

# PRODUCT DATA

## 1/2" Prepolarized Diffuse-field Microphone — Type 4942

Type 4942 is optimised for general, random-incidence measurements and for noise measurements in accordance with ANSI standards. Being prepolarized, it can be used with both DeltaTron® and classical preamplifiers.



### USES

- Diffuse-field measurements
- In-cabin measurements

### FEATURES

- Connects to DeltaTron input
- Sensitivity: 50 mV/Pa
- Frequency: 6.3 – 16000 Hz
- Dynamic Range: 14.6 – 146 dB
- Temperature: –40 to +150°C  
(–40 to +302°F)
- Polarization: 0 V

### 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

The use of a press-fitted stainless steel diaphragm ensures superior long-term stability and mechanical robustness. In fact, Type 4942 will withstand the 1 m drop test specified in 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

Being prepolarized, Type 4942 is especially well-suited for battery operated equipment or for operation in humid environments.

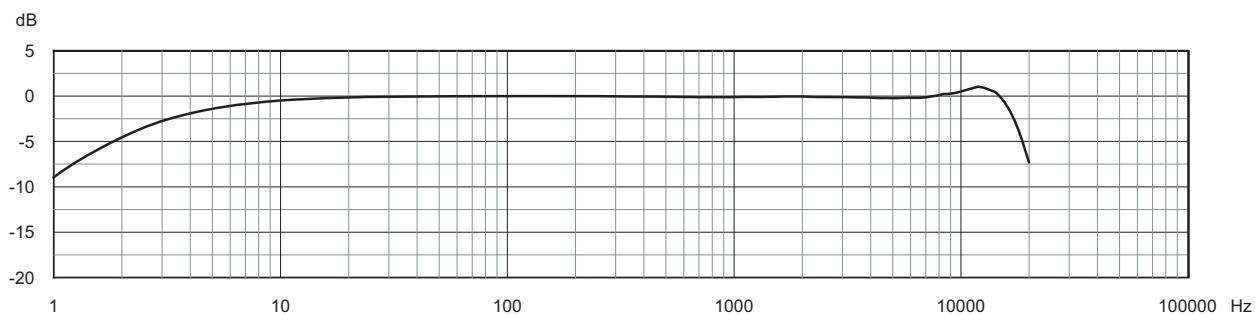
Type 4942 can be used with DeltaTron as well classical type preamplifiers.

### Individual Calibration Data

Each Type 4942 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, corrections 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" Prepolarized Diffuse-field Microphone Type 4942 (valid from serial number 2504591)

### IEC 61094–4 Type Designation: WS2D

**Polarization Voltage:** 0 V (prepolarized)

**Open-circuit Sensitivity (250 Hz)<sup>a</sup>:**

–26 ±1.5 dB re 1 V/Pa, 50 mV/Pa

**Random Incidence Response<sup>a</sup>:**

10 Hz to 10 kHz: ±1 dB

6.3 Hz to 16 kHz: ±2 dB

**Lower Limiting Frequency (–3 dB)<sup>a</sup>:**

2 to 4 Hz

**Pressure Equalization Vent:** Rear vented

**Diaphragm Resonance Frequency:**

14 kHz (90° phase shift)

**Capacitance (Polarized):** 14 pF at 250 Hz

**Equivalent Air Volume:** 46 mm<sup>3</sup> (250 Hz)

**Cartridge Thermal Noise:**

14.6 dB(A), 15.3 dB(Lin)

**Upper Limit of Dynamic Range**

**(3% Distortion):** >146 dB SPL<sup>b</sup>

**Max. Sound Pressure Level:** 158 dB (peak)

a. Individually calibrated

b. 137 dB (peak) with DeltaTron preamplifier and 24 V supply

### ENVIRONMENTAL

**Operating Temperature Range:**

–40 to +150°C (–40 to +302°F)

**Storage Temperature:**

**In Microphone Box:** –30 to +70°C

(–22 to +158°F)

**With Mini-CD:** 5 to 50°C (41 to 122°F)

**Temperature Coefficient (250 Hz):**

–0.006 dB/K (–10 to +50°C, 14 to 122°F)

**Pressure Coefficient:**

–0.010 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 1m/s<sup>2</sup> axial vibration

**Magnetic Field Sensitivity:**

6 dB SPL for 80 A/m, 50 Hz field

**Estimated Long-term Stability:**

> 1000 years/dB (dry air at 20°C (68°F))

> 2 hours/dB (dry air at 150°C (302°F))

> 40 years/dB (air at 20°C (68°F), 90% RH)

> 1 year/dB (air at 50°C (122°F), 90% RH)

### DIMENSIONS

**Diameter with Grid:** 13.2 mm (0.52")

**Diameter without Grid:** 12.7 mm (0.50")

**Height with Grid:** 18.2 mm (0.72")

**Height without Grid:** 16.3 mm (0.64")

**Thread for Preamplifier 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



Compliance with EMC Directive

## Ordering Information

Type 4942 1/2" Prepolarized Diffuse-field Microphone

Includes the following accessories:

- BC 0224: Calibration Chart<sup>c</sup>
- BC 5002: Microphone Data CD<sup>c</sup>

### TEDS COMBINATIONS

4942-A-021 1/2" Diffuse-field Microphone, incl. Preamplifier Type 2671 with TEDS

4942-A-031 1/2" Diffuse-field Microphone, incl. Preamplifier Type 2699 with TEDS

c. Quote microphone serial number if re-ordering

4942-B-001 1/2" Diffuse-field Microphone, incl. Preamplifier Type 2669-B with TEDS

4942-C-001 1/2" Diffuse-field Microphone, incl. Preamplifier Type 2669-C with TEDS

4942-L-001 1/2" Diffuse-field Microphone, incl. Preamplifier Type 2669-L with TEDS

### OPTIONAL ACCESSORIES

Type 2671 1/2" DeltaTron Microphone Preamplifier

Type 2669-B/L/C

1/2" Microphone Preamplifier

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

4942-CAI Accredited initial calibration

4942-CAF Accredited calibration

4942-CFF Factory standard calibration

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

