



# Spectra Lux

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



Lab Code: 200899-0

## Moving Mirror Goniophotometer Test Report

**Standard(s):** IES LM-63, IES LM-79, ANSI C82.77

**Customer** ANDlight, 1951 Franklin St., Vancouver, British Columbia , Canada, V5L 0C7

General Information		Lamp Details: CY4420		Driver Details: CY2018	
<b>DUT Lab ID</b>	SRIS 3021-8	<b>Seasoning</b>	0 Hour	<b>Type</b>	LED Power Supply
<b>Lamp Type</b>	LED/SSL	<b>Test Product</b>	VAL-P-41	<b>Manufacturer</b>	Meanwell
<b>Current Mode</b>	AC	<b>Manufacturer</b>	EPISTAR	<b>Catalog No.</b>	IDLV-45-24
<b>Test Report</b>	S2008253-R1	<b>Lamp Catalog No.</b>	4100K	<b>Maximum Power</b>	45 W
<b>Test Date</b>	25 August 2020	<b>Drive Current</b>	18 mA	<b>Input Voltage</b>	120.00 V
<b>Report Date</b>	23 November 2020	<b>Nominal Color</b>	4100 K	<b>Operating Frequency</b>	60 Hz
<b>Ambient</b>	25.9 °C	<b>Burning Position</b>	Junction Horizontal	<b>Input Power</b>	22.29 W

### Luminaire Data

General Information		Optics		Aperture (feet)	
<b>Manufacturer</b>	AndLight	<b>Reflector</b>	None	<b>X</b>	0.6875
<b>Name</b>	VALE	<b>Housing</b>	Aluminum Frame	<b>Y</b>	3.3333
<b>Catalog No.</b>	VAL-P-41	<b>Lens</b>	Up & Down Prismatic Acrylic Diffuser	<b>Z</b>	0.5000

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	iRDC	CIF-3000A	974998	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	27E116584	2020/07/22	2021/09/22
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	110802	2019/09/05	2020/09/05

### Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504176	2020/07/16	2021/07/16

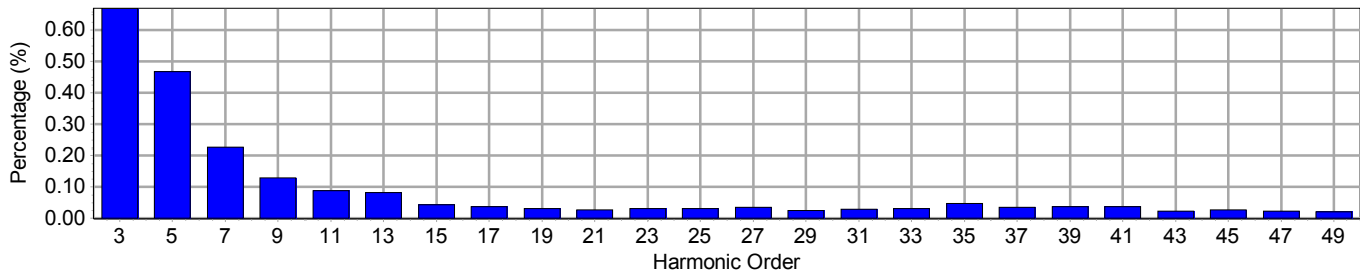


## Electrical Measurements

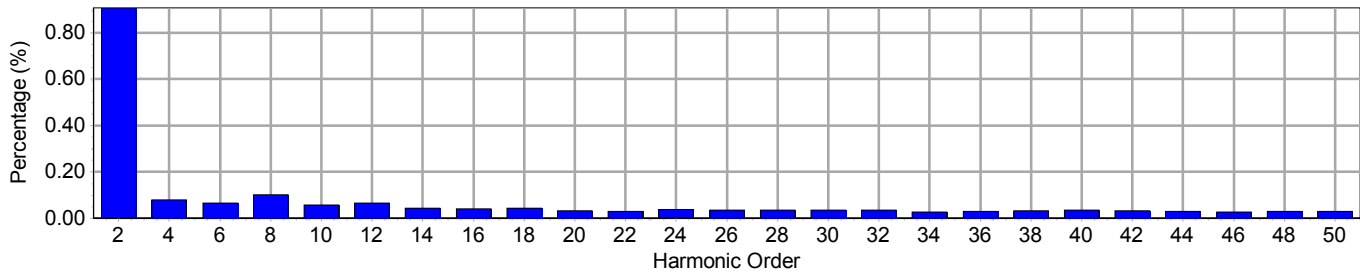
### Input

Frequency	60 Hz	Active Power	22.29 W	THDV [ANSI]	1.28 %
Voltage	120.3 V(rms)	Apparent Power	23.14 VA	THDA [ANSI]	8.87 %
Current	0.1923 A(rms)	Power Factor	0.963	Max. Harmonic At	3rd order

