

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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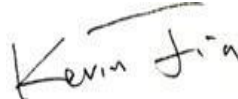
2018/11/2

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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Mid output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	5000	7366
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	113.9
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	4.01%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	2969
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80
Power Factor	ANSI C82.77:2014	0.873	0.933
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	13.10%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/1	IVAT5S-75L730U	I1
2	Goniophotometer Test	2018/11/1	IVAT5S-75L730U	I1
3	THD and PF Test	2018/11/1	IVAT5S-75L730U	I1

Remark(If any)

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3.0 Production Description

Luminaire Description: IVAT5S-75L730U

Electrical Specification: 120V-277V,50/60HZ, 75W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT5S-75L730U	Sample ID.	I1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	119.98	60	0.550	65.2	0.989

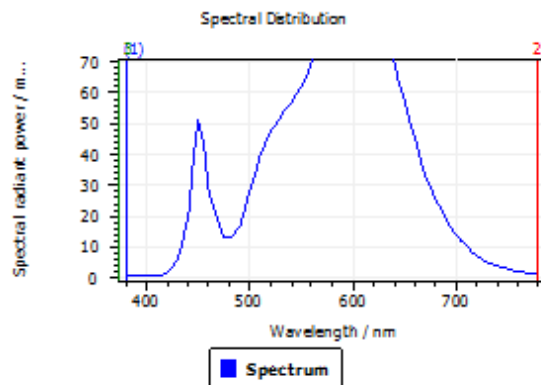
Test Result

CCT (K)	CRI (Ra)	Duv
2969	79.7	3.0E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

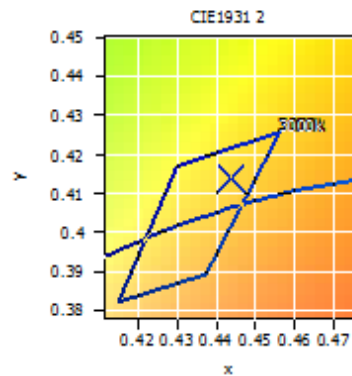
DominantWavelength	581.96 nm
Purity	0.575
PeakWavelength	601.40 nm
Radiant Power	14.51 W
Width50%	129.72 nm

Color Coordinates

Correlated Color Temperatu 2969 K

x: 0.4436 u: 0.2506 u': 0.2506
y: 0.4141 v: 0.3508 v': 0.5262

ResultsCRICRI01	77.1	ResultsCRICRI09	-4.9
ResultsCRICRI02	87.3	ResultsCRICRI10	71.4
ResultsCRICRI03	96.7	ResultsCRICRI11	76.9
ResultsCRICRI04	78.1	ResultsCRICRI12	62.1
ResultsCRICRI05	76.8	ResultsCRICRI13	79.3
ResultsCRICRI06	84.3	ResultsCRICRI14	98.3
ResultsCRICRI07	82.4	ResultsCRICRI15	68.3
ResultsCRICRI08	54.7	ResultsCRICRI16	66.4
ResultsCRI	79.7		



PlankDistance 3.0E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT5S-75L730U	Sample ID.	I1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

