

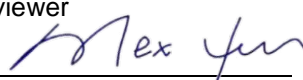


<b>Prüfbericht</b> <i>Test report</i>		<b>Auftragsnr. / order no.:</b> 244268555 <b>Berichtsnr. / report no.:</b> 60397073 001	
<b>Auftraggeber</b> <i>client:</i>		<b>Auftragsdatum /</b> <i>date of order:</i>	
<b>NISKO GROUP LTD.</b> 41 HAMAAYAN MODI'IN, Israel.		23.09.2020  <b>AG-Referenz-Nr. /</b> <i>client reference no.:</i> -	
<b>Inhalt des Auftrags</b> <i>content of order:</i>		Electrical and Photometric Measurement to LM-79-08	
<b>Prüfgrundlagen</b> <i>test specifications:</i>		IES LM-79-08	
<b>Prüfgegenstand</b> <i>test item:</i>		LED Street Light	
<b>EAN-Nr. / no.:</b>		N/A	
<b>Bezeichnung</b> <i>identification:</i>	EL-SL18LA-160W CLASS I T2S TFB 3000K		
<b>Eingang Prüfgegenstand</b> <i>receipt of test item:</i>	23.09.2020		
<b>Prüfgegenstands-Nr.</b> <i>test item no.:</i>	A002073542-019		
<b>Prüfzeitraum und -ort</b> <i>period of test and location:</i>	23.09.2020-28.08.2020, Shanghai Xingshang Photoelectric technology Co., Ltd		
<b>Prüflaboratorium</b> <i>testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.		
<b>Prüfergebnis</b> <i>test result *):</i>	<div style="border: 1px solid black; padding: 5px; text-align: center;">N/A</div>		
<b>Sonstiges / other aspects:</b>		<i>Tests at client's request and there is only test data available in this report and no further ratings for test result. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government..</i>	
<b>geprüft / tested by:</b>		<b>kontrolliert / reviewed by:</b>	
06.11.2020 Fernando Dai /PE		06.11.2020 Alex Yan /Reviewer	
			
<b>Datum</b> <i>Date</i>	<b>Name/Stellung</b> <i>Name/Position</i>	<b>Unterschrift</b> <i>Signature</i>	<b>Datum</b> <i>Date</i>
<p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> Dieser Prüfbericht wird neben der Dokumentation der Einzelergebnisse durch eine Bewertung des Produktes ergänzt. Diese Bewertung stützt sich nicht in jedem Fall auf ein durchgängiges Punkte- oder Bewertungssystem, wohl aber auf die Erfahrung der Experten des TÜV Rheinland. Die Bewertung ist keine rechtsverbindliche Interpretation der Mängelfreiheit eines Produktes.</p> <p><b>This test report relates to the a. m. test sample. Without permission of the testing laboratory this report is not permitted to be duplicated in extracts.</b> This test report does not entitle to carry any safety or other mark on this product. Besides single test results this test report contains an assessment of the product. This assessment is not always based on a continuous rating system, but on experience of the experts of TÜV Rheinland Group. This assessment is not a legally binding interpretation of the flawlessness of the product.</p>			

**General Remarks:**

Factory: NINGBO SKYZON ENERGY CO., LTD  
Address: No.19, Ke San Road, Ninghai 315600, Ningbo China

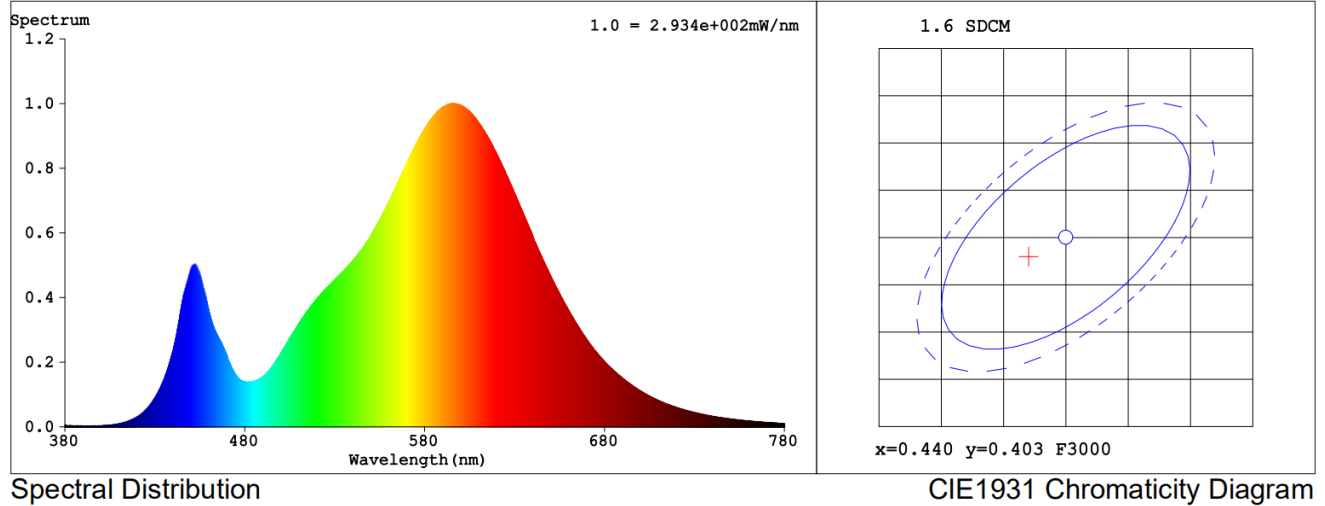
**Product Information**

Model name	Sample number	Rated voltage, frequency (V, Hz)	Nominal CCT (K)	Rated Wattage (W)	Type of LED Chip
EL-SL18LA-160W CLASS I T2S TFB 3000K	A002073542-019	200-240Vac, 50/60Hz	3000K	160W	LUMILEDS LUXEON 5050- L15030705006000 00 18S2P 2MODULE