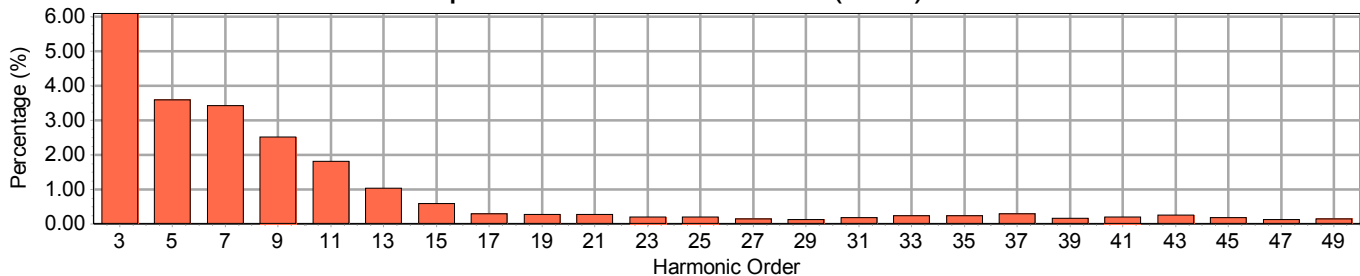
### Input Voltage Harmonics (Odd)



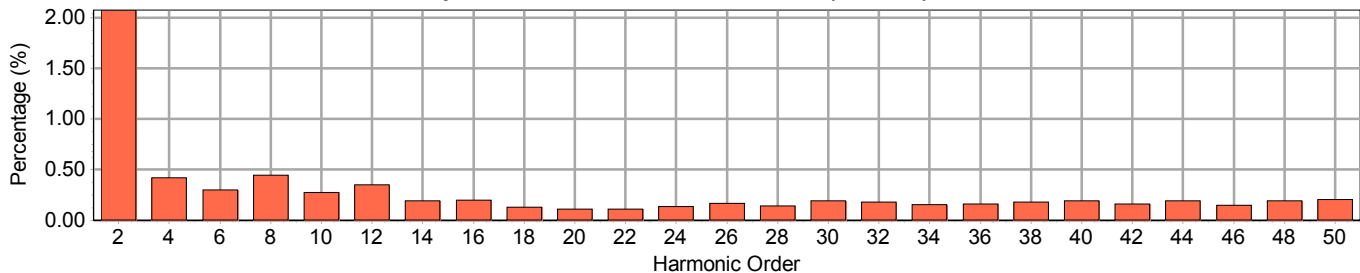
### Input Voltage Harmonics (Even)



### 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	0.908	2.080
3	180	0.669	6.102	4	240	0.079	0.422
5	300	0.466	3.585	6	360	0.065	0.298
7	420	0.228	3.428	8	480	0.101	0.448
9	540	0.129	2.507	10	600	0.055	0.275
11	660	0.088	1.805	12	720	0.064	0.350
13	780	0.082	1.038	14	840	0.043	0.195
15	900	0.044	0.577	16	960	0.040	0.201
17	1020	0.037	0.285	18	1080	0.043	0.132
19	1140	0.032	0.265	20	1200	0.032	0.109
21	1260	0.028	0.260	22	1320	0.030	0.113
23	1380	0.032	0.188	24	1440	0.038	0.137
25	1500	0.032	0.200	26	1560	0.035	0.170
27	1620	0.035	0.133	28	1680	0.034	0.143
29	1740	0.025	0.122	30	1800	0.036	0.195
31	1860	0.029	0.173	32	1920	0.035	0.183
33	1980	0.032	0.224	34	2040	0.026	0.156
35	2100	0.047	0.223	36	2160	0.029	0.160
37	2220	0.035	0.285	38	2280	0.032	0.183
39	2340	0.037	0.162	40	2400	0.035	0.190
41	2460	0.038	0.190	42	2520	0.031	0.161
43	2580	0.024	0.252	44	2640	0.028	0.195
45	2700	0.028	0.167	46	2760	0.026	0.146
47	2820	0.023	0.123	48	2880	0.028	0.194
49	2940	0.022	0.138	50	3000	0.030	0.203



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## Photometric Report: S2008253-R1

