

# Report of Test LL18267

Empyrean Lighting 300 W Spigot Mount Park Light. Product ID: AndromedaXPB-Park-300W-L42B.

Extruded and cast aluminium body with black finish, extent ~ 825 x 464 x 195 mm deep.

luminous volume of ~ 605 x 285 x 5 mm deep.

Array of 180 LEDs each with a clear "hemispherical" lens centred ~ 150 mm above L/V.

Two Andromeda AndromedaLDC-150W-0500mA 100-240V~ 50/60Hz electronic drivers.

Tested at 240 V 50 Hz, LED opening surround horizontal, C270 half plane through spigot.

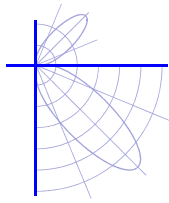


## Performance Summary

Luminous flux	33634 lm
Total Luminaire Power (LCP)	283.2 W
Luminous Efficacy	119 lm/W

**PREPARED FOR : Empyrean Lighting, Birtinya. QLD. 4575.**





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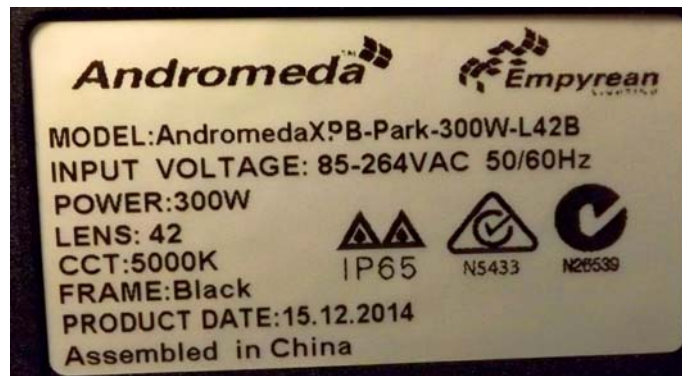
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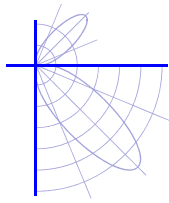
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**LM-79 Performance Data**

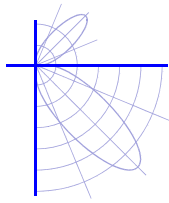
<b>Spectral</b>	CIE 1931 (x, y) <sup>(1)</sup>	(0.347, 0.359)
	CIE 1976 (u', v') <sup>(1)</sup>	(0.210, 0.488)
	Correlated Colour Temperature (CCT) <sup>(1)</sup>	4950 K
	Colour Spatial Uniformity <sup>(2)</sup>	0.0162
	Colour Rendering Index (Ra) <sup>(1)</sup>	67
	Special CRI 9 (R <sub>g</sub> ) <sup>(1),(3)</sup>	-31
	Distance from Planckian Locus (Duv) <sup>(1),(3)</sup>	0.0026
	Scotopic/Photopic Ratio <sup>(1),(3)</sup>	1.64
<b>Electrical</b>	Voltage	240 V
	Frequency	50 Hz
	Current	1.220 A
	Power	283.2 W
	Power Factor	0.97
	Current THD	7.8 %

Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer

(1) Value is computed from the weighted average of the spatial measurements

(2) Value is the maximum deviation of the spatial u' and v' measurements from the weighted average

(3) Quantity is in addition to the scope of IESNA LM-79-08



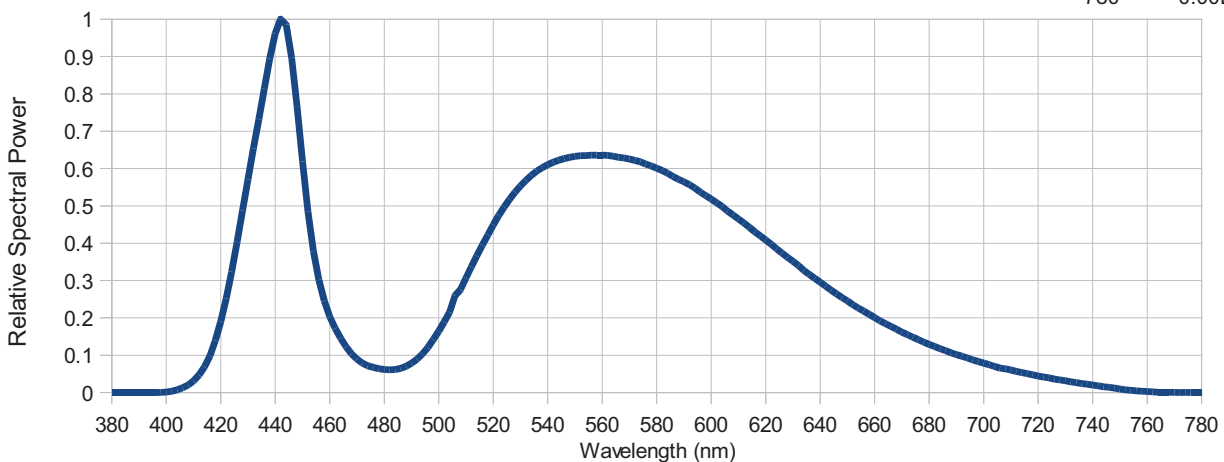
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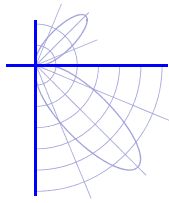
**LM-79 Performance Data**

