



DESIGNING AND DELIVERING  
A SUSTAINABLE FUTURE

## APPENDIX 10

Noise and Vibration

Appendix 10.1 – Glossary of Terms

Appendix 10.2 – Noise Survey Details

Appendix 10.3 – Calibration Certificates

## APPENDIX 10.1

### Glossary of Terms

### ***Ambient noise***

The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.

### ***Background noise***

The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ( $L_{AF90,T}$ ).

### ***dB***

Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micropascals (20  $\mu$ Pa).

### ***Free-field***

These are conditions in which the radiation from sound sources is unaffected by the presence of any reflecting boundaries or the source itself. In practice, it is a field in which the effects of the boundaries are negligible over the frequency range of interest. In environmental noise, true free-field measurement conditions are seldom achieved and generally the microphone will be positioned at a height between 1.2 and 1.5 metres above ground level. To minimise the influence of reflections, measurements are generally made at least 3.5 metres from any reflecting surface other than the ground.

### ***$L_{Aeq}$***

The average level recorded over the sampling period. The closer the  $L_{Aeq}$  value is to either the  $L_{A10}$  or  $L_{A90}$  value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

### ***$L_{A10}$***

Refers to those A-rated noise levels in the top 10 percentile of the sampling interval; it is the level which is exceeded for 10% of the measurement period. It is used to determine the intermittent high noise level features of locally generated noise and usually gives an indicator of the level of traffic.

### ***$L_{A90}$***

Refers to those A-rated noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level.

**Noise**

Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.

**Noise Sensitive Location (NSL)**

Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation/facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

## APPENDIX 10.2

### Noise Survey Details

## 10.1 Monitoring Locations

Noise monitoring was conducted at six locations, with details of the six noise monitoring locations provided in Table A.10.2.1. The position of the monitoring locations is shown in Figure 10.2, Volume 4 of this rEIAR.

**Table A10.2.1: Details on the Noise Monitoring Locations**

Location ID	Easting	Northing	Description	Photograph
N1	624078	659047	North of the site in the direction of the development, in the front garden of the property, 5m from the property facade. Screened from traffic noise to the north.	Plate A11.2-1
N2	625689	657056	At northern side of property, approximately 5m from the corner of the property, at end of cul de sac, near to forested area.	Plate A11.2-2
N3	624825	655721	Behind farm buildings at a property, approximately 100m from property façade.	Plate A11.2-3
N4	621749	652771	In rear garden of property, with view of development to north. Approximately 18m from the rear façade and 3.5m from garden fence.	Plate A11.2-4
N5	622066	650342	Near a track to the front (west of the house), some distance from local road, 17m from façade.	Plate A11.2-5
N6	622373	658422	In rear garden of property, approximately 13m from the property.	Plate A11.2-6

### Location N1

This location was to the north of the development. The noise meter was located in the front garden in the direction of the site, approximately 5m from the property facade. As there was noise from the M8 motorway to the north, the meter was located in the front garden overlooking the adjacent local road, at the quietest point in the front garden.



**Plate A10.2-1: Monitoring Location N1**

### Location N2

This location was located in a cul de sac and near to a wooded area, east of the site. The noise meter was located in the front garden north of the property in the direction of the site, approximately 5m from the property.



**Plate A10.2-2: Monitoring Location N2**

### Location N3

This was located north west of a cottage, behind farm buildings in the direction of the site. The location is approximately 100m from the property. There is a wooded area, at the edge of the field approximately 200m from the measurement location. This represents a group of properties to the north east of the measurement location. There was noise from livestock at an adjacent barn observed when equipment was deployed.



**Plate A10.1-3: Monitoring Location N3**

#### **Location N4**

This location is in the rear garden of the property, behind a shed in the rear garden. The measurement location is approximately 18m from the rear façade of the property. There is a slight embankment along the rear boundary of the property and some hawthorn in the next field.



