Prepolarized ½″ Sound Intensity Microphone Pairs Types 40GI and 40GK

Product Data

Typical Applications

- Sound intensity measurements
- Sound power measurements
- Sound source localization
- IEC 61043 Standard instrumentation

Typical Applications

- Class 1 Intensity Microphones

Fig. 1 Intensity-microphone Pair Type 40GK with adapters and a spacer. Below: Intensity-microphone Pair Type 40GI

Description

The G.R.A.S. Sound Intensity Microphone Pairs Types 40GI and 40GK (Fig. 1) are matched pairs of free-field microphones with extremely well-controlled phase characteristics for use in sound intensity probes. The Sound Intensity Microphone Pair Type 40GI consists of two phase-matched, ½″ prepolarized condenser microphones. The Sound Iintensity Microphone Pair Type 40GK is similar, but it also includes adapters for G.R.A.S. CCP ¼″ Preamplifiers Type 26CB and solid spacers for 12 mm, 25 mm, 50 mm and 100 mm intensity-probe configurations.

These intensity microphones are part of G.R.A.S.'s full range of condenser microphones. They are a recent generation of precision measurement microphones with improved performance and long term stability. Their design is based on more than 40 years of experience and utilizes the advantages of new high-tech materials and machining techniques. They comply with the requirements of the international standard IEC 1094 *Measurement Microphones, Part 4: Specifications for working standard microphones* and their mounting threads (11.7 mm 60 - UNS-2) are compatible with all the usual available makes of measurement-microphone preamplifiers.

Phase Match

The most important feature of a sound intensity probe 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 pair of intensity microphones. For high-quality pairs, the difference in phase responses must be extremely small. The pair of microphones of the Type 40GI comply with 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 phase difference between the two microphones of a Type 40GI pair is less than 0.05° in the range 20 Hz - 250 Hz and less than f/5000 Hz at frequencies above 250 Hz, where f is the frequency in Hz. This has been obtained while still maintaining the high sensitivity.

Vers. 30.03.2009

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Frequency Range

Type 40GK includes four spacers (12 mm, 25 mm, 50 mm, and 100 mm) which make it possible to measure sound intensity in the frequency range 20 Hz - 10 KHz according to IEC 61043 Class 1.

Sensitivity

The high open-circuit sensitivity of the microphones, typically 12,5 mV/Pa re. 20 µPa makes it feasible to measure signals as low as 27 dB and as high as 160 dB.

Calibration

These microphones have a uniquely-designed pressure equalization system that ensures a well-defined lower limiting frequency and an extremely low sensitivity to sound pressure at the pressure-equalization channel. This results in precise phase characteristics and allows the microphones to be phase-calibrated in a single-port calibrator such as the G.R.A.S. Sound Intensity Calibrator Type 51AB.

Materials

High-quality materials such as non-corrosive, stainless steel is used in manufacturing these microphones to enable them to withstand rough handling and corrosive environments.

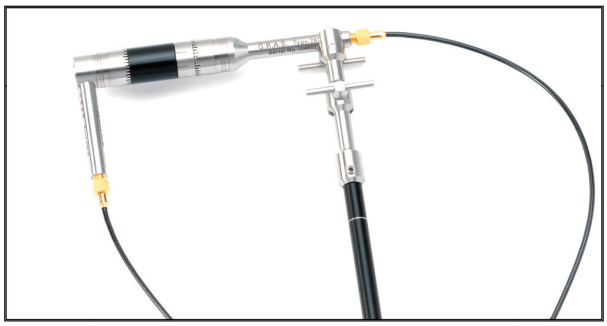

Fig. 2 Sound-intensity Microphone Pair with 25-mm spacer mounted on Intensity Probe Type 50GI

Warranty

All G.R.A.S. microphones are guaranteed for 5 years and are individually checked and calibrated before leaving the factory.

Sound-Intensity Probe

The Type 40GK is included in the G.R.A.S. CCP Sound Intensity Probe Type 50GI (Fig. 2) together with preamplifiers Type 26CB, probe handle, and an adjustable swivel-head mount for microphones.

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Technical Data

Open-circuit sensitivity:
12.5 mV/Pa ±1.5 dB

Polarization voltage:
0 V

Free-field frequency response (as a pair in a probe):
According to IEC 61043 1993 Class 1 and IEC 60651 Type 1 from 20 Hz to 10 kHz
1 Hz - 16 kHz . . . . . ± 2.0 dB
1 Hz - 12.5 kHz ± 1.0 dB

Resonant frequency:
12 kHz

Lower-limiting frequency, -3 dB:
2 Hz

Polarized cartridge capacitance at 250Hz:
20 pF

Inherent cartridge noise:
< 20 dBA re. 20 µ Pa

Upper limit of dynamic range:
160 dB re. 20 µ Pa
(< 1% THD at 100 Hz)

Temperature coefficient at 250 Hz:
From -0 °C to +50 °C. . . . . 0.002 dB/°C

Ambient pressure coefficient at 250 Hz:
– 0.0007 dB/hPa

Humidity coefficient:
< 0.1 dB/100% RH

Influence of axial vibrations, 1 m/s²:
66 dB re. 20 µ Pa

Influence of magnetic fields:
34 dB re. 20 µ Pa at 50 Hz, 80 A/m

Intensity-probe configuration specifications
Sound Intensity Microphone Pair Type 40GI fulfils the phase requirements of a Class 1 Sound Intensity Probe in accordance with IEC International Standard 61043.

Difference in phase response:
From 50 Hz to 250 Hz . . . . . < 0.05°
From 250 Hz to 6.3 kHz . . . . . < f/5000°

Difference in amplitude response:
(normalised at 250 Hz)
From 20 Hz to 1 kHz . . . . . < 0.2 dB
From 20 Hz to 5 kHz . . . . . < 0.4 dB

Difference in sensitivity at 250 Hz:
< 1dB

Dimensions:
Length: . . . . . 12.5 mm
Diameter: . . . . . 13.2 mm

Preamplifier mounting thread:
11.7 mm - 60 UNS

Weight:
6 g

Accessories

Accessories included with Type 40GK:
Solid spacers for microphone separation:
12 mm, 25 mm, 50 mm and 100 mm
Adapters, ½″ to ¼″:
Straight RA0003
Right-angled (2) RA0001

Optional Accessories for Type 40GK:
Sound Intensity Calibrator . . . . . Type 51AB

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice.

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