Annex 4 – Calibration/ Conformance Certificates for Sound Level Meters and Calibrator







Date of Issue: 02 January 2018

Issued by:

ANV Measurement Systems

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: UCRT18/1003

	Page	1	of	2	Pages	
Approved S	ignatory					
			11			
		//	15	/	1	
			NIU			
K. Mistry						

Customer

TNEI Services Ltd Milburn House Dean Street

Newcastle Upon Tyne

NE1 1LE

Order No.

5001

Test Procedure

Procedure TP 1 Calibration of Sound Calibrators

Description

Acoustic Calibrator

Identification

Manufacturer

Instrument

Model

Serial No.

Rion

Calibrator

NC-74

34762316

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No.

UKAS17/12696

Date Received

21 December 2017

Date Calibrated

02 January 2018

Previous Certificate

Dated

24 January 2017

Certificate No.

UCRT17/1033

Laboratory

7623

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UKAS Accredited Calibration Laboratory No. 0653

Certificate I	Number
UCRT1	8/1003

Page Pages

Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone

Manufacturer

Type

Brüel & Kjær

4134

Results

The level of the calibrator output under the conditions outlined above was

 $94.00 \pm$ 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was

1002.49 Hz

0.13 Hz

 \pm

The total distortion was

1.51 %

6.6 % of Reading

During the measurements environmental conditions were

Temperature

22 °C 22 to 38

Relative Humidity Barometric Pressure

48 % to

99.2 99.4 kPa to

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

Note:

END

Calibrator adjusted prior to calibration?

NO

Initial Level

N/A dB

Initial Frequency

N/A

Hz

Additional Comments

None

Calibrated by:

B. Bogdan

R 1



Date of Issue: 05 September 2017

Issued by:

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: TCRT17/1572

Page 1

of

Pages

Approved Signatory

K. Mistry

Customer

TNEI Services Ltd Milburn House

Dean Street

Newcastle Upon Tyne

NE1 1LE

Order No.

5001

Description

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer Instrument Type Serial No. / Version Rion Sound Level Meter NL-52 00643025 Rion **Firmware** 1.8 Rion Pre Amplifier NH-25 43053 Rion Microphone UC-59 06805 Rion Calibrator NC-74 34536109

Calibrator adaptor type if applicable

NC-74-002

Performance Class

Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002

YES

Approval Number

21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

04 September 2017

ANV Job No.

