Quick Guide

GRAS 40PO-L and 40PO-H

High Frequency Production Line Microphones with EQset™ technology

1. 40PO-L / 40PO-H

SPECIFICATIONS		40PO-L	40PO-H
Sensitivity (± 0.2 dB)		25 mV/Pa	8 mV/Pa
Frequency Range	± 0.5 dB	10 Hz - 25 kHz	
	± 1 dB	10 Hz - 40 kHz	
Dynamic Range		30 dBA to 128 dB	36 dBA to 138 dB

Thank you for choosing the world's most advanced production line microphone!

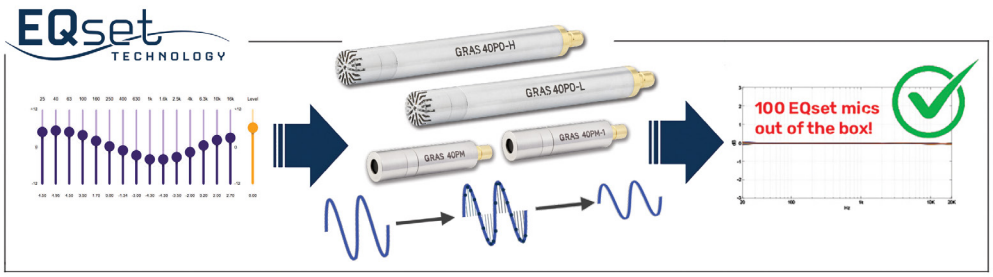
GRAS 40PO-L and 40PO-H are 1/4" pressure high frequency production line microphones with EQset™ technology, capable of performing measurements up to 40 kHz. They are made to be easy to use and environmentally stable. 40PO-L is optimized for low sound pressure level measurements and 40PO-H, is ideal for measuring higher sound pressure levels. Unlike other production line microphones, 40PO-L and 40PO-H microphones use a high-quality condenser measurement microphone capsule for high-precision and reliable tests up to 40 kHz.

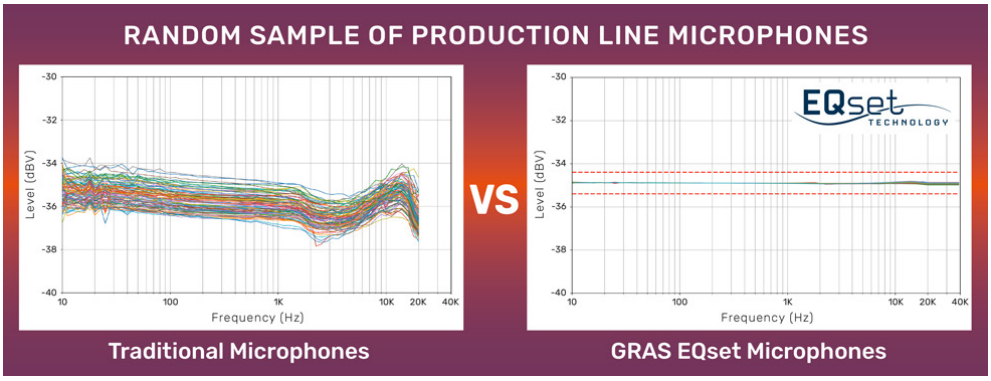
2. What is EQset?

EQset is a technology developed by GRAS, incorporating a digital signal processing (DSP) module directly into the microphone. This DSP module equalizes the microphone's frequency response and sets its sensitivity, ensuring that all microphones of the same type have a uniformly fixed sensitivity and flat frequency response with tight tolerances. As a result, these microphones are as identical to each other as technically possible, minimizing measurement uncertainty and significantly simplifying the signal path setup.

With EQset, everything is streamlined—no individual microphone adjustments or corrections are needed. This not only speeds up the setup process but also reduces the time required for operator training. However, the most significant advantage of EQset goes beyond time savings: it virtually eliminates the risk of false passes or fails on production lines, a common issue with other production microphones.

For more on EQset technology, see:
QR code or grasacoustics.com/EQset





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3. Environmental stability

The unique design and features of the 40PO-H and 40PO-L give them unmatched environmental stability: The sensitivity deviation on a typical production line* is less than ±0.1 dB despite changes in temperature, static pressure, and relative humidity. This means there is no need for corrections due to environmental changes over the course of a normal day in a typical production-line environment – which again makes the 40PO-H and 40PO-L ideal for production line system integration.

4. Calibration – Measurement Chain

GRAS 40PO-L and 40PO-H microphones can be calibrated both in sensitivity and frequency response. For sensitivity calibration it is possible to use a sound calibrator like GRAS 42AG, or pistonphones, like GRAS 42AA or 42AP. As 40PO-L and 40PO-H use a high-quality condenser measurement microphone capsule, there is the potential for measuring its frequency response in the same way any other measurement microphone is tested. It is possible to remove the microphone protection grid and have access to the diaphragm for a pressure response measurement using the electrostatic actuator method.

40PO-L and 40PO-H have EQset technology. Thanks to it, the sensitivity will always be within ±0.2 dB tolerance. If the rest of the signal chain like cables, signal conditioner and DAQ/Analyzer are not introducing any positive or negative gain, it is possible to use the nominal sensitivity value of the microphone as specified without the need of an acoustical calibration. However, if that is not a given or a check is required, a sound calibrator or pistonphone can be used. The acoustical calibration will then serve as a tool to adjust for sensitivity changes caused by other elements on the signal chain or checking if the microphone is working according to specifications. Once the signal chain remains stable and unchanged, swapping one 40PO-L or 40PO-H microphone for another microphone of the same type will not require an acoustical calibration, as one unit is virtually the same as the other.

5. How to power 40PO-L and 40PO-H microphones?

GRAS 40PO-L and 40PO-H microphones can be powered in different ways:

- CCP (Constant Current Power): requires 4-10 mA @ min 24 V

ICP, IEPE and CCLD are names for different technologies that are compatible with CCP. If your data acquisition system or analyzer doesn't have this type of microphone supply, GRAS can provide standalone power modules with this type of supply that can be connected in between the microphone and the analyzer.

- +48V Phantom Power

GRAS 40PO-L and 40PO-H microphones can also be powered with phantom power using an adapter like GRAS AG0003 (Adapter for CCP preamplifier to XLR) in combination with an SMB to BNC cable such as GRAS AA0027.

6. Sensor identification

40PO-L and 40PO-H are both compatible with TEDS (Transducer Electronic Data Sheet) IEEE 1451.4 v1.0. However, the use of EQset technology in the 40PO-L and 40PO-H, makes the use of TEDS data for sensitivity adjustment unnecessary, since all the units of the same type have practically the same sensitivity and flat frequency response. TEDS could be used for sensor identification or storing other data relevant for the user. 40PO-L and 40PO-H microphones have a bar code engraved on the microphone housing that can also be used for sensor identification.

*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.

GRAS Sound & Vibration
Skovlytoften 33
2840 Holte
Denmark
+45 4566 4046

www.GRASacoustics.com

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