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Production Test for Device

THOR Device

Serial Number: #07862

This device was tested according ISO 61672, ISO 60651 and the internal test specifications of the SINUS Messtechnik GmbH.

Date:	31-May-2018
Recommended Interval:	24 months
Next Production Test:	May-2020
Operator:	KUN
Signature:	.....

Summary

The results of the testing procedure can be found in the table below.Testing equipment:

Generator:	DS360, Stanford Research Systems (serialnumber: 61374) calibration certificate (3612045) valid until: 10 Dec 2018
Software:	testing program version is 1.20.21 driver version is 6.0.39.711

All measured data can be ordered in MATLAB file format for an additional price.

The following Tests are done:

Channel	*Apollo Firmware*	*Coupling*	*Frequency Response*	*Gain*	*Level Linearity*	*Inherent Noise*	*Phase Difference*	*THD*	*Third Octaves*
LEMO7_1	passed	passed	passed	passed	passed	passed	passed	passed	passed
LEMO7_2	passed	passed	passed	passed	passed	passed	passed	passed	passed

The following pages only show the test results for channel 1. The results for the other channels are available from SINUS Messtechnik GmbH upon request.

Apollo Firmware Test passed!

Part	ID	Serial Number
Digital	161	231791
AnalogBase	257(ok)	232917(ok)
Interface	33(ok)	232708(ok)
Connector	161(ok)	232891(ok)
Module	258(ok)	232853(ok)

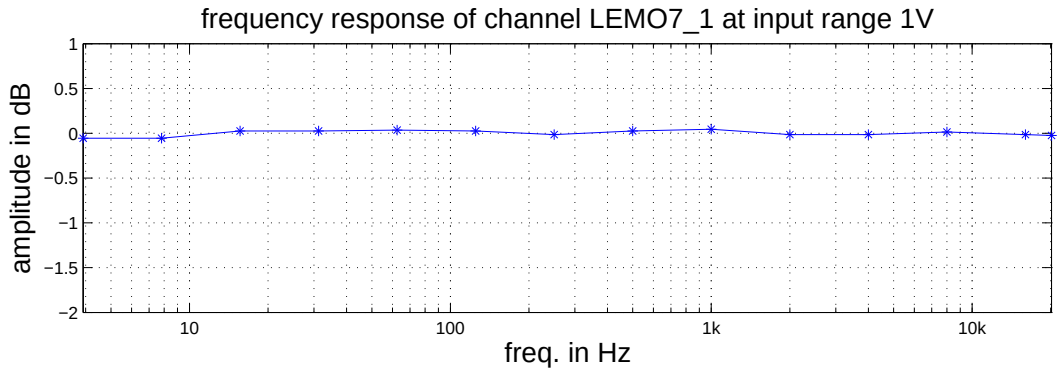
Coupling Test channel LEMO7_1 passed!

Generator V = 1V
Gain Setting: 1

Coupling	RMS Value (V_{rms})	Tol	MEAN Value (V_{rms})	Tol	Status
GND	1.5492e-005(-96dBV)	<0.1	1.4246e-008(-157dBV)	abs<0.1	ok
DC	None		0.50207(-6dBV)	<0.55 , >0.45	ok

Frequency Response Test channel LEMO7_1 passed!

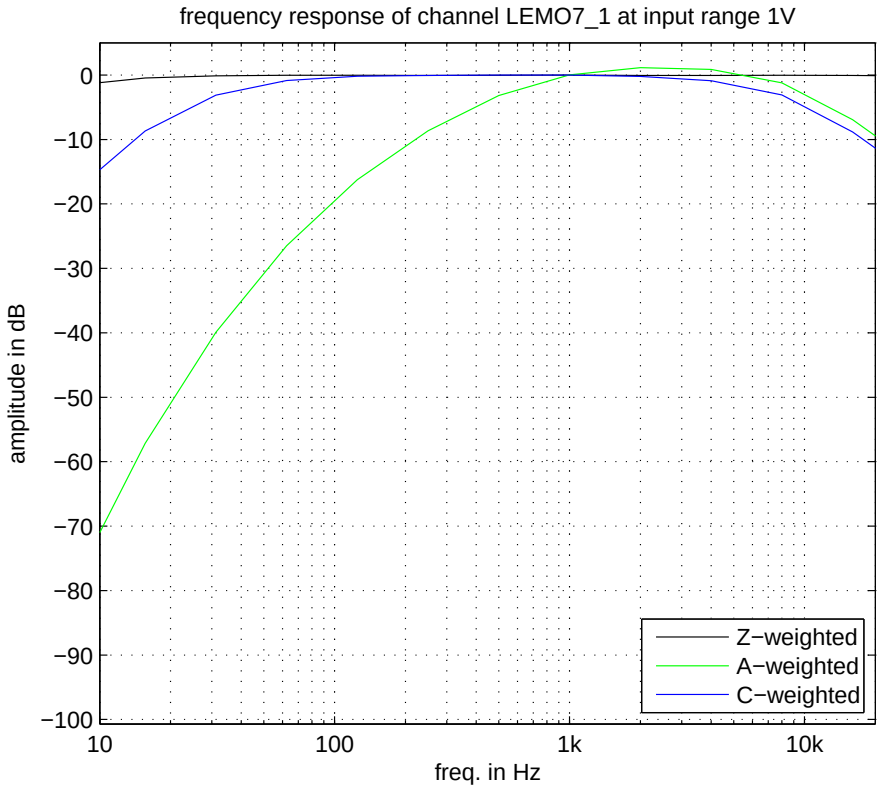
Max. Tolerance is 0.2dB
This test is done using DC coupling, 1V input range.



frequency in Hz	3.91	7.81	15.63	31.25	62.50	125.00	250.00	500.00	1000.00	2000.00	4000.00	8000.00	16000.00	20158.70
amplitude in dB	-0.055	-0.055	0.025	0.025	0.035	0.025	-0.015	0.025	0.045	-0.015	-0.015	0.015	-0.015	-0.025

Frequency Response for Z, A and C-weighted sound levels (Test passed)

Tolerance according to EN 61672-1:2003 class 1 (checked frequency range is 10 Hz ... 20 kHz



Gain Test channel LEMO7_1 passed!

Calibrated at 1V (Gain: 0dB).