**Plate A10.1-4: Monitoring Location N4**

#### **Location N5**

This location is near to a track close to the front (west) of the house. The house is on a farm, located approximately 680m from the local road. The measurement location overlooks the site and is away from trees north of the property. The measurement location is approximately 17m from the property.



**Plate A10.1-5: Monitoring Location N5**

### **Location N6**

This location is on a local road off the R639 and approximately 800m from the M8 motorway. The noise monitor was located in the rear garden, approximately 13m from the property in the direction of the proposed windfarm at the quietest point in the property. The monitoring location is next to a field of sheep and also the location of the rain gauge.



**Plate A10.1-6: Monitoring Location N6**

#### **10.1.1 Monitoring Equipment**

Baseline noise monitoring was carried out using Svantek 307, Svantek 977 and Larson Davis SoundExpert Lxt Class 1 sound level meters. Details of the noise monitoring equipment are presented in Table A10.2.2. The sound level meters were fitted with 1/2" microphones. The microphones connected to the Svantek sound level meters were fitted with a wind shield made from open-pored polyurethane foam with a diameter of 130mm. Both the Svantek 977 and the Larson Davis sound level meters were fitted with a 90mm diameter windshield with a secondary windshield. The setup used is in keeping with ESTU W/13/00386/REP, Noise Measurements in Windy Conditions and IOA Good Practice Guidelines, 2013. Calibration certificates for each sound level meter are provided in Appendix 10.3, Volume 3.

**Table A10.2.2: Details of Noise Monitoring Equipment**

Monitoring Location	Meter Type	Serial Number
N1	Larson Davis SoundExpert	LXT0006870
N2	Svantek 977	34173
N3	Svantek 307	104985
N4	Larson Davis SoundExpert	LXT0006603
N5	Larson Davis SoundExpert	LXT0006850
N6	Svantek 307	104990

A Campbell Scientific ARG100 Tipping Bucket Rain gauge and CR800 series datalogger was used to record rainfall and this was located at monitoring location N6. This meteorological data was acquired every 10 minutes synchronised to the hour, simultaneously with noise data.

## APPENDIX 10.3

### Calibration Certificates



# NSAI

## National Metrology Laboratory

### Certificate of Calibration

Issued to                      Fehily Timoney & Company  
                                         J5 Plaza  
                                         North Business Park  
                                         North Road  
                                         Dublin 11  
Attention of                    John Mahon

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Certificate Number	180300
Item Calibrated	Svantek SVAN 977 Sound Level Meter with ACO 7052E Microphone
Serial Number	34876 (SLM) and 56429 (Microphone)
Client ID Number	#2
Order Number	6252
Date Received	24 Jan 2018
NML Procedure Number	AP-NM-09

**Method**                      The above sound level meter was allowed to stabilise for a suitable period in laboratory conditions. It was then calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), *Periodic tests, specification for the verification of sound level meters*. This standard specifies a procedure for the periodic verification of conformance of a sound level meter or integrating-averaging meter to IEC 61672-1 (2003).

**Calibration Standards**      Norsonic 1504A Calibration System incorporating:  
                                         SR DS360 Signal Generator, No. 0735 [Cal Due Date: 21 Dec 2018]  
                                         Agilent 34401A Digital Multimeter, No. 0736 [Cal Due Date: 17 Nov 2018]  
                                         B&K 4134 Measuring Microphone, No. 0743 [Cal Due Date: 28 Apr 2019]  
                                         B&K 4228 Pistonphone, No. 0740 [Cal Due Date: 21 Mar 2019]  
                                         B&K 4226 Acoustical Calibrator, No. 0150 [Cal Due Date: 15 May 2018]

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Calibrated by	 David Fleming	Approved by	 Paul Hetherington
Date of Calibration	31 Jan 2018	Date of Issue	31 Jan 2018



This certificate is consistent with Calibration and Measurement Capabilities (CMC's) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures. Under the MRA, all participating institutes recognize the validity of each other's calibration certificates and measurement reports for quantities, ranges and measurement uncertainties specified in Appendix C (for details see [www.bipm.org](http://www.bipm.org))



