GRAS 40PM-1

EQset™ Miniature Production Line Microphone, High Precision

Freq range: 20 Hz to 20 kHz
Dyn range: 30 dB(A) to 125 dB
Sensitivity: 20 mV/Pa

GRAS 40PM-1 is an upgraded version of GRAS 40PM EQset™. The GRAS 40PM-1 is a short 20 kHz ¼ pressure microphone with a dynamic range from 30 dB (A) to 125 dB SPL (<3% THD) and the same length (34 mm) as traditional production line microphones. Its fixed sensitivity, flat response curve across all frequencies, and high environmental stability make GRAS 40PM-1 the ideal production line microphone.
Learn more about the EQset Technology >>

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GRAS 40PM-1 with EQset™

GRAS 40PM-1 with EQset is an upgraded version of the GRAS 40PM. It is designed for use in production line environments, and it provides many benefits over traditional production line- or array-style microphones. Designed to be cost-effective, easy to use, resistant to errors, and environmentally stable, GRAS 40PM is the best production line microphone option on the market. Each GRAS 40PM-1 microphone has a flat response curve and fixed sensitivity. The tolerance for individual microphone sensitivities is less than ±0.2 dB, and frequency-response variation is less than ±0.5 dB up to 20 kHz. And because GRAS 40PM-1 is dimensionally identical to the traditional production line microphones, it can easily replace them in existing setups.

EQset technology

EQset microphones all have a uniformly fixed sensitivity and flat curve. This reduces measurement uncertainty and greatly simplifies microphone setup, monitoring, replacement, and corrections. EQset means that everything can happen quickly and easily without any individual microphone adjustments or corrections. The simplification of setup and other tasks saves both time in the setup itself and time in operator training. There is, however, one additional benefit that outshines the time savings: EQset almost completely eliminates the inherent risk of false passes on production lines or correction error for frequencies outside the calibrated frequency in R&D—common issues with other microphones in the market.

Another benefit of the uniformly fixed sensitivity and flat response curve of each EQset microphone is that there is no need to make individual corrections for each microphone. There is, therefore, no need to store that correction information on the microphones via TEDS. This enables EQset microphones to be used effectively with systems based on audio sound cards using 48 V phantom power as well as any CCP-based system already in use, so there is no need for price-prohibitive new equipment or retooling of existing CCP-based systems.

For more on EQset technology scan the QR-Code or visit grasacoustics.com/EQset.

Environmental stability

The unique design of the GRAS 40PM-1 provides this range of microphones with unmatched environmental stability. The deviation on a typical production line is less than ±0.2 dB, so there is no need for corrections due to temperature or humidity over the course of a normal day in a typical production-line environment. Typical environmental conditions on a production line are defined by temperature varying between 13 and 35°C (55 to 95°F), static pressure varying between 983 and 1043 hPa, and non-condensing humidity.

Typical applications and use

- Production-line testing of audio devices such as drivers, receivers, micro-speakers, and miniature microphones
- Measurements in confined spaces

When starting up, these microphones have a settling time of approximately 5 seconds for accuracy better than 0.1 dB or 1 minute for full accuracy.

Design

The GRAS 40PM-1 is a robust, cost-effective microphone designed for use in production line testing of loudspeakers and acoustic transducers. It has a wide frequency range, from 20 Hz to 20 kHz,

and a dynamic range from 30 dB (A) to 125 dB.

The cost-effectiveness of the GRAS 40PM-1 is a key consideration when setting up multiple production lines. Each GRAS 40PM-1 is interchangeable with any other GRAS 40PM-1 without the need for recalibration or additional corrections.

GRAS 40PM-1 is a 34 mm long ¼ microphone that can be used in space-challenged setups where larger microphones would not fit or provide difficulties in testing. Additionally, its small aperture provides an advantage in testing micro-speakers, or miniature microphones. It is good practice to use a microphone with a diameter similar to or smaller than the device to be measured.

