

PRODUCT DATA

1" Pressure-field Microphone — Type 4144

USES

- Coupler measurements
- Audiometer calibration
- Low-frequency, low-level measurements
- Laboratory standard microphone

FEATURES

- Sensitivity: 50 mV/Pa
- Frequency: 2.6 Hz to 8 kHz
- Dynamic Range: 10 to 146 dB
- Temperature: -30 to 100°C (-22 to 212°C)
- Polarization: 200 V external

Description

Type 4144 is a 1" pressure-field microphone, that is, a microphone where the damping of the diaphragm is such that the pressure frequency response is flat over a wide frequency range. Hence no correction is needed to the pressure response below 8 kHz. The use of pressure-field microphones is recommended where measurement of the local pressure is of interest, for instance for coupler measurements or measurements at walls or surfaces. The excellent stability of Type 4144 combined with its low inherent noise and high sensitivity makes it the perfect choice for coupler measurements and other laboratory type measurements

Calibration

The sensitivity of Type 4144 can be calibrated at 250 Hz using Pistonphone Type 4228, or at 1 kHz using Sound Level Calibrator Type 4231. The pressure-field response can be measured using Electrostatic Actuator UA 0023. Insert voltage calibration can be performed using Preamplifier Type 2673 with Adaptor UA 0786.

Free-field Correction

Free-field corrections are added to the pressure (actuator) response of the microphone in order to obtain the free-field response at a particular angle of incidence. Free-field corrections represent the increase of sound pressure



caused by diffraction of the sound waves around the microphone and are only significant at higher frequencies where the wavelength is comparable with the external dimensions of the microphone. The free-field correction curves for various angles of incidence are given in Fig. 1. It can be seen that the random incidence (diffuse-field) corrections are very small at audio frequencies.

Fig. 1 Free-field correction curves for Type 4144

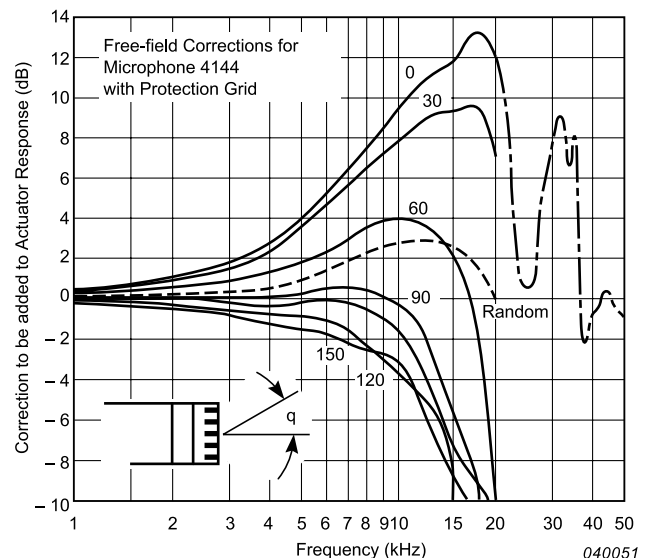
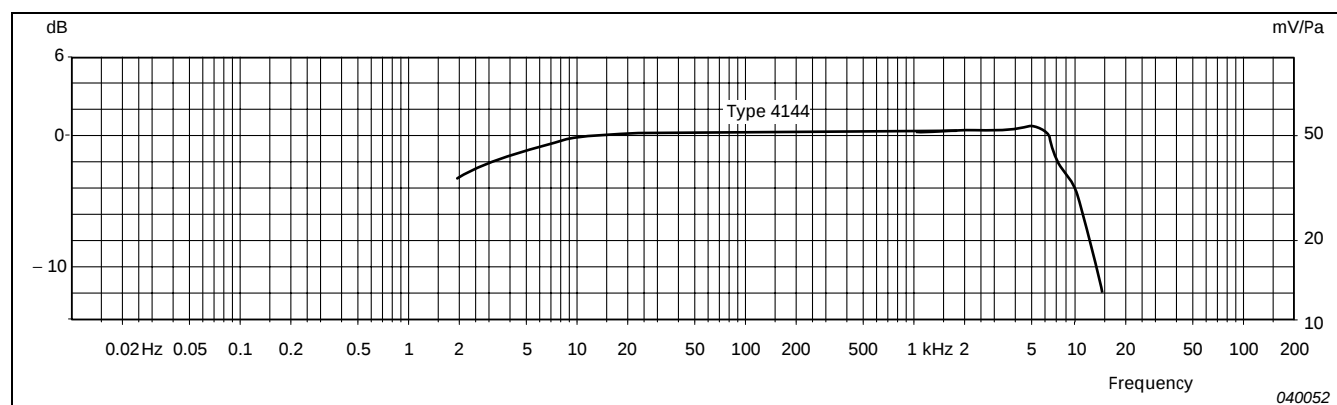


