160008221789

中国认可
国际互认
检测
TESTING
CNAS L0278

机检电 (2013) 33号

CHPTL

AQTC

№.

# 检 验 报 告

## Test Report

| | |
|---|---|
| 试品型号<br>TYPE | KYN28-12/1250-31.5 型 |
| 试品名称<br>DESIGNATION | 金属铠装移开式开关设备 |
| 委托单位<br>CLIENT | |
| 制造单位<br>MANUFACTURER | |
| 检验类别<br>TEST CATEGORY | 型式试验 |

辽宁高压电器产品质量检测有限公司

Liao Ning H.V Apparatus Quality Test Co.Ltd

机械工业高压电器设备质量检测中心

High Voltage Apparatus Quality Test Center of Machinery Industry

THE PEOPLE'S REPUBLIC OF CHINA

| Test Report | 说　　明<br>Information sheet | №. |
|---|---|---|

1　检验类别 Test category

1.1 型式试验 Type Test Report

型式试验包括一系列严格按照依据标准进行的试验。试品满足依据标准要求，制造单位提供的相关额定参数由 AQTC 验证。Test Report 只适用于被试产品。AQTC 对报告的内容及有效性负责。A Test Report contains a record of a series of type tests carried out strictly in accordance with a recognized standard. The equipment tested has fulfilled the requirements of this standard and the relevant ratings assigned by the manufacture are endorsed by AQTC. The Test Report is applicable only to the equipment tested. AQTC is responsible for the validity and the contents of the Test Report.

任何采用相同设计的同型号产品与被试产品的一致性由制造单位负责。检验报告中包含必要的图纸及试品描述。The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacture.Test Report contains the essential drawings and a description of the tested object

1.2 性能试验 Report of Performance

性能试验是按委托方要求进行的试验。这些试验不必符合依据标准。试验结果也不验证试品额定参数。A Report of Performance contains a record of one or more tests which have been carried out according to the client's instructions. These tests are not necessarily in accordance with a recognized standard. The test results do not verify ratings of the test object.

AQTC 出具 3 种性能报告 AQTC issues three types of Reports of Performance:

a) **试验是严格按照 ... 进行的，试品符合相关要求**（写在报告首页）The tests have been carried out strictly in accordance with ... The apparatus has complied with the relevant requirements.

试验是按照依据标准进行的，但有一部分试验不完全满足一个完整报告的要求（如：试验方式和/或试验次数不是一个完整的型式试验系列）。报告中包括对试品的描述、试验后试品状态的评价及记录。This sentence will appear on the front page of a Report of Performance if the tests have been performed in accordance with a recognized standard, but the series of tests does not completely fulfil the requirements for a Type Test Report (for example, if the test duties and/or the number of test is not a complete series of type tests). The Report contains a description of the tested object. The condition of the tested object after the tests is assessed and recorded in the Report.

b) **试验是按照委托方要求进行的，试验程序及试验参数是根据...制定的。**（写在报告首页）The tests have been carried out in accordance with client's instructions. Test procedure and test parameters were based on...

试验程序及试验参数是依据标准和制造单位赋予的额定值确定的。图纸的核实及试验后试品状态的评价仅按委托方要求进行。This sentence will appear on the front page of a Report of Performance if the test procedure and the test parameters are based on a recognized standard and related to the ratings assigned by the manufacture. Verification of the drawings (if submitted) and assessment of the condition after the tests is only done on the client's request.

c) **试验是按照委托方要求进行的**（写在报告首页）The tests have been carried out according to the client's instructions

试验程序和/或试验参数不是按照依据标准确定的。This sentence will appear on the front page of a Report of Performance if the test procedure and/or test parameters are not in accordance with a recognized standard.

2. 标准 Standards

引用的标准是最新的有效版本的标准，包括最新的修订。When reference is made to a standard, and the date of issue is not stated, this applies to the latest issue, including amendments which have been officially published prior to the date of this tests.

3. 正式的和非受控试验文件 Official and uncontrolled test documents

AQTC 的正式试验文件是以装订并盖试验专用章的方式出具的。非受控的复印件以活页形式提供。The official test documents of AQTC are issued in bound form. Untrolled copies may be provided as loose sheets. The copyright has to be respected at all times.

4. 测量不确定度 Accuracy of measurement

如无特殊说明，考虑整个测量系统的不确定度，试验结果的不确定度不大于 5%。In the table of test results the measured quantities are given in three digits. This method of presentation does not indicate an accuracy. The guaranteed uncertainty in the figures mentioned, taking into account the total measuring system, is less than 5%, unless mentioned otherwise.

5. CNAS 认证资质 Qualified by CNAS

AQTC 已经按照 CNAS-CL01(ISO/IEC 17025)的要求通过了 CNAS 的认可，认可证书编号 CNAS L0278。AQTC has been entered in the CNAS-register for laboratories under CNAS L0278 For the testing services as defined in the Field of Accreditation.

6. 专利 Patent

Test Report 中的试品和相关内容可能涉及专利，AQTC 不承担识别这些专利以及由此引发的任何责任。Tested object and relevant content in this report may involve patent. The laboratory will not responsible for identifying these patents or any others.

注 Note: **AQTC 是"机械工业高压电器设备质量检测中心"的缩写** AQTC is the abbreviation of High Voltage Apparatus Quality Test Center of Machinery Industry

**Test Report 无编制、审定及批准人签字无效；Test Report 涂改无效** The test report will be invalid without the original signature of "Prepared by", "verifiedeed by", "approved by"; The test report will be invalid with alter of any character or data

**对 Test Report 如有异议，应于收到报告之日起二十五天内向承检单位提出** Any dissension to this test report should be formally sunmitted to the laboratory within 25 days once receiving the report

地址 ADD: 沈阳市沈北新区虎石台南大街 16 号。№.16 Hushitai South street, Shenbei New Area, Shenyang, Liaoning,China
邮政编码 P.C.: 110122
电话 Tel: 024-89636993、89872239
传真 Fax: 024-89871262
网址 internet: www.shetc.com
电子邮箱 Email: syaqtc@163.com

| Test Report | 目　　录<br>Table of contents | No. |
|---|---|---|

| Test Report | 检 验 结 论<br>Test conclusions | №. |
|---|---|---|

试品名称　KYN28-12/1250-31.5 型交流金属封闭开关设备

制造单位

制造单位地址

委托单位

检测单位　机械工业高压电器设备质量检测中心

试验日期

检验类别　型式试验

按照报告中的图纸、照片及描述生产的试品依据下列标准进行了一系列验证试验

**GB 3906-2006、DL/T404-2007**，条款：6.2（绝缘试验）、6.4（回路电阻测量）、6.5(温升试验)、6.6(短时耐受电流和峰值耐受电流试验)、6.7（防护等级检验）、6.101(关合和开断能力的验证)、6.102(机械操作和机械特性测量试验)

**GB 1984-2014、DL/T 402-2016**，条款：6.101.2（机械操作试验）、6.106（基本短路试验方式）

**验证试验所获得的试验数据及整体性能符合上述标准及制造单位赋予试品的额定参数，试品相应性能合格。**

全部的验证试验项目和参数在第 4 页中给出。

本试验报告仅对被试样品有效。批量生产的产品是否与被试样品保持一致由制造单位负责。

本部分共 92 页。

本报告在中国合格评定国家认可委员会授权的 CNAS L0278 认可证书能力范围内。

© 版权：未经 AQTC 书面授权不得部分复制本报告。装订并盖有 AQTC 试验专用章的报告为有效版本。

委托方代表:　　此处无印鉴无效

主要参加试验人员：李玉恒、程凡、张威

编制：　　审定：　　批准：

日期:　　日期:　　日期:

| Test Report | 验证的检验项目和参数<br>Verified test items and test parameters | №. |
|---|---|---|

| 序号 | 检验项目 | 检验参数 |
|---|---|---|
| 1 | **绝缘试验** | |
| | 工频电压试验（干试） | 相间、对地、金属活门：42 kV；隔离断口：48 kV |
| | 雷电冲击电压试验 | 相间、对地、金属活门：75 kV；隔离断口：85 kV |
| | 观察窗的绝缘试验 | 工频电压 42 kV，雷电冲击电压 75kV |
| | 辅助和控制回路的绝缘试验 | 工频电压 2000 V，1 min |
| 2 | **主回路电阻测量** | ≤150 μΩ |
| 3 | **温升试验** | |
| | 主回路 | 1.1×1250 A |
| | 断路器的辅助和控制回路 | 符合技术要求 |
| 4 | **防护等级检验** | 外壳 IP4X，断路器室门打开/隔板 IP2X |
| 5 | **机械操作和机械特性测量试验** | |
| | 开关装置和可移开部件的机械操作试验 | 断路器 50 次；可移开部件，施加正常操作力，推入、抽出操作各 1000 次；接地开关 3000 次 |
| | 联锁装置的机械操作试验 | 联锁可靠 |
| | 机械特性测量试验 | 符合技术要求 |
| 6 | **关合和开断试验** | |
| | 试验方式 T100s | 12kV，开断电流 31.5 kA，关合电流 80 kA |
| | 试验方式 T100a | 12kV，开断电流 31.5 kA，直流分量 51% |
| 7 | **短时耐受电流和峰值耐受电流试验** | |
| | 主回路及接地开关 | 80 kA（峰值），31.5 kA（有效值），4 s |
| | 接地连接和接地导体 | 69.3 kA（峰值），27.4 kA（有效值），2 s |

