

Test Report for Luminous Intensity Distributions

Test Standard : CIE 70 (1987) 、 CIE 84 (1989)

Date of Receipt : 2018 / 03 / 06

Test Date : 2018 / 03 / 06 ~ 2018 / 03 / 13

1. Issue Date for test report : 2018 / 03 / 13
2. Report No : 18030603
3. Total pages : 20
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5. Test sample is not sampling by laboratory, test result relate only to the items tested.
6. Test report is not responsible for advertisement or promotion for products.

Approved Signatory:



毅豐光電股份有限公司
報告簽署人
黃錫偉

Test Report

Information for test items

Applicant : CoolLED Corp

Applicant address : 5F.-3, No.83, Sec. 2, Gongdao 5th Rd., East Dist., Hsinchu
City 30070, Taiwan, R.O.C.

Manufacturer : CoolLED Corp

Manufacturer address : 5F.-3, No.83, Sec. 2, Gongdao 5th Rd., East Dist.,
Hsinchu City 30070, Taiwan, R.O.C.

Product name : 21000lm LED High-bay

Trademark or brand name : CoolLED

Product model number : C3210C-001

Rated input voltage(V) : 100~277

Rated input frequency(Hz) : 50 / 60

Rated input power(W) : 165

Brand / model of controller : MEAN WELL / HBG-160-36A

LED brand / model / color temperature : Lumileds / LUXEON 3030 2D / 5000K

Outward appearance size : Φ 361 mm 、 H 310 mm

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Test Content

Test Condition

Temperature (°C)	25.2
Humidity (% RH)	57.8
γ Axis measurement of angles (°)	5
C Axis measurement of angles (°)	5

Electrical Test

Test item	Test Result
Voltage(V)	220.0
Frequency(Hz)	60
Current (A)	0.778
Watt (W)	166.7
Power factor (PF)	0.974

Luminosity Test

Test item	Test Result
Total luminous flux of luminaires (lm)	21864.1
Initial luminaires efficiency(lm/W)	131.2
Central intensity (cd)	9244.3
Max intensity (cd)	9358.2
Angle for max intensity (°)	C : 335.0 γ : 5.0
Beam Angle (50% I _{max})	C0_180 Left=51.2 Right=52.8
	C90_270 Left=51.3 Right=52.5
Color temperature(K)	5288
Chromaticity Coordinates	x : 0.3377 y : 0.3504
Rendering Index(Ra) / R9	83.1 / 18

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Diagram for luminous intensity distribution I