TRAC17/09334

Date Calibrated

05 September 2017

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

15 September 2016

TCRT16/1248

ANV Measurement Systems



None

Certificate Number TCRT17/1578

Page 2 of 2 Pages

		Name and Address of the Owner o				
Sound Level Meter Instruction ma	nual and data use	ed to adjust th	ne sound leve	ls indicate	d.	
		L-42 / NL-52			,	
SLM instruction manual ref / issue		11-03				
SLM instruction manual source	Mar	ufacturer				
Internet download date if applicable		N/A				
Case corrections available		Yes				
Uncertainties of case corrections		Yes				
Source of case data	Mar	ufacturer				
Wind screen corrections available		Yes	···			
Uncertainties of wind screen correction	ons	Yes				
Source of wind screen data	Mar	ufacturer	N== 40			
Mic pressure to free field corrections		Yes				
Uncertainties of Mic to F.F. correction	ıs	Yes				
Source of Mic to F.F. corrections		ufacturer				
Total expanded uncertainties within t		The second secon	002 Yes			
Specified or equivalent Calibrator		pecified				
Customer or Lab Calibrator		Calibrator				
Calibrator adaptor type if applicable		-74-002				
Calibrator cal. date	21 Aı	ıgust 2017				
Calibrator cert. number	UCRT17/1	705				
Calibrator cal cert issued by	0653					
Calibrator SPL @ STP	94.0	04 dB	Calibration re	eference sou	und press	sure level
Calibrator frequency	1001	.94 Hz	Calibration cl			
Reference level range	25 -	130 dB		.ook ii oquo	y	2.
Accessories used or corrected for du	ring calibration -	None				
Note - if a pre-amp extension cable is			e SI M and the	e nre-amn		
Environmental conditions during tests				s pro amp.		
Temperatu			End 22.37	. 0.00	~~	
Humidity	43.		43.1) °C	
Ambient P			100.84) %RH	
				± 0.03	3 kPa	
Response to associated Calibrator at		conditions abov	/e.			
Initial indicated level 93.		Adjusted i	ndicated level	94.0		dB
The uncertainty of the associated call	brator supplied with	the sound leve	el meter ±	0.10) (dB
Self Generated Noise This test is	currently not perfor	med by this La	b.			
Microphone installed (if requested by	customer) = Less	Than	N/A	dB A Wei	ghting	
Uncertainty of the microphone installed	ed self generated no	ise ±	N/A	dB		
Microphone replaced with electrical in	put device -	UR = Under	Range indicat	ed		
Weighting A		C	T Z	7	7	
12.3 dB	UR 17.1	dB UR	22.9	dB UR	┪	
Uncertainty of the electrical self gene				dB	_	
The reported expanded uncertainty is	based on a standa	d uncertainty r	multiplied by a	coverage fa	ctor k=2	providing a
coverage probability of approximately						
Guide to the Expression of Uncertain				ou out iii uo	Jordanioc	with the
For the test of the frequency weightin	.50			actual mic	ronhone f	free field
response was used.	go ao per paragrapi	1 12. 01 120 010	372-3.2000 110	actual mici	opnone	iree iielu
	au anay waighting a		b 11 of IEC 6	1670 2,2006		
The acoustical frequency tests of a frusing an electrostatic actuator.	equency weighting a	is per paragrap	II I OT IEC 6	1012-3:2006	were ca	irried out
using an electrostatic actuator.	18	ENID				
O-libertal base A Data		END				
Calibrated by: A Patel						R 1
Additional Comments						



Date of Issue: 01 December 2017

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: TCRT17/1794

Page

Approved Signatory

Pages

K. Mistry

Customer

TNEI Services Ltd.

Milburn House Dean Street

Newcastle Upon Tyne

NE1 1LE

Order No.

Description Identification 5001

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Manufacturer

Instrument

Type

Serial No. / Version

Rion

Sound Level Meter

NL-31

01273082

Rion

Firmware

1.400

Rion

Pre Amplifier

NH-21

26001

Rion Rion Microphone Calibrator

UC-53A

313385

NC-74

34536109

Calibrator adaptor type if applicable

NC-74-002

Performance Class

Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic test.

Type Approved to IEC 61672-1:2002

No

Approval Number

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

28 November 2017

ANV Job No.

TRAC17/11472

Date Calibrated

01 December 2017

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

16 October 2015

TCRT15/1274

ANV Measurement Systems



Reference level range

Certificate Number TCRT17/1794

Page 2 of 3 Pages

Sound Level Meter Instruction manual	and data used to a	ıdjust t	he sou	nd lev	els indicated.
SLM instruction manual title	NL-21 NL-31 Inst				
SLM instruction manual ref / issue	32006 09-0)4			
SLM instruction manual source	Manufactur	er			
Internet download date if applicable	N/A				
Case corrections available	Yes				
Uncertainties of case corrections	No		See c	ommer	nt on page 3
Source of case data	Manufactur	er			
Wind screen corrections available	Yes				
Uncertainties of wind screen corrections	No		See comment on page 3		
Source of wind screen data	Manufactur	er			
Mic pressure to free field corrections	Yes			****	
Uncertainties of Mic to F.F. corrections	No		See comment on page 3		
Source of Mic to F.F. corrections	Manufactur	er			
Total expanded uncertainties within the req	uirements of IEC 616	372-1:2	002	Yes	
Specified or equivalent Calibrator	Specified				
Customer or Lab Calibrator	Lab Calibra	tor			
Calibrator adaptor type if applicable	NC-74-00:	2			
Calibrator cal. date	13 November	2017			
Calibrator cert. number	UCRT17/2023				
Calibrator cal cert issued by Lab.	0653				
Calibrator SPL @ STP	94.01	dB	Calibra	ation re	eference sound pressure level
Calibrator frequency	1001.95	Hz			heck frequency

