Vojenský technický ústav, s.p. **The certified quality system according to ČSN EN ISO 9001** **Equipment Testing Centre – Testing Laboratory No. 1103 accredited by CAI according to CSN EN ISO/IEC 17025** L 1103 **SPECIAL MEASUREMENT SITE**	**Task/Order No:** 14-19-2-93-0003-005 **Test Report No:** 194200-2/2014 **Copy No:** 1 **Page Number:** 4 **Annex:** -

TEST REPORT

NOISE MEASUREMENT

Name and address of submitter (customer):
ROBE lighting, s.r.o., Házovice 2090, 756 61 Rožnov pod Radhoštěm, The Czech Republic

Identification: Moving Head ROBIN MiniMe
Serial No.: 1300404857
Producer: ROBE lighting, s.r.o., Rožnov pod Radhoštěm, The Czech Republic
Technical documentation: --

Date of entrance test: 13 December 2013	**Test method:** ČSN EN ISO 11 201 *1)*
Date of test, place of test: 13 December 2013 Semi-anechoic chamber site VTUPV Vyškov	**Tests leader:** Jiří LENIKUS **Test carried out by:** Jiří LENIKUS
Issue date: 15 January 2014	**Authorized by technical manager:** Ivan ŠTUCHAL

Test results:
The sound pressure levels emitted by the equipment during determined operation conditions (three operation modes), on determined measurement places (the distance from the equipment centre – 1 m; 5 m and 10 m).

			1. mode	2. mode	3. mode
emission sound pressure levels A	Lp_A (dB) :	1 m	**42.8**	**45.0**	**46.4**
		5 m	**28.5**	**33.3**	**35.1**
		10 m	**27.5**	**31.6**	**33.3**

The expanded measurement uncertainty is a product of a measurement standard uncertainty and a coverage factor K=2, this corresponds to a coverage probability 95 % for a normal distribution.

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Notes:
This test report is translation of Czech version of test report No. 194200-2/2014. In the case of difference is valid Czech version of test report.

1) This standard is the Czech version of the European Standards.

1 TEST CONDITIONS

- Test conditions of the test equipment:
  - stationary conditions, with determined operation conditions (three operation mode):
    1. operation mode – stationary-basic mode, lamp is switched on,
    2. operation mode – dynamic mode with rotation movement (*Pan, Tilt*),
    3. operation mode – dynamic mode with rotation movement (*Pan, Tilt*), maximum ventilator speed (*High mode*).
  - the equipment was placed on a wooden table (distance from floor – 0.8 m, table desktop dimension: 1.0 m × 1.5 m × 0.035 m),
  - the equipment front panel (control panel) and the side part of the moving head was turned towards the microphone for 1. mode measurement, head is rotating (in 2. and 3. mode),
  - the equipment was placed in the centre of the test room (as possible),
  - the equipment was placed on one-reflective plane, in an indoor environment, in the semianechoic chamber – Figure 1,
  - the equipment basic dimensions: length – 0.249 m, width – 0.191 m, height – 0.345 m.
- Acoustic environment:
  - the semianechoic chamber (for EMC measurement), length – 17 m, width – 10 m, height – 7.5 m,
  - the reflective surface: concrete,
  - test environmental correction K_2 (according to ČSN ISO 3744 [2] – calculation by means of test room absorbability),

    $K_{2\,(1\,m)}$ = 0.15 dB < 2 dB (α = 0.35) – in compliance with standard ČSN EN ISO 11 201 [1] – for 1 m distance.

    $K_{2\,(5\,m)}$ = 0.60 dB < 2 dB (sound absorbability mean factor α = 0.35) – in compliance with standard ČSN EN ISO 11 201 – for 5 m distance.

    $K_{2\,(10\,m)}$ = 1.10 dB < 2 dB (α = 0.35) – in compliance with standard ČSN EN ISO 11 201 – for 10 m distance.