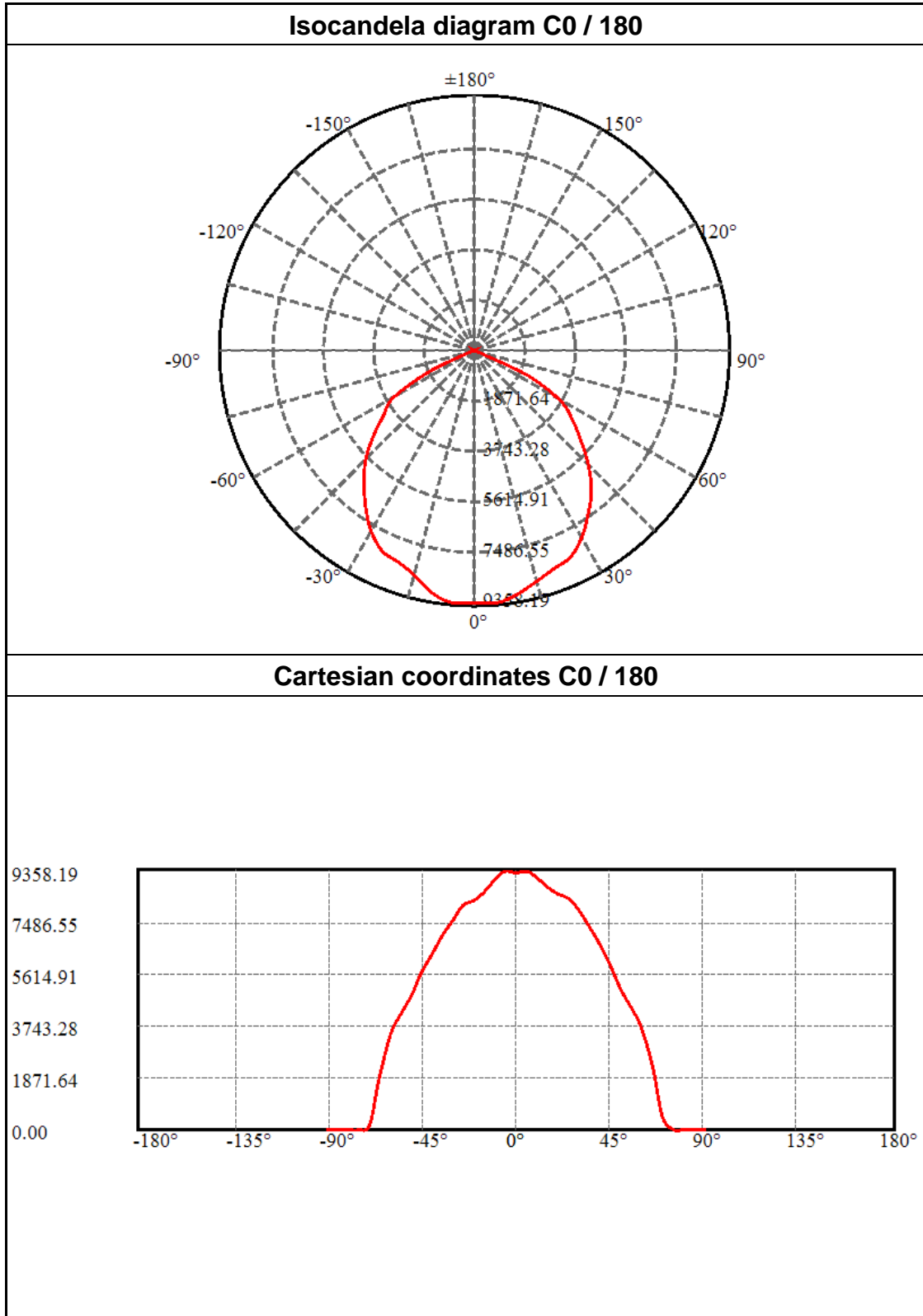


Diagram for luminous intensity distribution II