Accessories used or corrected for during calibration - None

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

dB

30 - 120

Environmental conditions	s during tests	Start	End		
	Temperature	22.20	22.70	±	0.30 °C
	Humidity	41.2	41.5	±	3.00 %RH
	Ambient Pressure	101.19	101.23	±	0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level 94.1 dB Adjusted indicated level 94.0 dB

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting
Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device -						UR = Under Range indicated			
Weighting	Α			C			Z		
	9.6	dB	UR	16.4	dB	UR	21.9	dB	
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

Comments

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.



Certificate Number TCRT17/1794

Page 3 of 3 Pages

If any of the "Uncertainties of" are set to NO above, then the following applies.

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator, or the manufacturer of the electrostatic actuator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of the measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

Calibrated by:

B. Bogdan

END

Additional Comments



Date of Issue: 01 December 2017

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Certificate Number: TCRT17/1793

Page

Pages

Approved Signatory

K. Mistry

Customer

TNEI Services Ltd Milburn House Dean Street

Newcastle Upon Tyne

NE1 1LE

Order No.

5001

Description

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer Instrument Type Serial No. / Version Rion Sound Level Meter **NL-31** 00593593 Rion **Firmware** 1.400 Rion Pre Amplifier NH-21 30355 Rion Microphone UC-53A 316118 Rion Calibrator NC-74 34536109 Calibrator adaptor type if applicable NC-74-002

Performance Class

Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic test.

Type Approved to IEC 61672-1:2002

No Approval Number

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

28 November 2017

ANV Job No.

TRAC17/11472

Date Calibrated

01 December 2017

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

16 February 2015

TCRT15/1055

ANV Measurement Systems



SLM instruction manual title

Certificate Number TCRT17/1793

See comment on page 3

Page 2 of 3 Pages

SLM instruction manual ref / issue 32006 09-04 SLM instruction manual source Manufacturer Internet download date if applicable N/A Case corrections available Yes Uncertainties of case corrections No See comment on page 3 Source of case data Manufacturer Wind screen corrections available Yes Uncertainties of wind screen corrections See comment on page 3 No

NL-21 NL-31 Instruction Manual

Source of wind screen corrections
Source of wind screen data
Manufacturer

Mic pressure to free field corrections
Yes

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

Uncertainties of Mic to F.F. corrections No Source of Mic to F.F. corrections Manufacturer

Total expanded uncertainties within the requirements of IEC 61672-1:2002 Yes

Specified or equivalent Calibrator

Customer or Lab Calibrator

Calibrator adaptor type if applicable

Calibrator cal. date

Specified

Lab Calibrator

NC-74-002

13 November 2017

Calibrator cert. number UCRT17/2023

Calibrator cal cert issued by Lab. 0653

Calibrator SPL @ STP 94.01 dB Calibration reference sound pressure level

Calibrator frequency 1001.95 Hz Calibration check frequency

Reference level range 30 - 120 dB

Accessories used or corrected for during calibration - None

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental co	onditions during tests	Start	End		
322	Temperature	21.70	22.30	±	0.30 °C
	Humidity	41.7	40.4	±	3.00 %RH
	Ambient Pressure	101.19	101.19	±	0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level 94.3 dB Adjusted indicated level 94.0 dB

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device -						UR = Under Range indicated			
Weighting	Α			С			Z		
	10.9	dB	UR	17.6	dB	UR	22.5	dB	
Uncertainty of the el			0.12	dB					

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

Comments

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.



Certificate Number TCRT17/1793

Page 3 of 3 Pages

If any of the "Uncertainties of" are set to NO above, then the following applies.

