GRAS 46BH-1

1/4" LEMO Pressure Standard Microphone Set, High pressure

Freq range: 10 Hz to 20 kHz
Dyn range: 54 dB(A) to 193 dB
Sensitivity: 0.4 mV/Pa

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GRAS Sound & Vibration A/S
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GRAS Sound & vibration

Introduction

Through a close cooperation with our customers, we know that data-safety is highly important because the costs related to unsuited and unreliable sensors may determine whether your project turns into a success or not.

For our users, data safety translates directly into requests for easier microphone selection, simple system configuration and reduction of measurement errors.

To meet these requirements, we invented the microphone set concept. It is simple, reliable and robust and consists of a microphone cartridge and preamplifier combination, which is calibrated as one unit. This eliminates errors because there is only one sensitivity value to account for and the risk of contaminating the interface is eliminated. Combine this with our unique and proven design and you have the most reliable measurement microphone sets available in the industry today.

Typical application and use

The 46BH-1 is a pressure microphone set and as such optimized for acoustic measurements of the sound source in a closed coupler or the measurement of sound pressure at a boundary or wall; in which case the microphone forms part of the wall and measures the sound pressure on the wall itself.

Regarding temperature range, see the Specifications. Should higher temperature limits be required, we recommend considering the GRAS probe microphones where the microphone and preamplifier can be isolated from the hot source.

Design

The GRAS 46BH-1 is a high-performance standard microphone set. In our clean-room environment the set is assembled and sealed with a label. However, the microphone set can be dismounted, if you wish to use the components separately.

Microphone
The microphone cartridge is the high-quality IEC 61094 WS3F standardized GRAS 40BH 1/4" Externally Polarized Pressure Microphone, designed for long-term reliability in multiple environments.

Preamplifier
The preamplifier is the GRAS 26AC-1 Preamplifier which is inclusive TEDS and based on our well-known circuit board substrates. In the industry these are famous for their low self-noise, wide frequency and excellent slew rate performance.

Compatibility

To perform as specified, the GRAS 46BH-1 microphone set requires a power module or an analyzer input which can supply the preamplifier with power as well as 200 V polarization. If the power supply is lower, the capability of driving long cables is reduced and consequently the upper frequency is reduced. If the voltage supply is lower it will influence the upper dynamic range.

The microphone set is terminated with a 5-pin mini-LEMO connector. Ready to use cable assemblies with LEMO connectors of various types and lengths are available in standard as well as customized lengths.

The 46BH-1 is IEEE 1451.4 TEDS 27v. 1.0 compliant. If your measurement platform supports Transducer Electronic Data Sheets you will be able to read and write data like properties and calibration data.

System verification

The functionality of TEDS is very useful to determine which microphone is connected to which input channel. However, it is not a check of whether the microphone is within specifications or not. For daily verification and check of your measurement setup, we therefore recommend using a sound source like the GRAS 42AB Sound Calibrator.

For proper sensitivity calibration we recommend using a reference sound source like the 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

GRAS microphone sets are made of components from our proven standard portfolio and are all manufactured of high-quality material and branded parts that were chosen and processed to ensure life-long stability and robustness.

All parts are manufactured and assembled at the factory in Denmark by skilled and dedicated operators in a verified clean-room environment. The microphone diaphragm, body and unique protection grid are made of high-grade stainless steel and make the microphone set resistant to physical damage as well as corrosion caused by aggressive air or gasses.

