



Spectra Lux

2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca



Lab Code: 200899-0

Moving Mirror Goniophotometer Test Report

Standard(s): IES LM-79:2019, ANSI C82.2:2002, ANSI C82.77-10:2021

Customer Studio d'Armes Inc. , 148 Watchorn, Morin-Heights, Quebec, Canada, J0R1H0

General Information		Lamp Details: CY5815		Driver Details: CY2777	
DUT Lab ID	SRIS 3188-1	Seasoning	0 Hour	Type	LED Power Supply
Lamp Type	LED/SSL	Test Product	RA-LI-B-CTGO-40K-120V	Manufacturer	ERP
Current Mode	AC	Manufacturer	N.K.	Catalog No.	PSB30W-1050-27
Test Report	S2402132-R1	Lamp Catalog No.	Mixed Color LEDs	Maximum Power	30 W
Test Date	13 February 2024	Drive Current	1000 mA	Input Voltage	120.00 V
Report Date	16 February 2024	Nominal Color	4000 K	Operating Frequency	60 Hz
Ambient	24.7 °C	Burning Position	Vertical Base Up & Down	Input Power	18.97 W

Luminaire Data

General Information		Optics		Aperture (feet)	
Manufacturer	Studio d'Armes Inc.	Optics	Up & Down LEDs Module	X	-0.1667
Name	RA Line Medium	Housing	(2) Cylindrical Holders	Y	4.5833
Catalog No.	RA-LI-B-CTGO-40K-120V	Lens	Clear Cylindrical Borosilicate Tube	Z	-0.1667

Stabilization Time: 1 hour

Approved Signatory: Chrisnel Blot

Signature:



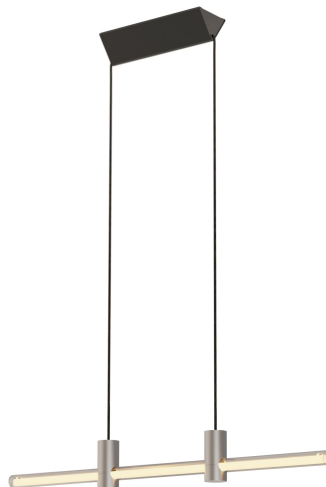
Luminaire Test Method

Precise installation and alignment of the luminaire to the rotation axis of the photometer is governed by a servomotor controlled via a microcontroller. A laser is used to validate the luminaire positioning. Before photometric measurements are taken, luminaire is operated long enough to reach stabilization and temperature equilibrium.

All movement commands issued to the photometer axes are mediated by the software to ensure the motion is within the limits of operation. The photometric detector used is a silicon detector corrected to closely match the spectral luminous efficiency photopic curve with a quality index less than 1.5%. Proper shielding is incorporated to the photometric test bench such that only the light from the unit under test is measured.

Luminous intensity measurements are performed at a distance great enough so that the inverse-square law applies. During each measurement the computer records the luminous intensity associated to the corresponding angles of radiation, as well as input electrical operational parameters and temperature measurements. Candela values are reported in IES format as per LM-63.

Equipment, reference standards are traceable to National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).





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Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Power Supply	Inventfine	CHP-500	GZBXD010148	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	27E116584	2023/09/05	2024/09/05
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.

Photometric Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Photometer	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Photodetector	INPHORA	IPR-PDET 19	110803	2023/09/05	2024/09/05

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504176	2023/09/05	2024/09/05

