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中国认可
国际互认
检测
TESTING
CNAS L0207

报告编号
Reference№ CT22-03938-1

检 测 报 告
Test Report

样品名称 Name of sample	8.7/15kV冷缩户内终端 8.7/15kV cold shrinkable indoor termination
样品型号 Type of sample	GHD-15HNLS
委托方 Consigner	航大电气有限公司 ZGHD ELECTRIC CO., LTD.
试验类型 Kind of test	型式试验 Type test

上海国缆检测股份有限公司
SHANGHAI NATIONAL CENTER OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE CO., LTD

国家电线电缆质量检验检测中心
CHINA NATIONAL CENTRE OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE

TICW 国缆检测
地址：上海市宝山区真陈路888号 邮编：200444
电话：021-65493333 传真：021-65490171
电子邮箱：ewec@ticw.com.cn
报告查询网站：www.ticw.com.cn

上海国缆检测股份有限公司
国家电线电缆质量检验检测中心
检测报告

Shanghai National Center of Testing and Inspection for Electric Cable and Wire Co.,Ltd
China National Centre of Testing and Inspection for Electric Cable and Wire
Test Report

试验类型 Kind of test			型式试验 Type Test		报告编号 Reference No.	CT22-03938-1
样品名称 Name of sample			8.7/15kV冷缩户内终端 8.7/15kV cold shrinkable indoor termination			
型号规格 Type and Size			GHD-15HNLS 3×400		检测日期 Date of test	2022-11-14 ～ 2023-02-07
委托方	Consigner	名 称 Name	航大电气有限公司 ZGHD ELECTRIC CO.,LTD.			
		地 址 Address	浙江省乐清市乐清湾港区乐商创业园 Yueshang Pioneer Park, Yueqing Bay Port Area, Yueqing City, Zhejiang Province			
		电话号码 Tel.	13764387888	邮政编码 P.C.	325600	单位编号 Unit No. 700993
生产单位	Manufacturer	名 称 Name	航大电气有限公司 ZGHD ELECTRIC CO.,LTD.			
		地 址 Address	浙江省乐清市乐清湾港区乐商创业园 Yueshang Pioneer Park, Yueqing Bay Port Area, Yueqing City, Zhejiang Province			
		电话号码 Tel.	13764387888	邮政编码 P.C.	325600	单位编号 Unit No. 700993
来样方式 Delivering mode			送样 Supplied by consigner	接收状态 Sample state at receiving	正常 Normal	收样日期 Receiving date 2022-10-26
检测依据 Test standard			见第2页 See page 2			
判定依据 Verdict standard			见第2页 See page 2			
检测结论 Conclusion			样品进行了GB/T 12706.4—2020和IEC 60502-4:2010标准要求的全部项目检测，经检测该样品符合GB/T 12706.4—2020和IEC 60502-4:2010标准要求。 All items for the sample have been carried out according to GB/T 12706.4—2020 and IEC 60502-4:2010, and the sample is qualified for the requirements of GB/T 12706.4—2020 and IEC 60502-4:2010.			
备 注 Note			1. 短路热稳定试验和短路动稳定试验不在本机构认可范围内，为分包项目，分包单位为上海电器设备检测所有限公司（CMA资质认定证书号为180008221885）和上海电气输配电试验中心有限公司（CMA资质认定证书号为220008349257），其它试验项目在本中心试验基地—上海市杨浦区军工路1000号开展。Thermal short-circuit test and dynamic short-circuit test are not accredited and are subcontract items. The subcontractor is Shanghai Testing & Inspection Institute for Electrical Equipment Co., Ltd. (CMA Certificate No. 180008221885) and Shanghai Electric Power Transmission & Distribution Testing Centre Co., Ltd. (CMA Certificate No. 220008349257). The other test items have been carried out at our test base No. 1000, Jungong Road, Yangpu district, Shanghai. 2. 样品名称和型号规格由委托方提供。The name and type and size of the sample are provided by consigner. 3. 短路热稳定试验(屏蔽，5kA，1s，2次)试验要求由委托方提供。 The requirements of thermal short-circuit test(screen, 5kA, 1s, two short-circuits)is provided by consigner.			

主 检 Tested by	贺金红 He Jinhong 贺金红	审 核 Checked by	王子强 Wang Ziqiang 王子强	批 准 Approved by	李闯 Li Chuang 李闯
日期 Date	2023.02.08	日期 Date	2023.02.08	日期 Date	2023.2.8

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

检 测 依 据 :
Test standard:

1. GB/T 12706.4—2020 额定电压1kV(U_m=1.2kV)到35kV(U_m =40.5kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到35kV(U_m =40.5kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1kV(U_m =1.2kV) up to 35kV (U_m =40.5kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6kV(U_m =7.2kV) up to 35kV (U_m =40.5kV)
2. IEC 60502-4:2010 额定电压1kV(U_m =1.2kV)到30kV(U_m =36kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到30kV(U_m =36kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)

判 定 依 据 :
Verdict standard:

1. GB/T 12706.4—2020 额定电压1kV(U_m=1.2kV)到35kV(U_m =40.5kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到35kV(U_m =40.5kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1kV(U_m =1.2kV) up to 35kV (U_m =40.5kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6kV(U_m =7.2kV) up to 35kV (U_m =40.5kV)
2. IEC 60502-4:2010 额定电压1kV(U_m =1.2kV)到30kV(U_m =36kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到30kV(U_m =36kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

1. 样品描述 Sample description

本试验共有三个试验回路，具体如下

Tests are carried out on three test loops, and details as follows:

1.1 试验回路1 Test loop 1

试验回路1包含一套8.7/15kV冷缩中间接头，一套8.7/15kV冷缩户外终端，一套8.7/15kV冷缩户内终端(一套测试样品)和一根三芯长度10米的电力电缆，电缆的型号规格为YJV22-8.7/15 3×400。

The test loop 1 comprises one 8.7/15kV cold shrinkable straight joint, one 8.7/15kV cold shrinkable outdoor termination, one 8.7/15kV cold shrinkable indoor termination (one test sample) and a 10m three cores power cable. Type and size of the cable is YJV22-8.7/15 3×400.

1.2 试验回路2 Test loop 2

组成同试验回路1（一套测试样品）。Assemblied same as test loop 1 (one test sample).

1.3 试验回路3 Test loop 3

试验回路3包含两套8.7/15kV冷缩户内终端(其中一套为被试样品)，一根三芯长度8米的电力电缆，电缆的型号规格为YJV22-8.7/15 3×400。

The test loop 3 comprises two 8.7/15kV cold shrinkable indoor terminations (one of the samples is test sample) and a 8m three cores power cable. Type and size of the cable is YJV22-8.7/15 3×400.

2. 试验程序 Test sequences

2.1 试验回路1和试验回路2均按GB/T 12706.4—2020中表2规定的终端试验程序1.1和IEC 60502-4:2010 表5规定的试验程序1.1进行试验。

Test loop 1 and test loop 2 are tested according to test sequence 1.1 of termination given in table 2 of GB/T 12706.4—2020 and test sequence 1.1 given in table 5 of IEC 60502-4:2010.

2.2 试验回路1完成终端试验程序1.1后，再按GB/T 12706.4—2020中表2规定的试验程序1.2和1.3和IEC 60502-4:2010 表5规定的试验程序1.2和1.3进行试验。

Test loop 1 is tested according to test sequence 1.2 and 1.3 given in table 2 of GB/T 12706.4—2020 and test sequence 1.2 and 1.3 given in table 5 of IEC 60502-4:2010 after completing test sequence 1.1 of termination .

