

PRODUCT DATA

1/2" Pressure-field Microphone — Type 4193

Type 4193 is specially designed for infrasound measurement. Being external polarized, Type 4193 must be used with a classical preamplifier. When used with adaptor UC-0211, the lower limiting frequency of the preamplifier is reduced to 0.1 Hz.



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USES

- Infrasound measurements
- Sonic boom measurements
- General pressure field measurements

FEATURES

- Sensitivity: 12.5 mV/Pa
- Frequency: 0.07 Hz – 20 kHz
- Dynamic Range: 19 – 162 dB
- Temperature: –30 to +300°C (–22 to +572°F)
- Polarization: 200 V

Use of Pressure-field Microphones

Pressure-field microphones are optimised to have a flat frequency response in a pressure field. Pressure-field microphones should be used for making measurements in small, closed couplers or close to hard, reflective surfaces.

Type 4193 is suited for situations where a robust and stable pressure-field microphone is required. Due to its extremely low cut-off frequency, Type 4193 is especially well suited for infrasound measurements.

Manufacturing and Stability

A press-fitted, stainless-steel diaphragm ensure superior long-term stability and mechanical robustness – Type 4193 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 floor and high stability, even when used in environments with a combination of high humidity and high temperature.

Polarization Voltage

Type 4193 requires an external polarization voltage and must therefore must be used with a classical preamplifier.

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

TEDS Microphones

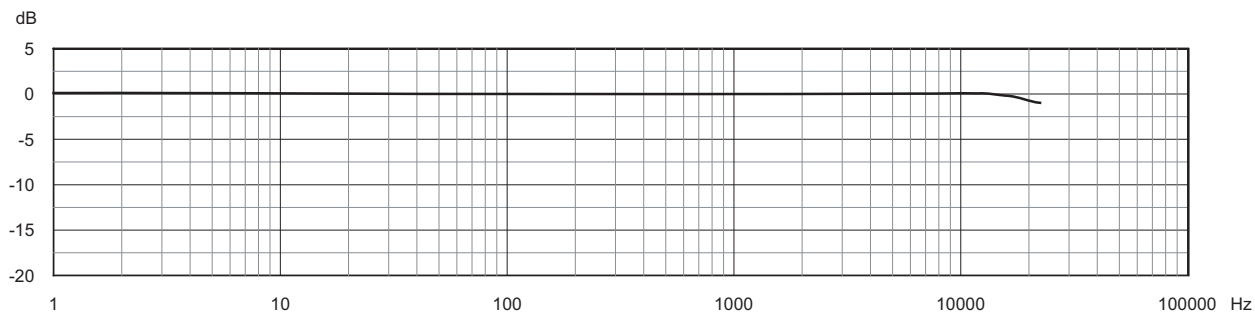
Type 4193 is available in TEDS combinations with the classical Preamplifier Type 2669. The TEDS microphone is considered one unit and has been sealed in a clean environment. The TEDS is programmed with the loaded sensitivity of the actual cartridge and the data is therefore readily available. The default TEDS template is to IEEE P 1451.4 but TEDS to IEEE 1451.4 is available on request.

Individual Calibration Data

Each Type 4193 comes with an individual calibration chart including information about the open-circuit sensitivity and frequency response in a pressure field.

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 pressure-field 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" Pressure-field Microphone Type 4193

IEC 61094-4 Type Designation: WS2P

Polarization Voltage: 200 V (external)

Open-circuit Sensitivity (250 Hz)^a:

12.5 mV/Pa, -38 dB ± 1.5 dB re 1 V/Pa

2 mV/Pa, -54 dB ± 1.5 dB with UC-0211

Pressure-field Response^a:

0.12 Hz to 7 kHz: ± 1 dB

0.07 Hz to 20 kHz ± 2 dB

0.13 Hz to 20 kHz ± 2 dB with UC-0211

Lower Limiting Frequency (-3 dB)^a:

0.01 to 0.05 Hz

0.1 Hz with UC-0211 and Type 2669

Pressure Equalization Vent: Side vented

Diaphragm Resonance Frequency:

23 kHz (90° phase shift)

Cartridge Capacitance^a (Polarized): 18 pF

at 250 Hz

Equivalent Air Volume: 8.8 mm³ (250 Hz)

Pistonphone Correction (Type 4228 with

DP-0776) 0.02 dB

Cartridge Thermal Noise:

19 dB(A), 21.3 dB(Lin)

29 dB(A), 38.2 dB(Lin) with UC-0211 and Type 2669

Upper Limit of Dynamic Range

(3% Distortion): >162 dB SPL^b

Max. Sound Pressure Level: 171 dB (peak)

ENVIRONMENTAL

Operating Temperature Range:

-30 to +150°C (-22 to +302°F)

Useable up to 300°C with a permanent sensitivity change of approx. 0.4 dB, which stabilizes after one hour.

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):

-0.002 dB/K (-10 to +50°C, 14 to 122°F)

Pressure Coefficient:

-0.005 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): 65.5 dB equivalent SPL for 1 m/s² axial vibration

Magnetic Field Sensitivity:

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

Estimated Long-term Stability:

> 100 hours/dB in 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: 13.5 mm (0.53")

Height without Grid: 12.6 mm (0.50")

Thread for Pre-amplifier Mounting:



11.7 mm-60 UNS

UC-0211 DIMENSIONS

Diameter 12.7 mm (0.5")

Height 14.1 mm (0.56")

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

  compliance with EMC Directive

a. Individually calibrated

b. 149 dB (152 dB peak) with ± 15 V supply.
151 dB peak with UC-0211

Ordering Information

Type 4193 1/2" Pressure-field Microphone

Includes the following accessories:

- BC-0228: Calibration Chart^c
- BC-5002: Microphone Mini-CD^c
- UC-0211: LF adaptor

TEDS COMBINATIONS

4193-B-004 1/2" Pressure-field Microphone with UC-0211 and Type 2669-B

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

4193-C-004 1/2" Pressure-field Microphone with UC-0211 and Type 2669-C

4193-L-004 1/2" Pressure-field Microphone with UC-0211 and Type 2669-L

OPTIONAL ACCESSORIES

Type 2669 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 1/2"

UA-1260 Angle Adaptor (approx. 80°)

UA-0386 Nose Cone for 1/2" Microphone

UA-0237 Windscreen for 1/2" Microphone,

90 mm diameter

UA-0459 Windscreen for 1/2" Microphone,

65 mm diameter

BA5105 The Microphone Handbook

CALIBRATION SERVICES

4193-CAI Accredited Initial Calibration

4193-CAF Accredited Calibration

4193-CFF Factory Standard Calibration

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

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