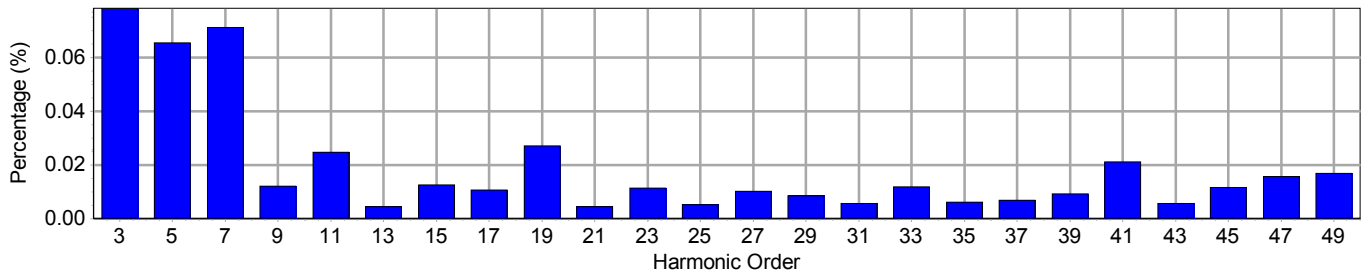


Electrical Measurements

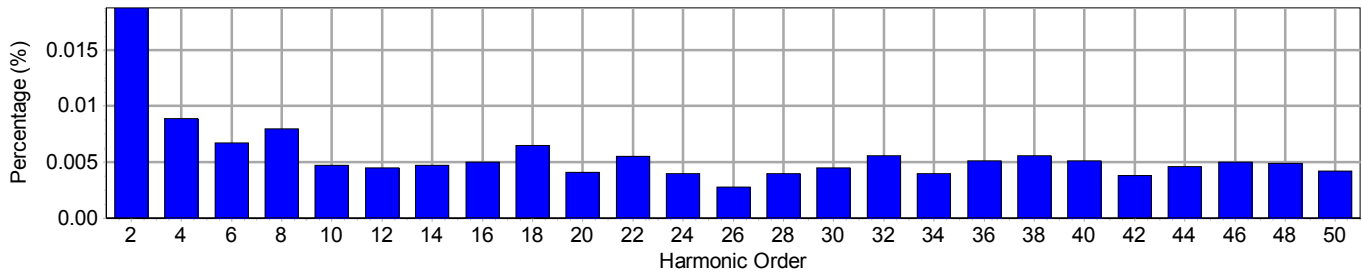
Input

Frequency	60 Hz	Active Power	18.97 W	THDV [ANSI]	0.14 %
Voltage	120.0 V(rms)	Apparent Power	19.46 VA	THDA [ANSI]	15.77 %
Current	0.1621 A(rms)	Power Factor	0.975	Max. Harmonic At	3rd order

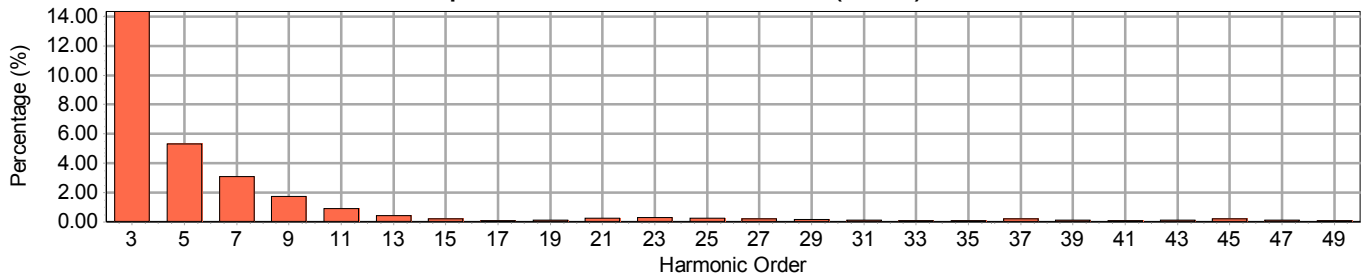
Input Voltage Harmonics (Odd)