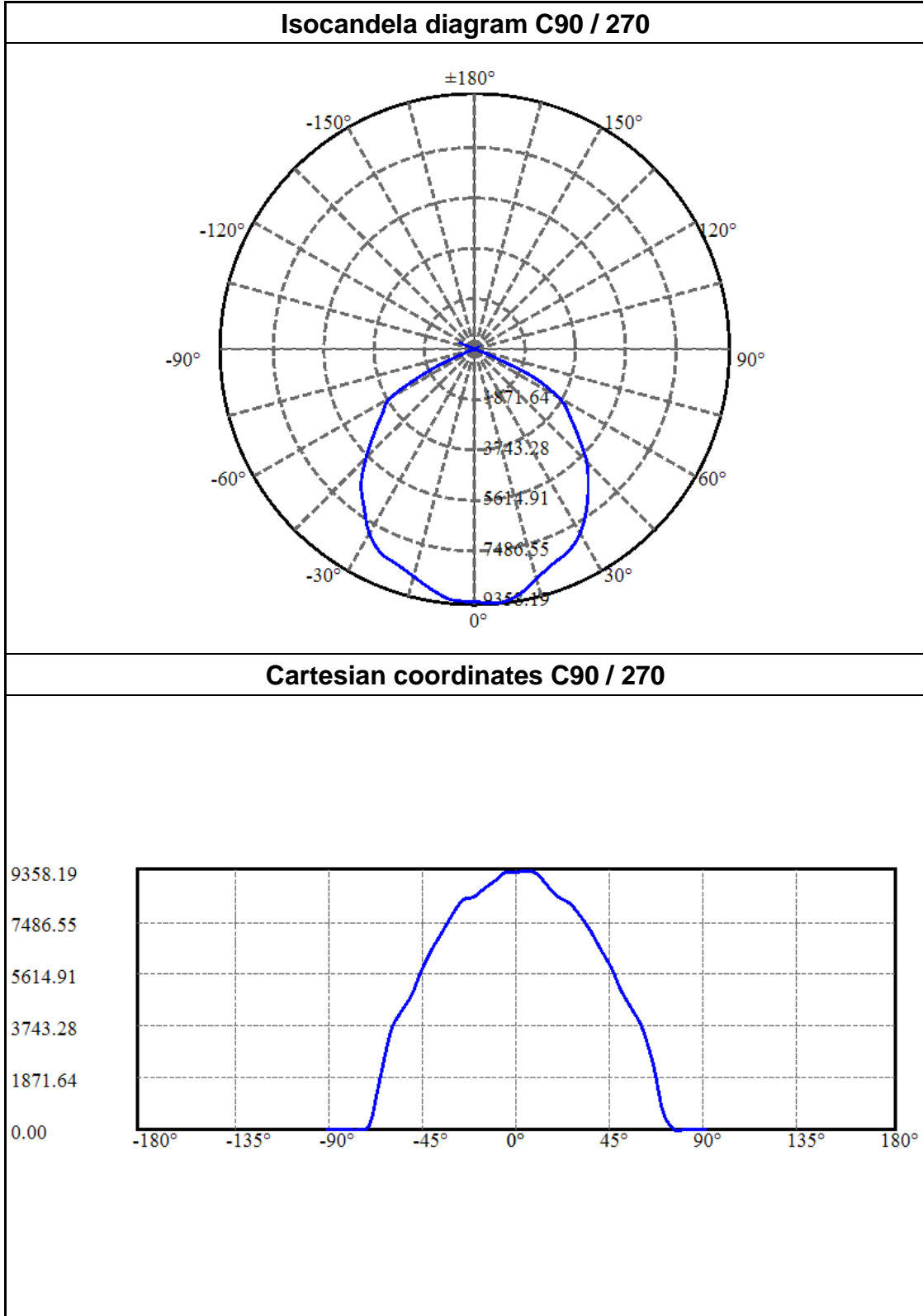
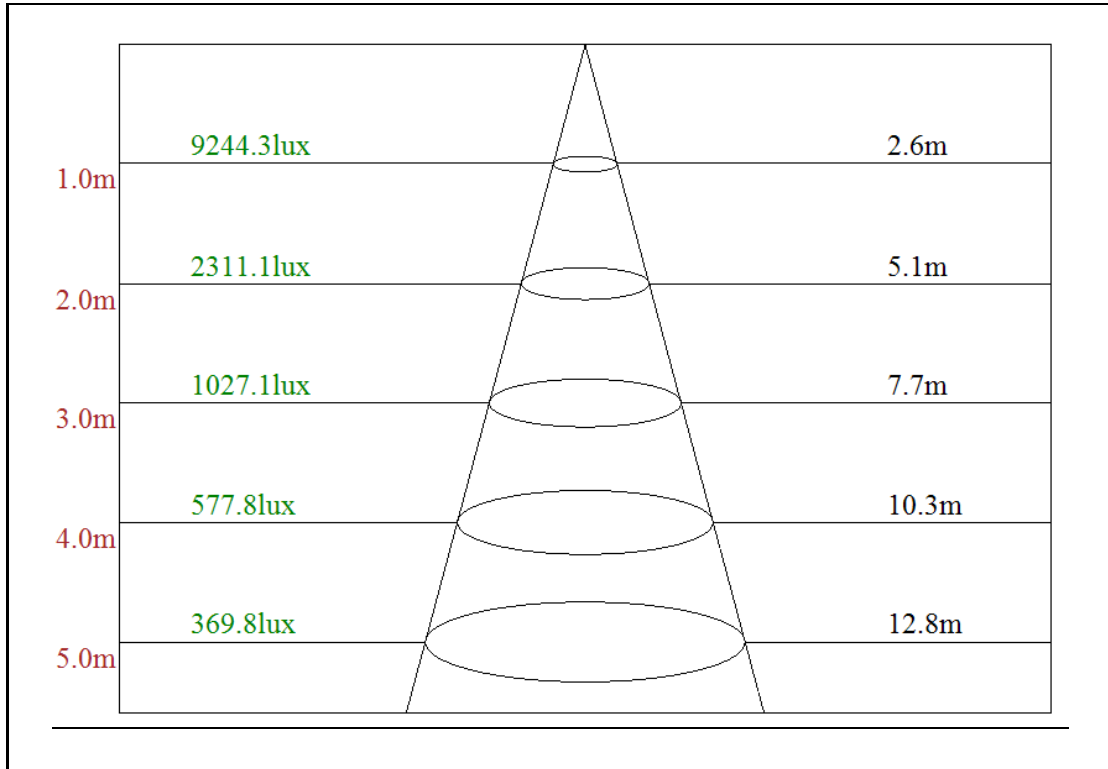


