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XIHARI

No. 235776

第一册 Part One

检 验 报 告

TEST REPORT

试 品 型 号: HXGN□-V
TYPE
试 品 名 称: 环保气体全绝缘全密封金属封闭环网开关设备
DESIGNATION ENVIRONMENT-FRIENDLY GAS FULLY INSULATED FULLY
SEALED METAL CLOSED RING SWITCHGEAR
委 托 单 位: 厦门宏发电气有限公司
APPLICANT XIAMEN HONGFA ELECTRIC CO., LTD.
制 造 单 位: 厦门宏发电气有限公司
MANUFACTURER XIAMEN HONGFA ELECTRIC CO., LTD.
检 验 类 别: 型式试验 (温升、开合、绝缘、短路及内部电弧性能)
CLASSIFICATION TYPE TEST (TEMPERATURE-RISE, SWITCHING, DIELECTRIC
SHORT-CIRCUIT AND INTERNAL ARC PERFORMANCE)



西安高压电器研究院常州有限责任公司

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注: 对高压开关类型式试验报告包含 6 种基本形式:

note: The six basic type test reports for high-voltage switchgear and controlgear are as follows:



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——温升性能型式试验报告 Type Test Report of Temperature Rise Performance

——短路/开断和关合性能型式试验报告 Type Test Report of Short-Circuit / Making and Breaking Performance

——开合性能型式试验报告 Type Test Report of Switching Performance

——内部电弧性能型式试验报告 Type Test Report of Internal Arc Performance

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11 本报告共分 2 册。There are Two parts for this report.

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目录

Table of contents

第一册 Part One

目录 Table of contents	1
试品基本信息 Description of the test object	3
检验结论 Conclusions	5
试品确认 Identification of the test object	10
测量不确定度 Measurement uncertainty	17
报告中使用的符号和缩写 Symbols and abbreviation used in test report	19
绝缘试验总则 General of dielectric test	21
工频耐受电压试验 Power-frequency withstand voltage test	22
雷电冲击耐受电压试验 Lightning impulse withstand voltage test	26
辅助和控制回路的绝缘试验 Dielectric test on auxiliary and control circuit	42
局部放电试验 Partial discharge tests test	44
X 射线试验 X-radiation test	49
IK 代码的检验 Verification of the IK coding	50
IP 代码的检验 Verification of the IP coding	52
凝露试验 Condensation test	62
空载特性试验 No-load test	86
短时耐受电流和峰值耐受电流试验 Short-time and peak withstand current tests	90
T60	114
T100s	122
T30	129
T100a	137
T10	147
电寿命试验 (100%) Electrical endurance(100%)	155
OP2	221
OP1	232
异相接地故障试验 Double-earth fault tests	243
CC2 (LC2)	252
CC1 (LC1)	281
背对背电容器组开合试验 BC2 Back-to-back capacitor bank switching test BC2	310

第二册 Part Two

单个电容器组开合试验 BC2 Single capacitor bank switching test BC2	395
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背对背/单个电容器组开合试验 BC1 Back-to-back/single capacitor bank switching test BC1	480
接地回路短路关合能力试验 Short-circuit making capacity tests	509
空载特性试验 No-load test	519
作为状态检查的电压试验 Voltage test as a condition check	524
内部电弧试验 Internal arc test	530
回路电阻测量 Measurement of the resistance of circuits	556
温升试验 Temperature-rise tests	561
机械试验 Mechanical tests	573
密封试验 Tightness test	613
气体状态测量 Humidity measurement	616
充气隔室的压力耐受试验 Pressure withstand test for gas-filled compartments	617
高、低温试验 Low and high temperature tests	618
接地金属部件的电气连续性试验 Electrical continuity of earthed metallic parts test	653
辅助触头的开断能力 Auxiliary contact breaking capacity	655
辅助触头的额定短时耐受电流 Auxiliary contact rated short time withstand current	656
辅助触头的额定连续电流 Auxiliary contact rated continuous current	657
电快速瞬变脉冲群抗扰度试验 Electrical fast transient/burst immunity test	660
电压暂降、短时中断和电压变化的抗扰度试验 Voltage dips, short interruptions and voltage variations immunity test	663
振荡波抗扰度试验 Oscillatory waves immunity test	666
直流电源输入端口纹波抗扰度试验 Ripple on d.c input power port immunity test	669
辅助和控制回路的发射试验（传导发射试验） Emission tests from the auxiliary and control circuits (Conducted emission test)	672
辅助和控制回路的发射试验（辐射发射试验） Emission tests from the auxiliary and control circuits (Radiated emission test)	678
端子静负载试验 Static terminal load test	683
悬臂负荷耐受试验 Cantilever load withstand Test	684
盐雾试验 Salt mist test	688
图纸 Drawings	722



试品基本信息

Description of the test object

型号名称: HXGN□-V 环保气体全绝缘全密封金属封闭环网开关设备
 Type and Designation: Environment-Friendly Gas Fully Insulated Fully Sealed Metal Closed Ring Switchgear

委托单位: 厦门宏发电气有限公司
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 Manufacturer: Xiamen Hongfa Electric Co., Ltd.