Fig. 2 Typical frequency response of Type 4144 recorded by means of the electrostatic actuator method



Specifications – 1" Pressure-field Microphone Type 4144

COMPLIANCE WITH STANDARDS



compliance with EMC Directive

The data below are valid at 23°C, 101.3 kPa and 50% RH unless otherwise specified

NOMINAL DIAMETER

1"

POLARIZATION VOLTAGE

External: 200 V

OPEN-CIRCUIT SENSITIVITY (250 Hz)*

-26 ± 1.5 dB re 1 V/Pa, 50 mV/Pa

FREQUENCY RESPONSE*

Pressure response

2.6 Hz to 8 kHz: ±2 dB

LOWER LIMITING FREQUENCY (-3 dB)

1 Hz to 2 Hz

PRESSURE EQUALIZATION VENT

Side vented

DIAPHRAGM RESONANCE FREQUENCY

8 kHz (90° phase-shift)

EQUIVALENT AIR VOLUME

148 mm³ (250 Hz)

CARTRIDGE THERMAL NOISE

9.5 dB(A)

3% DISTORTION LIMIT (UPPER)

>146 dB re 20 µPa at 100 Hz

POLARIZED CARTRIDGE CAPACITANCE*

55 pF at 250 Hz

EXPECTED LONG-TERM STABILITY

< 0.001 dB/year at 20°C

Environmental

OPERATING TEMPERATURE RANGE

-30 to +100°C (-22 to +212°F)

MEAN TEMPERATURE COEFFICIENT

-0.003 dB/°C (-10°C < t < +50°C)

PRESSURE COEFFICIENT

-0.016 dB/kPa, typical

INFLUENCE OF HUMIDITY

<0.1 dB in the absence of condensation

INFLUENCE OF VIBRATION

67 dB re 20 µPa and 1 ms⁻² axial vibration

INFLUENCE OF MAGNETIC FIELD

18 dB re 20 µPa in 50 Hz, 80 A/m field

Dimensions

DIAMETER

23.77 mm (0.92") (with grid)

23.77 mm (0.92") (without grid)

HEIGHT

19 mm (0.74") (with grid)

17 mm (0.66") (without grid)

THREAD FOR PREAMPLIFIER MOUNTING

23.11 mm – 60 UNS

*Individually calibrated

Ordering Information

Type 4144 1" Microphone

OPTIONAL ACCESSORIES

Type 2669 C ½" Microphone Preamplifier

Type 2669 B ½" Microphone Preamplifier

Type 2669 L ½" Microphone Preamplifier with LEMO connector

Type 2673 ½" Microphone Preamplifier with insert voltage facility

DB 0375 1" to ½" Adaptor (microphone to preamplifier)

UA 0786 1" to ½" Adaptor for insert voltage calibration

UA 0207 1" Windscreen

Type 4228 Pistonphone

Type 4231 Sound Calibrator
UA 0023 1" Electrostatic Actuator

For more information on microphone calibration equipment and accessories, please refer to the relevant product data sheets

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

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