Compatibility

This range of microphones is fully compatible with 48 V phantom power setups and CCP-based setups. As such the GRAS 40PM-1 can be used in new cost-saving production-line setups or as replacements for less accurate TEDS-based microphones in existing CCP setups.

Using a phantom power setup along with an analyzer such as the APx500 Flex Audio Analyzer will create a budget-friendly setup that can be expanded or upgraded easily as need arises.

Calibration—measurement chain

GRAS 40PM microphones can be calibrated to ensure that down-stream equipment (such as a sound card) is correctly set up using a pistonphone like GRAS 42AP or a hand-held calibrator like the GRAS 42AG Multifunction Sound Calibrator. The tolerance of the 42AG is comparable to 40PM-1 microphone, The most precise calibration with 42AG will be opbtained @250Hz

Quality and warranty

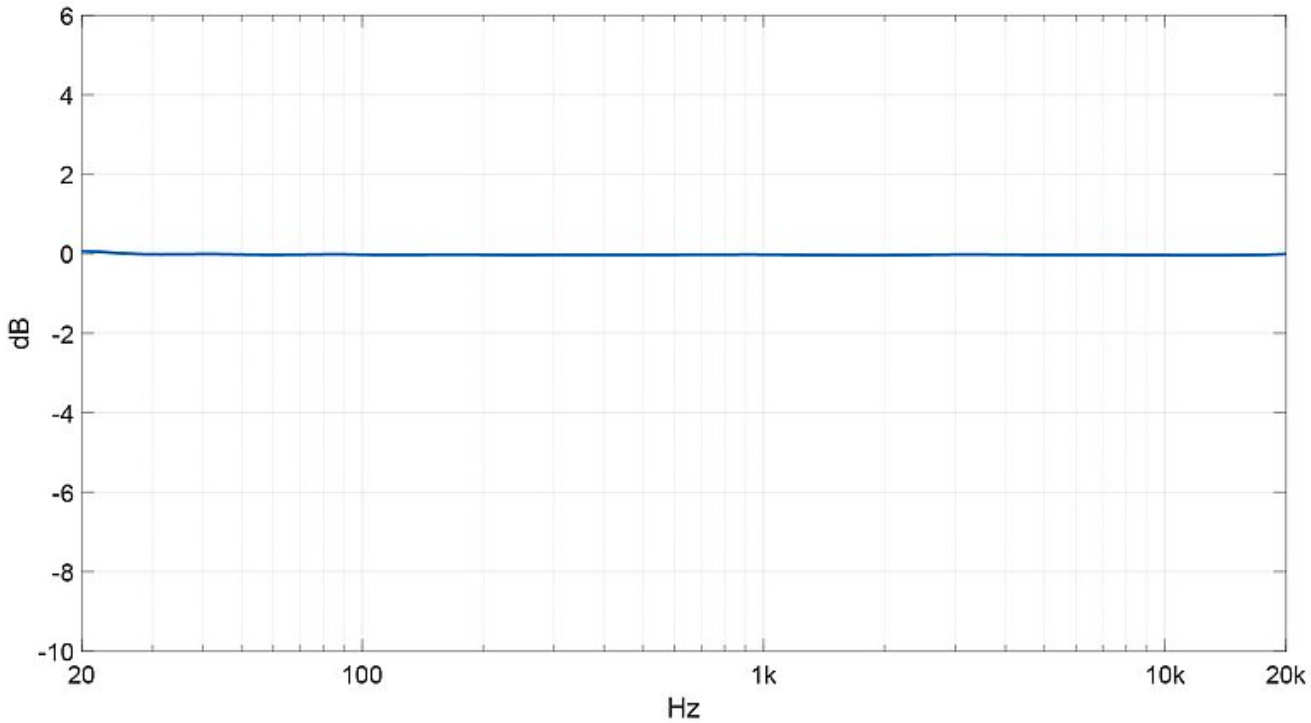
GRAS microphone sets are made of components from our proven standard portfolio and are all manufactured of high-quality material and branded parts that were chosen and processed to ensure life-long stability and robustness.