**Summary Relative Spectral Irradiance Distribution (wavelength – nm, irradiance – relative to peak = 1)**

380	0.00E+00	480	6.17E-02	580	6.01E-01	680	1.29E-01
385	0.00E+00	485	6.32E-02	585	5.83E-01	685	1.15E-01
390	0.00E+00	490	7.83E-02	590	5.64E-01	690	1.02E-01
395	0.00E+00	495	1.12E-01	595	5.42E-01	695	9.01E-02
400	1.38E-03	500	1.64E-01	600	5.18E-01	700	7.86E-02
405	9.97E-03	505	2.38E-01	605	4.92E-01	705	6.76E-02
410	3.14E-02	510	3.06E-01	610	4.65E-01	710	6.04E-02
415	8.30E-02	515	3.80E-01	615	4.36E-01	715	5.21E-02
420	1.90E-01	520	4.49E-01	620	4.08E-01	720	4.43E-02
425	3.64E-01	525	5.07E-01	625	3.79E-01	725	3.78E-02
430	5.71E-01	530	5.53E-01	630	3.51E-01	730	3.15E-02
435	7.73E-01	535	5.87E-01	635	3.22E-01	735	2.52E-02
440	9.61E-01	540	6.10E-01	640	2.96E-01	740	2.00E-02
445	9.41E-01	545	6.24E-01	645	2.69E-01	745	1.48E-02
450	6.19E-01	550	6.33E-01	650	2.46E-01	750	9.31E-03
455	3.40E-01	555	6.35E-01	655	2.22E-01	755	5.47E-03
460	2.03E-01	560	6.36E-01	660	2.01E-01	760	2.87E-03
465	1.34E-01	565	6.32E-01	665	1.81E-01	765	7.94E-04
470	8.96E-02	570	6.25E-01	670	1.62E-01	770	5.29E-04
475	6.93E-02	575	6.15E-01	675	1.45E-01	775	2.71E-04
						780	0.00E+00



\* The spectral power distribution combines the weighted spectral power distributions of all spatial measurements.



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**LM-79 Performance Data**

**Spatial measurements**

Gamma angle (deg)	CIE 1976 (u',v') coordinates	
	C 0 plane	C 90 plane
0	(0.210, 0.475)	(0.210, 0.476)
5	(0.210, 0.477)	(0.210, 0.477)
10	(0.210, 0.482)	(0.210, 0.482)
15	(0.210, 0.495)	(0.210, 0.487)
20	(0.211, 0.505)	(0.211, 0.494)
25	I <= 10 %	I <= 10 %
-	-	-
-	-	-
-	-	-
-	-	-

**Spatial measurements**

Gamma angle (deg)	CIE 1976 (u',v') coordinates	
	C 0 plane	C 90 plane
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

**Test procedure**

All measurements were performed in an environmentally controlled laboratory employing suitable baffling to minimise stray light. The sample was mounted in its normal operating orientation on a rotating mirror goniophotometer and operated from a stabilised supply. The photometric output was monitored and measurements were performed once stability was achieved.

The goniophotometer was used to measure the spatial distribution of both luminous intensity and, in conjunction with a spectroradiometer and spectrally flat reflectance tile, spectral irradiance. The distribution locus comprises points in two or more C planes at no more than 10° gamma intervals. The CIE (x,y) coordinates and other derived metrics (CIE (u', v'), CCT and CRI) are calculated from the weighted sum (weighted for intensity and represented solid angle) of the measured spectral irradiances.

Sample Orientation	Horizontal	Stabilisation Time	3 hour
		Total Operation Time	3.25 hour

**Equipment and uncertainties**

C-gamma rotating mirror goniophotometer with a test distance of 8 m.

Luminous Intensity	± 4 %	Temperature	± 1 °C
Luminous Flux	± 4 %	Luminous Efficacy	± 4.5 %
C, Gamma Angles	± 0.5°		

PhotoResearch PR-670 spectroradiometer (380 - 780 nm., 2 nm. per pixel) measuring from a spectrally flat reflectance tile attached to goniophotometer arm at a distance from sample deemed >5 times the maximum observed luminous opening dimension.

