中国计量科学研究院
National Institute of Metrology, China

中国认可
国际互认
校准
CALIBRATION
CNAS L0502

校 准 证 书
Calibration Certificate

证书编号 GXgf2025-02215
Certificate No.

客户名称 Client	IBEX LIGHTING
器具名称 Instrument	光度探头（可见光 Class L 级） Photometer
型号/规格 Type/Model	PHOTO-VIS-L
出厂编号 Serial No.	250316-1
生产厂商 Manufacturer	/
联络信息 Contact Information	2 Matarawa Place, Tauriko, Tauranga 3171, New Zealand (Post code: 3171)
校准日期 Date of Calibration	2025 年 06 月 30 日
接收日期 Date of Receiving	2025 年 06 月 23 日

批准人：
Approved by

中国计量科学研究院 校准专用章

发布日期：2025 年 07 月 02 日
Date of Issue

地址：中国北京北三环东路 18 号
Address：No.18 Bei San Huan Dong Lu,Beijing,P.R.China
邮编：100029
Post Code
电话：+86-10-64525569/74
Tel
传真：+86-10-64271948
Fax
网址：http://www.nim.ac.cn
Website
电子邮箱：kehufuwu@nim.ac.cn
Email

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中国计量科学研究院（NIM）是国家最高的计量科学研究中心和国家级法定计量技术机构。1999 年授权签署了国际计量委员会（CIPM）《国家计量基(标)准和国家计量院签发的校准与测量证书互认协议》（CIPM MRA）。The National Institute of Metrology (NIM) is China’s national metrology institute (NMI) and a state-level legal metrology institute. NIM is China’s signatory to the Mutual Recognition of National Measurement Standards and of Calibration and Measurement Certificates Issued by National Metrology Institutes (CIPM MRA) which is arranged by the International Committee of Weights and Measures (CIPM).
质量管理体系符合 ISO/IEC17025 标准，通过中国合格评定国家认可委员会（CNAS）和亚太计量规划组织（APMP）联合评审的校准和测量能力（CMCs）在国际计量局（BIPM）关键比对数据库中公布。NIM’s quality management system meets requirements of the ISO/IEC 17025. Its Calibration and Measurement Capabilities (CMCs) that are peer reviewed both by China National Accreditation Service for Conformity Assessment (CNAS) and the Asia Pacific Metrology Programme (APMP) are published in the International Bureau of Weights and Measures (BIPM) Key Comparison Database (KCDB).
2020 年，NIM 和 CNAS 就认可领域的技术评价活动签署了谅解备忘录，承认 NIM 的计量支撑作用和出具的校准/检测结果的溯源效力。NIM and CNAS signed a Memorandum of Understanding (MOU) for Recognition of Technical Assessment in Laboratory Accreditation Field in 2020, in which CNAS recognizing the technical supporting role of NIM in laboratory accreditation and the traceability of NIM’s calibration / test results.
校准结果不确定度的评估和表述均符合 JJF1059 系列标准的要求。The evaluation and expression of uncertainty of the calibration results are in line with the requirements of JJF1059 series standards.

校准所依据/参照的技术文件（代号、名称）Reference documents (Code,Name)

参照 JJF 1150-2006 光电探测器相对光谱响应度校准规范

校准环境条件及地点 Calibration place and environment

温度 Temperature:（24±2） ℃　　地点 Location:　　和-13-110

湿度 Humidity:（67±5） % RH　　其它 Others:　　/

校准使用的计量基（标）准装置(含标准物质)/主要仪器
Reference Standards（Including the Reference Material）/ Instruments used

名称 Name	测量范围 Measurement Range	不确定度/准确度等级 Uncertainty/Accuracy	证书编号 Certificate No.	证书有效期至 Due Date (YYYY-MM-DD)
光电探测器相对光谱响应度标准装置 Measurement Standard of relative spectral responsivity for photodetectors	300nm-1600nm	300nm-400nm 1.3%-1.2% (k=2); 400nm-450nm 1.2%-0.8% (k=2); 450nm-1000nm 0.8%-0.7% (k=2); 1000nm-1050nm 0.7%-1.2% (k=2); 1050nm-1600nm 1.2%-1.5% (k=2).	[1991] 国量标计证字第 185 号	2026-03-11

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校 准 结 果
Calibration Results

校准原理：利用已知光谱响应度的标准探测器标定单色光系统，再利用比较法测量被测探测器的光谱响应度。
Calibration mechanism: calibrating the monochromator-based facility by standard detectors with known absolute spectral responsivity, and then measuring the tested detectors based on comparison method.

