

校准证书

CALIBRATION CERTIFICATE

证书编号:

Certificate No.



J202310234458J-0001-G2

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委托方

Client

Energy & Power Industries Laboratories Co

联络信息

Contact Inf.

Unit 12, No. 2, Boujari Sefat Dead-End, Corner of
FarimanSt.,Bozorgmehr St.,Vali-Asr Ave.,Tehran, Iran(Post code:
1416854523)

仪器名称

Description

Sugre Generator

型号/规格

Model/Type

SG61000-5SA

制造厂

Manufacturer

LISUN GROUP

出厂编号

Serial No.

0506A1618055

管理号

Asset No.

接收日期

Receipt Date

2024年12月06日

校准日期

Cal. Date

2024年12月06日

Y M D

发布日期

Issued Date

2024年12月06日

Y M D

批准

Approved by

李文兴

李文兴

审核

Inspected by

刘灿星

刘灿星

校准

Calibrated by

陆鑫炜

陆鑫炜

证书专用章

(Stamp)

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扫一扫验真伪

校验码: 808763

校准说明 DIRECTIONS OF CALIBRATION

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1.本实验室的质量管理体系符合ISO/IEC 17025:2017标准的要求,校准结果均可溯源至国际单位制(SI)单位。(The quality system is in accordance with ISO/IEC 17025:2017,the calibration results are traceable to the International System of Units (SI).)

2.本结果仅对本次校准样品有效。未经实验室批准,不得部分复制。如有疑问请在15个工作日内反馈。(The result is only valid for the calibrated sample.The certificate shall not be reproduced except in full,without the written approval of our laboratory .please feedback to us within 15 days if you have any question.)

3.本证书编号具有唯一性,后缀若带有“-Gx”的证书为替换证书,自发出后原证书即刻作废,修改后的证书以客户端内容为准。(Each certificate has a unique number. The suffix of "-Gx" will be added to the number as a replacement of the old version. The original certificate will be officially invalid once the new certificate number is issued.The modified certificate shall be based on the client content.)

4.证书中最大允许误差、判定结果仅供参考,其中“P”代表“合格”,“F”代表“不合格”,“N/A”代表“不适用”。使用人员应结合实际测量需求,评估测量不确定度对符合性评定的影响。(MPE & judgement result in the datasheet is only for reference , "P" is "Pass" , "F" is "Fail" and "N/A" is "Not Applicable".Whereas users should evaluate the effects of MU of calibration results on conformance assessment by actual measurement.)

5.校准地点、环境条件(Place and environmental conditions of the calibration):

地点: 客户三楼实验室
Place

温度: 21℃
Temperature

相对湿度: 51%
Relative Humidity

6.本次校准的技术依据及CNAS认可范围,超出范围的内容未被认可。详细认可范围请查看CNAS网站证书附件。(Reference document and accredited scope by CNAS for calibration, beyond which isn't accredited. Please see the attachment of certificate on CNAS website for details.)

JJF 1741-2019 浪涌(冲击)模拟器校准规范 (C.S of Surge Simulators) 开路电压: (0.5~40)kV 短路电流: (0.01~20)kA 时间: 1ns~5s

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7. 本次校准使用的主要测量标准(Main Standards of Measurement Used in the Calibration.):

| 名称 | 编号 | 证书号/有效期 | 溯源机构 | 技术特征 |
|---|------------|---|---------------------------|-------------------------------------|
| Description | Serial No. | Certificate No./ Due Date | Traceability Institute | Technique Character |
| 高压差分探头 | C030102 | J202405305609- 0011 2025-07-01 | 广电计量检测集 团股份有限公司 | 衰减MPE: ±3% |
| 数字温湿度计 Digital temperature and humidity meter | 831903 | J202409090616- 0003 2025-09-10 | 广电计量检测集 团股份有限公司 | 温度: MPE: ±2.0°C, 湿 度: MPE: ±7%RH |
| 电流线圈 | 160556 | J202405305609- 0005 2025-06-25 | 广电计量检测集 团股份有限公司 | $U=1.0\text{dB}(K=2)$ |
| 示波器 Oscilloscope | C029580 | J202405305609-06- 0001 2025-07-14 | 广电计量检测集 团股份有限公司 | 直流增益: ±1.5%; 时基: ±10ppm |

8. 计量溯源性声明(Measurement traceability declaration.):