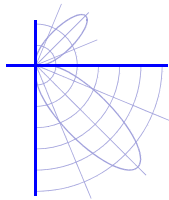
CIE (x, y) coordinates	± 0.004	CCT	± 150 K
CIE (u', v') coordinates	± 0.0025	CRI (Ra)	± 2
Δ (u', v') Colour difference	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Relative Spectral Irradiance *	± 2 %	R9 *	± 2

Yokogawa WT210 power meter connected in circuit to the sample electrical supply

Voltage	± 0.5 %	Frequency *	± 0.1 Hz
Current	± 0.5 %	Power	± 0.5 %
Current THD *	± 3 %	Power Factor	± 0.02

Quantities marked with \* : NATA accreditation does not cover the performance of this service.

IESNA LM-79-08 Calculator v4.9 (23rd Sep 2014)



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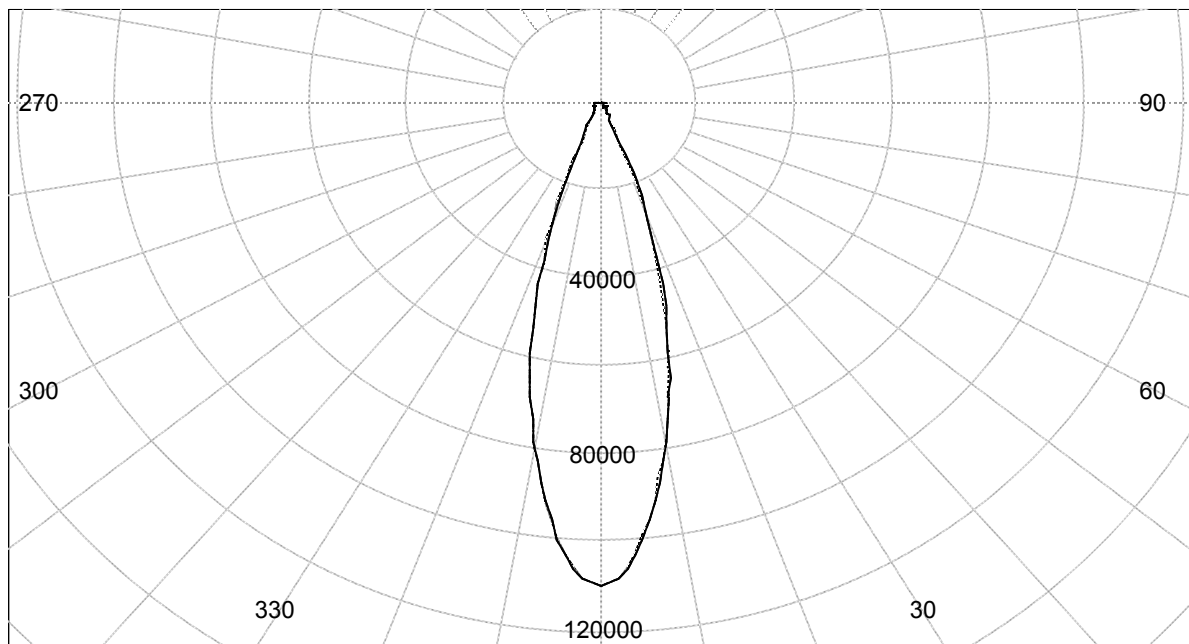
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**Polar Light Distribution Curves**



Kerbside / Downstream C0-Solid, Plane of maximum-Dashed, C90-Grey (cd)

Streetside / Upstream

**Street Lantern Summary:**

Report data as tested.

Percentage Outputs

	Upward	Downward	Total
Street Side	N / A	N / A	N / A
House Side	N / A	N / A	N / A

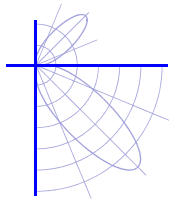
Luminaire Efficiency (Light Output Ratio) N / A

Certified by:

