

# PRODUCT DATA

## Diffuse-field ½-inch Microphone — Type 4943

*Diffuse-field ½-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: 200 V 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

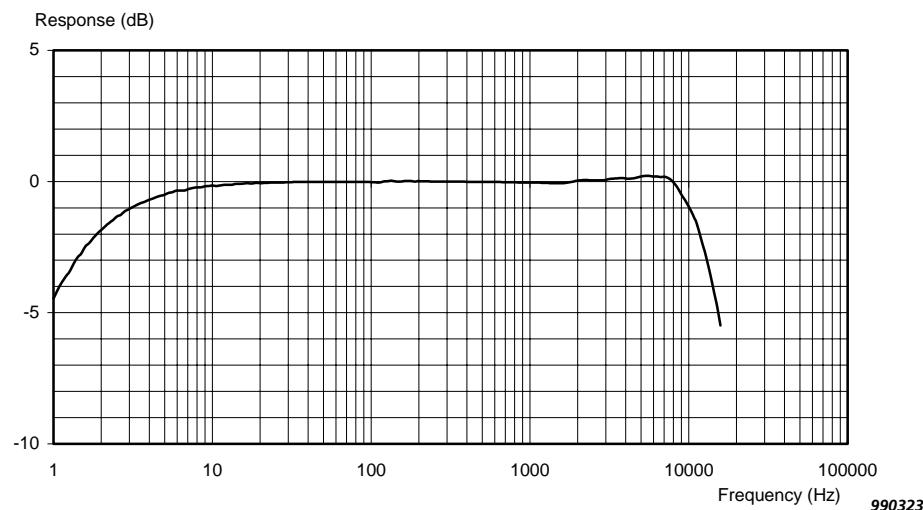
The microphone is supplied with a 3 ½" microphone data disk. This disk includes all calibration data as well as free-field, random-incidence and pressure-field corrections. The influence of different accessories is also available on the disk.

### Calibration

The sensitivity can be calibrated at 250 Hz by using Pistonphone Type 4228 with ½" 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)\*:**  $-26 \pm 2$  dB re 1 V/Pa, 50 mV/Pa

**Polarization Voltage:** 200 V external

**Random-incidence Response\*:**

$\pm 1$  dB, 5 Hz to 6.3 kHz

$\pm 2$  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 mm<sup>3</sup> (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  $50^\circ\text{C}$ ,  $14$  to  $122^\circ\text{F}$ )

**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/s<sup>2</sup> axial vibration

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

**Estimated Long-term Stability:** >1000 years/dB at  $20^\circ\text{C}$  ( $68^\circ\text{F}$ ), >100 hour/dB at  $150^\circ\text{C}$  ( $302^\circ\text{F}$ )

### 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  $23^\circ\text{C}$  ( $73.4^\circ\text{F}$ ), 101.3 kPa and 50% RH, unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at  $2\sigma$  (i.e., expanded uncertainty using a coverage factor of 2) compliance with EMC Directive



### Environmental

**Operating Temperature Range:**  $-40$  to  $150^\circ\text{C}$  ( $-40$  to  $302^\circ\text{F}$ )

**Storage Temperature:**

**In Case:**  $-30$  to  $+70^\circ\text{C}$  ( $-22$  to  $158^\circ\text{F}$ )

**With Data Disk:** 5 to  $50^\circ\text{C}$  ( $41$  to  $122^\circ\text{F}$ )

\*Individually calibrated

## Ordering Information

**Type 4943** Diffuse-field ½" Microphone

**Includes the following accessories:**

BC 0224 Calibration Chart<sup>†</sup>

BC 5002 Microphone Data Disk<sup>†</sup>

<sup>†</sup>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.