Gain (V)	(dB)	mean (%)	min (%)	max (%)	Tol. (%)	status
10	-20	0.0	0.0	0.0	0.3	pass
1	0	0.0	0.0	0.0	0.3	pass

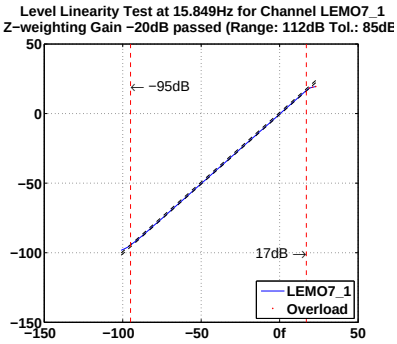
Checking internal calibration value passed (deviance: -0.63% Tol.: 5.1%).

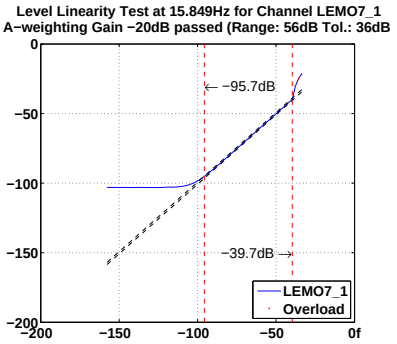
Level Linearity Test Normal Range channel LEMO7_1 passed!

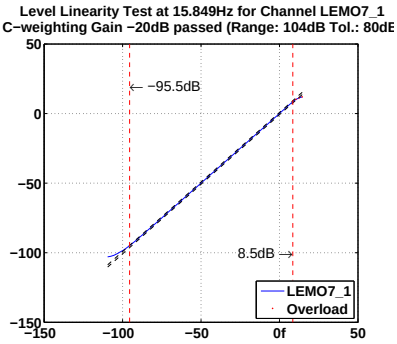
Max. Tolerance is 0.8dB

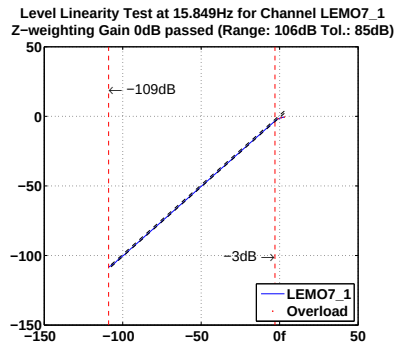
This test is done using AC coupling, 1Hz high pass switched on and ICP/200V off and in steps of 2dB

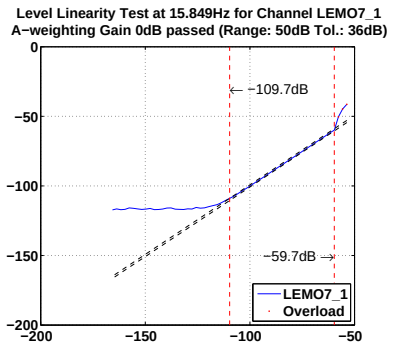
Gain	Frequency	Z				A				C			
		Range in dB		Status	Tol.	Range in dB		Status	Tol.	Range in dB		Status	Tol.
-20	15,849Hz	17..-95	112	passed	85	-39.7..-95.7	56	passed	36	8.5..-95.5	104	passed	80
0	15,849Hz	-3..-109	106	passed	85	-59.7..-109.7	50	passed	36	-11.5..-107.5	96	passed	80

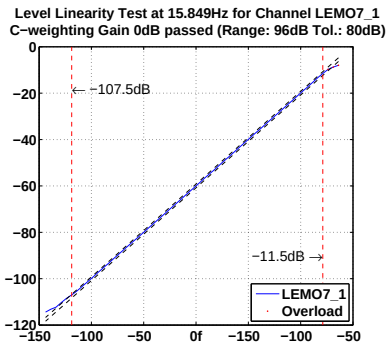












Inherent Noise Test channel LEMO7_1 passed!

Calibrated at 1V (Gain: 0dB).

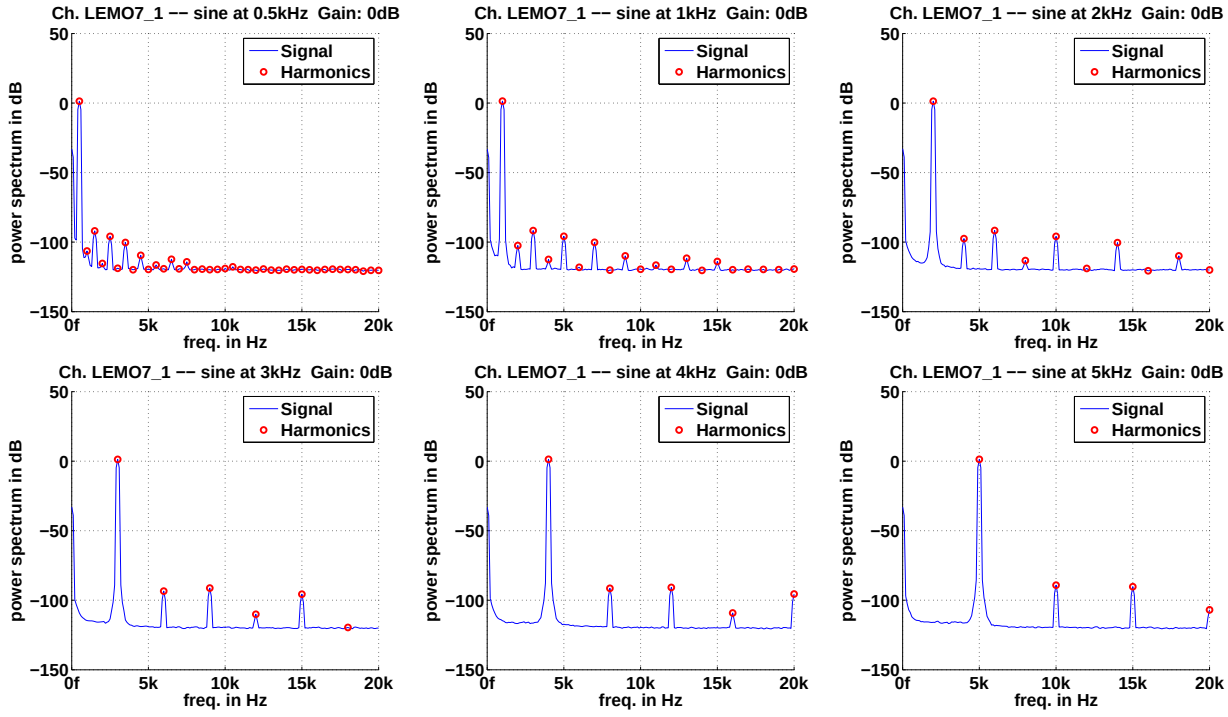
Gain (dB)	time data (mV_{rms})	Z (mV_{rms})	A (mV_{rms})	C (mV_{rms})	Status
-20	0.03973 (-88dBV)	0.00793 (-102dBV)	0.00512 (-106dBV)	0.00622 (-104dBV)	pass
0	0.00526 (-106dBV)	0.00457 (-107dBV)	0.00152 (-116dBV)	0.00441 (-107dBV)	pass

THD Test channel LEMO7_1 passed!