Kevin Monaghan  
Authorised Signatory

Date of test  
Date of report

21-Jan-2015  
27-Jan-2015



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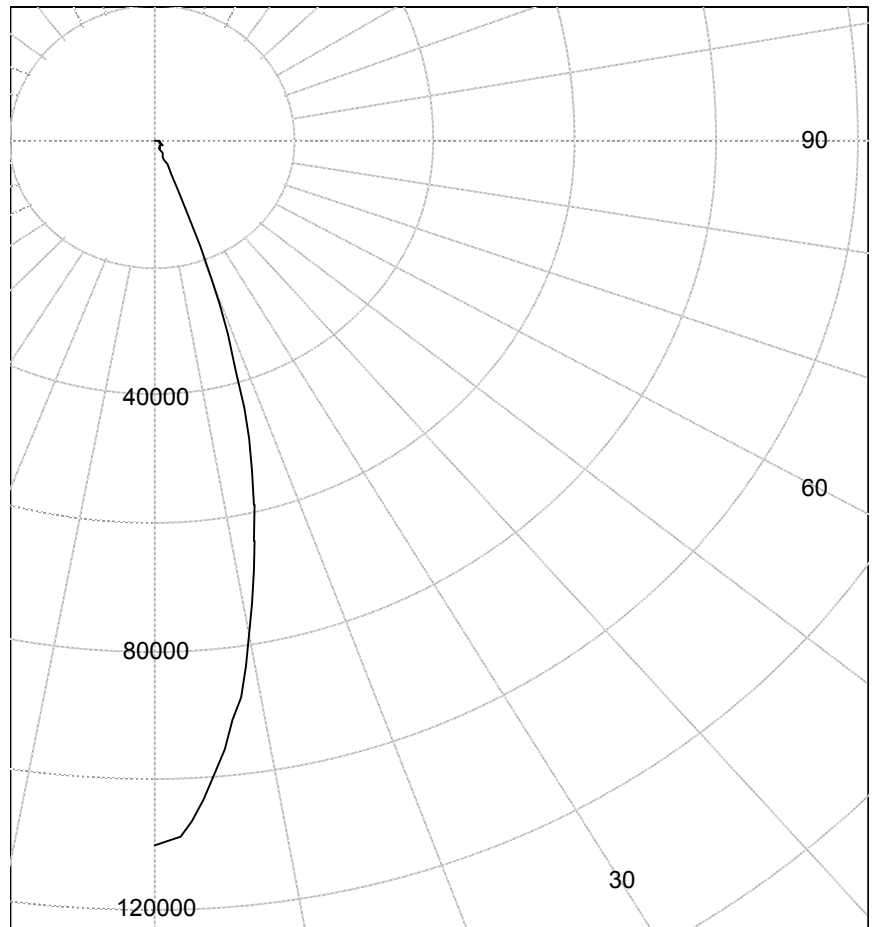
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Intensity  
in principal plane

**Principal Vertical Plane**

Gamma (Degrees)	Intensity (cd)
0.0	110463.2
10.0	79009.1
20.0	27758.1
30.0	2242.6
35.0	1505.1
40.0	1281.2
45.0	1366.1
47.5	1412.4
50.0	1454.9
52.5	1551.4
55.0	1532.1
57.5	1292.7
60.0	964.5
62.5	933.6
65.0	945.2
67.5	987.7
70.0	1258.0
72.5	810.1
75.0	694.2
77.5	566.8
80.0	497.3
82.5	404.6
85.0	350.6
87.5	95.7
90.0	14.6
92.5	3.1
95.0	0.0
97.5	0.0
100.0	0.0
102.5	0.0
105.0	0.0
120.0	0.0
135.0	0.0
150.0	0.0
165.0	0.0
180.0	0.0

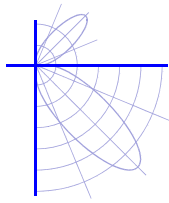


Legend: Plane of maximum intensity (cd)

	Maximum Intensity
House Side	110463.2 cd @ (270.0, 0.0)
Street Side	110463.2 cd @ (0.0, 0.0)

Note: The coordinate pairs in the above table are expressed in degrees and have the format (C plane, Gamma angle).

Data for the two symmetric halves of the luminaire has been averaged.



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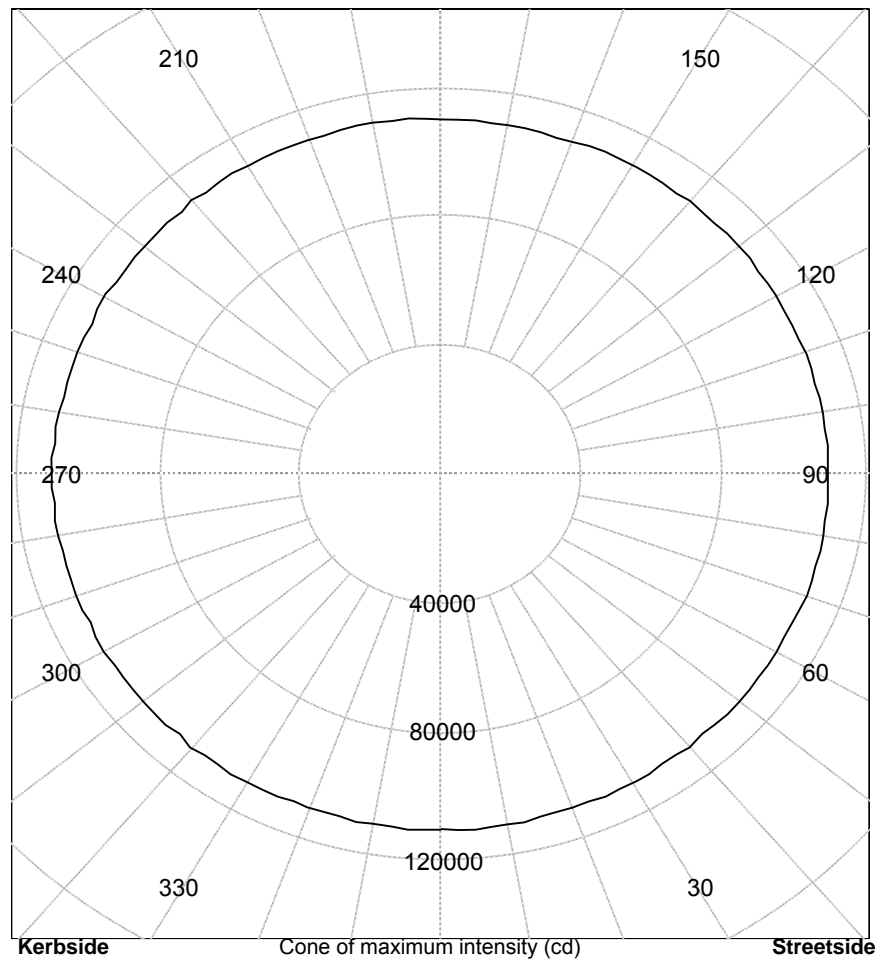
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**Principal Conical Surface**

