

## LM-79-08 Test Report

For

# Revolution Lighting Technologies, Inc

(Brand Name:  Revolution Lighting )

2280 Ward Ave. Simi Valley, CA. 93065

## Outdoor Pole/Arm-Mounted Area and Roadway

### Luminaires

Model name(s): 113XS9-3LT

Remark: 113 represents Area Light Type, X represents Standard Housing Color.  
S represents Sensor Options, can be 1=N/A; 2=photocell& motion sensor. 9 represents 220W(AC200-480V). L represents Lens Type, can be 3=TYPEIII, 5=TYPEV.  
T represents CCT, can be 2=4000K, 4=5000K. This is a multiple list report, the original report NO. is GZE1709137-H.

Representative (Tested) Model: 113029-332 [113019-332]  
113029-334 [113019-334]

Model Different: All construction and rating are the same, except CCT

Test &amp; Report By:

*Garman Mo*

Engineer: Garman Mo

Date: Oct.26,2017

Review By:

*Tommy Liang*

Manager: Tommy Liang

Note: 1.The results contained in this report pertain only to the tested samples.

2.This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center  
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2


Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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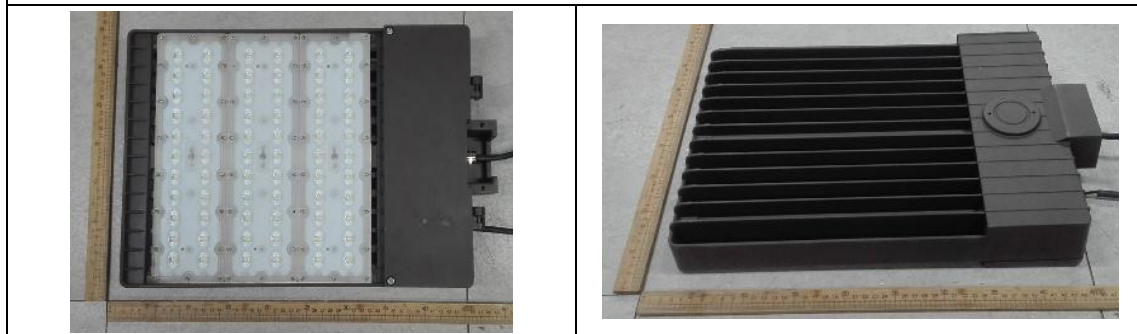
Fax: 8620-32290422

<http://www.standard-tech.com>

**1.1 Product Information:**

Organization Name	Revolution Lighting Technologies, Inc	
Brand Name		
Model Number	113XS9-3LT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
Rated Voltage / Frequency	200 -480Vac, 50/60 Hz	
Nominal Power	220W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	GZE1709137-H1(4000K),H2(5000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**



**1.2 Test Specifications:**

Date of Receipt	Oct.22,2017
Date of Test	Oct.23,2017
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	QD25

**1.3 Test Methods**

<p><b>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</b>                  Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ± 1 °C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 277 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.</p>
<p><b>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</b>                  Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °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 sample was operated at 277 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.</p>
<p><b>3) Electrical Measurements:</b>                  Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25 °C ± 1 °C. The sample was operated at 277 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.</p>

**2.1 Electrical, Photometric and Chromaticity Measurements**  
*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-10-23	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	113029-332 [113019-332]		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170913	277.0	60	0.7458	204.1	0.9880	7.50
7-H1	480.0	60	0.4415	200.3	0.9452	12.57
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