Diagram for illumination distance



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Test Results

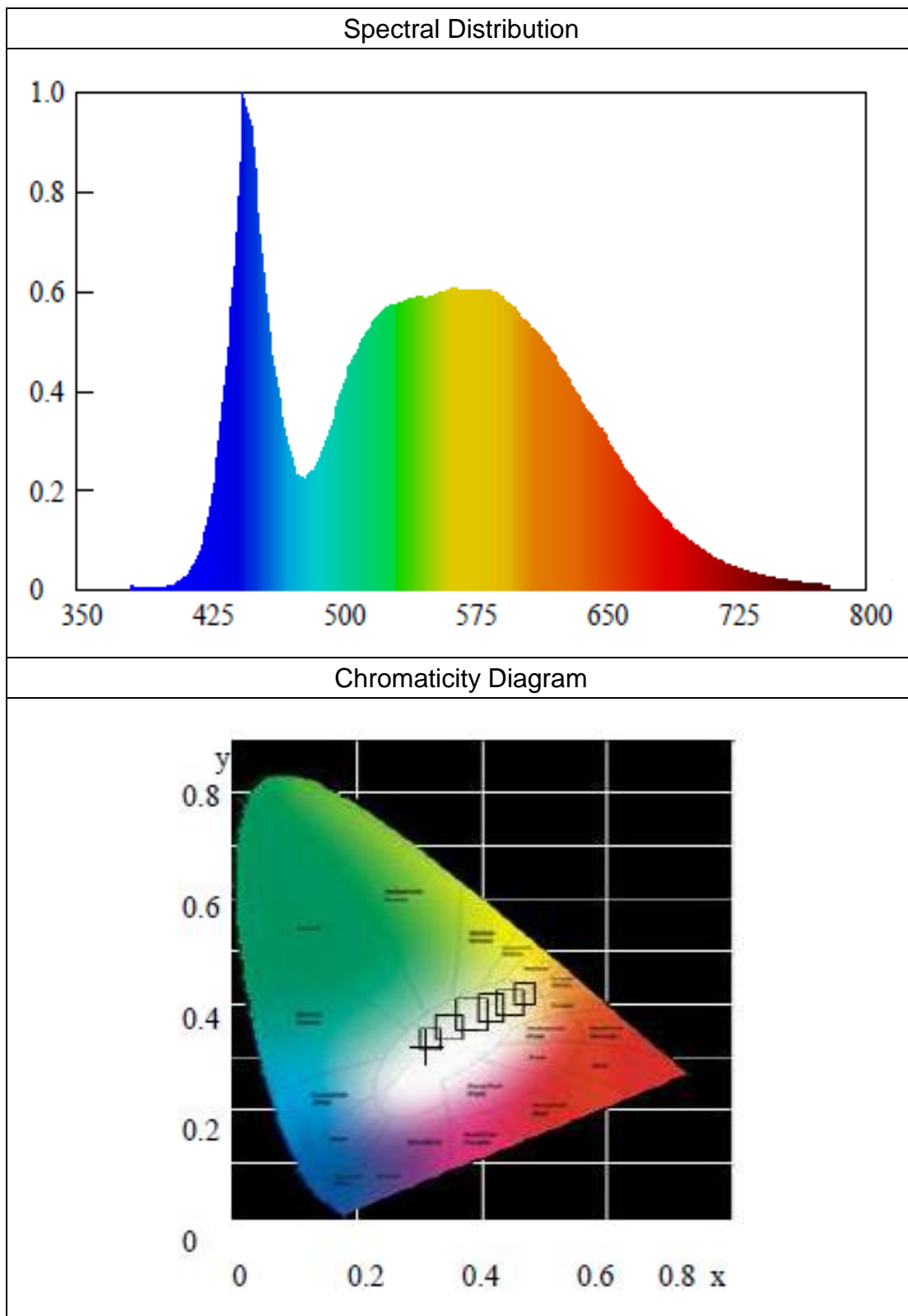


Photo for test items

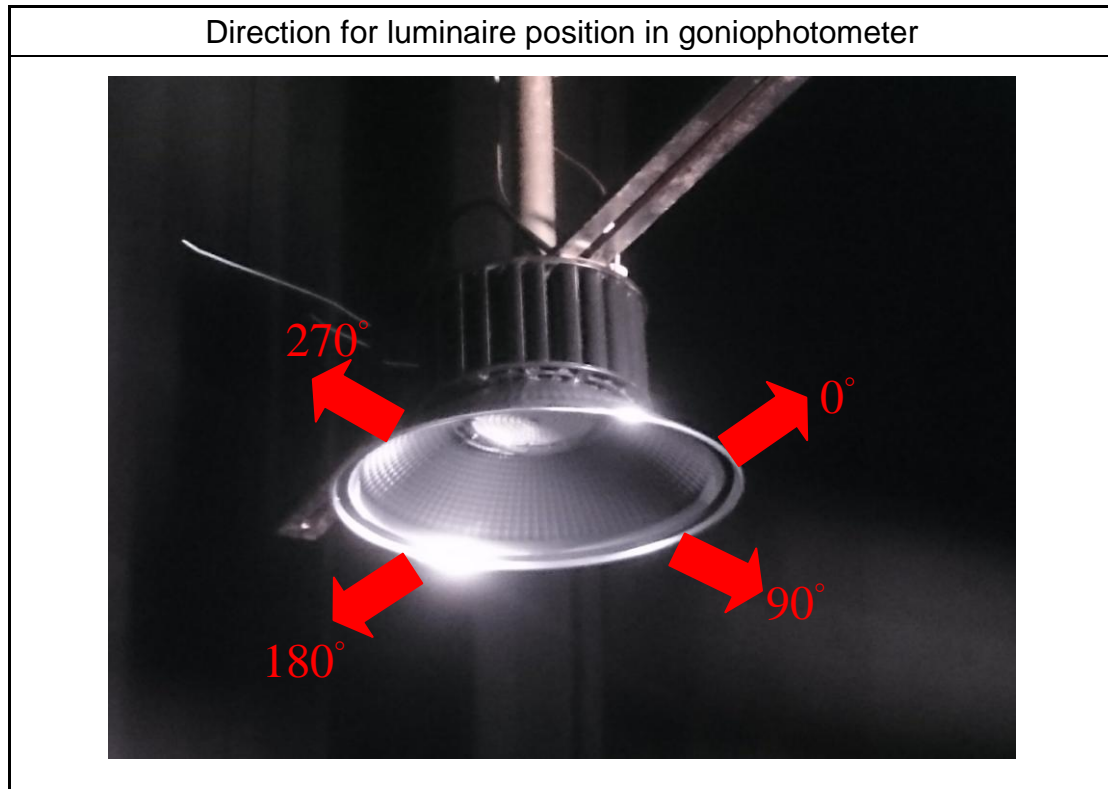
The appearance of photo



Photo of driver



Photo for test items



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Data for luminous intensity (1)