2.3 试验回路3按GB/T 12706.4—2020中表2规定的试验程序1.4和 IEC 60502-4:2010 表5规定的试验程序1.4进行试验。

Test loop 3 are tested according to test sequence 1.4 given in table 2 of GB/T 12706.4—2020 and test sequence 1.4 given in table 5 of IEC 60502-4:2010.

2.4 试验项目中检验（检查）项目结果“无异常”，是指试验后无以下任一现象：

The “no abnormality” in test result of examination in test item means the any of following phenomena shall not appear after testing:

(Ⅰ) 填充物和/或带材或管件有裂纹；cracking in the filling media and/or tape or tube components;

(Ⅱ) 主要密封部位有贯穿性潮湿通道；a moisture path across a primary seal;

(Ⅲ) 腐蚀和/或漏电痕迹、电蚀，最后导致附件的损坏；

corrosion and/or tracking and/or erosion which would, in time, lead to failure of the accessory;

(Ⅳ) 任何绝缘材料渗漏。leakage of any insulating material.

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序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
1	试验程序 Sequence 1.1				
1.1	交流耐压试验(39kV，5min) AC voltage test (39kV, 5min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.2	直流耐压试验 (负极性，35kV，15min) DC voltage test (Negative polarity, 35kV, 15min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.3	局部放电试验(15kV) Partial discharge(15kV)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.4	冲击电压试验 (95～100℃，95kV，正负极性各 10 次) Impulse voltage test (95～100℃, 95kV, 10 impulses of each polarity)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.5	空气中恒压负荷循环试验 (22kV。加热循环至少 8h，95℃～100℃至少 2h，自然冷却至少 3h，共 60 次热循环) Heating cycles test in air (22kV. Heating cycle at least 8h, 95℃～100℃ at least 2h, natural cooling at least 3h, total 60 heating cycles)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.6	局部放电试验 Partial discharge				
1.6.1	局部放电试验(15kV, 95～100℃) Partial discharge(15kV, 95～100℃)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.6.2	局部放电试验(15kV,环境温度) Partial discharge(15kV, ambient temperature)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.7	冲击电压试验 (室温，95kV，正负极性各 10 次) Impulse voltage test (ambient temperature，95kV, 10 impulses of each polarity)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.8	交流耐压试验(22kV，15min) AC voltage test (22kV, 15min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.9	检验（检查）Examination		/	样品无异常 No abnormality on the sample	N

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
2	试验程序 Sequence 1.2+1.3				
2.1	交流耐压试验(39kV，5min) AC voltage test (39kV, 5min)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.2	直流耐压试验 (负极性，35kV，15min) DC voltage test (Negative polarity, 35kV, 15min)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.3	短路热稳定试验 (屏蔽，5kA，1s，2 次) Thermal short-circuit test (Screen, 5kA, 1s, two short-circuits)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration	P
2.3.1	短路试验前导体加热 Conductor heating before carrying out the short-circuit test		应对导体加热并在95℃~100℃下至少稳定 2h The conductor shall be heated and stabilized for at least 2h at 95℃~100℃	导体温度稳定在95℃~100℃，并保持2h Conductor temperature is stabilized for 2h at 95℃～100℃	P
2.3.2	第一次短路试验 The 1st short-circuit test		/	5.12kA, 1.02s	N
	短路试验前屏蔽温度 Temperature of screen before carrying out the 1st short-circuit test	℃	/	81.5	N
	--短路试验后屏蔽最高温度 The highest temperature of screen after carrying out the 1st short-circuit test	℃	/	100.3	N
2.3.3	第二次短路试验 The 2nd short-circuit test		/	5.13kA, 1.02s	N
	--短路试验前屏蔽温度 Temperature of screen before carrying out the 2nd short-circuit test	℃	/	81.7	N
	--短路试验后屏蔽最高温度 The highest temperature of screen after carrying out the 2nd short-circuit test	℃	/	100.5	N

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
2.4	短路热稳定试验 (导体，42.8kA，3s，2 次) Thermal short-circuit test (conductor, 42.8kA, 3s, two short-circuits)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration for the sample (环境温度 ambient temperature：13℃)	P
2.5	短路动稳定试验 (185.3kA，至少 10ms，1 次) Dynamic short-circuit test (185.3kA, at least 10ms, One short-circuit)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration for the sample (环境温度 ambient temperature：13℃)	P
2.6	冲击电压试验 (室温，95kV，正负极性各 10 次) Impulse voltage test (ambient temperature，95kV, 10 impulses of each polarity)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.7	交流耐压试验(22kV，15min) AC voltage test (22kV, 15min)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.8	检验（检查）Examination		/	样品无异常 No abnormality on the sample	N
3	试验程序 Sequence 1.4				
3.1	潮湿试验 (喷雾速率：(0.4±0.1)L/(h·m^3) 雾水电导率：(70±10) mS/m 电压：11kV，时间：300h) Humidity test (Spray rate: (0.4±0.1)L/(h·m^3) Spray water conductivity: (70±10) mS/m Voltage: 11kV, time: 300h)		不击穿或闪络 跳闸不超过三次 无显著的损伤 No breakdown or flashover No more than three trippings No substantial damage	通过 Passed	P
3.2	检验（检查） Examination		/	样品无异常 No abnormality on the sample	N
	以下为试验图形和照片 Following oscillograms and photos about testing				

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

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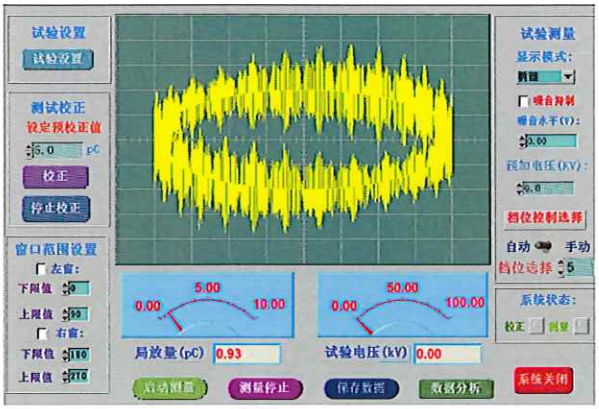
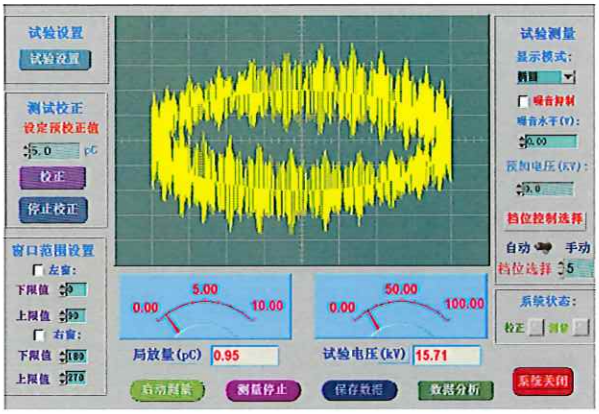
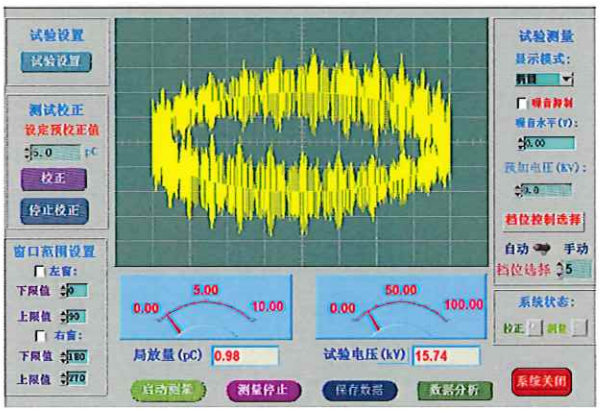
附录A 恒压负荷循环试验后局部放电试验图形（环境温度）
Annex A Oscillograms of partial discharges on the sample after heating cycles test (ambient temperature)



