

# PRODUCT DATA

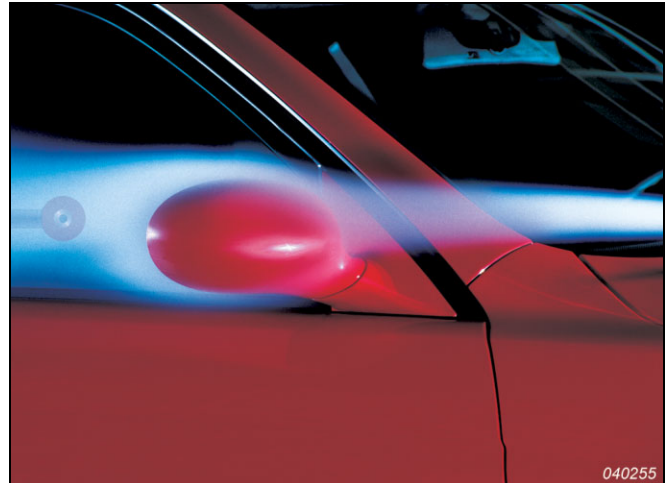
## Automotive Surface Microphones — Types 4949 and 4949 B

### USES

- Noise measurement on surfaces including glass and in confined spaces
- Wind-tunnel testing
- Low to medium noise measurements
- Flush mounting
- Connects to CCLD/DeltaTron® input

### FEATURES

- Sensitivity: 11.2 mV/Pa
- Frequency: 5 to 20000 Hz
- Dynamic Range: 30–140 dB
- Temperature: –30 to 100°C (–22 to 212°F)
- Optimised for surface pressure measurement
- Built-in DeltaTron preamplifier
- Simple mechanical interface
- Mounting pads and protection grid available
- TEDS – IEEE P1451.4
- CIC verification input (Type 4949 B)



- Patent pending
- PULSE™ template available for pressure mapping

### Description

Surface Microphone Type 4949 is optimised for measurement of the true surface pressure, especially in automotive applications. It is exceptionally well-suited for mounting directly on the car surface during wind-tunnel tests or for easy measurement in confined spaces, for example, on the firewall or the underside of a vehicle. The optional mounting pads allow easy mounting of the microphone even on the curved surfaces of an automobile. Despite its small size, Type 4949 is a rugged and stable measurement microphone. The microphone housing and the metallic parts of the diaphragm-backplate arrangement, including the diaphragm, are all titanium, ensuring uniquely high resistance to corrosion.

The diaphragm is flush with the microphone housing in order to minimise the wind-generated noise of the microphone. The microphone pressure-equalization vent is placed just next to the diaphragm on the front of the microphone. This is important since the static pressure

can vary rapidly with position when the microphone is exposed to turbulent pressure fluctuations.

Surface Microphone Type 4949 has a built-in DeltaTron preamplifier for connection to CCLD inputs. The sensitivity of the microphone is optimised in order to achieve a good noise floor and still allow measurements at higher levels without clipping. The microphone supports IEEE 1451.4 (TEDS) for remote identification of the transducer and reading of its calibrated sensitivity. Type 4949 B also supports Brüel & Kjær's proprietary Charge Injection Calibration (CIC) for remote verification of the complete, calibrated measurement channel.

Surface Microphone Type 4949 is yet another product based on Brüel & Kjær's new patent-pending microphone technology. With this technology, it is possible to obtain the same high stability and uniformity as that of the traditional and well-known Brüel & Kjær microphones and preamplifiers.

## Specifications – Surface Microphone Types 4949 and 4949 B

### COMPLIANCE WITH STANDARDS

**CE** Compliance with EMC Directive and Low Voltage Directive of the European Community

**C** Compliance with EMC requirements of Australia and New Zealand

Detailed EMC Specifications are given in the technical manual

The data below are valid at 23°C, 101.3 kPa and 50% RH unless otherwise specified. The values are valid with the cable configuration as delivered from the factory. If no tolerances are stated, the values are typical

#### Sensitivity at 250 Hz\*:

–39 dB ±3 dB re 1 V/Pa, 11.2 mV/Pa

#### Frequency Response (pressure field)\*:

- 10 Hz to 10 kHz ±1 dB re 250 Hz
- 5 Hz to 20 kHz ±3 dB re 250 Hz

#### Lower Limiting Frequency (–3 dB):

0.5 Hz to 5 Hz

#### Pressure Equalization Vent:

Front-vented (at edge of diaphragm)