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 Address: No.15, Dongfuxi Second Road, Haicang District, Xiamen (361028)

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制造单位规定的试品主要技术数据 Main technical data assigned by the manufacturer:

额定电压 Rated voltage kV	12	✓
额定电流 Rated current A	630	✓
额定频率 Rated frequency Hz	50	✓
额定短时耐受电流(主回路) Rated short-time withstand current (main circuit) kA	20	✓
额定峰值耐受电流(主回路) Rated peak withstand current(main circuit) kA	50	✓
额定短路持续时间(主回路) Rated duration of short-circuit(main circuit) s	4	✓
额定短时耐受电流(接地回路) Rated short-time withstand current (earthing circuit) kA	17.4	✓
额定峰值耐受电流(接地回路) Rated peak withstand current (earthing circuit) kA	43.5	✓
额定短路持续时间(接地回路) Rated duration of short-circuit (earthing circuit) s	2	✓
额定短时工频耐受电压 Rated short-duration power-frequency withstand voltage kV	42	✓
额定雷电冲击耐受电压 Rated lightning impulse withstand voltage kV	75	✓
额定短时工频耐受电压(断口) Rated power-frequency withstand voltage(across the open switching device) kV	48	✓
额定雷电冲击耐受电压(断口) Rated lightning impulse withstand voltage(across the open switching device) kV	85	✓



气体的额定压力(20℃表压) Rated pressure of gas(meter pressure at 20℃) Mpa	干燥空气 Dry air 0.02	✓
气体的最低功能压力(20℃表压) Min. function pressure of gas(meter pressure at 20℃) Mpa	干燥空气 Dry air 0.01	✓
内部电弧等级 IAC class	AFLR 20kA 1s	✓
防护等级 Degree of protection	IP41/IP2XC/IP67、IK10	✓
出厂日期及编号 Manufacture date and serial number(绝缘、温升及容量试验 Dielectric, temperature-rise and high power tests/ 内部电弧试验 Internal arc tests/ IP、IK、高低温试验 High and low temperature tests/ 机械及盐雾试验 Mechanical tests and salt mist test)	2023-07、G2023070089 2023-07、G2023070090 2023-07、G2023070093 2023-07、G2023070094	
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注 2: “✓” 表示该额定值在本检验报告中已得到验证。 Note2: “✓” This rating has been proved by the tests in this report.		



检验结论

Conclusions

型号名称: HXGN□-V 环保气体全绝缘全密封金属封闭环网开关设备
Type and Designation: Environment-Friendly Gas Fully Insulated Fully Sealed Metal Closed Ring Switchgear
委托单位: 厦门宏发电气有限公司
Applicant: Xiamen Hongfa Electric Co., Ltd.
地址: 厦门市海沧区东孚西二路 15 号 (361028)
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依据标准 Standards for Test Performance: GB/T 3906-2020、DL/T 404-2018、GB/T 1984-2014、DL/T 402-2016、DL/T 593-2016、GB/T 2423.1-2008、GB/T 2423.2-2008、GB/T 4109-2022、GB/T 2423.17-2008

实施的项目 Test have been performed:

序号 Serial	项目 Items	参数 Parameters	判定标准 Standards for Verdict	结果 Result
1	工频耐受电压试验 Power frequency withstand voltage tests	相间及对地 Between phases, to earth: 42kV 1min 真空断口 Across vacuum contact: 48kV 1min 隔离断口 Across the isolating distance: 48kV 1min	GB/T 3906-2020 7.2 DL/T 404-2018 6.2	符合 Satisfied
2	雷电冲击耐受电压试验 Lightning impulse withstand voltage tests	相间及对地 Between phases, to earth: 75kV 真空断口 Across vacuum contact: 85kV 隔离断口 Across the isolating distance: 85kV	GB/T 3906-2020 7.2 DL/T 404-2018 6.2	符合 Satisfied
3	控制和辅助回路的绝缘试验 Dielectric tests on auxiliary and control circuits	2000V 1min	GB/T 3906-2020 7.2.11 DL/T 404-2018 6.2.11	符合 Satisfied
4	局部放电测量 Partial discharge measurement	开关设备 Switchgear: 13.2kV \leq 20pC 套管 Bushing: 13.2kV \leq 5pC	GB/T 3906-2020 7.2.10 DL/T 404-2018 6.2.10	符合 Satisfied
5	X 射线试验 X-radiation test	/	GB/T 1984-2014 6.11 DL/T 402-2016 6.11	符合 Satisfied