<b>Test conditions:</b>	
<b>Number of hours operated prior to measurement</b>	<b><u>0</u> hours</b>
<b>Total operating time of the product for measurements including stabilization</b>	<b><u>2</u> hours and <u>30</u> minutes</b>
<b>Ambient</b>	<b>25 °C</b>
<b>Orientation</b>	<b>As normal use</b>
<b>Stabilization time</b>	<b><u>90</u> minutes</b>
<b>Test method</b>	<b>Type C Gonio-photometer with moving mirror was used for photometric measurement (C- <math>\gamma</math> system)</b>
<b>Designation and type of reference standard lamp</b>	<b>For standard luminous flux lamp</b> <b>Current: 1.389A</b> <b>Reference luminous flux: 4310 lm</b> <b>Lamp type: Filament lamp</b> <b>Intensity distribution type: Omni-directional</b>
	<b>For standard luminous intensity lamp:</b> <b>Current: 9.6217A</b> <b>Reference luminous intensity: 571.9 cd</b> <b>Lamp type: Tungsten halogen lamp</b> <b>Intensity distribution type: Omni-directional</b>
<b>Correction factor applied</b>	<b>N/A</b>
<b>Photometric distance</b>	<b>3.0m for photometric measurement</b>
	<b>8.98m for luminous intensity measurement</b>

<b>Measured Results</b>	
	EL-SL18LA 160W CLASS I T2S TFB 3000K
<b>Total luminous flux (lm)</b>	22999
<b>Input wattage (W)</b>	158.224
<b>Input current (A)</b>	0.7219
<b>Frequency (Hz)</b>	50
<b>Power factor</b>	0.9921
<b>Efficacy (Lm/W)</b>	145.36
<b>CCT (K)</b>	2978
<b>Chromaticity x</b>	0.4365
<b>Chromaticity y</b>	0.4005
<b>Chromaticity u'</b>	0.2514
<b>Chromaticity v'</b>	0.5193
<b>CRI</b>	74.0
<b>R9</b>	0
<b>Du'v' (Max.)</b>	-0.00119
<b>THDI(%)</b>	4.087
<b>LCS BUG Rating</b>	B2-U0-G3, Semi cut-off

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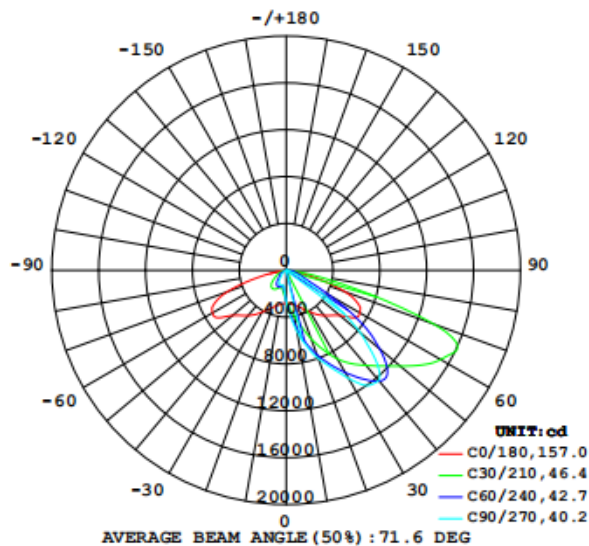
**Spectral power distribution: (Clause 10 of LM-79)**
**EL-SL18LA 160W CLASS I T2S TFB 3000K**

**Dominant WL: 583.1nm**  
**Peak WL: 595nm**
**Luminous Intensity Distribution, Ambient temperature: 25°C (Clause 10 of LM-79)**

Description	Data
<b>Model</b>	EL-SL18LA-160W CLASS I T2S TFB 3000K
<b>Test voltage (V)</b>	220VAC
<b>Test current (A)</b>	0.7219
<b>Test wattage (W)</b>	158.224
<b>Frequency (Hz)</b>	50
<b>Power factor</b>	0.9921
<b>Central luminous intensity (cd)</b>	2643
<b>Max. luminous intensity(cd)</b>	16603.72 (C=65, Gamma=63)

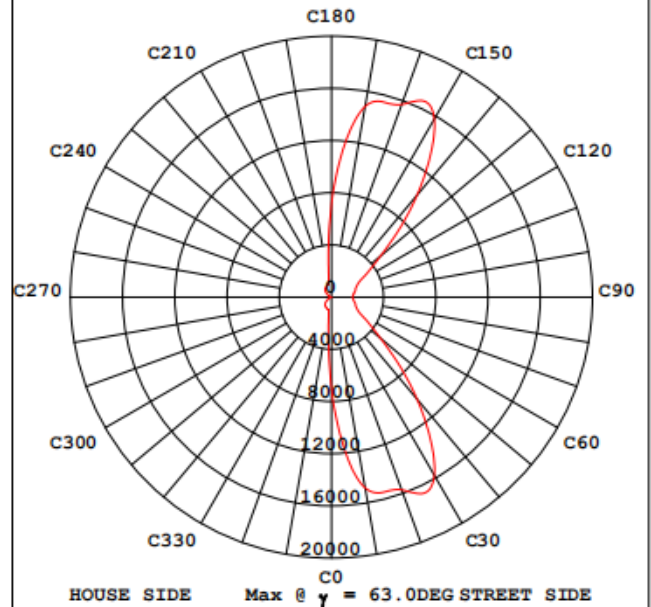
**For the distribution curve see next page.**
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DATA OF LAMP		PHOTOMETRIC DATA				Eff: 145.36 lm/W
MODEL	EL-SL18LA	I <sub>max</sub> (cd)	16603.72	η <sub>street_up</sub> (%)	0.0	
NOMINAL POWER (W)	160	LOR (%)	100.0	η <sub>street_down</sub> (%)	87.6	
RATED VOLTAGE (V)	220-240	TOTAL FLUX (lm)	22999	η <sub>house_up</sub> (%)	0.0	
NOMINAL FLUX (lm)	22999.5	MAXIMUM @ (C, γ )	65, 63.0	η <sub>house_down</sub> (%)	12.4	
LAMPS INSIDE	1	η <sub>up</sub> (%)	0.0	76 FLASHAREA (m2)	0.05000	
TEST VOLTAGE (V)	220	η <sub>down</sub> (%)	100.0	SLI	23.744	