检验地点：序号 1,6 的项目在沈阳市沈北新区虎石台南大街 16 号进行；其余检验项目在沈阳市铁西区景星北街 38 号进行。

| Test Report | 制造单位赋予试品的额定值<br>Ratings assigned by manufacturer | No. |
|---|---|---|

| 额定值 Ratings assigned by manufacturer | | |
|---|---|---|
| 额定电压 Voltage | 12 kV | ✓ |
| 额定电流 Normal current | 1250 A | ✓ |
| 额定频率 Frequency | 50 Hz | ✓ |
| 额定短时工频耐受电压 干试<br>Short-duration power-frequency withstand voltage(dry test) | 相间,对地, Between phases, to earth: 42kV;<br>隔离断口, Across the interrupter: 48 kV | ✓ |
| 额定雷电冲击耐受电压<br>lightning impulse withstand voltage | 相间,对地, Between phases, to earth: 75kV;<br>隔离断口, Across the interrupter: 85 kV | ✓ |
| 额定短时耐受电流 Short-time withstand current | 31.5 kA | ✓ |
| 额定短路持续时间 Duration of short-circuit | 4 s | ✓ |
| 额定峰值耐受电流 Peak withstand current | 80 kA | ✓ |
| 额定短路关合电流 Short-circuit making current | 80 kA | / |
| 额定短路开断电流 Short-circuit breaking current | | |
| 额定短路开断电流的交流分量 AC component | 31.5 kA | / |
| 额定短路开断电流的直流分量 DC component | 51% | / |
| 额定短路开断电流的直流时间常数 DC time constant | 45 ms | / |
| 额定操作顺序 Operating sequence | O-0.3s-CO-180s-CO | / |
| 防护等级 the degree of protection | 外壳 Enclosure: IP4X | ✓ |
| 操动机构电源电压 Supply voltage of operating device | DC 220 V | / |
| 合闸时间 Closing time; 分闸时间 Opening time | 35 ~ 70 ms; 20 ~ 50 ms | / |

注: "✓" 表示该额定值在本试验报告中已得到验证
Note: ✓=This rating has been proved by the tests of this test report

| Test Report | 试品确认<br>Identification of the tested apparatus | №. |
|---|---|---|

试品描述　　安装有固封式真空断路器、接地开关、电流互感器的金属铠装移开式开关设备，三极。

出厂编号

出厂日期

制造单位保证试品是按照下面提供的图纸及技术文件生产的：

图纸编号：KW.00ZT

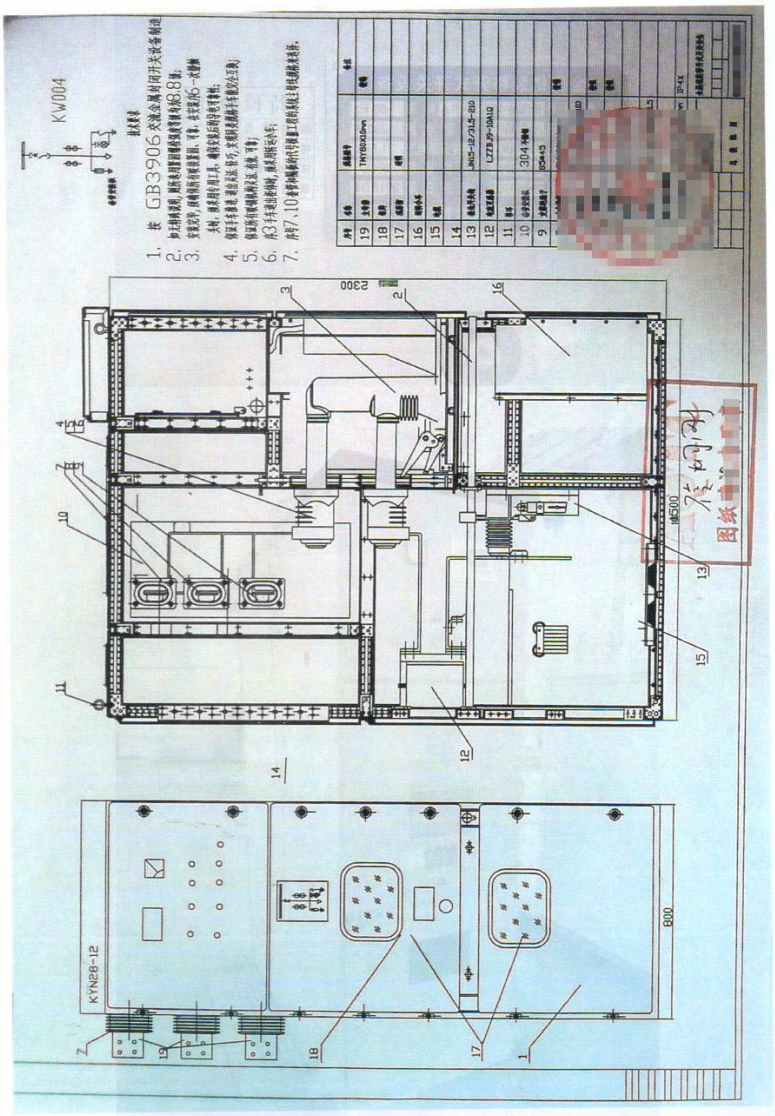
技术文件编号：TH-004SJ　　KW-004JT

AQTC 已经核实这些图纸及技术文件，认为它们与试品是相符的。

| Test Report | 试品确认<br>Identification of the tested apparatus | №. |
|---|---|---|
| 断路器：固封式真空断路器 | | |
| 型　　号 | VS1-12/1250-31.5 | |
| 制造单位 | | |
| 出厂编号 | | |
| 出厂日期 | | |
| 操动机构：弹簧储能电动操动机构 | | |
| 型　　号 | 与断路器一体 | |
| 灭弧室：真空灭弧室 | | |
| 型　　号 | TD34-12/1250-31.5A | |
| 制造单位 | | |
| 出厂编号 | A:　　B:　　C: | |
| 出厂日期 | | |
| 外壳材料 | 陶瓷 | |
| 固封极柱 | | |
| 型　　号 | EP34-12/1250-31.5A/RA | |
| 制造单位 | | |
| 出厂编号 | A:　　B:　　C: | |
| 出厂日期 | | |
| 外壳材料 | 环氧树脂 | |
| 电流互感器 | | |
| 型　　号 | LZZBJ9-10A1Q　　变比：1250/5 | |
| 制造单位 | | |
| 出厂编号 | A:　　B:　　C: | |
| 出厂日期 | | |
| 接地开关 | | |
| 型　　号 | JN15-12/31.5（210） | |
| 制造单位 | | |
| 出厂编号 | | |
| 出厂日期 | | |
| 操动机构 | 人力操动机构 | |

| Test Report | 试品确认<br>Identification of the tested apparatus | №. |
|---|---|---|
| 支柱绝缘子 | | |
| 型　　号 | ZG(Z1)-10Q | |
| 制造单位 | | |
| 出厂编号 | | |
| 出厂日期 | | |
| 爬电距离 | 240 mm | |
| 高　　度 | 140 mm | |
| 材　　料 | 环氧树脂 | |
| 触头盒 | | |
| 型　　号 | CHJ/150 | |
| 制造单位 | | |
| 爬电距离 | 240 mm | |
| 高　　度 | 250 mm | |
| 额定弯曲负荷 $P_0$ | 16 kN | |
| 材　　料 | 环氧树脂 | |
| 套管（不带导体） | | |
| 型　　号 | TG3-10Q/110 × 180 | |
| 制造单位 | | |
| 出厂编号 | | |
| 出厂日期 | | |
| 材　　料 | 环氧树脂 | |
| 额定电压 | 12 kV | |
| 绝缘拉杆 | | |
| 型　　号 | 专用 | |
| 制造单位 | | |
| 材　　料 | 环氧树脂 | |
| 导体 | | |
| 主母线 | 材料和规格：TMY，80 mm×10 mm×1 | |
| 分支母线 | 材料和规格：TMY，80 mm×10 mm×1 | |
| 接地导体 | 材料和规格：TMY，40 mm×4mm×1 | |
| 外壳 | | |
| 材　　料 | 镀锌板 | |
| 厚　　度 | 2 mm | |
| 柜体尺寸：800 mm×1500 mm×2300 mm | | |
| | | |

| Test Report | 试 品 确 认<br>Identification of the tested apparatus | No. |
|---|---|---|




