

CALIBRATION CERTIFICATE

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INSTRUMENT DETAILS

Manufacturer: **SVANTEK**
Model: **SVAN 971A**
Serial No.: 131636
Description: Sound Level Meter

SENSOR DETAILS

Manufacturer:	ACO	SVANTEK
Model:	7152	SV 18A
Serial No.:	85529	130674
Description:	Microphone	Preamplifier

CUSTOMER

Azymuth Acoustics UK Ltd

ENVIRONMENTAL CONDITIONS

Temperature:	21.0 – 21.7	°C
Humidity:	33 – 34	%
Pressure:	102.8 – 102.9	kPa

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APPROVED BY A. Pullinger

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CALIBRATION METHOD Method described in instruction IN-02 "Calibration of the sound level meter", issue number 11 date 27.01.2016, written on the basis of international standard EN IEC 61672-3:2013 Electroacoustics. Part 3: Periodic tests.

CALIBRATION RESULTS **The sound level meter submitted for testing has successfully completed the Class 1 periodic tests of IEC 61672-3:2013 (BS EN 61672-3:2013), for the environmental conditions under which the tests were performed.**

The results are presented on pages 3 to 8 of this certificate (including measurement uncertainty).

REPORTED RESULTS The results contained in this Certificate refer only to the measurements made at the time of test for the instrument detailed above. These results do not reflect the instrument's ability to maintain calibration.

CONFORMITY WITH REQUIREMENTS On the basis of the calibration results, it has been found that, the sound level meter meets metrological requirements specified in the standard IEC 61672-1:2013 Electroacoustics – Sound level meters. Part 1: Specifications, for class 1.

UNCERTAINTY OF MEASUREMENTS Uncertainty of measurement has been evaluated in compliance with EA-4/02:2013. The expanded uncertainty assigned corresponds to a coverage probability of 95 % and the coverage factor $k = 2$.

NOTES

- The information appearing on this certificate has been compiled specifically for this instrument. This calibration certificate is produced with traceable and advanced equipment which permit comprehensive quality assurance verification of all data supplied herein.*
- The measurements in this document are traceable to GUM (Central Office of Measures), Poland*
- This calibration certificate shall not be reproduced except in full, without written permission from AcSoft Ltd.*

MEASUREMENT TRACEABILITY

The instrument under test was calibrated using the following equipment

Description	Manufacturer	Model	Serial Number
Signal Generator	Svantek	SV401	124
Sound & Vibration Analyser	Svantek	SV912AE	15909
Thermo-Barometer	LAB-EL	LB-706B	912
Acoustical Calibrator	Svantek	SV30A	83782

CALIBRATION RESULTS

Calibration results are as follows:

1. Indication at the calibration check frequency

The sound level meter was calibrated in compliance with the instruction manual. During this process, the indication of this SLM was adjusted to the sound pressure level of the sound level calibrator type SV 30A, No 83782, from SVANTEK. The sound pressure level was corrected by the free-field factor.

Deviation of the acoustic pressure measurement of the A-weighted sound level using the sound calibrator type SV 30A, No 83782, from SVANTEK, was made according to the standard reference conditions: for static pressure 1003 hPa, for temperature 24 °C and for relative humidity 60 %, results:

0.0 ± 0.2 dB

The deviation was determined as a difference between the measured sound level and the sound level corrected by the free-field factor appropriate to mentioned sound calibrator.

2. Self-generated noise with microphone installed

Frequency weighting	A
The highest level of self-generated noise stated in the instruction manual [dB]	n/a
Indication [dB]	0.0

3. Self-generated noise with microphone replaced by the electrical input signal device

Frequency weighting	A	C	Z
The highest expected level of self-generated noise stated in the instruction manual [dB]	12.0	12.0	17.0
Level of self-generated noise [dB]	4.5	3.5	7.8

4. Acoustical signal tests of a frequency weighting C

Frequency	Relative frequency-weighted free-field response	Design-goal frequency weighting	The deviation of frequency weighting	Expanded uncertainty	Acceptable limits
Hz	dB	dB	dB	dB	dB
125.0	0.10	-0,2	0.3	0.3	±1.5
1000.0	0.00	0,0	0.0	0.3	±1.1
4000.0	-0.90	-0,8	-0.1	0.4	±1.6
8000.0	-3.31	-3,0	-0.3	0.4	-3.1; +2.5

5. Electrical signal tests of frequency weightings

Frequency	Design-goal frequency weighting			The deviation of frequency weighting			Expanded uncertainty	Acceptable limits
	A	C	Z	A	C	Z		
Hz	dB	dB	dB	dB	dB	dB	dB	dB
63	-26,2	-0,8	0,0	0.2	0.1	0.1	0,3	±1,5
125	-16,1	-0,2	0,0	0.2	0.2	0.1	0,3	±1,5
250	-8,6	0,0	0,0	0.1	0.1	0.1	0,3	±1,4
500	-3,2	0,0	0,0	0.0	0.1	0.1	0,3	±1,4
1000	0,0	0,0	0,0	0.0	0.0	0.0	0,3	±1,1
2000	1,2	-0,2	0,0	-0.3	-0.2	-0.3	0,3	±1,6
4000	1,0	-0,8	0,0	0.0	0.0	0.0	0,3	±1,6
8000	-1,1	-3,0	0,0	0.2	0.2	0.0	0,4	-3,1; +2,1
16000	-6,6	-8,5	0,0	0.1	0.1	0.3	0,6	-17,0; +3,5