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator, or the manufacturer of the electrostatic actuator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of the measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

Calibrated by:	B. Bogdan			R 1
		,	END	

Additional Comments



Date of Issue: 14 March 2018

Issued by:

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Certificate Number: TCRT18/1213

Page

Pages

Approved Signatory

K. Mistry

Customer

TNEI Services Ltd

Milburn House Dean Street

Newcastle Upon Tyne

NE1 1LE

Manufacturer

Order No.

5001

Description

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Rion Sound Level Meter Type NL-31 Serial No. / Version

Rion

00593595

Rion Rion **Firmware** Pre Amplifier

Instrument

NH-21

1.400 30357

Rion

Microphone Calibrator

UC-53A NC-74

316120

Calibrator adaptor type if applicable

34973250 NC-74-002

Performance Class Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic test.

Type Approved to IEC 61672-1:2002

No

Approval Number

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

13 March 2018

ANV Job No.

TRAC18/03118

Date Calibrated

14 March 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

10 March 2017

TCRT17/1076

ANV Measurement Systems



Certificate Number TCRT18/1213

Page 2 of 3 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-21 NL-31 Instruc	tion N	Manual		
SLM instruction manual ref / issue	32006 09-04				
SLM instruction manual source	Manufacturer				
Internet download date if applicable	N/A				
Case corrections available	Yes				
Uncertainties of case corrections	No		See co	mmen	t on page 3
Source of case data	Manufacturer				
Wind screen corrections available	Yes				
Uncertainties of wind screen corrections	No		See co	mmen	t on page 3
Source of wind screen data	Manufacturer				
Mic pressure to free field corrections	Yes				
Uncertainties of Mic to F.F. corrections	No		See comment on page 3		
Source of Mic to F.F. corrections	Manufacturer				
Total expanded uncertainties within the requ		2-1:20	002	Yes	
Specified or equivalent Calibrator	Specified				
Customer or Lab Calibrator	Customers Calibra	ator			
Calibrator adaptor type if applicable	NC-74-002				
Calibrator cal. date	14 March 2018	3			
Calibrator cert. number	UCRT18/1293				
Calibrator cal cert issued by Lab.	0653				
Calibrator SPL @ STP	93.99	dB	Calibra	tion re	eference sound pressure level
Calibrator frequency	1002.89	Hz	Calibra	tion ch	neck frequency
Reference level range	30 - 120	dB			

Accessories used or corrected for during calibration - Wind Shield WS-10

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests		Start	End			
	Temperature	22.87	22.70	±	0.30	°C
	Humidity	44.0	45.5	±	3.00	%RH
	Ambient Pressure	99.21	99.11	+	0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level 94.3 dB Adjusted indicated level 94.0 dB

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device -					UR =	- Under	Range indic	cated	
Weighting	Α				С		Z		
	11.1	dB	UR	17.1	dB	UR	23.4	dB	
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

Comments

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.



Certificate Number TCRT18/1213

Page 3 of 3 Pages

No information on given in the instru manufacturer of the the electrostatic ac The uncertainty of the purpose of this	ction manual or obtained from the e microphone, or the manufacturer of tuator was published in the instruction the measurement of the adjustment	quired by manufact of the multion manual data has are not a	11.7 of IEC 61672-3:2006, of the adjustment data turer or supplier of the sound level meter, or the ti-frequency sound calibrator, or the manufacturer of I or made available by the manufacturer or supplier. therefore been assumed to be numerically zero for actually zero, there is a possibility that the frequency
Calibrated by:	B. Bogdan		R 2
		END	

Additional Comments



Date of Issue: 16 February 2018

Issued by:

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Certificate Number: TCRT18/1163

Page

Approved Signatory

Pages

K. Mistry

Customer

TNEI Services Ltd Milburn House

Dean Street

Newcastle Upon Tyne

NE1 1LE

Order No.

Description

Identification

5001

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Manufacturer Instrument Type Serial No. / Version Rion Sound Level Meter **NL-32** 00661767 Rion **Firmware** 1.0009 Rion Pre Amplifier NH-21 19771 Rion Microphone UC-53A 310458 Rion Calibrator NC-74 34536109

> Calibrator adaptor type if applicable NC-74-002

Performance Class

Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic test.