试品总装配图
Drawings

| Test Report | 试品确认<br>Identification of the tested apparatus | No.: |
|---|---|---|


试品照片
Photographs

| Test Report | 测量不确定度<br>Measurement Uncertainty | №: |
|---|---|---|

温升试验温度测量不确定度 Measurement uncertainty for Temperature-rise tests: 0.8K（-10℃～120℃）

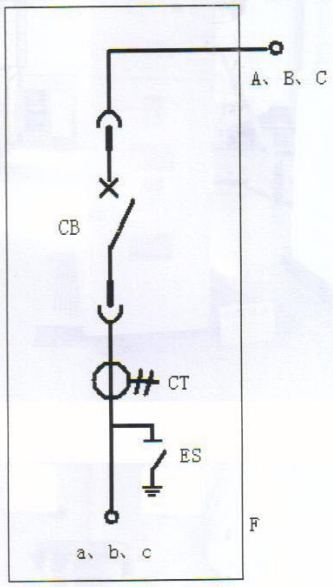
绝缘试验 Dielectrics:

| 序号<br>№. | 测量系统 measuring system | 扩展不确定度 expanded uncertainty |
|---|---|---|
| 1 | 温度 Temperature<br>WSB-A6 毛发温湿度表<br>WSB-A6 hair hygrometer | U=0.6℃ （k=2） |
| 2 | 相对湿度 Relative humidity<br>WSB-A6 毛发温湿度表<br>WSB-A6 hair hygrometer | U=2.6% RH （k=2） |
| 3 | 局部放电测量系统<br>PD561 measuring system | <20pC：U=1.5pC（k=2）<br>20pC～50pC：U=2.0pC（k=2）<br>>50pC：U=14%（k=2） |
| 4 | 无线电干扰电压试验测量系统<br>ZN3950 RIV measuring receiving set | U=±0.6dB |
| 5 | 电压测量系统 Voltage measuring system | U=0.42% |
| 6 | 冲击电压波形时间测量系统<br>Time measuring system for impulse voltage waveform | U=1.5% |

| Test Report | 示波图中的符号说明 Legend | №. |
|---|---|---|

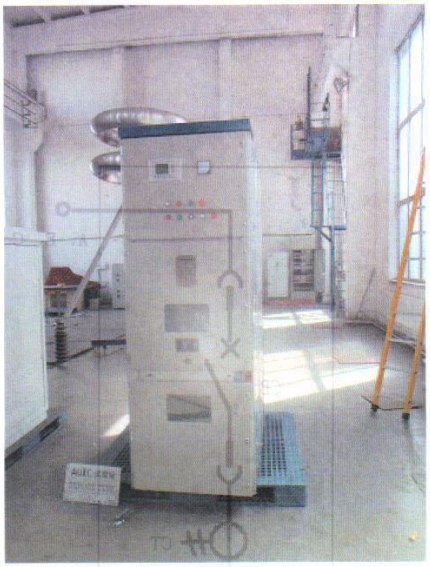
| | |
|---|---|
| CS | 触头信号 Timing signal contact separation |
| CSa | 触头信号 Timing signal contact separation |
| CSb | 触头信号 Timing signal contact separation |
| CSc | 触头信号 Timing signal contact separation |
| Isyn | 高频引入电流 Current synthetic circuit |
| ITO | 流过试品的电流 Current through test object |
| ITOa | 流过试品的电流 Current through test object |
| ITOb | 流过试品的电流 Current through test object |
| ITOc | 流过试品的电流 Current through test object |
| ITOcl | 试品合闸线圈电流 Current closing coil test object |
| ITOop | 试品分闸线圈电流 Current opening coil test object |
| Ics | 合成试验电流源电流 Current current source |
| TR | 行程曲线 Travel recorder |
| UL | 负载电压 Load voltage |
| ULa | 负载电压 Load voltage |
| ULb | 负载电压 Load voltage |
| ULc | 负载电压 Load voltage |
| US | 电源电压 Supply voltage |
| USa | 电源电压 Supply voltage |
| USb | 电源电压 Supply voltage |
| USc | 电源电压 Supply voltage |
| UTO | 试验电压 Test voltage |
| UTOa | 试验电压 Test voltage |
| UTOb | 试验电压 Test voltage |
| UTOc | 试验电压 Supply voltage |
| Ucs | 电流源电压 Voltage current source |

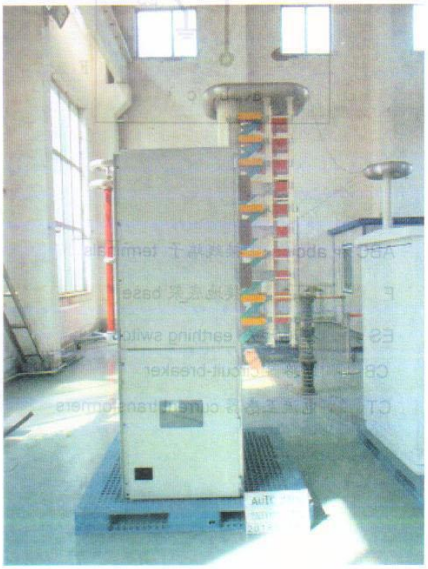
| Test Report | 试品主回路电气原理图<br>Electrical diagram of the main circuit of the test specimen | №. |
|---|---|---|




| | |
|---|---|
| ABC 和 abc | 接线端子 terminals |
| F | 接地底架 base |
| ES | 接地开关 earthing switch |
| CB | 断路器 circuit-breaker |
| CT | 电流互感器 current transformers |

| Test Report | 绝缘试验<br>Dielectrics tests | №. |
|---|---|---|



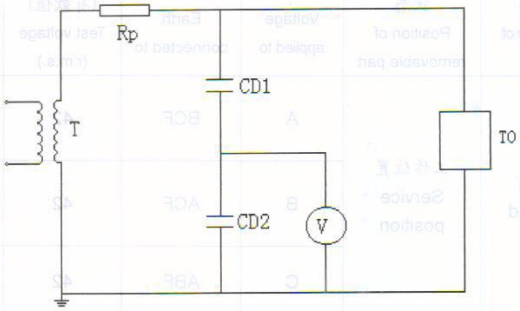


试验前试品照片

Photograph before the tests

| Test Report | 工频电压试验（干试）<br>Power frequency voltage dry tests | №. |
|---|---|---|

试验回路 tests circuit: H-PV03




V－PV2-1 峰值电压表 peak value voltmeter
T－工频试验变压器 power frequency test transformer
Rp－保护电阻 protective resistor
TO－试品 tested object
CD1、CD2－工频分压器 power frequency voltage divider

1.试验前试品状况：新的试品，接地开关始终保持在分闸位置

Condition of the tested apparatus: New apparatus. The earthing switch is kept in the opening positon

2.试区大气条件 Ambient air conditions: $b$=100.8 kPa $t$=20.0 ℃ $h$=12.5 g/m$^3$ ;

3.大气修正因数 Atmospheric correction factor: $k_t$=1.0

4.试验电压是按内绝缘确定的（未按标准大气条件修正），表中电压以标称电压值表示

Applied voltage in the tables has been proofread accordance to internal insulation of the apparatus. Applied voltage in the tables has been proofread accordance to standard atmospheric conditions. Applied voltage in the tables is the normal voltage.

