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CERTIFICATE OF CALIBRATION

ISSUED BY AV CALIBRATION

Date of issue 26 July 2016 Certificate N° 09307

UKAS CALIBRATION
0653

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Approved Signatory

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CLIENT	On behalf of ANV Measurement Systems AECOM Infrastructure & Environment UK Ltd 12 Regan Way Chetwynd Business Park Chilwell Nottinghamshire NG9 6RZ
F.A.O.	Heather Billin
ORDER No	- Job No UKAS16/07230/01
DATE OF RECEIPT	12 July 2016
PROCEDURE	AV Calibration Engineer's Handbook, section 25: periodic testing of sound level meters to IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009
IDENTIFICATION	Sound level meter Rion type NL-52 serial No 01021279 connected via a preamplifier type NH-25 serial No 21321 to a half-inch microphone type UC-59 serial No 04334 fitted with a foam windshield type WS-10.
CALIBRATED ON	26 July 2016
PREVIOUS CALIBRATION	Calibrated on 20 January 2015, Certificate No. 08142 issued by this laboratory.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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The sound level meter was set up using a type 4231 sound calibrator supplied by the laboratory; it was set to frequency weighting A, and initially read 93.8 dB. It was then adjusted to read 94.0 dB (corresponding to 94.0 dB at standard atmospheric pressure). This reading was derived from the certified output level of the calibrator and manufacturers' information on the free-field response of the sound level meter when fitted with the windshield. The calibration check frequency was 1kHz.

Procedures from IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009 were used to perform the periodic tests.

RESULTS

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

The self-generated noise recorded with the microphone replaced by the electrical input device was:

10.7 dB (A) 15.4 dB (C) 21.1 dB (Z)

The environmental conditions recorded at the start and end of testing were:

Start: 21 to 22 °C, 31 to 41 %RH and 101.4 to 101.5 kPa
End: 21 to 22 °C, 31 to 41 %RH and 101.4 to 101.5 kPa

Technical information including adjustment data specified in the manufacturers' Technical Notes 55750 (11-03) and , Instruction Manual 55530 (11-03) , Description for IEC 61672-1 56030 (11-04) has been used to carry out this verification. These data include manufacturer-specified uncertainties.

Publicly-available evidence has been found that the Rion NL-52 sound level meter design has successfully undergone pattern evaluation in accordance with IEC 61672-2:2002 (BS EN 61672-2:2003) by Physikalisch-Technische Bundesanstalt (PTB), an independent testing organisation responsible for pattern approvals.

All measurement data are held at AV Calibration for a period of at least six years.

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.

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NOTES

Any opinions or interpretations which may be expressed in the following notes are not UKAS Accredited.

1 Windscreen correction filter was set to "WS-10" and the diffuse field correction filter to "off".

2 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

3 The instrument was running firmware version 1.7

4 All tests were carried out on the main measurement channel, with the exception of that for Peak C sound level which is available only on the sub-channel.

5 It was noted that in order to obtain the correct A-weighted response to the sound calibrator on the reference range, the meter had to be set 0.1 dB higher in the calibration mode.

6 Typical case reflection factors specified by the manufacturer have been used for this verification.

7 The following adjustment data, to be added to the electrostatic actuator response, have been issued by Rion. Where conflicting data are shown in the Technical Notes supplied with the instrument, they are superseded by the revised values shown below. The uncertainties are for a coverage factor $k=2$.

Frequency Hz	Correction dB	Uncertainty dB
63	-0.02	± 0.23
125	-0.02	± 0.23
250	-0.02	± 0.23
500	-0.04	± 0.23
1000	0.00	± 0.23

Frequency Hz	Correction dB	Uncertainty dB
2000	0.25	± 0.23
4000	1.04	± 0.28
8000	3.55	± 0.41
16000	9.25	± 0.57

8 The instrument was labelled "SLM 23"

END