**INTENSITY DISTRIBUTION DIAGRAM  
IN C PLANS**



**MAX INTENSITY CONE SURFACE  
DISTRIBUTION DIAGRAM**



**Zonal Lumen Summary and Percentages****Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-20	1284.19	5.60	5.60
0-30	3473.81	15.10	15.10
0-40	7138.55	31.00	31.00
0-60	16865.29	73.30	73.30
0-80	22734.91	98.90	98.80
0-90	22999.49	100.00	100.00
10-90	22732.96	98.80	98.80
20-40	5854.37	25.50	25.50
20-50	10647.47	46.30	46.30
40-70	13766.84	59.90	59.90
60-80	5869.61	25.50	25.50
70-80	1829.5	8.00	8.00
80-90	264.60	1.20	1.20
90-110	0.00	0.00	0.00
90-120	0.00	0.00	0.00
90-130	0.00	0.00	0.00
90-150	0.00	0.00	0.00
90-180	0.00	0.00	0.00
110-180	0.00	0.00	0.00
0-180	22999.49	100.00	100.00

Total Luminaire Efficiency = 100.00%



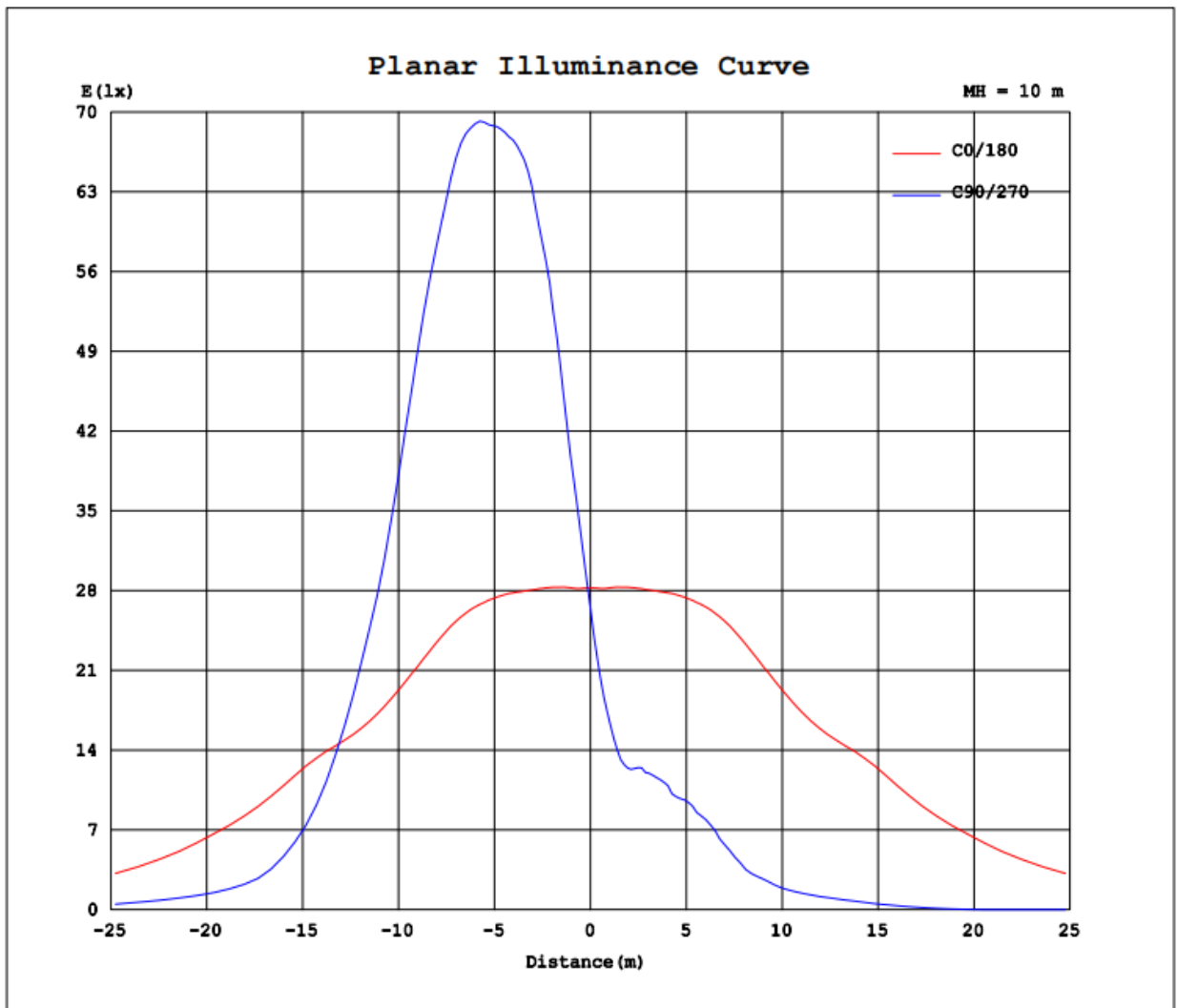
## Prüfbericht Nr. / Test report no. 60397073 001