#### Diaphragm Resonance Frequency:

24 kHz, typical (90° phase shift)

#### Equivalent Air Volume:

6.8 mm<sup>3</sup> ± 0.8 mm<sup>3</sup> (2σ)

### Pistonphone Type 4228 Correction with

**DP 0977 or DP 0979:** 0.00 dB

#### Inherent Noise:

<9 µV, linear 22.4 Hz – 22.4 kHz

#### Typical Values:

6 µV, A-weighted, 29 dB equivalent SPL at nominal sensitivity;

8.9 µV, linear 22.4 Hz – 22.4 kHz, 32 dB equivalent SPL at nominal sensitivity

#### Upper Limit of Dynamic Range:

>140 dB SPL (500 Hz, 3% distortion)

#### Clipping Limit:

>144 dB re 20 µPa peak (7 V peak at maximum sensitivity)

#### Constant Current Supply:

DeltaTron supply 2 mA to 20 mA, nominally 4 mA

#### Supply Voltage (unloaded):

+22 V to +30 V DC

Minimum 18 V with reduced specifications

#### Bias Voltage: 12.7 V ±1.3 V

#### Maximum Output Voltage: >7 V peak

#### Maximum Output Current:

Peak value 1 mA below supply current

#### Output Impedance:

<50 Ω at 1 kHz, typically 22 Ω 430 pF

#### Expected Long-term Stability:

- <0.001 dB/year at 20°C and < 50% RH
- <0.025 dB/year at 20°C and <90% RH
- <0.5 dB/month at 100°C in dry air

### Environmental

#### Operating Temperature Range:

–30 to +100°C (–22 to +212°F)

#### Storage Temperature:

–30 to +70°C (–22 to +158°F)

#### Temperature Coefficient (250 Hz):

+0.013 dB/°C

#### Pressure Coefficient (250 Hz):

–0.007 dB/kPa

#### Operating Humidity Range:

0–100% RH without condensation

#### Influence of Humidity:

<0.1 dB in the absence of condensation

#### Influence of Vibration (<2 kHz):

Typically 65 dB equivalent SPL for 1 m/s<sup>2</sup>

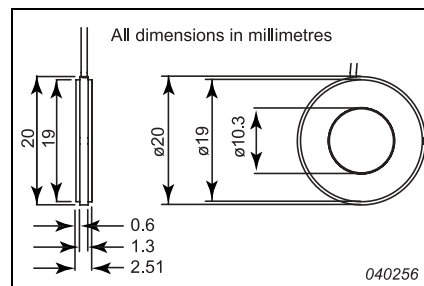
### Dimensions

#### MICROPHONE UNIT

**Diameter:** 20 mm (0.79")

**Height:** 2.5 mm (0.1")

**Weight:** 2.3 g (0.08 oz.) without cable



\* Individually calibrated

## Ordering Information

Type 4949 Surface Microphone with 1.2 m miniature coaxial cable (1 mm Ø) mounted with 10–32 UNF coaxial connector

Type 4949 B Surface Microphone with CIC input and two 1.2 m miniature coaxial cables (each 1 mm Ø) mounted with 10–32 UNF coaxial connectors

### ACCESSORIES INCLUDED

KE 0414 Carrying Box  
Calibration Chart

### OPTIONAL ACCESSORIES

UA 1667 10 × Mounting Pad Ø 50 mm  
UA 1668 10 × Mounting Pad Ø 35 mm  
UA 1640 Mounting Flange, Titanium with screws  
UA 1669 25 × Protection Grid (self-adhesive)  
DP 0977 Pistonphone Adaptor for unflanged microphone  
DP 0979 Pistonphone Adaptor for flush mounted microphone  
UA 1639 Electrostatic Actuator

ZG 0328 DeltaTron Power Supply (for Brüel & Kjær 7-pin sockets)

4949 CAI Accredited Initial Calibration  
4949 CAF Accredited Calibration  
4949 EW1 Extended Warranty

The calibration products include factory calibration and accredited sensitivity calibration

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

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