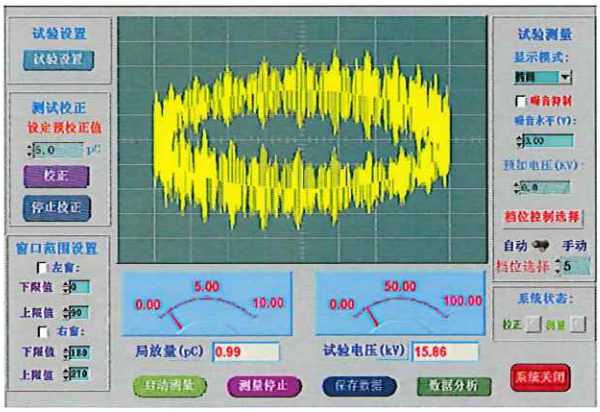
A1：试验回路1局部放电试验背景噪声
The background noise during partial discharge test on test loop 1



A2: 试验回路1红芯在15kV下局部放电试验图形
The oscillogram of partial discharge of red core at 15kV on test loop 1

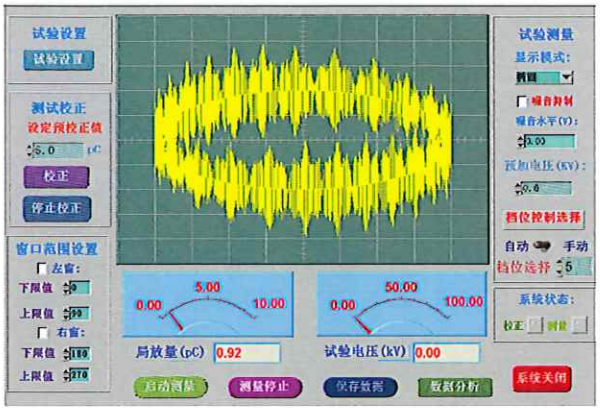


A3：试验回路1黄芯在15kV下局部放电试验图形
The oscillogram of partial discharge of yellow core at 15kV on test loop 1

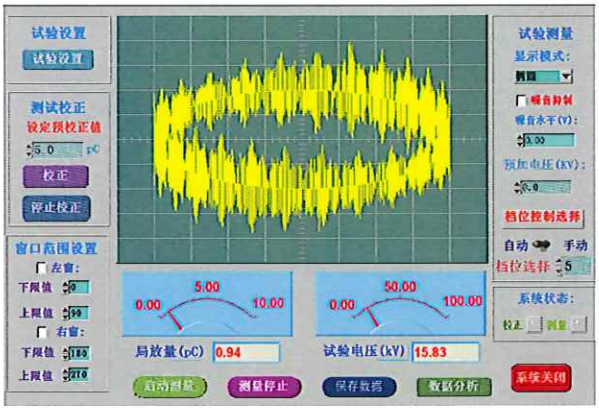


A4：试验回路1绿芯在15kV下局部放电试验图形
The oscillogram of partial discharge of green core at 15kV on test loop 1

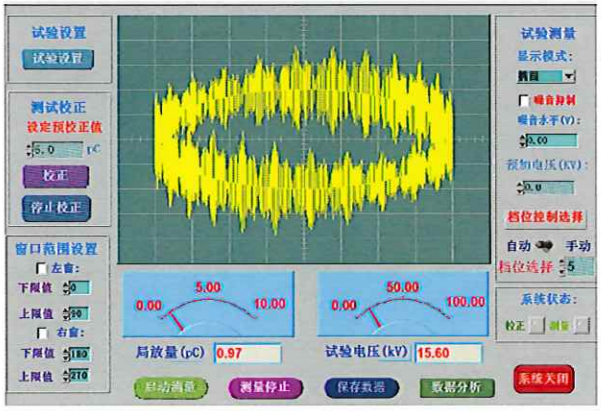
型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1



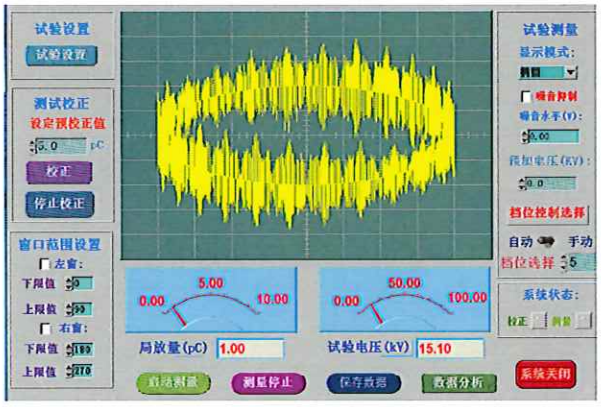
A5：试验回路2局部放电试验背景噪声
The background noise during partial discharge test on test loop 2



A6：试验回路2红芯在15kV下局部放电试验图形
The oscillogram of partial discharge of red core at 15kV on test loop 2



A7：试验回路2黄芯在15kV下局部放电试验图形
The oscillogram of partial discharge of yellow core at 15kV on test loop 2



A8： 试验回路2绿芯在15kV下局部放电试验图形
The oscillogram of partial discharge of green core at 15kV on test loop 2

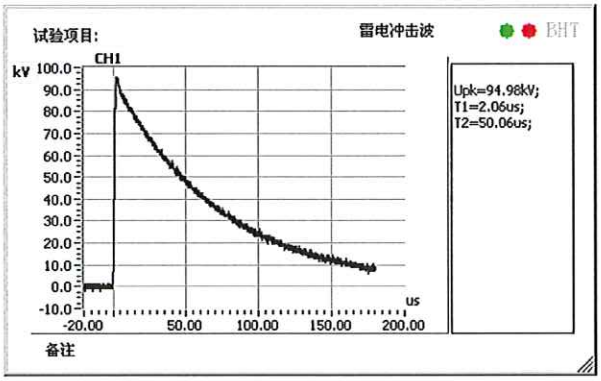
型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录B 恒压负荷循环试验后样品冲击电压试验实际耐受电压值及其波形图(95kV，允许±3%偏差)
Annex B The values and oscillograms of impulse voltages test on samples after heating cycles voltage test (95kV, ±3% tolerance)

