校 准 证 书

CALIBRATION CERTIFICATE

证书编号： JL2402024831

客户名称 Name of Customer	：	信恒检测技术(深圳)有限公司
客户地址 Address of Customer	：	广东省深圳市宝安区松岗街道潭头社区潭头工业 城二区 1 栋厂房 101、201、301
计量器具名称 Name of Instrument	：	Conditioning Amplifier 调节放大器
型号/规格 Type/Specification	：	Type-2690-030
出厂编号 Serial No	：	2673666
资产编号 Asset No	：	BTF-EM-146
制造单位 Manufacture	：	Brule&Kjaer
校准依据 Calibrated in Accordance to	：	JJF1157-2006 测量放大器校准规范

（校准专用章）
Stamp

校准日期 Operation Date	：	2024 年 01 月 30 日 Year Month Day	批准人 ： 张瑞纹 Approved by
建议复校日期： Suggested Recal.Date		---- 年 -- 月 -- 日 Year Month Day	签名 ： Signature
签发日期 Issue Date	：	2024 年 01 月 30 日 Year Month Day	核验员 ： Checked by
			校准员 ： Calibrated by

证书首页背面“重要声明”是证书的组成部分，任何未包含“重要声明”内容的复制均为不完整复制。

深圳市计量质量检测研究院
地址：广东省深圳市南山区龙珠大道 92 号
客户服务热线：400 900 8999 – 1
邮编：518055 网址： www.smq.com.cn
电子邮件：kfzx@smq.com.cn

Shenzhen Academy of Metrology & Quality Inspection
Add:No.92,Longzhu Avenue, NanShan District, Shenzhen.
Customer Service Hotline:400 900 8999 - 1
Post Code: 518055 http://www.smq.com.cn
Email:kfzx@smq.com.cn

重 要 声 明

Important statement

1. 本院(站)是由深圳市人民政府依据《中华人民共和国计量法》设置并由国家市场监督管理总局、广东省市场监督管理局依法授权的法定计量检定机构。
SMQ is a legal metrological verification organization established by the Shenzhen Municipal People's Government and authorized by the State Administration for Market Regulation and Guangdong Administration for Market Regulation according to the Law on Metrology of the People's Republic of China.

2. 本院(站)进行的检定、校准和检测均可溯源至国际单位制（SI）单位和社会公用计量标准。
All verifications, calibrations and tests made by SMQ are traceable to the International System of Units (SI) and social public measurement standards.

3. 未经本院(站)许可，不得部分复印、摘用或篡改本证书/报告的内容；复印证书/报告未重新加盖本院证书/报告专用章无效。
Copying or excerpting portion of, or altering the content of the certificate/report is not permitted without the written authorization of SMQ.Any copy of certificates/reports without the Dedicated certificate/report Seal is deemed to be invalid.

4. 如果要满足被校准仪器的技术指标，或者技术法规要求，在规定范围内适用，请在建议复校日期前校准（适用于校准报告）。
To ensure that the calibrated object is properly used under given conditions in compliance with technical specifications or regulations, recalibrate before the suggested date (Applicable to calibration report only).

5. 本证书/报告提供的结果仅对本次被检的计量器具有效。
The results provided by the certificate/report are only valid for the measuring object under test this time.

6. 证书/报告无检定员/校准员、核验员、批准人签字，或涂改，或未盖本院证书/报告专用章及骑缝章无效。
Any certificate/report having not been signed by relevant responsible engineer, reviewer or authorized approver, or having been altered without authorization, or without both the Dedicated certificate/report Seal and its across-page seal is deemed to be invalid.

7. 证书/报告更改后，发出的电子版证书/报告、证书/报告的扫描件及传真件将不被追回，委托方有义务将更改后的证书/报告提供给使用原证书/报告的相关方。
SMQ is not responsible for recalling the electronic version of the original certificate/report when any revision is made to them. The applicant assumes the responsibility of providing the revised version to any interested party who uses them.

8. 申领电子证书时，相关内容和效力以电子证书为准；电子证书和纸质证书同时申领时，电子证书仅作为纸质证书的副本，相关内容和效力以同编号纸质证书为准
The relevant content and effectiveness is subject to the electronic version of the original report which was only applied for. When an electronic report and a paper report are applied for at the same time, the electronic report is only a copy of the paper report, and the relevant content and effectiveness is subject to the paper report.

