

CERTIFICATE OF CALIBRATION

No: CDK2604806

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CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 3050-A-060	No: 3050-101157 Id: 123050001
Microphone:	Brüel & Kjær Type 4966	No: 3396613
PreAmplifier:	Brüel & Kjær Type 1706	No: 3392881
Calibrator:	None	
FrontPanel:	Brüel & Kjær Type UA-2100-060	No: UA2100060-100786
Software version:	BKConnect 30.0.0.281	Pattern Approval: -
Instruction manual:	None	

CUSTOMERHottinger Brüel & Kjær A/S
Teknikerbyen 26-40
2830 Virum
Denmark**CALIBRATION CONDITIONS**Preconditioning: 4 hours at 23°C ± 3°C
Environmental conditions: See actual values in **Environmental conditions** sections.**SPECIFICATIONS**

The Sound Level Meter Brüel & Kjær Type 3050-A-060 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

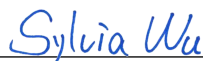
The measurements have been performed with the assistance of Hottinger Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 10.1 - DB: 10.10) by using procedure B&K proc LAN-XI, 4966+1706 (IEC 61672:2013) - BK Connect.

RESULTSCalibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device(s) under calibration. The results are only applicable for the specific device(s) listed above.

Date of calibration: 2026-08-07

Date of issue: 2026-08-10

Sylvia Wu Andersen
Calibration TechnicianJesper Bo Vedel
Approved Signatory

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1. Calibration Note

n/a

2. Summary

4.1. Preliminary inspection	Passed
4.2. Environmental conditions, Prior to calibration	Passed
4.3. Channel information	Passed
4.4. Reference information	Passed
4.5. Indication at the calibration check frequency	Passed
4.6. Acoustical signal tests of a frequency weighting, C weighting	Passed
4.7. Self-generated noise, Microphone installed	Passed
4.8. Self-generated noise, Electrical	Passed
4.9. Electrical signal tests of frequency weightings, A weighting	Passed
4.10. Electrical signal tests of frequency weightings, C weighting	Passed
4.11. Electrical signal tests of frequency weightings, Z weighting	Passed
4.12. Frequency and time weightings at 1 kHz	Passed
4.13. Long-term stability, Reference	Passed
4.14. Level linearity on the reference level range, Upper	Passed
4.15. Level linearity on the reference level range, Lower	Passed
4.16. Toneburst response, Leq	Passed
4.17. C-weighted peak sound level, 8 kHz	Passed
4.18. C-weighted peak sound level, 500 Hz	Passed
4.19. Overload indication	Passed
4.20. Long-term stability, 1. relative	Passed
4.21. High-level stability	Passed
4.22. Long-term stability, 2. relative	Passed
4.23. Environmental conditions, Following calibration	Passed

Conformance to a performance specification is demonstrated when the following criteria are both satisfied: (a) a measured deviation from a design goal does not exceed the applicable acceptance limit and (b) the corresponding uncertainty of measurement does not exceed the corresponding maximum-permitted uncertainty of measurement given in IEC 61672-1:2013 for the same coverage probability of 95 %.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Calibration has been performed regardless of the specific requirement in IEC 61672-3 section 3.1 for an instruction manual. Applied specifications have been calculated based on specifications for similar type/configuration, available product data and/or estimated values. Unknown corrections are assumed to be zero.

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3. Instruments

	Instrument	Inventory No.
Adaptor	Brüel & Kjær, Type WA-0302-B 15 pF	150503013
Calibrator	Brüel & Kjær, Type 4226	124226023
Voltmeter	Agilent, Type 34461A	142114002
AmplifierDivider	Brüel & Kjær, Type WB-3630	163630002
Generator	Brüel & Kjær, Type 3161-A-011	123161058
Environmental Values	Vaisala, Type Indigo 520	142908001

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4. Measurements**4.1. Preliminary inspection**

Visually inspect instrument, and operate all relevant controls. (clause 5)

	Result	
Visual inspection	OK	

4.2. Environmental conditions, Prior to calibration

Actual environmental conditions prior to calibration. (clause 7)