All parts are manufactured and assembled at the factory in Denmark by skilled and dedicated operators.

Thanks to the high quality, our warranty against defective materials and workmanship is two years.

Specifications

Dynamic range lower limit (microphone thermal noise)	dB(A)	<30
Dynamic range upper limit	dB	125
Sensitivity @ 250 Hz (±0.2 dB)	dB re 1V/Pa	-34
Sensitivity @ 250 Hz (±0.2 dB)	mV/Pa	20
Power supply (Constant Current Power)	mA	4 to 10 (min. to max.)
Pressure response (±0.5 dB)	Hz	20 - 20k
Output DC bias voltage	V	13.7 ±0.5
Output impedance	Ω	<50
Temperature range	°C / °F	-10 to 55 / 14 to 131
Humidity range non condensing	% RH	0 to 90
CE/RoHS compliant/WEEE registered		Yes/Yes/Yes
Maximum cable length	m	10 (@ 4 mA)



Typical pressure response

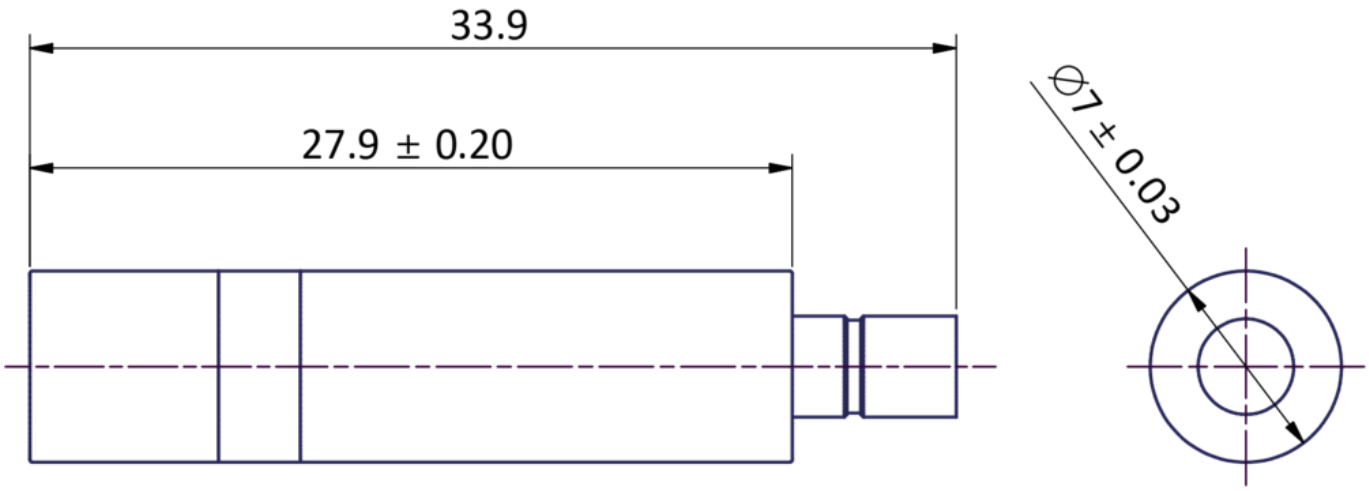
GRAS Sound & Vibration reserves the right to change specifications and accessories without notice.

Dimensions

Linear dimensions in millimeters:

Length (incl. connector): 34
Diameter: 7

Weight: 3.5 g / 0.12346 oz



Optional items

GRAS AA0027	3 m SMB - BNC Cable
AA0028	10 m SMB - BNC Cable
GRAS AA0078	3 m SMB angled - BNC Cable
GRAS AG0003	Adapter for CCP preamplifier to 48V phantom power (BNC to XLR)
GRAS AL0028	7 mm Microphone Holder, POM
GRAS 42AG	Multifunction Sound Calibrator, Class 1
GRAS 42AP	Intelligent Pistonphone, Class 0

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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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