PRODUCT DATA

Prepolarized Pressure-field 1/2-inch Microphone — Type 4947

Prepolarized Pressure-field 1/2-inch Microphone Type 4947 is optimised for coupler measurements, for example, in connection with telephone and hearing aid testing. It is prepolarized, which enables connection to CCLD input conditioning.

USES

- ❍ Coupler measurements
- ❍ Hearing aid testing
- ❍ Telephone testing
- ❍ Connect to CCLD input

FEATURES

❍ Sensitivity:	12.5 mV/Pa
❍ Frequency:	8 – 10000 Hz
❍ Dynamic Range:	17.5 – 160 dB
❍ Temperature:	–30 to 125°C (–22 to 257°F)
❍ Polarization:	0 V

Use of Pressure-field Microphones

For measurements to be made in small, closed couplers or close to hard reflective surfaces, a pressure-field microphone is the best choice. An application that illustrates such usage is where a set of pressure sensing microphones are positioned at different points across an aircraft wing. A complete picture of the pressure variations across the wing surface can then be established.

Pressure-field

A pressure-field is characterised by a sound pressure that has the same magnitude and phase at any position within the field. Microphone Pressure Sensitivity refers to this type of field. Pressure fields can be found in enclosures or cavities that are small compared to the wavelength. Such fields occur in couplers applied for testing of earphones or calibration of microphones. They also occur in most types of sound level calibrator and in pistonphones.

Robustness, Ageing and Assembly

The microphone is capable of withstanding the IEC 68-2-32 1 meter drop test. Ageing at high temperature and assembly of the microphone in a clean room environment ensure that the microphone can be used in high-humidity environments and still produce reliable results.

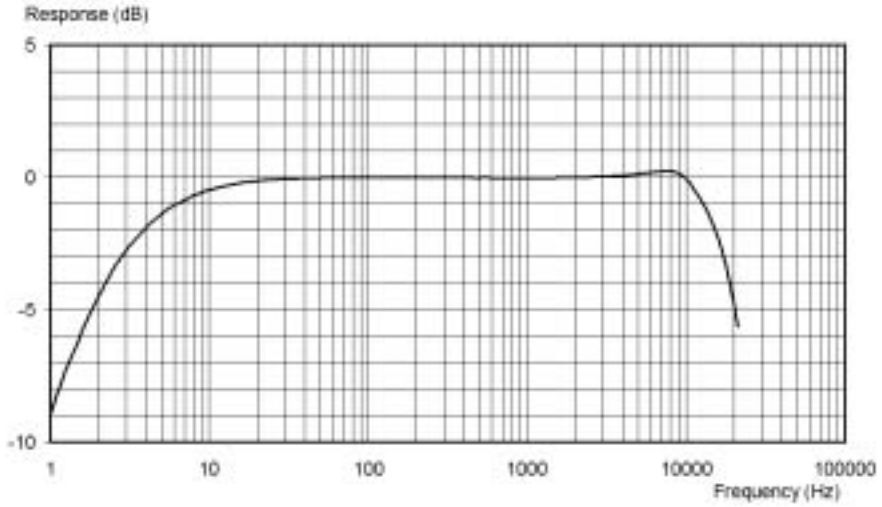
Calibration of Sensitivity and Frequency Response

The sensitivity can be calibrated at 250 Hz by using Pistonphone Type 4228 with ½″ inch Adaptor DP 0776. The actuator response can be measured using Actuator UA 0033. The pressure-field response can be obtained by adding the relevant correction curve to the actuator response.

Use Type 4947 in 2 cc Click-on Coupler Type 4946

2 cc Click-on Coupler Type 4946 is intended for measurements on all types of hearing aids. The design is optimised for quick and easy use in the laboratory as well as on the production line. It fulfils the requirements of the ANSI S 3.7 and IEC 60126 standards. A wide range of ear-mould simulators click onto the coupler body, making it easy to change to different hearing-aid designs. The calibration procedure has also been kept simple – it is not necessary to dismount the coupler body to gain access to the microphone and the grid stays on the microphone – both features that eliminate the risk of damaging the microphone.

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



Specifications – Prepolarized Pressure-field 1/2-inch Microphone Type 4947

Typical Use: Pressure-field measurement
Nominal Diameter: ½″
Open Circuit Sensitivity (250 Hz)[a]**:** –38 ±1.5 dB re 1 V/Pa, 12.5 mV/Pa
Polarization Voltage: 0 V
Pressure-field Response:
±2 dB, 8 Hz to 10 kHz
Lower Limiting Frequency (–3 dB): 1 Hz to 5 Hz
Pressure Equalization Vent: Rear vented
Diaphragm Resonance Frequency: 16 kHz (90° phase-shift)
Capacitance (Polarized): 14 pF at 250 Hz
Equivalent Air Volume: 14.5 mm^3 (250 Hz)
Cartridge Thermal Noise: 17.5 dB(A), 18.7 dB (Lin.)
Upper Limit of Dynamic Range (3% Distortion): >160 dB SPL
Maximum Sound Pressure Level: 172 dB (peak)

ENVIRONMENTAL
Operating Temperature Range: –30 to 125°C (–22 to 257°F)
Storage Temperature:
In case: –30 to +70°C (–22 to 158°F)
With data disk: 5 to 50°C (41 to 122°F)
Temperature Coefficient (250 Hz): +0.006 dB/°C (–10 to 50°C, 14 to 122°F)
Pressure Coefficient: –0.006 dB/kPa, typical

a) Individually calibrated

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/s^2 axial vibration
Magnetic Field Sensitivity: 16 dB SPL for 80 A/m, 50 Hz field

ESTIMATED LONG-TERM STABILITY:
> 1000 years/dB (dry air at 20°C (68°F))
> 2 hours/dB (dry air at 150°C (302°F))
> 40 years/dB (air at 20°C (68°F), 90% RH)
> 6 months/dB (air at 50°C (122°F), 90% RH)

DIMENSIONS
Diameter with Grid: 13.2 mm (0.52″)
Diameter without Grid: 12.7 mm (0.50″)
Height with Grid: 14.9 mm (0.59″)
Height without Grid: 14.0 mm (0.55″)
Thread for Preamplifier Mounting: 11.7 mm–60UNS
Note: All values are typical at 23°C (73.4°F), 101.3 kPa and 50% RH, unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at 2σ (i.e., expanded uncertainty using a coverage factor of 2)

CE compliance with EMC Directive, and EMC requirements of Australia and New Zealand

Ordering Information

Type 4947 Prepolarized pressure-field ½-inch Microphone
Includes the following accessories:
BC 0359 Calibration Chart[b]

b) Quote microphone number if reordering

OPTIONAL ACCESSORIES

Type 2671	½″ DeltaTron® Microphone Preamplifier
Type 2695	½″ DeltaTron Microphone Preamplifier
Type 4231	Sound Level Calibrator
Type 4228	Pistonphone
DP 0776	Calibration Adaptor for ½″ Microphones
UA 0033	Electrostatic Actuator
UA 0237	½″ Windscreen (90 mm)
UA 0459	½″ Windscreen (65 mm)

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

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