



校准证书

CALIBRATION CERTIFICATE

证书编号 GDDL202400064
Certificate No.

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委托方 优利德科技(中国)股份有限公司
Client

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

计量器具名称 真有效值数字钳形表(钳形电流表, 数字多用表)
Description

型号规格 UT216D
Model/Type

制造厂 UNI-T
Manufacturer

出厂编号 C232416838
Serial No.

设备编号 /
Equipment No.

接收日期 2024 年 01 月 22 日
Date of Receipt Y M D

结果 见校准结果
Results

校准日期 2024 年 01 月 23 日
Date of calibration Y M D

批准人 何洪波
Approved Signatory

核 验 何洪波
Reviewed by

校 准 郑艺成
Calibrated by

证书专用章
Stamp





说明

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DIRECTIONS

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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 A4-403 电力实验室 温度 (19.2~19.4) °C 相对湿度 (41~42) %
Place Temperature RH

4. 本次校准的技术依据:

Reference documents for the calibration:

JJF 1587-2016 数字多用表校准规范 C. S. for Multimeters
JJF 1075-2015 钳形电流表校准规范 C. S. of Clamp Ammeters

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 | 编号 | 证书号/有效期/溯源单位 | 计量特性 |
|---|------------|--|---|
| Name of Equipment /Model/Type/Range | Serial No. | Certificate No./Due Date /Traceability to | Metrological Characteristic |
| 多功能标准源 /3041A/DCV: 1mV~1025V; ACV: : 1mV~1020V; DCA: 10 μA~30 A; ACA: 30 μA~30A; OHM: 0.1 Ω~100MΩ | L1398B16 | DBS202302961 /2024-12-17 /省计量院 | MPE: DCV: ±0.0032%, ACV: ±0.04%, DCA: ±0.0065%, ACA: ±0.08%, OHM: ±0.008% |
| 钳形表标准线圈 /5500A/COIL/(10~1000)A | 20083345 | DBB202306736 /2024-07-05 /省计量院 | MPE: ±0.25% |

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. “委托方”、“委托方联络信息”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 Client and Contact Information are provided by client, and the Manufacturer, Model/Type, Serial No. and Equipment No. are marked on the items.

4. 本次校准日期视为发布日期。 The calibration date is the date of issue of the certificate.



校准结果 RESULTS OF CALIBRATION

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一、直流电流: 见表1

DCA: Shown in table 1

表1 Table 1

| 量程 Range | 标准值 Reference Value | 指示值 Indication Value | 误差 Error | 允许误差 MPE | 结论 Conclusion |
|-------------|------------------------|-------------------------|-------------|-------------|------------------|
| (A) | (A) | (A) | (A) | (A) | P/F |
| 60 | 59.00 | 59.06 | 0.06 | ±1.53 | Pass |
| 600 | 70.0 | 69.9 | -0.1 | ±2.2 | Pass |
| | 200.0 | 200.3 | 0.3 | ±5.5 | Pass |
| | 400.0 | 400.8 | 0.8 | ±10.5 | Pass |
| | 590.0 | 591.4 | 1.4 | ±15.3 | Pass |

二、交流电流: 见表2

ACA: Shown in table 2

表2 Table 2

| 测试频率 Freq | 量程 Range | 标准值 Reference Value | 指示值 Indication Value | 误差 Error | 允许误差 MPE | 结论 Conclusion |
|--------------|-------------|------------------------|-------------------------|-------------|-------------|------------------|
| (Hz) | (A) | (A) | (A) | (A) | (A) | P/F |
| 50 | 60 | 59.00 | 59.19 | 0.19 | ±1.53 | Pass |
| | 600 | 70.0 | 70.0 | 0.0 | ±2.3 | Pass |
| | | 200.0 | 200.9 | 0.9 | ±5.5 | Pass |
| | | 400.0 | 401.6 | 1.6 | ±10.5 | Pass |
| | | 590.0 | 591.8 | 1.8 | ±15.3 | Pass |