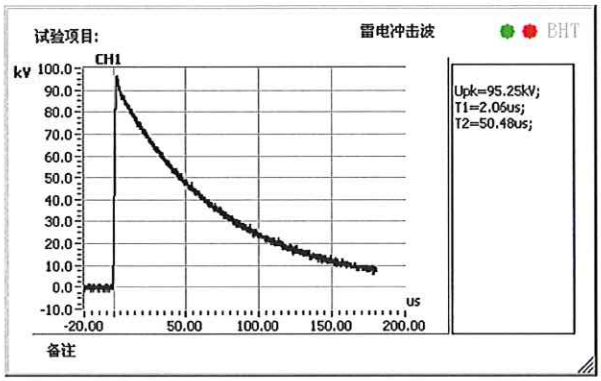
温度：12℃，相对湿度：45%，大气压力：103.5kPa
Ambient temperature:12℃, Relative humidity:45%, Atmosphere: 103.5kPa

kV

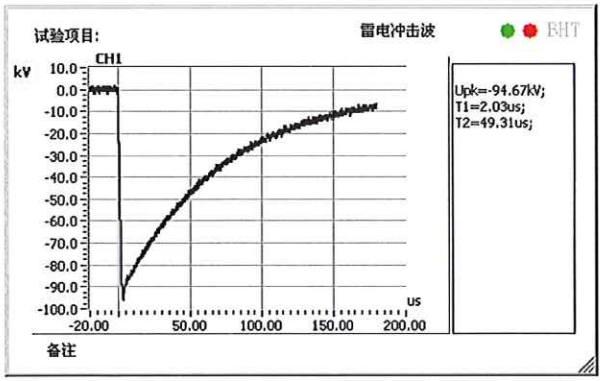
+	94.98	94.15	95.39	95.16	94.82	95.17	95.08	95.18	95.42	95.25
—	94.67	94.67	94.58	95.18	94.28	94.96	95.25	95.24	94.58	94.51



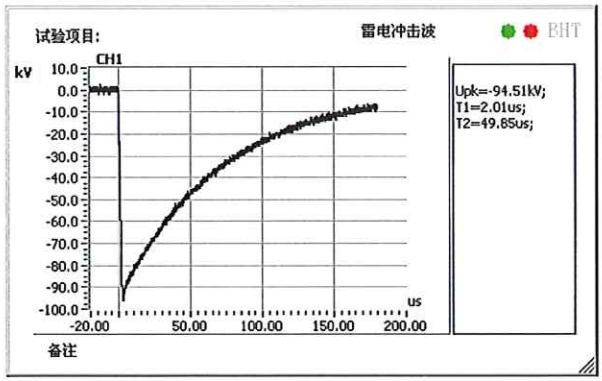
B1:正极性第1次
The 1st positivity lightning impulse waveform



B2:正极性第10次
The 10th positivity lightning impulse waveform



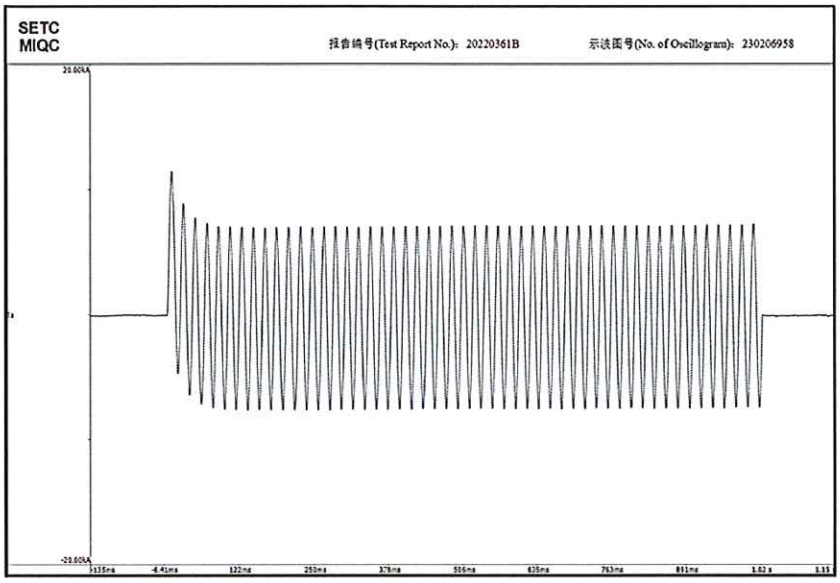
B3:负极性第1次
The 1st negative lightning impulse waveform



B4:负极性第10次
The 10th negative lightning impulse waveform

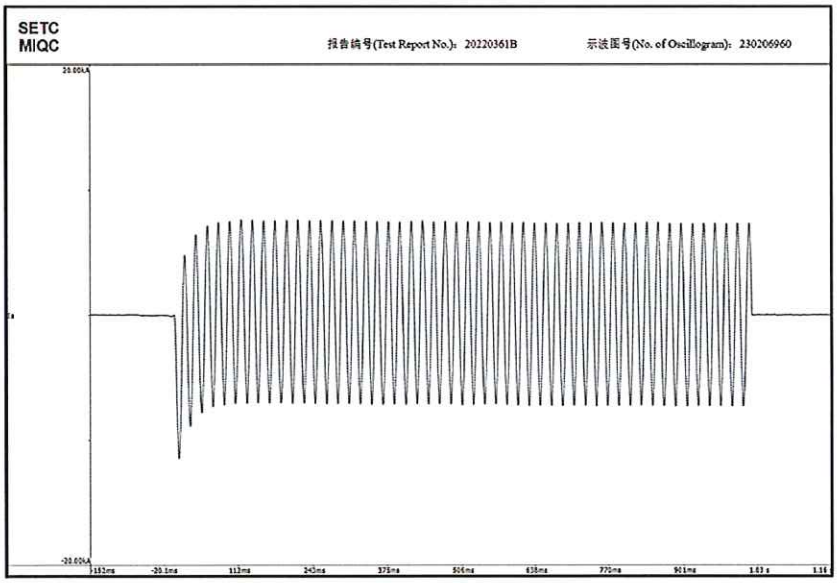
型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录C 短路热稳定（屏蔽）电流曲线图
Annex C The graphs of thermal short-circuit (screen) current



短路电流有效值
R.M.S.
value of short-circuit current:
I: 5.12kA
持续时间
Duration time:
t: 1.02s

C1：第1次 The 1st

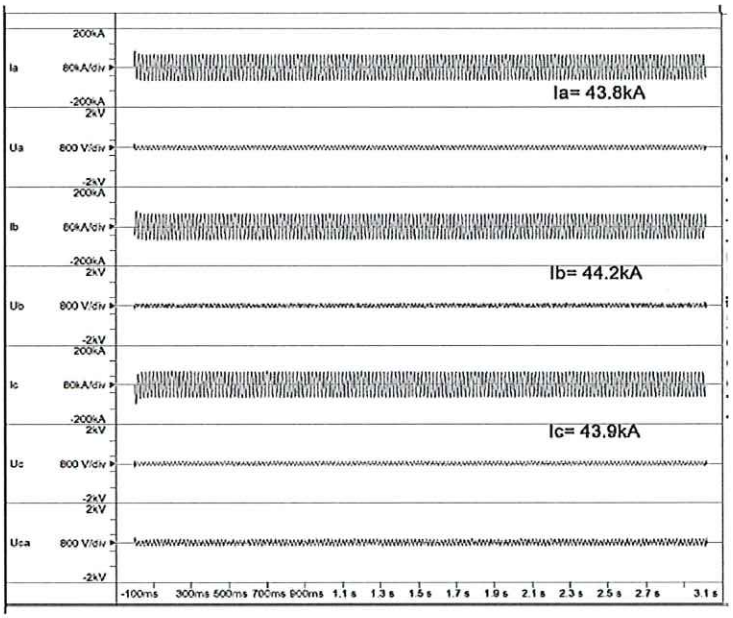


短路电流有效值
R.M.S.
value of short-circuit current:
I: 5.13kA
持续时间
Duration time:
t: 1.02s