Intensity data(cd)								
$\gamma/C(^{\circ})$	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0
0	9244.271	9237.903	9237.196	9230.827	9244.979	9225.874	9226.582	9229.412
5	9298.754	9318.565	9314.319	9279.649	9313.612	9285.31	9276.819	9278.942
10	9082.947	9133.893	9104.882	9126.816	9156.534	9144.505	9147.336	9131.062
15	8747.564	8760.3	8773.744	8782.234	8792.141	8753.225	8769.499	8765.253
20	8490.012	8482.229	8477.984	8475.861	8473.031	8463.833	8456.757	8429.869
25	8337.888	8337.888	8325.15	8305.339	8304.632	8275.622	8274.207	8257.933
30	7897.077	7897.785	7886.464	7889.294	7868.067	7890.709	7885.049	7874.435
35	7270.887	7293.528	7304.142	7285.038	7311.925	7328.906	7328.906	7314.048
40	6668.753	6672.998	6663.092	6679.366	6681.489	6697.056	6682.904	6661.677
45	5899.635	5914.494	5927.23	5942.796	5938.551	5944.919	5947.75	5957.655
50	5036.412	5051.271	5049.148	5047.025	5056.224	5054.101	5085.941	5090.187
55	4352.909	4362.107	4378.381	4388.287	4386.165	4379.796	4388.287	4397.485
60	3677.897	3685.68	3696.293	3702.661	3704.784	3701.246	3695.586	3695.586
65	2260.654	2317.259	2342.731	2363.25	2379.524	2417.733	2438.959	2474.337
70	456.8008	481.2823	521.6132	517.2971	528.5473	527.6275	541.7079	574.3264
75	9.976596	10.18886	10.40113	10.6134	10.89642	11.03794	11.25021	11.46247
80	4.316116	4.386872	4.386872	4.457628	4.457628	4.59914	4.669896	4.740652
85	1.981168	2.051924	2.051924	2.051924	2.12268	2.051924	2.193436	2.193436
90	0.990584	1.06134	1.06134	1.06134	1.06134	0.990584	1.132096	1.132096

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Data for luminous intensity (2)

Intensity data(cd)									Page: 2 Total:10
$\gamma/C(^{\circ})$	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	
0	9240.026	9244.979	9261.253	9248.517	9254.178	9258.423	9248.517	9254.178	
5	9283.188	9283.895	9300.877	9301.584	9300.877	9309.366	9313.612	9308.659	
10	9165.024	9156.534	9162.901	9176.346	9166.439	9171.393	9158.657	9158.657	
15	8740.488	8735.535	8724.215	8728.46	8693.789	8671.855	8699.45	8695.912	
20	8427.747	8429.869	8405.105	8390.246	8383.878	8371.85	8379.634	8369.728	
25	8255.811	8248.734	8251.564	8217.602	8206.28	8199.205	8175.856	8170.195	
30	7870.19	7864.529	7833.397	7827.029	7785.99	7773.254	7769.716	7769.716	
35	7297.066	7299.897	7294.944	7265.934	7257.443	7235.508	7206.499	7211.452	
40	6651.063	6651.063	6650.356	6637.62	6612.148	6606.488	6590.921	6572.524	
45	5955.532	5947.75	5947.042	5938.551	5930.768	5901.05	5882.654	5878.408	
50	5093.724	5095.847	5090.895	5095.847	5085.941	5066.129	5073.205	5052.686	
55	4390.41	4382.626	4361.4	4367.768	4354.324	4330.975	4347.956	4345.833	
60	3667.991	3686.388	3678.604	3680.727	3670.114	3673.651	3658.793	3664.453	
65	2460.186	2475.752	2454.526	2496.979	2502.64	2499.81	2477.167	2455.233	
70	578.9256	605.2468	612.7469	618.9735	631.3558	649.257	671.3329	648.0542	
75	11.67474	11.88701	12.02852	12.24079	12.45306	12.66532	12.80684	12.94835	
80	4.811408	4.95292	5.023676	5.094432	5.3067	5.377456	5.448212	5.518968	
85	2.193436	2.264192	2.405704	2.405704	2.405704	2.47646	2.547216	2.617972	
90	1.06134	1.132096	1.132096	1.132096	1.06134	1.132096	1.132096	1.202852	

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Data for luminous intensity (3)

Intensity data(cd)		Page: 3 Total:10						
$\gamma/C(^{\circ})$	80.0	85.0	90.0	95.0	100.0	105.0	110.0	115.0
0	9250.64	9258.423	9243.563	9236.488	9247.102	9239.318	9247.102	9250.64
5	9301.584	9310.782	9315.027	9315.027	9311.489	9297.339	9286.725	9310.782
10	9167.147	9153.704	9167.854	9167.147	9150.166	9160.779	9139.553	9124.693
15	8707.233	8705.818	8705.818	8718.554	8717.847	8720.677	8729.168	8722.8
20	8358.406	8352.746	8352.038	8340.01	8330.104	8336.472	8320.905	8323.028
25	8163.12	8172.318	8145.431	8136.232	8114.298	8081.75	8077.505	8061.938
30	7766.886	7754.15	7757.688	7727.262	7684.102	7685.517	7665.705	7657.214
35	7196.592	7185.979	7144.233	7146.356	7128.667	7115.223	7120.884	7104.61
40	6551.298	6535.024	6531.486	6504.599	6479.834	6470.637	6464.976	6458.608
45	5866.38	5859.304	5831.709	5811.19	5774.397	5769.444	5753.878	5748.217
50	5032.167	5014.478	5001.742	5005.987	4988.298	4970.609	4955.042	4944.429
55	4324.607	4333.098	4317.531	4305.502	4293.474	4286.398	4280.738	4268.002
60	3663.038	3640.396	3641.811	3646.764	3604.311	3590.159	3591.575	3578.839
65	2421.978	2387.307	2354.052	2371.741	2323.627	2296.032	2273.39	2243.673
70	639.2805	625.3416	650.3184	618.9735	597.8174	585.8597	598.5958	570.9302
75	13.08986	13.16062	13.08986	13.0191	12.87759	12.66532	12.3823	12.02852
80	5.66048	5.731236	5.801992	5.731236	5.66048	5.66048	5.589724	5.518968
85	2.688728	2.759484	2.759484	2.759484	2.83024	2.759484	2.759484	2.688728
90	1.132096	1.202852	1.273608	1.202852	1.273608	1.202852	1.273608	1.132096

