

# 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

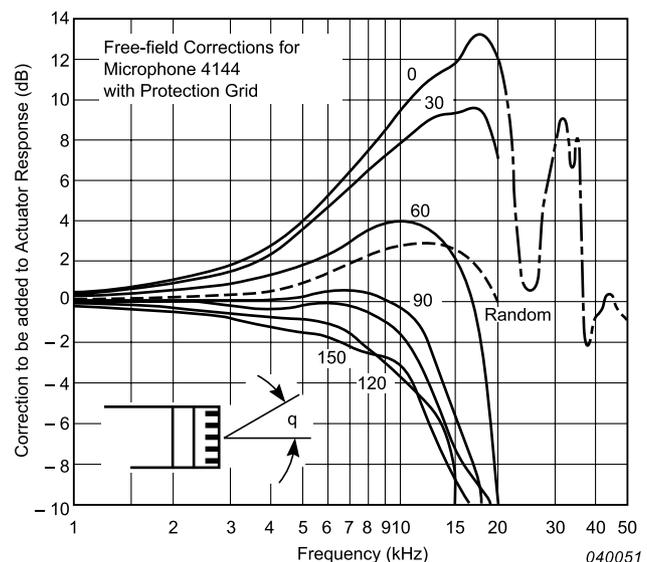
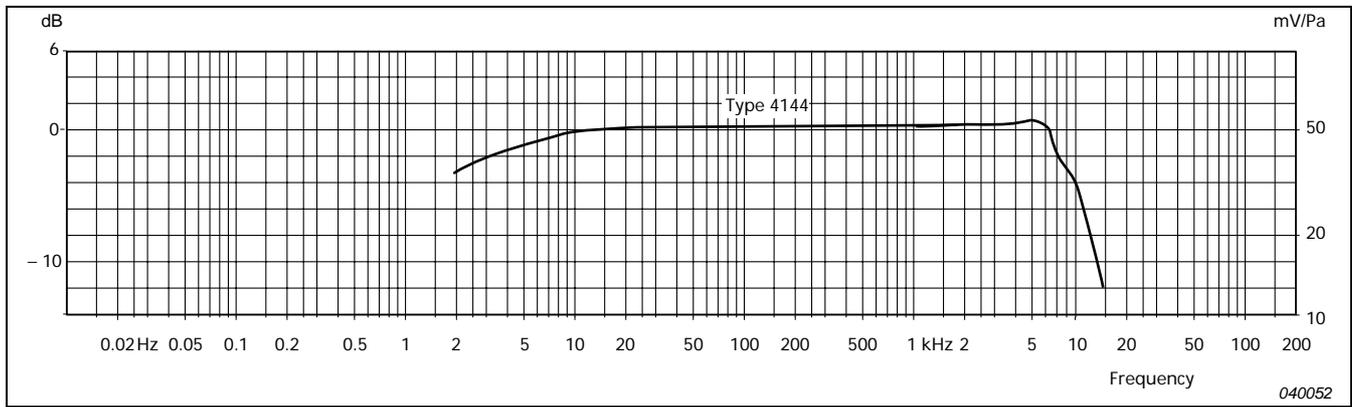


Fig. 2 Typical frequency response of Type 4144 recorded by means of the electrostatic actuator method



## 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

\*Individually calibrated

### PRESSURE EQUALIZATION VENT

Side vented

### DIAPHRAGM RESONANCE FREQUENCY

8 kHz (90° phase-shift)

### EQUIVALENT AIR VOLUME

148 mm<sup>3</sup> (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<sup>-2</sup> 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 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

HEADQUARTERS: DK-2850 Nærum · Denmark · Telephone: +45 4580 0500  
Fax: +45 4580 1405 · www.bksv.com · info@bksv.com

Australia (+61) 2 9889-8888 · Austria (+43) 1 865 74 00 · Brazil (+55) 11 5188-8166  
Canada (+1) 514 695-8225 · China (+86) 10 680 29906 · Czech Republic (+420) 2 6702 1100  
Finland (+358) 9-755 950 · France (+33) 1 69 90 71 00 · Germany (+49) 421 17 87 0  
Hong Kong (+852) 2548 7486 · Hungary (+36) 1 215 83 05 · Ireland (+353) 1 807 4083  
Italy (+39) 0257 68061 · Japan (+81) 3 3779 8671 · Republic of Korea (+82) 2 3473 0605  
Netherlands (+31) 318 55 9290 · Norway (+47) 66 77 11 55 · Poland (+48) 22 816 75 56  
Portugal (+351) 21 47 11 4 53 · Singapore (+65) 377 4512 · Slovak Republic (+421) 25 443 0701  
Spain (+34) 91 659 0820 · Sweden (+46) 8 449 8600 · Switzerland (+41) 1 880 7035  
Taiwan (+886) 2 2502 7255 · United Kingdom (+44) 14 38 739 000 · USA (+1) 800 332 2040

Local representatives and service organisations worldwide

**Brüel & Kjær**