5.表中的符号：A、B、C 和 a、b、c 分别为上、下接线端子，F 为底架，见主回路电气图

Symbols in the table: A、B、C–upper terminals; a、b、c–lower terminals; F–earthed base

| Test Report | 工频电压试验（干试）<br>Power frequency voltage dry test | №. |
|---|---|---|

6.试验测量数据 Test measurement data　　试验日期 test date(s):　　单位 unit:　kV

| 考核部位 Tested part(s) | 断路器状态 Position of CB | 可移开部件状态 Position of removable part | 加压部位 Voltage applied to | 接地部位 Earth connected to | 试验电压（有效值）Test voltage (r.m.s.) | 加压次数 Number of applied voltage | 放电次数 Number of discharge |
|---|---|---|---|---|---|---|---|
| 相间，相对地及观察窗 Between Phases, Phase to earth And window | 合闸 closed | 工作位置 Service position | A | BCF | 42 | 1 | 0 |
| | | | B | ACF | 42 | 1 | 0 |
| | | | C | ABF | 42 | 1 | 0 |
| 相间，相对地 Between Phases, Phase to earth | 分闸 open | 工作位置 Service position | A | BCabcF | 42 | 1 | 0 |
| | | | B | ACabcF | 42 | 1 | 0 |
| | | | C | ABabcF | 42 | 1 | 0 |
| | | | a | ABCbcF | 42 | 1 | 0 |
| | | | b | ABCacF | 42 | 1 | 0 |
| | | | c | ABCabF | 42 | 1 | 0 |
| 相间，相对地及金属活门 Between Phases, Phase to earth and metal shutte | 合闸 closed | 隔离位置 Disconnected position | A | BCabcF | 42 | 1 | 0 |
| | | | B | ACabcF | 42 | 1 | 0 |
| | | | C | ABabcF | 42 | 1 | 0 |
| | | | a | ABCbcF | 42 | 1 | 0 |
| | | | b | ABCacF | 42 | 1 | 0 |
| | | | c | ABCabF | 42 | 1 | 0 |

7.接地开关的绝缘性能已同时考核
The earthing switch insulation capability have been also tested
8.观察窗试验时，观察窗可触及表面贴附 100　$cm^2$ 面积的金属箔
The metal foil having an area of 100 $cm^2$ covered on the accessible surface of the inspection window

| Test Report | 工频电压试验（干试）<br>Power frequency voltage dry test | №. |
|---|---|---|

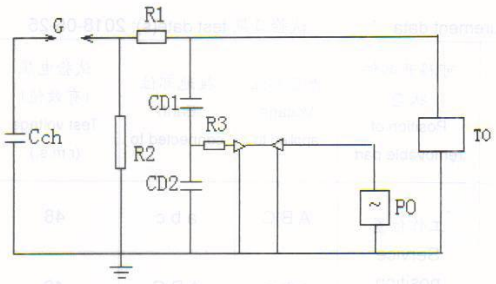
续前
试验测量数据 Test measurement data　　试验日期 test date(s):　　单位 unit:　kV

| 考核部位<br>Tested part(s) | 断路器状态<br>Position of the CB | 可移开部件状态<br>Position of removable part | 加压部位<br>Voltage applied to | 接地部位<br>Earth connected to | 试验电压（有效值）<br>Test voltage (r.m.s.) | 加压次数<br>Number of applied voltage | 放电次数<br>Number of discharge |
|---|---|---|---|---|---|---|---|
| 断路器断口<br>Across intrerupter | 分闸<br>open | 工作位置<br>Service position | A B C | a b c | 48 | 1 | 0 |
| | | | a b c | A B C | 48 | 1 | 0 |
| 隔离断口<br>Across the Isolating distance | 合闸<br>closed | 隔离位置<br>Disconnected position | A B C | a b c | 48 | 1 | 0 |
| | | | a b c | A B C | 48 | 1 | 0 |

9.检验结论：合格
Test results: passed

| Test Report | 雷电冲击电压试验<br>Lightning impulse voltage tests | №. |
|---|---|---|

试验回路 tests circuit: H-IV03




R1、R2、Cch、G－冲击电压发生器 impulse voltage generator

PO－BF-3012C 冲击测量系统 impulse measuring system

R3－阻尼电阻 damping resistor

CD1、CD2－冲击分压器 impulse voltage divider

1.试验前试品状况: 1min 工频电压试验后， 未修整，接地开关始终保持在分闸位置

Condition of the tested apparatus: not maintained after power-frequency voltage tests for 1 min. The earthing switch is kept in the opening positon

2.试区大气条件 Ambient air conditions: $b$=100.8 kPa $t$=20.0 ℃ $h$=12.5 g/m$^3$

3.大气修正因数 Atmospheric correction factor: $k_t$=1.0

4.试验电压是按内绝缘确定的（未按标准大气条件修正），表中电压以标称电压值表示

Applied voltage in the tables has been proofread accordance to internal insulation of the apparatus. Applied voltage in the tables has been proofread accordance to standard atmospheric conditions. Applied voltage in the tables is the normal voltage

5.表中的符号: A、B、C 和 a、b、c 分别为上、下接线端子，F 为底架，见主回路电气图

Symbols in the table: A、B、C–upper terminals; a、b、c–lower terminals; F–earthed base

6.示波图编号·

Oscillograms: -LI-01 ~ -LI-570

| Test Report | 雷电冲击电压试验<br>Lightning impulse voltage tests | №. |
|---|---|---|

7.试验测量数据 Test measurement data　　试验日期 test date(s):　　单位 unit: kV

| 考核部位 Tested part(s) | 断路器/可移开部件状态 Position of CB/ removable part | 加压部位 Voltage applied to | 接地部位 Earth connected to | 极性 Polarity | 试验电压(峰值) Test voltage (peak) | 加压次数 Number of applied voltage | 放电次数 Number of discharge | 典型示波图 Typical oscillogram 185432-LI- |
|---|---|---|---|---|---|---|---|---|
| 相间，相对地及观察窗 Between Phases, Phase to earth And window | 合闸/工作位置 closed/Service position | A | BCF | + | 75 | 15 | 0 | 01-30 |
| | | | | – | 75 | 15 | 0 | |
| | | B | ACF | + | 75 | 15 | 0 | 31-60 |
| | | | | – | 75 | 15 | 0 | |
| | | C | ABF | + | 75 | 15 | 0 | 61-90 |
| | | | | – | 75 | 15 | 0 | |
| 相间 相对地 Between Phases, Phase to earth | 分闸/工作位置 open/Service position | A | BC abcF | + | 75 | 15 | 0 | 91-120 |
| | | | | – | 75 | 15 | 0 | |
| | | B | AC abcF | + | 75 | 15 | 0 | 121-150 |
| | | | | – | 75 | 15 | 0 | |
| | | C | AB abcF | + | 75 | 15 | 0 | 151-180 |
| | | | | – | 75 | 15 | 0 | |
| | | a | ABC bcF | + | 75 | 15 | 0 | 181-210 |
| | | | | – | 75 | 15 | 0 | |
| | | b | ABC acF | + | 75 | 15 | 0 | 211-240 |
| | | | | – | 75 | 15 | 0 | |
| | | c | ABC abF | + | 75 | 15 | 0 | 241-270 |
| | | | | – | 75 | 15 | 0 | |
| 相间，相对地及金属活门 Between Phases, Phase to earth and metal shutte | 合闸/隔离位置 closed/ disconnected position | A | BC abcF | + | 75 | 15 | 0 | 271-300 |
| | | | | – | 75 | 15 | 0 | |
| | | B | AC abcF | + | 75 | 15 | 0 | 310-330 |
| | | | | – | 75 | 15 | 0 | |
| | | C | AB abcF | + | 75 | 15 | 0 | 331-360 |
| | | | | – | 75 | 15 | 0 | |
| | | a | ABC bcF | + | 75 | 15 | 0 | 361-390 |
| | | | | – | 75 | 15 | 0 | |
| | | b | ABC acF | + | 75 | 15 | 0 | 391-420 |
| | | | | – | 75 | 15 | 0 | |
| | | c | ABC abF | + | 75 | 15 | 0 | 421-450 |
| | | | | – | 75 | 15 | 0 | |

| Test Report | 雷电冲击电压试验<br>Lightning impulse voltage tests | №. |
|---|---|---|

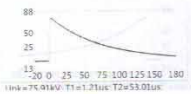
续前

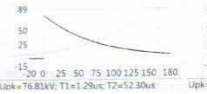
试验测量数据 Test measurement data　　试验日期 test date(s): --　　单位 unit: kV

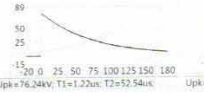
| 考核部位 Tested part(s) | 断路器/可移开部件状态 Position of CB/ removable part | 加压部位 Voltage applied to | 接地部位 Earth connected to | 极性 Polarity | 试验电压(峰值) Test voltage (peak) | 加压次数 Number of applied voltage | 放电次数 Number of discharge | 典型示波图 Typical oscillogram -LI- |
|---|---|---|---|---|---|---|---|---|
| 断路器断口 Across intrerupter | 分闸/工作位置 open/Service position | A B C | a b c | + | 85 | 15 | 0 | 451-480 |
| | | | | - | 85 | 15 | 0 | |
| | | a b c | A B C | + | 85 | 15 | 0 | 481-510 |
| | | | | - | 85 | 15 | 0 | |
| 隔离断口 Across the Isolating distance | 合闸/隔离位置 cclosed/ disconnected position | A B C | a b c | + | 85 | 15 | 0 | 511-540 |
| | | | | - | 85 | 15 | 0 | |
| | | a b c | A B C | + | 85 | 15 | 0 | 541-570 |
| | | | | - | 85 | 15 | 0 | |

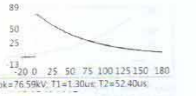
8.接地开关的绝缘性能已同时考核
The earthing switch insulation capability have been also tested
9.观察窗试验时，观察窗可触及表面贴附 100 $cm^2$ 面积的金属箔
The metal foil having an area of 100 $cm^2$ covered on the accessible surface of the inspection window
10.检验结论：合格
Test results: passed