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Data for luminous intensity (4)

Intensity data(cd)									Page: 4 Total:10
$\gamma/C(^{\circ})$	120.0	125.0	130.0	135.0	140.0	145.0	150.0	155.0	
0	9244.979	9227.29	9239.318	9211.016	9229.412	9224.46	9238.611	9249.932	
5	9315.735	9289.555	9275.404	9241.441	9227.997	9237.903	9273.989	9305.121	
10	9133.185	9127.523	9092.854	9090.73	9074.457	9076.58	9045.447	9010.776	
15	8718.554	8702.28	8705.111	8686.007	8676.808	8649.214	8644.969	8621.619	
20	8323.735	8318.075	8302.509	8308.169	8288.357	8266.423	8256.518	8248.026	
25	8063.354	8069.015	8074.674	8046.372	8039.297	8025.854	8021.607	8028.684	
30	7658.63	7641.648	7648.016	7641.648	7607.685	7604.147	7607.685	7602.025	
35	7076.308	7056.496	7049.42	7046.59	7055.081	7040.222	7034.562	7044.468	
40	6426.06	6408.371	6396.342	6392.805	6382.191	6372.285	6382.898	6370.163	
45	5722.038	5736.189	5723.453	5718.5	5691.612	5675.339	5663.31	5655.527	
50	4942.307	4926.74	4932.401	4908.344	4891.362	4860.937	4854.569	4843.956	
55	4234.747	4236.869	4227.671	4199.369	4186.632	4174.604	4165.406	4152.669	
60	3568.933	3551.951	3533.555	3537.8	3526.479	3498.884	3496.761	3494.639	
65	2267.73	2235.182	2202.634	2164.426	2119.142	2097.915	2051.216	1992.489	
70	546.3778	514.8206	499.8911	433.805	402.2478	360.0066	340.1949	336.1618	
75	11.81625	11.39172	10.96718	10.54264	10.04735	9.764328	9.410548	8.986012	
80	5.377456	5.235944	4.95292	4.882164	4.669896	4.457628	4.386872	4.24536	
85	2.617972	2.47646	2.405704	2.264192	2.264192	2.193436	2.12268	1.981168	
90	1.202852	1.132096	1.132096	1.132096	1.06134	0.990584	0.990584	0.919828	

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Data for luminous intensity (5)

Intensity data(cd)									Page: 5 Total:10
$\gamma/C(^{\circ})$	160.0	165.0	170.0	175.0	180.0	185.0	190.0	195.0	
0	9255.593	9247.102	9226.582	9246.394	9242.148	9233.658	9235.073	9238.611	
5	9289.555	9312.197	9329.886	9311.489	9292.386	9323.519	9318.565	9267.62	
10	9041.909	8993.796	9036.956	9036.956	9027.758	9032.004	9009.361	9022.805	
15	8591.193	8565.014	8532.466	8530.343	8532.466	8537.419	8521.146	8508.409	
20	8251.564	8248.026	8243.073	8248.734	8240.244	8250.149	8243.781	8258.641	
25	8035.051	8041.419	8050.618	8045.665	8065.477	8067.6	8069.722	8066.184	
30	7608.393	7600.609	7599.194	7575.845	7583.628	7568.062	7592.826	7610.515	
35	7026.778	7018.288	6993.523	6994.231	6978.664	6973.003	6991.4	6986.447	
40	6379.361	6385.021	6380.069	6353.889	6346.813	6346.813	6356.719	6360.257	
45	5637.13	5623.687	5620.856	5643.499	5651.282	5637.838	5618.734	5609.536	
50	4846.079	4843.956	4826.267	4821.314	4824.852	4816.361	4810.7	4778.86	
55	4158.33	4144.886	4125.075	4127.198	4110.923	4113.046	4120.122	4103.14	
60	3443.695	3445.11	3451.478	3452.893	3446.525	3444.402	3441.572	3440.157	
65	1971.262	1914.657	1892.016	1885.647	1870.081	1863.005	1834.703	1798.618	
70	304.3216	257.6934	229.2494	211.9142	194.579	173.6352	120.2852	112.1483	
75	8.773745	8.49072	8.278452	8.13694	7.853916	7.78316	7.641648	7.641648	
80	4.174604	4.033092	3.962336	3.820824	3.820824	3.750068	3.750068	3.608556	
85	1.981168	1.981168	1.981168	1.7689	1.839656	1.7689	1.839656	1.7689	
90	0.919828	0.919828	0.990584	0.990584	0.990584	0.919828	0.990584	1.06134	