Intensity  
in principal cone

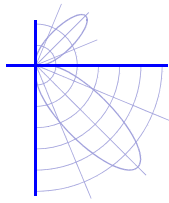
C-Plane (Degrees)	Intensity (cd)
90.0	110463.2
75.0	110463.2
60.0	110463.2
50.0	110463.2
45.0	110463.2
40.0	110463.2
35.0	110463.2
30.0	110463.2
25.0	110463.2
20.0	110463.2
15.0	110463.2
10.0	110463.2
5.0	110463.2
0.0	110463.2
355.0	110463.2
350.0	110463.2
345.0	110463.2
340.0	110463.2
335.0	110463.2
330.0	110463.2
325.0	110463.2
320.0	110463.2
315.0	110463.2
310.0	110463.2
300.0	110463.2
285.0	110463.2
270.0	110463.2



	Maximum Intensity
House Side	110463.2 cd @ (270.0, 0.0)
Street Side	110463.2 cd @ (0.0, 0.0)

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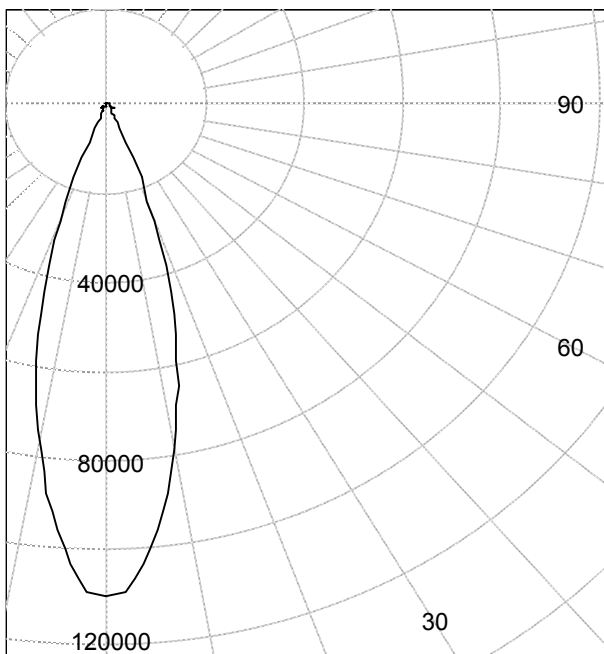




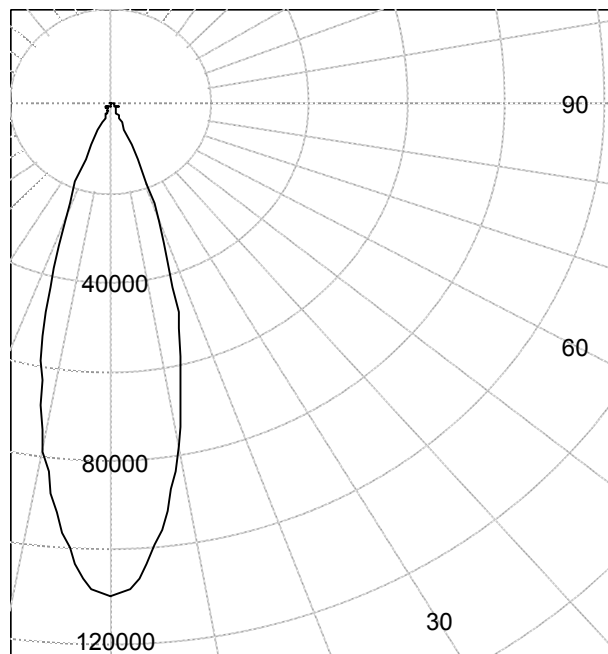
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**Polar curve through CIE C0 / C180**



**Polar curve through CIE C90 / C270**



**Downstream  
(C180)**

(cd)