Max. THD Tolerance is -80dB
Measured at Gain: 0dB

definition: $THD = \frac{P_2 + P_3 + \cdots + P_n}{P_1}$

Frequency (Hz)	THD (dB)	THD+N (dB)	Number of Harmonics	Status
500.0	-91.0	-91.0	39	pass
1000.0	-90.8	-90.3	19	pass
2000.0	-90.4	-89.6	9	pass
3000.0	-89.5	-88.8	5	pass
4000.0	-88.6	-88.0	4	pass
5000.0	-88.0	-87.4	3	pass



Third Octave Test according ISO 61260 class 0 channel LEMO7_1 passed!

This test is done using DC coupling, 1Hz high pass switched off and ICP/200V off and amplitude 17dBV
The following Third Octaves are tested according ISO 61260 class 0

Tolerances marked with * are interpolated, due to generator and device frequency tolerances!

f_m in Hz	G^{-4}	G^{-3}	G^{-2}	G^{-1}	$G^{-\frac{1}{2}}$	$G^{-\frac{1}{2}}$	$G^{-\frac{3}{8}}$	$G^{-\frac{1}{4}}$	$G^{-\frac{1}{8}}$	G^{0}	$G^{\frac{1}{8}}$	$G^{\frac{1}{4}}$	$G^{\frac{3}{8}}$	$G^{\frac{1}{2}}$	$G^{\frac{1}{2}}$	G^{1}	G^{2}	G^{3}	G^{4}
upper lim	-75	-62	-42.5	-18	-2.3	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-2.3	-18	-42.5	-62	-75
lower lim	-Inf	-Inf	-Inf	-Inf	-4.5	-4.5	-1.1	-0.4	-0.2	-0.15	-0.2	-0.4	-1.1	-4.5	-4.5	-Inf	-Inf	-Inf	-Inf
15.625	-86.74	-66.82	-47.31	-22.82	-3.17	-3.2	-0.56	-0.05	-0.08	-0.01	-0.01	-0.06	-0.3	-3.26	-3.29	-31.07	-93.09	-110.78	-121.94
19.686	-78.39	-80.85	-52.2	-24.9	-3.28	-3.33	-0.46	-0.08	-0.07	-0.08	-0.04	-0.06	-0.43	-3.02	-3.05	-26.38	-57.1	-86.32	-121.99
24.803	-104.48	-68.05	-49.22	-23.89	-3.18	-3.18	-0.48	-0.03	-0.08	-0.07	-0.09	-0.08	-0.44	-3.29	-3.26	-27.04	-57.72	-101.67	-126.43
31.25	-86.73	-66.7	-47.25	-22.88	-3.25	-3.24	-0.57	-0.08	-0.07	-0.02	-0.08	-0.08	-0.27	-3.29	-3.31	-31.04	-93.92	-111.38	-122.07
39.373	-78.32	-80.9	-52.25	-24.9	-3.33	-3.31	-0.49	-0.06	-0.06	0.03	-0.03	-0.06	-0.43	-3.03	-3.03	-26.36	-57.04	-86.36	-124.63
49.606	-105.22	-68.08	-49.19	-23.83	-3.24	-3.23	-0.49	-0.1	-0.04	-0.05	0.03	-0.06	-0.44	-3.21	-3.23	-27.03	-57.72	-102.79	-121.19
62.5	-86.72	-66.73	-47.19	-22.84	-3.24	-3.19	-0.5	-0.04	-0.02	-0.03	0.04	-0.1	-0.32	-3.32	-3.32	-31.17	-94.46	-111.18	-121.56
78.745	-78.31	-80.86	-52.19	-24.86	-3.32	-3.31	-0.49	-0.05	-0.02	0.02	-0.04	0.01	-0.4	-3.07	-3.08	-26.35	-57.05	-86.33	-124.13
99.213	-105.21	-68.1	-49.21	-23.81	-3.26	-3.24	-0.55	-0.08	-0.04	-0.03	0.02	-0.03	-0.43	-3.23	-3.23	-27.02	-57.79	-101.59	-116.51
125	-86.79	-66.68	-47.23	-22.79	-3.17	-3.16	-0.54	-0.05	-0.01	-0.06	-0.07	0.02	-0.26	-3.38	-3.28	-31.11	-93.13	-111.44	-120.78
157.49	-78.25	-80.88	-52.19	-24.88	-3.31	-3.35	-0.49	-0.07	-0.05	0	-0.04	-0.03	-0.4	-3.09	-3.06	-26.4	-57.08	-86.42	-119.49
198.425	-105.4	-68.07	-49.22	-23.81	-3.22	-3.19	-0.46	-0.09	-0.07	-0.09	-0.06	-0.01	-0.4	-3.13	-3.19	-27.09	-57.8	-102.47	-118.8
250	-86.72	-66.77	-47.24	-22.86	-3.14	-3.12	-0.49	-0.01	-0.11	-0.05	-0.12	-0.06	-0.35	-3.36	-3.34	-31.1	-92.67	-111.22	-120.43
314.98	-78.26	-80.83	-52.27	-24.91	-3.35	-3.36	-0.5	-0.11	-0.04	-0.05	-0.08	-0.08	-0.41	-3.06	-3.08	-26.37	-57.06	-86.37	-120.33
396.85	-105.44	-68.1	-49.25	-23.86	-3.23	-3.19	-0.51	-0.03	-0.02	-0.04	-0.02	-0.04	-0.39	-3.17	-3.19	-27.03	-57.76	-102.42	-121.61
500	-86.77	-66.73	-47.26	-22.81	-3.2	-3.16	-0.51	-0.06	0.03	-0.03	-0.08	-0.01	-0.38	-3.26	-3.24	-31.11	-93.63	-110.85	-118.43
629.961	-78.28	-80.93	-52.27	-24.89	-3.31	-3.27	-0.52	-0.04	0.02	-0.02	-0.06	-0.09	-0.4	-3.09	-3.11	-26.3	-57.04	-86.37	-119.93
793.701	-105.47	-68.06	-49.19	-23.85	-3.22	-3.22	-0.51	-0.07	-0.01	0	-0.01	-0.1	-0.45	-3.24	-3.24	-27.01	-57.87	-103.19	-118.76
1000	-86.75	-66.73	-47.23	-22.79	-3.2	-3.23	-0.52	-0.07	-0.06	-0.01	0.02	-0.05	-0.32	-3.35	-3.35	-31.19	-94	-110.09	-116.94
1259.921	-78.29	-80.89	-52.17	-24.87	-3.34	-3.34	-0.53	-0.07	-0.03	-0.06	-0.03	-0.05	-0.41	-3.11	-3.1	-26.37	-57.1	-86.41	-119.26
1587.401	-105.43	-68.02	-49.17	-23.88	-3.24	-3.26	-0.57	-0.11	-0.08	-0.05	-0.06	-0.05	-0.41	-3.22	-3.19	-27.07	-57.87	-102.19	-115.63
2000	-86.7	-66.72	-47.28	-22.82	-3.19	-3.2	-0.6	-0.08	-0.08	-0.07	-0.04	-0.08	-0.34	-3.3	-3.29	-31.19	-93.34	-110.57	-114.3
2519.842	-78.27	-80.91	-52.23	-24.93	-3.29	-3.29	-0.53	-0.13	-0.08	-0.08	-0.1	-0.09	-0.46	-3.11	-3.11	-26.37	-57.1	-86.38	-112.49
3174.802	-105.28	-68.07	-49.23	-23.89	-3.25	-3.26	-0.56	-0.13	-0.07	-0.06	-0.08	-0.08	-0.42	-3.24	-3.24	-27.08	-57.8	-102.39	-113.81
4000	-86.75	-66.78	-47.29	-22.83	-3.23	-3.22	-0.54	-0.06	-0.02	-0.08	-0.07	-0.09	-0.33	-3.31	-3.31	-31.13	-93.19	-108.8	-112.27
5039.684	-78.33	-80.9	-52.24	-24.93	-3.31	-3.31	-0.55	-0.05	-0.04	-0.04	-0.06	-0.08	-0.44	-3.08	-3.08	-26.38	-57.06	-86.37	-109.78
6349.604	-104.85	-68.09	-49.23	-23.85	-3.21	-3.21	-0.55	-0.07	-0.04	-0.06	-0.08	-0.08	-0.45	-3.23	-3.23	-27.03	-57.8	-101.85	-109.87
8000	-86.76	-66.77	-47.24	-22.83	-3.22	-3.22	-0.55	-0.09	-0.05	-0.04	-0.06	-0.08	-0.34	-3.35	-3.34	-31.13	-93.11	-105.35	-108.64
10079.368	-78.33	-80.74	-52.24	-24.89	-3.35	-3.34	-0.52	-0.07	-0.07	-0.03	-0.05	-0.05	-0.45	-3.11	-3.11	-26.42	-57.1	-86.38	-107.13
12699.208	-103.17	-68.07	-49.19	-23.84	-3.24	-3.24	-0.59	-0.1	-0.07	-0.1	-0.07	-0.09	-0.45	-3.24	-3.24	-27.08	-57.85	-100.79	-105.25
16000	-86.73	-66.72	-47.24	-22.87	-3.24	-3.24	-0.58	-0.12	-0.08	-0.08	-0.1	-0.07	-0.36	-3.33	-3.33	-31.17	-92.89	-102.9	-105.7
20158.737	-78.27	-80.24	-52.28	-24.93	-3.34	-3.33	-0.55	-0.1	-0.1	-0.08	-0.07	-0.11	-0.44	-3.1	-3.1	-26.43	-57.11	-86.34	-99.69
25398.417	-99.56	-68.07	-49.24	-23.89	-3.24	-3.24	-0.58	-0.14	-0.1	-0.12	-0.12	-0.12	-0.51	-3.28	-3.27	-27.08	-57.85	-98.03	-98.83
32000	-86.64	-66.71	-47.29	-22.89	-3.27	-3.27	-0.62	-0.16	-0.08	-0.08	-0.11	-0.08	-0.36	-3.35	-3.35	-31.18	-92.02	-95.18	-97.07
40317.474	-78.27	-78.49	-52.3	-24.94	-3.35	-3.35	-0.53	-0.11	-0.06	-0.09	-0.09	-0.13	-0.45	-3.11	-3.11	-26.39	-57.12	-85.97	-95.53
50796.834	-94.52	-67.89	-49.24	-23.89	-3.25	-3.25	-0.59	-0.1	-0.1	-0.08	-0.08	-0.12	-0.46	-3.24	-3.24	-27.09	-57.83	-79.71	-93.57
64000	-86.19	-66.4	-47.29	-22.85	-3.23	-3.23	-0.61	-0.09	-0.08	-0.09	-0.09	-0.09	-0.38	-3.34	-3.34	-31.16	-70.42	-92.28	-90.27
80634.947	-81.52	-69.46	-46.49	-20.51	-3.09	-3.09	-0.8	-0.18	-0.08	-0.1	-0.09	-0.11	-0.45	-3.25	-3.25	-84.02	-86.3	-86.53	-85.01

