB	163
Dynamic range upper limit with GRAS preamplifier @ +120 V / ±60 V power supply	dB	172
Polarization voltage	V	200 V / Traditional
Microphone venting		Rear
IEC 61094-4 Compliance		WS3P
Temperature range, operation	°C / °F	-40 to 150 / -40 to 302
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	-0.008
Humidity range non condensing	% RH	0 to 100
Humidity coefficient @250 Hz	dB/% RH	-0.001
Influence of axial vibration @1 m/s²	dB re 20 µPa	59
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes
Weight	g / oz	1.5 / 0.053

Difference in phase response
From 20 Hz to 1000 Hz < 0.2°
From 1000 Hz to 10 kHz < f [kHz] x 0.2°

Difference in amplitude response (normalised at 250 Hz)
From 20 Hz to 2 kHz < 0.2 dB
From 2 Hz to 10 kHz < 0.3 dB

Difference in sensitivity at 250 Hz < 2dB

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

GRAS Sound & Vibration reserves the right to change specifications and 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.GRASacoustics.com
gras@grasacoustics.com

USA
GRAS SOUND & VIBRATION
9290 SW Nimbus Avenue
Beaverton, OR 97008
Tel: 503-627-0832
Toll Free: 800-231-7350
www.GRASacoustics.com
sales-usa@grasacoustics.com

UK
GRAS SOUND & VIBRATION
Unit 115, Gibson House,
Ermine Business Park, Huntingdon,
Cambridgeshire, PE29 6XU
Tel: +44 (0)7762 584 202
www.GRASacoustics.com
sales-uk@grasacoustics.com

CHINA
GRAS SOUND & VIBRATION
Room 502, Building T1,
No.1398 Ali Center
Shenchang Road,
Minhang District,
Shanghai, China, 201107
Tel: +86 21 400-888-9826
www.GRASacoustics.cn
cnsales@grasacoustics.com

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

www.GRASacoustics.com

GRAS

An Axiometrix Solutions Brand