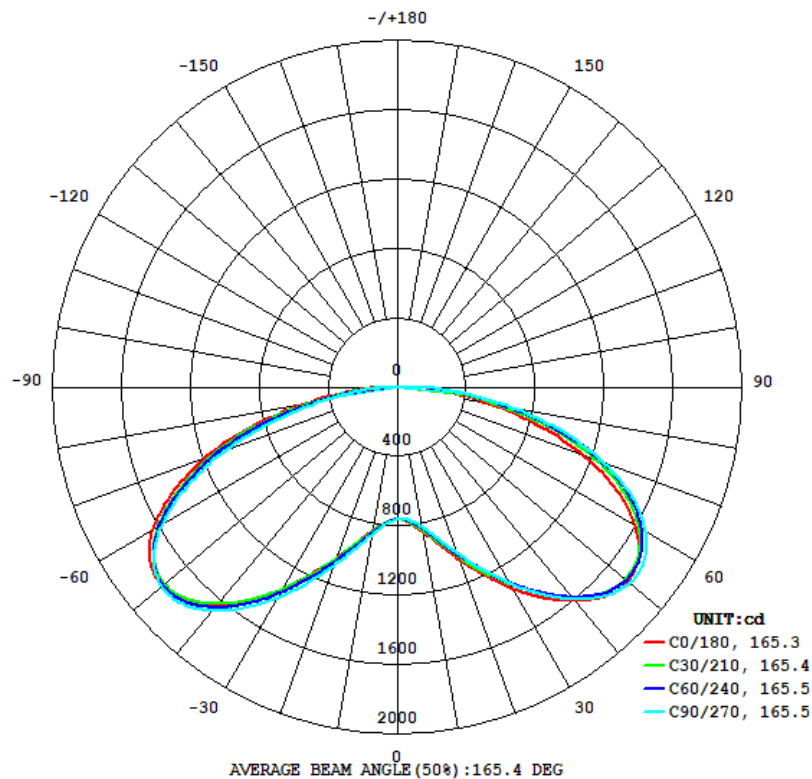
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.93	60	0.546	64.7	0.988	Light Down

Test Result

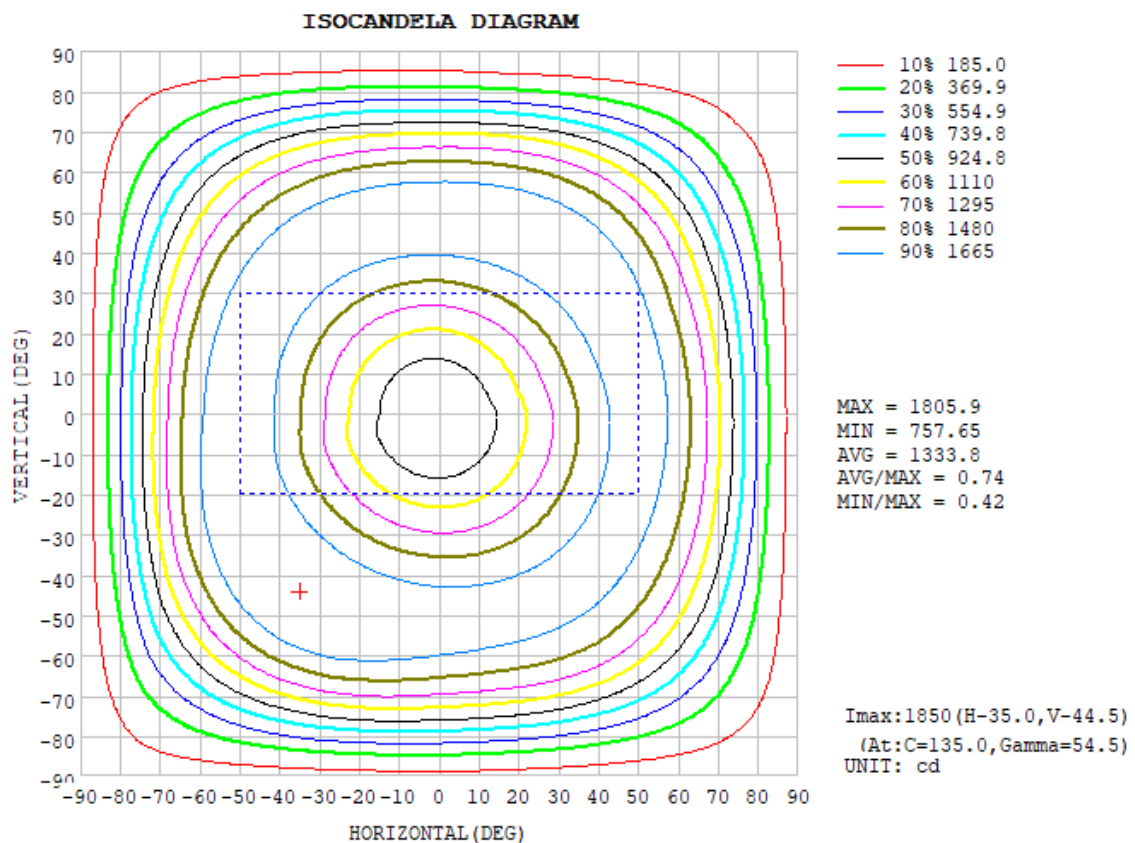
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7366	100.00%	4.01%	178.5	179.4	165.3	165.5	113.9