Prepared for: ANDlight · Test Date: 25 August 2020

Luminaire: VALE · Lumcat: VAL-P-41

### 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		105	99	94	90	97	92	87	83	89	85	81	77	71	68	66	48	46	45	40
2		95	86	78	72	87	79	73	67	80	73	68	63	62	57	54	41	39	37	32
3		87	75	66	59	80	69	62	55	73	64	57	52	54	49	45	36	33	31	27
4		79	66	57	50	73	61	53	47	66	57	49	44	48	42	38	32	29	26	23
5		72	59	49	42	67	54	46	40	61	50	43	37	43	37	32	29	26	23	20
6		67	52	43	36	61	49	40	34	56	45	38	32	38	32	28	26	23	20	17
7		61	47	38	32	57	44	36	30	52	41	33	28	35	29	25	24	20	18	15
8		57	43	34	28	52	40	32	26	48	37	30	25	32	26	22	22	18	16	13
9		53	39	30	25	49	36	29	23	45	34	27	22	29	23	19	20	17	14	12
10		49	36	27	22	46	33	26	21	42	31	24	20	27	21	17	19	15	13	11

### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0 - 10	21	1.50	1.50
10 - 20	59	4.25	4.25
20 - 30	89	6.42	6.42
30 - 40	108	7.79	7.79
40 - 50	114	8.24	8.24
50 - 60	107	7.67	7.67
60 - 70	88	6.33	6.33
70 - 80	63	4.55	4.55
80 - 90	45	3.24	3.24
90 - 120	196	14.12	14.12
90 - 130	303	21.80	21.80
90 - 150	525	37.83	37.83
90 - 180	694	50.00	50.00
0 - 180	1388	100.00	100.00

### Average Luminance (Cd/m<sup>2</sup>)

Angle	0 Degree	45 Degree	90 Degree
45.0	268	256	268
55.0	288	246	253
65.0	323	242	247
75.0	324	260	286
85.0	293	590	659

