# Appendix E Noise Monitoring Equipment Calibration Certificate

# **Certificate of Calibration**

### for

Description:	Sound Level Meter
Manufacturer:	SVANTEK
Type No.:	971 (Serial No.: 96063)
Microphone:	ACO 7052 E (Serial No.: 78092)
Preamplifier:	SVANTEK SV 18 (Serial No.:97278)

# Submitted by:

Customer:	Acuity Sustainability Consulting Limited
Address:	Unit E, 12/F., Ford Glory Plaza,
	Nos. 37-39 Wing Hong Street,
	Cheung Sha Wan, Kowloon, Hong Kong

Upon receipt for calibration, the instrument was found to be:

$\checkmark$	Within
	Outside

### the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 21 June 2022

Date of calibration: 27 June 2022

Date of NEXT calibration: 26 June 2023

Calibrated by: alibration Technician

Date of issue: 27 June 2022

Certificate No.: APJ22-029-CC001

Certified by:

Mr. Tang Cheuk Hang Quality Manager



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## 1. Calibration Precaution:

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

## 2. Calibration Conditions:

Air Temperature:	24.2 °C
Air Pressure:	1004 <b>hPa</b>
<b>Relative Humidity:</b>	60.8 %

## 3. Calibration Equipment:

	Туре	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV200041	HOKLAS

# 4. Calibration Results

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Appl	ied value	UUT Reading,	IEC 61672 Class 1	
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
25-124.5	dBA	SPL	Fast	94	1000	93.7	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1	
Range, dB	Freq.	Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
				94		93.7	Ref
25-124.5	dBA	SPL	Fast	104	1000	103.7	±0.3
			114		113.7	±0.3	

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1	
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
25 124 5	A CIL	CDI	Fast	0.4	1000	93.7	Ref
25-124.5	dBA SH	SPL	Slow	94	1000	93.7	±0.3

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Frequency Response

### Linear Response

Setting of Unit-under-test (UUT)			Appl	Applied value		IEC 61672 Class 1	
Range, dB	Freq. We	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
					31.5	94.1	±2.0
					63	94.0	±1.5
					125	94.0	±1.5
					250	94.0	±1.4
25-124.5	dB	SPL	Fast	94	500	93.9	±1.4
					1000	93.7	Ref
					2000	93.7	±1.6
					4000	95.5	±1.6
					8000	92.3	+2.1; -3.1

A-weighting

Setting of Unit-under-test (UUT)			Appl	Applied value		IEC 61672 Class 1	
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
					31.5	54.8	-39.4 ±2.0
					63	67.9	-26.2±1.5
					125	77.9	-16.1±1.5
					250	85.3	-8.6±1.4
25-124.5	dBA	SPL	Fast	94	500	90.7	$-3.2 \pm 1.4$
					1000	93.7	Ref
					2000	95.0	$+1.2 \pm 1.6$
					4000	96.6	$+1.0 \pm 1.6$
					8000	91.3	-1.1+2.1; -3.1

C-weighting

Setting of Unit-under-test (UUT)			Appl	Applied value		IEC 61672 Class 1	
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
					31.5	91.1	-3.0 ±2.0
					63	93.2	$-0.8 \pm 1.5$
					125	93.8	-0.2 ±1.5
					250	94.0	$-0.0 \pm 1.4$
25-124.5	dBC	SPL	Fast	94	500	93.9	-0.0±1.4
					1000	93.7	Ref
					2000	93.6	-0.2±1.6
					4000	94.8	-0.8±1.6
					8000	89.4	-3.0+2.1; -3.1

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# 5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.10
	63 Hz	± 0.05
	125 Hz	$\pm 0.05$
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)\*L shall not be liable for any loss or damage resulting from the use of the equipment.



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Certificate No.: APJ22-029-CC001



#### FACTORY CALIBRATION DATA OF THE SVAN 971 No. C119577

#### with preamplifier SVANTEK type SV 18 No. C122487 and

with microphone ACO type 7052E No. 85197

#### 1. CALIBRATION\* (acoustical)

LEVEL METER function; Range: Low; Reference frequency: 1000Hz; Sound Pressure Level: 114.03 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	114.03	114.05	0.02
A	114.03	114.05	0.02
С	114.03	114.05	0.02

Calibration measured with the microphone ACO type 7052E No. 85197. Calibration factor: 0.74 dB.