高压差分探头(C030102)→数字万用表(MY60058136)→多功能校准仪(含示波器校准仪选件)(6027905)→三相多功能综合校验仪(89439)→三相标准功率电能表(中国计量科学研究院/NIM);高压差分探头(C030102)→示波器(C058276)→多功能校准仪(含示波器校准仪选件)(4996902)→数字多用表(北京东方计量测试研究所/CASC);
数字温湿度计/Digital temperature and humidity meter(831903)→自校式铂电阻数字测温仪(19075)→高精度测温仪(612514)→电阻箱(200110)→数字多用表(498876915)→高值电阻器(北京东方计量测试研究所);
电流线圈(160556)→多功能校准仪(4416901)→精密交流测量标准(4439903)/精密交直流同轴分流器(05155847)/三相多功能综合校验仪(89439)→精密交流测量标准/精密交直流同轴分流器/三相多功能综合校验仪(中国计量科学研究院/NIM);电流线圈(160556)→多功能校准仪(4416901)→频率计(6E5042030)→铷原子频率标准(051101)→铷原子频率标准(广东省计量科学研究院/SMC);
示波器/Oscilloscope(C029580)→频率计(6B321008)→高性能铷钟(22-STMRbN001-0031-P-D398-H)→铷原子频率标准(中国计量科学研究院/NIM);示波器/Oscilloscope(C029580)→多功能校准仪(含示波器校准仪选件)/Multi-function calibrator (Includes oscilloscope calibrator options)(5542903)→数字多用表/Digital multimeter(498876915)→固态电压标准(北京东方计量测试研究所/CASC);

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1、外观以及一般性检查: 正常

In view of External and Generality check : Pass

2、浪涌(Surge)

2.1开路脉冲电压的校准(Calibration of Open Circuit Voltage):

| 耦合 Couple | 标称值 Nominal (kV) | 实测值 Measured (kV) | 误差 Error (kV) | 不确定度 $U_{rel}(k=2)$ (%) | 允许误差 MPE (kV) | 结论 Conclusion (Pass/Fail) |
|--------------|------------------------|-------------------------|---------------------|-------------------------------|---------------------|---------------------------------|
| LSG-HV | 0.5 | 0.49 | 0.01 | 3.5 | ±0.05 | P |
| | 1.0 | 0.98 | 0.02 | 3.5 | ±0.10 | P |
| | 2.0 | 1.98 | 0.02 | 3.5 | ±0.20 | P |
| | 4.0 | 3.96 | 0.04 | 3.5 | ±0.40 | P |
| | 6.0 | 5.98 | 0.02 | 3.5 | ±0.60 | P |
| | -6.0 | -5.94 | -0.06 | 3.5 | ±0.60 | P |
| L-N | 6.0 | 5.98 | 0.02 | 3.5 | ±0.60 | P |
| L-PE | 6.0 | 5.88 | 0.12 | 3.5 | ±0.60 | P |
| N-PE | 6.0 | 5.88 | 0.12 | 3.5 | ±0.60 | P |

2.2开路电压脉冲波前时间的校准(Calibration of Open Circuit Front Time):

| 耦合 Couple | 电压 Voltage (kV) | 标称值 Nominal (μ s) | 实测值 Measured (μ s) | 误差 Error (μ s) | 不确定度 $U_{rel}(k=2)$ (%) | 允许误差 MPE (μ s) | 结论 Conclusion (Pass/Fail) |
|--------------|-----------------------|------------------------------|-------------------------------|---------------------------|-------------------------------|---------------------------|---------------------------------|
| LSG-HV | 0.5 | 1.2 | 1.05 | 0.15 | 5.5 | ±0.36 | P |
| | 1.0 | 1.2 | 1.00 | 0.20 | 5.5 | ±0.36 | P |
| | 2.0 | 1.2 | 0.99 | 0.21 | 5.5 | ±0.36 | P |
| | 4.0 | 1.2 | 0.99 | 0.21 | 5.5 | ±0.36 | P |
| | 6.0 | 1.2 | 1.02 | 0.18 | 5.5 | ±0.36 | P |
| | -6.0 | 1.2 | 1.00 | 0.20 | 5.5 | ±0.36 | P |
| L-N | 6.0 | 1.2 | 1.00 | 0.20 | 5.5 | ±0.36 | P |
| L-PE | 6.0 | 1.2 | 1.02 | 0.18 | 5.5 | ±0.36 | P |
| N-PE | 6.0 | 1.2 | 1.02 | 0.18 | 5.5 | ±0.36 | P |

2.3开路电压脉冲半波时间的校准(Calibration of Open Circuit Time to Half Value):

| 耦合 Couple | 电压 Voltage (kV) | 标称值 Nominal (μ s) | 实测值 Measured (μ s) | 误差 Error (μ s) | 不确定度 $U_{rel}(k=2)$ (%) | 允许误差 MPE (μ s) | 结论 Conclusion (Pass/Fail) |
|--------------|-----------------------|------------------------------|-------------------------------|---------------------------|-------------------------------|---------------------------|---------------------------------|
| LSG-HV | 0.5 | 50 | 54 | -4 | 5.5 | ±10 | P |
| | 1.0 | 50 | 53 | -3 | 5.5 | ±10 | P |
| | 2.0 | 50 | 54 | -4 | 5.5 | ±10 | P |
| | 4.0 | 50 | 53 | -3 | 5.5 | ±10 | P |
| | 6.0 | 50 | 53 | -3 | 5.5 | ±10 | P |
| | -6.0 | 50 | 53 | -3 | 5.5 | ±10 | P |
| L-N | 6.0 | 50 | 51 | -1 | 5.5 | ±10 | P |
| L-PE | 6.0 | | 32 | | 5.5 | 25~60 | P |
| N-PE | 6.0 | | 31 | | 5.5 | 25~60 | P |

