

# Test Report on Dry-Type Transformer

# 干式变压器试验报告

产品型号Product model: SCB11-1250/10.5-0.42KV

产品代号Product code: 1519A

出厂编号Ex-factory No. : B250032

报告编号 Report No. :2025.03.1832

四川众信通用电能股份有限公司

**Sichuan Zhongxin General Electric Energy Co., Ltd.**

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# 声明

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四川众信通用电能股份有限公司  
*Sichuan Zhongxin General Electric Energy Co., Ltd.*

## 产品参数表 Table of Product Parameters

产品名称 Product name	干式变压器 Dry-type transformer		
产品型号 Product model	SCB11-1250/10.5-0.42KV		
产品代号 Product code	1519A		
产品编号 Product No.	B250032		
试验日期 Test Date	2025.03.18		
生产单位 Manufacturer	四川众信通用电能股份有限公司 Sichuan Zhongxin General Electric Energy Co., Ltd.		
生产地址 Production address	四川天府智能制造产业园新津区兴化 5 路 998 号 No. 998, Xinghua 5 <sup>th</sup> Road, Xinjin District, Tianfu Intelligent Manufacturing Industrial Park, Chengdu, Sichuan		
额定容量 Rated capacity	1250KVA		
分接范围 Tapping range	10.5±2×2.5%/0.42		
额定电压 Rated voltage	10500V/420V	冷却方式 Cooling type	AN&AF
额定电流 Rated current	68.7A/1718.3A	相数 Number of phases	3
联结组别 Coupling group	Dyn11	额定频率 Rated frequency	50HZ
绝缘水平 Insulation level	高压线路端子 HV line terminals	LI75 AC 35kV	
	低压线路端子 LV line terminals	AC 3kV	
应用标准 Application standards	1、GB / T 1094.1-2013 《电力变压器第一部分总则》 Power Transformers - Part 1: General (GB/T 1094. 1-2013) 2、GB / T 1094.3-2017 《电力变压器第三部分绝缘水平绝缘试验和外绝缘空气间隙》 Power Transformers - Part 3: Insulation Levels, Dielectric Tests and External Clearances in Air (GB/T 1094.3-2017) 3、GB / T 1094.11-2022 《电力变压器第十一部分干式变压器》 Power Transformers - Part 11: Dry-type Transformers (GB/T 1094. 11-2022) 4、GB / T10228-2023 《干式变压器技术参数和要求》 Technical Parameters and Requirements for Dry-type Power Transformers (GB/T10228-2023) 5、GB / T 311.1-2012 《绝缘配合第一部分定义、原则和规则》 Insulation Co-ordination – Part 1: Definitions, Principles and Rules (GB/T 311. 1-2012) 6、GB 20052-2024 电力变压器能效限定值及能效等级 Minimum Allowable Values of Energy Efficiency and the Energy Efficiency Grades for Power Transformers (GB 20052-2024)		
试验结论 Test conclusions	此台变压器的试验结果符合上述标准要求，产品试验合格。 The test results of this transformer comply with the requirements of the above-mentioned standards. The product passed the test.		
编制 Prepared by		审核 Reviewed by	批准 Approved by

No.	试验项目 Test items	试验类型 Test type	试验结论 Test result
1	电压比测量和联结组别标号检定 Measurement of voltage ratio and verification of code of coupling group	例行试验 Routine test	合格 Qualified
2	绕组直流电阻测量 Measurement of DC resistance of winding	例行试验 Routine test	合格 Qualified
3	绕组对地及绕组间直流绝缘电阻测量 Measurement of winding-to-earth DC insulation resistance and DC insulation resistance between windings	例行试验 Routine test	合格 Qualified
4	感应耐压试验 Induced voltage withstand test	例行试验 Routine test	通过 Passed
5	空载损耗和空载电流测量 Measurement of no-load loss and no-load current	例行试验 Routine test	合格 Qualified
6	短路阻抗和负载损耗测量 Measurement of short-circuit impedance and load loss	例行试验 Routine test	合格 Qualified
7	外施耐压试验 Applied voltage withstand test	例行试验 Routine test	通过 Passed
8	局部放电测量 Measurement of partial discharge	例行试验 Routine test	合格 Qualified

