

# BRÜEL & KJÆR® Transducers

## ½-inch Prepolarized Pressure-field Microphone Cartridge Type 4971

### Uses

- Precision coupler measurements
- Precision-grade sound level meters
- General, random-incidence measurements
- Free-field measurements with 90° incidence

### Features

- Sensitivity: 12.5 mV/Pa, -38 dB
- Frequency: 5 Hz to 20 kHz, ±2 dB
- Dynamic Range: 19 to 162 dB
- Temperature: -30 to +150 °C (-22 to +302 °F)
- Polarization: Prepolarized



### Introduction

Type 4971 is designed for high-precision coupler measurements or noise measurements according to ANSI/IEC standards. Being prepolarized, Type 4971 can be used with cost-effective CCLD input as well as a classical (LEMO®-type) input.

### Use of Pressure-field Microphones

Type 4971 is suited for situations where a robust and stable pressure-field microphone is required. Pressure-field microphones are optimized to have a flat frequency response in pressure fields. Use Type 4971 for making measurements in small, closed couplers or close to hard, reflective surfaces.

### Manufacturing and Stability

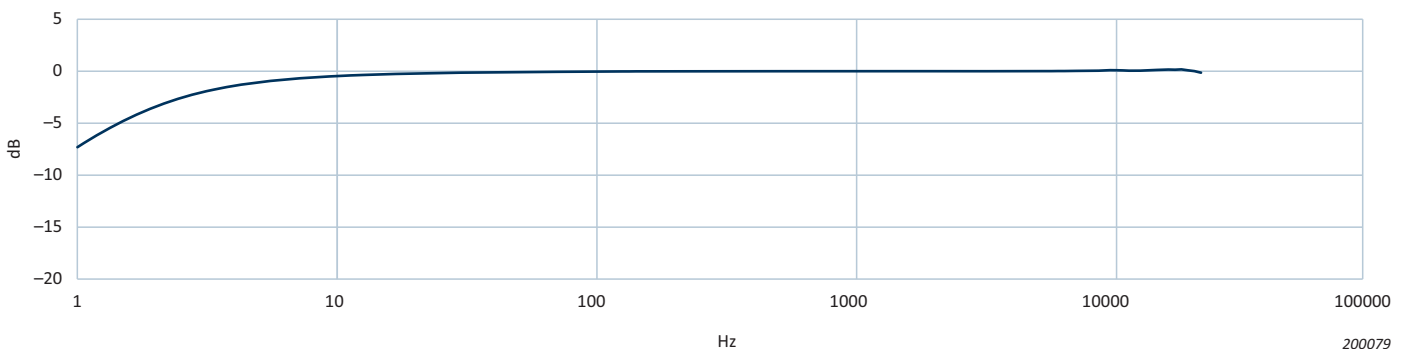
A press-fitted, stainless steel diaphragm ensures superior long-term stability and mechanical robustness. Type 4971 withstands the 1 m drop test of IEC 60068-2-32.

All Brüel&Kjær measuring microphones are assembled in a clean room. This ensures that the microphones maintain their low noise floor and high stability, even when used in environments with a combination of high humidity and high temperature.

### Polarization Voltage

Being prepolarized, Type 4971 is especially well suited for battery operated equipment and in environments with high humidity levels.

Fig. 1 Typical pressure-field frequency response for Type 4971



### TEDS Microphones

A TEDS (transducer electronic data sheet) microphone is a combined cartridge and a preamplifier with TEDS. It is assembled and sealed in a clean environment. The microphone is considered one unit, with a single type and serial number. Each TEDS is programmed with the loaded sensitivity of the actual cartridge, making its data readily available in TEDS-compliant data acquisition and analysis systems.

Type 4971 is available in a TEDS combination with CCLD Microphone Preamplifier Type 1706: Type 4971-H-041. By default, the TEDS template in Type 4971-H-041 complies with IEEE P1454.4 version 0.9, but a mapping that complies with IEEE 1454.4 version 1.0 is available on request.