C2：第2次 The 2nd

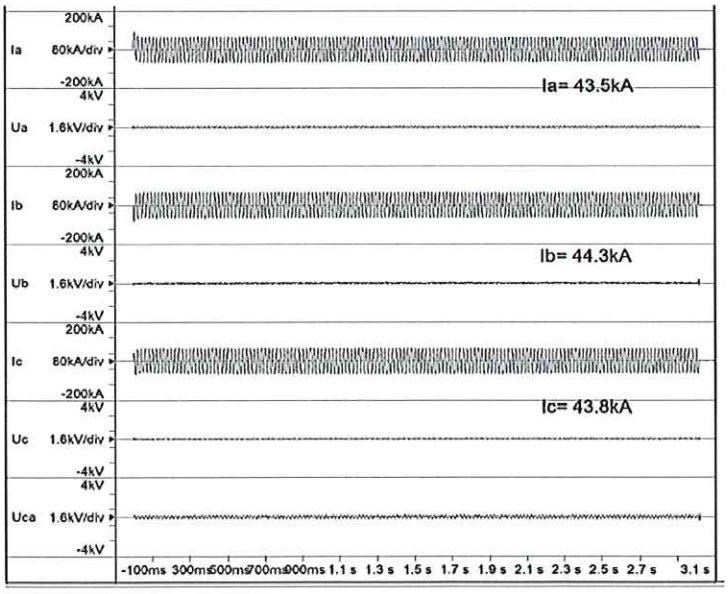
型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录D: 短路热稳定（导体）电流曲线图
Annex D The graphs of thermal short-circuit (conductor) current



短路电流有效值
R.M.S.
value of short-circuit current:
I_A: 43.8 kA
I_B: 44.2 kA
I_C: 43.9 kA
持续时间
Duration time:
t:3.02s

D1：第1次 The 1st



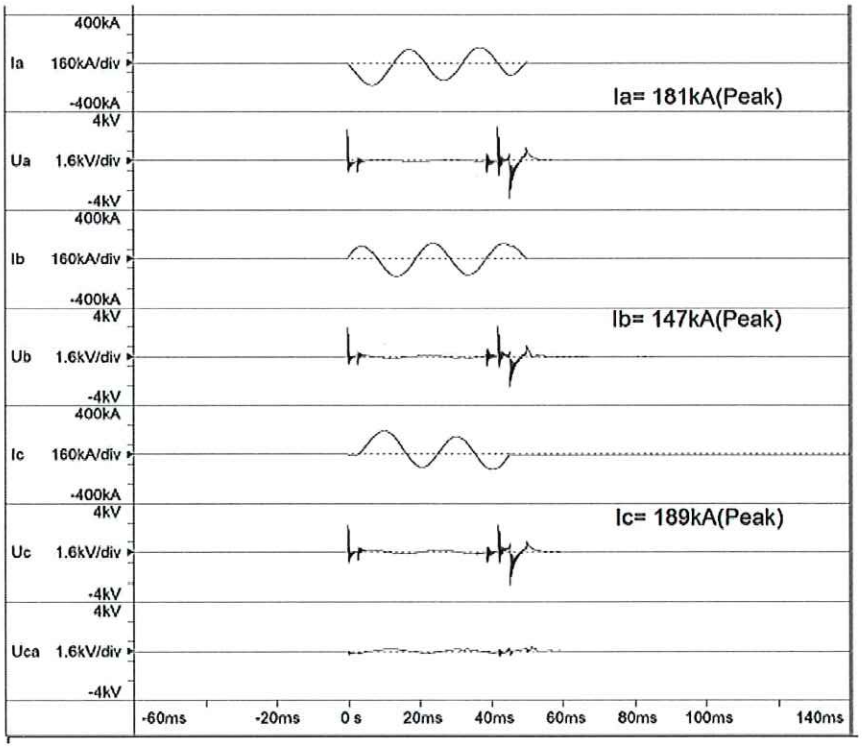
短路电流有效值
R.M.S.
value of short-circuit current:
I_A: 43.5 kA
I_B: 44.3 kA
I_C: 43.8 kA
持续时间
Duration time:
t:3.02s

D2：第2次 The 2nd

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录 E 短路动稳定电流曲线图

Annex E The graphs of dynamic short-circuit current



短路电流峰值
Peak value of short-circuit current:
I_A: 181 kA
I_B: 147 kA
I_C: 189 kA
持续时间
Duration time:
t:49.6ms

E1: 短路动稳定电流曲线图 The graphs of dynamic short-circuit current

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录F 短路动热稳定试验后样品冲击电压试验实际耐受电压值及其波形图(95kV，允许±3%偏差)

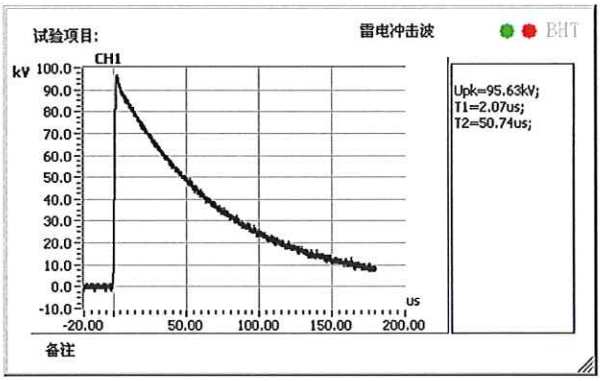
Annex F The values and oscillograms of impulse voltages test on samples after thermal and dynamic short-circuit test (95kV, ±3% tolerance)

温度：10℃，相对湿度：46%，大气压力：103.2kPa

Ambient temperature:10℃, Relative humidity: 46%, Atmosphere: 103.2kPa

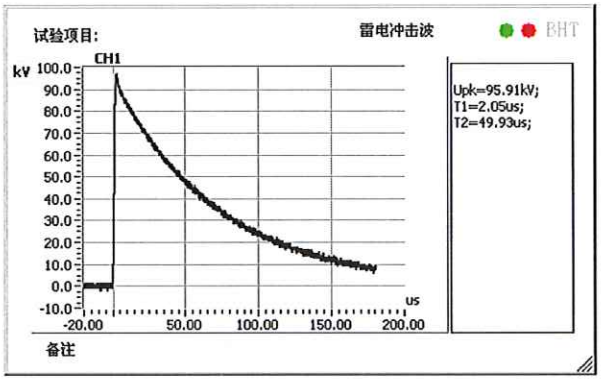
kV

+	95.63	95.86	95.83	95.51	95.09	95.65	95.66	94.58	95.61	95.91
—	94.58	94.93	93.97	94.62	94.85	94.85	94.26	94.77	95.17	94.85