Luminaire Luminous Flux: 1388

Measured Input Power: 22.29 W

Total Luminaire Efficiency: N/A

Luminaire Luminous Efficacy: 62.3 lm/W

Luminaire Spacing Criterion (0 Degree): 1.2257

Luminaire Spacing Criterion (90 Degree): 1.2570

Category: Up and Down

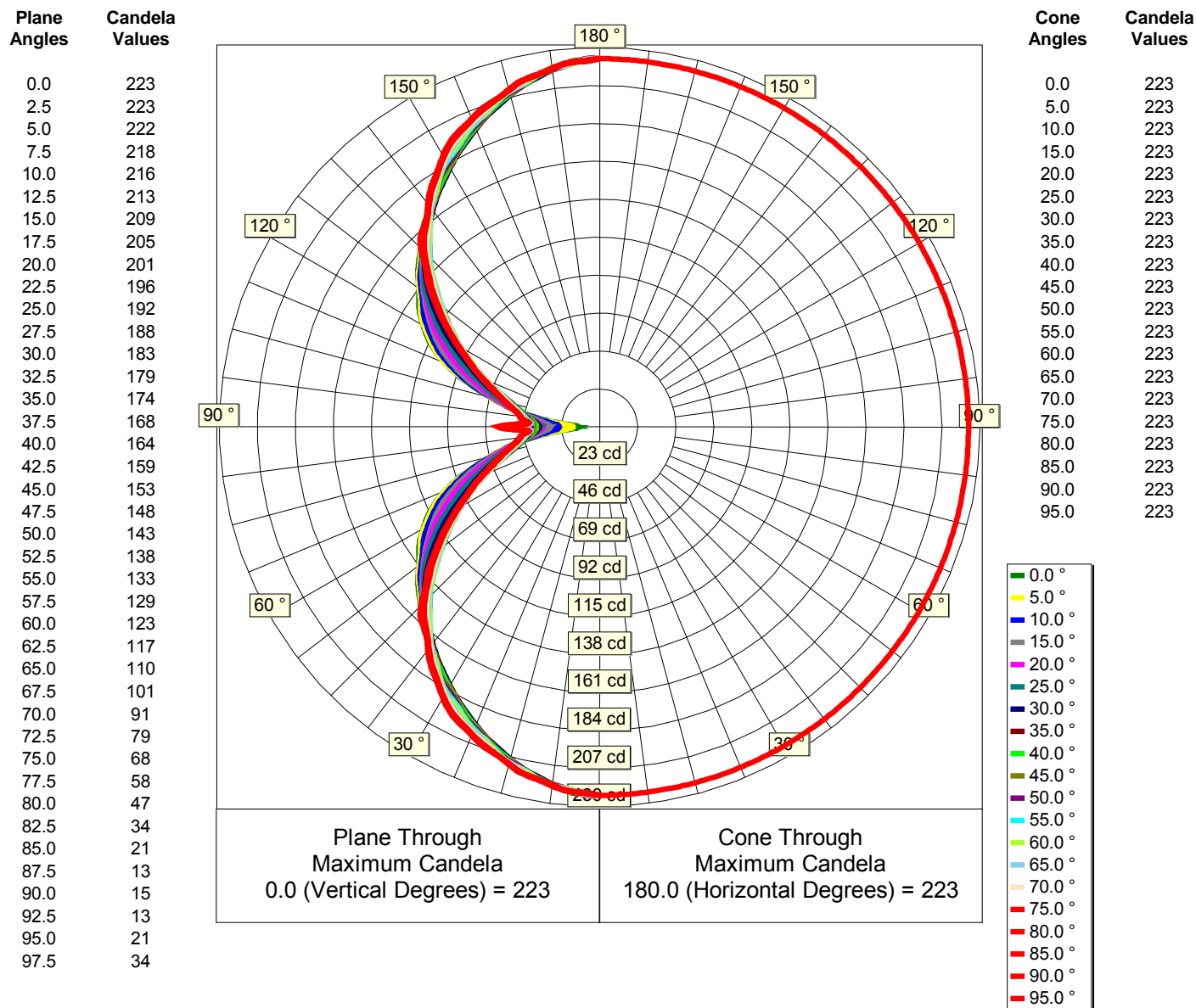


## Photometric Report: S2008253-R1

Prepared for: ANDlight · Test Date: 25 August 2020

Luminaire: VALE · Lumcat: VAL-P-41

### Luminous Intensity - Polar Curve for each Plane(1)





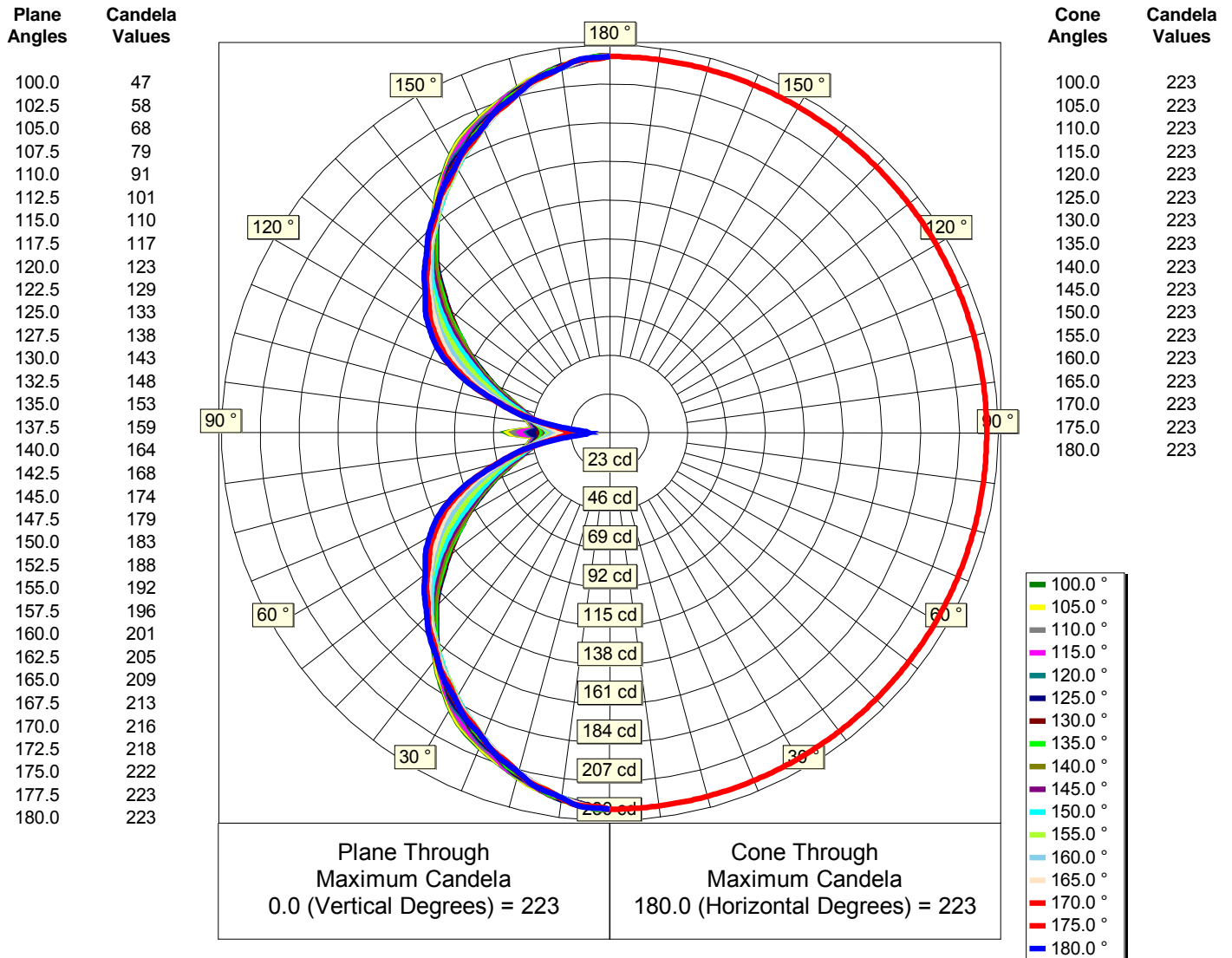


## Photometric Report: S2008253-R1

Prepared for: ANDlight · Test Date: 25 August 2020

Luminaire: VALE · Lumcat: VAL-P-41

### Luminous Intensity - Polar Curve for each Plane(2)







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## IES File Headers

IESNA:LM-63  
[ISSUEDATE] 25 August 2020  
[TESTLAB] Spectra Lux  
[TEST] S2008253-R1  
[MANUFAC] AndLight  
[LUMCAT] VAL-P-41  
[LUMINAIRE] VALE  
[LAMP] Clusters of EPISTAR 4100K LEDs c/w Meanwell Driver IDLV-45-24 @ 120.00V  
[\_BURNING] Horizontal (1,388 Luminaire Lumens)  
[\_REFLECTOR] None  
[\_LENS] Up & Down Prismatic Acrylic Diffuser  
[\_HOUSING] Aluminum Frame  
[\_NOMINAL COLOR] 4100 K  
[\_DRIVE CURRENT] 18 mA

## Candela Table

### Lateral Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
Vertical Angles	0.0	223	223	223	223	223	223	223	223	223
	2.5	223	222	222	222	222	222	223	222	223