**Upstream  
(C0)**

**Kerbside  
(C270)**

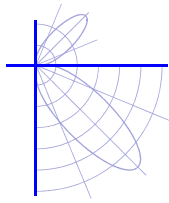
(cd)

**Streetside  
(C90)**

**Performance Parameters**

$I_{80}$	=	485.4 cd
$I_{88}$	=	98.0 cd
$I_{90}$	=	41.8 cd
$I_{80} / I_{88}$	=	4.954

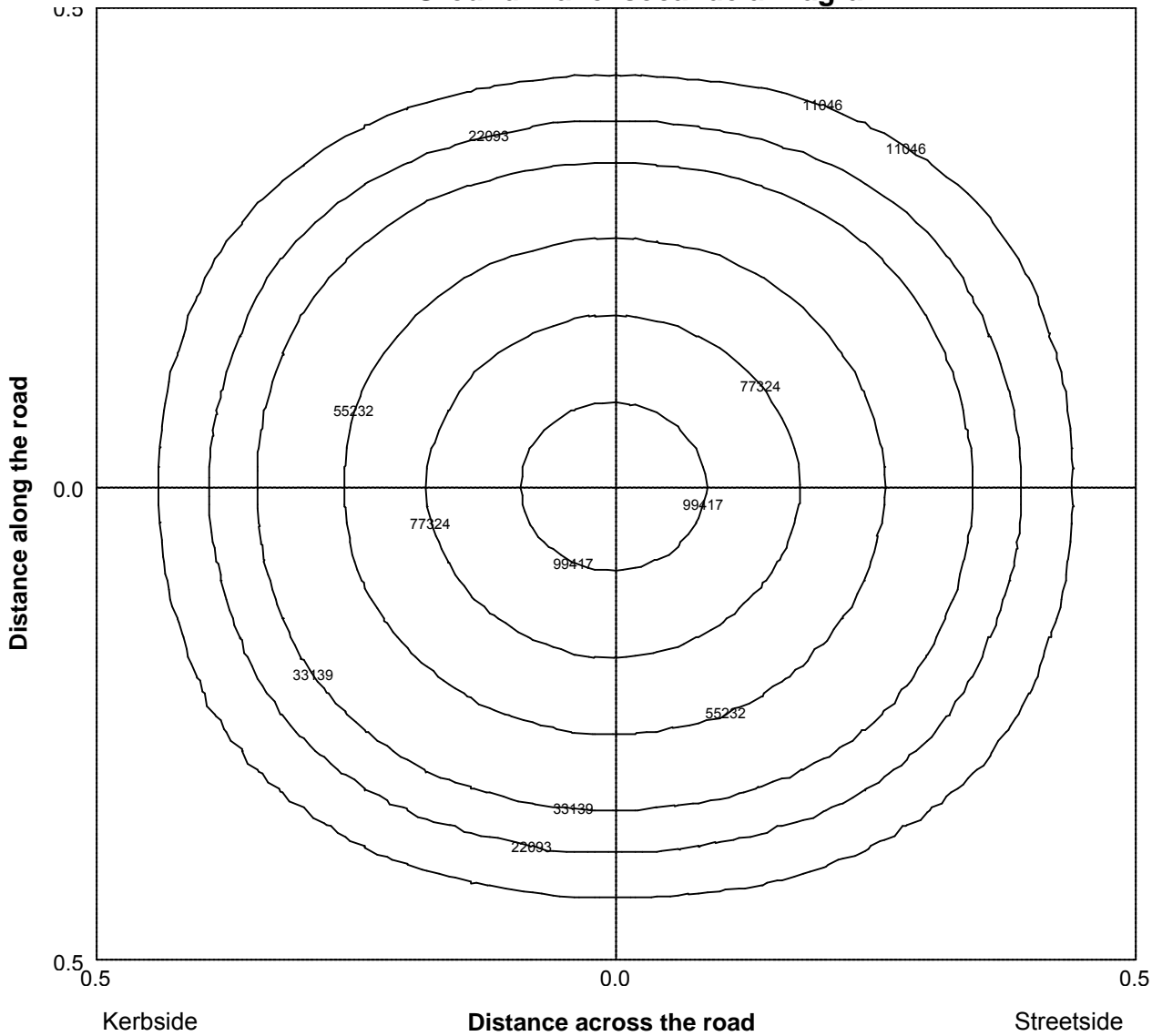
Note: The intensity values listed ( $I_{xx}$ ) are all within the C0 half plane, the subscript refers to the gamma angle.



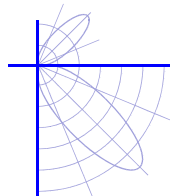
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**Ground Plane Isocandela Diagram**



Note: The isocandela levels are based on a mounting height of H = 10.0 metres. Grid values show multiples of mounting height.  
The isocandela contours are set to 10%, 20%, 30%, 50%, 70%, 90% of the maximum.  
The isocandela contour units are expressed as candela. Upstream and downstream sides have been averaged.