6. Frequency and time weightings at 1 kHz

	Sound level				Time-averaged sound level
Frequency weighting	A	A	C	Z	A
Time weighting	Fast	Slow	Fast	Fast	-
Indication [dB]	94.0	94.0	94.0	94.0	94.0
The deviation of indication from the indication of A-weighted sound level with Fast time weighting [dB]		0.0	0.0	0.0	0.0
Expanded uncertainty [dB]		0.1			
Acceptable limits [dB]		±0.3	±0.4	±0.4	±0.3

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7. Level linearity

Reference level range: 25

Expected sound level	Indication	Level linearity error	Expanded uncertainty	Acceptable limits
dB	dB	dB	dB	dB
122.0	122.0	0.0	0.2	±1.1
121.0	121.0	0.0		
120.0	120.0	0.0		
119.0	119.0	0.0		
118.0	118.0	0.0		
117.0	117.0	0.0		
116.0	116.0	0.0		
115.0	115.0	0.0		
114.0	114.0	0.0		
109.0	109.0	0.0		
104.0	104.0	0.0		
99.0	99.0	0.0		
94.0	94.0	0.0		
89.0	89.0	0.0		
84.0	84.0	0.0		
79.0	79.0	0.0		
74.0	73.9	-0.1		
69.0	68.9	-0.1		
64.0	63.9	-0.1		
59.0	58.9	-0.1		
54.0	54.0	0.0		
49.0	49.0	0.0		
44.0	44.0	0.0		
39.0	39.0	0.0		
34.0	33.9	-0.1		
33.0	32.9	-0.1		
32.0	31.9	-0.1		
31.0	30.9	-0.1		
30.0	29.8	-0.2		

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Level range: 27

Expected sound level	Indication	Level linearity error	Expanded uncertainty	Acceptable limits
dB	dB	dB	dB	dB
136.0	136.0	0.0	0.2	±1.1
135.0	135.0	0.0		
134.0	134.0	0.0		
133.0	133.0	0.0		
132.0	132.0	0.0		
131.0	131.0	0.0		
130.0	130.0	0.0		
129.0	129.0	0.0		
124.0	124.0	0.0		
119.0	119.0	0.0		
114.0	114.0	0.0		
109.0	109.0	0.0		
104.0	104.0	0.0		
99.0	99.0	0.0	0.3	±1.1
94.0	94.0	0.0		
89.0	89.0	0.0		
84.0	84.0	0.0		
79.0	79.0	0.0		
74.0	74.0	0.0		
69.0	69.0	0.0		
64.0	64.0	0.0		
59.0	59.0	0.0		
54.0	54.0	0.0		
49.0	49.0	0.0		
44.0	44.0	0.0		
39.0	39.0	0.0		
34.0	33.9	-0.1		
33.0	32.9	-0.1		

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8. Level linearity including the level range control

Level range	25	27
Indication for the reference sound pressure level [dB]	94.0	94.0
The deviation of indication [dB]		0.0
Anticipated level that is 5 dB less than the upper limit specified in the instruction manual for level range at 1 kHz [dB]	118.0	132.0
Indication [dB]	118.0	132.0
The deviation of indication [dB]	0.0	0.0
Expanded uncertainty [dB]	0.2	
Acceptable limits[dB]	±1.1	

9. Toneburst response

Measurement quantity	Time weighting	Toneburst duration	The indications in response to toneburst relative to steady sound level	Reference toneburst response relative to steady sound level	Deviation of measured toneburst response from reference toneburst	Expanded uncertainty	Acceptable limits
		ms	dB	dB	dB	dB	dB
Time-weighted sound level	Fast	200	-1.0	-1.0	0.0	0.2	±0.8
		2	-18.0	-18.0	0.0		-1.8; +1.3
		0.25	-27.2	-27.0	-0.2		-3.3; +1.3
Time-weighted sound level	Slow	200	-7.5	-7.4	-0.1		±0.8
		2	-27.1	-27.0	-0.1		-1.8; +1.3
Sound exposure level	-	200	-7.0	-7.0	0.0		±0.8
		2	-27.0	-27.0	0.0		-1.8; +1.3
		0.25	-36.2	-36.0	-0.2		-3.3; +1.3

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10. Peak C sound level

Numbers of cycles in test signal	Frequency of test signal	The deviation of indication	Expanded uncertainty	Acceptable limits
	Hz	dB	dB	dB
One	8000	-0.6	0.2	±2.4
Positive half-cycle	500	-0.1		±1.4
Negative half-cycle	500	-0.1		

11. Overload indication

Frequency weighting A

The difference between the levels of the positive and negative one-half-cycles input signals that first cause the displays of overload indication	Expanded uncertainty	Maximum value of the difference
dB	dB	dB
0.2	0.3	1.8