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测试环境 Test environment			
环境温度 Ambient temperature	12	相对湿度 Relative humidity	40
大气压力 Atmospheric pressure	85		

1、电压比测量及联结组标号检定 Measurement of voltage ratio and verification of code of coupling group					
仪器型号编号: QBC-3628G 14120246 Instrument model No.: QBC-3628G 14120246					
分接 Tapping	高压电压 (V) HV voltage (V)	低压电压 (V) LV voltage (V)	偏差 Deviation		
			AB/ab	BC/bc	CA/ca
1	11025	420	0.16	0.16	0.16
2	10763		0.17	0.16	0.16
3	10500		0.16	0.16	0.16
4	10238		0.16	0.16	0.16
5	9975		0.16	0.16	0.16
联结组标号 Code of coupling group			Dyn11		
要求值 Required values			$<\pm 0.5\%$ 或小于短路阻抗的 $1/10$ $<\pm 0.5\%$ or less than $1/10$ of short-circuit impedance (两者取较小值) (Whichever is smaller)		
试验结果 Tested results			测试值符合要求。 Tested values meet relevant requirements.		
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2、绕组电阻测量

Measurement of winding resistance

仪器型号编号: BZHC-3386 1147413

Instrument type number: BZHC-3386 1147413

高压绕组 HV winding	分接位置 Tapping Duty	AB (Q)	B C (Q)	CA(Q)	不平衡率(%) Unbalance rate
	2-3	0.5319	0.5319	0.5317	0.04
	3-4	0.5184	0.5184	0.5182	0.04
	4-5	0.5049	0.5049	0.5047	0.04
	5-6	0.4916	0.4916	0.4914	0.04
	6-7	0.4782	0.4783	0.4781	0.04
低压绕组 LV winding		ab (Q)	be (Q)	ca (Q)	/
		/	/	/	/
		ao (Q)0.0003420	bo (Q)0.0003427	co(Q)0.0003416	0.32

要求值 Required values

线电阻不平衡率 V2%

Unbalance rate of phase resistance <2%

相电阻不平衡率 V4%

Unbalance rate of phase resistance <4%

试验结果 Tested results

测试值符合要求。

Tested values meet relevant requirements.

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3、绕组对地, 绕组间直流绝缘电阻, 接地电阻测量 Measurement of winding-to-earth DC insulation resistance, DC insulation resistance between windings, and Grounding Resistance

仪器型号编号: 3127 100029763 Instrument model No.: 3127 100029763

试验绕组 Tested winding	60( Ω)
高压对低压及地 HV to LV & earth	>5000
低压对高压及地 LV to HV & earth	>5000
高压对低压 HV to LV	>10000
铁芯对夹件及地 Core to clamp & earth	>5000
穿心螺杆对地 Core clamping bolt to earth	>5000
接地电阻 Grounding resistance	0.1
试验结果 Tested results	测试值符合要求 Tested values meet relevant requirements.

4、感应耐压试验

Induced voltage withstand test

仪器型号编号: TWPD-2E1706XY654

Instrument model No.: TWPD-2E1706XY654

试验频率 (Hz) Tested frequency (Hz)	施加电压 (kV) Applied voltage (kV)	持续时间 (s) Duration (s)
200	2Ur	30
试验结果 Test results		在持续时间内, 试验电压无突然下降。 No sudden drop in the test voltage occurs in the duration.

5、空载损耗和空载电流测量

Measurement of no-load loss and no-load current

仪器型号编号: NORMA-4000 15589

Instrument type No.: NORMA-4000 15589

平均值试验电压 (V) Mean value test voltage (V)		空载电流 I <sub>0</sub> (%) No-load current I <sub>0</sub> (%)	空载损耗 P <sub>0</sub> (W) No-load loss P <sub>0</sub> (W)
420		0.34	1700
要求值 Required values	100% Ur	I <sub>0</sub> (%)	0.85(+30%)
		P <sub>0</sub> (W)	1880(+15%)
试验结果 Tested results		测试值符合要求。 Tested values meet relevant requirements.	