	Expected	Accept - Limit	Accept + Limit	Measured	
				[Deg / kPa / %RH]	
Air temperature	23.00	-3.00	3.00	23.20	
Air pressure	101.30	-21.30	3.70	101.51	
Relative humidity	50.00	-25.00	20.00	40.00	

4.3. Channel information

Input being calibrated	3050-A-060 Input Module LAN-XI 51.2kHz (Slot 1), 4966 H 41	

4.4. Reference information

Information about reference range, level and channel. (clause 22.h + 22.m)

	Value	
	[dB SPL]	
Reference sound pressure level	94	
Reference level range	132	
Channel number	1	

4.5. Indication at the calibration check frequency

Measure and adjust sound level meter using the supplied calibrator. (clause 10 + 22.m)

Sound pressure level corrected as described in clause 10.2, if corrections are available.

	Expected	Measured / Entered	Uncertainty	
	[dB SPL / Hz]	[dB SPL / Hz]	[dB / Hz]	
Calibration check frequency (in-house calibrator)	1000.00	1000.00	-	
Initial indication (in-house calibrator)	93.99	93.99	0.20	
Adjusted indication (in-house calibrator)	93.99	93.99	0.20	

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4.6. Acoustical signal tests of a frequency weighting, C weighting

Frequency weightings measured acoustically with a calibrated multi-frequency sound calibrator. Averaging time is 10 seconds, and the result is the average of 3 measurements. (clause 12)

	Coupler Pressure Lc	Mic. Correction C4226	Body Influence	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB]	[dB]	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
1000Hz, Ref. (1st)	94.05	0.06	0.00	93.99	93.99	-0.7	0.7	0.00	0.33	
1000Hz, Ref. (2nd)	94.05	0.06	0.00	93.99	93.99	-0.7	0.7	0.00	0.33	
1000Hz, Ref. (3rd)	94.05	0.06	0.00	93.99	93.99	-0.7	0.7	0.00	0.33	
1000Hz, Ref. (Average)	94.05	0.06	0.00	93.99	93.99	-0.7	0.7	0.00	0.33	
125.89Hz (1st)	93.96	0.00	0.00	93.76	93.85	-1.0	1.0	0.09	0.31	
125.89Hz (2nd)	93.96	0.00	0.00	93.76	93.86	-1.0	1.0	0.10	0.31	
125.89Hz (3rd)	93.96	0.00	0.00	93.76	93.82	-1.0	1.0	0.06	0.31	
125.89Hz (Average)	93.96	0.00	0.00	93.76	93.85	-1.0	1.0	0.08	0.31	
7943.3Hz (1st)	93.56	2.88	0.00	87.68	87.63	-2.5	1.5	-0.05	0.48	
7943.3Hz (2nd)	93.56	2.88	0.00	87.68	87.63	-2.5	1.5	-0.06	0.48	
7943.3Hz (3rd)	93.56	2.88	0.00	87.68	87.63	-2.5	1.5	-0.05	0.48	
7943.3Hz (Average)	93.56	2.88	0.00	87.68	87.63	-2.5	1.5	-0.05	0.48	

4.7. Self-generated noise, Microphone installed

Self-generated noise measured with microphone submitted for periodic testing. Averaging time is 30 seconds. An anechoic chamber is used to isolate environmental noise.

The level of self-generated noise is reported for information only and is not used to assess conformance to a requirement. (clause 11.1)

	Max	Measured	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	
A weighted	19.70	15.98	0.50	

4.8. Self-generated noise, Electrical

Self-generated noise measured in most sensitive range, with electrical substitution for microphone, according to manufactures specifications.