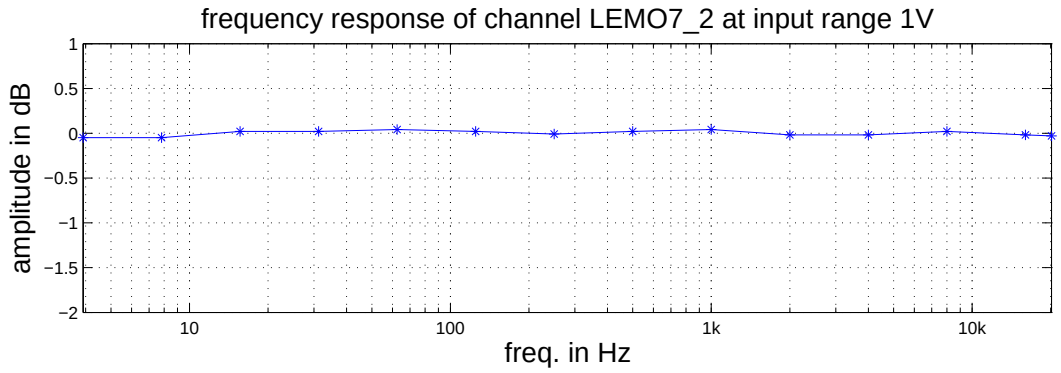
Coupling Test channel LEMO7_2 passed!