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
γ	C0	C45	C90	C135	C180	C225	C270	C315		
10	845.0	830.1	818.9	813.9	834.8	842.1	856.9	868.2		
20	1057	1029	1016	1016	1046	1056	1091	1109		
30	1339	1303	1305	1316	1342	1350	1398	1409		
40	1609	1577	1593	1624	1636	1641	1681	1680		
50	1742	1725	1758	1828	1780	1770	1787	1784		
60	1593	1633	1663	1800	1638	1606	1578	1597		
70	1146	1260	1276	1408	1192	1146	1063	1107		
80	534.7	621.8	675.5	710.2	542.2	483.2	416.7	421.5		
90	0	0	0	0	0	0	0	0		
100	0	0	0	0	0	0	0	0		
110	0	0	0	0	0	0	0	0		
120	0	0	0	0	0	0	0	0		
130	0	0	0	0	0	0	0	0		
140	0	0	0	0	0	0	0	0		
150	0	0	0	0	0	0	0	0		
160	0	0	0	0	0	0	0	0		
170	0	0	0	0	0	0	0	0		
180	0	0	0	0	0	0	0	0		

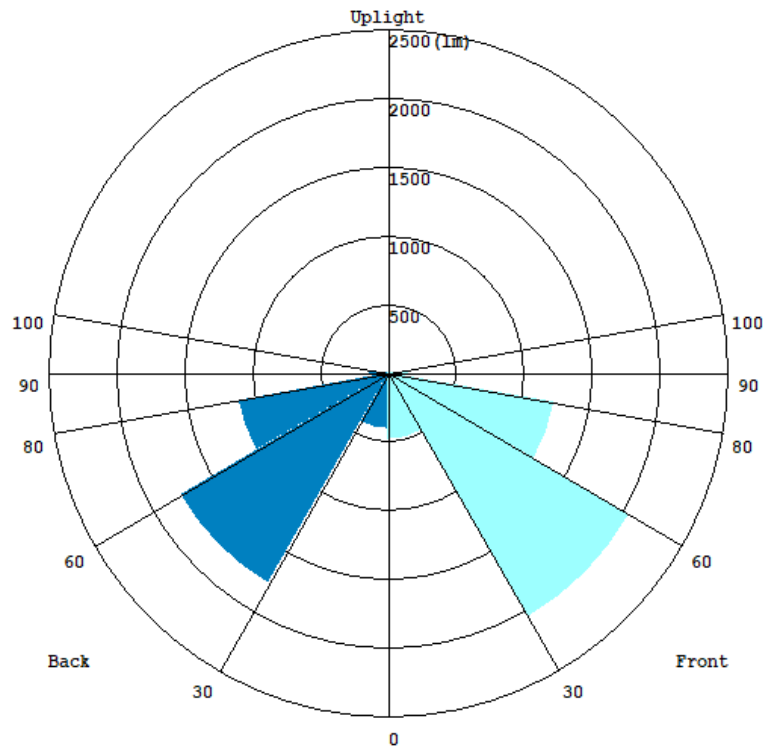
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	76.35	0 - 10	76.35	1.04%
10-20	268.41	0 - 20	344.76	4.68%
20-30	556.60	0 - 30	901.36	12.24%
30-40	939.35	0 - 40	1840.71	24.99%
40-50	1328.45	0 - 50	3169.16	43.03%
50-60	1545.37	0 - 60	4714.53	64.01%
60-70	1424.52	0 - 70	6139.05	83.35%
70-80	931.10	0 - 80	7070.15	95.99%
80-90	295.43	0 - 90	7365.58	100.00%
90-100	0.00	0 - 100	7365.58	100.00%
100-110	0.00	0 - 110	7365.58	100.00%
110-120	0.00	0 - 120	7365.58	100.00%
120-130	0.00	0 - 130	7365.58	100.00%
130-140	0.00	0 - 140	7365.58	100.00%
140-150	0.00	0 - 150	7365.58	100.00%
150-160	0.00	0 - 160	7365.58	100.00%
160-170	0.00	0 - 170	7365.58	100.00%
170-180	0.00	0 - 180	7365.58	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	493.42	6.7
FM - Front-Medium(30-60)	2057.8	27.9
FH - Front-High(60-80)	1240.7	16.8
FVH - Front-Very High(80-90)	152.24	2.1
Total Forward Light	3944.2	53.4