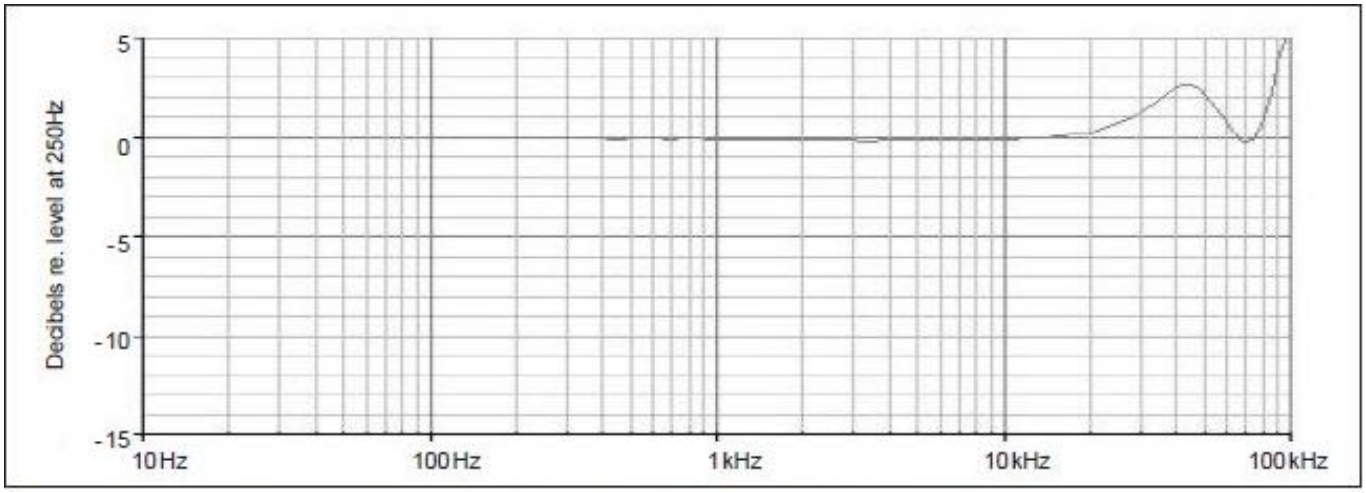
This, together with the enforced gold-plated microphone terminal guarantees a highly reliable connection. Thanks to the high quality, our warranty against defective materials and workmanship is 5 years.

Service

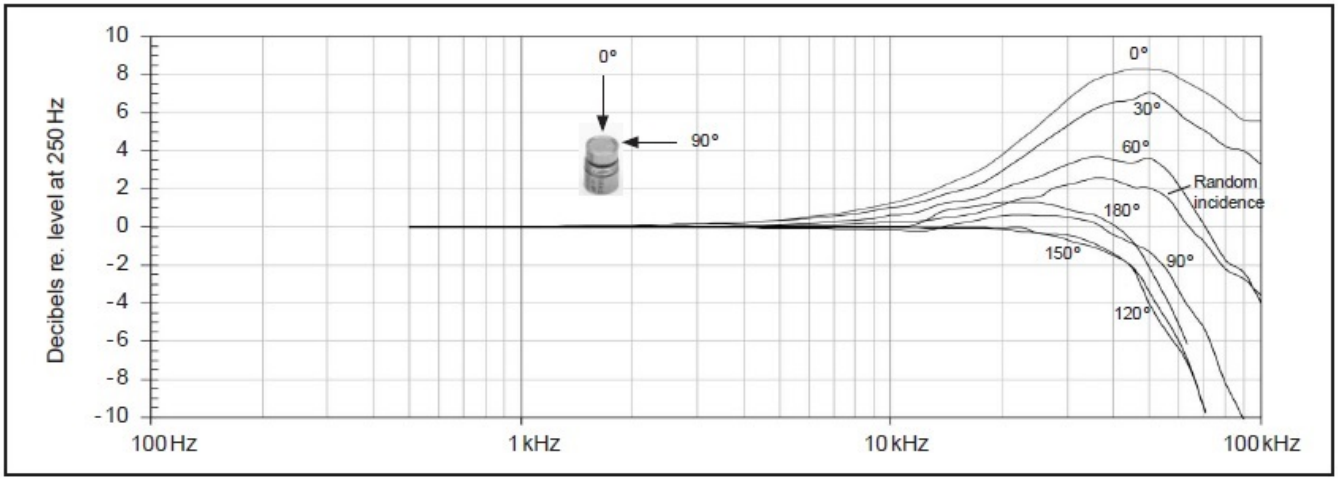
Should you by mistake damage the diaphragm on a GRAS microphone we will in most cases be able to exchange it at a very reasonable cost and short turn-around time. This not only protects your investment but also meets your quality assurance department since you do not have to worry about new serial numbers etc.