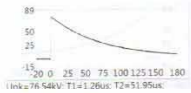
| Test Report | 雷电冲击电压试验<br>Lightning impulse voltage tests | №. |
|---|---|---|

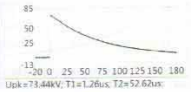


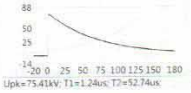



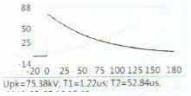



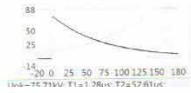



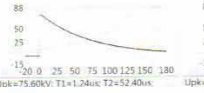



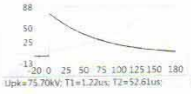



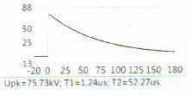



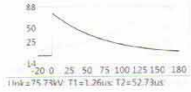



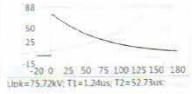



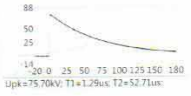



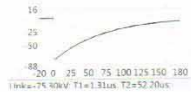



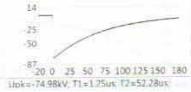



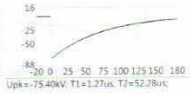



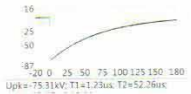



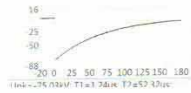



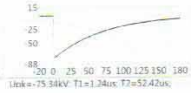



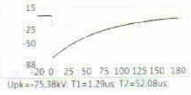



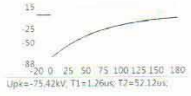



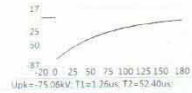



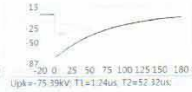



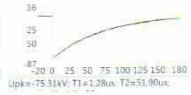



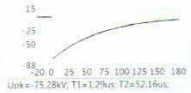



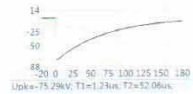



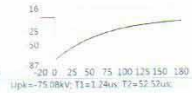



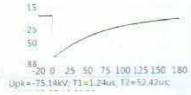



| Test Report | 辅助回路和控制回路的绝缘试验<br>Dielectric tests on auxiliary circuit and control circuits | №. |
|---|---|---|

开关设备的辅助回路和控制回路绝缘试验

**Dielectric tests on auxiliary circuit and control circuits of the switchgear**

检验日期 Test date(s): ：

| 序号<br>№. | 施加电压部位 Test parts | 试验电压<br>有效值<br>Test voltage<br>(r.m.s)<br>V | 电压持续时间<br>Duration<br>min | 试验情况<br>Test result | 试验结果<br>Test results |
|---|---|---|---|---|---|
| 1 | 辅助回路和控制回路导电部分与接地部分之间<br>Between the auxiliary and control circuits connected together as a whole and the frame of the switching device | 2000 | 1 | 未发生闪络<br>No breakdown and flashover | 合格<br>Passed |
| 2 | 不同回路各导电部分之间、同一导电回路各分断点之间<br>Between each part of the auxiliary and control circuits, which in normal use may be insulated from the other parts, and the other parts connected together and to the frame | 2000 | 1 | 未发生闪络<br>No breakdown and flashover | 合格<br>Passed |

AQTC



| Test Report | 回路电阻测量<br>Measurement of resistance of main circuit | №. |
|---|---|---|

**1.机械操作试验前主回路电阻测量 Before mechanical operation tests**

检验日期 Test date:　　单位 unit: μΩ

| 测量部位<br>Measured parts | 温升试验前（周围空气温度）<br>Before temperature-rise tests (Ambient air temperature) 25.1℃ | | | 温升试验后（周围空气温度）<br>After temperature-rise tests (Ambient air temperature) 25.3℃ | | | 规定值<br>Technical requirements | 检验结果<br>Test results |
|---|---|---|---|---|---|---|---|---|
| | A 极 | B 极 | C 极 | A 极 | B 极 | C 极 | | |
| 主回路<br>Main circuit | 112.0 | 103.0 | 123.3 | 112.7 | 103.7 | 124.3 | ≤150 | 合格<br>passed |
| 断路器<br>Circuit-breaker | 30.7 | 31.0 | 31.0 | 31.0 | 31.3 | 31.3 | ≤45 | 合格<br>passed |

采用直流电压降法，试验电流 100A。温升试验前后电阻值变化未超过温升试验前的 20 %。

The measurement is made by means of D.C. voltage drop. Test current is 100A. The resistance after temperature-rise test did not vary by more than 20 % from the value measured before the test.

**2.机械操作试验后主回路电阻测量 After mechanical operation tests**

检验日期 Test date:　　单位 unit: μΩ

| 测量部位<br>Measured parts | 测量值（周围空气温度）<br>Measurement value (Ambient air temperature) 25.0℃ | | | 规定值<br>Technical requirements | 检验结果<br>Test results |
|---|---|---|---|---|---|
| | A 极 | B 极 | C 极 | | |
| 主回路<br>Main circuit | 113.7 | 104.3 | 125.0 | ≤150 | 合格<br>passed |
| 断路器<br>Circuit-breaker | 31.3 | 31.7 | 32.0 | ≤45 | 合格<br>passed |

采用直流电压降法，试验电流 100A。

The measurement is made by means of D.C. voltage drop. Test current is 100A.

| Test Report | 温升试验<br>Temperature-rise tests | №. |
|---|---|---|

温升试验前试品照片
Photograph before temperature-rise tests

| Test Report | 温升试验<br>Temperature-rise tests | №. |
|---|---|---|

**1.机械操作试验前主回路温升试验**

**Temperature-rise tests of main circuit before mechanical endurance tests**

1.1 试验条件 Test condition

| | | | | |
|---|---|---|---|---|
| 试验电流<br>Test current A | A | 1380 | 周围风速<br>Ambient air velocity m/s | ≯0.5 |
| | B | 1379 | | |
| | C | 1381 | | |
| 电流频率<br>Supply frequency Hz | | 50 | 试验极数<br>Number of tested poles | 3 |
| 临时连接线<br>Connected bus bar | | 材料：铜排，长度：2 m，规格：10mm×80mm，数量：1 根/板<br>Material:Copper, Length: 2m, Specification:10mm×80mm, Cable:1pice /per pole | | |
| 模拟并柜材料<br>Material for cabinet combination | | 50mm 聚乙烯泡沫塑料<br>50mm Expanded Polyethylene | | |

1.2 测量结果 Measured results

检验日期 Test date: 环境温度 Ambient air temperature：26.9℃ 单位 unit: K

| 测量部位编号<br>No. | 温升测量值<br>Measuring Value | | | 温升限值<br>Permitted-values | 部件或位置<br>Parts or position | 镀层<br>Coating |
|---|---|---|---|---|---|---|
| | A 极 | B 极 | C 极 | | | |
| 1 | 52.9 | 53.6 | 53.3 | 75 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 2 | 56.3 | 57.2 | 56.9 | 65 | 触头 Contacts | 镀银 Silver-coated |
| 3 | 55.8 | 56.5 | 56.1 | 65 | 触头 Contacts | 镀银 Silver-coated |
| 4 | 54.0 | 54.8 | 54.5 | 75 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 5 | 56.4 | 57.5 | 56.9 | 65 | 触头 Contacts | 镀银 Silver-coated |
| 6 | 55.9 | 56.9 | 56.7 | 65 | 触头 Contacts | 镀银 Silver-coated |
| 7 | 54.2 | 55.3 | 54.6 | 75 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 8 | 50.9 | / | 51.3 | 75 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 9 | 48.5 | / | 48.8 | 75 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 10 | 45.6 | 46.1 | 45.8 | 65 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 前门<br>Front door | 2.7 | | | 30 | 可触及外壳<br>Accessible enclosure | / |
| 侧板<br>Side board | 11.4 | | | 40 | 不可触及外壳<br>No Accessible enclosure | / |
| 上接线端<br>upper terminal | 48.9 | 49.4 | 49.1 | 65 | 螺栓联结 Screwed connection | 镀银 Silver-coated |
| 距上接线端一米处<br>1m to the upper terminal | 44.5 | 46.0 | 44.8 | / | / | / |

检验结果 Test result：合格 Passed

| Test Report | 温升试验<br>Temperature-rise tests | №. |
|---|---|---|

**2.断路器的辅助和控制回路的温升试验**

**Temperature-rise tests of auxiliary circuit and control circuit of the circuit breaker**

2.1 试验方法 Test method:

采用电阻法在如下情况及相应状态的开始前和结束后，测量线圈电阻并计算其温升。对短时载流元件，且具有自动切换回路的装置，在额定操作电压下，用尽可能短的时间间隔连续分合闸操作 10 次。Temperature-rise is calculated by means of the difference of coils resistance measured before and after the tests under the following conditions:

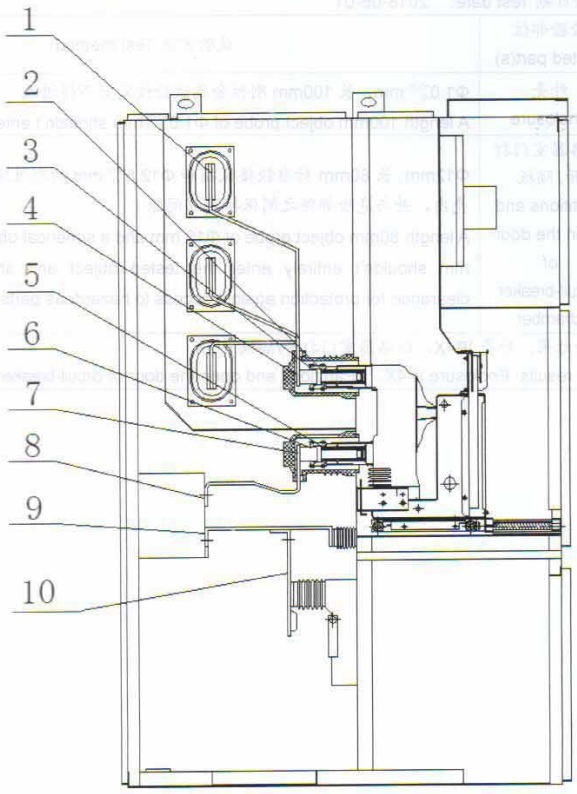
The circuit-breaker is continuously closed and opened for 10 times as soon as possible under rated operating voltage.

2.2 试验测量结果 Measured results　　检验日期 Test date:

| 线圈<br>Coil | 线圈电阻<br>coil resistance<br>Ω | | 周围空气温度<br>Ambient air temperature<br>℃ | | 计算温升值<br>Calculated Temperature -rise<br>K | 允许温升值<br>Permitted Temperature -rise<br>K | 检验结果<br>test results |
|---|---|---|---|---|---|---|---|
| | 冷态时<br>Before energizing | 热态时<br>After energizing | 冷态时<br>Before energizing | 热态时<br>After energizing | | | |
| 分闸<br>Opening | 223.4 | 224.3 | 25.7 | 25.7 | 1.0 | 65 | 合格<br>passed |
| 合闸<br>Closing | 221.5 | 222.4 | 25.7 | 25.7 | 1.1 | 65 | 合格<br>passed |

| Test Report | 温升试验<br>Temperature-rise tests | No. |
|---|---|---|

测量位置说明




| | |
|---|---|
| 1 | 连接母线 Bus |
| 2 | 隔离触头 Isolating contact |
| 3 | 隔离触头 Isolating contact |
| 4 | 静触头与母线 Fixed contacts and bus |
| 5 | 隔离触头 Isolating contact |
| 6 | 隔离触头 Isolating contact |
| 7 | 静触头与母线 Fixed contacts and bus |
| 8 | 连接母线与互感器 Bus and instrument transformer |
| 9 | 连接母线与互感器 Bus and instrument transformer |
| 10 | 下接线端 Lowe terminal |

温升试验测量位置示意图

Schematic diagram of the measured positions for temperature-rise

| Test Report | 防护等级检验<br>Verification of degree of protection | №. |
|---|---|---|

**防护等级检验（IP 代码的检验）Verification of degree of protection**

检验日期 Test date:

| 检验部位<br>Tested part(s) | 试验方法 Test method | IP 代码<br>IP code |
|---|---|---|
| 外壳<br>Enclosure | Φ1.0$^{+0.05}_{0}$mm、长 100mm 刚性金属试验线完全不得进入<br>A length 100mm object probe of Φ1.0$^{+0.05}_{0}$mm shouldn't enter the tested object. | IP4X |
| 断路器室门打开/隔板<br>Partitions and open the door of circuit-breaker chamber | Φ12mm、长 80mm 标准铰接试指和 Φ12.5$^{+0.2}_{0}$ mm 的刚性球形试具不得完全进入壳内，并与危险部件之间保持足够间隙<br>A length 80mm object probe of Φ12 mm and a spherical object probe of Φ12.5$^{+0.2}_{0}$ mm shouldn't entirely enter the tested object and should have adequate clearance for protection against access to hazardous parts. | IP2X |

检验结果：外壳 IP4X，断路器室门打开/隔板 IP2X

Test results: Enclosure IP4X， Partitions and open the door of circuit-breaker chamber IP2X

| Test Report | 机械操作试验<br>Mechanical operation tests | №. |
|---|---|---|

直线式传感器安装位置

Location of Liner sensor

| Test Report | 机械操作试验<br>Mechanical operation tests | №. |
|---|---|---|

**1.开关设备内开关装置的机械操作试验 Mechanical operation test**

检验日期 Test date(s):

| 元件<br>Components | 试验内容及技术要求<br>Test items and technical requirements | 试品状态<br>Test result |
|---|---|---|
| 断路器<br>Circuit-breaker | 在额定、最高、最低操作电压下，分别进行 10 次合、分操作，应动作正常；<br>10 close-open operating cycles are respectively performed at the maximum, the minimum and rated supply voltage, and the circuit-breaker should act correctly. | 正常<br>Passed |
| | 在额定操作电压下，进行 10 次 "分-0.3s-合分" 操作，应动作正常；<br>10 "O-0.3s-CO"operating cycles at the rated supply voltage are performed, and the circuit-breaker should act correctly. | 正常<br>Passed |
| | 断路器在合闸状态下，对储能电机分别施加 85% 和 110% 额定工作电压，各进行 3 次储能操作，操动机构应无异常<br>10 circuit-breaker is in closed position, the motor is applied respectively by 85% and 110% rated supply voltage, and the motor should be energized correctly, repeat these 3 times. | 正常<br>Passed |
| | 使断路器处于合闸位置，将操动机构合闸弹簧全部储能，进行 3 次空载合闸储能释放操作，动作正常<br>Full energy of the closing spring of operating device is stored when the circuit breaker is in closed position, and then no-load closing operations is performed for 3 times and the operating device operates normally. | 正常<br>Passed |
| | 断路器处于合闸位置，施加 30% 额定分闸操作电压，连续操作 3 次，不得分闸<br>The circuit-breaker is in closed position, it shouldn't be opened at 30％rated operating voltage, repeated these 3 times. | 正常<br>Passed |
| | 断路器处于分闸位置，施加 30% 额定合闸操作电压，连续操作 3 次，不得合闸<br>The circuit-breaker is in open position, it shouldn't be closed at 30％rated operating voltage, repeat these 3 times. | 正常<br>Passed |
| 可移开部件<br>The removable part | 可移开部件从工作位置抽出至移开位置再从移开位置推入到工作位置，施加正常操作力，推入、抽出操作各 1000 次，应动作正常，隔离插头镀层应良好。<br>The removable part is withdrawn from the service position and put it into removed position, and then is pushed into service position under normal operating force. Repeat these for 1000 times, and the tested object should operate correctly, and a layer of coating material should remain at the isolating plugs area after test. | 正常<br>Passed |
| 接地开关<br>Earthing switch | 安装在开关柜内的接地开关配人力操动机构进行合、分闸操作各 3000 次（共 3 个循环，每个循环连续操作 1000 次），应动作正常，试验前后分别进行 5 次合、分操作验证，机械特性应符合技术要求<br>The closing and opening operations are performed respectively for 3000 times (1000×3) by manual operating device for the earthing switch, and the earthing switch should act correctly. The verification of 5 closing and opening operations are performed before and after the test. | 正常<br>Passed |

| Test Report | 机械操作试验<br>Mechanical operation tests | №. |
|---|---|---|

**2.联锁装置的机械操作试验 Mechanical operation tests of interlocking devices**

检验日期 Test date(s):