	5.0	222	222	222	221	221	221	220	221	220
	7.5	218	219	219	218	219	218	218	218	218
	10.0	216	215	215	216	215	215	216	216	217
	12.5	213	213	213	212	212	212	212	212	212
	15.0	209	209	209	208	208	209	208	209	209
	17.5	205	204	204	204	204	204	205	205	206
	20.0	201	201	201	200	201	200	200	200	200
	22.5	196	197	196	196	196	195	196	196	197
	25.0	192	192	191	191	191	191	191	192	193
	27.5	188	188	187	187	187	186	186	186	187
	30.0	183	183	182	182	182	181	181	182	183
	32.5	179	178	177	177	176	176	177	177	178
	35.0	174	174	173	172	172	171	171	172	172
Angular	37.5	168	168	168	167	166	166	166	167	167
	40.0	164	163	162	162	161	160	161	161	161
	42.5	159	159	158	156	156	155	155	154	153
	45.0	153	153	152	151	150	149	149	147	146
	47.5	148	147	146	146	144	143	142	140	139
	50.0	143	143	142	140	139	137	134	132	130
	52.5	138	138	136	134	133	132	129	126	122
	55.0	133	132	131	128	127	124	121	118	114
	57.5	129	128	126	123	121	117	113	109	104
	60.0	123	123	120	117	114	109	104	101	98
	62.5	117	116	113	110	106	100	95	92	90
	65.0	110	110	107	103	98	92	87	85	82
	67.5	101	101	98	95	90	84	79	77	75
	70.0	91	91	88	86	81	76	72	70	68
	72.5	79	79	78	76	72	69	65	63	60
	75.0	68	68	67	66	64	62	58	56	54
	77.5	58	58	56	56	56	54	52	50	50
	80.0	47	47	46	47	49	48	47	46	46
	82.5	34	35	36	39	43	44	43	43	43
	85.0	21	24	29	35	38	40	40	40	41
	87.5	13	17	25	31	35	37	37	38	40
	90.0	15	16	24	30	34	35	36	37	40