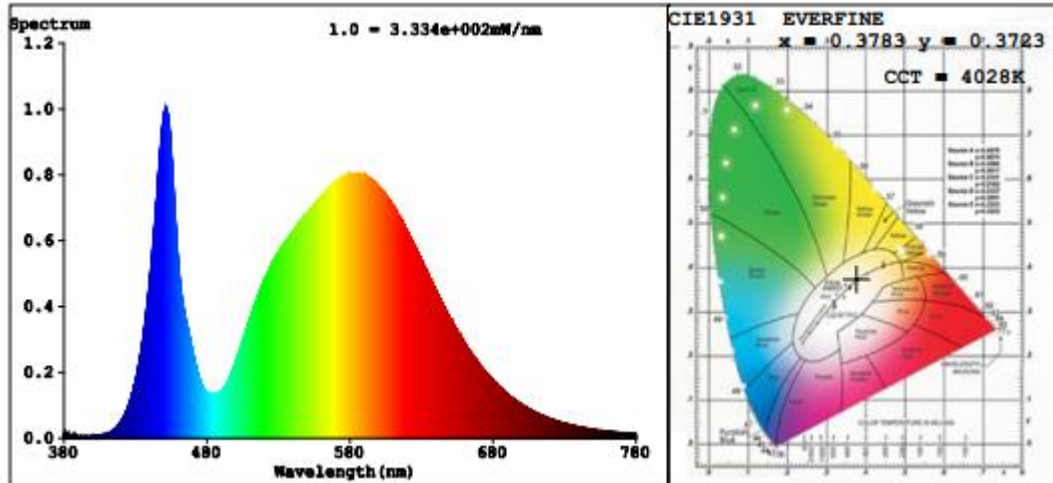
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	72	R9	0
Frequency (Hz)	60	R2	81	R10	55
CCT (K)	4028	R3	87	R11	68
Duv	-0.0015	R4	73	R12	44
Chromaticity (x, y)	x=0.3783 y=0.3723	R5	72	R13	74
Chromaticity (u', v')	u'=0.2254 v'=0.4993	R6	73	R14	93
Color Rendering Index (CRI)	74.7	R7	83	R15	68
R9	0	R8	57	--	--

**Photometric Measurement – Goniophotometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	277.0	480.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	27889	27652	>=1000(-10%)	
Luminous Efficacy (lm/W)	136.64	138.05	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	135.48		100(-3%)	120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.7	--	>=100(-1)	
Zonal lumens in the 80-90 °zone (%)	1.7	--	<=10(+3)	
Beam Angle ( °)	134.2	--	--	
Center Beam Candle Power (cd)	6352	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

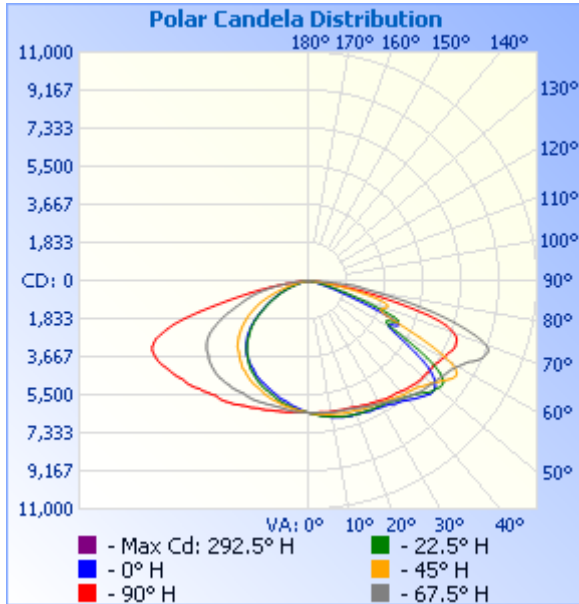


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,341.7	19.2%
0-40	9,340.0	33.5%
0-60	19,759.4	70.8%
60-90	8,061.1	28.9%
70-100	3,309.0	11.9%
90-120	30.0	0.1%
0-90	27,820.4	99.7%
90-180	71.3	0.3%
0-180	27,891.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	607.2	2.2%	90-100	7.7	0%
10-20	1,798.7	6.4%	100-110	10.1	0%
20-30	2,935.9	10.5%	110-120	12.1	0%
30-40	3,998.3	14.3%	120-130	12.1	0%
40-50	4,963.3	17.8%	130-140	10.3	0%
50-60	5,456.0	19.6%	140-150	8.1	0%
60-70	4,759.8	17.1%	150-160	5.9	0%
70-80	2,833.4	10.2%	160-170	3.6	0%
80-90	467.9	1.7%	170-180	1.4	0%