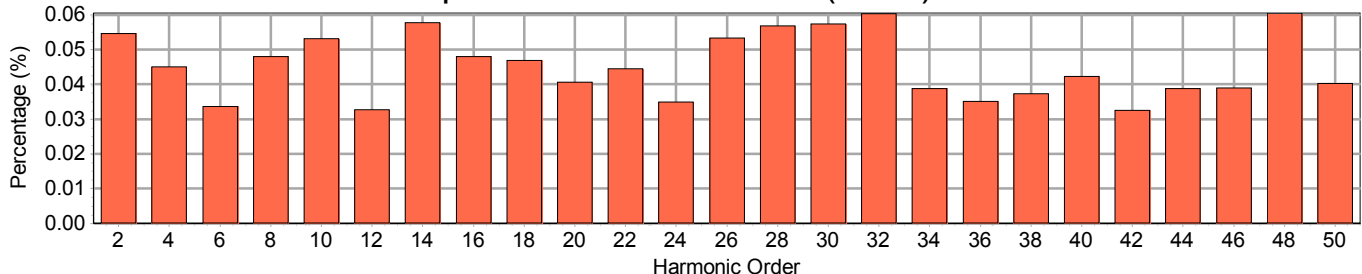
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.019	0.055
3	180	0.079	14.375	4	240	0.009	0.045
5	300	0.066	5.315	6	360	0.007	0.034
7	420	0.071	3.073	8	480	0.008	0.048
9	540	0.012	1.724	10	600	0.005	0.053
11	660	0.025	0.902	12	720	0.005	0.033
13	780	0.005	0.417	14	840	0.005	0.058
15	900	0.013	0.195	16	960	0.005	0.048
17	1020	0.011	0.080	18	1080	0.007	0.047
19	1140	0.027	0.130	20	1200	0.004	0.041
21	1260	0.004	0.226	22	1320	0.006	0.044
23	1380	0.011	0.262	24	1440	0.004	0.035
25	1500	0.005	0.256	26	1560	0.003	0.053
27	1620	0.010	0.210	28	1680	0.004	0.057
29	1740	0.008	0.143	30	1800	0.005	0.057
31	1860	0.006	0.098	32	1920	0.006	0.060
33	1980	0.012	0.074	34	2040	0.004	0.039
35	2100	0.006	0.064	36	2160	0.005	0.035
37	2220	0.007	0.182	38	2280	0.006	0.037
39	2340	0.009	0.113	40	2400	0.005	0.042
41	2460	0.021	0.051	42	2520	0.004	0.033
43	2580	0.006	0.130	44	2640	0.005	0.039
45	2700	0.012	0.180	46	2760	0.005	0.039
47	2820	0.016	0.128	48	2880	0.005	0.061
49	2940	0.017	0.068	50	3000	0.004	0.040



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Photometric Report: S2402132-R1

Prepared for: Studio d'Armes Inc. · Test Date: 13 February 2024

Luminaire: RA Line Medium · Lumcat: RA-LI-B-CTGO-40K-120V

Coefficients of Utilization - Zonal Cavity Method

RCR	RC	0.9				0.8				0.7				0.5			0.1			0
	RW	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0
0		116	116	116	116	107	107	107	107	99	99	99	99	83	83	83	56	56	56	50
1		103	96	91	85	95	89	84	79	87	82	77	73	68	65	62	45	43	41	35
2		93	82	74	67	85	76	68	62	78	70	63	58	58	53	49	37	35	32	27
3		84	71	62	54	77	66	57	50	70	60	53	47	50	44	40	32	29	26	22
4		76	62	52	45	70	58	49	42	64	53	45	39	44	38	33	28	25	22	18
5		70	55	45	38	64	51	42	35	58	47	39	33	39	33	28	25	22	19	15
6		64	49	39	32	59	45	37	30	53	42	34	28	35	29	24	23	19	16	13
7		59	44	35	28	54	41	32	26	49	38	30	24	32	25	21	21	17	14	11
8		55	40	31	24	50	37	29	23	46	34	27	21	29	23	18	19	15	12	10
9		51	36	27	22	47	34	26	20	43	31	24	19	26	20	16	17	14	11	9
10		47	33	25	19	43	31	23	18	40	28	21	17	24	18	15	16	13	10	8

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0 - 10	9	0.99	0.99
10 - 20	26	2.90	2.90
20 - 30	42	4.59	4.59
30 - 40	54	5.95	5.95
40 - 50	62	6.87	6.87
50 - 60	66	7.33	7.33
60 - 70	67	7.37	7.37
70 - 80	65	7.12	7.12
80 - 90	62	6.87	6.87
90 - 120	194	21.36	21.36
90 - 130	260	28.70	28.70
90 - 150	376	41.52	41.52
90 - 180	453	50.00	50.00
0 - 180	907	100.00	100.00

Average Luminance (Cd/m²)

Angle	0 Degree	45 Degree	90 Degree
45.0	427	509	568
55.0	415	587	691
65.0	377	744	927
75.0	284	1147	1504
85.0	182	3290	4436