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2.4 短路电流的校准(Calibration of Short Current):

| 耦合 Couple | 电压 Voltage (kV) | 标称值 Nominal (A) | 实测值 Measured (A) | 误差 Error (A) | 不确定度 $U_{rel}(k=2)$ (%) | 允许误差 MPE (A) | 结论 Conclusion (Pass/Fail) |
|--------------|-----------------------|-----------------------|------------------------|--------------------|-------------------------------|--------------------|---------------------------------|
| LSG-HV | 0.5 | 250 | 238 | 12 | 5.0 | ± 25 | P |
| | 1.0 | 500 | 482 | 18 | 5.0 | ± 50 | P |
| | 2.0 | 1000 | 984 | 16 | 5.0 | ± 100 | P |
| | 4.0 | 2000 | 1980 | 20 | 5.0 | ± 200 | P |
| | 6.0 | 3000 | 2970 | 30 | 5.0 | ± 300 | P |
| | -6.0 | -3000 | -2970 | -30 | 5.0 | ± 300 | P |
| L-N | 6.0 | 3000 | 2980 | 20 | 5.0 | ± 300 | P |
| L-PE | 6.0 | 500 | 494 | 6 | 5.0 | ± 50 | P |
| N-PE | 6.0 | 500 | 494 | 6 | 5.0 | ± 50 | P |

2.5 短路电流脉冲波前时间的校准(Calibration of Short Circuit Front Time):

| 耦合 Couple | 电压 Voltage (kV) | 标称值 Nominal (μ s) | 实测值 Measured (μ s) | 误差 Error (μ s) | 不确定度 $U_{rel}(k=2)$ (%) | 允许误差 MPE (μ s) | 结论 Conclusion (Pass/Fail) |
|--------------|-----------------------|------------------------------|-------------------------------|---------------------------|-------------------------------|---------------------------|---------------------------------|
| LSG-HV | 0.5 | 8 | 7.8 | 0.3 | 5.5 | ± 1.6 | P |
| | 1.0 | 8 | 7.9 | 0.1 | 5.5 | ± 1.6 | P |
| | 2.0 | 8 | 7.5 | 0.5 | 5.5 | ± 1.6 | P |
| | 4.0 | 8 | 7.8 | 0.3 | 5.5 | ± 1.6 | P |
| | 6.0 | 8 | 7.8 | 0.3 | 5.5 | ± 1.6 | P |
| | -6.0 | 8 | 7.6 | 0.4 | 5.5 | ± 1.6 | P |
| L-N | 6.0 | 8 | 7.3 | 0.8 | 5.5 | ± 1.6 | P |
| L-PE | 6.0 | 2.5 | 2.43 | 0.08 | 5.5 | ± 0.75 | P |
| N-PE | 6.0 | 2.5 | 2.46 | 0.04 | 5.5 | ± 0.75 | P |

2.6 短路电流脉冲半波时间的校准(Calibration of Short Circuit Time to Half Value):

| 耦合 Couple | 电压 Voltage (kV) | 标称值 Nominal (μ s) | 实测值 Measured (μ s) | 误差 Error (μ s) | 不确定度 $U_{rel}(k=2)$ (%) | 允许误差 MPE (μ s) | 结论 Conclusion (Pass/Fail) |
|--------------|-----------------------|------------------------------|-------------------------------|---------------------------|-------------------------------|---------------------------|---------------------------------|
| LSG-HV | 0.5 | 20 | 20.3 | -0.3 | 5.5 | ± 4.0 | P |
| | 1.0 | 20 | 20.6 | -0.6 | 5.5 | ± 4.0 | P |
| | 2.0 | 20 | 20.1 | -0.1 | 5.5 | ± 4.0 | P |
| | 4.0 | 20 | 20.5 | -0.5 | 5.5 | ± 4.0 | P |
| | 6.0 | 20 | 20.5 | -0.5 | 5.5 | ± 4.0 | P |
| | -6.0 | 20 | 20.2 | -0.2 | 5.5 | ± 4.0 | P |
| L-N | 6.0 | 20 | 20.1 | -0.1 | 5.5 | ± 4.0 | P |
| L-PE | 6.0 | 25 | 25.2 | -0.2 | 5.5 | ± 7.5 | P |
| N-PE | 6.0 | 25 | 25.9 | -0.9 | 5.5 | ± 7.5 | P |

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备注:

Notes:

结论(Conclusion): 所校项目符合技术要求

The calibration items meet the provisions of the technical indicators

1.本报告中的扩展不确定度是由标准不确定度乘以包含概率约为95%时的包含因子 k 。

The expanded uncertainty is given in the report by the standard uncertainty multiplied by the probability of about 95% when the factor k .

2.依据(Reference document)

JJF 1059.1-2012 测量不确定度评定与表示

(JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement)

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