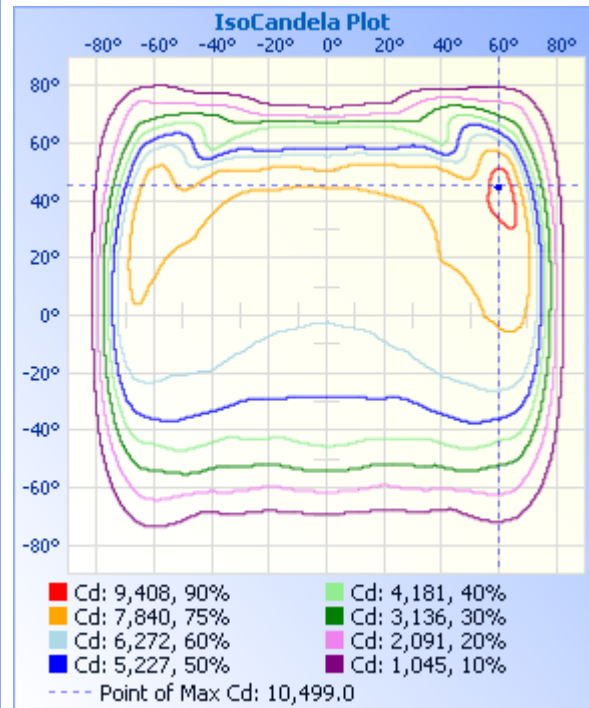
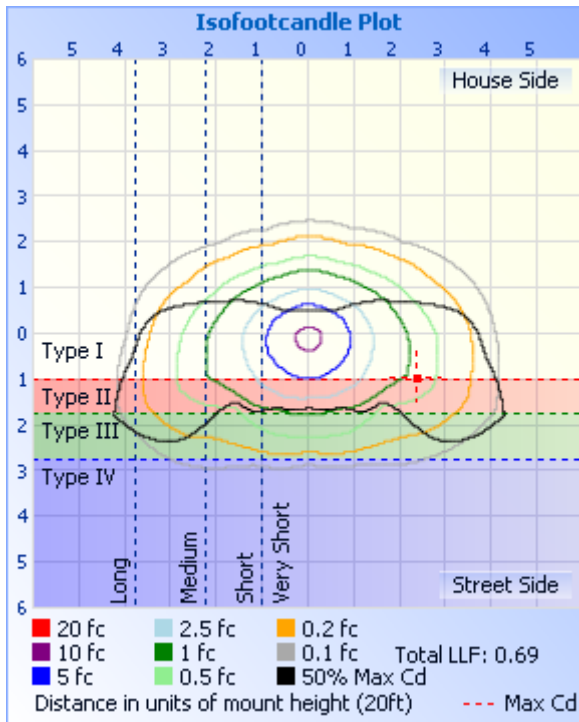
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	22.0 fc	40.1 ft	97.6 ft
34.0ft	5.49 fc	80.2 ft	195.2 ft
51.0ft	2.44 fc	120.3 ft	292.8 ft
68.0ft	1.37 fc	160.5 ft	390.4 ft
85.0ft	0.88 fc	200.6 ft	488.1 ft
102.0ft	0.61 fc	240.7 ft	585.7 ft