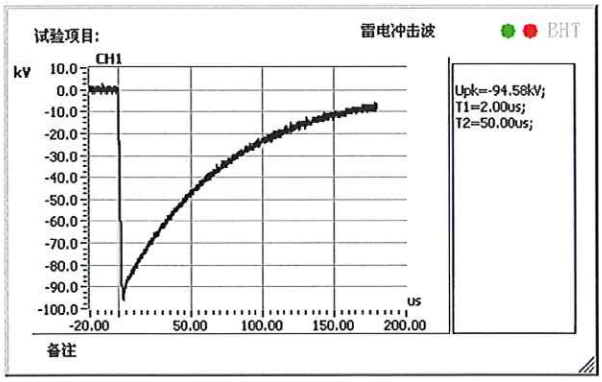
F1:正极性第1次

The 1st positivity lightning impulse waveform



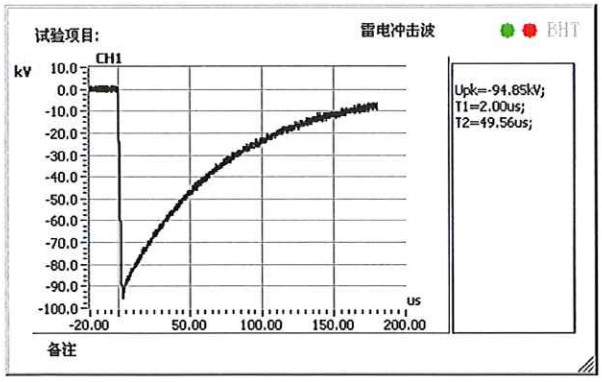
F2:正极性第10次

The 10th positivity lightning impulse waveform



F3:负极性第1次

The 1st negative lightning impulse waveform



F4:负极性第10次

The 10th negative lightning impulse waveform

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录G 试验照片

Annex G Photos about testing

G1: 样品外观 The appearance of the sample

G2：样品局部放电试验及交流耐压试验
Partial discharge test and AC voltage test on the sample

G3：冲击电压试验 Impulse voltage test

型号和规格 Type and size	GHD-15HNLS 3×400	报告编号 Reference No.	CT22-03938-1

附录H 试验电缆的标识 Annex H Identification of test cable

额定电压$U_0/U(U_m)$ Rated voltage	8.7/15(17.5) kV	
结构： Construction	芯数 Core number	三芯 Three-core
	屏蔽结构 Screened	分相屏蔽 Individually screened
导体： Conductor	材料 Material	铜 Copper
	形状 Shape	紧压圆形绞合 Stranded compacted circular
	截面 Cross-sectional area	400mm^2
	外径 Overall diameter	22.6mm
绝缘： Insulation	材料 Material	交联聚乙烯 XLPE
	厚度 Thickness	4.5mm
	外径 Overall diameter	33mm
屏蔽： Screen	绝缘屏蔽厚度 Thickness of insulation screen	0.8mm
	绝缘屏蔽是否可剥离 Strippability for insulation screen	可剥离 Strippable
	绝缘屏蔽外径 Overall diameter of insulation screen	34.6mm
	金属屏蔽 Metallic screen	铜带屏蔽 Copper tape
铠装： Armour	结构和材料 Construction and Material	双层钢带 Two steel tapes
外护套： Oversheath	材料 Material	聚氯乙烯 PVC
	外径 Overall diameter	91.2mm
电缆标示： Cable marking	YJV22-8.7/15 3×400	

CMA
220008343840

ilac-MRA CNAS
中国认可
国际互认
检测
TESTING
CNAS L0207

报告编号
Reference№ CT22-03938-2

检 测 报 告
Test Report

样品名称 Name of sample	8.7/15kV冷缩户外终端 8.7/15kV cold shrinkable outdoor termination
样品型号 Type of sample	GHD-15HWLS
委托方 Consigner	航大电气有限公司 ZGHD ELECTRIC CO., LTD.
试验类型 Kind of test	型式试验 Type test

上海国缆检测股份有限公司
SHANGHAI NATIONAL CENTER OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE CO., LTD

国家电线电缆质量检验检测中心
CHINA NATIONAL CENTRE OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE

TICW 国缆检测
地址：上海市宝山区真陈路888号 邮编：200444
电话：021-65493333 传真：021-65490171
电子邮箱：ewec@ticw.com.cn
报告查询网站：www.ticw.com.cn

上海国缆检测股份有限公司
国家电线电缆质量检验检测中心
检测报告

Shanghai National Center of Testing and Inspection for Electric Cable and Wire Co.,Ltd
China National Centre of Testing and Inspection for Electric Cable and Wire
Test Report

试验类型 Kind of test			型式试验 Type Test		报告编号 Reference No.	CT22-03938-2
样品名称 Name of sample			8.7/15kV冷缩户外终端 8.7/15kV cold shrinkable outdoor termination			
型号规格 Type and Size			GHD-15HWLS 3×400		检测日期 Date of test	2022-11-14 ～ 2022-02-07
委托方	Consigner	名 称 Name	航大电气有限公司 ZGHD ELECTRIC CO.,LTD.			
		地 址 Address	浙江省乐清市乐清湾港区乐商创业园 Yueshang Pioneer Park, Yueqing Bay Port Area, Yueqing City, Zhejiang Province			
		电话号码 Tel.	13764387888	邮政编码 P.C.	325600	单位编号 Unit No. 700993
生产单位	Manufacturer	名 称 Name	航大电气有限公司 ZGHD ELECTRIC CO.,LTD.			
		地 址 Address	浙江省乐清市乐清湾港区乐商创业园 Yueshang Pioneer Park, Yueqing Bay Port Area, Yueqing City, Zhejiang Province			
		电话号码 Tel.	13764387888	邮政编码 P.C.	325600	单位编号 Unit No. 700993
来样方式 Delivering mode			送样 Supplied by consigner	接收状态 Sample state at receiving	正常 Normal	收样日期 Receiving date 2022-10-26
检测依据 Test standard			见第2页 See page 2			
判定依据 Verdict standard			见第2页 See page 2			
检测结论 Conclusion			样品进行了GB/T 12706.4—2020和IEC 60502-4:2010标准要求的全部项目检测，经检测该样品符合GB/T 12706.4—2020和IEC 60502-4:2010标准要求。 All items for the sample have been carried out according to GB/T 12706.4—2020 and IEC 60502-4:2010, and the sample is qualified for the requirements of GB/T 12706.4—2020 and IEC 60502-4:2010.			
备 注 Note			1. 短路热稳定试验和短路动稳定试验不在本机构认可范围内，为分包项目，分包单位为上海电器设备检测所有限公司（CMA资质认定证书号为180008221885）和上海电气输配电试验中心有限公司（CMA资质认定证书号为220008349257），其它试验项目在本中心试验基地—上海市杨浦区军工路1000号开展。Thermal short-circuit test and dynamic short-circuit test are not accredited and are subcontract items. The subcontractor is Shanghai Testing & Inspection Institute for Electrical Equipment Co., Ltd. (CMA Certificate No. 180008221885) and Shanghai Electric Power Transmission & Distribution Testing Centre Co., Ltd. (CMA Certificate No. 220008349257). The other test items have been carried out at our test base No. 1000, Jungong Road, Yangpu district, Shanghai. 2. 样品名称和型号规格由委托方提供。The name and type and size of the sample are provided by consigner. 3. 短路热稳定试验(屏蔽，5kA，1s，2次)试验要求由委托方提供。 The requirements of thermal short-circuit test(screen, 5kA, 1s, two short-circuits)is provided by consigner.			

