



中国赛宝实验室  
(工业和信息化部电子第五研究所)  
CHINA CEPREI LABORATORY



# 校准证书

## CALIBRATION CERTIFICATE

证书编号: 2GB14004530-0004  
Certificate No.



委托单位:  
Client

华为技术有限公司

委托方地址:  
Address

广东省深圳市龙岗区坂田华为基地

仪器名称:  
Description

数字功率计/DIGITAL POWER METER

型号规格:  
Model/Type

WT210

制造商:  
Manufacturer

YOKOGAWA

机身号:  
Serial No.

91K801825

管理号:  
Asset No.

A101062130

校准日期:  
Cal. Date

2014-06-11



建议再校日期:  
Next Cal. Date

2015-06-11

结论:  
Conclusion

所校准项目合格(Passed at Calibration Items)

校准:  
Calibrated by

霍佳

核验:  
Inspected by

黄晓娜

签发:  
Approved by

王康

中心主任  
Director of  
Calibration Center

印章:  
Stamp



赛宝计量检测中心  
广州总部地址: 广州天河区东莞庄路110号  
客服电话: 020-87237633 传真: 020-87236189  
投诉电话: 020-87236896、020-87236789  
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网址: www.ceprei-cal.com

CEPREI Calibration and Testing Center  
H.Q. Addr: No.110 Dongguanzhuang Road, Tianhe District, Guangzhou  
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Email: cal@ceprei.com  
Website: www.ceprei-cal.com

# 说 明

## DIRECTIONS

证书编号(Certificate No.) 2GB14004530-0004

1. 本机构是国家质量监督检验检疫总局授权的国家法定计量技术机构，授权证编号：(国)法计(2012)00068号。质量管理体系符合ISO/IEC 17025的要求，获得中国合格评定国家认可委员会(CNAS)认可，认可证书号为：CNAS L0462。

This laboratory is the legal metrological institute authorized by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, No. (国)法计(2012)00068. Its quality management system meets the ISO/IEC 17025 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L0462.

2. 本机构出具的数据均可溯源到国家计量基准和国际单位制(SI)。

The data issued by this laboratory is traceable to national primary standards and International system of Units (SI).

3. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):

JJG 315-1983 直流数字电压表试行检定规程 直流电压：1mV~1000V

JJG (航天) 34-1999 交流数字电压表检定规程 电压：(1mV~1000V)@(10Hz~1MHz)

JJG 598-1989 直流数字电流表试行检定规程 直流电流：1μA~100A

JJG (航天) 35-1999 交流数字电流表检定规程 (1μA~100A)@(10Hz~30kHz)

JJG 780-1992 交流数字功率表检定规程 直流功率：33mV~1020V, 3.3mA~20.5A; 交流功率：33mV~1008V, 3.3mA~21A; 频率：40Hz~10kHz; 功率因数：-1~1

JJF 1205-2008 谐波和闪烁分析仪校准规范 电流：(0.01~20) A@(16~2000) Hz; 电压：(6~1000)V@(16Hz~850Hz); 谐波电流：(0~6) A@(0.1~6) kHz; 谐波电压：(0~302) V@(0.1~6) kHz; 相角：(0~360)°@(16~850) Hz; 总谐波失真：0.1%~50%; 交流功率：6.4V~1008V, (3.3mA~21A)

4. 本次校准所使用的主要测量标准(Main measurement standards used during the calibration):

名 称 Description	技术指标 Specification	有效期至 Due Date	证书编号 Certificate No.
超级多产品校准器	DCV:1.2×10 <sup>-5</sup> ; DCI:1×10 <sup>-4</sup> ; ACV:1.2×10 <sup>-4</sup> ; ACI:0.06%; R:2.8×10 <sup>-5</sup> ; ACPower:0.08%; DCPower: 0.023%; T:0.14℃; Phase:±0.07°; f:1×10 <sup>-9</sup>	2015-04-23	4GC14000137-0007

5. 校准地点(The location where the calibrations were carried out):

赛宝计量检测中心广州实验室

6. 环境条件(Environmental condition):

温度(Temperature): 23 ℃

相对湿度(Relative Humidity): 60 %

7. 证书数据页中"P"代表"合格", "F"代表"不合格", "N/A"代表"不适用".