BL - Back-Low(0-30)	408.79	5.5
BM - Back-Medium(30-60)	1766.7	23.9
BH - Back-High(60-80)	1120.7	15.2
BVH - Back-Very High(80-90)	145.74	2.0
Total Back Light	3441.9	46.6

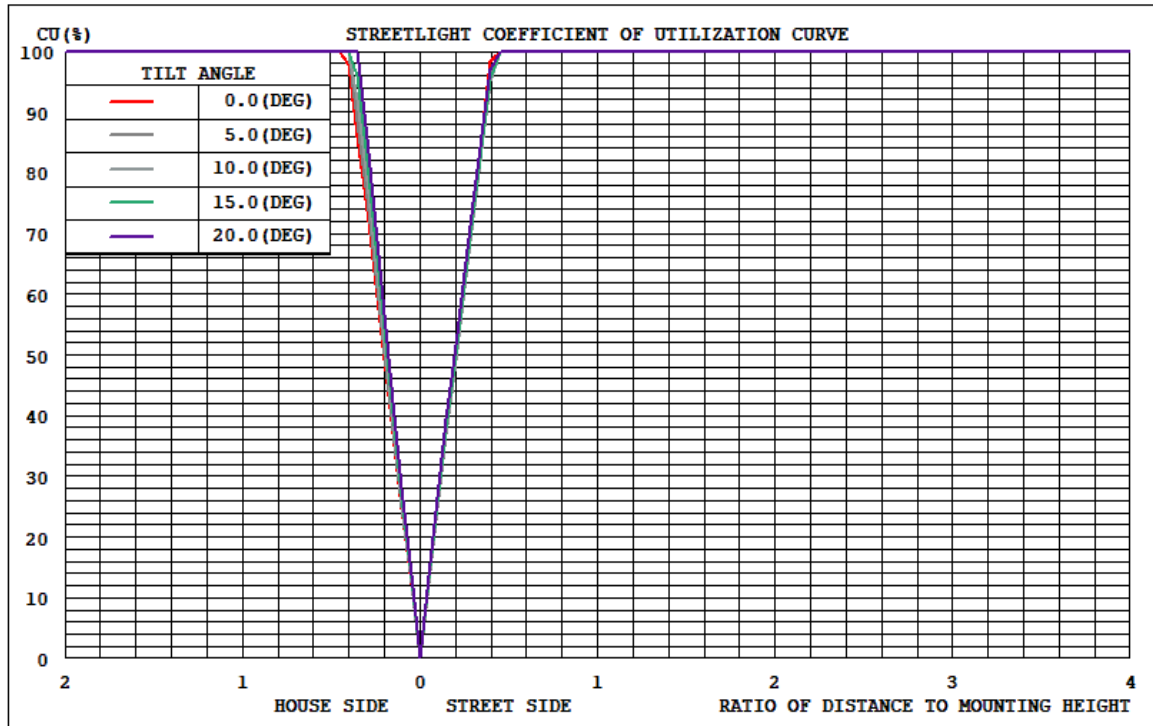