Figure 1: Equipment under test in test chamber

- Acoustic date:
  - response characteristic: F (fast),
  - weighting network: A,
  - measurement time interval: 30 s,
  - background noise correction K_1 – for 1 m, 5 m and 10 m distance (according to ČSN EN ISO 11 201).

2 MEASUREMENT LOCATION

It was defined measurement location according to the customer requirements, microphone height 1.10 m, distance from equipment (centre of equipment) 1 m; 5 m and 10 m.

3 TEST RESULTS

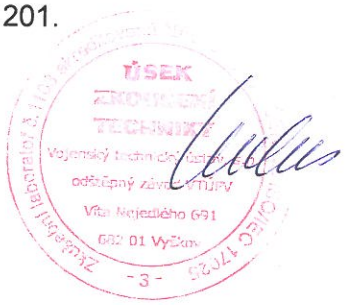
$L'p_A$ - measured sound pressure levels A
Lp_A - emission sound pressure levels A ($Lp_A = L'p_A - K_1$)

Measurement location - distance (m)	1. mode				Background noise (dB)	Standard
	$L'p_A$ (dB)	K_1 (dB)	K_3 (dB)	Lp_A (dB)		
1	42.8	0.00	-	**42.8** ± 3.6 dB	20.0	ČSN EN ISO 11 201 accuracy class 2 (technical)
5	29.0	0.55	-	**28.5** ± 3.6 dB	19.8	ČSN EN ISO 11 201 accuracy class 2 (technical)
10	28.2	0.67	-	**27.5** ± 3.6 dB	19.6	ČSN EN ISO 11 201 accuracy class 2 (technical)

Measurement location - distance (m)	2. mode				Background (dB)	Standard
	$L'p_A$ (dB)	K_1 (dB)	K_3 (dB)	Lp_A (dB)		
1	45.0	0.00	-	**45.0** ± 3.6 dB	20.0	ČSN EN ISO 11 201 accuracy class 2 (technical)
5	33.5	0.18	-	**33.3** ± 3.6 dB	19.8	ČSN EN ISO 11 201 accuracy class 2 (technical)
10	31.9	0.27	-	**31.6** ± 3.6 dB	19.6	ČSN EN ISO 11 201 accuracy class 2 (technical)

Measurement location - distance (m)	3. mode				Background (dB)	Standard
	$L'p_A$ (dB)	K_1 (dB)	K_3 (dB)	Lp_A (dB)		
1	46.4	0.00	-	**46.4** ± 3.6 dB	20.0	ČSN EN ISO 11 201 accuracy class 2 (technical)
5	35.1	0.00	-	**35.1** ± 3.6 dB	19.8	ČSN EN ISO 11 201 accuracy class 2 (technical)
10	33.5	0.19	-	**33.3** ± 3.6 dB	19.6	ČSN EN ISO 11 201 accuracy class 2 (technical)

The reproducibility standard deviation $\sigma_{Ro} \leq 1.5$ dB (ČSN EN ISO 11 201).
The results were acquired in compliance with standard ČSN EN ISO 11 201.



4 MEASURING INSTRUMENTS

Inventory number	Name	Calibration Validity
14003	Sound analyzer B&K 2260 „Observer" SN 2354773	17.10.2014
14003.1	Microphone B&K 4189 SN 2345687	11.10.2014
518100	Calibrator Pistonphon B&K 4220 SN 704632	31.01.2014
96012261	Measure Tape	28.04.2014

5 REFERENCES

[1] ČSN EN ISO 11 201 „Acoustics-Noise emitted by machinery and equipment-Determination of emission sound pressure levels at a work station and other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections". December 2010.

This national standard is the Czech version of the European standard EN ISO 11201:2010.

[2] ČSN EN ISO 3744 „Acoustics – Determination of sound power levels and sound energy of noise sources using sound pressure. Engineering methods for an essentially free field over a reflecting plane". April 2011.

This national standard is the Czech version of the European standard EN ISO 3744:2010.