华南国家计量测试中心
广东省计量科学研究院
SOUTH CHINA NATIONAL CENTER OF METROLOGY
GUANGDONG INSTITUTE OF METROLOGY

# 校 准 证 书
# CALIBRATION CERTIFICATE

证书编号 Certificate No. GDDL202500121



客户名称 Name of the Customer 优利德科技(中国)股份有限公司

联络信息 Contact Information 广东省东莞市松山湖园区工业北一路6号

计量器具名称 Description 钳形功率表（电参数测量仪，数字多用表，直流数字功率表）

型号/规格 Model/Type UT219PV

制造厂 Manufacturer UNI-T

出厂编号 Serial No. C242212558

设备管理编号/ Equipment No.

接收日期 Receipt on 2025 年 Y 03 月 M 11 日 D

结论 Conclusion 见校准结果

校准日期 Calibration on 2025 年 Y 03 月 M 18 日 D

发布日期 Issue on 2025 年 Y 03 月 M 18 日 D

批 准 Authorized by 何洪波

核 验 Reviewed by 何洪波

校 准 Calibrated by 张东顺

证书专用章 Stamp

扫一扫查真伪

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# 说　明

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## DIRECTIONS



1. 本中心是国家市场监督管理总局在华南地区设立的国家法定计量检定机构，本中心的质量管理体系符合ISO/IEC 17025:2017标准的要求。
**This laboratory is the National Legal Metrological Verification Institution in southern China set up by the General Administration of Quality Supervision. The quality system is in accordance with ISO/IEC 17025:2017.**

2. 本中心所出具的数据均可溯源至国家计量基准和/或国际单位制(SI)。
**All data issued by this laboratory are traceable to national primary standards and/or International System of Units (SI)**

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

| 地点 Location | A4-403电力实验室 | 温度 Temperature | (20.2～20.9) ℃ | 相对湿度 RH | (44～50) % |
|---|---|---|---|---|---|

4. 本次校准的技术依据：
**Reference documents for the calibration:**

JJF 1075-2015 钳形电流表校准规范　C.S. of Clamp Ammeters
JJG(粤) 055-2019 直流数字功率表检定规程　V.R. of DC Digital Power Meters
JJF 1587-2016 数字多用表校准规范　C.S. for Multimeters

5. 本次校准所使用的主要计量标准器具：
**Major standards of measurement used in the calibration:**

| 设备名称/型号规格/测量范围 Name of Equipment /Model/Type/Range | 编号 Serial No. | 证书号/有效期/溯源单位 Certificate No./Due Date /Traceability to | 计量特性 Metrological Characteristic |
|---|---|---|---|
| 钳形电流表检定装置 /TD1050/DCV:20mV～1000V;DCI:10mA～2000A;ACV:1V～750V;ACI:10mA～2000A;DCR:10Ω～110MΩ | 23070220101 | DBB202401102 /2025-08-11 /省计量院 | DCV:±0.02%;DCI:±0.02%;ACV:±0.02%;ACI:±0.02%;DCR:±0.05%;DCW:±0.10%;ACW:±0.10%; φ:±0.05° |

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注：1. 本证书校准结果只与受校准仪器有关。The results relate only to the items calibrated.
Note: 2. 未经本机构书面批准，不得部分复制此证书。This certificate shall not be reproduced except in full, without the written approval of our laboratory.
3. “客户名称”、“联络信息”由委托方提供，“制造厂”、“型号规格”、“出厂编号”以及“设备编号”为仪器上标注。
The information Name of the Customer and Contact Information are provided by client, and the Manufacturer, Model/Type, Serial No. and Equipment No. are marked on the items.

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一、钳形电流表部分

1.工作正常性检查

Work normality check

结论： Pass

2.交直流电流校准（交流电流）:见表1

AC/DC current calibration(AC Current):Shown in table 1

表1 Table 1

| 测试频率 Freq (Hz) | 量程 Range (A) | 标准值 Standard value (A) | 显示值 Indication Value (A) | 误差 Error (A) | 最大允许误差 MPE (A) | 结论 Conclusion P/F |
|---|---|---|---|---|---|---|
| 50 | 600 | 60.0 | 60.5 | 0.5 | ±1.7 | Pass |
| | | 120.0 | 121.3 | 1.3 | ±2.9 | Pass |
| | | 300.0 | 303.2 | 3.2 | ±6.6 | Pass |
| | | 480.0 | 481.3 | 1.3 | ±10.1 | Pass |
| | | 590.0 | 591.7 | 1.7 | ±12.3 | Pass |
| | 1000 | 950 | 959 | 9 | ±24 | Pass |