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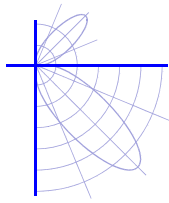
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**KERB SIDE INTENSITY DATA (cd)**

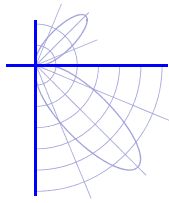
Gamma	C-Plane								
	C270	C285	C300	C310	C315	C320	C325	C330	C335
0.0	110463	110463	110463	110463	110463	110463	110463	110463	110463
10.0	79009	78612	77920	78148	78065	77982	78307	78631	78291
20.0	27758	28825	29920	30270	30370	30471	29959	29448	28918
30.0	2243	2294	2363	2421	2428	2435	2393	2350	2346
35.0	1505	1532	1534	1528	1528	1528	1541	1555	1561
40.0	1281	1285	1288	1288	1288	1288	1290	1292	1297
45.0	1366	1346	1317	1303	1298	1294	1297	1300	1310
47.5	1412	1400	1394	1392	1389	1387	1381	1375	1376
50.0	1455	1444	1423	1421	1424	1427	1425	1423	1420
52.5	1551	1548	1505	1487	1498	1508	1528	1547	1553
55.0	1532	1518	1464	1466	1484	1503	1520	1537	1554
57.5	1293	1286	1267	1249	1265	1282	1301	1321	1325
60.0	965	983	1008	1036	1036	1036	1028	1019	1011
62.5	934	925	938	945	941	938	935	932	934
65.0	945	915	886	892	890	887	887	887	905
67.5	988	972	950	950	947	943	934	924	945
70.0	1258	1353	1300	1295	1289	1282	1287	1292	1306
72.5	810	1057	1050	1040	1028	1017	1021	1025	1024
75.0	694	918	952	935	931	928	927	926	923
77.5	567	800	855	646	742	837	834	831	824
80.0	497	691	763	534	635	736	741	746	739
82.5	405	569	662	458	548	638	571	504	569
85.0	351	451	492	391	444	496	463	429	453
87.5	96	322	343	193	264	336	334	332	341
90.0	15	66	88	46	79	111	94	77	91
92.5	3	10	17	15	22	30	31	32	44
95.0	0	0	0	9	8	7	11	15	15
97.5	0	0	0	0	0	0	3	7	7
100.0	0	0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0



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Tested at 240 V 50 Hz, LED opening surround horizontal, C270 half plane through spigot.

Gamma	KERB SIDE				INTENSITY DATA (cd)		ROAD SIDE			
	C340	C345	C350	C355	C-Plane		C10	C15	C20	
					C0	C5				
0.0	110463	110463	110463	110463	110463	110463	110463	110463	110463	110463
10.0	77950	78439	78928	78711	78493	78413	78333	78352	78371	
20.0	28388	27912	27436	27504	27572	27641	27710	28344	28977	
30.0	2342	2305	2268	2286	2304	2340	2377	2394	2411	
35.0	1568	1568	1568	1576	1584	1585	1586	1573	1560	
40.0	1303	1300	1298	1302	1307	1300	1294	1296	1297	
45.0	1320	1329	1338	1349	1359	1352	1344	1331	1318	
47.5	1376	1376	1375	1387	1400	1393	1387	1384	1380	
50.0	1417	1428	1439	1451	1464	1450	1437	1424	1411	
52.5	1558	1570	1582	1591	1601	1589	1576	1554	1531	
55.0	1570	1579	1587	1589	1591	1575	1559	1536	1514	
57.5	1330	1323	1317	1319	1320	1312	1304	1275	1247	
60.0	1003	996	988	984	979	964	948	943	937	
62.5	935	947	959	964	968	942	915	893	871	
65.0	922	941	959	954	948	925	902	881	860	
67.5	966	960	954	836	718	813	908	908	908	
70.0	1320	1304	1288	1156	1024	1155	1286	1295	1303	
72.5	1022	980	938	861	784	872	960	993	1026	
75.0	920	846	772	722	671	732	793	861	929	
77.5	817	731	645	593	542	594	647	737	827	
80.0	732	641	550	518	485	514	542	639	736	
82.5	634	547	461	434	408	435	461	554	647	
85.0	477	445	413	375	338	375	411	439	467	
87.5	349	332	314	213	112	211	310	323	336	
90.0	106	122	138	90	42	88	134	120	106	
92.5	55	54	53	39	24	37	49	50	51	
95.0	15	16	17	15	13	16	19	18	17	
97.5	7	9	11	9	7	10	13	12	11	
100.0	0	1	2	1	0	1	2	1	0	
102.5	0	0	0	0	0	0	0	0	0	
105.0	0	0	0	0	0	0	0	0	0	
120.0	0	0	0	0	0	0	0	0	0	
135.0	0	0	0	0	0	0	0	0	0	
150.0	0	0	0	0	0	0	0	0	0	
165.0	0	0	0	0	0	0	0	0	0	
180.0	0	0	0	0	0	0	0	0	0	



**Test Report No. LL18267**

Empyrean Lighting 300 W Spigot Mount Park Light. Product ID: AndromedaXPB-Park-300W-L42B.

