

PRODUCT DATA

½" Prepolarized Infrasound Microphone Type 4964

Type 4964 is designed for high-precision, acoustic measurements where an infrasound microphone with high sensitivity is required. Being prepolarized, Type 4964 can be used with both CCLD and classical preamplifiers.

Uses

- General noise measurements
- Wind turbine measurements
- Sonic boom measurements

Features

- Sensitivity: 50 mV/Pa
- Frequency: 0.02 Hz – 20 kHz (± 3 dB)
- Dynamic Range: 14.6 – 146 dB
- Temperature: -30 to $+150^{\circ}\text{C}$ (-22 to $+302^{\circ}\text{F}$)
- Polarization: Pre-polarized



Use of Free-field Microphones

Free-field means that the frequency response at 0 degrees incidence is flat. Free-field microphones are commonly used, for example, for recording sound measurements in anechoic chambers and far away from reflecting buildings. Another area for free-field microphones is for general electroacoustic measurement purposes like loudspeaker and microphone measurements.

At infrasound and frequencies below a few kHz, the pressure and free-field response are the same. At higher frequencies, reflections and diffractions cause pressure to increase in front of a microphone's diaphragm. Type 4964 has been optimized for free-field, and designed for use with the protection grid in place.

Type 4964 is also suited for use in class 1 sound level meters and for all high-precision acoustic measurements where a robust and stable free-field microphone with an upper frequency of 20 kHz is required.

Manufacturing and Stability

A press-fitted, stainless-steel diaphragm ensures superior long-term stability and mechanical robustness – Type 4964 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

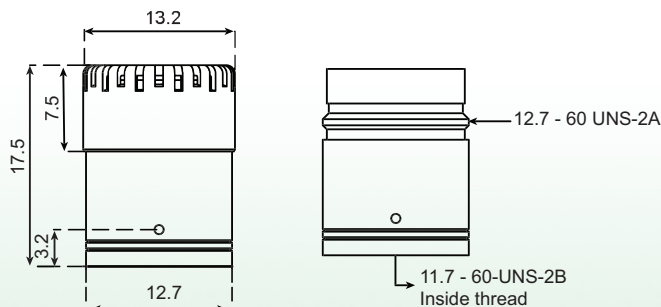
Being prepolarized, Type 4964 is especially well-suited for battery operated equipment and operation in environments with high humidity.

Individual Calibration Data

Each Type 4964 comes with an individual calibration chart including information about the open-circuit sensitivity, the frequency response in a free 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 Physical specifications of Type 4964



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Specifications – Prepolarized Infrasound Microphone Type 4964 (valid for serial number 2495 387)

Specification	Value
IEC 61094–4 Type Designation	WS2F
Polarization Voltage (external)	0 V (prepolarized)
Open-circuit Sensitivity (250 Hz) [*]	50 mV/Pa, –26 dB ± 1.5 dB re 1 V/Pa
0° Incidence Free-field Response [*]	0.04 Hz to 8 kHz: ± 1 dB 0.03 Hz to 20 kHz: ± 2 dB
Lower Limiting Frequency (–3 dB) [*]	0.01 to 0.05 Hz
Pressure Equalization Vent	Rear vented
Diaphragm Resonance Frequency	14 kHz (90° phase shift)
Cartridge Capacitance (Polarized) [*]	14 pF at 250 Hz
Equivalent Air Volume	46 mm ³ (250 Hz)
Pistonphone Correction	0.00 dB (with Type 4228 and DP-0776)
Cartridge Thermal Noise	14.6 dB(A), 15.3 dB(Lin)
Upper Limit of Dynamic Range [†]	3% Distortion: > 148 dB SPL Max. SPL: 158 dB (peak)
Environmental	
Operating Temperature Range	–30 to +150°C (–22 to +302°F)
Storage Temperature (in Microphone Box)	–30 to +70°C (–22 to +158°F) With mini-CD: +5 to +150°C (+41 to 122°F)
Temperature Coefficient (250 Hz)	–0.006 dB/K (–10 to +50°C/+14 to 122°F)
Pressure Coefficient	–0.01 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, ≈ SPL for 1 m/s ² axial vibration
Magnetic Field Sensitivity	6 dB SPL for 80 A/m, 50 Hz field
Estimated Long-term Stability	>1 dB/1000 years in dry air at 20°C (68°F) >2 hours/ dB in dry air at 150°C (302°F) >40 years/ dB in air at 20°C (68°F), 90% RH >1 dB/year in air at 50°C (122°F), 90% RH
Physical	
Thread for Preamplifier Mounting	11.7 mm–60 UNS
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")

^{*} Individually calibrated

[†] 137 dB (peak) with CCLD preamplifier and 24 V supply and 140 (peak) with ±15 V supply

Ordering Information

Type 4964 ½" Prepolarized Infrasound Microphone Type 4964

Includes the following accessories:

- BC-0224: Calibration Chart[‡]
- BC-5002: Microphone Mini-CD[‡]

Optional Accessories	
Type 1706	½" CCLD High Temperature Preamplifier
Type 2669	½" Microphone Preamplifier
2671-W-001	½" CCLD Preamplifier (version with LLF <1.2 Hz)
Type 2699	½" CCLD Preamplifier, A-weighted
Type 4231	Sound Calibrator
Type 4228	Pistonphone
Type 4226	Multifunction Acoustic Calibrator
DP-0776	Calibration Adapter for ½" Microphones
UA-0033	Electrostatic Actuator
UA-1260	½" Angle Adaptor (approx. 80°)
UA-0386	Nose Cone for ½" Microphone
UA-0237	Windscreen for ½" microphone, 90 mm diameter
UA-0459	Windscreen for ½" Microphone, 65 mm diameter
Calibration Services	
4964-CAI	Accredited Initial Calibration
4964-CAF	Accredited Calibration
4964-CFF	Factory Standard Calibration



Compliance with EMC Directive and Low Voltage Directive of the EU

Compliance with the EMC requirements of Australia and New Zealand

[‡] State microphone serial number if re-ordering calibration data

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