Type Approved to IEC 61672-1:2002

No

Approval Number

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

15 February 2018

ANV Job No.

TRAC18/02083

Date Calibrated

16 February 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

25 January 2017

TCRT17/1024

ANV Measurement Systems



Certificate Number TCRT18/1163

Page 2 of 3 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated. SLM instruction manual title NL-22 NL-32 Instruction Manual SLM instruction manual ref / issue 33625 09-06 SLM instruction manual source Manufacturer Internet download date if applicable N/A Case corrections available Yes Uncertainties of case corrections See comment on page 3 No Source of case data Manufacturer Wind screen corrections available Yes Uncertainties of wind screen corrections No See comment on page 3 Source of wind screen data Manufacturer Mic pressure to free field corrections Yes Uncertainties of Mic to F.F. corrections No See comment on page 3 Source of Mic to F.F. corrections Manufacturer Total expanded uncertainties within the requirements of IEC 61672-1:2002 Yes Specified or equivalent Calibrator Specified Lab Calibrator

Customer or Lab Calibrator
Calibrator adaptor type if applicable
Calibrator cal. date
Calibrator cert. number
Calibrator cert issued by Lab.
Calibrator SPL @ STP

Specified
NC-74-002
07 February 2018
UCRT18/1145
0653
Calibrator SPL @ STP
94.03

definition
Specified

Calibrator SPL @ STP 94.03 dB Calibration reference sound pressure level Calibrator frequency 1001.88 Hz Calibration check frequency

Reference level range 30 - 120 dB

Accessories used or corrected for during calibration - None

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental co	nditions during tests	Start	End			
	Temperature	22.18	22.45	±	0.30	°C
	Humidity	40.0	40.8	±	3.00	%RH
	Ambient Pressure	101.47	101.42	±	0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level 94.2 dB Adjusted indicated level 94.0 dB

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replace	d with elec	trical in	put devic	e -	UR :	Under I	Range indi	cated	
Weighting		Α			С			Z	
	10.9	dB	UR	17.8	dB	UR	25.1	dB	
Uncertainty of the el	ectrical sel	f gene	rated nois	se ±			0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

Comments

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.



Certificate Number TCRT18/1163

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2

If any of the "Uncertainties of" are set to NO above, then the following applies.
No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data
given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the
manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator, or the manufacturer of
the electrostatic actuator was published in the instruction manual or made available by the manufacturer or supplier.
The uncertainty of the measurement of the adjustment data has therefore been assumed to be numerically zero for
the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency
response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

Calibrated by:	B. Bogdan		R
		END	

Additional Comments



Date of Issue: 16 February 2018

Issued by:

ANV Measurement Systems

Beaufort Court 17 Roebuck Wav

Milton Kevnes MK5 8HL

Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: TCRT18/1165

Page

Pages

Approved Signatory

K. Mistry

Customer

TNEI Services Ltd Milburn House Dean Street

Newcastle Upon Tyne

NE1 1LE

Order No.

Description

5001

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer Instrument Type

Serial No. / Version

Rion Rion Sound Level Meter

NL-32

00972337

Rion

Firmware Pre Amplifier

NH-21

1.0009 25122

Rion Rion

Microphone Calibrator

UC-53A NC-74 Calibrator adaptor type if applicable

313228 34536109 NC-74-002

Performance Class

Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic test.

Type Approved to IEC 61672-1:2002

No

Approval Number

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

15 February 2018

ANV Job No.