主 检 Tested by	贺金红 He Jinhong 贺金红	审 核 Checked by	王子强 Wang Ziqiang 王子强	批 准 Approved by	李闯 Li Chuang 李闯
日期 Date	2023.02.08	日期 Date	2023.02.08	日期 Date	2023.2.8

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

检 测 依 据 :
Test standard:

1. GB/T 12706.4—2020 额定电压1kV(U_m=1.2kV)到35kV(U_m =40.5kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到35kV(U_m =40.5kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1kV(U_m =1.2kV) up to 35kV (U_m =40.5kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6kV(U_m =7.2kV) up to 35kV (U_m =40.5kV)
2. IEC 60502-4:2010 额定电压1kV(U_m =1.2kV)到30kV(U_m =36kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到30kV(U_m =36kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)

判 定 依 据 :
Verdict standard:

1. GB/T 12706.4—2020 额定电压1kV(U_m=1.2kV)到35kV(U_m =40.5kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到35kV(U_m =40.5kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1kV(U_m =1.2kV) up to 35kV (U_m =40.5kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6kV(U_m =7.2kV) up to 35kV (U_m =40.5kV)
2. IEC 60502-4:2010 额定电压1kV(U_m =1.2kV)到30kV(U_m =36kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到30kV(U_m =36kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

1. 样品描述 Sample description

本试验共有三个试验回路，具体如下

Tests are carried out on three test loops, and details as follows:

1.1 试验回路1 Test loop 1

试验回路1包含一套8.7/15kV冷缩中间接头，一套8.7/15kV冷缩户外终端(一套测试样品)，一套8.7/15kV冷缩户内终端和一根三芯长度10米的电力电缆，电缆的型号规格为YJV22-8.7/15 3×400。

The test loop 1 comprises one 8.7/15kV cold shrinkable straight joint, one 8.7/15kV cold shrinkable outdoor termination(one test sample), one 8.7/15kV cold shrinkable indoor termination and a 10m three cores power cable. Type and size of the cable is YJV22-8.7/15 3×400.

1.2 试验回路2 Test loop 2

组成同试验回路1（一套测试样品）。Assemblied same as test loop 1 (one test sample).

1.3 试验回路3 Test loop 3

试验回路3包含两套8.7/15kV冷缩户外终端(其中一套为被试样品)，一根三芯长度8米的电力电缆，电缆的型号规格为YJV22-8.7/15 3×400。

The test loop 3 comprises two 8.7/15kV cold shrinkable outdoor terminations (one of the samples is test sample) and a 8m three cores power cable. Type and size of the cable is YJV22-8.7/15 3×400.

2. 试验程序 Test sequences

2.1试验回路1和试验回路2均按GB/T 12706.4—2020中表2规定的终端试验程序1.1和IEC 60502-4:2010 表5规定的试验程序1.1进行试验。

Test loop 1 and test loop 2 are tested according to test sequence 1.1 of termination given in table 2 of GB/T 12706.4—2020 and test sequence 1.1 given in table 5 of IEC 60502-4:2010.

2.2 试验回路1完成终端试验程序1.1后，再按GB/T 12706.4—2020中表2规定的试验程序1.2和1.3和IEC 60502-4:2010 表5规定的试验程序1.2和1.3进行试验。

Test loop 1 is tested according to test sequence 1.2 and 1.3 given in table 2 of GB/T 12706.4—2020 and test sequence 1.2 and 1.3 given in table 5 of IEC 60502-4:2010 after completing test sequence 1.1 of termination .

2.3 试验回路3按GB/T 12706.4—2020中表2规定的试验程序1.5和 IEC 60502-4:2010 表5规定的试验程序1.5进行试验。

Test loop 3 are tested according to test sequence 1.5 given in table 2 of GB/T 12706.4—2020 and test sequence 1.5 given in table 5 of IEC 60502-4:2010.

2.4 试验项目中检验（检查）项目结果“无异常”，是指试验后无以下任一现象：

The “no abnormality” in test result of examination in test item means the any of following phenomena shall not appear after testing:

(Ⅰ) 填充物和/或带材或管件有裂纹；cracking in the filling media and/or tape or tube components;

(Ⅱ) 主要密封部位有贯穿性潮湿通道；a moisture path across a primary seal;

(Ⅲ) 腐蚀和/或漏电痕迹、电蚀，最后导致附件的损坏；

corrosion and/or tracking and/or erosion which would, in time, lead to failure of the accessory;

(Ⅳ) 任何绝缘材料渗漏。leakage of any insulating material.

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
1	试验程序 Sequence 1.1				
1.1	交流耐压试验(39kV，5min) AC voltage test (39kV, 5min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.2	直流耐压试验 (负极性，35kV，15min) DC voltage test (Negative polarity, 35kV, 15min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.3	交流耐压(淋雨，35kV，1min) AC voltage test (wet, 35kV, 1min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.4	局部放电试验(15kV) Partial discharge(15kV)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.5	冲击电压试验 (95～100℃，95kV，正负极性各 10 次) Impulse voltage test (95～100℃, 95kV, 10 impulses of each polarity)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.6	空气中恒压负荷循环试验 (22kV。加热循环至少 8h，95℃～100℃至少 2h，自然冷却至少 3h，共 60 次热循环) Heating cycles test in air (22kV. Heating cycle at least 8h, 95℃～100℃ at least 2h, natural cooling at least 3h, total 60 heating cycles)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.7	浸水试验(加热循环至少 8h，导体稳定在 95℃～100℃至少 2h，自然冷却至少 3h，共 10 次热循环) Immersion test (The duration of heating cycle is at least 8h. During heating period , conductor temperature is stabilized for at least 2h at 95℃～100℃, natural cooling at least 3h, total 10 heating cycles)		应完成10个加热循环 10 heating cycles shall be finished	10个加热循环完成 10 heating cycles finished	P
1.8	局部放电试验 Partial discharge				
1.8.1	局部放电试验(15kV, 95～100℃) Partial discharge(15kV, 95～100℃)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
1.8.2	局部放电试验(15kV,环境温度) Partial discharge(15kV, ambient temperature)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.9	冲击电压试验 (室温，95kV，正负极性各 10 次) Impulse voltage test (ambient temperature，95kV, 10 impulses of each polarity)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.10	交流耐压试验(22kV，15min) AC voltage test (22kV, 15min)		不击穿或闪络 No breakdown or flashover	两个样品均未击穿、未闪络 No breakdown and flashover for two samples	P
1.11	检验（检查）Examination		/	样品无异常 No abnormality on the sample	N
2	试验程序 Sequence 1.2+1.3				
2.1	交流耐压试验(39kV，5min) AC voltage test (39kV, 5min)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.2	直流耐压试验 (负极性，35kV，15min) DC voltage test (Negative polarity, 35kV, 15min)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashove	P
2.3	短路热稳定试验 (屏蔽，5kA，1s，2 次) Thermal short-circuit test (Screen, 5kA, 1s, two short-circuits)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration	P
2.3.1	短路试验前导体加热 Conductor heating before carrying out the short-circuit test		应对导体加热并在 95℃~100℃下至少稳定 2h The conductor shall be heated and stabilized for at least 2h at 95℃~100℃	导体温度稳定在95℃~100℃，并保持2h Conductor temperature is stabilized for 2h at 95℃～100℃	P
2.3.2	第一次短路试验 The 1st short-circuit test		/	5.12kA, 1.02s	N
	短路试验前屏蔽温度 Temperature of screen before carrying out the 1st short-circuit test	℃	/	81.5	N