(In the data sheet, "P" stands for "Pass", "F" stands for "Fail", "N/A" stands for "Not applicable".)

注: 1. 本证书未经本机构书面授权, 不得部分复制。

(The certificate shall not be partly reproduced without written approval of the laboratory.)

2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)



## 1 外观与工作正常性检查(Appearance and Function Check)

结论  
(Pass/Fail)  
P

## 2 交流电压测量(AC Voltage Measurement)

频率 (Frequency)	量程 (Range)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(Hz)	(V)	(V)	(V)	(V)	(V)	
50	15	15.000	14.991	-0.009	±0.225	P
	30	30.000	29.982	-0.018	±0.450	P
	60	60.000	59.961	-0.039	±0.900	P
	150	150.00	149.92	-0.08	±2.25	P
	300	300.00	299.83	-0.17	±4.50	P
	600	600.00	599.71	-0.29	±9.00	P
60	15	15.000	14.991	-0.009	±0.225	P
	30	30.000	29.983	-0.017	±0.450	P
	60	60.000	59.964	-0.036	±0.900	P
	150	150.00	149.92	-0.08	±2.25	P
	300	300.00	299.85	-0.15	±4.50	P
	600	600.00	599.72	-0.28	±9.00	P

## 3 直流电压测量(DC Voltage Measurement)

量程 (Range)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(V)	(V)	(V)	(V)	(V)	
15	15.000	14.992	-0.008	±0.225	P
30	30.000	29.986	-0.014	±0.450	P
60	60.000	59.966	-0.034	±0.900	P
150	150.00	149.94	-0.06	±2.25	P
300	300.00	299.86	-0.14	±4.50	P
600	600.00	599.71	-0.29	±9.00	P

## 4 交流电流测量(AC Current Measurement)

频率	量程	标准值	指示值	误差	允许误差	结论	
(Frequency)	(Range)	(Reference)	(Indicated)	(Error)	(Limit)	(Pass/Fail)	
( Hz)	(mA)	(mA)	(mA)	(mA)	(mA)		
50	5	2.5000	2.4986	-0.0014	±0.0375	P	
	50	25.000	24.988	-0.012	±0.375	P	
		50.000	49.962	-0.038	±0.750	P	
		100	100.000	99.94	-0.06	±1.50	P
	(A)	(A)	(A)	(A)	(A)		
	0.5	0.25000	0.24989	-0.00011	±0.00375	P	
	1	0.50000	0.4998	-0.0002	±0.0075	P	
		1.00000	0.9998	-0.0002	±0.0150	P	
		5	2.50000	2.4996	-0.0004	±0.0375	P
	5	5.00000	4.9996	-0.0004	±0.1250	P	
		10	10.000	10.000	0.000	±0.250	P
		20	20.000	20.001	0.001	±0.500	P
	( Hz)	(mA)	(mA)	(mA)	(mA)		
	60	5	2.5000	2.4990	-0.0010	±0.0375	P
50		25.000	24.988	-0.012	±0.375	P	
		50.000	49.963	-0.037	±0.750	P	
		100	100.000	99.94	-0.06	±1.50	P
(A)		(A)	(A)	(A)	(A)		
0.5		0.25000	0.24989	-0.00011	±0.00375	P	
1		0.50000	0.4998	-0.0002	±0.0075	P	
		1.00000	0.9997	-0.0003	±0.0150	P	
		5	2.50000	2.4996	-0.0004	±0.0375	P
5		5.00000	4.9997	-0.0003	±0.1250	P	
		10	10.000	10.000	0.000	±0.250	P
		20	20.000	20.000	0.000	±0.500	P

