

# 1/2-inch Prepolarized, Random-incidence Mic. Type 40AQ

## Product Data and Specifications

### Typical applications

- Precision acoustic measurements
- Diffuse-field measurements
- Inside-vehicle measurements
- Use with G.R.A.S. CCP<sup>1</sup> preamplifiers

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

As a random-incidence microphone, the Type 40AQ 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.

### Specifications

<b>Frequency response:</b>		<b>Polarization voltage:</b>	0 V
3.15 Hz - 12.5 kHz: . . . . .	±2.0 dB	<b>Dynamic range:</b>	
12.5 Hz - 8 kHz: . . . . .	±1.0 dB	Upper limit (3% distortion):	148 dB re. 20 µPa
3.15 Hz - 16 kHz: . . . . .	±3.0 dB	Microphone thermal noise:	16 dB re. 20 µPa
<b>Resonant frequency:</b>		<b>Capacitance:</b>	
90° phase shift: . . . . .	14 kHz	Polarized: . . . . .	13.3 pF
<b>Nominal sensitivity:</b>		<b>Effective front volume:</b>	
at 250 Hz: . . . . .	50 mV/Pa	Nominal at 250 Hz: . . . . .	50 mm <sup>3</sup>

...continued overleaf



Fig. 1 1/2-inch Prepolarized, Random-incidence Microphone Type 40AQ

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

G.R.A.S. CCP<sup>1</sup> preamplifiers are also available for use with the Type 40AQ, these are:

- 1/2-inch Preamplifier Type 26CA
- 1/4-inch Preamplifier Type 26CB with the included adaptor GR0010
- (see separate data sheets)

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.

<sup>1</sup> Constant Current Power

# 1/2-inch Prepolarized, Random-incidence Microphone Type 40AQ

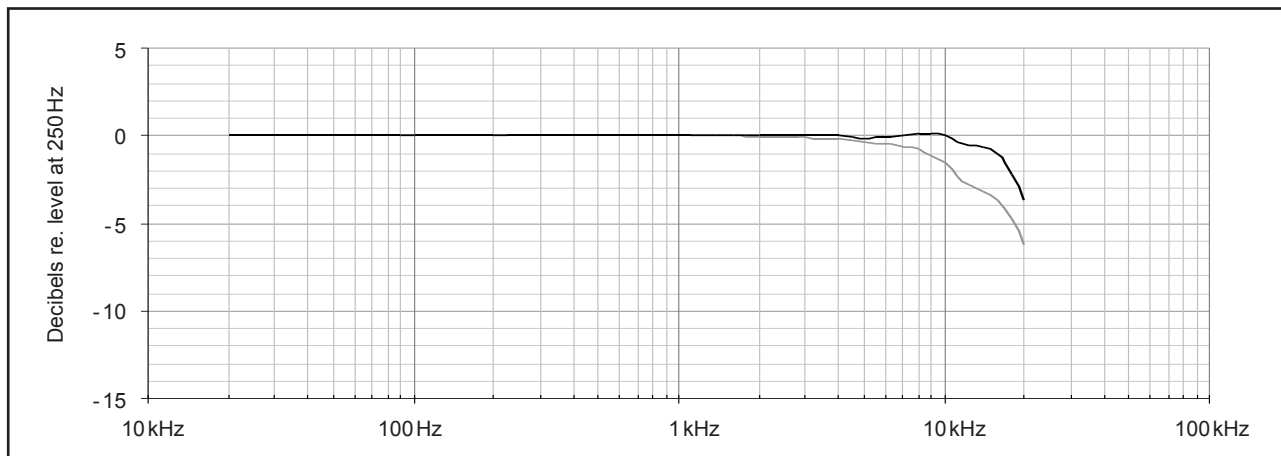


Fig. 2 Typical frequency response for Type 40AQ. Upper curve shows response in a diffuse sound field (random incidence), lower curve shows pressure response

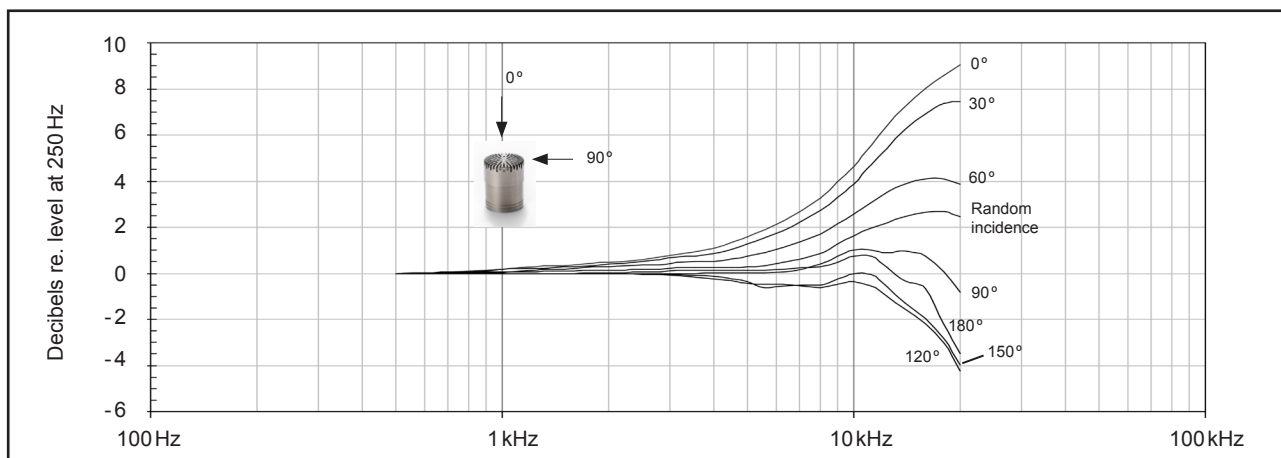


Fig. 3 Free-field corrections for various angles of incidence and the calculated random incidence

## Specifications (continued)

<b>Temperature range:</b>	-40 °C to +150 °C	<b>IEC 1094-4 type designation:</b>	WS2P/D
<b>Temperature coefficient (250 Hz):</b>	-10 °C to +50 °C: ..... -0.01 dB/°C	<b>Dimensions (with protection grid):</b>	
<b>Static-pressure coefficient:</b>	250 Hz/25 °C: ..... -0.011 dB/k Pa	Length: .....	16.2 mm
<b>Humidity (non-condensing):</b>		Diameter: .....	13.2 mm
Range: .....	0 - 100 % RH	<b>(without protection grid):</b>	
Influence (250 Hz): .....	<0.1 dB (0 - 100 % RH)	Length: .....	15.3 mm
<b>Influence of axial vibration, 1 m/s<sup>2</sup>:</b>	62 dB re. 20 μ Pa	Diameter: .....	12.7 mm
<b>Venting:</b>	Rear vented	<b>Diameter (diaphragm ring):</b>	12.1 mm
		<b>Threads:</b>	
		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