Generator V = 1V
Gain Setting: 1

Coupling	RMS Value (V_{rms})	Tol	MEAN Value (V_{rms})	Tol	Status
GND	1.8476e-005(-95dBV)	<0.1	2.3003e-008(-153dBV)	abs<0.1	ok
DC	None		0.50244(-6dBV)	<0.55 , >0.45	ok

Frequency Response Test channel LEMO7_2 passed!

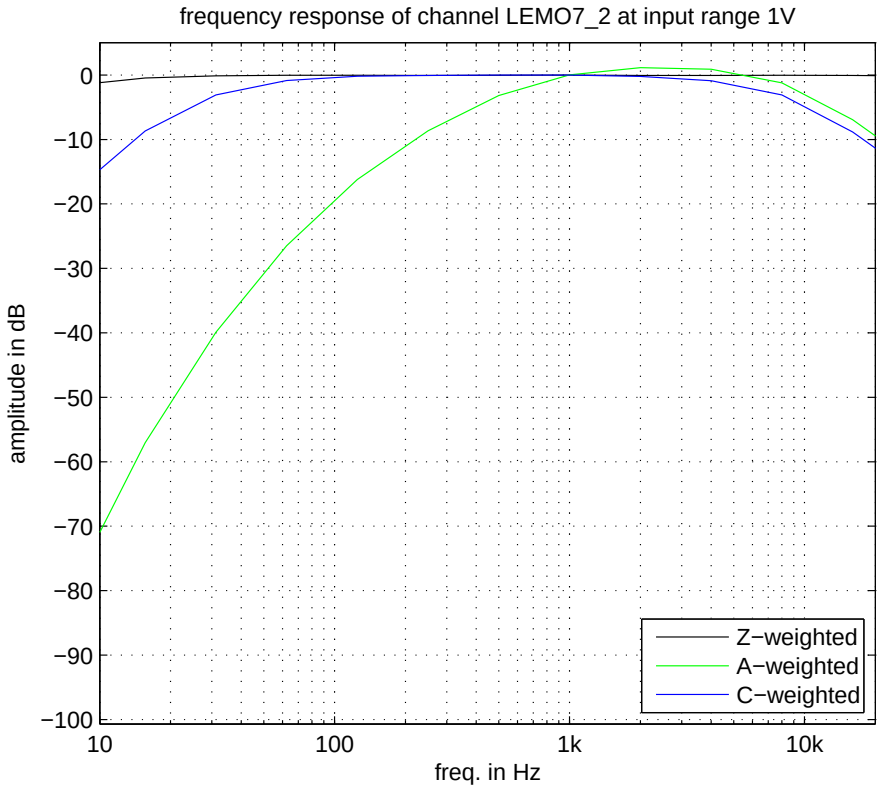
Max. Tolerance is 0.2dB
This test is done using DC coupling, 1V input range.



frequency in Hz	3.91	7.81	15.63	31.25	62.50	125.00	250.00	500.00	1000.00	2000.00	4000.00	8000.00	16000.00	20158.70
amplitude in dB	-0.049	-0.049	0.021	0.021	0.041	0.021	-0.009	0.021	0.041	-0.019	-0.019	0.021	-0.019	-0.029

Frequency Response for Z, A and C-weighted sound levels (Test passed)

Tolerance according to EN 61672-1:2003 class 1 (checked frequency range is 10 Hz ... 20 kHz



Gain Test channel LEMO7_2 passed!

Calibrated at 1V (Gain: 0dB).

Gain (V)	(dB)	mean (%)	min (%)	max (%)	Tol. (%)	status
10	-20	0.0	0.0	0.0	0.3	pass
1	0	0.0	0.0	0.0	0.3	pass

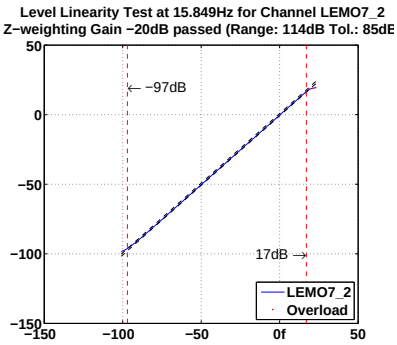
Checking internal calibration value passed (deviance: -0.57% Tol.: 5.1%).

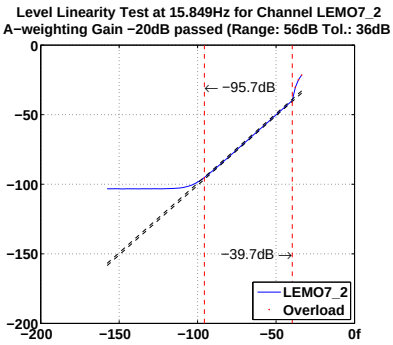
Level Linearity Test Normal Range channel LEMO7_2 passed!

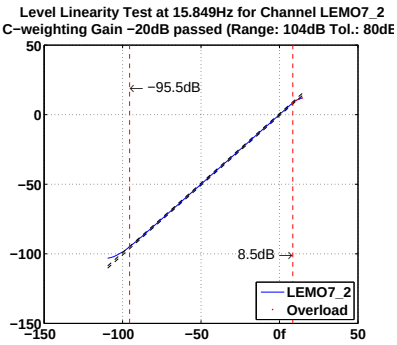
Max. Tolerance is 0.8dB

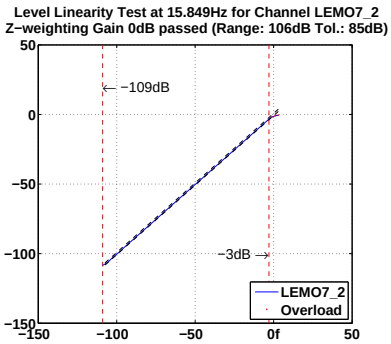
This test is done using AC coupling, 1Hz high pass switched on and ICP/200V off and in steps of 2dB

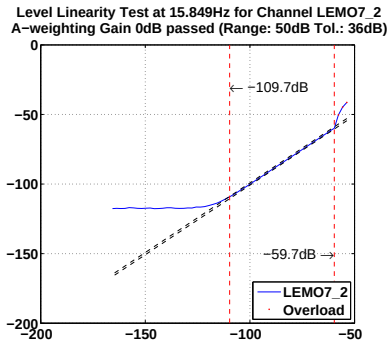
		Z				A				C			
Gain	Frequency	Range in dB		Status	Tol.	Range in dB		Status	Tol.	Range in dB		Status	Tol.
-20	15,849Hz	17..-97	114	passed	85	-39.7..-95.7	56	passed	36	8.5..-95.5	104	passed	80
0	15,849Hz	-3..-109	106	passed	85	-59.7..-109.7	50	passed	36	-11.5..-109.5	98	passed	80

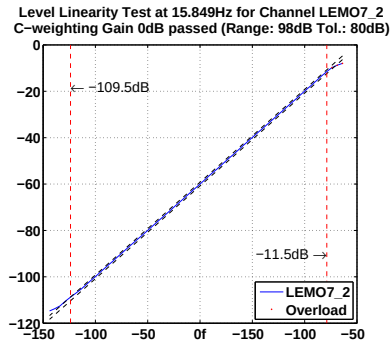












Inherent Noise Test channel LEMO7_2 passed!