## 5 交流电流加电流互感器751574测量(AC Current Measurement with 751574transductor 1500:1)

频率 (Frequency)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(Hz)	(A)	(A)	(A)	(A)	
50	40.000	39.973	-0.027	±1.000	P
	60.000	59.974	-0.026	±1.500	P
	80.000	79.963	-0.037	±2.000	P
	100.000	99.97	-0.03	±2.50	P
	120.000	119.96	-0.04	±3.00	P
	150.000	149.95	-0.05	±3.75	P
	200.000	199.94	-0.06	±5.00	P
	300.000	299.93	-0.07	±7.50	P
(Hz)	(A)	(A)	(A)	(A)	
60	40.000	39.973	-0.027	±1.000	P
	60.000	59.971	-0.029	±1.500	P
	80.000	79.962	-0.038	±2.000	P
	100.000	99.96	-0.04	±2.50	P
	120.000	119.96	-0.04	±3.00	P
	150.000	149.95	-0.05	±3.75	P
	200.000	199.95	-0.05	±5.00	P
	300.000	299.93	-0.07	±7.50	P

## 6 直流电流测量(DC Current Measurement)

量程 (Range)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(mA)	(mA)	(mA)	(mA)	(mA)	
5	2.5000	2.5026	0.0026	±0.0375	P
	50	25.000	24.994	±0.375	P
100	50.000	49.976	-0.024	±0.750	P
	100.000	99.96	-0.04	±1.50	P
(A)	(A)	(A)	(A)	(A)	
0.5	0.25000	0.24992	-0.00008	±0.00375	P
	0.50000	0.50022	0.00022	±0.0075	P
1	1.00000	1.0002	0.0002	±0.0150	P
	5	2.50000	2.4997	±0.0375	P
10	5.00000	5.0007	0.0007	±0.1250	P
	10.000	10.001	0.001	±0.250	P
20	20.000	20.001	0.001	±0.500	P



## 7 直流电流加电流互感器751574测量(DC Current Measurement with 751574 transductor 1500:1)

标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(A)	(A)	(A)	(A)	
40.000	39.981	-0.019	±1.000	P
60.000	59.968	-0.032	±1.500	P
80.000	79.956	-0.044	±2.000	P
100.000	99.95	-0.05	±2.50	P
120.000	119.92	-0.08	±3.00	P
150.000	149.92	-0.08	±3.75	P
200.000	199.86	-0.14	±5.00	P
300.000	299.81	-0.19	±7.50	P

## 8 交流功率测量(AC Power Measurement)

频率 (Frequency)	量程 (Range)	功率因数 (PF)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(Hz)			(W)	(W)	(W)	(W)	
50	15V,0.5A		5.0000	4.9964	-0.0036	±0.1500	P
	60V,1A		50.000	49.968	-0.032	±1.500	P
	150V,2A		200.000	199.91	-0.09	±6.00	P
			(kW)	(kW)	(kW)	(kW)	
	150V,10A		1.0000	0.9998	-0.0002	±0.0300	P
	600V,10A		5.0000	4.9988	-0.0012	±0.2500	P
			6.0000	5.9987	-0.0013	±0.3000	P
	600V,20A		8.0000	7.9990	-0.0010	±0.4000	P
			(W)	(W)	(W)	(W)	
60	15V,0.5A		5.0000	4.9972	-0.0028	±0.1500	P
	60V,1A		50.000	49.970	-0.030	±1.500	P
	150V,2A		200.000	199.93	-0.07	±6.00	P
			(kW)	(kW)	(kW)	(kW)	
	150V,10A		1.0000	0.9998	-0.0002	±0.0300	P
	600V,10A		5.0000	4.9990	-0.0010	±0.2500	P
			6.0000	5.9992	-0.0008	±0.3000	P
	600V,20A		8.0000	7.9990	-0.0010	±0.4000	P
			(W)	(W)	(W)	(W)	