| 序号<br>№ | 试验内容及技术要求<br>Test items and technical requirements | 检查结果<br>Test result |
|---|---|---|
| 1 | 可移开部件只有在工作位置、隔离位置、移开位置、试验位置时，断路器才能进行分、合闸操作，试操作 50 次，联锁应可靠。<br>Only when the circuit-breaker is in the service, disconnected, test or removed position, it could be opened and closed. The operations were performed for 50 times, and the interlocking devices should be reliable. | 联锁可靠<br>Passed |
| 2 | 断路器只有在分闸位置时，才能用操作手柄抽出或插入可移开部件，试操作 25 次，联锁应可靠。<br>Only when the circuit-breaker is in opening position, it could be inserted and withdrew by the operation-handle. The operations are performed for 25 times, and the interlocking devices should be reliable. | 联锁可靠<br>Passed |
| 3 | 处于合闸位置的接地开关只有相应隔室的门关闭后才能分闸，可移开部件才能插入，试操作 25 次，联锁应可靠。<br>Only after the relevant door of compartment is closed, the earthing switch in closed position could be opened, the removable part could be inserted. The operations of 25 times are performed, and the interlocking devices should be reliable. | 联锁可靠<br>Passed |
| 4 | 可移开部件只有处于试验位置时，接地开关才能合闸，相应隔室的门才能打开，试操作 25 次，联锁应可靠。<br>Only when the removable part is within test position, the earthing switch could be closed，and the relevant door of compartment be opened. The operations are performed for 25 times, and the interlocking devices should be reliable. | 联锁可靠<br>Passed |
| 5 | 断路器只有在与自动分闸相关的辅助回路均已接通时才能在工作位置合闸，试操作 25 次，联锁应可靠。<br>Only when the auxiliary circuit related to the auto-opening was switched on, the circuit-breaker could be closed in the service position. The operations are performed for 25 times, and the interlocking devices should be reliable. | 联锁可靠<br>Passed |
| 6 | 断路器在工作位置时辅助回路不能断开，相应隔室的门不能打开，试操作 25 次，联锁应可靠。<br>The auxiliary circuit should not be cut off when the circuit-breaker was in the service position, and the relevant door of compartment should not be opened. The operations are performed for 25 times, and the interlocking devices should be reliable. | 联锁可靠<br>Passed |

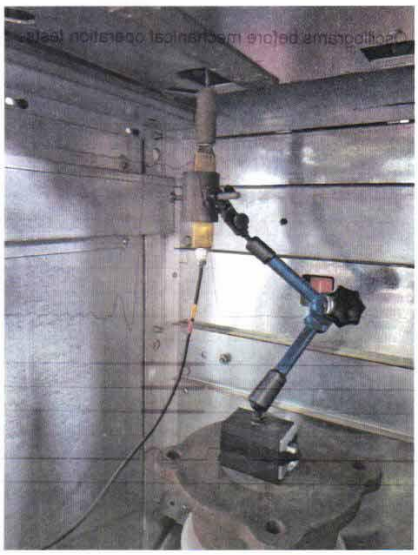
| Test Report | 机械操作试验<br>Mechanical operation tests | №. |
|---|---|---|

**3.开关设备内接地开关机械特性测量 Mechanical characteristics of the ear thing switch**

检验日期 Test date(s):

| 元件<br>Compartment | 检验项目<br>Test items | | 操作试验前<br>Before mechanical operation test | | | 操作试验后<br>After mechanical operation test | | | 规定值<br>Technical requirements | 单位<br>Units |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | B | C | A | B | C | | |
| 接地开关<br>Earthing switch | 断口开距<br>Isolating distance across open contacts | | 131 | 132 | 132 | 130 | 131 | 131 | ≥125 | mm |
| | 人力操作力矩<br>Manual operating moment | 合闸<br>Closing | 83 | | | 85 | | | ≤200 | N·m |
| | | 分闸<br>Opening | 71 | | | 73 | | | | |

| Test Report | 关合和开断试验<br>Making and breaking tests | №. |
|---|---|---|

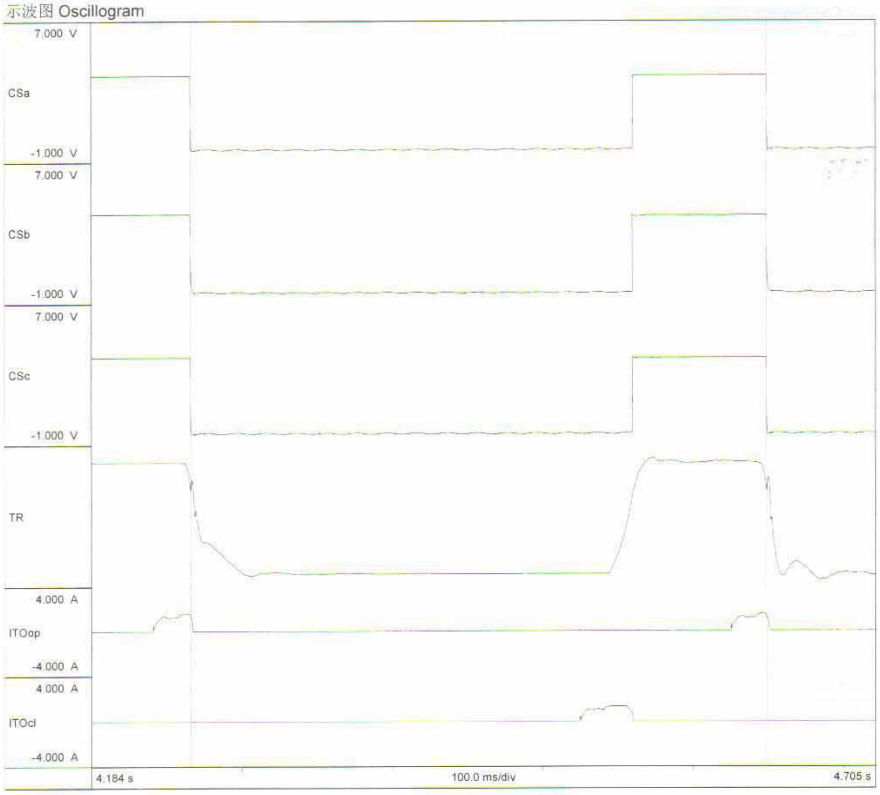


直线式传感器安装位置
Location of the liner sensor


关合和开断试验前试品照片
Photographs before making and breaking tests

| Test Report | 关合和开断试验前的空载操作<br>No-load operating before making and breaking tests | No. |
|---|---|---|

示波图 Oscillogram




| 操作顺序 Operation : | | O | | | -0.3s-CO | | |
|---|---|---|---|---|---|---|---|
| 相序 Phase | / | A | B | C | A | B | C |
| 合闸线圈电流 Current closing coil | A | | | | 1.35 | | |
| 合闸时间 Closing time | ms | | | | 34.9 | 34.7 | 34.8 |
| 分闸线圈电流 Current opening coil | A | 1.65 | | | 1.59 | | |
| 分闸时间 Opening time | ms | 24.9 | 25.0 | 25.0 | 23.6 | 23.7 | 23.6 |

试验日期 Test date(s):: 周围空气温度 Ambient air temperature:26 ℃ 试验极 Tested pole(s): A,B,C

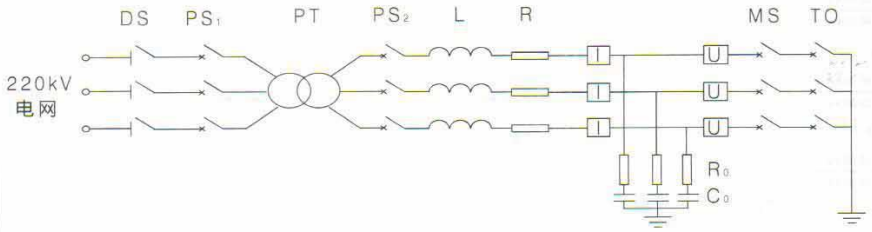
合闸操作电源电压 Supply voltage for closing: 242Vd.c.

分闸操作电源电压 Supply voltage for opening: 242Vd.c.