9. 证书中二维码具浏览和下载完整报告功能是应委托方选择所设，该二维码及其复制图能使任何人扫描获取完整的证书电子版，本证书持有人如需限制他人经该二维码获取证书内容，应自行遮盖或消除证书及其复制件所附二维码，我院对委托方选择证书二维码功能所致的信息泄露概不负责（适用于附二维码证书）。
The QR code has the function of browsing and downloading complete report. Setting this function or not is chosen by the customer. The QR code and its copy enable anyone to scan and obtain the complete electronic version of the test report. Thus, if the owner of this report needs to restrict others from obtaining the content of the test report through the QR code, he shall cover or remove the QR code attached to the test report and its copies by himself. SMQ assumes no responsibility for the information leakage caused by the customer's selection of the QR code function of the test report (This clause applies to certificates with QR code attached) ..

获得的国家、省、市专业站 Establishment of Following Institutions

国家数字电子产品质量检验检测中心
National Digital Electronic Product Testing Center (NETC)
国家营养食品质量检验检测中心（广东）
National Nutrition Food Testing Center (Guangdong)
国家体育用品质量检验检测中心（广东）
National Sports Product Testing Center (Guangdong)
国家环保产品质量检验检测中心（广东）
National Environmental Product Testing Center (Guangdong)
国家分布式光伏发电系统质量检验检测中心（广东）
National Distributed Photovoltaic Power Generation System Testing Center (Guangdong)
国家电动汽车电池及充电系统产业计量测试中心
National Metrology Center for Electric Vehicle Battery and Charging System Industry
国家民用无人机产品质量检验检测中心（广东）
National Civil Unmanned Aerial Vehicle Product Testing Center (Guangdong)
国家高新技术计量站
National Hi-tech Metrology Station
国家医疗器械产业计量测试中心
National Metrology and Testing Center for Medical Device Industry
国家计量数据科学中心深圳分中心
National Metrology Data Science Center (Shenzhen)
国家城市能源计量中心（深圳）
National Urban Energy Measurement Center (Shenzhen)
中国轻工业联合会家具质量监督检测深圳站
Accredited Testing Station (Shenzhen) for Furniture by China National Light Industry Council (CNLIC)
广东省质量监督食品检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Food (Shenzhen)
广东省质量监督生态纺织服装产品检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Ecological Textile and Garment Products (Shenzhen)
广东省质量监督皮革制品检验站
Guangdong Quality Supervision and Inspection Institution for Leather Products
广东省质量监督家具检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Furniture Products (Shenzhen)
广东省质量监督学生用品检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Student's Articles (Shenzhen)
广东省质量监督自行车检验站
Guangdong Quality Supervision and Inspection Institution for Bicycle Quality
广东省质量监督钟表检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Horological Products (Shenzhen)
广东省质量监督环保节能产品（安全性能）检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Safety Performance of Environmental Protection and Energy Saving Products (Shenzhen)
广东省质量监督眼镜检验站（深圳）
Guangdong Quality Supervision and Inspection Institution for Eyewear Products (Shenzhen)
广东省质量监督电磁兼容检验站
Guangdong Quality Supervision and Inspection Institution for Electromagnetic Compatibility
广东省质量监督综合布线系统检验站
Guangdong Quality Supervision and Inspection Institution for Generic Cabling System
深圳市纤维纺织检验所
Shenzhen Quality Inspection Institution for Fiber and Textile
深圳市建材产品质量监督检验站
Shenzhen Quality Supervision and Inspection Institution for Building Materials
深圳市消防产品燃烧性能检测中心
Shenzhen Testing Center for Burning Behavior of Fire Protection Products

联系方式 Contact Information

联系电话 Contact Tel.：0755-26941696 26941546（龙珠） 27591789（宝安） 82426246（八卦岭） 28932280（龙岗） 0769-21684525（东莞）
传真电话 Fax No.：0755-27591716（宝安） 82408176（八卦岭） 28932840（龙岗） 0769-21684527（东莞）
投诉及证书/报告真伪查询电话 Complaint Tel.：400-900-8999 按 5 Email：complaint@smq.com.cn

校准证书

CALIBRATION CERTIFICATE

校准用主要计量标准装置信息

Main Standard Devices Used

名称 Equipment Name	测量范围 Measuring Range	不确定度/准确度等级/最大允许误差 Uncertainty/Accuracy Class/ Maximum Permissible Error	计量标准考核证书号 Certificate №	有效期至 Due Date
————	————	————	————	————

校准用主要标准器信息

Main Standards of Measurement Used

名称 Equipment Name	测量范围 Measuring Range	不确定度/准确度等级/最大允许误差 Uncertainty/Accuracy Class/ Maximum Permissible Error	设备编号 Equipment №	有效期至 Due Date	溯源单位/证书号 Traceability to/ Certificate №
多功能声分析系统	0.1 Hz ～ 100 kHz	电压 Urel = 0.1 %, k = 2	SB3979	2024-06-11	
数字万用表	1 MHz,1 kV	U_{rel} = 0.01 %， k = 2	SB0425	2024-06-12	
函数发生器	80 MHz	平坦度优于 0.1dB	SB5260	2024-09-07	