# NSAI

## National Metrology Laboratory

### Certificate of Calibration

Issued to **Fehily Timoney & Company**  
J5 Plaza  
North Park Business Park  
North Road  
Dublin 11

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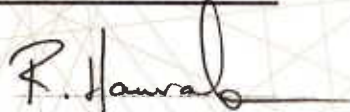
<b>Certificate Number</b>	242697
<b>Item Calibrated</b>	Svantek SVAN 977 Sound Level Meter with ACO 7052E Microphone
<b>Serial Number</b>	69552 (SLM) and 69543 (Microphone)
<b>ID Number</b>	None
<b>Order Number</b>	7629
<b>Date Received</b>	10 Jun 2024
<b>NML Procedure Number</b>	TFAP-NM-16

**Method** The above sound level meter was allowed to stabilise for a suitable period in laboratory conditions. It was then calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), *Periodic tests, specification for the verification of sound level meters*. This standard specifies a procedure for the periodic verification of conformance of a sound level meter or integrating-averaging meter to IEC 61672-1 (2003).

**Calibration Standards** Norsonic 1504A Calibration System incorporating:  
SR DS360 Signal Generator, No. 0735 [Cal Due Date: 01 Sep 2024]  
Agilent 34401A Digital Multimeter, No. 0736 [Cal Due Date: 01 Sep 2024]  
B&K 4180 Measuring Microphone, No. 1069 [Cal Due Date: 15 Sep 2025]  
B&K 4228 Pistonphone, No. 0741 [Cal Due Date: 14 Sep 2025]  
B&K 4226 Acoustical Calibrator, No. 0150 [Cal Due Date: 04 Jan 2025]

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**Calibrated by**   
David Fleming

**Approved by**   
Rory Hanrahan

**Date of Calibration** 03 Jul 2024

**Date of Issue** 03 Jul 2024



This certificate is consistent with Calibration and Measurement Capabilities (CMC's) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures. Under the MRA, all participating institutes recognize the validity of each other's calibration certificates and measurement reports for quantities, ranges and measurement uncertainties specified in Appendix C (for details see [www.bipm.org](http://www.bipm.org))



# NSAI

## National Metrology Laboratory

### Certificate of Calibration

Issued to Fehily Timoney & Company  
J5 Plaza  
North Park Business Park  
North Road  
Dublin 11

Attention of John Mahon

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Certificate Number	173660
Item Calibrated	Svantek SVAN 977 Sound Level Meter with ACO 7052E Microphone
Serial Number	34173 (SLM) and 54691 (Microphone)
Client ID Number	#3
Order Number	6308
Date Received	20 Oct 2017
NML Procedure Number	AP-NM-09

**Method** The above sound level meter was allowed to stabilise for a suitable period in laboratory conditions. It was then calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), *Periodic tests, specification for the verification of sound level meters*. This standard specifies a procedure for the periodic verification of conformance of a sound level meter or integrating-averaging meter to IEC 61672-1 (2003).

**Calibration Standards** Norsonic 1504A Calibration System incorporating:  
SR DS360 Signal Generator, No. 0735 [Cal Due Date: 18 Nov 2017]  
Agilent 34401A Digital Multimeter, No. 0736 [Cal Due Date: 07 Nov 2017]  
B&K 4134 Measuring Microphone, No. 0742 [Cal Due Date: 18 Jan 2018]  
B&K 4228 Pistonphone, No. 0741 [Cal Due Date: 08 Jan 2018]  
B&K 4226 Acoustical Calibrator, No. 0150 [Cal Due Date: 15 May 2018]

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Calibrated by



David Fleming

Approved by



Paul Hetherington

Date of Calibration

31 Oct 2017

Date of Issue

01 Nov 2017



This certificate is consistent with Calibration and Measurement Capabilities (CMC's) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures. Under the MRA, all participating institutes recognize the validity of each other's calibration certificates and measurement reports for quantities, ranges and measurement uncertainties specified in Appendix C (for details see [www.bipm.org](http://www.bipm.org))

