

PRODUCT DATA

1/2" Diffuse-field Microphone — Type 4943

Type 4943 is optimised for general, random-incidence measurements and for noise measurements in accordance with ANSI standards. Being externally polarized, it must be used with a classical preamplifier.



990322

USES

- Diffuse-field measurements
- In-cabin measurements

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

Diffuse-field microphones, also called random-incidence microphones, are designed to have a flat response to signals arriving simultaneously from all directions. They should be used in all situations where the sound field is diffuse, including measurements in reverberation chambers and where several sources contribute to the sound pressure at the measurement position. Applications include indoor measurements, where the sound is reflected by walls, ceilings and objects in the room. Another important application area is in cabin measurements.

Manufacturing and Stability

A press-fitted, stainless-steel diaphragm ensures superior long-term stability and mechanical robustness – Type 4943 will withstand the 1 m drop test of IEC 60068–2–32.

All Brüel & Kjær Measuring Microphones are assembled in a clean room. This ensures that the microphones maintain their inherent low noise and high stability even when used in environments with a combination of high humidity and high temperature.

Polarization Voltage

Type 4943 requires an external polarization voltage and must therefore be used with a classical preamplifier.

Externally polarized microphones may be used at higher temperatures without severe changes in sensitivity

TEDS Microphones

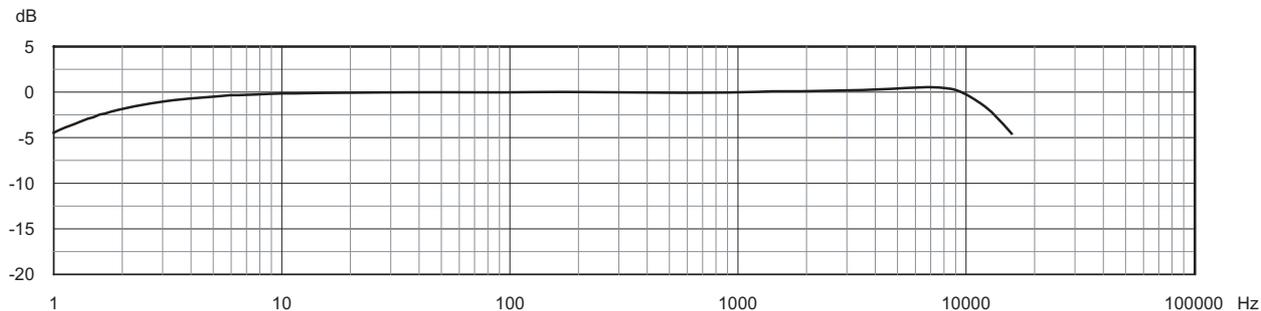
Type 4943 is available in TEDS combinations with the classical Preamplifier Type 2669. The TEDS microphone is considered one unit and has been sealed in a clean environment. The TEDS is programmed with the loaded sensitivity of the actual cartridge and the data is therefore readily available in the transducer. The default TEDS template is according to IEEE P1451.4 but TEDS to IEEE 1451.4 is available on request.

Individual Calibration Data

Each Type 4943 comes with an individual calibration chart including the open-circuit sensitivity, the frequency response in a diffuse field as well as the electrostatic actuator response.

An enclosed mini-CD contains the individual calibration data at 1/12-octave frequencies plus a wealth of technical information, such as the influence of different accessories, response in different sound fields and much more. Using the CD data and the REq-X feature of PULSE™, a real-time correction for different measurement situations, can increase measurement accuracy.

Fig. 1 Typical random-incidence response of the microphone with protection grid. The low-frequency response is valid when the vent is exposed to the sound field



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Specifications – 1/2" Diffuse-field Microphone Type 4943 (valid from serial number 2527704)

IEC 61094-4 Type Designation: None

Polarization Voltage: 200 V

Open-circuit Sensitivity (250 Hz)^a:

50 mV/Pa, -26 ± 2 dB re 1 V/Pa

Random Incidence Response^a:

5 Hz to 6.3 kHz: ± 1 dB

3.15 Hz to 10 kHz: ± 2 dB

Lower Limiting Frequency (-3 dB)^a:

1 to 2 Hz

Pressure Equalization Vent: Rear vented

Diaphragm Resonance Frequency:

12 kHz (90° phase shift)

Polarized Cartridge Capacitance^a:

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^b

Max. Sound Pressure Level: 159 dB (peak)

ENVIRONMENTAL

Operating Temperature Range:

-40 to $+150^\circ\text{C}$ (-40 to $+302^\circ\text{F}$)

Storage Temperature:

In Microphone Box: -30 to $+70^\circ\text{C}$

(-22 to $+158^\circ\text{F}$)

With Mini-CD: 5 to 50°C (41 to 122°F)

Temperature Coefficient (250 Hz):

-0.015 dB/K (-10 to $+50^\circ\text{C}$, 14 to 122°F)

Pressure Coefficient: -0.008 dB/kPa

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 (dry air at 20°C (68°F))

> 100 hours/dB (dry air at 150°C (302°F))

DIMENSIONS

Diameter with Grid: 13.2 mm (0.52")

Diameter without Grid: 12.7 mm (0.50")

Height with Grid: 17.6 mm (0.69")

Height without Grid: 16.3 mm (0.64")

Thread for Pre-amplifier Mounting:

11.7 mm–60 UNS

Note: All values are typical at 23°C (73.4°F), 101.3 kPa and 50% RH unless otherwise specified

a. Individually calibrated

b. 140 dB (peak) with ± 15 V supply

  compliance with EMC Directive

Ordering Information

Type 4943 1/2" Diffuse-field Microphone

Includes the following accessories:

• BC-0224: Calibration Chart^c

• BC-5002: Microphone Data CD^c

TEDS COMBINATIONS

4943-B-001 1/2" Diffuse-field Microphone,
with Pre-amplifier Type 2669-B

4943-C-001 1/2" Diffuse-field Microphone,
with Pre-amplifier Type 2669-C

4943-L-001 1/2" Diffuse-field Microphone,
with Pre-amplifier Type 2669-L

OPTIONAL ACCESSORIES

Type 2669-B/L/C

1/2" Microphone Pre-amplifier

Type 4231 Sound Calibrator

Type 4228 Pistonphone

Type 4226 Multifunction Acoustic
Calibrator

DP-0776 Calibration Adaptor for 1/2"
Microphones

UA-0033 Electrostatic Actuator

UA-0237 Windscreen for 1/2"
Microphones, 90 mm diameter

UA-0459 Windscreen for 1/2"
Microphones, 65 mm diameter

BA 5105 The Microphone Handbook

CALIBRATION SERVICES

4943-CAI Initial Calibration

4943-CAF Accredited Re-calibration

4943-CFF Factory Standard Calibration

c. Quote microphone serial number if re-ordering
calibration data

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

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