## Luminous Intensity Distribution Data

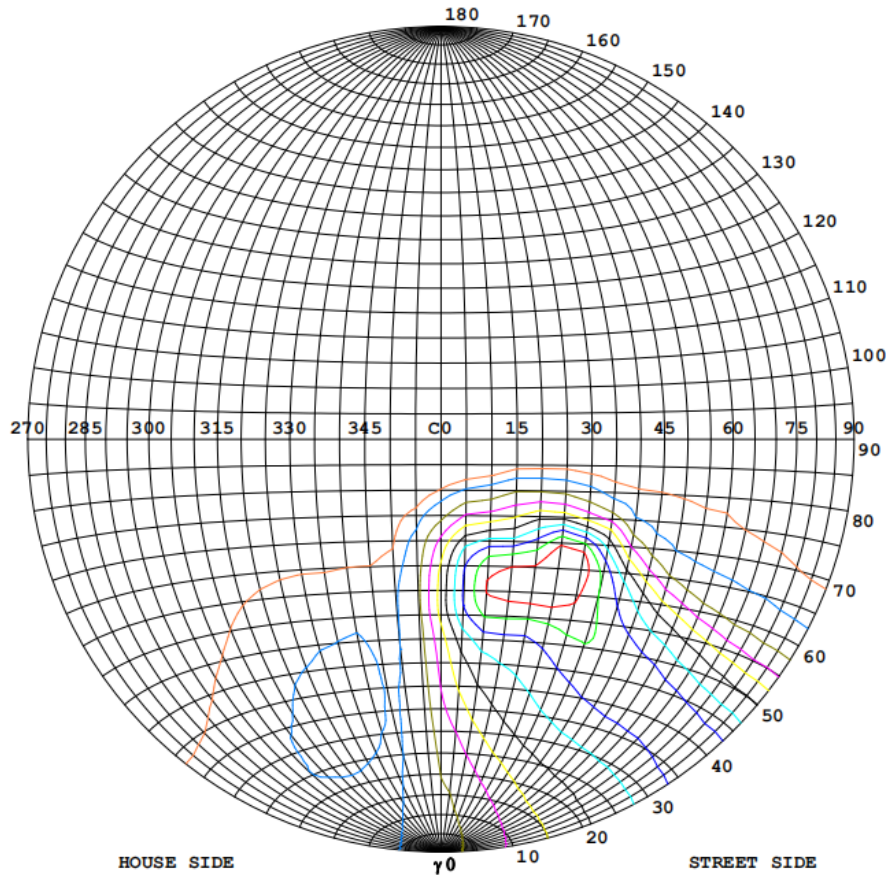
Total View EL-S18LA 160W CLASS I T2S TFB 300CRIES																								
Keywords					Candela										20					30				
Vertical Angles		Horizontal Angles		Multiplier=1	Max Cd																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105		
46	10276.90	10434.62	10473.78	10811.06	11101.09	11595.39	11981.44	12481.30	12749.70	12859.23	12812.50	12398.52	11760.62	11013.56	10381.27	10114.03	9531.84	8008.33	5540.22	2717.21	1656.62	1506.09	105	
47	9731.45	9902.76	9959.90	10268.68	10604.87	11178.46	11657.64	12279.89	12548.02	12887.98	12360.53	12625.55	11984.92	11207.51	10547.53	10331.14	9801.74	8232.57	5632.76	2735.79	1663.24	1600.41	105	
48	9223.59	9382.74	9449.97	9761.41	10111.23	10736.42	11194.52	12009.18	12483.42	12861.12	13060.37	12834.21	12222.88	11424.32	10724.72	10570.79	10109.68	8486.57	5742.65	2752.84	1660.36	1592.32	105	
49	8752.95	8896.24	8975.73	9266.20	9638.12	10254.12	10877.66	11668.17	12247.76	12778.90	13119.13	13021.39	12465.04	11645.51	10958.58	10846.24	10496.03	8792.13	5861.08	2763.23	1657.61	1576.72	105	
50	8235.96	8362.46	8445.00	8775.23	9128.97	9718.97	10411.53	11247.14	11936.65	12632.15	13101.23	13188.08	12728.40	11931.93	11204.64	11155.98	10658.04	9070.15	6008.57	2776.29	1643.89	1559.88	105	
51	7598.80	7809.94	7948.63	8256.76	8609.71	9301.62	9942.16	10840.89	11587.95	12421.05	13070.30	13300.18	12934.46	12128.14	11536.10	11541.32	11334.57	9463.23	6178.21	2786.76	1627.82	1527.28	105	
52	6954.96	7145.22	7218.53	7503.05	8009.70	8809.36	9498.08	10365.78	11212.03	12155.61	12970.09	13443.23	13271.67	12592.11	11926.95	11981.90	11337.22	9869.09	6384.18	2802.44	1616.03	1491.72	105	
53	6285.82	6519.01	6553.00	6974.23	7478.74	8253.90	9020.54	9944.78	10804.07	11846.34	12825.39	13526.95	13550.76	12902.48	12397.12	12483.29	12281.03	10304.27	6606.77	2828.03	1600.97	1452.41	105	
54	5626.27	5495.44	5810.14	6280.35	6781.47	7618.17	8464.25	9481.10	10380.07	11500.94	12628.32	13580.71	13822.88	13300.43	12919.12	13018.89	12384.16	10704.85	6853.30	2865.11	1605.26	1412.88	105	
55	4867.55	5028.54	5109.76	5593.68	6043.67	6943.35	7827.45	8975.09	9943.41	11142.42	12430.00	13596.92	14101.03	13797.95	13487.11	13552.54	13347.36	11105.63	7053.01	2917.58	1590.68	1377.23	105	
56	4246.75	4411.47	4478.25	4991.58	5432.35	6212.58	7151.72	8404.20	9512.52	10781.23	12128.73	13578.48	14377.13	14284.10	14050.88	14064.93	13918.80	11393.32	7217.29	2956.95	1559.28	1345.86	105	
57	3687.09	3843.44	3892.41	4310.95	4655.66	5478.82	6452.64	7778.74	9029.06	10432.96	12006.21	13532.52	14637.09	14810.37	14581.41	14534.34	14341.81	11624.51	7292.31	2968.58	1559.13	1316.01	105	
58	3140.76	3271.30	3370.47	3758.26	4042.39	4761.32	5704.71	7082.58	8484.22	10084.14	11788.31	13471.79	14851.66	15082.80	15064.02	14928.79	14647.30	11762.47	7320.01	2996.39	1562.14	1276.71	105	
59	2613.88	2727.81	2845.74	3206.09	3460.39	4121.09	4942.95	6341.53	7871.75	9708.57	11549.30	13393.01	15052.95	15737.13	15464.36	15256.63	14873.03	11817.90	7298.75	2992.84	1527.04	1232.87	105	
60	2193.89	2318.84	2385.71	2712.77	2938.30	3552.82	4240.23	5578.52	7176.06	9269.69	11305.90	13323.66	15229.14	16113.92	15753.98	15491.97	14998.73	11840.93	7255.93	2979.95	1486.80	1175.25	105	