序号 Serial	项目 Items	参数 Parameters	判定标准 Standards for Verdict	结果 Result
6	IK 代码的检验 Verification of IK code	IK10	GB/T 3906-2020 7.7.2 DL/T 404-2018 6.7.2	符合 Satisfied
7	IP 代码的检验 Verification of IP code	外壳 Enclosure: IP41 隔室间 Between compartments: IP2XC 充气隔室 Gas compartment: IP67	GB/T 3906-2020 7.7.1 DL/T 404-2018 6.7.1	符合 Satisfied
8	凝露试验 condensation test	/	DL/T 593-2016 6.2.9	符合 Satisfied
9	短时耐受电流和峰值耐受 电流试验 Short-time and peak withstand current tests	主回路及接地开关 Main circuit and ES: 20kA、4s、峰值(peak) 50kA 接地连接回路 Earthing circuit: 17.4kA、2s 峰值(peak) 43.5kA	GB/T 3906-2020 7.6 DL/T 404-2018 6.6	符合 Satisfied
10	T10~T100	12kV 20kA 峰值(peak) 50kA DC:52%	GB/T 1984-2014 6.102~106 DL/T 402-2016 6.102~106	符合 Satisfied
11	电寿命 Electrical endurance tests	12kV 20kA E2 级(class) 30 次(times)	GB/T 1984-2014 6.112 DL/T 402-2016 6.112	符合 Satisfied
12	异相接地故障试验 Double earth fault test	12kV 17.4kA	GB/T 1984-2014 6.108 DL/T 402-2016 6.108	符合 Satisfied
13	OP1、OP2	17.3kV 5kA	GB/T 1984-2014 6.110 DL/T 402-2016 6.110	符合 Satisfied
14	CC1、CC2 (LC1、LC2)	12kV 50A C2 级(class)	GB/T 1984-2014 6.111 DL/T 402-2016 6.111	符合 Satisfied
15	BC1、BC2 (单个电容器组开合试验 Single-capacitor bank switching tests)	12kV 800A C2 级(class)	GB/T 1984-2014 6.111 DL/T 402-2016 6.111	符合 Satisfied
16	BC1、BC2 (背对背电容器组开合试验 Back-to-back capacitor bank switching tests)	12kV 630A C2 级(class) 关合涌流 Inrush making current: 20kA 4250Hz	GB/T 1984-2014 6.111 DL/T 402-2016 6.111	符合 Satisfied
17	接地回路短路关合能力试验 Earthing circuit short-circuit making capacity tests	12kV 峰值(peak)50kA 5 次(times)	GB/T 3906-2020 7.101 DL/T 404-2018 6.101	符合 Satisfied



序号 Serial	项目 Items	参数 Parameters	判定标准 Standards for Verdict	结果 Result
18	内部电弧试验 Internal arc tests	IAC 级(class): AFLR 12kV、20kA、1s 峰值(peak) 50kA (开关室和电缆室 CB compartment and cable compartment)	GB/T 3906-2020 7.106 DL/T 404-2018 6.105	符合 Satisfied
19	回路电阻测量 Measurement of the resistance of circuits	/	GB/T 3906-2020 7.4 DL/T 404-2018 6.4	符合 Satisfied
20	温升试验 Temperature-rise tests	1.1×630A	GB/T 3906-2020 7.5 DL/T 404-2018 6.5	符合 Satisfied
21		800A (按委托方要求, 通流 693A 至温升稳定后, 升流至 800A, 持续 1 小时 Required by clients, apply current 693A until the temperature rise is stable, rises the current to 800A for 1h)	HF.392.020	符合 Satisfied
22	辅助和控制设备的温升试验 Temperature-rise tests of A.C.E	/	GB/T 3906-2020 7.5.6 DL/T 404-2018 6.5.5	符合 Satisfied
23	机械试验 Mechanical tests	断路器 CB: 10000 次(times) 隔离开关 DS: 5000 次(times) 接地开关 ES: 5000 次(times) 联锁检查 Interlocks verification	GB/T 3906-2020 7.102	符合 Satisfied
24	密封试验 Tightness Tests	环网柜 Switchgear: ≤0.01%/Y	GB/T 3906-2020 7.8	符合 Satisfied
25	气体状态测量试验 Humidity measurement	水分含量 Moisture content: ≤150 μ L/L	GB/T 3906-2020 7.103 DL/T 404-2018 6.103	符合 Satisfied
26	充气隔室的压力耐受试验 Pressure withstand test for gas-filled compartments	设计压力 Design pressure: 0.07MPa (20℃时表压 meter pressure)	GB/T 3906-2020 7.103 DL/T 404-2018 6.103	符合 Satisfied
27	高温试验 High temperature test	60℃ 16h	GB/T 2423.2-2008	符合 Satisfied
28	低温试验 Low temperature test	-45℃ 16h	GB/T 2423.1-2008	符合 Satisfied