■ Vert. Spread: 99.4°  
■ Horiz. Spread: 141.6°



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Table--1

UNIT: \*10cd

C (DEG) \ γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
5	636	646	651	651	650	652	645	638	636	628	626	621	615	624	624	634
10	642	656	661	665	667	665	653	644	640	626	615	601	592	606	614	628
15	648	663	669	678	679	676	661	646	643	623	600	582	573	588	601	624
20	659	671	680	686	683	684	665	653	648	621	588	564	552	566	587	627
25	671	685	696	693	696	688	674	668	660	620	576	544	534	547	569	631
30	688	705	710	701	703	696	683	685	671	622	558	521	511	523	554	625
35	706	733	724	716	724	710	697	706	683	620	536	489	487	494	530	632
40	717	764	744	733	749	732	715	733	695	620	506	454	460	456	505	631
45	736	793	761	777	786	766	731	758	712	617	474	411	419	413	475	629
50	765	810	793	835	796	807	769	775	721	600	434	362	366	358	437	615
55	786	834	844	807	675	773	828	795	728	575	383	295	297	290	387	593
60	811	874	840	522	453	491	796	828	748	546	328	221	224	217	327	557
65	822	967	520	468	468	474	456	902	773	489	264	153	156	149	253	478
70	753	1047	396	304	172	287	388	912	748	389	179	93.1	83.7	88.0	165	368
75	469	797	418	111	64.0	105	353	669	520	297	87.2	42.7	39.7	41.1	75.4	276
80	187	354	225	39.3	25.9	36.4	150	354	204	179	32.5	22.5	19.6	21.8	29.4	156
85	34.2	135	29.4	8.32	4.78	7.62	24.1	155	32.2	43.4	10.9	7.86	5.86	8.04	10.0	33.3
90	1.59	1.81	0.89	0.26	0.13	0.20	0.64	1.74	1.53	1.35	0.54	0.15	0.09	0.18	0.61	1.45
95	1.42	1.07	0.49	0.13	0.08	0.11	0.37	1.04	1.28	1.37	0.61	0.28	0.13	0.29	0.63	1.41
100	1.65	0.99	0.44	0.15	0.13	0.15	0.36	0.96	1.42	1.56	0.81	0.48	0.34	0.48	0.78	1.53
105	1.94	1.16	0.53	0.26	0.25	0.25	0.52	1.13	1.69	1.82	1.09	0.68	0.55	0.68	1.08	1.76
110	2.13	1.42	0.65	0.39	0.39	0.39	0.68	1.41	1.82	1.88	1.33	0.93	0.87	0.91	1.28	1.89
115	2.17	1.58	0.82	0.49	0.48	0.43	0.83	1.54	1.76	1.83	1.38	1.09	1.09	1.03	1.30	1.79
120	2.16	1.58	0.97	0.72	0.63	0.69	0.94	1.59	1.70	1.73	1.35	1.32	1.22	1.30	1.30	1.64
125	2.12	1.65	1.00	0.94	0.94	0.93	0.96	1.66	1.59	1.65	1.23	1.32	1.48	1.34	1.30	1.60
130	1.97	1.55	0.97	1.07	1.05	1.07	1.02	1.50	1.56	1.45	1.27	1.42	1.53	1.39	1.32	1.53
135	1.77	1.41	0.97	1.18	1.27	1.21	1.05	1.38	1.45	1.33	1.20	1.46	1.48	1.45	1.28	1.41
140	1.65	1.39	0.97	1.17	1.31	1.22	0.92	1.37	1.47	1.34	1.00	1.43	1.44	1.40	1.11	1.39
145	1.58	1.24	0.99	1.25	1.03	1.23	0.98	1.23	1.50	1.31	0.97	1.42	1.46	1.51	1.20	1.40
150	1.50	1.19	1.18	1.27	1.39	1.27	1.17	1.19	1.43	1.31	1.05	1.43	1.52	1.52	1.48	1.35
155	1.33	1.15	1.29	1.27	1.39	1.30	1.31	1.19	1.18	1.28	1.18	1.29	1.37	1.39	1.34	1.22
160	1.28	1.12	1.31	1.27	1.32	1.30	1.33	1.14	1.26	1.23	1.15	1.10	1.26	1.21	1.21	1.14
165	1.37	1.10	1.36	1.20	1.26	1.30	1.30	1.08	1.28	1.24	1.16	1.07	1.18	1.14	1.17	1.24
170	1.49	1.21	1.50	1.52	1.46	1.49	1.43	1.22	1.48	1.46	1.31	1.48	1.60	1.52	1.47	1.49
175	1.55	1.34	1.56	1.57	1.59	1.53	1.51	1.33	1.55	1.56	1.42	1.52	1.60	1.60	1.48	1.51
180	1.41	1.36	1.51	1.58	1.59	1.47	1.49	1.31	1.44	1.44	1.33	1.47	1.56	1.58	1.45	1.48