备注： Remark(s):

| Test Report | 基本短路试验方式 T100s<br>Test-duty T100s | №. |
|---|---|---|

试验线路原理图 Test circuit: NT12-31.5 T100s




| | | | |
|---|---|---|---|
| 电网 | power system | DS | 隔离开关 Disconnector |
| PS | 保护开关 Protective CB | MS | 合闸开关 making switch |
| L | 限流电抗器 Current-limited reactor | PT | 短路试验变压器 Test transformer |
| U | 电压测量元件 Voltage measurement | $R_0$ | TRV 调节电阻 Resistor controlled TRV |
| I | 电流测量元件 Current measurement | $C_0$ | TRV 调节电容 Capacitor controlled TRV |
| TO | 试品 Tested object | R | 功率因数电阻 Resistor adjusted power factor |

| 电源回路 supply circuit | | 负载回路 load circuit | |
|---|---|---|---|
| 电压 voltage kV | 12 | $L_1$ mH | |
| 频率 frequency Hz | 50 | $R_1$ Ω | |
| 功率因数 power factor | <0.15 | $C_1$ μF | |
| 电流 current kA | 31.5 | $R_2$ Ω | |
| L mH | 0.7 | $C_2$ μF | |
| R mΩ | 4 | 功率因数 power factor | |
| $R_0$ Ω | 18 | 中性点 neutral | 接地 earthed |
| $C_0$ μF | 0.7 | | |
| 中性点 neutral | 不接地 non-earthed | | |
| 电源回路预期 TRV<br>Prospective TRV of supply circuit | | 负载回路预期 TRV<br>Prospective TRV of load circuit | |
| $u_c$ kV | 22.5 | $u_c$ kV | |
| $t_3$ μs | 57.1 | $t_3$ μs | |
| $u_c / t_3$ kV/μs | 0.39 | $u_c / t_3$ kV/μs | |
| $t_d$ μs | <9 | $k_{af}$ | |
| | | $f_0$ kHz | |

验前试品状态：未检修 Condition of tested object before test: not maintained.
试验方法：三相直接试验。Test method: Three phases direct test
试验电源连接到静触头侧 Test power supply was connected to the static contact terminals
示波图编号 Oscillograms -T100s-01 !-T100s-02

| Test Report | 基本短路试验方式 T100a<br>Test-duty T100a | №. |
|---|---|---|

试验前试品状态：未检修。

试验方法：三相直接试验。

试验电源连接到静触头侧。

试验回路：见 NT12-31.5 T100s

试验采用了 GB 1984-2014 中 6.102.10.1（三相试验）或 6.102.10.2（单相试验）的试验程序以及 6.106.6 中的非对称判据。

Condition of tested object before test: not maintained

test method: Three phases direct test

Test power supply was connected to the static contact terminals

Test circuit can be seen NT12-31.5 T100s

Test procedure according to 6.102.10.1 (three-phase test) or 6.102.10.2 (single-phase test) and test criteria according to 6.106.6.

示波图编号 Oscillograms:

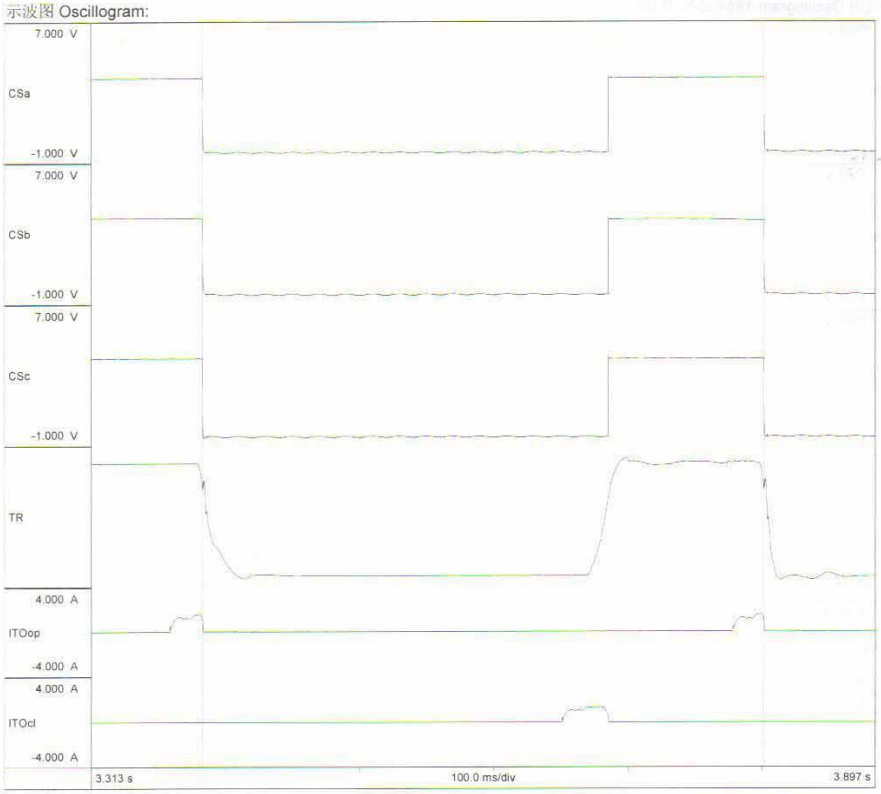
!-T100a-01

!-T100a-02

!-T100a-03

| Test Report | 关合和开断试验后的空载操作<br>No-load operating after making and breaking tests | No. |
|---|---|---|

示波图 Oscillogram:




| 操作顺序 Operation : | | O | | | -0.3s-CO | | |
|---|---|---|---|---|---|---|---|
| 相序 Phase | / | A | B | C | A | B | C |
| 合闸线圈电流 Current closing coil | A | | | | 1.33 | | |
| 合闸时间 Closing time | ms | | | | 34.3 | 34.4 | 34.3 |
| 分闸线圈电流 Current opening coil | A | 1.63 | | | 1.58 | | |
| 分闸时间 Opening time | ms | 24.6 | 24.5 | 24.5 | 23.5 | 23.4 | 23.4 |

| | | |
|---|---|---|
| 试验日期 Test date(s): | 周围空气温度 Ambient air temperature:26 ℃ | 试验极 Tested pole(s): A,B,C |
| 合闸操作电源电压 Supply voltage for closing: 242Vd.c. | | |
| 分闸操作电源电压 Supply voltage for opening: 242Vd.c. | | |
| 备注： Remark(s): | | |

| Test Report | 状态检查电压试验<br>The voltage tests as condition check | №. |
|---|---|---|

试验前照片
Photograph before the test

| Test Report | 状态检查电压试验<br>The voltage tests as condition check | №. |
|---|---|---|

1.试验回路原理图 tests circuitt: 工频 H-PV03 冲击 H-IV03
试验前试品状况：关合和开断试验后，未修整
2.Condition of the tested apparatus: not maintained after making and breaking
3.试区大气条件 Ambient air conditions: *b*= 101.1 kPa *t*= 19.5 ℃ *h*=11.5 g/m$^3$ ；
4.试验电压是按内绝缘确定的（未按标准大气条件修正），表中电压以标称电压值表示
Applied voltage in the tables has been proofread accordance to internal insulation of the apparatus. Applied voltage in the tables is the normal voltage.
5.1min 工频电压试验 Power-frequency voltage dry tests for 1 min

试验日期 test date(s): 单位 unit: kV

| 考核部位 Tested part(s) | 断路器状态 Position of the CB | 可移开部件状态 Position of the removable part | 加压部位 Voltage applied to | 接地部位 Earth connected to | 试验电压(有效值) Test voltage (r.m.s.) | 加压次数 Number of applied voltage | 放电次数 Number of discharge |
|---|---|---|---|---|---|---|---|
| 断路器断口 Accorss intrerupter | 分闸 Open | 工作位置 Service position | A B C | a b c | 48 | 1 | 0 |
| | | | a b c | A B C | 48 | 1 | 0 |

6.雷电冲击电压试验 lightning impulse voltage tests 试验日期 test date(s): 单位 unit: kV

| 考核部位 Tested part(s) | 断路器/可移开部件状态 Position of the CB/ the removable part | 加压部位 Voltage applied to | 接地部位 Earth connected to | 极性 Polarity | 试验电压(峰值) Test voltage (peak) | 加压次数 Number of applied voltage | 放电次数 Number of discharge | 典型示波图 Typical oscillogram 185432-CND- |
|---|---|---|---|---|---|---|---|---|
| 断路器断口 Accorss intrerupter | 分闸/工作位置 Open/ Service position | A B C | a b c | + | 85 | 15 | 0 | 01-30 |
| | | | | − | 85 | 15 | 0 | |
| | | a b c | A B C | + | 85 | 15 | 0 | 31-60 |
| | | | | − | 85 | 15 | 0 | |

7.检验结论：合格
Test results: passed
8.示波图编号 Oscillograms:

| Test Report | 短时耐受电流和峰值耐受电流试验<br>Short-time and peak withstand current tests | №. |
|---|---|---|

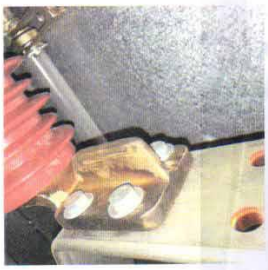
主回路试验前照片

Photograph of main circuit before test

接地连接及接地导体试验前照片

Photograph of earthing connections and earthing terminals before test

| Test Report | 短时耐受电流和峰值耐受电流试验<br>Short-time and peak withstand current tests | №. |
|---|---|---|



A 相

B 相

动触头

Movable contact

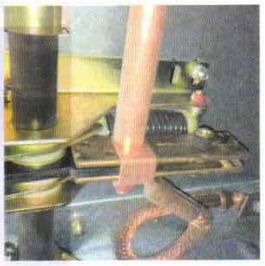
C 相

A 相

B 相

静触头

Fixed contact



C 相

接地开关试验前触头照片

Photographs before the test of earthing switch

| Test Report | 试品照片<br>Photographs | №. |
|---|---|---|