序号 Serial	项目 Items	参数 Parameters	判定标准 Standards for Verdict	结果 Result
29	辅助和控制回路的附加试验 -接地金属部件的电气连续性试验 Additional tests on auxiliary and control circuits -Electrical continuity of earthed metallic parts test	/	GB/T 3906-2020 7.10 DL/T 404-2018 6.10	符合 Satisfied
30	辅助和控制回路的附加试验 -辅助触头的额定短时耐受电流 Additional tests on auxiliary and control circuits -Auxiliary contact rated short time withstand current	辅助触头等级 Auxiliary contact classes: 1 级(Class)	GB/T 3906-2020 7.10 DL/T 404-2018 6.10	符合 Satisfied
31	辅助和控制回路的附加试验 -辅助触头的开断能力 Additional tests on auxiliary and control circuits -Auxiliary contact breaking capacity	辅助触头等级 Auxiliary contact classes: 1 级(Class)	GB/T 3906-2020 7.10 DL/T 404-2018 6.10	符合 Satisfied
32	辅助和控制回路的附加试验 -辅助触头的额定连续电流 Additional tests on auxiliary and control circuits -Auxiliary contact rated continuous current	辅助触头等级 Auxiliary contact classes: 1 级(Class)	GB/T 3906-2020 7.10 DL/T 404-2018 6.10	符合 Satisfied
33	电快速瞬变脉冲群 抗扰度试验 Electrical fast transient/burst immunity test	3 级(Class)	GB/T 3906-2020 7.9 DL/T 404-2018 6.9	符合 Satisfied
34	电压暂降、短时中断和电压变化的抗扰度试验 Voltage dips, short interruptions and voltage variations immunity test	/	GB/T 3906-2020 7.9 DL/T 404-2018 6.9	符合 Satisfied
35	振荡波抗扰度试验 Oscillatory waves immunity test	2 级(Class)	GB/T 3906-2020 7.9 DL/T 404-2018 6.9	符合 Satisfied
36	直流电源输入端口纹波 抗扰度试验 Ripple on d.c. input power port immunity test	2 级(Class)	GB/T 3906-2020 7.9 DL/T 404-2018 6.9	符合 Satisfied



序号 Serial	项目 Items	参数 Parameters	判定标准 Standards for Verdict	结果 Result
37	辅助和控制回路的发射试验 Emission test for auxiliary circuit and control circuit	1 组 A 类设备 Group 1, Class A Equipment	GB/T 3906-2020 7.9 DL/T 404-2018 6.9	符合 Satisfied
38	端子静负载试验 Static terminal load test	3kN	HF.392.020	符合 Satisfied
39	悬臂负荷耐受试验 Cantilever load withstand Test	5kN 60min	HF.392.020	符合 Satisfied
40	盐雾试验 Salt mist test	168h	GB/T 2423.17-2008	符合 Satisfied

注 Note:

- 序号 12~17、37 试验项目在分包实验室海检检测有限公司实施(CNAS L10793 CMA 180008344069; 地址: 山东省青岛市即墨区鳌山卫街道齐云山一路 118 号)。序号 12~17 项对应的分包试验为有能力分包; 序号 37 项对应的分包试验为无能力分包。No.12~17, 37 (test item) are performed in subcontracting laboratory Marine Equipment Inspection & Testing Co., Ltd. (CNAS L10793 CMA 180008344069; Address: No.118, Qiyunshan Yilu, Aoshanwei Street, Jimo, Qingdao, Shandong, China). No.12~17 (test item) are within the authorized testing scope of the laboratory; No.37 (test item) are not covered in the authorized testing scope of the laboratory.
- 判定标准《HF.392.020 鉴定大纲》不在实验室授权/认可范围。Verdict standard 《HF.392.020 Test outline》 was not authorized / accredited to the laboratory.

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