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**2.2 Electrical, Photometric and Chromaticity Measurements**

*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-10-23	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	113029-334 [113019-334]		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170913	277.0	60	0.7568	206.0	0.9827	8.12
7-H2	480.0	60	0.4490	202.3	0.9386	13.19
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

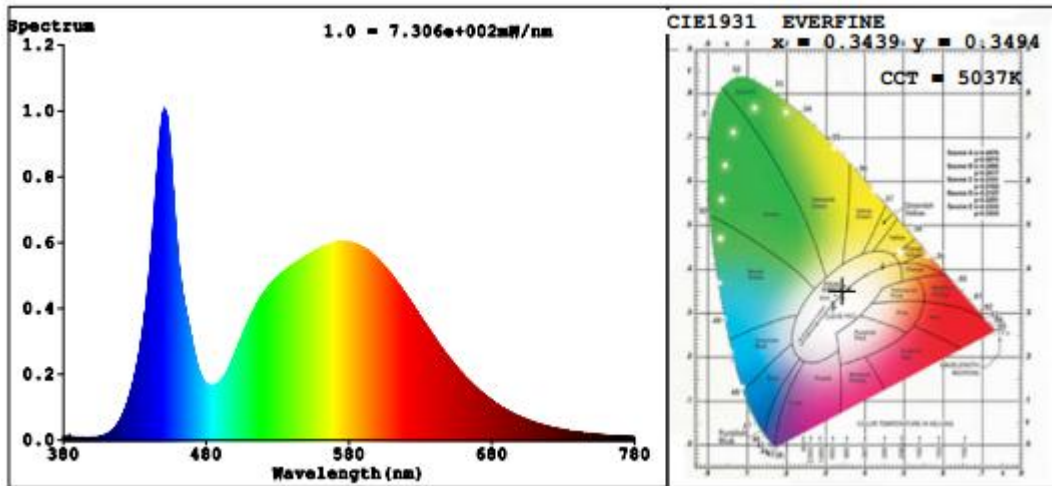
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	76	R9	0
Frequency (Hz)	60	R2	83	R10	58
CCT (K)	5037	R3	87	R11	75
Duv	-0.0006	R4	78	R12	53
Chromaticity (x, y)	x=0.3439 y=0.3494	R5	77	R13	77
Chromaticity (u', v')	u'=0.2115 v'=0.4834	R6	76	R14	92
Color Rendering Index (CRI)	77.7	R7	84	R15	71
R9	0	R8	62	--	--

**Photometric Measurement – Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	277.0	480.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	28123	28306	≥1000(-10%)	
Luminous Efficacy (lm/W)	136.52	139.92	Standard: ≥=	Premium: ≥=
Most worst Luminous/Highest Watts	136.52		100(-3%)	120(-3%)



**Spectral Power Distribution & Chromaticity Diagram**



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**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06

Expand Uncertainty:  
Photometric Measurement (Sphere):2.04%, k=2  
Chromaticity Measurement(Sphere):28.8K, k=2  
Photometric Measurement(Goniophotometer):2.36%, k=2

**\*\*\*\*\* END OF REPORT \*\*\*\*\***

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