

PRODUCT DATA

Sound Intensity Microphone Pair — Type 4178

USES

- Measurement of sound intensity using two-microphone technique, in accordance with IEC 61043 Class 1
- Sound power measurements in accordance with ISO 9614-1, ISO 9614-2, ECMA 160 and ANSIS12.12, using Sound Intensity Probes
- Measurement of particle velocity of sound sources

FEATURES

- Broadband matching of phase responses
- Phase calibrated in 1/3-octave frequency bands from 100 Hz – 20 kHz

Description

Type 4178 consists of a pair of selected Type 4939 1/4" microphones, whose phase responses are matched between 100 Hz and 20 kHz.

The Type 4939 microphones are specially designed for high level and high frequency measurements. By using stainless steel diaphragm and protection grid, the microphone is optimised to withstand rough environments and is capable of working at high temperatures – up to 150°C (302°F). The microphones are mainly used in Sound Intensity Probes to measure sound intensity and can also be used for particle velocity measurements.



Other uses include measuring the volume velocity of a sound source, using, for example, Brüel & Kjær's Volume Velocity Adaptor Type 4299 fitted to the OmniSource™ Omnidirectional Sound Source Type 4295.

Type 4178 is supplied with 6 mm and 12 mm spacers, along with calibration charts giving the individually measured free-field frequency response for each microphone and a Phase Response Comparison Calibration (100 Hz – 20 kHz) see Fig. 1.

Fig. 1 Calibration chart for Type 4178

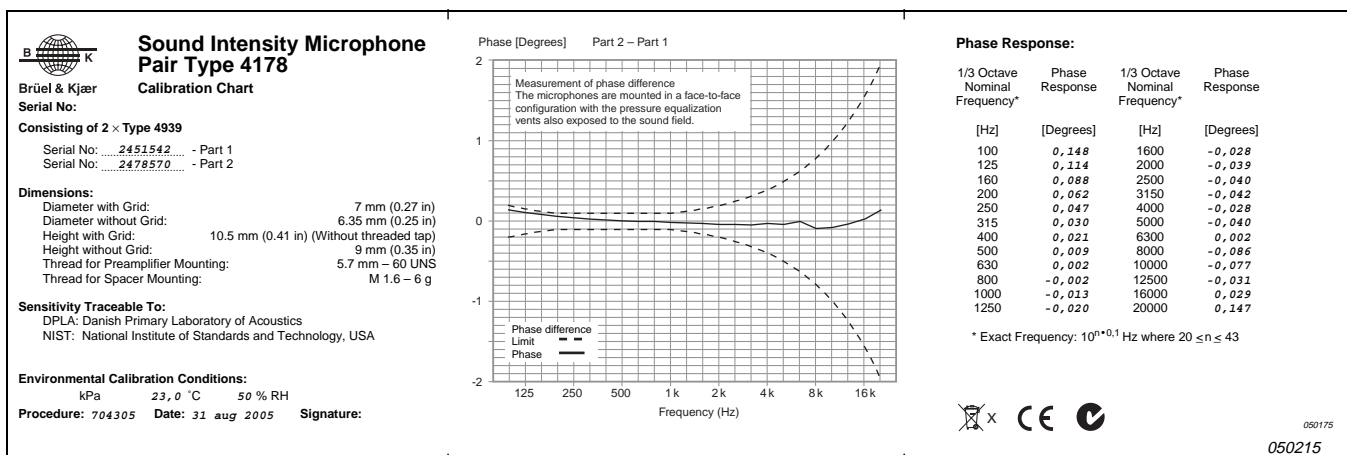


Fig. 2 Sound Intensity Calibrator Type 3541 for pressure, intensity and velocity calibration of sound intensity measuring systems



Calibration

Phase calibration of 1/4" microphone pair Type 4178 is done at Brüel & Kjær by subjecting the two microphones to the same sound signal in a pressure coupler. This individual phase calibration can be used to derive the Pressure-Residual Intensity Index for the microphone pair.

Sound intensity measurement systems containing a sound intensity probe set can be conveniently calibrated using a Sound Intensity Calibrator Type 3541 (see Fig. 2).

This permits simultaneous sensitivity adjustment of both channels of the processor (in pressure, particle velocity or intensity modes) and allows determination of the 20 Hz–5 kHz Pressure-Residual Intensity Index of the probe and processor combinations.

Further details can be found in the separate Product Data for Type 3541.

Specifications

COMPLIANCE WITH STANDARDS



Compliance with EMC Directive and Low Voltage Directive of the EU
Compliance with the EMC requirements of Australia and New Zealand

GENERAL SPECIFICATIONS – TYPE 4939

Sensitivity: 4 mV/Pa
Frequency: 4 Hz – 100 kHz
Dynamic Range: 28 – 164 dB
Temperature: –40 to +150°C (–40 to +302°F)
Polarization: 200 V External

MICROPHONE MATCHING

SPECIFICATIONS – TYPE 4178
Phase Response Difference (1/3-octave centre frequencies):
100 Hz–200 Hz: ±0.2 deg/f [Hz]
200 Hz–1 kHz: ±0.1 deg
1 kHz–20 kHz: ±0.1 deg×f [kHz]
Amplitude Response Difference (normalised at 200 Hz):
<0.3 dB: 100 Hz to 10 kHz
<0.5 dB: 100 Hz to 20 kHz

Ordering Information

Type 4178 Sound Intensity Microphone Pair

Includes the following accessories:

2 × Type 4939 1/4" Free-field Microphone
UC 0196 6 mm Spacer
UC 0195 12 mm Spacer

OPTIONAL ACCESSORIES

Type 2683 Dual Preamplifier for Sound Intensity Probes
Type 3541 Sound Intensity Calibrator (includes Pistonphone Type 4228)

Type 3595 Sound Intensity Probe Kit for Hand-held Analyzers
Type 3599 Sound Intensity Probe Kit

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 5188-8161 · Canada (+1) 514 695-8225
China (+86) 10 680 29906 · Czech Republic (+420) 2 6702 1100 · Finland (+358) 9-521 300 · 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 5715 1612 · Netherlands (+31) 318 55 9290 · Norway (+47) 66 77 11 55
Poland (+48) 22 816 75 56 · Portugal (+351) 21 47 11 4 53 · Republic of Korea (+82) 2 3473 0605
Singapore (+65) 6377 4512 · Slovak Republic (+421) 25 443 0701 · Spain (+34) 91 659 0820 · Sweden (+46) 8 449 8600
Switzerland (+41) 44 880 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