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Data for luminous intensity (6)

Intensity data(cd)		Page: 6 Total:10						
$\gamma/C(^{\circ})$	200.0	205.0	210.0	215.0	220.0	225.0	230.0	235.0
0	9224.46	9236.488	9239.318	9246.394	9249.224	9251.347	9247.809	9252.055
5	9274.696	9291.678	9272.573	9225.167	9267.62	9284.603	9229.412	9229.412
10	8988.135	9019.268	8991.673	8997.333	8930.115	8926.577	8927.284	8932.945
15	8497.796	8516.899	8534.589	8540.249	8532.466	8540.249	8528.928	8547.325
20	8259.348	8256.518	8269.961	8269.254	8280.574	8279.16	8294.019	8295.434
25	8069.015	8073.259	8095.194	8121.374	8136.232	8157.459	8176.563	8174.441
30	7617.591	7611.931	7614.053	7628.912	7636.695	7658.63	7667.121	7678.441
35	6987.155	6988.57	7000.599	7009.796	7013.334	7023.948	7024.656	7045.175
40	6376.531	6375.116	6385.021	6365.917	6375.823	6390.682	6410.494	6400.587
45	5609.536	5627.932	5631.47	5643.499	5639.253	5627.225	5623.687	5622.272
50	4793.012	4791.596	4817.068	4823.437	4833.342	4827.682	4822.021	4811.408
55	4116.584	4126.49	4155.5	4139.226	4160.453	4147.717	4132.15	4128.613
60	3449.355	3460.676	3459.261	3454.308	3472.704	3456.431	3455.723	3447.232
65	1791.542	1774.56	1773.853	1763.947	1749.796	1723.616	1693.191	1683.993
70	109.2473	105.9925	94.95456	92.33659	95.09606	115.7568	122.4786	116.8889
75	7.570892	7.500136	7.42938	7.358624	7.42938	7.42938	7.42938	7.570892
80	3.5378	3.5378	3.5378	3.5378	3.467044	3.467044	3.467044	3.5378
85	1.7689	1.7689	1.7689	1.627388	1.698144	1.7689	1.7689	1.910412
90	1.06134	1.06134	1.132096	1.132096	1.06134	1.132096	1.06134	1.06134

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Data for luminous intensity (7)

Intensity data(cd)									Page: 7 Total:10
$\gamma/C(^{\circ})$	240.0	245.0	250.0	255.0	260.0	265.0	270.0	275.0	
0	9249.932	9256.3	9252.055	9255.593	9249.224	9260.546	9255.593	9258.423	
5	9278.234	9281.064	9231.535	9214.554	9266.913	9261.961	9235.073	9251.347	
10	8953.465	8965.492	8986.012	8989.55	8986.72	8976.813	8970.446	8965.492	
15	8553.692	8551.57	8574.212	8563.599	8584.118	8615.958	8635.77	8643.553	
20	8315.245	8330.104	8350.623	8356.991	8376.096	8373.973	8397.322	8410.058	
25	8185.762	8180.809	8192.13	8198.498	8215.479	8216.895	8243.073	8242.366	
30	7689.054	7695.423	7710.989	7709.574	7727.262	7738.584	7759.811	7772.546	
35	7052.958	7043.053	7050.127	7073.477	7089.751	7091.874	7107.44	7117.346	
40	6405.541	6405.541	6420.4	6443.042	6460.73	6477.711	6482.665	6455.07	
45	5614.489	5623.687	5633.593	5641.376	5649.867	5653.404	5673.924	5685.245	
50	4807.87	4826.974	4809.993	4822.729	4826.974	4834.05	4834.758	4818.483	
55	4144.886	4128.613	4144.886	4143.471	4144.179	4165.406	4176.019	4202.199	
60	3450.77	3459.968	3460.676	3480.488	3473.412	3486.856	3498.177	3485.441	
65	1685.408	1655.69	1669.134	1671.257	1699.559	1722.909	1712.295	1718.663	
70	111.936	104.7189	103.0207	129.2005	162.8803	180.7816	186.2298	174.6258	
75	7.641648	7.712404	7.853916	7.995428	8.13694	8.278452	8.419964	8.49072	
80	3.5378	3.750068	3.750068	3.89158	3.89158	4.033092	4.174604	4.174604	
85	1.7689	1.7689	1.839656	1.910412	1.910412	2.051924	1.981168	2.051924	
90	1.06134	1.132096	1.132096	1.06134	1.132096	1.132096	1.06134	1.06134	

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Data for luminous intensity (8)