Luminaire Luminous Flux: 907

Measured Input Power: 18.97 W

Total Luminaire Efficiency: N/A

Luminaire Luminous Efficacy: 47.8 lm/W

Luminaire Spacing Criterion (0 Degree): 1.3090

Luminaire Spacing Criterion (90 Degree): 1.4942

Category: Up and Down

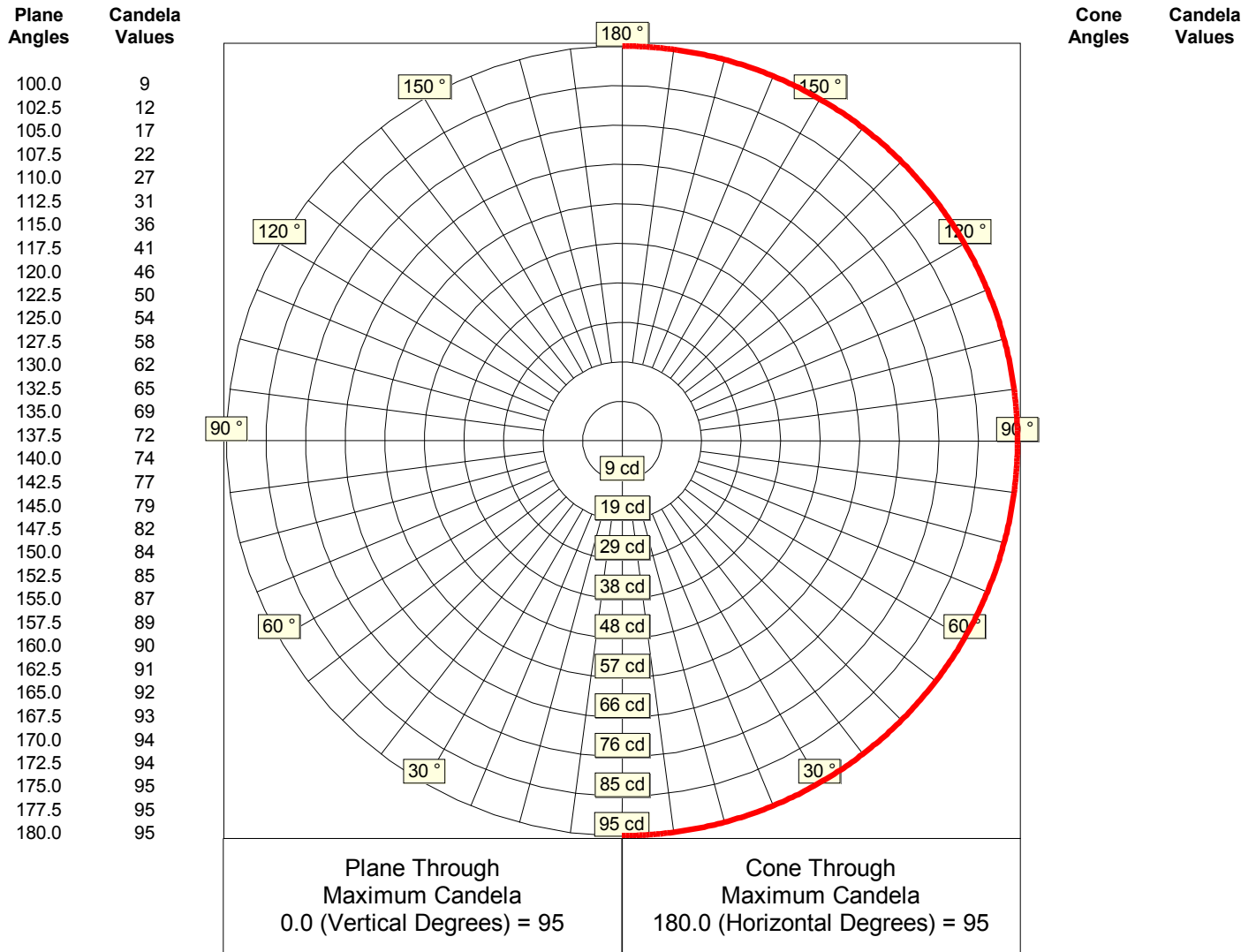


Photometric Report: S2402132-R1

Prepared for: Studio d'Armes Inc. · Test Date: 13 February 2024

Luminaire: RA Line Medium · Lumcat: RA-LI-B-CTGO-40K-120V

Luminous Intensity - Polar Curve for each Plane(2)





IES File Headers

IESNA:LM-63:2019
[ISSUEDATE] 13 February 2024
[TESTLAB] Spectra Lux
[TEST] S2402132-R1
[MANUFAC] Studio d'Armes Inc.
[LUMCAT] RA-LI-B-CTGO-40K-120V
[LUMINAIRE] RA Line Medium
[LAMP] Clusters of Mixed Color LEDs c/w ERP Driver PSB30W-1050-27 @ 120.00V
[_BURNING] Vertical Base Up & Down (907 Luminaire Lumens)
[_OPTICS] Up & Down LEDs Module
[_LENS] Clear Cylindrical Borosilicate Tube
[_HOUSING] (2) Cylindrical Holders
[_NOMINAL COLOR] 4000 K
[_DRIVE CURRENT] 1000 mA