The level of self-generated noise is reported for information only and is not used to assess conformance to a requirement. (clause 11.2)

	Max	Measured	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	
A weighted	12.10	10.30	0.30	
C weighted	13.30	13.50	0.30	
Z weighted	21.60	24.00	0.30	

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4.9. Electrical signal tests of frequency weightings, A weighting

Frequency response measured with electrical signal in reference range. (clause 13)

Electrical and acoustical response and body influence corrections are adjusted with the respective correction values, in accordance with clause 13.6

	Input Level	Expected	Measured	Response Corr.	Body Influence	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dBV]	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
1000Hz, Ref.	-32.39	87.00	87.00	0.00	0.00	87.00	-0.5	0.5	0.00	0.38	
63.096Hz	-6.19	87.00	87.02	0.00	0.00	87.02	-1.0	1.0	0.02	0.38	
125.89Hz	-16.29	87.00	87.00	0.00	0.00	87.00	-1.0	1.0	0.00	0.38	
251.19Hz	-23.79	87.00	86.97	0.00	0.00	86.97	-1.0	1.0	-0.03	0.38	
501.19Hz	-29.19	87.00	86.96	0.00	0.00	86.96	-1.0	1.0	-0.04	0.38	
1995.3Hz	-33.59	87.00	87.00	0.00	0.00	87.00	-1.0	1.0	0.00	0.38	
3981.1Hz	-33.39	87.00	86.97	0.00	0.00	86.97	-1.0	1.0	-0.03	0.38	
7943.3Hz	-31.29	87.00	87.00	0.00	0.00	87.00	-2.5	1.5	0.00	0.51	
15849Hz	-25.79	87.00	87.02	0.00	0.00	87.02	-16.0	2.5	0.02	0.58	

4.10. Electrical signal tests of frequency weightings, C weighting

Frequency response measured with electrical signal in reference range. (clause 13)

Electrical and acoustical response and body influence corrections are adjusted with the respective correction values, in accordance with clause 13.6

	Input Level	Expected	Measured	Response Corr.	Body Influence	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dBV]	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
1000Hz, Ref.	-32.39	87.00	87.00	0.00	0.00	87.00	-0.5	0.5	0.00	0.38	
63.096Hz	-31.59	87.00	86.98	0.00	0.00	86.98	-1.0	1.0	-0.02	0.38	
125.89Hz	-32.19	87.00	87.02	0.00	0.00	87.02	-1.0	1.0	0.02	0.38	
251.19Hz	-32.39	87.00	86.98	0.00	0.00	86.98	-1.0	1.0	-0.02	0.38	
501.19Hz	-32.39	87.00	87.03	0.00	0.00	87.03	-1.0	1.0	0.03	0.38	
1995.3Hz	-32.19	87.00	87.04	0.00	0.00	87.04	-1.0	1.0	0.04	0.38	
3981.1Hz	-31.59	87.00	86.98	0.00	0.00	86.98	-1.0	1.0	-0.02	0.38	
7943.3Hz	-29.39	87.00	87.00	0.00	0.00	87.00	-2.5	1.5	0.00	0.51	
15849Hz	-23.89	87.00	86.99	0.00	0.00	86.99	-16.0	2.5	-0.01	0.58	

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4.11. Electrical signal tests of frequency weightings, Z weighting

Frequency response measured with electrical signal in reference range. (clause 13)

Electrical and acoustical response and body influence corrections are adjusted with the respective correction values, in accordance with clause 13.6

	Input Level	Expected	Measured	Response Corr.	Body Influence	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dBV]	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
1000Hz, Ref.	-32.39	87.00	87.00	0.00	0.00	87.00	-0.5	0.5	0.00	0.38	
63.096Hz	-32.39	87.00	86.98	0.00	0.00	86.98	-1.0	1.0	-0.02	0.38	
125.89Hz	-32.39	87.00	87.01	0.00	0.00	87.01	-1.0	1.0	0.01	0.38	
251.19Hz	-32.39	87.00	87.00	0.00	0.00	87.00	-1.0	1.0	0.00	0.38	
501.19Hz	-32.39	87.00	87.00	0.00	0.00	87.00	-1.0	1.0	0.00	0.38	
1995.3Hz	-32.39	87.00	87.01	0.00	0.00	87.01	-1.0	1.0	0.01	0.38	
3981.1Hz	-32.39	87.00	87.01	0.00	0.00	87.01	-1.0	1.0	0.01	0.38	
7943.3Hz	-32.39	87.00	87.02	0.00	0.00	87.02	-2.5	1.5	0.02	0.51	
15849Hz	-32.39	87.00	87.02	0.00	0.00	87.02	-16.0	2.5	0.02	0.58	

