

½" 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. ½" free-field microphone Type 40AZ is a precision condenser microphone for low-frequency (including infra-sound) measurements in open acoustic fields. It is a prepolarized 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 40AZ, this compensation is shown in Fig. 3.



Fig. 1 ½" free-field microphone Type 40AZ (inset shows true size)

The G.R.A.S. ¼" 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 and the calibration chart is 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.

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

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

1/2" Free-Field Microphone, Infra-Sound Type 40AZ

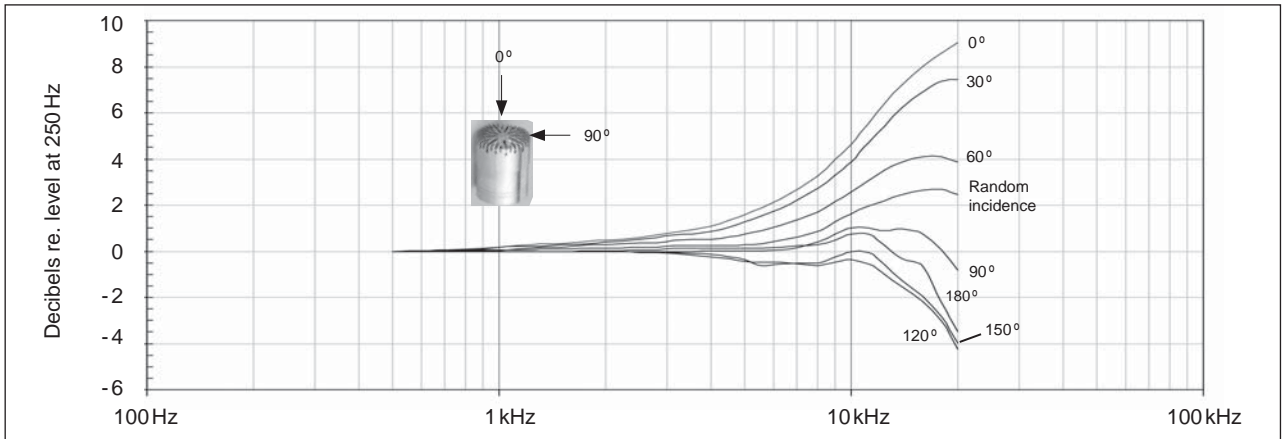


Fig. 2 Free-field corrections for various angles of incidence (1/2" microphone)

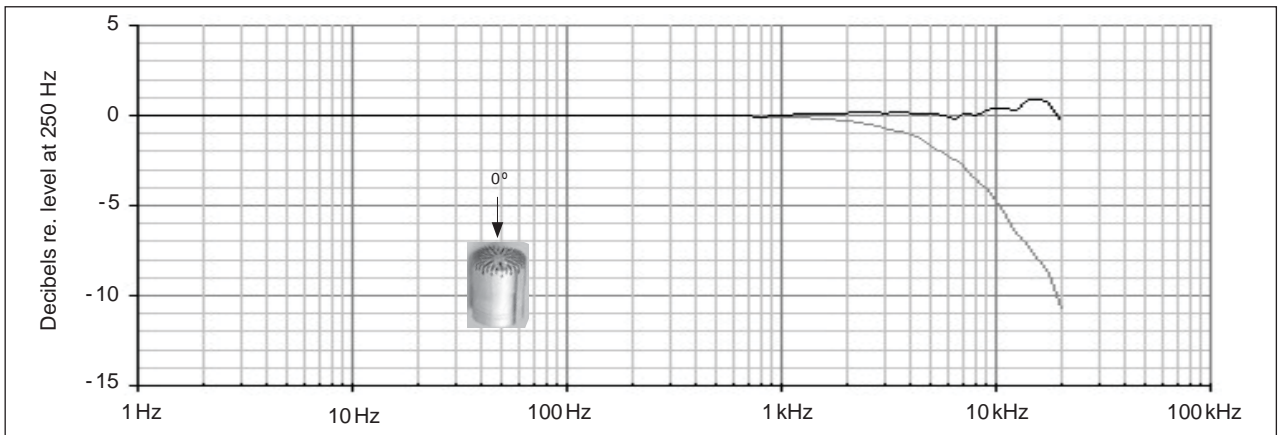


Fig. 3 Typical frequency response of Type 40AZ.

Upper curve shows free-field response for 0° incidence; lower curve shows pressure response.

Specifications (continued)

Effective front volume:

Nominal at 250 Hz: 50 mm³

Temperature range: -40°C to +70°C

Temperature coefficient (250 Hz):

-10°C to +50°C: 0.01 dB/°C

Static-pressure coefficient:

250 Hz/25°C: -0.008 dB/kPa

Humidity (non-condensing):

Range: 0-100% RH

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

Influence of axial vibration equivalent to 1 m/s²:

..... 62 dB re. 20 µPa

Venting: Rear-vented

IEC 1094-4 type designation: WS2F

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 – 60UNS

Preamplifier Mounting: 11.7 mm – 60UNS

Weight: 9 g (0.32 oz)

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