#### 2. LINEARITY TEST\* (electrical)

LEVEL METER function; Range: Low; Characteristic: A; f sin= 31.5 Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	83.0
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 sin= 1000 Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	123.0
Error [dB]	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A; f sin= 8000 Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	122.0
Error [dB]	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0

#### LEVEL METER function; Range: High; Characteristic: A; f sin= 31.5 Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0

#### LEVEL METER function; Range: High; Characteristic: A; f sin= 1000 Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	-0.0	0.0	-0.0	-0.0	-0.1	-0.1	· -0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; f sin= 8000 Hz

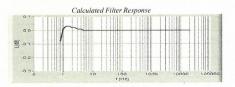
Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.0	0.0

#### 1/3 OCTAVE (1kHz); Range: Low; f sin= 1000 Hz

Nominal result [dB]	25.0	30.0	40.0	60.0	80.0	100.0	120.0	123.0
Error [dB]	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

#### 4. FREQUENCY RESPONSE' (electrical)

LEVEL METER function; Characteristic: Z; Range: Low; Input signal =120 dB;



Measured Filter Response with Preamplifier SV18 (f-frequency, L-level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	0.0	4000	0.0
12.5	-0.0	125	0.0	8000	0.0
16	0.0	250	0.0	16000	0.0
20	0.0	500	0.0	20000	0.0
25	0.0	1000	0.0		
31.5	0.0	2000	0.0		

All frequencies are nominal center values for the 1/3 octave bands

#### 5. INTERNAL NOISE LEVEL\* (electrical - compensated)

LEVEL METER function; Range:	Low; (Back-light	<ul> <li>off) ; Calibratio</li> </ul>	n factor: 0dB	
Characteristic	7	Δ	C	

Level [dB]	≤20	≤12	≤12
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\* measured with preamplifier SVANTEK type SV 18 No. C122487.

#### 6. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A; (Backlight - off)
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Range	Low	High
Indication [dB]	≤15	20.5

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

#### ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
23 °C	42%	1008 hPa

#### **TEST EQUIPMENT**

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	4369	Sound & Vibration Analyser
3.	RIGOL	DM3068	DM30155100773	Digital multimeter
4.	SVANTEK	SV33B	93171	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)

#### **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 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.

4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Cezary Dardziński ...

Test date: 2022-10-11



ISO9001 certified

# FACTORY CALIBRATION DATA OF THE SVAN 971 No. C132260

# with preamplifier SVANTEK type SV 18 No. C132221 and

with microphone ACO type 7052E No. 82767

#### 1. CALIBRATION\* (acoustical)

LEVEL METER function; Range: Low; Reference frequency: 1000Hz; Sound Pressure Level: 114.03 dB

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	114.03	114.05	0.02
A	114.03	114.05	0.02
С	114.03	114.05	0.02

Calibration measured with the microphone ACO type 7052E No. 82767. Calibration factor: 0.68 dB.