波长 WL(nm)	光谱响应度(A/W) Responsivity	波长 WL(nm)	光谱响应度(A/W) Responsivity	波长 WL(nm)	光谱响应度(A/W) Responsivity	波长 WL(nm)	光谱响应度(A/W) Responsivity
380	5.474E-06	495	6.295E-03	610	1.221E-02	725	1.141E-05
385	6.930E-06	500	7.805E-03	615	1.068E-02	730	7.510E-06
390	1.313E-05	505	9.690E-03	620	9.207E-03	735	5.486E-06
395	2.880E-05	510	1.190E-02	625	7.763E-03	740	3.514E-06
400	6.785E-05	515	1.435E-02	630	6.416E-03	745	2.096E-06
405	1.187E-04	520	1.683E-02	635	5.246E-03	750	2.033E-06
410	1.657E-04	525	1.910E-02	640	4.221E-03	755	1.415E-06
415	2.041E-04	530	2.095E-02	645	3.351E-03	760	1.297E-06
420	2.517E-04	535	2.234E-02	650	2.661E-03	765	1.173E-06
425	3.221E-04	540	2.328E-02	655	2.045E-03	770	2.147E-06
430	4.137E-04	545	2.382E-02	660	1.548E-03	775	1.319E-06
435	5.115E-04	550	2.397E-02	665	1.153E-03	780	5.681E-07
440	6.150E-04	555	2.395E-02	670	8.441E-04	-	-
445	7.297E-04	560	2.372E-02	675	6.071E-04	-	-
450	8.708E-04	565	2.329E-02	680	4.288E-04	-	-
455	1.062E-03	570	2.265E-02	685	2.991E-04	-	-
460	1.330E-03	575	2.181E-02	690	2.053E-04	-	-
465	1.693E-03	580	2.079E-02	695	1.390E-04	-	-
470	2.155E-03	585	1.961E-02	700	9.296E-05	-	-
475	2.702E-03	590	1.829E-02	705	6.210E-05	-	-
480	3.351E-03	595	1.682E-02	710	4.018E-05	-	-
485	4.149E-03	600	1.530E-02	715	2.672E-05	-	-
490	5.103E-03	605	1.377E-02	720	1.781E-05	-	-

被测光度探头的相对光谱响应度与 CIE 明视觉光谱光视效率 V(λ)相比较，根据如下公式计算得到匹配误差为：f_1=1.22%.

Comparing the relative spectral responsivity of the measured photometer with the CIE visual spectral efficiency function V(λ), the matching error is calculated according to the following formula: f1=1.22%.

$$f_1 = \frac{\int_{380}^{780} |S(\lambda)_{rel} - V(\lambda)| \mathrm{d}\lambda}{\int_{380}^{780} V(\lambda) \mathrm{d}\lambda} \times 100\%$$

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不确定度：
Uncertainty:
U_{ref}=12.0%-1.7% (k=2）(380nm-500nm),
U_{rel} =1.7%-1.2% (k=2）(500nm-550nm),
U_{rel} =1.2%-1.7% (k=2）(550nm-600nm),
U_{rel} =1.7%-12.0% (k=2）(600nm-780nm)。

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建议 Suggestion：
根据客户要求和校准规范 JJF 1150-2006 的规定，通常情况下 12 个月校准一次。
According to the client or the calibration specification, the recommended calibration cycle is 12 months.

声明 Statement：
1. 我院仅对加盖“中国计量科学研究院校准专用章”的完整证书负责。
NIM is ONLY responsible for the complete certificate with the calibration stamp of NIM.
2. 本证书的校准结果仅对所校准的计量器具有效。
The certificate is ONLY valid for the calibrated instrument.
3. 本证书用中英文两种语言表达，准确含义以中文为准。
The certificate is reported in both English and Chinese, with the Chinese version as standard.

校 准 员： 核 验 员：
Calibrated by Checked by