

# 1/2" Free-field Microphone, Infra-sound Type 40AZ

## Product Data

### Typical applications

- Precision acoustic measurements
- Type 0 and 1 SPL measurements
- Free-field measurements
- Low-frequency measurements
- Infra-sound measurements

The G.R.A.S. 1/2" Free-field microphone Type 40AZ is a precision condenser microphone for low-frequency (incl. infra-sound) measurements in open acoustic fields. It is a pre-polarized free-field microphone with a large dynamic range and a wide frequency response.

As a free-field microphone, Type 40AZ is designed essentially to measure the sound pressure as it would appear if the microphone were not present, the sound field pointing towards the microphone.

At low frequencies, the disturbing effects of its presence in the sound field are minimal (large wavelengths compared to the size of the microphone).

At higher frequencies (>1 kHz), the effects of diffractions generally cause microphones to measure sound pressure levels increasing with frequency. Fig. 2 shows corrections to be made for various angles of incidence. In a free-field microphone, the effects of diffraction are compensated for to provide a flat frequency response in a free-field for 0° incidence. For Type 40 AZ, this compensation is shown in Fig. 3.

### Specifications

#### Frequency response:

0.5 Hz - 20 kHz: ..... ±2.0 dB  
1 Hz - 10 kHz: ..... ±1.0 dB

#### Resonant frequency:

90° phase shift: ..... 4 kHz

#### Nominal sensitivity:

at 250 Hz: ..... 50 mV/Pa



Fig. 1 1/2" Free-field Microphone Type 40AZ  
(inset shows true size)

The G.R.A.S. 1/4" High Impedance preamplifier Type 26CG (input impedance = 40 GΩ)\* is available for use with Type 40AZ (see data sheet for Type 26CG). The mounting thread (11.7 mm - 60 UNS-2) is compatible with microphone preamplifiers for WS2P/F microphones.

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.

G.R.A.S. WS2P/F microphones are guaranteed for 5 years, and each microphone is individually calibrated, calibration chart supplied.

\* For the microphone capsule capacity of Type 40AZ (20 pF), the high input impedance of Type 26CG (40 GΩ) leads to a low-frequency 3-dB limit  $f_L = 0,2$  Hz.

**Polarization voltage:** ..... 0 V

#### Dynamic range:

Upper limit (3% distortion): ..... 146 dB re. 20 μPa  
Microphone thermal noise ..... 14 dB re. 20 μPa

#### Capacitance:

Polarized: ..... 20 pF

...continued overleaf

## ½" Free-field Microphone, Infra-sound Type 40AZ

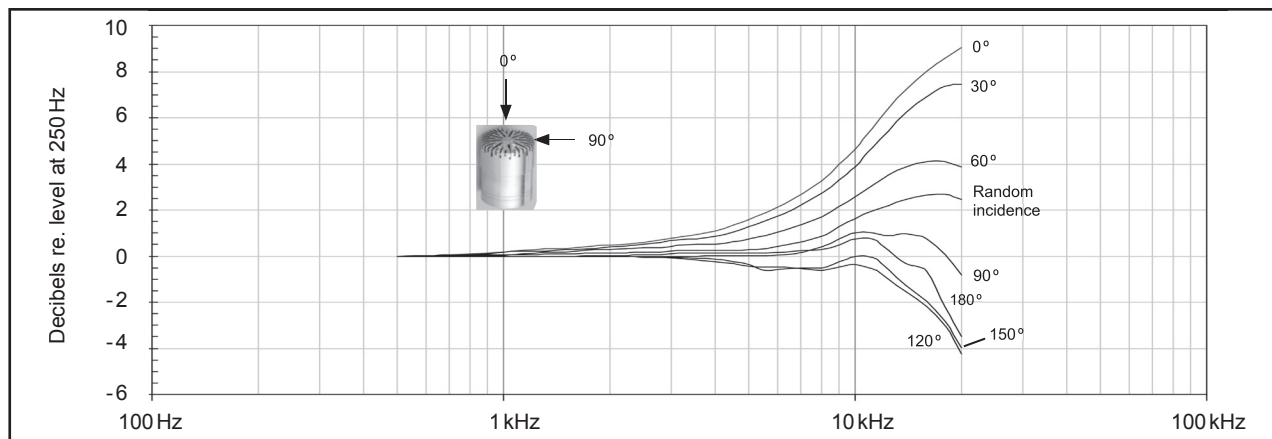


Fig. 2 Free-field corrections for various angles of incidence (½" microphone)

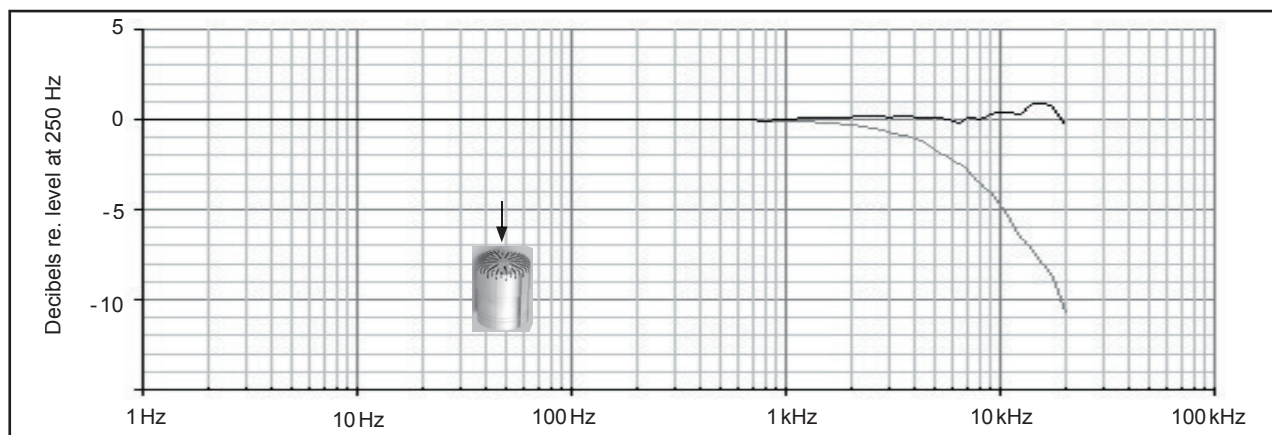


Fig. 3 Typical frequency response of Type 40AZ. Upper curve shows free-field response for 0° incidence; lower curve shows pressure response.

### Specifications (continued)

#### Effective front volume:

Nominal at 250 Hz: ..... 50 mm<sup>3</sup>

#### Temperature coefficient (250 Hz):

-10 °C to +50 °C: ..... 0.01 dB/°C

#### Static-pressure coefficient:

250 Hz/25 °C: ..... -0.008 dB/k Pa

#### Humidity (non-condensing):

Range: ..... 0 - 100 % RH

Influence (250 Hz): ..... <0.1 dB (0 - 100 % RH)

#### Influence of axial vibration equivalent to 1 m/s<sup>2</sup>:

62 dB re. 20 µ Pa

#### Venting:

Rear-vented

#### IEC 1094-4 type designation:

W2SF

#### 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

#### Weight:

9 g (0.32 oz)

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

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