## 9 交流功率加电流互感器751574测量(AC Power Measurement with 751574 transductor 1500:1)

频率 (Frequency)	功率因数 (PF)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(Hz)		(kW)	(kW)	(kW)	(kW)	
50	1	6.000	5.996	-0.004	±0.012	P
		8.000	7.998	-0.002	±0.014	P
		10.000	9.995	-0.005	±0.016	P
		20.000	19.987	-0.013	±0.026	P
(Hz)		(kW)	(kW)	(kW)	(kW)	
60	1	6.000	5.992	-0.008	±0.012	P
		8.000	7.994	-0.006	±0.014	P
		10.000	9.990	-0.010	±0.016	P
		20.000	19.986	-0.014	±0.026	P

## 10 直流功率测量(DC Power Measurement)

量程 (Range)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
	(W)	(W)	(W)	(W)	
15V,0.5A	5.0000	5.0018	0.0018	±0.1500	P
60V,1A	50.000	50.001	0.001	±1.500	P
150V,2A	200.000	199.97	-0.03	±6.00	P
	(kW)	(kW)	(kW)	(kW)	
150V,10A	1.0000	1.0000	0.0000	±0.0300	P
600V,10A	5.0000	5.0012	0.0012	±0.2500	P
	6.0000	6.0003	0.0003	±0.3000	P
600V,20A	8.0000	8.0010	0.0010	±0.4000	P

## 11 时间测量(Time Measurement)

指示值 (Indicated)	标准值 (Reference)	误差 (Error)
(min)	(min)	(min)
1.0000	1.0000	0.0000
5.0000	5.0000	0.0000
30.000	30.000	0.000
(h)	(h)	(h)
1.0000	1.0001	-0.0001



## 12 电能测量(Electric Energy Measurement)

频率 Frequency)	时间 (Time)	功率 (Power)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
	(min)	(W)	(Wh)	(Wh)	(Wh)	(Wh)	
DC	5	10	0.83333	0.83348	0.00015	±0.0042	P
50Hz	5	100	8.3333	8.3312	-0.0021	±0.0167	P
60Hz	5	100	8.3333	8.3318	-0.0015	±0.0167	P

## 13 功率因数测量(Power Factor Measurement)

频率 (Frequency)	输入值 (Input)	标准值 (Reference)	指示值 (Indicated)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)
(Hz)						
50	100V,1A	1.0000	1.0000	0.0000	±0.0500	P
		0.8000	0.8000	0.0000	±0.0500	P
		0.6000	0.6000	0.0000	±0.0500	P
		0.4000	0.4001	0.0001	±0.0500	P
		0.2000	0.2002	0.0002	±0.0500	P
		0.0000	0.0002	0.0002	±0.0500	P
60	100V,1A	1.0000	1.0000	0.0000	±0.0500	P
		0.8000	0.8000	0.0000	±0.0500	P
		0.6000	0.6001	0.0001	±0.0500	P
		0.4000	0.4001	0.0001	±0.0500	P
		0.2000	0.2001	0.0001	±0.0500	P
		0.0000	0.0001	0.0001	±0.0500	P

With CURRENT TRANSDUCER Model:751574

SN: 9100280096





附(Appendix):

关于测量结果不确定度的说明

(Directions of measurement uncertainty)

1 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)

2 本次测量结果的扩展不确定度(The expanded uncertainty of the measurement results)( $k=2$ )

2.1直流电压(DCV)	0.006%
2.2交流电压(ACV)	0.05%
2.3直流电流(DCA)	0.06%
2.4交流电流(ACA)	0.08%
2.5功率因数(PF)	0.1%
2.6频率(Frequency)	0.02%
2.7直流功率(DC Power)	0.08%
2.8交流功率(AC Power)	0.1%
2.9 时间(Time)	0.1%
2.10 电能 (Energy)	0.5%

以下空白/No data hereafter