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G2
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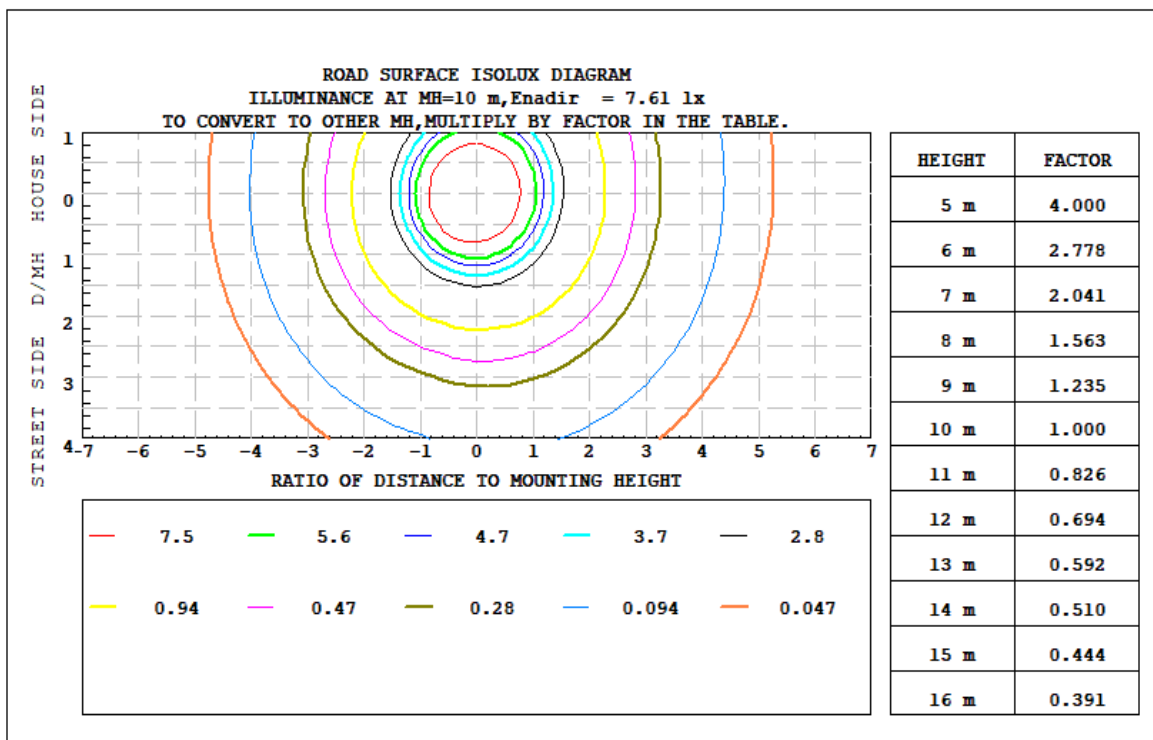
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	3441.9	0	3441.9
Street Side	3944.2	0	3944.2