Extruded and cast aluminium body with black finish, extent ~ 825 x 464 x 195 mm deep.

luminous volume of ~ 605 x 285 x 5 mm deep.

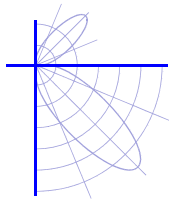
Array of 180 LEDs each with a clear "hemispherical" lens centred ~ 150 mm above L/V.

Two Andromeda AndromedaLDC-150W-0500mA 100-240V~ 50/60Hz electronic drivers.

Tested at 240 V 50 Hz, LED opening surround horizontal, C270 half plane through spigot.

**ROAD SIDE INTENSITY DATA (cd)**

Gamma	C-Plane								
	C25	C30	C35	C40	C45	C50	C60	C75	C90
0.0	110463	110463	110463	110463	110463	110463	110463	110463	110463
10.0	77839	77307	77371	77435	77341	77247	77029	77489	77621
20.0	29259	29542	29840	30138	30202	30267	29037	28504	27805
30.0	2420	2430	2410	2389	2373	2357	2379	2353	2285
35.0	1561	1563	1544	1524	1526	1529	1539	1548	1548
40.0	1295	1294	1296	1298	1297	1296	1301	1300	1301
45.0	1307	1296	1294	1292	1291	1290	1303	1318	1335
47.5	1375	1369	1369	1369	1362	1354	1342	1327	1332
50.0	1411	1410	1398	1387	1377	1368	1351	1325	1308
52.5	1513	1495	1470	1445	1426	1407	1384	1329	1293
55.0	1482	1451	1424	1397	1373	1349	1303	1217	1185
57.5	1235	1224	1189	1155	1138	1122	1090	1031	1007
60.0	940	944	944	944	936	928	918	898	880
62.5	866	860	862	864	868	872	881	891	880
65.0	848	837	837	837	840	843	870	926	945
67.5	896	884	886	889	899	909	945	1039	1054
70.0	1304	1305	1304	1304	1309	1314	1365	1464	1490
72.5	1041	1056	1056	1056	1065	1074	1131	1199	822
75.0	945	961	970	978	986	994	1026	1070	729
77.5	844	860	869	878	766	654	943	928	571
80.0	752	767	772	777	653	530	846	802	509
82.5	573	498	587	675	563	452	728	642	412
85.0	446	425	477	529	455	381	628	476	358
87.5	333	330	332	334	283	232	344	325	131
90.0	91	77	96	115	80	44	96	81	19
92.5	45	38	39	40	29	19	20	13	7
95.0	15	13	11	9	7	5	0	0	0
97.5	8	5	3	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0
102.5	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0



## Test Report No. LL18267

Empyrean Lighting 300 W Spigot Mount Park Light. Product ID: AndromedaXPB-Park-300W-L42B.  
Extruded and cast aluminium body with black finish, extent ~ 825 x 464 x 195 mm deep.  
luminous volume of ~ 605 x 285 x 5 mm deep.  
Array of 180 LEDs each with a clear "hemispherical" lens centred ~ 150 mm above L/V.  
Two Andromeda AndromedaLDC-150W-0500mA 100-240V~ 50/60Hz electronic drivers.  
Tested at 240 V 50 Hz, LED opening surround horizontal, C270 half plane through spigot.

**Test Distance:** 8.0 metres  
**Test Temperature:** 25.4 degrees Celsius

**Significance:** This laboratory has no control over the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

**Special Notes:** The intensity values contained in this report are shown as tested. When using these values in calculations the appropriate Ballast Factor and Manufacturer's rated lumens MUST be taken into account.  
It should also be noted that prorating the lumen output for the use of other lamp/ballast combinations, or for use in different environmental conditions, than that tested may produce erroneous results.  
The generic term "LOR" is used in this report, it denotes the "Light Output Ratio Luminaire" as defined in Australian Standard AS1680, Part 3, 1991, Section 1.3.9.  
This report is free of erasures and corrections.  
Photometric intensity values are reported using the CIE Cgamma coordinate system as described in CIE Publication number 121.

**Uncertainties:** At the 95% confidence interval with a factor k = 2, the uncertainties for this report are :-

Temperature	+/- 1 degree Celsius
Light Output Ratio	+/- 4%
Luminous Intensity	+/- 4%
Angular displacement	+/- 0.5 degrees.

**Testing Procedure:** Tested in accordance with the applicable sections of CIE Publications Numbers 121 (1996) and 34 (1977).