TRAC18/02083

Date Calibrated

16 February 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

25 January 2017

TCRT17/1021

ANV Measurement Systems



Certificate Number TCRT18/1165

Page 2 of 3 Pages

0.10

dB

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

0.14.			·· · · · · · · · · · · · · · · · · · ·
SLM instruction manual title	NL-22 NL-32 Ins	truction	Manual
SLM instruction manual ref / issue	33625 09-	06	
SLM instruction manual source	Manufactu	rer	
Internet download date if applicable	N/A		
Case corrections available	Yes		
Uncertainties of case corrections	No		See comment on page 3
Source of case data	Manufactu	rer	897 199
Wind screen corrections available	Yes		
Uncertainties of wind screen corrections	No		See comment on page 3
Source of wind screen data	Manufactu	rer	
Mic pressure to free field corrections	Yes		
Uncertainties of Mic to F.F. corrections	No		See comment on page 3
Source of Mic to F.F. corrections	Manufactu		
Total expanded uncertainties within the requ	uirements of IEC 61	672-1:2	002 Yes
Specified or equivalent Calibrator	Specified	t	
Customer or Lab Calibrator	Lab Calibra	ator	
Calibrator adaptor type if applicable	NC-74-00	12	
Calibrator cal. date	07 February	2018	
Calibrator cert. number	UCRT18/1145		
Calibrator cal cert issued by Lab.	0653		
Calibrator SPL @ STP	94.03	dB	Calibration reference sound pressure level
Calibrator frequency	1001.88	Hz	Calibration check frequency
Reference level range	30 - 120	dB	

Accessories used or corrected for during calibration -None Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental of	conditions during tests	Start	End			
	Temperature	22.41	22.67	±	0.30	°C
	Humidity	39.8	41.6	±	3.00	%RH
	Ambient Pressure	101.42	101.35	+	0.03	kPa

Response to associated Calibrator at the environmental conditions above. Initial indicated level 94.0 dB Adjusted indicated level 94.0 dB The uncertainty of the associated calibrator supplied with the sound level meter ±

Self Generated Noise This test is currently not performed by this Lab. Microphone installed (if requested by customer) = Less Than N/A dB A Weighting Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced	d with elec	trical in	put devic	e -	UR =	Under F	Range indic	cated	1
Weighting	144	Α			С			Z	
	11.3	dB	UR	17.9	dB	UR	23.7	dB	
Uncertainty of the ele	ectrical sel	f gene	rated nois	se ±			0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

Comments

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.



Certificate Number TCRT18/1165

Page 3 of 3 Pages

If any of the "Uncer	rtainties of" are se	t to NO above, then	the following appli	es.	
	the uncertainty of meas				
	uction manual or obtaine				
	e microphone, or the ma				
	ctuator was published in t				
	the measurement of the a				
	eriodic test. If these unc und level meter may not d				nat the frequency
responde or the co-	and level meter may not e	omorm to the require	cincins of IEO of C	772-1.2002.	
					_
Calibrated by:	A Patel				R 1

END

Additional Comments



Date of Issue: 22 May 2018

Issued by:

ANV Measurement Systems

Beaufort Court 17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: TCRT18/1449

Page

Approved Signatory

Pages

K. Mistry

Customer

TNEI Services Ltd

7th Floor

West One, Forth Banks Newcastle Upon Tyne

NE1 3PA

Manufacturer

Order No.

5001

Description

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Rion Sound Level Meter Type NL-31 Serial No. / Version

Rion Rion **Firmware**

01283554 1.400

Rion

Pre Amplifier

Instrument

NH-21 UC-53A 29311

Rion

Microphone Calibrator

NC-74

315581 34536109 NC-74-002

Performance Class

Test Procedure

TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic test.

Calibrator adaptor type if applicable

Type Approved to IEC 61672-1:2002

No

Approval Number

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

21 May 2018

ANV Job No.