61	1959.74	2040.31	2097.79	2300.14	2495.33	3023.24	3633.77	4870.48	6422.68	8733.46	11033.29	13267.63	15399.89	16408.37	15883.96	15611.22	15022.87	11832.62	7215.11	2949.43	1424.40	1100.58	105	
62	1776.96	1834.59	1909.00	2059.04	2168.97	2521.04	3070.91	4173.72	5639.24	8081.17	10662.06	13242.17	15756.41	16573.13	15860.80	15597.64	14959.51	11804.52	7173.60	2896.37	1348.39	1042.64	105	
63	1606.83	1674.01	1745.10	1892.41	1972.95	2179.43	2563.37	3528.97	4903.00	7305.68	10210.65	13180.68	15765.89	16503.72	15702.72	15475.32	14832.47	11772.61	7124.47	2818.19	1263.67	966.87	105	
64	1480.86	1523.98	1604.32	1754.41	1817.19	1983.21	2198.69	2948.99	4223.75	6526.88	9590.15	13044.32	15969.70	16529.15	15410.69	15255.47	14632.01	11688.52	6981.84	2732.96	1172.79	902.60	105	
65	1355.92	1393.71	1472.34	1612.48	1689.70	1834.75	1960.96	2498.79	3578.51	5793.11	8825.13	12761.13	16076.11	16298.33	15062.05	14925.34	14330.68	11536.13	6788.47	2637.57	1087.40	840.62	105	
66	1230.99	1261.24	1340.55	1472.44	1569.20	1698.65	1809.56	2082.91	2943.77	5059.06	8073.17	12294.18	16022.37	16325.75	14650.01	14451.05	13867.36	11264.32	6577.72	2532.10	1041.30	770.91	105	
67	1096.13	1130.35	1214.97	1342.86	1444.52	1577.62	1687.94	1858.49	2454.54	4386.90	7215.83	11641.09	15787.97	16042.56	14179.90	13737.95	13226.19	10911.34	6331.42	2434.98	926.76	726.32	105	
68	940.54	995.45	1095.07	1228.77	1325.55	1465.32	1587.77	1713.57	2067.33	371.84	6461.07	10883.73	15275.67	15756.31	13599.43	12794.15	12438.43	10439.35	6007.95	2320.07	859.61	687.16	105	
69	784.26	860.69	974.90	1115.96	1211.27	1354.93	1472.83	1597.95	1816.07	3103.80	5704.10	10112.07	14524.23	15081.20	12891.26	11689.80	11053.82	9848.70	5739.67	2205.01	795.24	642.82	105	
70	652.50	737.14	873.49	1006.81	1106.33	1241.63	1368.81	1591.45	1666.89	2607.63	4976.84	9335.38	13426.41	14618.50	12154.39	10608.90	10553.22	9143.05	5326.41	2071.23	734.04	599.30	105	
71	563.05	652.34	792.60	912.22	1008.05	1134.37	1262.33	1387.40	1534.73	2161.37	4212.14	8495.24	11969.26	13646.24	11345.09	9600.82	9440.40	8330.95	4874.83	1912.93	677.05	953.12	105	
72	506.30	600.91	725.33	842.28	928.45	1044.24	1162.01	1290.11	1415.77	1833.37	3471.90	7597.68	10399.03	12371.65	10503.71	8729.91	8426.62	7491.38	4363.37	1708.79	623.65	510.61	105	
73	453.72	554.53	666.83	776.30	855.69	962.27	1073.29	1201.99	1309.73	1623.72	2881.11	6635.34	8843.43	10871.81	9675.23	7958.84	7410.53	6580.61	3851.45	1517.25	571.77	472.24	105	
74	388.39	488.96	615.48	714.82	793.69	886.68	996.88	1101.30	1208.39	1463.71	2245.17	5568.79	7395.77	9331.96	8783.48	7203.11	6480.30	5694.19	3308.95	1331.57	522.70	425.53	105	
75	305.77	423.56	568.93	665.71	738.78	821.29	933.72	1031.40	1129.12	1335.84	1837.69	4505.14	6135.12	7804.21	7834.67	6456.72	5638.64	5128.05	2824.45	1137.29	457.16	375.75	105	
76	243.79	373.66	528.24	623.57	686.38	767.09	883.22	959.89	1063.26	1227.90	1523.63	3485.79	5080.52	6591.23	6894.95	5753.01	4388.67	4368.07	2362.25	933.55	399.27	320.77	105	
77	175.40	322.56	442.34	585.91	638.75	719.86	843.09	893.41	1002.71	1139.85	1357.97	2746.41	4189.01	5433.62	5837.12	5080.15	4099.29	3685.03	1961.17	730.11	330.58	265.39	105	
78	117.10	229.43	354.76	505.77	636.76	673.71	809.14	836.03	936.38	1051.36	1194.07	2136.09	3401.14	4511.21	4976.63	4444.22	3460.09	3095.65	1504.73	621.90	262.74	216.10	105	

