

# PRODUCT DATA

## Electrostatic Actuator — UA-1639

The calibration of microphones using an electrostatic actuator is a widely applied laboratory method for the determination of frequency response characteristics of measurement microphones. The actuator produces an electrostatic force that simulates a sound pressure acting on the microphone diaphragm. In comparison with sound-based methods, the actuator method has a great advantage; it provides a simpler means of producing a well-defined calibration pressure over a wide frequency range without the special facilities of an acoustics laboratory.

The actuator's construction allows for the calibration of surface microphone Types 4948 and 4949, even when the microphone is mounted in Mounting Flange UA-1640.

### FEATURES

- Calibrate microphones with or without Mounting Flange UA-1640
- Simple setup
- Functions like other Brüel & Kjær electrostatic actuators

### USES

- Frequency response calibration of Types 4948 and 4949

### Pressure-field Corrections

Pressure-field correction (PFC) must be added to the result achieved with UA-1639 in order to establish the pressure-field response, which is shown on the original calibration chart<sup>a</sup>.

Performing repetitive measurements, including remounting, is recommended to detect possible random resonances. Any non-repeatable peak or dip in the frequency response is probably caused by such resonances and should be omitted from the test results.

### Setup

The microphone, with or without mounting flange UA-1640, should be placed on top of UA-1639's base. The microphone's diaphragm should be pointing upwards and its cable should be in the notch. Ensuring that the microphone's cable is in the blue part's larger slot, align

a. The PFC is frequency dependent, as shown in Table 1 and Fig 3.



the blue part's two L-shaped slots with the pins on the base. Press down and turn slightly.

Connect the micro-jack from the small cable to the UA-1639 and the banana plug to the actuator output voltage socket. Finally, connect the cable from the microphone to the calibration system's DeltaTron<sup>®</sup> Microphone input.

**Fig. 1** Aerospace Surface Microphone Type 4948, with and without mounting flange UA-1640



## Specifications – Electrostatic Actuator UA-1639

Table 1 PFC Values

Frequency (Hz)	PFC (dB)	Frequency (Hz)	PFC (dB)
4731.51	-0.05	10592.5	-0.15
5011.87	-0.06	11220.2	-0.09
5308.84	-0.07	11885.0	-0.06
5623.41	-0.08	12589.2	-0.03
5956.62	-0.09	13335.2	-0.02
6309.58	-0.10	14125.4	-0.07
6683.44	-0.11	14962.4	-0.16
7079.46	-0.13	15848.9	-0.01
7498.94	-0.15	16788.0	0.17
7943.28	-0.17	17782.8	0.28
8413.95	-0.19	18836.5	0.41
8912.51	-0.20	19952.6	0.64
9440.61	-0.19	21134.9	0.71
10000.00	-0.17	22387.2	0.56

### Pressure-field Correction

For all practical applications, the PFC values from Table 1 can be used. Below 4.4 kHz, the correction is less than 0.05 dB

### Uncertainty of PFC Values

250 Hz – 4.7 kHz: < 0.05 dB  
 4.7 kHz – 10 kHz: < 0.1 dB  
 10 kHz – 16 kHz: < 0.5 dB  
 16 kHz – 22 kHz: < 0.6 dB

### Dimensions

#### DIAMETER

50 mm (2")

#### HEIGHT

30.25 mm (1.25")

#### WEIGHT

112.5g (4.0 oz.)

Fig. 2 UA-1639 Mechanical Dimensions

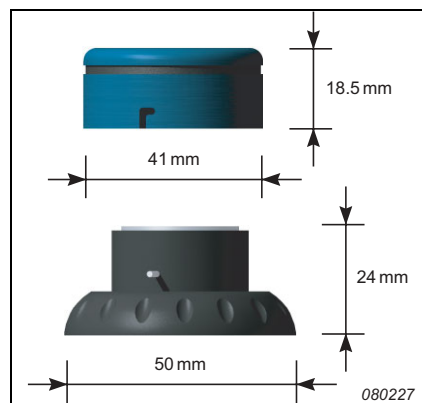
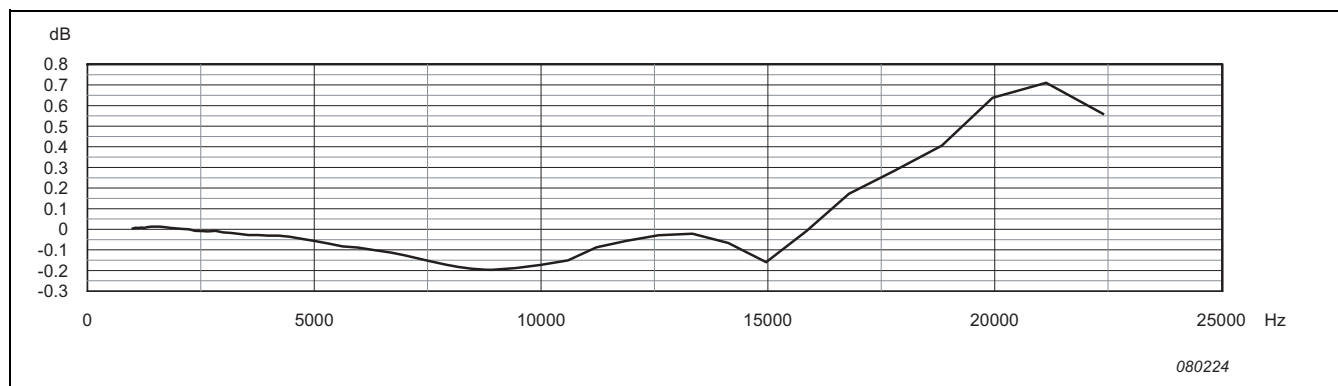


Fig. 3 PFC graph



### Ordering Information

UA-1639 Electrostatic Actuator  
 Type 9721 Microphone Calibration System  
 Type 5001 Microphone Calibration Module

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

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