TRAC18/05251

Date Calibrated

22 May 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

31 May 2017

TCRT17/1315

ANV Measurement Systems



Certificate Number TCRT18/1449

Page 2 of 3 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-21 NL-31 Instru	uction	Manual		
SLM instruction manual ref / issue	32006 09-04	ŀ			
SLM instruction manual source	Manufacture	r			
Internet download date if applicable	N/A				
Case corrections available	Yes				
Uncertainties of case corrections	No		See co	ommer	nt on page 3
Source of case data	Manufacture	r			
Wind screen corrections available	Yes				
Uncertainties of wind screen corrections	No		See co	ommer	nt on page 3
Source of wind screen data	Manufacture	r			
Mic pressure to free field corrections	Yes				
	No		See co	ommer	nt on page 3
ncertainties of Mic to F.F. corrections No ource of Mic to F.F. corrections Manufacturer					
Total expanded uncertainties within the requ	irements of IEC 6167	72-1:20	002	Yes	
Specified or equivalent Calibrator	Specified				
Customer or Lab Calibrator	Lab Calibrato	r			
Calibrator adaptor type if applicable	NC-74-002				
Calibrator cal. date	09 May 2018	3			
Calibrator cert. number	UCRT18/1502				
Calibrator cal cert issued by Lab.	ANV Measurement	Syste	ems		
Calibrator SPL @ STP	94.02	dB	Calibra	ation re	eference sound pressure level
Calibrator frequency	1001.88	Hz			heck frequency
Reference level range	30 - 120	dB			. ,

Accessories used or corrected for during calibration - None

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	7	
Temperature	24.00	23.95	±	0.30 °C
Humidity	40.9	34.9	±	3.00 %RH
Ambient Pressure	100.71	100.73	±	0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level 94.0 dB Adjusted indicated level 94.0 dB

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting
Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replace	d with elec	trical in	put devic	e -	UR :	= Under F	Range indi	cated	1
Weighting		Α			C			Z	
	11.4	dB	UR	17.1	dB	UR	22.7	dB	
Uncertainty of the el	ectrical se	lf genei	rated nois	se ±			0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement published by the International Organisation for Standards (ISO).

Comments

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.



Certificate Number TCRT18/1449

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If any of the "Uncertainties of" are set to NO above, then the following applies. No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator, or the manufacturer of the electrostatic actuator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of the measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.				
Calibrated by:	A Patel		R 1	
		END		

Additional Comments



Date of Issue

08 March 2018

Customer

CONF031805

Certificate Number

TNEI Services Ltd

	Manufacturer	Type	Serial
Sound Level Meter	Rion	NL-52	01176428
Preamplifier	Rion	NH-25	76447
Microphone	Rion	UC-59	12471

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Amrat c Patel

Position. Calibration Technician Date. 08 March 2018



Date of Issue

20 June 2018

Customer

TNEI Services Ltd

Certificate Number

CONF061809

	Manufacturer	Type	Serial
Sound Level Meter	Rion	NL-52	000386739
Preamplifier	Rion	NH-25	76889
Microphone	Rion	UC-59	12362

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Amat c Patel Position. Calibration Technician Date. 20 June 2018



Date of Issue

20 June 2018

Customer

TNEI Services Ltd

Certificate Number

CONF061806

	Manufacturer	Туре	Serial
Sound Level Meter	Rion	NL-52	00386758
Preamplifier	Rion	NH-25	76908
Microphone	Rion	UC-59	12755

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Amrat c Patel Position. Calibration Technician Date. 20 June 2018



Date of Issue

20 June 2018

Customer

TNEI Services Ltd

Certificate Number

CONF061807

	Manufacturer	Type	Serial
Sound Level Meter	Rion	NL-52	000386759
Preamplifier	Rion	NH-25	76909
Microphone	Rion	UC-59	12756

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Annual C. Patel Position. Calibration Technician Date. 20 June 2018



Date of Issue

20 June 2018

Customer

TNEI Services Ltd

Certificate Number

CONF061811

	Manufacturer	Type	Serial
Sound Level Meter	Rion	NL-52	00386760
Preamplifier	Rion	NH-25	76910
Microphone	Rion	UC-59	12778

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Amult C. Patel Position. Calibration Technician Date. 20 June 2018



Date of Issue

20 June 2018

Customer

TNEI Services Ltd

Certificate Number

CONF061808

	Manufacturer	Туре	Serial
Sound Level Meter	Rion	NL-52	000386761
Preamplifier	Rion	NH-25	76911
Microphone	Rion	UC-59	12788

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Amuat c Patel Position. Calibration Technician Date. 20 June 2018