Tool_View EL-SL18A 160W CLASS I T2S TFB 300KJIES																																												
Keywords						Candela																2D								3D														
Vertical Angles	Horizontal Angles				Multiplier=1	Max Ccd																																						
	255	260	265	270			275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	^																			
48	1592	1620	1650	1752	84	5742	65	8496	57	10109	60	10570	79	10734	72	11423	32	12222	88	12834	21	13063	37	12861	12	12483	42	12009	18	11294	52	10726	42	10111	23	9761	41	9449	37	9385	74	9229	51	
49	1576	172	1651	1763	23	5861	08	8786	13	10458	03	10846	24	10975	15	11645	51	12465	04	13021	39	13113	13	12778	30	12247	76	11688	17	10877	66	10254	12	9638	12	9266	20	8975	73	8896	24	8752	95	
50	1598	88	1649	1678	29	6008	57	8955	15	10866	04	11655	98	11204	16	11911	93	12728	40	13188	08	13210	12	12632	15	11936	65	11241	10	10411	53	9777	19	9128	96	8775	23	8445	40	8366	42	8235	96	
51	1527	28	1627	166	1786	75	6178	11	9463	23	1134	57	11541	32	11501	12	12194	12	12994	46	13380	13	13370	32	12421	05	11567	55	10840	89	9942	16	9301	62	8603	71	8256	76	7898	730	7898	90		
52	1481	72	1616	163	1802	44	6384	18	9859	09	1237	22	11981	30	11326	95	12528	11	13271	67	13443	23	12970	08	12155	61	11212	03	10385	78	9458	08	8905	36	8079	50	7650	35	7210	52	6954	92		
53	1452	41	1605	163	1830	33	6034	10	10381	12	1281	03	12483	29	11280	48	12650	13	13560	15	13526	32	12826	39	11604	37	10607	94	9940	31	9020	87	8273	74	7478	14	6953	01	6503	44	6253	90		
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## STREETLIGHT ISOCANDELA DIAGRAM