4.12. Frequency and time weightings at 1 kHz

Frequency and time weighting measured at 1 kHz with electrical signal in reference range. Measured relative to A-weighted and Fast response. (clause 14)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
LAF, Ref.	94.00	94.00	-0.5	0.5	0.00	0.12	
LCF	94.00	94.00	-0.2	0.2	0.00	0.12	
LZF	94.00	94.00	-0.2	0.2	0.00	0.12	
LAS	94.00	94.00	-0.1	0.1	0.00	0.12	
LAeq	94.00	94.00	-0.1	0.1	0.00	0.12	

4.13. Long-term stability, Reference

Long-term stability over 25 to 35 minutes, with steady 1kHz signal at reference level. (clause 15)

Adjusting to reference level indication.

	Measured	Accept - Limit	Accept + Limit	Deviation	Timestamp	Uncertainty	
	[dB SPL]	[dB]	[dB]	[dB]		[dB]	
Reference	94.00	-0.5	0.5	0.00	2026-08-07 15:16:20	0.10	

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4.14. Level linearity on the reference level range, Upper

Level linearity in reference range, measured at 8 kHz until overload. (clause 16)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
94 dB	94.00	94.00	-0.5	0.5	0.00	0.13	
99 dB	99.00	99.00	-0.8	0.8	0.00	0.13	
104 dB	104.00	104.00	-0.8	0.8	0.00	0.13	
109 dB	109.00	109.00	-0.8	0.8	0.00	0.13	
114 dB	114.00	114.00	-0.8	0.8	0.00	0.13	
119 dB	119.00	119.00	-0.8	0.8	0.00	0.13	
124 dB	124.00	124.00	-0.8	0.8	0.00	0.13	
127 dB	127.00	127.00	-0.8	0.8	0.00	0.13	
128 dB	128.00	128.00	-0.8	0.8	0.00	0.13	
129 dB	129.00	129.00	-0.8	0.8	0.00	0.13	
130 dB	130.00	130.00	-0.8	0.8	0.00	0.13	
131 dB	131.00	131.00	-0.8	0.8	0.00	0.13	
132 dB	132.00	131.99	-0.8	0.8	-0.01	0.13	

4.15. Level linearity on the reference level range, Lower

Level linearity in reference range, measured at 8 kHz down to lower limit, or until underrange. (clause 16)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
94 dB	94.00	94.00	-0.5	0.5	0.00	0.13	
89 dB	89.00	89.00	-0.8	0.8	0.00	0.13	
84 dB	84.00	84.00	-0.8	0.8	0.00	0.13	
79 dB	79.00	79.00	-0.8	0.8	0.00	0.13	
74 dB	74.00	74.00	-0.8	0.8	0.00	0.13	
69 dB	69.00	69.00	-0.8	0.8	0.00	0.13	
64 dB	64.00	64.00	-0.8	0.8	0.00	0.13	
59 dB	59.00	59.00	-0.8	0.8	0.00	0.13	
54 dB	54.00	54.01	-0.8	0.8	0.01	0.13	
49 dB	49.00	49.01	-0.8	0.8	0.01	0.13	
44 dB	44.00	44.01	-0.8	0.8	0.01	0.13	
39 dB	39.00	39.01	-0.8	0.8	0.01	0.24	
34 dB	34.00	34.02	-0.8	0.8	0.02	0.24	
32 dB	32.00	32.04	-0.8	0.8	0.04	0.24	
31 dB	31.00	31.03	-0.8	0.8	0.03	0.24	
30 dB	30.00	30.05	-0.8	0.8	0.05	0.24	
29 dB	29.00	29.08	-0.8	0.8	0.08	0.24	
28 dB	28.00	28.08	-0.8	0.8	0.08	0.24	
27 dB	27.00	27.10	-0.8	0.8	0.10	0.24	

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4.16. Toneburst response, Leq

Response to 4 kHz toneburst measured in reference range, relative to continuous signal. (clause 18)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	129.00	129.00	-0.5	0.5	0.00	0.12	
200 ms Burst	112.00	111.99	-0.5	0.5	-0.01	0.12	
2 ms Burst	92.00	91.98	-1.5	1.0	-0.02	0.12	
0.25 ms Burst	83.00	82.87	-3.0	1.0	-0.13	0.12	

