

PRODUCT DATA

1" Free-field Microphone — Type 4145

USES

- Low-level measurements
- Laboratory measurements

FEATURES

- Sensitivity: 50 mV/Pa
- Frequency: 2.6 Hz to 18 kHz
- Dynamic Range: 10 to 146 dB
- Temperature: -30 to 100°C (-22 to 212°C)
- Polarization: 200 V external
- Complies with IEC 61094-4 WS1F

Description

Type 4145 is a 1" free-field microphone designed for low-level and laboratory free-field measurements. The specifications of Type 4145 also make it suitable for sound pressure measurements in accordance with IEC 61672 class 1. When fitted with Random Incidence Corrector UA 0055, Type 4145 can also be used for random-incidence measurements.

Calibration

The sensitivity of Type 4145 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.

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.

Fig. 1 Free-field correction curves for Type 4145

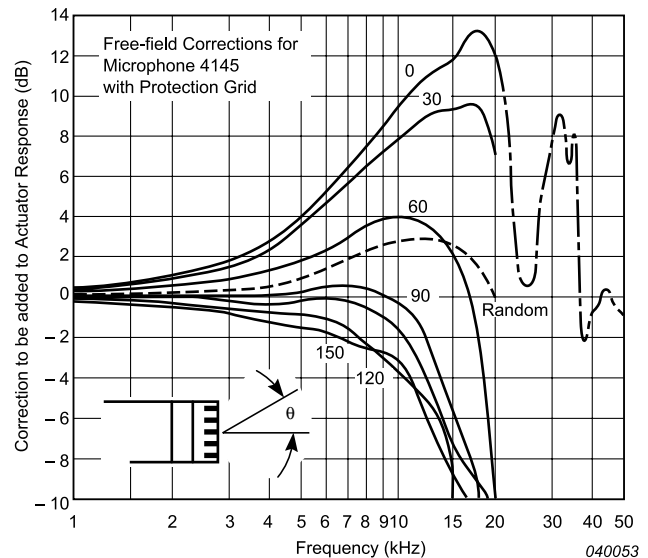
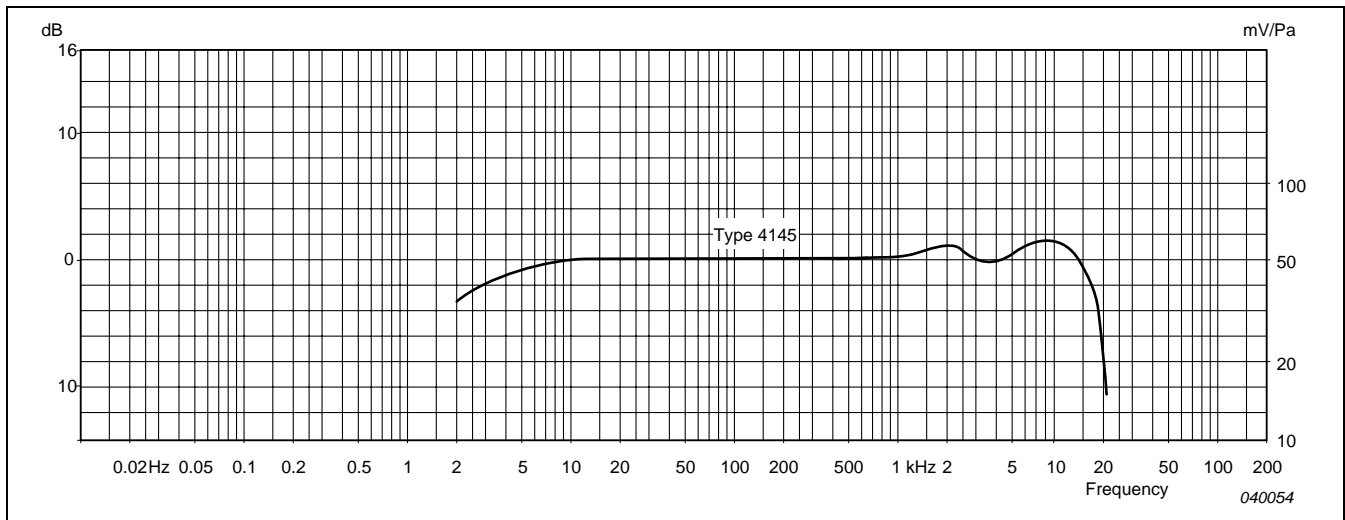


Fig. 2 Typical frequency response of Type 4145 recorded by means of the electrostatic actuator method



Specifications – 1" Free-field Microphone Type 4145

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 (1000 Hz)*

-26 dB ±1.5 dB re 1 V/Pa, 50 mV/Pa

FREQUENCY RESPONSE*

Free-field response, 0° incidence

2.6 Hz to 18 kHz: ±2 dB

Complies with IEC61094-4 WS1F and

ANSI S1.12, Type M

LOWER LIMITING FREQUENCY (-3 dB)

1 Hz to 2 Hz (vent exposed to sound)

*Individually calibrated

PRESSURE EQUALIZATION VENT

Rear vented

DIAPHRAGM RESONANCE FREQUENCY

11 kHz (90° phase-shift)

EQUIVALENT AIR VOLUME

130 mm³ (250 Hz)

CARTRIDGE THERMAL NOISE

10 dB(A)

3% DISTORTION LIMIT (UPPER)

>146 dB re 20 µPa at 100 Hz

POLARIZED CARTRIDGE

CAPACITANCE*:

66 pF at 250 Hz

EXPECTED LONG-TERM STABILITY

< 0.001 dB/year at 20°C

< 0.5 dB/hour at 150°C

Environmental

OPERATING TEMPERATURE RANGE

-30 to +100°C (-22 to +212°F)

MEAN TEMPERATURE COEFFICIENT

-0.002 dB/°C (250 Hz, -10°C < t < +50°C)

PRESSURE COEFFICIENT

-0.015 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

Ordering Information

Type 4145 1" Microphone

OPTIONAL ACCESSORIES

Type 2669 B ½" Microphone Preamplifier, cable w. B&K 7-pin connector

Type 2669 B ½" Microphone Preamplifier, no cable

Type 2669 L ½" Microphone Preamplifier, cable w. LEMO connector

Type 2673 ½" Microphone Preamplifier, w. insert voltage calibration

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 information on microphone calibration equipment and microphone 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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