

1/2-inch Random-incidence Microphone Type 40AR

Product Data and Specifications

Typical applications

- *Precision acoustic measurements*
- *Diffuse-field measurements*
- *Inside-vehicle measurements*

The G.R.A.S. Microphone Type 40AR is a 1/2-inch precision condenser microphone for general purpose acoustic measurements, e.g. in diffuse fields and inside vehicles. It is an externally-polarized, random-incidence microphone with a large dynamic range and a wide frequency response.

As a random-incidence microphone, the Type 40AR measures the sound pressure which existed before it was placed in a diffuse sound field. It will, however, also include the disturbing effects of its presence in a sound field. These are minimal at low frequencies (large wavelengths compared with microphone size).

At higher frequencies the effects of reflections and diffractions must be accounted for. Generally, they lead to an increase in the measured sound pressure and corrections have to be made. Fig. 3 shows what these corrections are in a free field for various angles of incidence and, based on these, random incidence. The random-incidence correction curve in Fig. 3 is defined as described in ANSI standard S1.10.



Fig. 1 1/2-inch Random-incidence Microphone Type 40AR

Fig. 2 shows a frequency response typical of a Type 40AR when placed in a diffuse sound field.

G.R.A.S. 1/2-inch preamplifiers (see data sheets for Types 26AG, 26AH, 26AJ, 26AK and 26AM) are also available for use with the Type 40AR. The mounting thread (11.7 mm - 60 UNS-2) is compatible with other available makes of similar microphone preamplifiers.

All G.R.A.S. microphones comply with the specifications of IEC 1094: *Measurement Microphones, Part 4: Specifications for working standard microphones*.

Non-corrosive, stainless materials are used in manufacturing these microphones to enable them to withstand rough handling and corrosive environments.

All G.R.A.S. microphones are guaranteed for 5 years and are individually checked and calibrated before leaving the factory. An individual calibration chart is supplied with each microphone.

Specifications

Frequency response:

3.15 Hz - 12.5 kHz:	±2.0 dB
12.5 Hz - 8 kHz:	±1.0 dB
3.15 Hz - 16 kHz:	±3.0 dB

Resonant frequency:

90° phase shift:	14 kHz
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Nominal sensitivity:

at 250 Hz:	50 mV/Pa
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Polarization voltage:

200 V

Dynamic range:

Upper limit (3% distortion):	146 dB re. 20 µPa
Microphone thermal noise:	17 dB re. 20 µPa

Capacitance:

Polarized:	17.5 pF
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Effective front volume:

Nominal at 250 Hz:	50 mm ³
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Fig. 2 Typical frequency response for Type 40AR. Upper curve shows response in a diffuse sound field (random incidence), lower curve shows pressure response

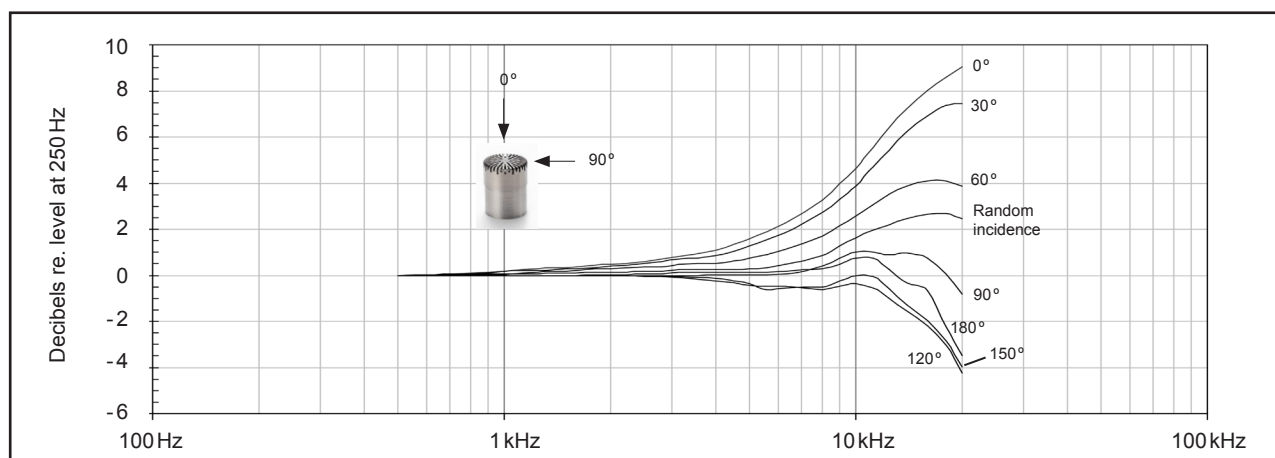


Fig. 3 Free-field corrections for various angles of incidence and the calculated random incidence
Specifications (continued)

Temperature range:
-40 °C to +150 °C

Temperature coefficient (250 Hz):
-10 °C to +50 °C: -0.01 dB/°C

Static-pressure coefficient:
250 Hz/25 °C: -0.014 dB/k Pa

Humidity (non-condensing):
Range: 0 - 100 % RH
Influence (250 Hz): <0.1 dB (0 - 100 % RH)

Influence of axial vibration, 1 m/s²:
62 dB re. 20 µ Pa

Venting:
Rear vented

IEC 1094-4 type designation:
WS2P/D

Dimensions (with protection grid):
Length: 16.2 mm
Diameter: 13.2 mm

(without protection grid):
Length: 15.3 mm
Diameter: 12.7 mm

Diameter (diaphragm ring):
12.1 mm

Threads:
Protection Grid: 12.7 mm - 60 UNS
Preamplifier Mounting: 11.7 mm - 60 UNS

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