Calibrated at 1V (Gain: 0dB).

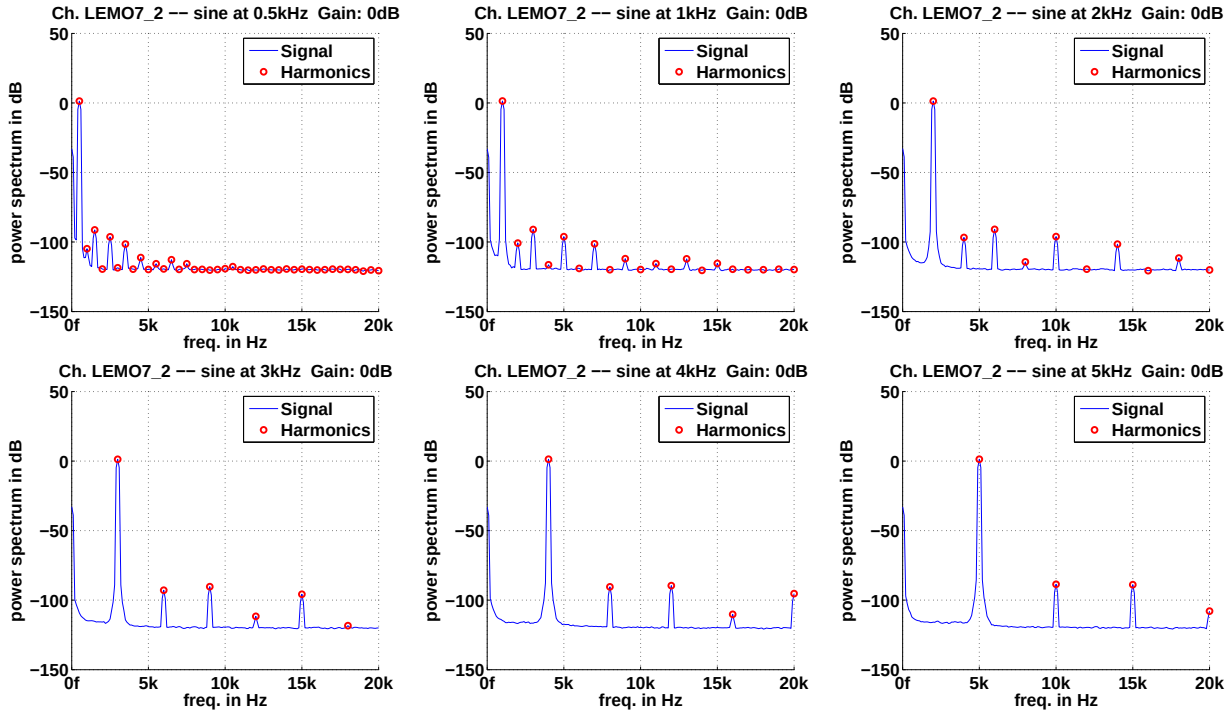
Gain (dB)	time data (mV_{rms})	Z (mV_{rms})	A (mV_{rms})	C (mV_{rms})	Status
-20	0.03780 (-88dBV)	0.00787 (-102dBV)	0.00503 (-106dBV)	0.00617 (-104dBV)	pass
0	0.00512 (-106dBV)	0.00456 (-107dBV)	0.00147 (-117dBV)	0.00441 (-107dBV)	pass

THD Test channel LEMO7_2 passed!

Max. THD Tolerance is -80dB
Measured at Gain: 0dB

definition: $THD = \frac{P_2 + P_3 + \cdots + P_n}{P_1}$

Frequency (Hz)	THD (dB)	THD+N (dB)	Number of Harmonics	Status
500.0	-90.8	-90.8	39	pass
1000.0	-90.5	-90.1	19	pass
2000.0	-90.0	-89.3	9	pass
3000.0	-88.9	-88.3	5	pass
4000.0	-87.7	-87.2	4	pass
5000.0	-87.0	-86.5	3	pass



Third Octave Test according ISO 61260 class 0 channel LEMO7_2 passed!

This test is done using DC coupling, 1Hz high pass switched off and ICP/200V off and amplitude 17dBV
The following Third Octaves are tested according ISO 61260 class 0

Tolerances marked with * are interpolated, due to generator and device frequency tolerances!