3.2 Goniophotometer Test

Coefficients of Utilization

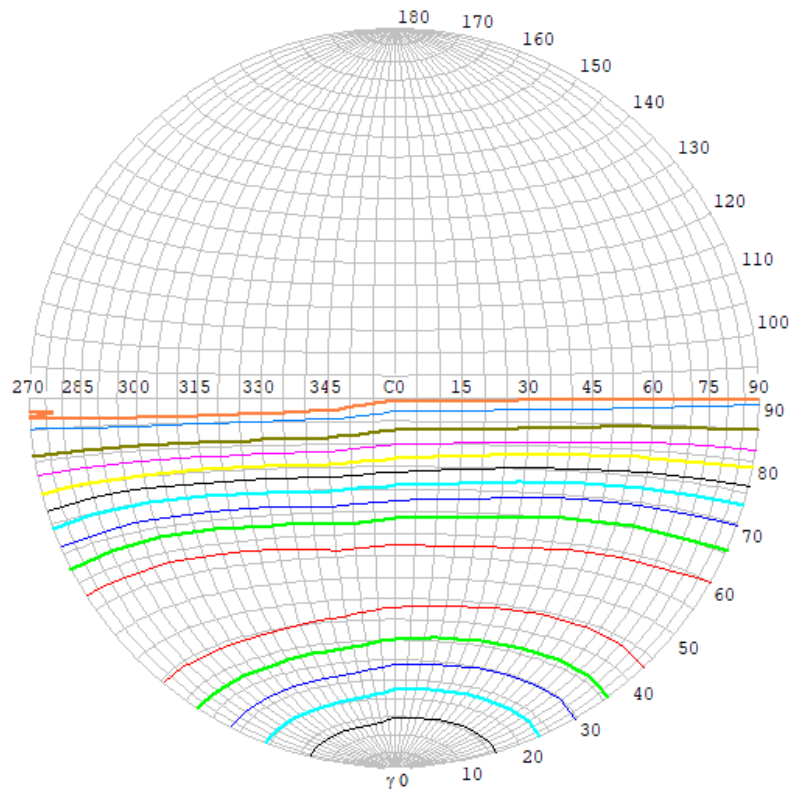


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

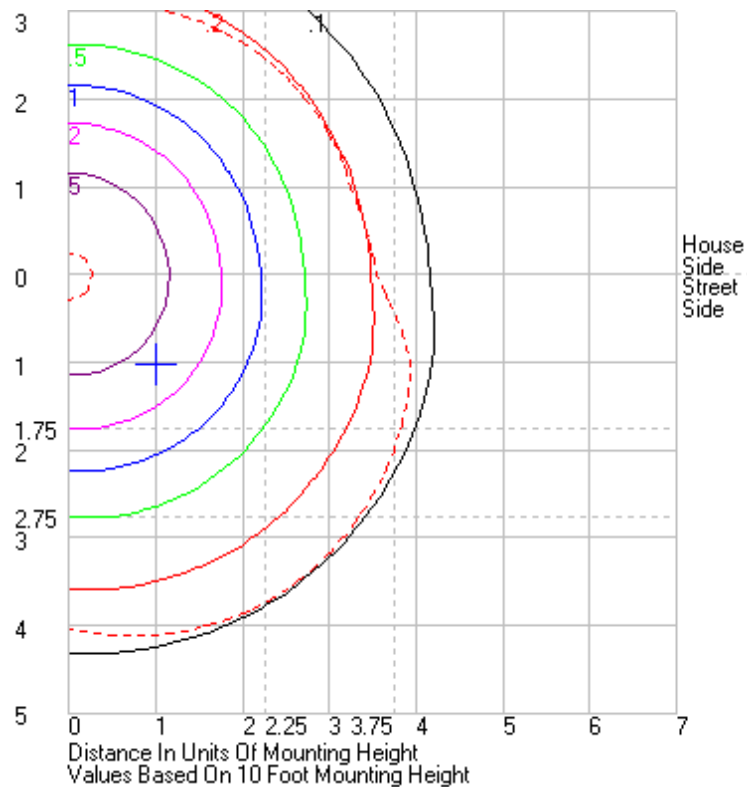


Classification:

IES: Type V - Very Short
CIE: Broad - Short
IES: None cut-off
CIE: Non-cut-off
Max. At 80: 717.2 cd/klm
Max. At 90: 0 cd/klm
Max. 80-90: 717.2 cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	1850
90%	1665
80%	1480
70%	1295
60%	1110
50%	925
40%	740
30%	555
20%	370
10%	185
5%	92

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT5S-75L730U	Sample ID.	I1
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Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.1	277.01	60	0.244	63.2	0.933	13.10%
25.1	119.98	60	0.550	65.2	0.989	12.33%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

***** End of Test Report*****