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
29 °C	37%	1005 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	127	Signal generator
2.	SVANTEK	SVAN 912A	9537	Sound & Vibration Analyser
3.	KEITHLEY	2000	0910165	Digital multimeter
4.	SVANTEK	SV33	48878	Acoustic calibrator
5.	SVANTEK	ST00	-	Microphone equivalent electrical impedance (18pF)
6.	DYTRAN	3333A	1376	Reference accelerometer

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The vibrational calibration was performed using the Back-to-Back Comparison method and is traceable to the GUM (Central Office of Measures) reference standard - accelerometer type 8305 No 1435233.
4. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
5. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Kubel



Test date: 2018-06-01



ISO9001 certified

FACTORY CALIBRATION DATA OF THE SVAN 977A No. 69557

with preamplifier SVANTEK type SV12L No. 72140 and microphone ACO PACIFIC type 7052E No. 69617

SOUND LEVEL METER

1. CALIBRATION (electrical)

LEVEL METER function; Characteristic: A;  $f_{ref}=1$  kHz; Input signal = 110.9 dB;

Range	Low (120dB)	High (137dB)
Indication [dB]	114.0	114.0
Error [dB]	0.0	0.0

2. CALIBRATION\* (acoustical)

LEVEL METER function; Range: High; Reference frequency: 1000 Hz; Sound Pressure Level: 113.99 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	113.99	113.97	-0.02
A	113.99	113.97	-0.02
C	113.99	113.97	-0.02

Calibration measured with the microphone ACO PACIFIC type 7052E No. 69617. Calibration factor: 0.02 dB.

3. LINEARITY TEST\* (electrical)

LEVEL METER function; Range: Low; Characteristic: A;  $f_{ref}=31.5$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

LEVEL METER function; Range: Low; Characteristic: A;  $f_{ref}=1000$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	120.0
Error [dB]	0.1	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A;  $f_{ref}=8000$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	119.0
Error [dB]	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{ref}=31.5$  Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.1	0.1	0.1	0.0	0.0	-0.0	-0.0	0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{ref}=1000$  Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{ref}=8000$  Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0

4. TONE BURST RESPONSE\*

LEVEL METER function; Characteristic: A;  $f_{ref}=4000$  Hz; Burst duration: 2 s

Range: Low; Steady level nominal result = 117dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	117.0	116.9	116.0	114.4	112.2	109.7	105.8	102.9	99.9	95.9	92.9	89.9
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	115.0	112.9	109.6	106.8	103.9	100.0	97.0	94.0	90.0	-	-	-
		Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL	-	Indication [dB]	117.0	114.0	110.0	107.0	104.0	100.0	97.0	94.0	90.0	86.9	83.9	80.9
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1

**Issued to:**

**Fehily Timoney**  
J5 Plaza  
North Park Business Park  
North Road  
Dublin 11

**Calibration Reference**

SLM200094

**Test Date:** 03/06/2020

**Procedure:** TP-SLM-1

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**Equipment**

<b>Item Calibrated:</b>	Sound Level Meter	<b>Model</b>	977
<b>Make:</b>	Svantek	<b>Serial Number:</b>	69558

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**Calibration Procedure**

The sound level meter was allowed to stabilize for a suitable period, as described in the manufacturer's instruction manual, in laboratory conditions. The sound level meter was calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), Periodic tests, specification of sound level meters. Tolerances for verification procedures are specified in IEC 61672-1 (2003).

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**Calibration Standards**

<b>Description</b>	<b>Serial Number</b>
National Instruments PXI-4461	19C91D2
Stanford Research DS360	123803

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The standards used in this calibration are traceable to NIST and/or other National Measurement Institutes (NMI's) that are signatories of the International Committee of Weights and Measures (CIPM) mutual recognition agreement (MRA).