f_m in Hz	G^{-4}	G^{-3}	G^{-2}	G^{-1}	$G^{-\frac{1}{2}}$	$G^{-\frac{1}{2}}$	$G^{-\frac{3}{8}}$	$G^{-\frac{1}{4}}$	$G^{-\frac{1}{8}}$	G^{0}	$G^{\frac{1}{8}}$	$G^{\frac{1}{4}}$	$G^{\frac{3}{8}}$	$G^{\frac{1}{2}}$	$G^{\frac{1}{2}}$	G^{1}	G^{2}	G^{3}	G^{4}
upper lim	-75	-62	-42.5	-18	-2.3	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-2.3	-18	-42.5	-62	-75
lower lim	-Inf	-Inf	-Inf	-Inf	-4.5	-4.5	-1.1	-0.4	-0.2	-0.15	-0.2	-0.4	-1.1	-4.5	-4.5	-Inf	-Inf	-Inf	-Inf
15.625	-86.75	-66.82	-47.31	-22.83	-3.17	-3.21	-0.56	-0.05	-0.08	-0.01	-0.01	-0.06	-0.3	-3.26	-3.3	-31.07	-93.09	-110.86	-121.7
19.686	-78.39	-80.86	-52.2	-24.9	-3.29	-3.33	-0.47	-0.09	-0.07	-0.08	-0.04	-0.06	-0.43	-3.02	-3.05	-26.38	-57.1	-86.32	-122.52
24.803	-104.64	-68.06	-49.22	-23.89	-3.18	-3.18	-0.49	-0.04	-0.08	-0.07	-0.09	-0.08	-0.44	-3.29	-3.26	-27.04	-57.72	-101.67	-125.26
31.25	-86.73	-66.7	-47.26	-22.88	-3.25	-3.24	-0.57	-0.08	-0.07	-0.02	-0.08	-0.08	-0.27	-3.29	-3.31	-31.04	-93.93	-111.4	-122.51
39.373	-78.32	-80.91	-52.26	-24.9	-3.33	-3.31	-0.49	-0.06	-0.07	0.03	-0.03	-0.06	-0.43	-3.03	-3.03	-26.36	-57.04	-86.36	-124.44
49.606	-105.23	-68.08	-49.19	-23.83	-3.24	-3.23	-0.49	-0.1	-0.05	-0.05	0.02	-0.06	-0.44	-3.21	-3.23	-27.03	-57.72	-102.79	-121.28
62.5	-86.72	-66.73	-47.19	-22.84	-3.24	-3.2	-0.5	-0.04	-0.03	-0.03	0.04	-0.1	-0.32	-3.32	-3.32	-31.17	-94.46	-111.17	-121.48
78.745	-78.32	-80.86	-52.19	-24.86	-3.32	-3.31	-0.49	-0.05	-0.02	0.02	-0.04	0.01	-0.4	-3.07	-3.08	-26.35	-57.05	-86.33	-124.01
99.213	-105.2	-68.11	-49.21	-23.82	-3.26	-3.24	-0.55	-0.08	-0.04	-0.03	0.02	-0.03	-0.43	-3.24	-3.23	-27.02	-57.79	-101.59	-116.44
125	-86.79	-66.68	-47.23	-22.79	-3.17	-3.17	-0.54	-0.05	-0.01	-0.07	-0.07	0.01	-0.26	-3.38	-3.28	-31.11	-93.13	-111.46	-120.62
157.49	-78.25	-80.88	-52.19	-24.88	-3.31	-3.35	-0.49	-0.07	-0.05	-0.01	-0.04	-0.04	-0.4	-3.1	-3.06	-26.41	-57.08	-86.43	-119.82
198.425	-105.38	-68.08	-49.22	-23.81	-3.23	-3.2	-0.47	-0.09	-0.07	-0.09	-0.06	-0.02	-0.41	-3.13	-3.19	-27.09	-57.8	-102.47	-118.96
250	-86.72	-66.77	-47.24	-22.86	-3.14	-3.12	-0.49	-0.01	-0.11	-0.05	-0.12	-0.06	-0.35	-3.36	-3.34	-31.11	-92.67	-111.24	-120.52
314.98	-78.26	-80.83	-52.27	-24.92	-3.35	-3.37	-0.5	-0.12	-0.04	-0.05	-0.08	-0.08	-0.42	-3.07	-3.08	-26.38	-57.06	-86.37	-120.78
396.85	-105.42	-68.1	-49.26	-23.86	-3.23	-3.2	-0.51	-0.03	-0.02	-0.04	-0.02	-0.04	-0.39	-3.17	-3.19	-27.03	-57.77	-102.43	-121.16
500	-86.77	-66.73	-47.26	-22.81	-3.2	-3.17	-0.51	-0.06	0.03	-0.03	-0.08	-0.01	-0.38	-3.27	-3.24	-31.11	-93.64	-110.79	-118.31
629.961	-78.28	-80.92	-52.27	-24.89	-3.31	-3.27	-0.52	-0.04	0.02	-0.02	-0.06	-0.09	-0.4	-3.09	-3.11	-26.3	-57.04	-86.37	-120.07
793.701	-105.46	-68.06	-49.19	-23.85	-3.22	-3.22	-0.51	-0.07	-0.01	0	-0.01	-0.1	-0.45	-3.24	-3.25	-27.01	-57.87	-103.2	-118.59
1000	-86.75	-66.73	-47.24	-22.79	-3.2	-3.23	-0.52	-0.07	-0.07	-0.01	0.02	-0.05	-0.33	-3.35	-3.35	-31.19	-94	-110.1	-116.74
1259.921	-78.29	-80.89	-52.17	-24.87	-3.34	-3.34	-0.53	-0.07	-0.03	-0.06	-0.03	-0.05	-0.41	-3.11	-3.1	-26.37	-57.1	-86.41	-118.81
1587.401	-105.41	-68.02	-49.17	-23.89	-3.24	-3.26	-0.57	-0.11	-0.08	-0.06	-0.06	-0.05	-0.41	-3.22	-3.2	-27.08	-57.88	-102.19	-115.67
2000	-86.7	-66.72	-47.28	-22.82	-3.19	-3.2	-0.6	-0.08	-0.08	-0.08	-0.04	-0.08	-0.34	-3.3	-3.29	-31.19	-93.34	-110.52	-114.22
2519.842	-78.27	-80.91	-52.23	-24.93	-3.3	-3.29	-0.53	-0.13	-0.08	-0.09	-0.1	-0.1	-0.46	-3.11	-3.11	-26.37	-57.11	-86.38	-112.39
3174.802	-105.26	-68.07	-49.23	-23.89	-3.26	-3.26	-0.57	-0.13	-0.07	-0.06	-0.08	-0.08	-0.42	-3.24	-3.24	-27.08	-57.8	-102.39	-113.68
4000	-86.76	-66.78	-47.29	-22.84	-3.23	-3.22	-0.54	-0.06	-0.02	-0.08	-0.07	-0.09	-0.34	-3.31	-3.31	-31.13	-93.19	-108.79	-112.28
5039.684	-78.33	-80.9	-52.24	-24.93	-3.31	-3.31	-0.55	-0.06	-0.04	-0.04	-0.06	-0.09	-0.44	-3.08	-3.08	-26.38	-57.07	-86.37	-109.85
6349.604	-104.89	-68.09	-49.24	-23.86	-3.21	-3.21	-0.55	-0.08	-0.04	-0.07	-0.09	-0.08	-0.45	-3.23	-3.23	-27.04	-57.8	-101.83	-109.94
8000	-86.76	-66.78	-47.24	-22.83	-3.23	-3.22	-0.55	-0.09	-0.05	-0.04	-0.06	-0.08	-0.34	-3.35	-3.35	-31.13	-93.11	-105.34	-108.67
10079.368	-78.33	-80.74	-52.24	-24.89	-3.35	-3.35	-0.52	-0.07	-0.07	-0.04	-0.05	-0.05	-0.45	-3.11	-3.11	-26.42	-57.11	-86.38	-107.13
12699.208	-103.32	-68.07	-49.2	-23.84	-3.24	-3.24	-0.59	-0.1	-0.07	-0.11	-0.07	-0.09	-0.45	-3.25	-3.24	-27.08	-57.85	-100.8	-105.2
16000	-86.73	-66.72	-47.24	-22.87	-3.24	-3.24	-0.58	-0.13	-0.08	-0.08	-0.1	-0.07	-0.36	-3.33	-3.33	-31.18	-92.89	-102.9	-105.7
20158.737	-78.28	-80.25	-52.28	-24.94	-3.34	-3.34	-0.56	-0.1	-0.1	-0.09	-0.07	-0.12	-0.44	-3.1	-3.11	-26.43	-57.11	-86.34	-99.73
25398.417	-99.84	-68.08	-49.24	-23.9	-3.24	-3.24	-0.58	-0.14	-0.1	-0.12	-0.12	-0.12	-0.51	-3.28	-3.28	-27.08	-57.85	-98.06	-98.83
32000	-86.65	-66.71	-47.29	-22.89	-3.27	-3.27	-0.62	-0.17	-0.08	-0.08	-0.11	-0.08	-0.36	-3.35	-3.35	-31.18	-92.02	-95.21	-97.06
40317.474	-78.27	-78.63	-52.3	-24.94	-3.35	-3.35	-0.53	-0.12	-0.06	-0.09	-0.09	-0.13	-0.45	-3.11	-3.11	-26.39	-57.12	-85.96	-95.59
50796.834	-94.81	-67.92	-49.24	-23.89	-3.25	-3.25	-0.59	-0.1	-0.1	-0.08	-0.08	-0.12	-0.46	-3.24	-3.24	-27.09	-57.83	-79.71	-93.57
64000	-86.23	-66.42	-47.29	-22.85	-3.23	-3.23	-0.61	-0.09	-0.08	-0.09	-0.09	-0.09	-0.38	-3.34	-3.34	-31.16	-70.42	-92.23	-90.45
80634.947	-81.53	-69.53	-46.49	-20.51	-3.09	-3.09	-0.79	-0.18	-0.08	-0.1	-0.09	-0.11	-0.44	-3.24	-3.24	-84.02	-86.43	-86.71	-85