6、短路阻抗和负载损耗测量 Measurement of short-circuit impedance and load loss			
仪器型号编号： NORMA-4000 15589 Instrument model No. : NORMA-4000 15589			
绕组 Winding	分接档位 Tapping position	短路阻抗 $U_k$ ( 120°C) Short circuit impedance $U_k$ (120°C)	负载损耗 (120°C) Load loss (120°C)
HV-LV	3	5.82	10350
要求值 Required values		6(± 10%)	9690(+15%)
试验结果 Test results	测试值符合要求，试验合格。 Tested values meet relevant requirements, test qualified.		

7、外施耐压试验 Applied voltage withstand test 变压器运行海拔为 ≤1000 米 The transformer operates at an altitude of ≤1,000m .				
仪器型号编号： TRF150-0.0001J 2008067 Instrument model No. : TRF150-0.0001J 2008067				
试验项目 Test item	额定短时外施耐受电压 Rated short-term applied withstand voltage	试验电压 ( kV) Test voltage ( kV)	频率 (Hz) Frequency (Hz)	持续时间 (s) Duration (s)
高压绕组所有端子对其他绕组及地 All terminals of HV winding to other windings and earth	35	35	50	60
低压绕组所有端子对其他绕组及地 All terminals of LV winding to other windings and earth	3	3	50	60
试验结果 Test results	在持续时间内，试验电压无突然下降。 No sudden drop in the test voltage occurs in the duration.			

8、局部放电测量 Measurement of partial discharge			
仪器型号编号： TWPD-2E 1706XY654 Instrument Model No. : TWPD-2E 1706XY654			
施加电压 (kV) Applied voltage (kV)	试验时间 (s) Duration time (s)	局部放电量 (pC) Magnitude of partial discharge (pC)	
		A	B
1.8Ur	30	通过 Passed	
1.3Ur	180	5.1	4.9
要求值 Required values	1、相间施加 1.8U，电压下，持续时间 30s，无击穿或异常响声。 Apply 1.8U voltage between phases for 30s. No breakdown should occur or no abnormal sound should be heard. 2、1.3U，电压下，三相局部放电量 < 10pC。 Apply 1.3U voltage. The magnitude of three-phase local discharge is < 10pC.		
试验结果 Test results	测试值符合要求，试验合格。 Test values meet relevant requirements . The product passed the test.		

9、冷却风机试验 Cooling Fans Operation and Function test	
试验项目 Test item	超过设定温度触发风扇运行，低于设定温度风扇停止运行 When the temperature is over the pre-set value, the cooling fans operate; When the temperature is lower than the pre-set value, the cooling fans stop working.
实验条件 Test Conditions	1, 风机电源电压：220V交流 Cooling Fans Power Supply: 220V AC 2, 风机电源频率（50Hz）Cooling Fans power Supply Frequency(50Hz) 3,环境温度（11℃）Environment Temperature
实验过程描述 Test Process Description	温控器接220V交流50Hz电源，测试时环境温度为11℃，冷却风扇启动温度设定为15℃。测试开始时，测试人员用手握住温度探头，约半分钟后，6个风扇全部启动，在控制器上观察到温度为20℃。测试人员随后松开探头，在控制器屏幕上观察到温度逐渐下降，当温度下降到14.9℃时，观察到所有冷却风扇停止工作。The temperature controller is connected with 220v AC 50Hz electricity supply. The environment of the testing time is 11℃, the cooling fans operation triggering temperature is set at 15℃. At the beginning of the test, tester uses hand to hold the temperature probe, about half minutes later, all six fans start to operate, and the temperature is observed on the controller as 20℃. The tester then released the probe, the temperature is observed to decrease gradually on the controller screen, when the temperature decreases to 14.9℃, all cooling fans are observed to stop working.
试验结果 Test Results	风机及温度控制系统正常运行The cooling fans and the temperature control system works without problem