#### 2. LINEARITY TEST (electrical)

Nominal result LEQ [dB]	e: Low; Cha	25.0	26.0	28.0	30.0	40.0	Ten	
Error [dB]	0.1	0.1	0.0	0.0	0.0	0.0	60.0	83.0
LEVEL METER function; Rang	e: Low; Char	acteristic:	A; f <sub>sin</sub> = 10			0.0	0.0	0.0
Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60	
Error [dB]	0.1	0.1	0.1	0.0	0.1	0.0	<u>60.0</u> -0.0	80.0 100.0 12
LEVEL METER function; Range	e: Low; Char	acteristic:	A; f <sub>sin</sub> = 80	00 Hz			-0.0	-0.0 0.0 -0.
Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60	
Error [dB]	0.1	0.1	0.0	0.0	0.0	-0.0	<u>60.0</u> -0.0	80.0 100.0 122
Nominal result LEQ [dB]	34.0	35.0	36.0		40.0	60.0	20	
LEVEL METER function; Range	: High; Char	acteristic:	$A \cdot f_{m} = 31$	5 Hz				
Nominal result LEQ [dB]	34.0	35.0		38.0	40.0	60.0	80.0	
Nominal result LEQ [dB]					40.0 0.0	60.0 0.0	80.0	97.0
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range	34.0 0.0	35.0 0.0	36.0 0.0	38.0 0.0				97.0 0.0
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB]	34.0 0.0	35.0 0.0	36.0 0.0	38.0 0.0		0.0	-0.0	
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB] Error [dB]	34.0 0.0 High; Char	35.0 0.0	36.0 0.0 A; f <sub>sin</sub> = 10	38.0 0.0 00 Hz	0.0		-0.0	0.0
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB] Error [dB] EVEL METER function; Range	34.0 0.0 High; Char. 34.0 0.1 High; Chara	35.0 0.0 acteristic: 1 35.0 0.1	$\frac{36.0}{0.0}$ A; f <sub>sin</sub> = 10 36.0 0.1	38.0 0.0 00 Hz 38.0 0.0	0.0	0.0 60.0	-0.0	0.0
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB] EVEL METER function; Range Nominal result LEQ [dB]	34.0 0.0 High; Char 34.0 0.1	35.0 0.0 acteristic: 1 35.0 0.1	$\frac{36.0}{0.0}$ A; f <sub>sin</sub> = 10 36.0 0.1	38.0 0.0 00 Hz 38.0 0.0	0.0	0.0 60.0	-0.0 80.0 -0.0	0.0 100.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB]	34.0 0.0 High; Char. 34.0 0.1 High; Chara	35.0 0.0 acteristic: 7 35.0 0.1 acteristic: 7	$\frac{36.0}{0.0}$ A; f <sub>sin</sub> = 10 36.0 0.1 A; f <sub>sin</sub> = 800	38.0 0.0 00 Hz 38.0 0.0 00 Hz	0.0 40.0 0.0	0.0 60.0 -0.0 60.0	-0.0 80.0 -0.0 80.0	0.0 100.0 120.0 137.0 -0.0 -0.0 -0.0 100.0 120.0
Nominal result LEQ [dB] Error [dB] .EVEL METER function; Range Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB] Error [dB] 3 OCTAVE (1kHz); Range: Lov	34.0 0.0 High; Char. 34.0 0.1 High; Chara 34.0 0.1 v; f <sub>stn</sub> = 1000	35.0 0.0 35.0 0.1 acteristic: 7 35.0 0.0 Hz	$\frac{36.0}{0.0}$ A; f <sub>sin</sub> = 10 36.0 0.1 A; f <sub>sin</sub> = 80 36.0	38.0 0.0 00 Hz 38.0 0.0 00 Hz 38.0	0.0 40.0 0.0 40.0	0.0 60.0 -0.0	-0.0 80.0 -0.0	0.0 100.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0
Nominal result LEQ [dB] Error [dB] EVEL METER function; Range Nominal result LEQ [dB] EVEL METER function; Range Nominal result LEQ [dB]	34.0 0.0 High; Char. 34.0 0.1 High; Char. 34.0 0.1	35.0 0.0 acteristic: 1 35.0 0.1 acteristic: 1 35.0 0,0	$\frac{36.0}{0.0}$ A; f <sub>sin</sub> = 10 36.0 0.1 A; f <sub>sin</sub> = 80 36.0	38.0 0.0 00 Hz 38.0 0.0 00 Hz 38.0	0.0 40.0 0.0 40.0	0.0 60.0 -0.0 60.0	-0.0 80.0 -0.0 80.0	0.0 100.0 120.0 137.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 136.0 -0.