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三、直流电压: 见表3

DCV: Shown in table 3

表3 Table 3

| 极性 | 量程 | 标准值 | 指示值 | 误差 | 允许误差 | 结论 |
|-------|-------|-----------------|------------------|--------|--------|------------|
| Polar | Range | Reference Value | Indication Value | Error | MPE | Conclusion |
| + | (mV) | (mV) | (mV) | (mV) | (mV) | P/F |
| | 600 | 590.0 | 589.7 | -0.3 | ±5.0 | Pass |
| | (V) | (V) | (V) | (V) | (V) | P/F |
| | 6 | 5.900 | 5.900 | 0.000 | ±0.050 | Pass |
| | 60 | 59.00 | 59.01 | 0.01 | ±0.50 | Pass |
| - | 600 | 590.0 | 589.9 | -0.1 | ±5.0 | Pass |
| | (mV) | (mV) | (mV) | (mV) | (mV) | P/F |
| | 600 | 590.0 | 590.6 | 0.6 | ±5.0 | Pass |
| | (V) | (V) | (V) | (V) | (V) | P/F |
| | 6 | 5.900 | 5.895 | -0.005 | ±0.050 | Pass |
| 60 | 59.00 | 58.99 | -0.01 | ±0.50 | Pass | |
| 600 | 590.0 | 589.5 | -0.5 | ±5.0 | Pass | |

四、交流电压: 见表4

ACV: Shown in table 4

表4 Table 4

| 测试频率 | 量程 | 标准值 | 指示值 | 误差 | 允许误差 | 结论 |
|------|-------|-----------------|------------------|-------|--------|------------|
| Freq | Range | Reference Value | Indication Value | Error | MPE | Conclusion |
| (Hz) | (V) | (V) | (V) | (V) | (V) | P/F |
| 50 | 6 | 5.900 | 5.903 | 0.003 | ±0.074 | Pass |
| | 60 | 59.00 | 59.02 | 0.02 | ±0.74 | Pass |
| | 600 | 590.0 | 589.9 | -0.1 | ±7.4 | Pass |



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五、电阻：见表5

OHM: Shown in table 5

表5 Table 5

| 量程 | 标准值 | 指示值 | 误差 | 允许误差 | 结论 |
|---------------|-----------------|------------------|---------------|---------------|------------|
| Range | Reference Value | Indication Value | Error | MPE | Conclusion |
| (Ω) | (Ω) | (Ω) | (Ω) | (Ω) | P/F |
| 600 | 590.0 | 590.0 | 0.0 | ± 6.1 | Pass |
| (k Ω) | (k Ω) | (k Ω) | (k Ω) | (k Ω) | P/F |
| 6 | 5.900 | 5.895 | -0.005 | ± 0.061 | Pass |
| 60 | 59.00 | 58.98 | -0.02 | ± 0.61 | Pass |
| 600 | 590.0 | 589.7 | -0.3 | ± 6.1 | Pass |
| (M Ω) | (M Ω) | (M Ω) | (M Ω) | (M Ω) | P/F |
| 6 | 5.900 | 5.900 | 0.000 | ± 0.061 | Pass |

说明:

Note:

1. 本次测量结果的扩展不确定度:

The Expanded Uncertainty of Measurement:

直流电流: $U_{rel}=0.5\%$; 交流电流: $U_{rel}=0.5\%$;

直流电压: $U_{rel}=0.12\%$; 交流电压: $U_{rel}=0.12\%$; 电阻: $U_{rel}=0.12\%$;

包含因子 $k=2$, 本证书中给出的扩展不确定度依据 JJF 1059.1-2012《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 JJF 1094-2002《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 JJF 1094-2002 *Evaluation of the Characteristic of Measuring Instruments (5.3.1)* and the technical requirements in the manual.

3. 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。

According to the demand of 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.