附加说明

Appended Directions

委托日期：Application Date　2024 年 01 月 26 日

环境条件：Operation Environment　温度 22.9℃ 相对湿度 60.1%

校准地点：Operation Location　本院声学龙珠实验室

校准项目/参数说明：Items Instructions　本次校准根据委托方要求实施，校准项目/参数详见校准结果

符合性及限制使用说明：Statement of Compliance and Limitation　参见校准结果使用(Use refering to the results of Calibration)

校准结果

RESULTS OF CALIBRATION

1 外观检查：符合要求
Appearance Check：Pass.

2 频率响应特性（参考频率：1000 Hz）：见表1
Frequency Response(Ref. 1000 Hz):See Table 1

表1 Table 1

频率 Frequency	频率响应 Frequency Response		最大允许范围 Limit
(Hz)	(dB)		(dB)
	CH1	CH2	
20	-0.08	-0.08	±0.2
31.5	-0.01	-0.02	±0.2
63	0.00	-0.01	±0.2
125	0.00	0.00	±0.2
250	0.00	0.00	±0.2
500	0.00	0.00	±0.2
1000	0.0 (ref)	0.0 (ref)	±0.2
2000	0.00	0.00	±0.2
4000	0.00	0.00	±0.2
8000	0.00	-0.01	±0.2
12500	0.00	0.00	±0.2
16000	0.00	0.01	±0.2
20000	+0.01	+0.01	±0.2

校准结果

RESULTS OF CALIBRATION

3 总谐波失真：见表2
THD: See Table 2

表2 Table 2

频率标称值 Freq. Nominal Value	总谐波失真 THD		最大允许范围 M.P.R.
(Hz)	(%)		(%)
	CH1	CH2	
63	0.054	0.068	≤0.3
125	0.045	0.038	≤0.3
250	0.049	0.032	≤0.3
500	0.041	0.048	≤0.3
1000	0.044	0.045	≤0.1
2000	0.051	0.055	≤0.3
4000	0.054	0.057	≤0.3
8000	0.051	0.052	≤0.3
12500	0.055	0.044	≤0.3
16000	0.044	0.047	≤0.3
20000	0.047	0.047	≤0.3

校准结果
RESULTS OF CALIBRATION

4 增益控制偏差（1 kHz）：见表3、表4
Gain Indication Error: See Table 3 and Table 4

CH1 表3 Table 3

增益档 Gain	增益标称值 Gain Indi.Value	增益实测值 Gain Meas. Value	误差 Error	最大允许误差 M.P.E.
(mV/Pa)	dB	dB	dB	dB
10	-20	-19.99	0.01	±0.1
31.6	-10	-10.00	0.00	±0.1
100	0	0.00	0.00	±0.1
316	10	10.00	0.00	±0.1
(V/Pa)	dB	dB	dB	dB
1	20	20.00	0.00	±0.1
3.16	30	30.00	0.00	±0.1
10	40	40.00	0.00	±0.1
31.6	50	50.01	0.01	±0.1

CH2 表4 Table 4

增益档 Gain	增益标称值 Gain Indi.Value	增益实测值 Gain Meas. Value	误差 Error	最大允许误差 M.P.E.
(mV/Pa)	dB	dB	dB	dB
10	-20	-19.99	0.01	±0.1
31.6	-10	-10.00	0.00	±0.1
100	0	0.00	0.00	±0.1
316	10	10.00	0.00	±0.1
(V/Pa)	dB	dB	dB	dB
1	20	20.00	0.00	±0.1
3.16	30	30.00	0.00	±0.1
10	40	40.00	0.00	±0.1
31.6	50	50.01	0.01	±0.1

校准结果

RESULTS OF CALIBRATION

附注：

Notes：

1.电压测量结果扩展不确定度：U_{rel} = 0.1%,k = 2

Relative Expanded Uncertainty of Voltage: U_{rel} = 0.1%,k = 2

2.失真测量结果扩展不确定度：U_{rel} = 1.8%,k = 2

Relative Expanded Uncertainty of Distortion: U_{rel} = 1.8%,k = 2

3.本证书中给出的测量不确定度依据 JJF 1059.1-2012 《测量不确定度评与表示》评定

The uncertainty given in this certificate is evaluated according to JJF 1059.1-2012 *Evaluation and Expression of Uncertainty in Measurement*.