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**Signed on behalf of Sonitus Systems:**



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Self-generated noise - IEC 61672-3 Test #10

SLM Measuring Mode: Leq

SLM Configuration	Freq. Weighting Network	SLM Reading
Microphone Installed	A	18.8
Microphone replaced by electrical input device fitted with short circuit	A	10.6
	C	10.6
	Z	10.6

Acoustical signal test of a frequency weighting - IEC 61672-3 Test #11

Range: reference level range

Frequency Weighting: C

Time Weighting: Slow

Input	Freq	Expected Level	Deviation	Tol +/-
94 dB	1000 Hz	94.0	0.0	1.0
	125 Hz	93.7	0.2	1.0
	4000 Hz	92.3	0.5	1.0

The frequency response was tested using an electrostatic actuator. Appropriate correction factors were applied where available from the manufacturer's instruction manual.

Electrical tests of frequency weighting - IEC 61672-3 Test #12

Range: reference level range

A-weighting

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	95.0	0.0	1.5	-1.5
125	95.0	94.9	-0.1	1.5	-1.5
250	95.0	94.9	-0.1	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.0	0.0	1.6	-1.6
4000	95.0	95.1	0.1	1.6	-1.6
8000	95.0	95.1	0.1	2.1	-3.1
16000	95.0	94.7	-0.3	3.5	-17.0

C-weighting

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	95.0	0.0	1.5	-1.5
125	95.0	95.4	0.4	1.5	-1.5
250	95.0	95.0	0.0	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.1	0.1	1.6	-1.6
4000	95.0	95.1	0.1	1.6	-1.6
8000	95.0	95.1	0.1	2.1	-3.1
16000	95.0	94.7	-0.3	3.5	-17.0

Linear

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	95.0	0.0	1.5	-1.5
125	95.0	95.0	0.0	1.5	-1.5
250	95.0	95.0	0.0	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.0	0.0	1.6	-1.6
4000	95.0	95.0	0.0	1.6	-1.6
8000	95.0	95.0	0.0	2.1	-3.1
16000	95.0	95.0	0.0	3.5	-17.0

Frequency and Time Weightings at 1 kHz IEC 61672-3 Test #13

Range: reference level range

Time Weighting	Freq. Weighting	Expected Level	Deviation	Tol +/-
Fast	A	94.0	ref	
	C	94.0	0.0	0.2
Slow	A	94.0	0.0	0.2
LEQ	A	94.0	0.0	0.2

Linearity level on reference range - IEC 61672-3 Test #14

Input frequency: 8 kHz

SLM Measuring Mode: SPL

Range	Expected Level	SLM Reading	Deviation	Tol +/-
123 dB	94.0	94.0	0.0	1.1
	99.0	99.0	0.0	1.1
	104.0	104.0	0.0	1.1
	109.0	109.0	0.0	1.1
	114.0	114.0	0.0	1.1
	119.0	119.0	0.0	1.1
	124.0	124.0	0.0	1.1
	129.0	129.0	0.0	1.1
	134.0	134.0	0.0	1.1
	135.0	135.0	0.0	1.1
	136.0	136.0	0.0	1.1
	137.0	137.0	0.0	1.1
	89.0	89.0	0.0	1.1
	84.0	84.0	0.0	1.1
	79.0	79.0	0.0	1.1
	74.0	74.0	0.0	1.1
	69.0	69.0	0.0	1.1
	64.0	64.0	0.0	1.1
	59.0	59.0	0.0	1.1
	54.0	54.0	0.0	1.1
	49.0	49.1	0.1	1.1
	44.0	44.1	0.1	1.1
	39.0	39.1	0.1	1.1
	38.0	38.1	0.1	1.1
	37.0	37.2	0.2	1.1
	36.0	36.2	0.2	1.1
	35.0	35.3	0.3	1.1