#### 4. FREQUENCY RESPONSE' (electrical)

LEVEL METER function; Characteristic: Z; Range: Low; Input signal =120 dB;

01-11	Calculated	Filter Resp	ponse		
00-	$\sim$				
E -0.1	4				
-0.2-					
.an.	10	100 1 (HP)	1000	taboe	100000

f [Hz]	LIdBI	True	se with cy, L-le	evel)	plifier S
10	-0.1	63	L [dB]	f[Hz]	L [dB]
12.5	0.0	125	0.0	4000	0.0
16	0.0	250	0.0	8000	0.0
20	0.0	500	0.0	16000	0.0
25	0.0	1000	0.0	20000	0.0

-0.0

for the 1/3 octave bands

# 5. INTERNAL NOISE LEVEL' (electrical - compensated)

VEL METER function; Ra	inge. Den, (data o	A	C
	L	-12	<12
haracteristic evel (dB)	<20	512	

\* measured with preamplifier SVANTEK type SV 18 No. C132221.

# 6. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Cha		ght - off)
LEVEL METER function, Cha	Low	High
Range	<15	20.4

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421 Indication [dB]

#### ENVIRONMENTAL CONDITIONS

	into interest of the	Ambient pressur
Temperature	Relative humidity	1012 hPa
21.90	43%	1012

#### TEST EQUIPMENT

		Model	Serial no.	Ci al apparator
tem	Manufacturer	SVAN 401	100	Signal generator
	SVANTEK		4369	Sound & Vibration Analyser
	SVANTEK	SVAN 912A	DM30155100773	Digital multimeter
2.		DM3068		
3.	RIGOL	SV33B	93171	Acoustic calibrator Microphone equivalent electrical impedance (18pF)
4	SVANTEK			Microphone equivalent et
-	SVANTEK	ST02		

**CONFORMITY & TEST DECLARATION** 

CONFORMITY & TEST DECLARATION

 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.
 The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard meta calibration uppearing 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.
 This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd

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Calibration specialist: Cezary Dardziński .....

Test date: 2022-10-27

# **Certificate of Calibration**

for

Description:	Sound Level Meter
Manufacturer:	Svantek
Type No.:	971 (Serial No.: 103449)
Microphone:	ACO 7052E (Serial No.: 78092)
Preamplifier:	SV 18 (Serial No.:78763)

## Submitted by:

Customer: Acuity Sustainability Consulting Limited Address: Unit E, 12/F, Ford Glory Plaza, Nos. 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong

# Upon receipt for calibration, the instrument was found to be:

☑ Within (31.5Hz – 8kHz) □ Outside

### the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 2 February 2023

Date of calibration: 6 February 2023

Date of NEXT calibration: 5 February 2024

Calibrated by:

Calibration Technician

Date of issue: 6 February 2023

Certificate No.: APJ22-136-CC001

Certified by:

Mr. Ng Yan Wa Laboratory Manager

TESTING LA

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Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong Tel: (852) 2668 3423 Fax:(852) 2668 6946 Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

## 1. Calibration Precaution:

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

## 2. Calibration Conditions:

Air Temperature:	23.9°C
Air Pressure:	1006 hPa
<b>Relative Humidity:</b>	47.9 %

# 3. Calibration Equipment:

	Туре	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV220061	HOKLAS

# 4. Calibration Results

Sound Pressure Level

Reference Sound Pressure Level

Sett	ing of Uni	it-under-t	est (UUT)	Арр	lied value	UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	vonest.	Specification, dB
25-124.3	dBA	SPL	Fast	94	1000	94.0	$\pm 0.4$

Linearity

Sett	ing of Uni	t-under-t	est (UUT)	Арр	lied value	UUT Reading,	IEC 61672 Class
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz		Specification, dB
25.124.2				94		94.0	Ref
25-124.3	dBA	SPL	Fast	104	1000	104.0	±0.3
				114		114.0	±0.3

Time Weighting

Sett	ing of Ur	iit-under-t	est (UUT)	Appl	lied value	UUT Reading.	IEC 61672 Class 1
Range, dB	Freq. V	Veighting	Time Weighting	Level, dB	Frequency, Hz		Specification, dB
25-124.3	dBA	SPL	Fast	0.4	1000	94.0	Ref
	ubA	51 L	Slow	94	1000	94.0	+0.3