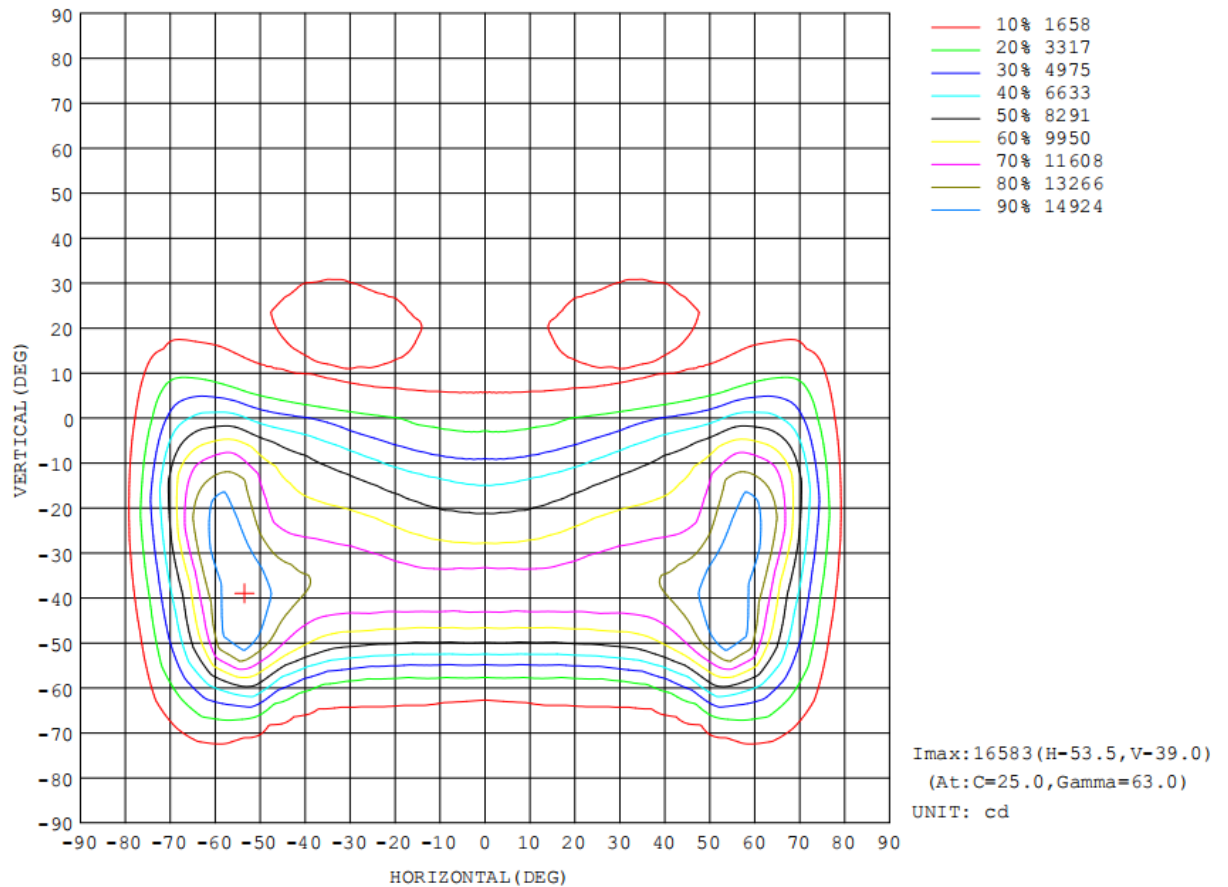


### Classification:

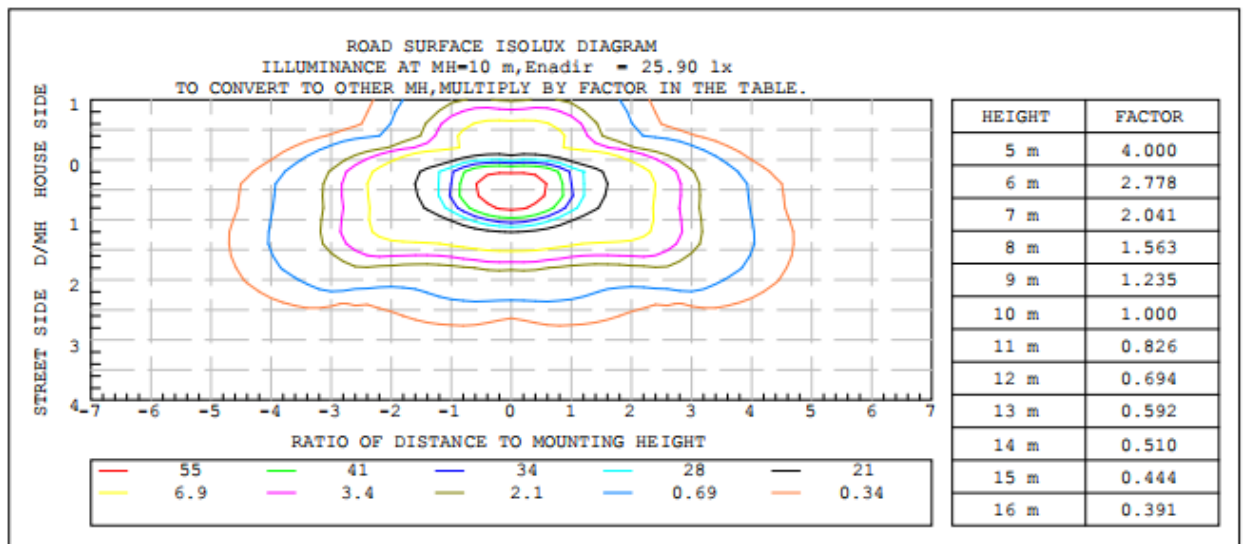
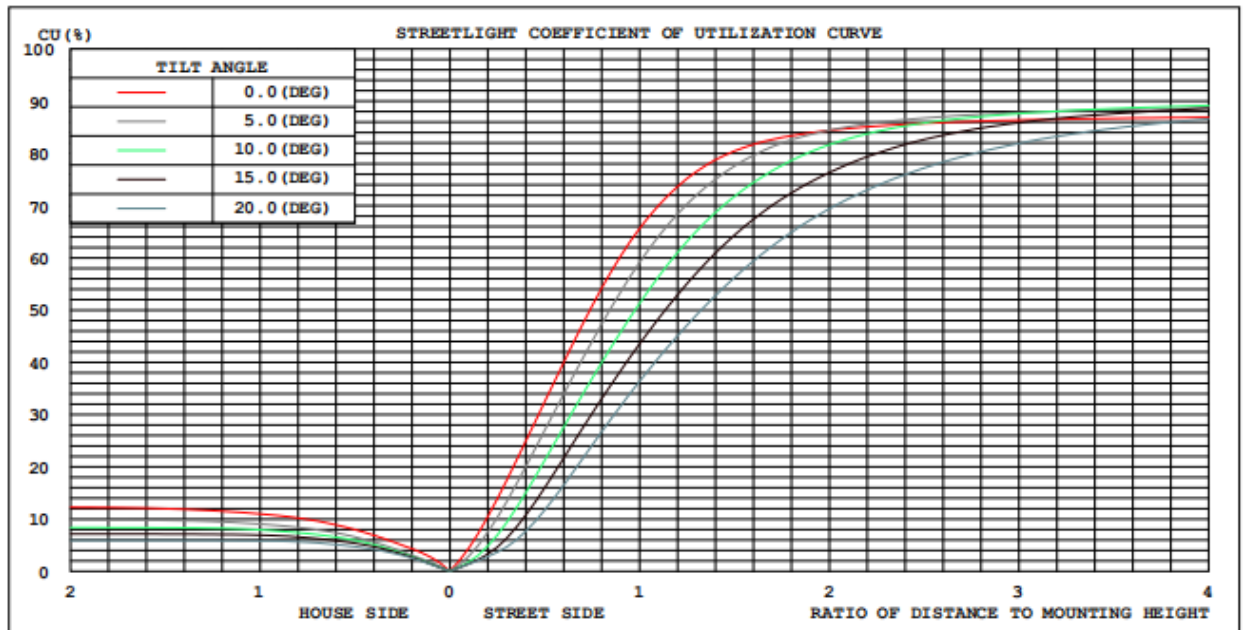
IES:Type II - Short  
CIE:Average - Intermediate  
IES:Semi cut-off  
CIE:Non-cut-off  
Max.At80:138.4cd/klm  
Max.At90:0cd/klm  
Max.80-90:138.4cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	16604
90%	14943
80%	13283
70%	11623
60%	9962
50%	8302
40%	6641
30%	4981
20%	3321
10%	1660
5%	830