3.交直流电流校准（直流电流）:见表2

AC/DC current calibration(DC Current):Shown in table 2

表2 Table 2

| 量程 Range (A) | 标准值 Standard value (A) | 显示值 Indication Value (A) | 误差 Error (A) | 最大允许误差 MPE (A) | 结论 Conclusion P/F |
|---|---|---|---|---|---|
| 600 | 60.0 | 60.1 | 0.1 | ±1.7 | Pass |
| | 120.0 | 120.6 | 0.6 | ±2.9 | Pass |
| | 300.0 | 302.4 | 2.4 | ±6.5 | Pass |
| | 480.0 | 484.2 | 4.2 | ±10.2 | Pass |
| | 590.0 | 595.3 | 5.3 | ±12.4 | Pass |
| 1000 | 950 | 961 | 11 | ±24 | Pass |

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二、数字多用表部分

1.交流电压的示值误差（交流电压）:见表3

Error of AC voltage indication(AC voltage):Shown in table 3

表3 Table 3

| 测试频率 Freq (Hz) | 量程 Range (V) | 标准值 Standard value (V) | 显示值 Indication Value (V) | 误差 Error (V) | 最大允许误差 MPE (V) | 结论 Conclusion P/F |
|---|---|---|---|---|---|---|
| 50 | 1000 | 100.0 | 100.2 | 0.2 | ±1.5 | Pass |
| | | 200.0 | 200.0 | 0.0 | ±2.5 | Pass |
| | | 500.0 | 499.6 | -0.4 | ±5.5 | Pass |
| | | 600.0 | 599.5 | -0.5 | ±6.5 | Pass |
| | | 750.0 | 749.2 | -0.8 | ±8.0 | Pass |

2.直流电压的示值误差（直流电压）:见表4

Error of DC voltage indication(DC voltage):Shown in table 4

表4 Table 4

| 量程 Range (V) | 标准值 Standard value (V) | 显示值 Indication Value (V) | 误差 Error (V) | 最大允许误差 MPE (V) | 结论 Conclusion P/F |
|---|---|---|---|---|---|
| 1000 | 100.0 | 99.9 | -0.1 | ±1.5 | Pass |
| | 200.0 | 200.0 | 0.0 | ±2.5 | Pass |
| | 500.0 | 500.2 | 0.2 | ±5.5 | Pass |
| | 600.0 | 600.2 | 0.2 | ±6.5 | Pass |
| | 750.0 | 750.3 | 0.3 | ±8.0 | Pass |

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三、直流数字功率表部分

1.直流功率示值误差（功率）：见表5

DC power indication error(DC Power):Shown in table 5

表5 Table 5

| 量程 Range (kW) | 标准值 Standard value (kW) | 示值 Indication Value (kW) | 误差 Error (kW) | 最大允许误差 MPE (kW) | 结论 Conclusion P/F |
|---|---|---|---|---|---|
| 600 | 13.2 | 13.2 | 0.0 | ±2.3 | Pass |
| | 26.4 | 26.6 | 0.2 | ±2.5 | Pass |
| | 66.0 | 66.5 | 0.5 | ±3.3 | Pass |
| | 105.6 | 106.5 | 0.9 | ±4.1 | Pass |
| | 129.8 | 131.0 | 1.2 | ±4.6 | Pass |
| 1000 | 209 | 211 | 2 | ±24 | Pass |

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说明：

Note:

1.本次测量结果的扩展不确定度:

The Expanded Uncertainty of Measurement:

(1)钳形电流表:交流电流:$U_{rel}$=0.6%;直流电流:$U_{rel}$=0.6%;

(2)数字多用表:交流电压:$U_{rel}$=0.3%;直流电压:$U_{rel}$=0.3%;

(3)直流数字功率表:功率:$U_{rel}$=0.6%;

包含因子$k$=2，本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度评定与表示》评定，由合成标准不确定度乘以包含概率约为95%时对应的包含因子$k$得到。

Coverage factor $k$=2,the expanded uncertainty given in this certificate is evaluated according to JJF 1059.1-2012 "*Evaluation and Expression of Uncertainty in Measurement*", which is obtained by multiplying the combined standard uncertainty by the coverage factor $k$ corresponding to the coverage probability of about 95%.

2.校准结果符合性判定依据JJF1094-2002《测量仪器特性评定》第5.3.1条款和该仪器说明书技术要求。

Decision rules of conformity is in JJF1094-2002 "*Evaluation of the Characteristice of Measuring Instruments*"(5.3.1) the technical requirements in the manual.

3.该仪器的溯源日期为本证书的"校准日期"，按照所依据技术文件的规定，建议复校时间间隔不超过1年。更换重要部件、维修或对仪器性能有怀疑时，应及时校准。

The traceability date of this instrument is the "Calibration Date" on this certificate, According to the demand of

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reference document,next calibration is proposed within 1 year.In case of replacement of important parts, maintenance or doubt on the performance of the instrument,it shall be calibrated in time.

4.校准活动中对测量结果有影响的条件:

Conditions under which the calibrations were made that have an influence on the measurement results:

温度(Temperature):(20.2～20.9)℃，湿度(Humidity):(44～50)%RH。

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