4.17. C-weighted peak sound level, 8 kHz

Peak-response to a 8 kHz single-cycle sine measured in least-sensitive range, relative to continuous signal. (clause 19)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	124.00	124.00	-0.5	0.5	0.00	0.09	
Single Sine	127.40	128.45	-2.0	2.0	1.05	0.12	

4.18. C-weighted peak sound level, 500 Hz

Peak-response to a 500 Hz half-cycle sine measured in least-sensitive range, relative to continuous signal. (clause 19)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	127.00	127.00	-0.5	0.5	0.00	0.09	
Half-sine, Positive	129.40	129.29	-1.0	1.0	-0.11	0.12	
Half-sine, Negative	129.40	129.27	-1.0	1.0	-0.13	0.12	

4.19. Overload indication

Overload indication in the least sensitive range determined with a 4 kHz positive/negative half-cycle signal. (clause 20)

	Measured / Input Level	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
Continuous	132.00	-0.5	0.5	0.00	0.20	
Half-sine, Positive	134.10	-10.0	10.0	2.10	0.20	
Half-sine, Negative	134.40	-10.0	10.0	2.40	0.20	
Difference	134.40	-1.5	1.5	0.30	0.24	

4.20. Long-term stability, 1. relative

Long-term stability over 25 to 35 minutes, with steady 1kHz signal at reference level. (clause 15)

Relative to prior adjustment to reference level indication.

	Measured	Accept - Limit	Accept + Limit	Deviation	Timestamp	Uncertainty	
	[dB SPL / Min]	[dB / Min]	[dB / Min]	[dB / Min]		[dB]	
Measurement	94.00	-0.1	0.1	0.00	2026-08-07 15:37:24	0.10	
Time passed	21.04	0.0	35.0	21.04	0	-	

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4.21. High-level stability

High-level stability over 5 minutes, with steady 1kHz signal, 1dB below upper boundary. (clause 21)

	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB SPL]	[dB]	[dB]	[dB]	[dB]	
High-level, Ref.	131.00	-0.5	0.5	0.00	0.10	
High-level, after 5min	131.00	-0.1	0.1	0.00	0.10	

4.22. Long-term stability, 2. relative

Long-term stability over 25 to 35 minutes, with steady 1kHz signal at reference level. (clause 15)

Relative to prior adjustment to reference level indication.

	Measured	Accept - Limit	Accept + Limit	Deviation	Timestamp	Uncertainty	
	[Min / dB SPL]	[Min / dB]	[Min / dB]	[Min / dB]		[dB]	
Wait	26.47	25.0	120.0	26.47	0	-	
Measurement	94.00	-0.1	0.1	0.00	2026-08-07 15:43:28	0.10	

4.23. Environmental conditions, Following calibration

Actual environmental conditions following calibration. (clause 7)

	Expected	Accept - Limit	Accept + Limit	Measured	
				[Deg / kPa / %RH]	
Air temperature	23.00	-3.00	3.00	22.80	
Air pressure	101.30	-21.30	3.70	101.54	
Relative humidity	50.00	-25.00	20.00	40.00	

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DANAK

DANAK is the national accreditation body in Denmark in compliance with Regulation (EC) No. 765/2008 of the European Parliament and of the Council.

DANAK is covered by the multilateral agreements for testing, medical examination, calibration, proficiency testing providers and reference material producers under European co-operation for Accreditation (EA) and under International Laboratory Accreditation Cooperation (ILAC) based on peer-evaluation. This implies that accredited reports and certificates issued by companies accredited by DANAK are recognized across borders by members of EA and ILAC equal to reports and certificates issued by companies accredited by these members.

The use of the accreditation symbol on reports and certificates or reference to accreditation, documents that the service is provided as an accredited service under the company's DANAK accreditation.

This calibration certificate is compliant with ISO 17025, covered by DANAK accreditation, the multilateral agreements from EA and ILAC for calibration which ensures that measurements are metrologically traceable.

Comments/Questions or Complaints may be addressed to:
Your local HBK service representative

End of calibration certificate.