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## Lateral Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	
V e r t i c a l	92.5	13	17	25	31	35	37	37	38	39	40
	95.0	21	24	29	35	38	40	40	40	40	41
	97.5	34	35	36	39	43	44	43	43	43	43
	100.0	47	47	46	47	49	48	47	46	46	46
	102.5	58	58	56	56	56	54	52	50	50	50
	105.0	68	68	67	66	64	62	58	56	55	54
	107.5	79	79	78	76	72	69	65	63	61	60
	110.0	91	91	88	86	81	76	72	70	68	68
	112.5	101	101	98	95	90	84	79	77	76	75
	115.0	110	110	107	103	98	92	87	85	83	82
	117.5	117	116	113	110	106	100	95	92	91	90
	120.0	123	123	120	117	114	109	104	101	98	98
	122.5	129	128	126	123	121	117	113	109	106	104
	125.0	133	132	131	128	127	124	121	118	115	114
	127.5	138	138	136	134	133	132	129	126	124	122
	130.0	143	143	142	140	139	139	137	134	132	130
	132.5	148	147	146	146	144	144	143	142	140	139
	135.0	153	153	152	151	150	150	149	149	147	146
	137.5	159	159	158	156	156	155	155	155	154	153
	140.0	164	163	162	162	161	160	160	161	161	161
A n g l e s	142.5	168	168	168	167	166	166	166	166	167	167
	145.0	174	174	173	172	172	172	171	171	172	172
	147.5	179	178	177	177	176	176	176	177	177	178
	150.0	183	183	182	182	182	181	181	181	182	183
	152.5	188	188	187	187	187	187	186	186	186	187
	155.0	192	192	191	191	191	191	191	191	192	193
	157.5	196	197	196	196	196	196	195	196	196	197
	160.0	201	201	201	200	201	200	200	200	200	200
	162.5	205	204	204	204	204	204	204	205	205	206
	165.0	209	209	209	208	208	209	208	209	209	209
167.5	213	213	213	212	212	212	212	212	212	212	
170.0	216	215	215	216	215	215	215	216	216	217	
172.5	218	219	219	218	219	219	218	218	218	218	
175.0	222	222	222	221	221	221	221	220	221	220	
177.5	223	222	222	222	222	222	222	223	222	223	
180.0	223	223	223	223	223	223	223	223	223	223	



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## Lateral Angles

	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0
V e r t i c a l	0.0	223	223	223	223	223	223	223	223	223
	2.5	223	222	222	223	222	222	222	222	222
	5.0	220	220	220	220	221	221	221	221	221
	7.5	219	219	220	219	219	219	219	219	219
	10.0	217	216	216	217	217	216	217	217	217
	12.5	212	213	213	214	214	215	215	215	215
	15.0	210	210	211	210	211	211	212	211	212
	17.5	206	206	207	208	208	208	208	208	208
	20.0	201	202	202	203	204	205	205	206	206
	22.5	197	198	199	200	200	201	202	202	202
	25.0	193	194	194	196	197	198	199	199	199
	27.5	188	189	190	191	193	194	195	195	195
	30.0	184	185	186	187	187	188	189	190	189
	32.5	179	179	180	181	181	182	183	183	183
	35.0	173	173	173	174	175	176	177	178	177
	37.5	167	167	167	167	168	169	170	171	170
	40.0	160	159	160	161	161	162	163	164	163
	42.5	152	152	152	153	155	157	158	159	159
	45.0	145	145	146	146	148	150	151	152	153
A n g l e s	47.5	138	137	137	138	139	140	142	142	143
	50.0	129	128	128	129	130	133	134	135	136
	52.5	121	120	121	122	122	124	125	125	126
	55.0	112	112	113	114	114	115	116	117	117
	57.5	105	104	105	106	106	107	107	108	108
	60.0	97	97	97	97	97	98	99	99	100
	62.5	90	89	89	90	89	90	91	91	91
	65.0	82	81	81	82	82	83	84	84	84
	67.5	74	74	74	74	75	76	76	76	77
	70.0	67	67	67	68	68	69	70	70	71
	72.5	60	60	61	62	62	63	64	65	65
	75.0	55	56	56	57	58	59	59	59	60
	77.5	51	51	52	53	53	54	55	55	55
	80.0	47	48	48	49	50	50	51	51	51
	82.5	44	45	46	46	47	48	48	49	48
	85.0	42	43	44	45	45	46	46	46	46
	87.5	41	42	43	43	44	45	45	45	45
	90.0	42	47	49	53	57	60	61	60	62
	92.5	41	42	43	43	44	45	45	45	45
	95.0	42	43	44	45	45	45	46	46	46
	97.5	44	45	46	46	47	48	48	48	49
	100.0	47	48	48	49	50	50	51	51	51
	102.5	51	51	52	53	53	54	55	55	55
	105.0	55	56	56	57	58	59	59	59	60
	107.5	60	60	61	62	62	63	64	65	65
	110.0	67	67	67	68	68	69	70	70	71
	112.5	74	74	74	74	75	76	76	76	77
	115.0	82	81	81	82	82	83	84	84	84
	117.5	90	89	89	90	89	90	91	91	91
	120.0	97	97	97	97	97	98	99	99	100
	122.5	105	104	105	106	106	107	107	108	108
	125.0	112	112	113	114	114	115	116	117	117
	127.5	121	120	121	122	122	124	125	125	126
	130.0	129	128	128	129	130	133	134	135	136
	132.5	138	137	137	138	139	140	142	142	143