Candela Table

Lateral Angles

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
V e r t i c a l	0.0	95	95	95	95	95	95	95	95
	2.5	95	95	95	95	95	95	95	95
	5.0	95	94	95	95	95	95	94	95
	7.5	94	94	94	95	95	94	94	94
	10.0	94	94	94	95	94	94	94	94
	12.5	93	93	94	94	94	94	93	93
	15.0	92	92	93	94	94	93	92	92
	17.5	91	91	93	94	94	93	91	91
	20.0	90	90	92	93	93	92	90	90
	22.5	89	89	91	93	93	91	89	89
	25.0	87	88	90	93	93	90	88	87
	27.5	85	86	89	92	92	89	86	85
	30.0	84	85	88	92	93	88	85	84
	32.5	82	83	87	91	93	87	83	82
	35.0	79	81	86	91	92	86	81	79
	37.5	77	79	85	90	92	85	79	77
	40.0	74	77	84	90	92	84	77	74
	42.5	72	75	83	89	92	83	75	72
	45.0	69	73	82	89	91	82	73	69
	47.5	65	70	80	88	91	80	70	65
A n g l e s	50.0	62	67	79	88	91	88	79	62
	52.5	58	65	78	87	90	87	78	58
	55.0	54	62	76	87	90	87	76	54
	57.5	50	59	75	86	90	86	75	50
	60.0	46	56	74	86	90	86	74	46
	62.5	41	53	73	85	90	85	73	41
	65.0	36	50	71	85	89	85	71	36
	67.5	31	47	70	85	89	85	70	31
	70.0	27	44	70	84	89	84	70	27
	72.5	22	42	68	84	89	84	68	22
	75.0	17	39	67	83	88	83	67	17
	77.5	12	37	67	84	88	84	67	12
	80.0	9	35	66	83	88	83	66	9
	82.5	6	34	66	83	88	83	66	6
	85.0	4	33	65	82	88	82	65	4
	87.5	3	32	65	83	87	83	65	3
	90.0	3	32	65	83	87	83	65	3



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Lateral Angles

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	
V e r t i c a l	92.5	3	32	65	83	87	83	65	32	3
	95.0	4	33	65	82	88	82	65	33	4
	97.5	6	34	66	83	88	83	66	34	6
	100.0	9	35	66	83	88	83	66	35	9
	102.5	12	37	67	84	88	84	67	37	12
	105.0	17	39	67	83	88	83	67	39	17
	107.5	22	42	68	84	89	84	68	42	22
	110.0	27	44	70	84	89	84	70	44	27
	112.5	31	47	70	85	89	85	70	47	31
	115.0	36	50	71	85	89	85	71	50	36
	117.5	41	53	73	85	90	85	73	53	41
	120.0	46	56	74	86	90	86	74	56	46
	122.5	50	59	75	86	90	86	75	59	50
	125.0	54	62	76	87	90	87	76	62	54
	127.5	58	65	78	87	90	87	78	65	58
	130.0	62	67	79	88	91	88	79	67	62
	132.5	65	70	80	88	91	88	80	70	65
	A n g l e s	135.0	69	73	82	89	91	89	82	73
137.5		72	75	83	89	92	89	83	75	72
140.0		74	77	84	90	92	90	84	77	74
142.5		77	79	85	90	92	90	85	79	77
145.0		79	81	86	91	92	91	86	81	79
147.5		82	83	87	91	93	91	87	83	82
150.0		84	85	88	92	93	92	88	85	84
152.5		85	86	89	92	93	92	89	86	85
155.0		87	88	90	93	94	93	90	88	87
157.5		89	89	91	93	94	93	91	89	89
160.0		90	90	92	93	94	93	92	90	90
162.5		91	91	93	94	94	94	93	91	91
165.0		92	92	93	94	94	94	93	92	92
167.5		93	93	94	94	94	94	94	93	93
170.0		94	94	94	94	95	94	94	94	94
172.5		94	94	94	95	95	95	94	94	94
175.0		95	94	95	95	95	95	95	94	95
177.5		95	95	95	95	95	95	95	95	95
180.0	95	95	95	95	95	95	95	95	95	