Intensity data(cd)		Page: 8 Total:10						
$\gamma/C(^{\circ})$	280.0	285.0	290.0	295.0	300.0	305.0	310.0	315.0
0	9245.687	9254.178	9249.224	9252.762	9247.102	9243.563	9246.394	9244.979
5	9274.696	9237.196	9227.29	9276.819	9257.715	9220.922	9251.347	9321.396
10	8950.634	8986.72	8964.785	8998.748	8982.474	9029.173	9013.607	9055.354
15	8631.524	8654.874	8676.101	8705.111	8736.243	8741.196	8751.103	8774.451
20	8427.039	8436.238	8436.945	8451.804	8463.125	8480.814	8487.89	8486.475
25	8258.641	8261.471	8262.886	8267.131	8274.914	8278.452	8289.065	8292.604
30	7776.084	7790.943	7808.632	7814.292	7807.924	7807.924	7817.83	7840.473
35	7109.563	7126.544	7144.94	7172.536	7175.366	7177.489	7147.771	7182.441
40	6467.099	6482.665	6484.787	6496.108	6494.693	6498.939	6505.307	6517.335
45	5695.858	5704.349	5701.518	5712.84	5741.849	5773.689	5767.322	5796.332
50	4859.522	4862.353	4872.258	4882.164	4889.947	4893.485	4909.051	4918.957
55	4219.888	4214.227	4238.284	4223.425	4227.671	4243.237	4271.54	4265.879
60	3509.498	3533.555	3551.951	3558.319	3573.178	3582.376	3585.207	3601.48
65	1748.381	1772.438	1800.74	1819.137	1865.128	1916.072	1955.696	1986.828
70	152.5499	163.3049	195.9941	205.5462	211.702	210.4991	224.0843	241.1364
75	8.702988	8.702988	8.702988	8.773745	8.773745	8.773745	8.773745	8.632232
80	4.316116	4.316116	4.457628	4.386872	4.316116	4.316116	4.24536	4.24536
85	2.12268	2.193436	2.12268	2.12268	2.12268	2.12268	2.051924	2.051924
90	1.06134	1.06134	0.990584	1.06134	1.132096	1.06134	0.919828	1.06134

-The following blank-

Data for luminous intensity (9)

Intensity data(cd)		Page: 9 Total:10							
$\gamma/C(^{\circ})$	320.0	325.0	330.0	335.0	340.0	345.0	350.0	355.0	
0	9221.63	9229.412	9235.073	9231.535	9236.488	9259.838	9253.47	9239.318	
5	9307.951	9293.801	9332.716	9358.188	9326.349	9329.179	9337.669	9304.414	
10	9052.522	9044.031	9070.919	9043.324	9088.608	9060.306	9078.702	9091.438	
15	8743.319	8724.923	8712.894	8715.017	8719.262	8710.063	8707.233	8729.168	
20	8473.738	8487.182	8472.323	8479.399	8471.615	8477.984	8480.814	8480.814	
25	8313.83	8323.028	8306.754	8306.754	8309.585	8318.783	8337.18	8340.01	
30	7844.718	7848.255	7852.5	7851.085	7861.699	7875.85	7882.219	7887.171	
35	7189.517	7206.499	7217.82	7231.971	7236.216	7257.443	7257.443	7280.084	
40	6545.638	6571.817	6582.431	6601.535	6622.761	6629.837	6649.649	6651.063	
45	5802.7	5850.106	5843.031	5844.446	5850.813	5885.484	5889.022	5900.343	
50	4926.033	4939.476	4945.137	4949.382	4972.024	4986.175	5009.525	5019.431	
55	4268.002	4287.106	4311.871	4329.56	4338.758	4337.343	4343.003	4335.928	
60	3617.754	3632.613	3643.227	3648.179	3641.104	3670.114	3664.453	3680.02	
65	2013.716	2032.112	2059	2079.519	2119.85	2150.982	2192.729	2216.785	
70	236.4666	260.0283	284.9344	312.6708	385.1249	389.0872	421.7765	436.2815	
75	8.702988	8.844501	8.773745	8.986012	8.986012	9.269036	9.410548	9.693572	
80	4.174604	4.24536	4.174604	4.174604	4.174604	4.174604	4.24536	4.24536	
85	2.051924	1.981168	1.981168	1.981168	1.981168	1.910412	1.981168	1.910412	
90	0.990584	0.990584	0.990584	0.990584	0.919828	1.06134	0.990584	0.990584	

-The following blank-

Data for luminous intensity (10)

Intensity data(cd)

Page: 10 Total:10

$\gamma/C(^{\circ})$	360.0
0	9244.271
5	9298.754
10	9082.947
15	8747.564
20	8490.012
25	8337.888
30	7897.077
35	7270.887
40	6668.753
45	5899.635
50	5036.412
55	4352.909
60	3677.897
65	2260.654
70	456.8008
75	9.976596
80	4.316116
85	1.981168
90	0.990584

-The following blank-



Equipment list and testing engineer for test

Item	Equipment No	Equipment	Manufacturer / Type / Series No
1	99A-01	Magnetic angle locator	Nigata Seiki/LM-90
2	99E-05	Digital power meter	YOKOGAWA WT210 (91K116100)
3	99E-08	Digital power meter	YOKOGAWA WT210 (91K539455)
4	99E-17	AC Power Source	APC AFC-5KW
5	99O-01	Goniophotometer System	Sensing GMS-2000
6	99O-22	Spectroradiometer (2π)	Sensing SPR-3000
7	99O-23	Integrating sphere (2π)	Sensing
8	104O-31	Photometric standard lamp 110V/100W	Sensing (S13100197)
Testing engineer : Chun-Min Chang			

-Following blank-