

PRODUCT DATA

Diffuse-field 1/2-inch Microphone — Type 4943

Diffuse-field 1/2-inch Microphone Type 4943 is optimised for general random-incidence measurements, and for standardised noise measurements in accordance with ANSI standards.

USES

- Diffuse-field measurements
- In-car measurement
- Replacement of Type 4166

FEATURES

- Sensitivity: 50 mV/Pa
- Frequency: 3.15 – 10 kHz
- Dynamic Range: 15.5 – 148 dB
- Temperature: –40 to 150°C
(–40 to 302°F)
- Polarization: 200V External



Use of Diffuse-field Microphones

A diffuse-field microphone, also called a random-incidence microphone, is designed to have a uniform response when signals arrive simultaneously from all angles. They should therefore not only be used for measurement in reverberation chambers, but in all situations where the sound field is diffuse, or where several sources are contributing to the sound pressure at the measurement position. Practical examples are indoor situations, where the sound is reflected by walls, ceilings, and objects in the room, or measurements inside a car.

Robustness, Ageing and Assembly

The microphone is capable of withstanding the IEC 68–2–32 1 metre drop test. The assembly of the microphone in a clean room environment ensures that the microphone can be used in high humidity environments and still produce reliable results.

Microphone Data Disk

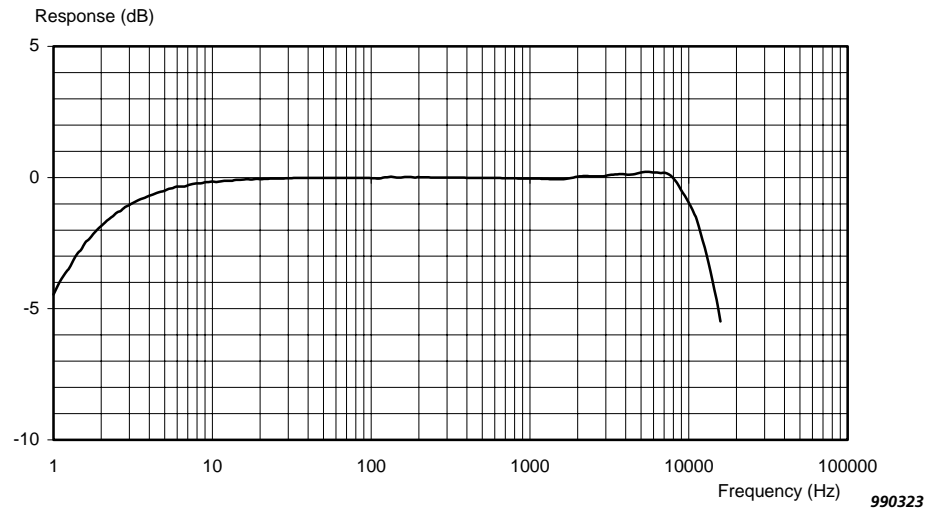
The microphone is supplied with a 3 1/2" microphone data disk. This disk includes all calibration data as well as free-field, random-incidence and pressure-field corrections. The influence of different accessories is also available on the disk.

Calibration

The sensitivity can be calibrated at 250 Hz by using Pistonphone Type 4228 with 1/2" Adaptor DP0776, or at 1 kHz using Sound Level Calibrator Type 4231. For calibration at other frequencies use Multifunction Acoustic Calibrator Type 4226. The actuator response can be measured using Actuator UA0033. The random-incidence response can be obtained by adding the type-specific, random-incidence correction to the actuator response.

4943

Fig. 1
Type 4943 random-incidence response with protection grid in place



Specifications – Diffuse-field ½-inch Microphone Type 4943

Typical Use: Diffuse field measurements

Nominal Diameter: ½"

Open Circuit Sensitivity (250 Hz)*: -26 ±2 dB re 1 V/Pa, 50 mV/Pa

Polarization Voltage: 200 V external

Random-incidence Response*:

±1 dB, 5 Hz to 6.3 kHz

±2 dB, 3.15 Hz to 10 kHz

Lower Limiting Frequency (-3 dB): 1 Hz to 2 Hz

Pressure Equalization Vent: Rear vented

Diaphragm Resonance Frequency: 12 kHz (90° phase-shift)

Capacitance (Polarized)*: 20 pF at 250 Hz

Equivalent Air Volume: 36 mm³ (250 Hz)

Cartridge Thermal Noise: 15.5 dB(A) 16.2 dB (Lin)

Upper Limit of Dynamic Range (3% Distortion): >148 dB SPL

Maximum Sound Pressure Level: 159 dB (peak)

Temperature Coefficient (250 Hz): -0.010 dB/°C (-10 to 50°C, 14 to 122°F)

Pressure Coefficient: -0.008 dB/kPa, typical

Operating Humidity Range: 0 to 100% RH (without condensation)

Influence of Humidity: <0.1 dB in the absence of condensation

Vibration Sensitivity (<1000 Hz): 62.5 dB equivalent SPL for 1 m/s² axial vibration

Magnetic Field Sensitivity: 4 dB SPL for 80 A/m, 50 Hz field

Estimated Long-term Stability: >1000 years/dB at 20°C (68°F), >100 hour/dB at 150°C (302°F)

Dimensions

Diameter with Grid: 13.2 mm (0.52 in)

Diameter without Grid: 12.7 mm (0.50 in)

Height with Grid: 17.6 mm (0.69 in)

Height without Grid: 16.3 mm (0.64 in)

Thread for Preamplifier Mounting: 11.7 mm – 60UNS

Note: All values are typical at 23°C (73.4°F), 101.3 kPa and 50% RH, unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at 2σ (i.e., expanded uncertainty using a coverage factor of 2) compliance with EMC Directive



Environmental

Operating Temperature Range: -40 to 150°C (-40 to 302°F)

Storage Temperature:

In Case: -30 to +70°C (-22 to 158°F)

With Data Disk: 5 to 50°C (41 to 122°F)

*Individually calibrated

Ordering Information

Type 4943 Diffuse-field ½" Microphone

Includes the following accessories:

BC 0224 Calibration Chart †

BC 5002 Microphone Data Disk †

†Quote microphone serial number if re-ordering

Optional Accessories

Type 2669B/L/C ½" Microphone Preamplifier
 DP 0776 Calibration Adaptor for ½" microphones
 UA 0033 Electrostatic Actuator
 BA 5105 The Microphone Handbook
 UA 0459 Windscreen 65 mm (2.6")
 UA 0237 Windscreen 90 mm (3.5")
 UA 0386 Nose Cone for ½" Microphone

Brüel & Kjær reserves the right to change specifications and accessories without notice.