### Individual Calibration Data

Each Type 4971 comes with an individual calibration chart with information about the open-circuit sensitivity and frequency response in a pressure field.

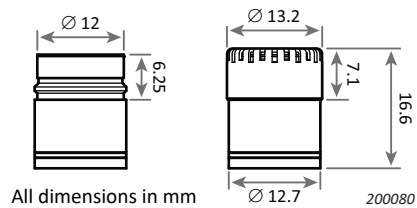
An enclosed mini CD contains calibration data at 1/12-octave frequencies plus a wealth of technical information, such as the influence of different accessories, the frequency response in different sound fields and much more. Using the CD data and the REq-X feature of PULSE LabShop applications, a real-time correction for different measurement situations, can increase measurement accuracy.

STANDARD		
IEC 61094-4 Type Designation	WS2P	
DYNAMIC CHARACTERISTIC		
Polarization Voltage	Prepolarized	
Open-circuit Sensitivity (250 Hz)*	12.5 mV/Pa -38 dB ± 1.5 dB re 1 V/Pa	
Pressure-field Response*	10 Hz to 20 kHz: ±1 dB	
Lower Limiting Frequency (-3 dB)*	1 to 3 Hz	
Pressure Equalization Vent	Rear vented	
Diaphragm Resonance Frequency	21 kHz (90° phase shift)	
Cartridge Capacitance*	14 pF at 250 Hz	
Pistonphone Correction (Type 4228 with DP-0776)	0.02 dB	
Cartridge Thermal Noise	18.6 dB(A), 20.9 dB(Lin)	
Upper Limit of Dynamic Range (3% distortion)	>162 dB SPL †	
Max. Sound Pressure Level	169 dB(peak)	
ENVIRONMENTAL CHARACTERISTICS		
Operating Temperature Range	-30 to +150 °C (-22 to +302 °F)	
Storage Temperature	In microphone box	-30 to +70 °C (-22 to +158 °F)
	With mini CD	5 to 50 °C (41 to 122 °F)
Temperature Coefficient (250 Hz)	+0.003 dB/K (-10 to +50 °C (14 to 122 °F))	
Pressure Coefficient	-0.0023 dB/kPa, typical	
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 <sup>2</sup> axial vibration	
Estimated Long-term Stability	20 °C (68 °F), dry air	<1 dB/1000 years
	150 °C (302 °F), dry air	<1 dB/2 hours
	20 °C (68 °F), 90% RH	<1 dB/40 years

\* Individually calibrated  
 † 149 dB (152 dB peak) with ±15 V supply, 146 dB with CCLD input

**Note:** All values are typical at 23 °C (73.4 °F), 101.3 kPa and 50% RH unless otherwise specified

**DIMENSIONS**



**Type 4971 ½-inch Pressure-field Microphone Cartridge**

Includes the following accessories:

- Calibration chart\*
- Microphone mini CD\*

\* State the microphone serial number if re-ordering calibration data

TEDS COMBINATION	
Type 4971-H-041	Type 4971 with Preamp Type 1706
OPTIONAL ACCESSORIES	
Type 1706	CCLD Microphone Preamp
Type 2669	½-inch Classical Microphone Preamp
Type 4231	Sound Calibrator
Type 4228	Pistonphone
Type 4226	Multifunction Acoustic Calibrator
DP-0776	Adaptor for Calibration, for ½-inch microphones, for use with Type 4228
UA-0033	Electrostatic Actuator, for ½-inch microphones
UA-1260	Angle Piece
UA-0459	Spherical Windscreen, diameter 65 mm (2.56 in)
UA-0237	Spherical Windscreen, diameter 90 mm (3.54 in)
CALIBRATION SERVICES	
MIC-CAI	Accredited Initial Calibration
MIC-CAF	Accredited Calibration
MIC-CFF	Factory Standard Calibration

**COMPLIANCE WITH STANDARDS**



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