Toneburst response - IEC 61672-3 Test #16

Range: reference level range

Burst Type	Response	Expected Level	SLM Reading	Deviation	Tol +	Tol -
0.25 ms	LAF <sub>MAX</sub>	111.0	110.8	-0.2	0.8	-0.8
2.0 ms	LAF <sub>MAX</sub>	120.0	119.9	-0.1	1.3	-1.3
200 ms	LAF <sub>MAX</sub>	137.0	137.0	0.0	1.3	-3.3
2.0 ms	LAS <sub>MAX</sub>	111.0	111.3	0.3	0.8	-0.8
200 ms	LAS <sub>MAX</sub>	130.6	130.6	0.0	1.3	-3.3

Peak C sound level - IEC 61672-3 Test #17

Range: reference level range

Pulse Type	Freq	Expected Level	SLM Reading	Deviation	Tol +/-
1 cycle	8 kHz	135.4	135.3	-0.1	2.4
Pos ½ cycle	500 Hz	137.4	137.4	0	1.4
Neg ½ cycle	500 Hz	137.4	137.4	0	1.4

Overload indication IEC 61672-3 Test #18

Test Description	Overload at	Meas. Diff. (Pos – Neg)	Tol +/-
Pos. ½ cycle at 4 kHz	142.5		
Neg. ½ cycle at 4 kHz	142.5		
Level difference		0.0	1.8

**Calibration Notes**

1. The manufacturer's instruction manual was accessed through the manufacturer's website.
2. The sound level meter was powered by a regulated 9V power supply provided by the testing laboratory.

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
29 °C	37%	1005 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	127	Signal generator
2.	SVANTEK	SVAN 912A	9537	Sound & Vibration Analyser
3.	KEITHLEY	2000	0910165	Digital multimeter
4.	SVANTEK	SV33	4987#	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)
6.	DYTRAN	3333A	1376	Reference accelerometer

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The vibrational calibration was performed using the Back-to-Back Comparison method and is traceable to the GUM (Central Office of Measures) reference standard - accelerometer type 8305 No 1435233.
4. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
5. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Kubel



Test date: 2018-06-01



ISO9001 certified

FACTORY CALIBRATION DATA OF THE SVAN 977A No. 69556

with preamplifier SVANTEK type SV12L No. 72145 and microphone ACO PACIFIC type 7052E No. 69608

SOUND LEVEL METER

1. CALIBRATION (electrical)

LEVEL METER function; Characteristic: A;  $f_{ref}=1$  kHz; Input signal =110.9 dB;

Range	Low (120dB)	High (137dB)
Indication [dB]	114.0	114.0
Error [dB]	0.0	0.0

2. CALIBRATION\* (acoustical)

LEVEL METER function; Range: High; Reference frequency: 1000 Hz; Sound Pressure Level: : 113.99 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	113.99	114.02	0.03
A	113.99	114.02	0.03
C	113.99	114.02	0.03

Calibration measured with the microphone ACO PACIFIC type 7052E No. 69608. Calibration factor: 0.63 dB.

3. LINEARITY TEST\* (electrical)

LEVEL METER function; Range: Low; Characteristic: A;  $f_{ref}=31.5$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0
Error [dB]	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0

LEVEL METER function; Range: Low; Characteristic: A;  $f_{ref}=1000$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	120.0
Error [dB]	0.1	0.1	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A;  $f_{ref}=8000$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	119.0
Error [dB]	0.1	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{ref}=31.5$  Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	-0.0	-0.0	0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{ref}=1000$  Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{ref}=8000$  Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	0.1	0.1	0.0	0.1	0.0	-0.0	-0.0	0.0	-0.0	0.0

4. TONE BURST RESPONSE\*

LEVEL METER function; Characteristic: A;  $f_{ref}=4000$  Hz; Burst duration: 2 s

Range: Low; Steady level nominal result = 117dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	117.0	116.9	116.0	114.4	113.3	108.7	105.8	102.9	99.0	96.0	92.9	89.9
		Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
	Slow	Indication [dB]	115.0	113.0	106.6	106.3	103.9	100.0	97.0	94.0	90.0	-	-	-
		Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL	-	Indication [dB]	117.0	114.0	110.9	107.0	104.0	100.0	97.0	94.0	90.0	87.0	83.9	80.9
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0



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