

# 1/2-inch Wide-frequency, Free-field Microphone Type 40AC

## Product Data and Specifications

### Typical applications

- Precision acoustic measurements
- Type 0 and 1 SPL measurements
- Free-field measurements
- Precision laboratory measurements

The G.R.A.S. Microphone Type 40AC is a 1/2-inch wide-frequency, precision condenser microphone for laboratory work as well as for measurements in open acoustic fields. It is an externally polarized free-field microphone with a large dynamic range and an extended frequency response.

As a free-field microphone, the Type 40AC is for measuring the sound pressure which existed before it was placed in the sound field pointing towards the sound source.

The disturbing effects of its presence in the sound field are minimal at low frequencies (large wavelengths compared with microphone size). At higher frequencies, the effects of reflections and diffractions generally lead to an increase in the measured sound pressure levels.

Fig. 3 shows what these are in a free-field for various angles of incidence. The Type 40AC compensates for this to provide a flat frequency response at an angle of 0° incidence in a free-field (see Fig. 2).



Fig. 1 1/2-inch Wide-frequency, Free-field Microphone Type 40AC (inset shows true size)

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 40AC. 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

|                              |            |                              |                       |
|------------------------------|------------|------------------------------|-----------------------|
| <b>Frequency response:</b>   |            | <b>Dynamic range:</b>        |                       |
| 3.15 Hz - 40 kHz             | ±2.0 dB    | Upper limit (3% distortion): | 160 dB re. 20 µ Pa    |
| 5 Hz - 16 kHz                | ±1.0 dB    | Microphone thermal noise:    | 20 dBA re. 20 µ Pa    |
| <b>Nominal sensitivity:</b>  | 12.5 mV/Pa | <b>Capacitance:</b>          | 17 pF                 |
| <b>Polarization voltage:</b> | 200 V      | <b>Temperature range:</b>    | -40 °C to +150 °C     |
|                              |            |                              | ...continued overleaf |

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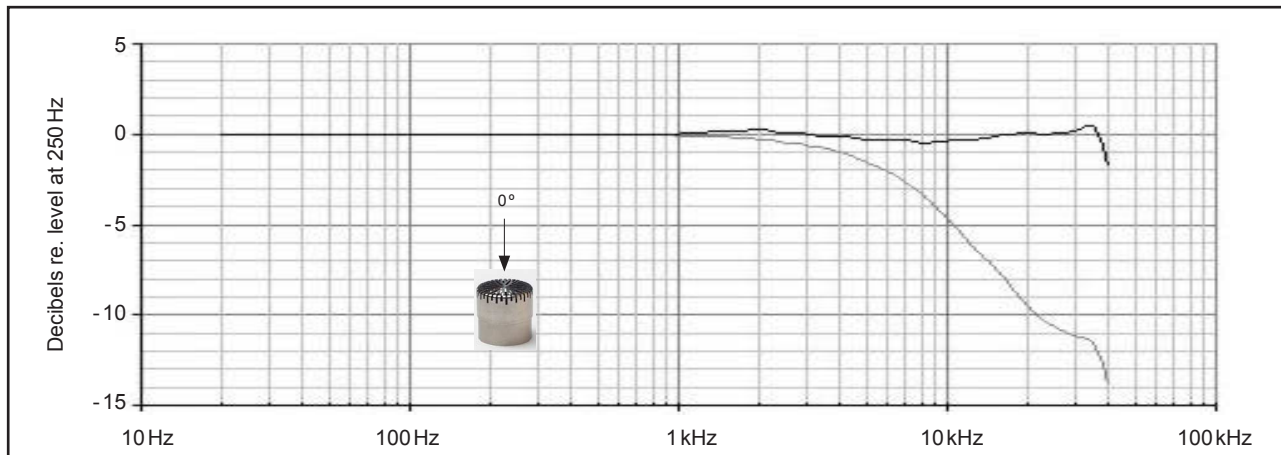


Fig. 2 Typical frequency response of Type 40AC. Upper curve shows free-field response for 0°, lower curve shows pressure response

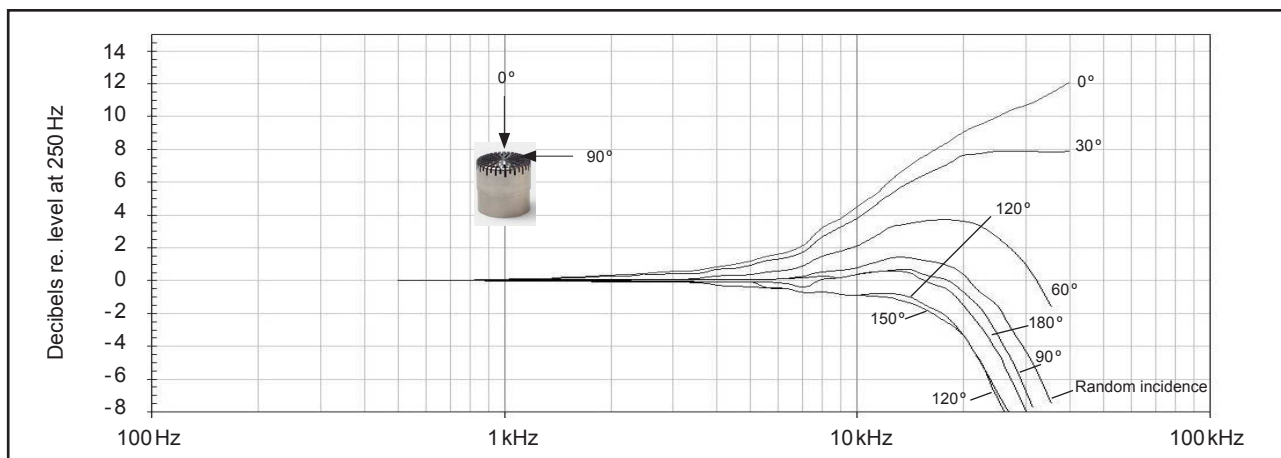


Fig. 3 Free-field corrections for various angles of incidence

### Specifications (continued)

|   |                           |   |   |
|---|---------------------------|---|---|
| <b>Temperature coefficient (250 Hz):</b>                | -0.002 dB/°C              | <b>Dimensions (with protection grid):</b> | Length: ..... 12.5 mm                         |
| <b>Static-pressure coefficient:</b>                     | -0.008 dB/k Pa            |   | Diameter: ..... 13.2 mm                       |
| <b>Humidity range:</b>                                  | 0 - 100% (non-condensing) | <b>(without protection grid):</b>         | Length: ..... 11.6 mm                         |
| <b>Influence of humidity (250 Hz):</b>                  | <0.1 dB (0 - 100% RH)     |   | Diameter: ..... 12.7 mm                       |
| <b>Influence of axial vibration, 1 m/s<sup>2</sup>:</b> | 66 dB re. 20 µ Pa         | <b>Diameter (diaphragm ring):</b>         | 12.1 mm                                       |
| <b>Venting:</b>   | Rear vented               | <b>Threads:</b>                           | Protection Grid: ..... 12.7 mm - 60 UNS       |
| <b>IEC 1094-4 designation:</b>                          | WS2F                      |   | Preamplifier Mounting: ..... 11.7 mm - 60 UNS |
|   |                           | <b>Weight:</b>                            | 7 gm  |

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

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