Phase Test passed!

Tolerance is 0.3 °

gain	frequency	phase difference	to channel	status
-20 dB	20000 Hz	0.00000 °	LEMO7_1	pass
-20 dB	20000 Hz	-0.00234 °	LEMO7_2	pass
0 dB	20000 Hz	0.00000 °	LEMO7_1	pass
0 dB	20000 Hz	-0.03923 °	LEMO7_2	pass

Calibration Chart for
41AM Outdoor Microphone
Serial No. 317391

VAN 03 NEW

G.R.A.S.
Sound & Vibration

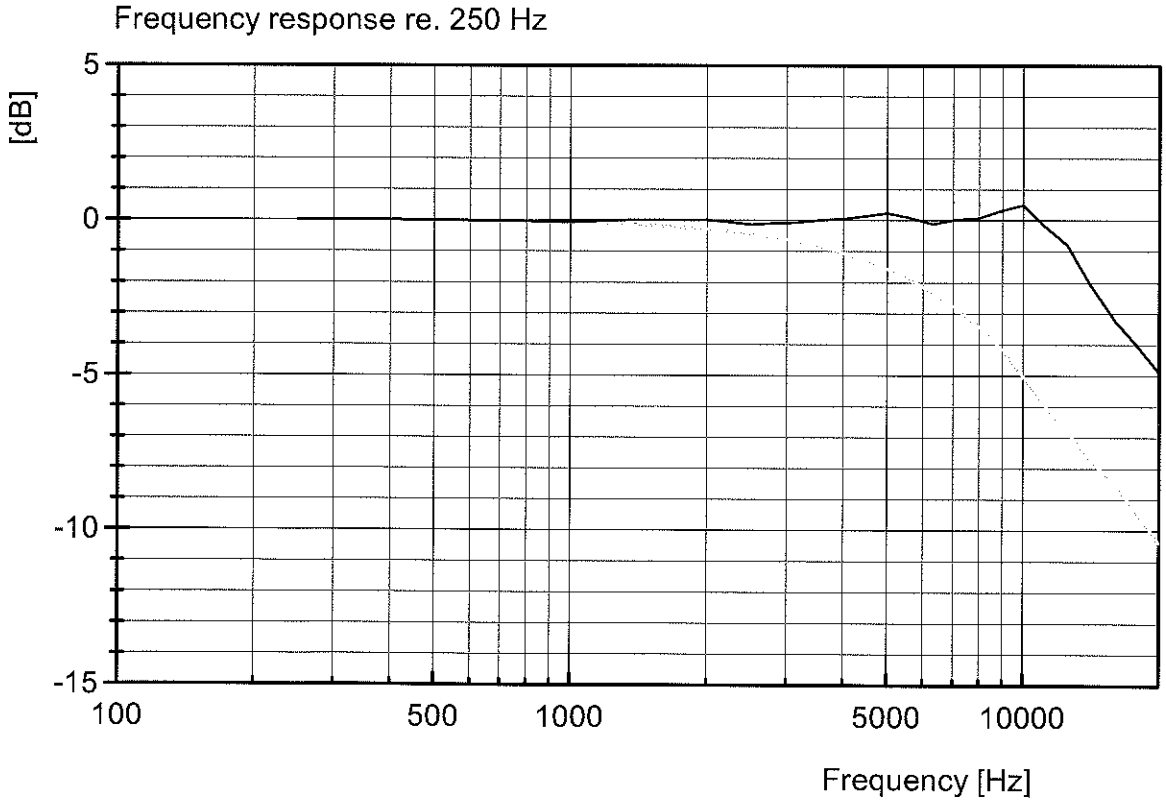
System Sensitivity:	50.05 mV/Pa
	-26.01 dB re. 1V/Pa
Actuator output:	31.67 mV
Preamplifier type:	26AX
Preamplifier serial no:	321090
Microphone type:	41AS
Microphone Serial No:	142045
Operator:	FBL
Date:	6. jun 2018

The stated sensitivity is the sensitivity for the complete microphone unit including preamplifier for 0 dB Gain setting and without A-weighting filter, with an uncertainty of ± 0.1 dB. The calibration is performed with a 42AA Pistonphone and is traceable to National Physical Laboratory, UK. The stated actuator calibration output is for 1kHz and with an uncertainty of ± 0.4 dB.

The frequency response is recorded with electrostatic actuator. The grey curve is the pressure response and the black curve is the free field response for 0 deg. incidence with the raincap and windscreen mounted on the microphone.

Environmental Calibration Conditions:

Temperature:	23 ± 3 C°
Relative humidity:	60 ± 20 %
Barometric pressure:	101.3 ± 3 kPa



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