# Calibration Chart
# Type 40AF
# ½" Free Field Microphone

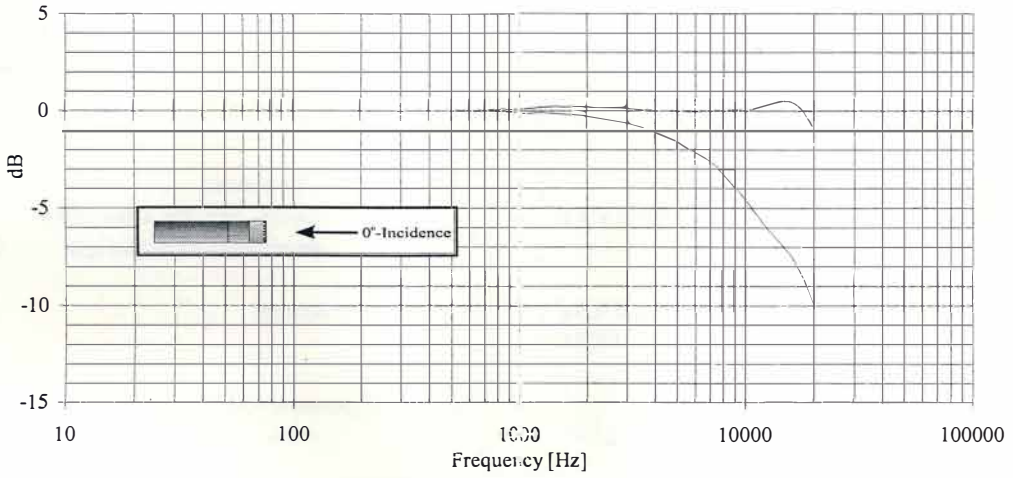
Serial No. 46952

**Sensitivity :** 47.01 mV/Pa
-26.56 dB re. 1V/Pa

**Cal. Date :** 03-dec-04
**Operator :** LJ

**Reference conditions:**
Temperature : 23 Celcius
Relative humidity : 50%
Barometric pressure : 101.3 kPa

The calibration is performed by comparison with a Calibration Reference Microphone Cartridge Type 40AG and is traceable to the National Physical Laboratory, UK.
The stated sensitivity for the microphone cartridge is the Open Circuit Sensitivity. When used with a typical preamplifier, like the G.R.A.S. Type 26AH, the sensitivity will be 0.2 dB lower.
The frequency response is recorded by electrostatic actuator.
The lower curve is the pressure response and the upper curve is the free field response for 0° incidence with the protection grid mounted on the microphone. (See back for more information)




**G.R.A.S.**
Sound & Vibration

Calibration data for
Free Field Microphone
Type 40AF
Serial No. 46952

G.R.A.S.
Sound & Vibration

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## 40AF Free Field Microphone

The 40AF is a ½" precision microphone for general purpose acoustic measurements in the audio-frequency range. The microphone complies with the requirements in IEC Standard 1094 part 4 and can be used for measurements according to IEC Standard 651 Type 0 and Type 1.

The free-field microphone is designed to essentially measure the sound pressure, as it existed before the microphone was introduced into the sound field. At higher frequencies the presence of the microphone itself in the sound field will change the sound pressure. In general the sound pressure around the microphone cartridge will increase due to reflections and diffraction. The free-field microphone is designed so that the frequency characteristics compensates for this pressure increase. The resulting output of the free-field microphone is a signal proportional to the sound pressure, as it existed before the microphone was introduced into the sound field. The free-field microphone should always be pointed towards the sound source ('0° incidence'). In this situation the presence of the microphone diaphragm in the sound field will result in a pressure increase in front of the diaphragm. The microphone is then designed so that the sensitivity of the microphone decreases with the same amount as the acoustical pressure increases in front of the diaphragm. This is obtained by increasing the internal acoustical damping in the microphone cartridge. The result is an output from the microphone, which is proportional to the sound pressure as it existed before the microphone was introduced into the sound field.

## Specifications

| | |
|---|---|
| Nominal Open Circuit Sensitivity : | |
| at 250Hz | 50 mV/Pa |
| Frequency Response: | |
| ±2 dB | 3.15Hz-20kHz |
| ±1 dB | 12.5Hz-10kHz |
| Polarization Voltage: | 200V |
| Upper Limit of Dynamic Range: | |
| 3% Distortion | 146dB re. 20µPa |
| Lower Limit of Dynamic Range: | |
| Thermal noise | 14dBA re. 20µPa |
| Nominal Cartridge Capacitance: | |
| Polarized | 20pF |
| Resonance Frequency: | |
| 90° Phase shift | 14kHz |
| Effective Front Volume: | |
| Nominal at 250Hz | 50mm$^3$ |
| Static Pressure Coefficient: | |
| 250Hz at 25°C | -0.008 dB/kPa |
| Sensitivity to Vibrations: | |
| Equiv. SPL for 1m/s$^2$ per-pendicular to diaphragm | 62 dB re. 20µPa |
| Temperature Range: | -40 to +150°C |
| Mean Temperature Coefficient: | |
| -10 to +50°C | -0.01dB/°C |
| IEC 1094-4 Type Designation: | WS2F |
| Length: | |
| With Protection Grid | 16.2mm |
| Diameter: | |
| With Protection Grid | 13.2mm |
| Without Protection Grid | 12.7mm |
| Thread: | |
| Protection Grid | 12.7mm 60 UNS |
| Preamplifier | 11.7mm 60 UNS |
| Weight: | 9g |