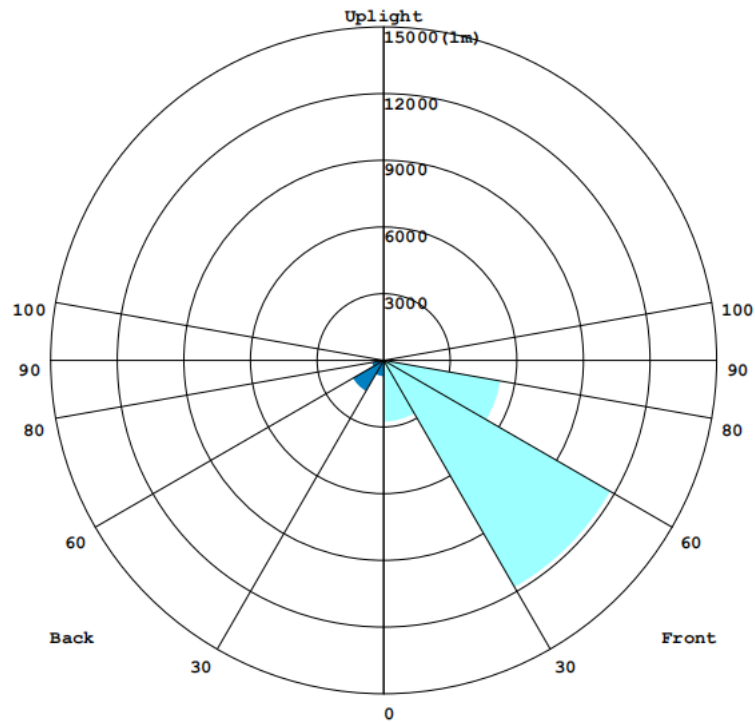
## ISOCANDELA DIAGRAM



### COEFFICIENT OF UTILIZATION CURVE AND ISOLUX DIAGRAM



## LCS REPORT



**IESNA Luminaire Flux Distribution Table:**

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	2759.9	12.0
FM - Front-Medium (30-60)	11793	51.3
FH - Front-High (60-80)	5344.2	23.2
FVH - Front-Very High (80-90)	255.98	1.1
<b>Total Forward Light</b>	<b>20153</b>	<b>87.6</b>

BL - Back-Low (0-30)	713.88	3.1
BM - Back-Medium (30-60)	1598.2	6.9
BH - Back-High (60-80)	525.38	2.3
BVH - Back-Very High (80-90)	8.6209	0.0
<b>Total Back Light</b>	<b>2846.1</b>	<b>12.4</b>

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

<b>BUG (Back, Up, Glare) Rating</b>	<b>B2-U0-G3</b>
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	2846.1	0	2846.1
Street Side	20153	0	20153

**Photo**



**overview**



**Back-side**



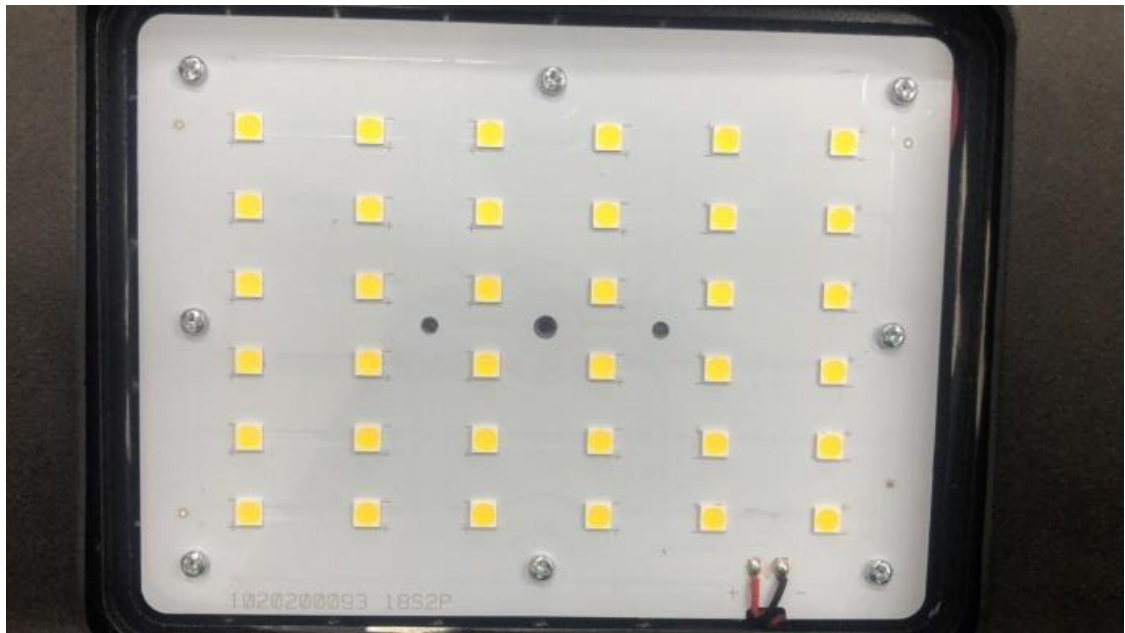


LED Driver + SPD



Optical lens





**LED module**

United States Department of Commerce  
National Institute of Standards and Technology



## Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 201063-0

**TUV Rheinland (Shanghai) Co., Ltd**  
Jing'An District, Shanghai  
China

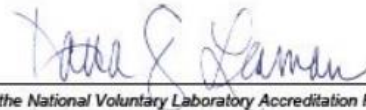
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

### Energy Efficient Lighting Products

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2020-06-09 through 2021-06-30  
Effective Dates



  
For the National Voluntary Laboratory Accreditation Program