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## Lateral Angles

	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	
V e r t i c a l	135.0	145	145	146	146	148	150	151	152	153	152
	137.5	152	152	152	153	155	157	158	159	160	159
	140.0	160	159	160	161	161	162	163	163	164	163
	142.5	167	167	167	167	168	169	170	170	171	170
	145.0	173	173	173	174	175	176	177	177	178	177
	147.5	179	179	180	181	181	182	183	183	183	183
	150.0	184	185	186	187	187	188	189	189	190	189
	152.5	188	189	190	191	193	194	194	195	195	195
	155.0	193	194	194	196	197	198	199	199	199	199
	157.5	197	198	199	200	200	201	202	202	202	202
	160.0	201	202	202	203	204	205	205	206	206	206
	162.5	206	206	207	208	208	208	208	208	208	208
	165.0	210	210	211	210	211	211	212	211	212	211
	167.5	212	213	213	214	214	215	215	215	215	215
	170.0	217	216	216	217	217	216	217	217	217	217
	172.5	219	219	220	219	219	219	219	219	219	219
	175.0	220	220	220	220	221	221	221	221	221	221
	177.5	223	222	222	223	222	222	222	222	222	222
	180.0	223	223	223	223	223	223	223	223	223	223
A n g l e s											



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Lab Code: 200899-0

## Lateral Angles

	100.0	105.0	110.0	115.0	120.0	125.0	130.0	135.0	140.0	145.0
V e r t i c a l	0.0	223	223	223	223	223	223	223	223	223
	2.5	222	222	222	223	222	222	223	223	222
	5.0	221	221	221	220	220	220	220	220	221
	7.5	219	219	219	219	220	219	219	218	218
	10.0	217	216	217	217	216	216	217	217	216
	12.5	215	215	214	214	213	213	212	212	212
	15.0	212	211	211	210	211	210	210	209	209
	17.5	208	208	208	208	207	206	206	206	205
	20.0	205	205	204	203	202	202	201	200	200
	22.5	202	201	200	200	199	198	197	197	196
	25.0	199	198	197	196	194	194	193	193	192
	27.5	194	194	193	191	190	189	188	187	186
	30.0	189	188	187	187	186	185	184	183	182
	32.5	183	182	181	181	180	179	179	178	177
	35.0	177	176	175	174	173	173	173	172	172
	37.5	170	169	168	167	167	167	167	167	167
	40.0	163	162	161	161	160	159	160	161	161
	42.5	158	157	155	153	152	152	152	153	154
	45.0	151	150	148	146	146	145	145	146	147
A n g l e s	47.5	142	140	139	138	137	137	138	139	140
	50.0	134	133	130	129	128	128	129	130	132
	52.5	125	124	122	122	121	120	121	122	124
	55.0	116	115	114	114	113	112	112	114	115
	57.5	107	107	106	106	105	104	105	104	106
	60.0	99	98	97	97	97	97	97	98	98
	62.5	91	90	89	90	89	89	90	90	91
	65.0	84	83	82	82	81	81	82	82	83
	67.5	76	76	75	74	74	74	74	75	76
	70.0	70	69	68	68	67	67	67	68	68
	72.5	64	63	62	62	61	60	60	60	61
	75.0	59	59	58	57	56	56	55	54	55
	77.5	55	54	53	53	52	51	51	50	50
	80.0	51	50	50	49	48	48	47	46	46
	82.5	48	48	47	46	46	45	44	43	43
	85.0	46	45	45	45	44	43	42	41	40
	87.5	45	45	44	43	43	42	41	40	39
	90.0	61	60	57	53	49	47	42	40	38
	92.5	45	45	44	43	43	42	41	40	39
	95.0	46	45	45	45	44	43	42	41	40
	97.5	48	48	47	46	46	45	44	43	43
	100.0	51	50	50	49	48	48	47	46	46
	102.5	55	54	53	53	52	51	51	50	50
	105.0	59	59	58	57	56	56	55	54	55
	107.5	64	63	62	62	61	60	60	60	61
	110.0	70	69	68	68	67	67	67	68	68
	112.5	76	76	75	74	74	74	74	75	76
	115.0	84	83	82	82	81	81	82	82	83
	117.5	91	90	89	90	89	89	90	90	91
	120.0	99	98	97	97	97	97	97	98	98
	122.5	107	107	106	106	105	104	105	104	106
	125.0	116	115	114	114	113	112	112	114	115
	127.5	125	124	122	122	121	120	121	122	124
	130.0	134	133	130	129	128	128	129	130	132
	132.5	142	140	139	138	137	137	138	139	140



