

# PRODUCT DATA

## Surface Microphone — Type 4948 A

### USES

- Measurement of sound pressure on surfaces
- Acoustic-fatigue testing of airplanes
- Wind-tunnel measurements
- Medium- to high-level measurements
- Measurement in confined spaces

### FEATURES

- Sensitivity: 1.4 mV/Pa
- Frequency Range: 5 to 20000 Hz
- Dynamic Range: 55 to 160 dB
- Temperature:  $-55$  to  $100^{\circ}\text{C}$  ( $-67$  to  $212^{\circ}\text{F}$ )
- Optimised for pressure-field measurements
- Built-in DeltaTron<sup>®</sup> preamplifier
- Simple mechanical interface
- Supports TEDS standard – IEEE P1451.4
- Input for CIC verification
- Patent pending
- Flush mounting



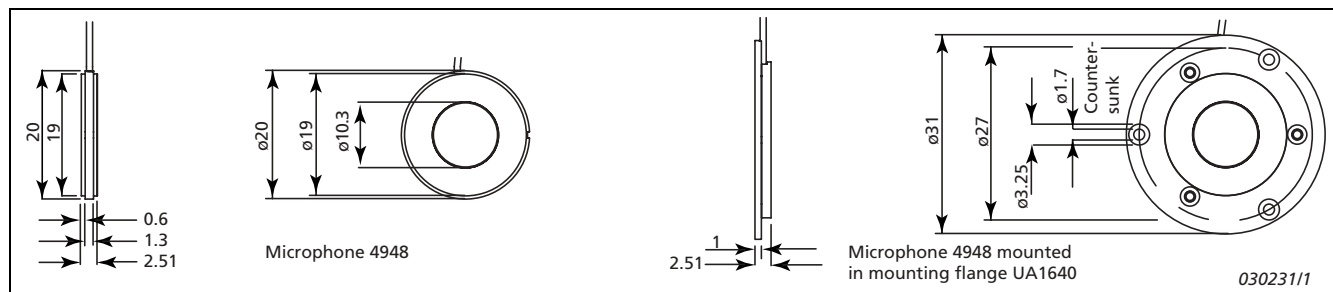
Designed for use on airplane surfaces during in-flight testing, as well as in wind-tunnel testing and other, similar applications, Surface Microphone Type 4948 A is a rugged and stable measurement microphone. The microphone housing and the metallic parts of the diaphragm-backplate arrangement are all titanium, ensuring uniquely high resistance to corrosion.

Surface Microphone Type 4948 A has a built-in Delta-Tron preamplifier for connection to CCLD inputs. The microphone sensitivity is adjusted so as to allow measurements at high levels without clipping. Type 4948 A support TEDS (Transducer Electronic Data Sheet). TEDS enables remote transducer identification and reading of calibration data. It also supports Brüel & Kjær's proprietary Charge Injection Calibration (CIC) for remote verification of the complete, calibrated measurement channel.

The microphone offers high mounting flexibility and its diaphragm is flush with the microphone housing in order to minimise the microphone's wind-generated noise. The microphone's pressure-equalisation vent is placed just next to the diaphragm on the front of the microphone; this is important as static pressure can vary rapidly with position in the applications for which the microphone is designed.



Surface Microphone Type 4948 A is the first product based on Brüel & Kjær's new, patent-pending, microphone-manufacturing technology. With this technology, it is possible to obtain the same high stability and uniformity as those of the traditional and well-known Brüel & Kjær microphones and preamplifiers, even with Type 4948 A's flat, compact design.

Fig. 1 Surface microphone dimensions (in mm)



## Specifications – Surface Microphone Type 4948 A

### COMPLIANCE WITH STANDARDS

-  Compliance with EMC Directive and Low Voltage Directive of the European Community
-  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, 101.325 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\*:

-57 dB  $\pm$  3 dB re 1 V/Pa, 1.4 mV/Pa

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

- 10 Hz to 10 kHz  $\pm$  1 dB re 250 Hz
- 5 Hz to 20 kHz  $\pm$  3 dB re 250 Hz

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

1 Hz to 5 Hz

#### Pressure Equalization Vent:

Front-vented (at edge of diaphragm)

\* Individually calibrated

#### Diaphragm Resonance Frequency:

24 kHz, typical (90° phase shift)

#### Equivalent Air Volume:

6.8 mm<sup>3</sup>  $\pm$  0.8 mm<sup>3</sup> (2 $\sigma$ )

#### Pistonphone Type 4228 Correction with DP 0977 or DP 0979: 0.00 dB

#### Inherent Noise:

<30  $\mu$ V, linear 22.4 Hz – 22.4 kHz

#### Typical Values:

15  $\mu$ V, A-weighted, 55 dB equivalent SPL at nominal sensitivity;

23  $\mu$ V, linear 22.4 Hz – 22.4 kHz, 58 dB equivalent SPL at nominal sensitivity

#### Upper Limit of Dynamic Range:

>160 dB SPL (500 Hz, 3% distortion)

#### Clipping Limit:

>165 dB re 20  $\mu$ Pa 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 $\pm$ 1.3 V

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

#### Maximum Output Current:

Peak value 1 mA below supply current

#### Output Impedance:

<50  $\Omega$  at 1 kHz, typically 22  $\Omega$  || 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:

-55 to 100°C (-67 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:

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 Mounting Flange

5.3 g (0.19 oz.) with Mounting Flange

UA 1640

## Ordering Information

Type 4948 A Surface Microphone permanently mounted in mounting flange with CIC input. The microphone has a miniature connector type "Omnetics nano connector NS-S-4-0.050-W single row female connector" and an 8 cm, 4-core cable encapsulated in a silicone cable sheath

#### ACCESSORIES INCLUDED

UA 1640 Mounting Flange  
KE 0444 Carrying Box

Calibration Chart

#### OPTIONAL ACCESSORIES

DP 0977 Pistonphone Adaptor for Unflanged Microphone  
DP 0979 Pistonphone Adaptor for Flush-mounted Microphone  
UA 1639 Electrostatic Actuator  
WL 3216-001 Cable Adaptor, Omnetics to 1.2 m, cable with 10–32 UNF  
WL 3216-002 Cable Adaptor, Omnetics to 2 x 1.2 m, cable with 10–32 UNF

ZG 0328 DeltaTron Power Supply (for B & K 7-pin sockets)  
4948 CAI Accredited Initial Calibration  
4948 CAF Accredited Calibration  
4948 EW1 Extended Warranty  
The calibration products include factory calibration and accredited sensitivity calibration

Customer-specified mounting devices may be delivered on request

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 