Specifications

Frequency range (±2 dB)	Hz	10 to 20 k
Dynamic range lower limit with GRAS preamplifier	dB(A)	54
Dynamic range upper limit with GRAS preamplifier @ +28 V / ±14 V power supply	dB	181
Dynamic range upper limit with GRAS preamplifier @ +120 V / ±60 V power supply	dB	193
Set sensitivity @ 250 Hz (±1 dB)	mV/Pa	0.4
Set sensitivity @ 250 Hz (±1 dB)	dB re 1V/Pa	-68
Output impedance		75
DC-offset, min., single suppy	V	0.5 x Vs - 1
DC-offset, max., single suppy	V	0.5 x Vs + 4
DC-offset, balanced supply	V	-1 to 4
Microphone venting		Rear
IEC 61094-4 Compliance		WS3P
Temperature range, operation	°C / °F	-30 to 70 / -22 to 158
Temperature range, storage	°C / °F	- 40 to 85 / - 40 to 185
Temperature coefficient @250 Hz	dB/°C / dB/°F	-0.01 / -0.006
Humidity range non condensing	% RH	0 to 100
Humidity coefficient @250 Hz	dB/% RH	-0.001
TEDS UTID (IEEE 1451.4)		27 v. 1.0
Connector type		5-pin LEMO 00
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes



Typical frequency response (without protection grid).

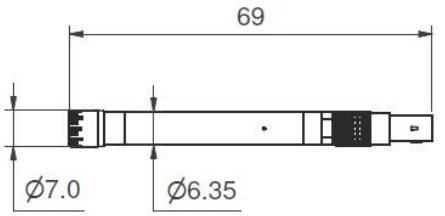


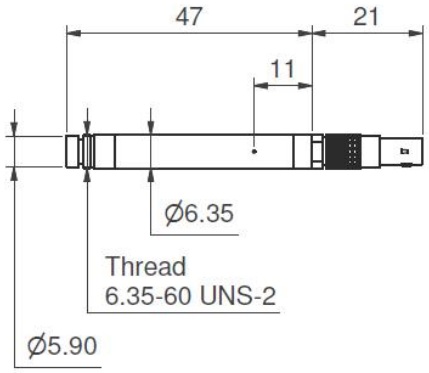
Free-field corrections for different angles of incidence

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

Dimensions

Dimensions in mm





Optional items

GRAS AA0091	3 m LEMO 5-pin - LEMO 7-pin Cable
GRAS AA0092-CL	Customized Length LEMO 5-pin - LEMO 7-pin Cable
GRAS AL0029	1/4" Microphone Holder, POM
GRAS AL0013	1/4" Microphone Holder, Stainless Steel
GRAS AL0005	Swivel head
GRAS AL0006	Tripod
GRAS RA0022	1/4" Nosecone
GRAS AM0071	Windscreen for 1/4" Microphones
GRAS RA0127	Rain-protection cap for 1/4” microphones
GRAS 12AA	2-Channel Power Module with gain, filters and SysCheck generator
GRAS 12AK	1-Channel Power Module with gain, filters and SysCheck generator
GRAS 12AQ	2-Channel Universal Power Module with signal conditioning and PC interface
GRAS 42AB	Sound Calibrator, Class 1
GRAS 42AP	Intelligent Pistonphone, Class 0
GRAS CA0029	Traceable Calibration of Microphone Set
GRAS CA2301	Accredited Calibration of Microphone Set

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We Make Microphones

Tradition

Since the establishment in 1994, GRAS has been 100% dedicated to developing and manufacturing high-quality measurement microphones and related acoustic equipment.

Innovation

We work with everybody with an interest in sound or noise within the fields of aerospace, automotive, audiology, consumer electronics, noise monitoring, building acoustics and telecommunications.

Quality

At GRAS we know that in order for you to trust your measurement results; signal quality, stability and robustness are essentials. We design and build them to perform under real life conditions – and beyond.

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