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## Lateral Angles

	100.0	105.0	110.0	115.0	120.0	125.0	130.0	135.0	140.0	145.0
135.0	151	150	148	146	146	145	145	146	147	149
137.5	158	157	155	153	152	152	152	153	154	155
140.0	163	162	161	161	160	159	160	161	161	161
142.5	170	169	168	167	167	167	167	167	167	166
145.0	177	176	175	174	173	173	173	172	172	171
147.5	183	182	181	181	180	179	179	178	177	177
150.0	189	188	187	187	186	185	184	183	182	181
152.5	194	194	193	191	190	189	188	187	186	186
155.0	199	198	197	196	194	194	193	193	192	191
157.5	202	201	200	200	199	198	197	197	196	196
160.0	205	205	204	203	202	202	201	200	200	200
162.5	208	208	208	208	207	206	206	206	205	205
165.0	212	211	211	210	211	210	210	209	209	209
167.5	215	215	214	214	213	213	212	212	212	212
170.0	217	216	217	217	216	216	217	217	216	216
172.5	219	219	219	219	220	219	219	218	218	218
175.0	221	221	221	220	220	220	220	220	221	220
177.5	222	222	222	223	222	222	223	223	222	223
180.0	223	223	223	223	223	223	223	223	223	223

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### Lateral Angles

	150.0	155.0	160.0	165.0	170.0	175.0	180.0
V e r t i c a l	0.0	223	223	223	223	223	223
	2.5	222	222	222	222	222	223
	5.0	221	221	221	221	222	222
	7.5	218	219	219	218	219	218
	10.0	215	215	215	216	215	216
	12.5	212	212	212	212	213	213
	15.0	208	209	208	208	209	209
	17.5	204	204	204	204	204	205
	20.0	200	200	201	200	201	201
	22.5	195	196	196	196	197	196
	25.0	191	191	191	191	192	192
	27.5	186	187	187	187	188	188
	30.0	181	181	182	182	183	183
	32.5	176	176	176	177	178	179
	35.0	171	172	172	172	173	174
	37.5	166	166	166	167	168	168
	40.0	160	160	161	162	163	164
	42.5	155	155	156	156	158	159
	45.0	149	150	150	151	152	153
	47.5	143	144	144	146	147	148
A n g l e s	50.0	137	139	139	140	142	143
	52.5	129	132	133	134	136	138
	55.0	121	124	127	128	131	133
	57.5	113	117	121	123	126	129
	60.0	104	109	114	117	120	123
	62.5	95	100	106	110	113	117
	65.0	87	92	98	103	107	110
	67.5	79	84	90	95	98	101
	70.0	72	76	81	86	88	91
	72.5	65	69	72	76	78	79
	75.0	58	62	64	66	67	68
	77.5	52	54	56	56	56	58
	80.0	47	48	49	47	46	47
	82.5	43	44	43	39	36	34
	85.0	40	40	38	35	29	21
	87.5	37	37	35	31	25	17
	90.0	36	35	34	30	24	16
	92.5	37	37	35	31	25	17
	95.0	40	40	38	35	29	24
	97.5	43	44	43	39	36	35
	100.0	47	48	49	47	46	47
	102.5	52	54	56	56	56	58
	105.0	58	62	64	66	67	68
	107.5	65	69	72	76	78	79
	110.0	72	76	81	86	88	91
	112.5	79	84	90	95	98	101
	115.0	87	92	98	103	107	110
	117.5	95	100	106	110	113	116
	120.0	104	109	114	117	120	123
	122.5	113	117	121	123	126	128
	125.0	121	124	127	128	131	132
	127.5	129	132	133	134	136	138
	130.0	137	139	139	140	142	143
	132.5	143	144	144	146	146	147





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## Lateral Angles

	150.0	155.0	160.0	165.0	170.0	175.0	180.0
V e r t i c a l	135.0	149	150	150	151	152	153
	137.5	155	155	156	156	158	159
	140.0	160	160	161	162	162	163
	142.5	166	166	166	167	168	168
	145.0	171	172	172	172	173	174
	147.5	176	176	176	177	178	179
	150.0	181	181	182	182	183	183
	152.5	186	187	187	187	188	188
	155.0	191	191	191	191	192	192
	157.5	195	196	196	196	197	196
	160.0	200	200	201	200	201	201
	162.5	204	204	204	204	204	205
	165.0	208	209	208	208	209	209
	167.5	212	212	212	213	213	213
	170.0	215	215	215	216	215	216
	172.5	218	219	219	218	219	218
	175.0	221	221	221	221	222	222
	177.5	222	222	222	222	222	223
	180.0	223	223	223	223	223	223
A n g l e s							