Certificate No.: APJ22-136-CC001



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# Frequency Response

## Linear Response

Sett	ing of Uni	t-under-t	est (UUT)	Appl	ied value	UUT Reading	IEC 61672 Class 1
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz		Specification, dB
					31.5	94.2	±2.0
					63	94.1	±1.5
					125	94.1	±1.5
25-124.3	ID				250	94.1	±1.4
25-124.3	dB	SPL	Fast	94	500	94.0	±1.4
					1000	94.0	Ref
				-	2000	93.9	±1.6
			· · · · · · · · ·		4000	93.6	±1.6
					8000	90.9	+2.1: -3.1

A-weighting

Sett	ing of Uni	t-under-t	est (UUT)	Appl	ied value	UUT Reading.	IEC 61672 Class 1
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz		Specification, dB
					31.5	54.8	$-39.4 \pm 2.0$
					63	68.0	$-26.2 \pm 1.5$
					125	78.0	-16.1±1.5
25-124.3					250	85.4	-8.6±1.4
23-124.5	dBA	SPL	Fast	94	500	90.8	$-3.2 \pm 1.4$
					1000	94.0	Ref
					2000	95.1	$+1.2\pm1.6$
					4000	94.6	$+1.0 \pm 1.6$
					8000	90.0	-1.1+2.1; -3.1

C-weighting

Sett	Setting of Unit-under-test (UUT)		Appl	Applied value		IEC 61672 Class	
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz		Specification, dE
					31.5	91.2	$-3.0\pm 2.0$
					63	93.3	-0.8±1.5
					125	93.9	$-0.2 \pm 1.5$
25-124.3	IDC				250	94.0	$-0.0 \pm 1.4$
23-124.3	dBC	SPL	Fast	94	500	94.1	$-0.0 \pm 1.4$
					1000	94.0	Ref
					2000	93.7	$-0.2 \pm 1.6$
					4000	92.9	-0.8±1.6
					8000	88.1	-3.0 +2.1: -3.1

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## 5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.10
	63 Hz	± 0.05
	125 Hz	± 0.05
	250 Hz	± 0.10
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)\*L shall not be liable for any loss or damage resulting from the use of the equipment.



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# CALIBRATION CERTIFICATE

Product	:	SOUND CALIBRATOR
Туре	:	NC-75
Serial number	:	34724245
Manufacturer	:	RION CO., LTD.
Calibration quantities	:	Sound pressure level (with reference standard microphone)
Calibration method	:	Measured by specified secondary standard microphone
		according to JCSS calibration procedure specified by RION.
Ambient conditions	:	Temperature 23.9 °C, Relative humidity 49 %,
		Static pressure 99.9 kPa
Calibration date	:	05/07/2022 (DD/MM/YYYY)
Calibration location	:	3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
		RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 11/07/2022 (DD/MM/YYYY)

Junichi Kawamura Manager Quality Assurance Section, Quality Assurance Department, Environmental Instrument Division, RION CO., LTD. 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan

This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).

The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).

The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.

The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.

This calibration certificate was issued by the calibration laboratory accredited by IAJapan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.



Certificate No. D224351E

# CALIBRATION RESULT

1. Sound pressure level (with reference standard microphone)

Measured	Expanded
value	uncertainty *1
93.99 dB	0.09 dB

Specified secondary standard microphone: Type : 4160 Serial number : 2973341 Reference Sound pressure :  $2 \times 10^{-5}$  Pa

\*1 Defines an interval estimated to have a level of confidence of approximately 95 %. Coverage factor k=2

Calibration result is the calibration value in ambient conditions during calibration.

# BE OUT OF JCSS CALIBRATION

1. Frequency

Measured value	Measurement uncertainty (k=2)
1000.0 Hz	$3.9  imes 10^{\cdot 4} \mathrm{Hz}$

Working measurement standard universal counter: Type : 53132A Serial number : MY40005574 (JCSS Calibration Certificate No. 21081499079575510)

### 2. Total distortion

	Measured	
	value	
	0.2 %	
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Working measurement standard distortion meter: Type : VA-2230A Serial number : 11076061 (A2LA Calibration Certificate No. 1501-03080)

· closing ·