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
	--短路试验后屏蔽最高温度 The highest temperature of screen after carrying out the 1st short-circuit test	℃	/	100.3	N
2.3.3	第二次短路试验 The 2nd short-circuit test		/	5.13kA, 1.02s	N
	--短路试验前屏蔽温度 Temperature of screen before carrying out the 2nd short-circuit test	℃	/	81.7	N
	--短路试验后屏蔽最高温度 The highest temperature of screen after carrying out the 2nd short-circuit test	℃	/	100.5	N
2.4	短路热稳定试验 (导体，42.8kA，3s，2 次) Thermal short-circuit test (conductor, 42.8kA, 3s, two short-circuits)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration for the sample (环境温度 ambient temperature：13℃)	P
2.5	短路动稳定试验 (185.3kA，至少 10ms，1 次) Dynamic short-circuit test (185.3kA, at least 10ms, One short-circuit)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration for the sample (环境温度 ambient temperature：13℃)	P
2.6	冲击电压试验 (室温，95kV，正负极性各 10 次) Impulse voltage test (ambient temperature，95kV, 10 impulses of each polarity)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.7	交流耐压试验(22kV，15min) AC voltage test (22kV, 15min)		不击穿或闪络 No breakdown or flashover	样品未击穿、未闪络 No breakdown and flashover	P
2.8	检验（检查）Examination		/	样品无异常 No abnormality on the sample	N

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

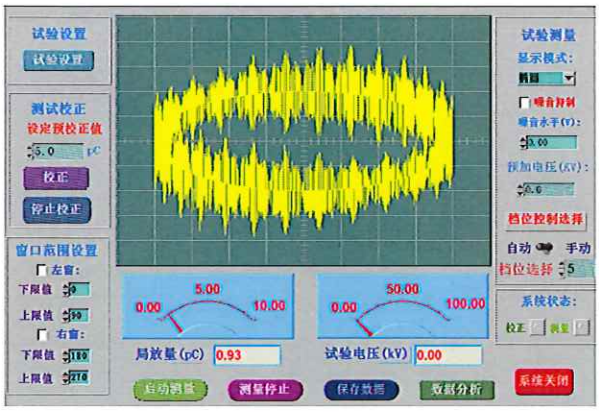
型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
3	试验程序 Sequence 1.5				
3.1	盐雾试验 (喷雾速率： (0.4±0.1)L/(h·m^3) 雾水电导率： (1600±200)mS/m 电压：11kV，时间：1000h) Salt fog test (Spray rate: (0.4±0.1)L/(h·m^3) Spray water conductivity: (1600±200)mS/m Voltage: 11kV, time: 1000h)		不击穿或闪络 跳闸不超过三次 无显著的损伤 No breakdown or flashover No more than three trippings No substantial damage	通过 Passed	P
3.2	检验（检查）Examination		/	样品无异常 No abnormality on the sample	N
	以下为试验图形和照片 Following oscillograms and photos about testing				

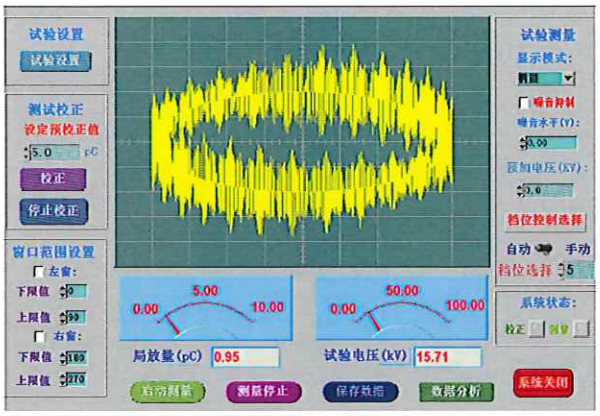
注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

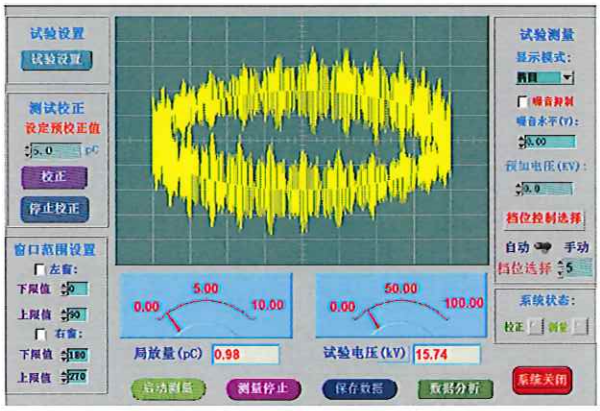
附录A 恒压负荷循环试验后局部放电试验图形（环境温度）
Annex A Oscillograms of partial discharges on the sample after heating cycles test (ambient temperature)



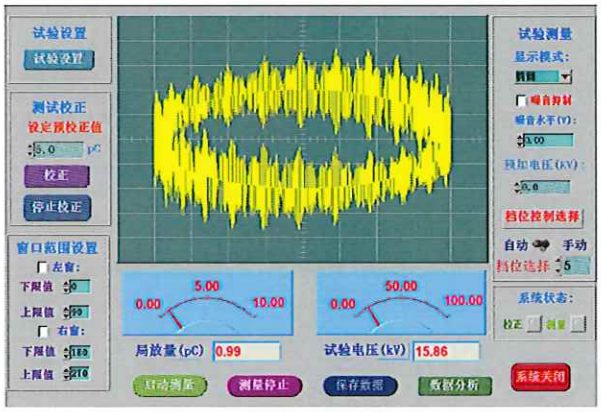
A1：试验回路1局部放电试验背景噪声
The background noise during partial discharge test on test loop 1



A2: 试验回路1红芯在15kV下局部放电试验图形
The oscillogram of partial discharge of red core at 15kV on test loop 1

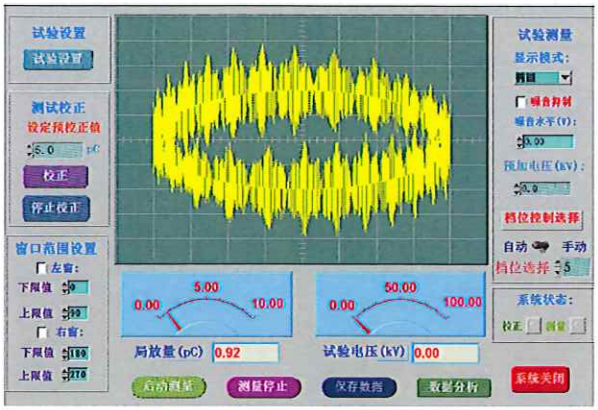


A3：试验回路1黄芯在15kV下局部放电试验图形
The oscillogram of partial discharge of yellow core at 15kV on test loop 1

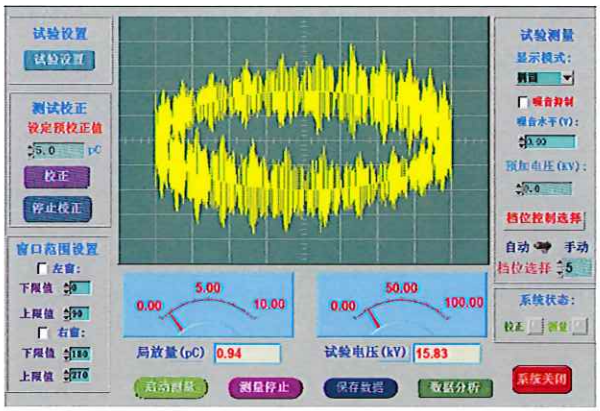


A4：试验回路1绿芯在15kV下局部放电试验图形
The oscillogram of partial discharge of green core at 15kV on test loop 1

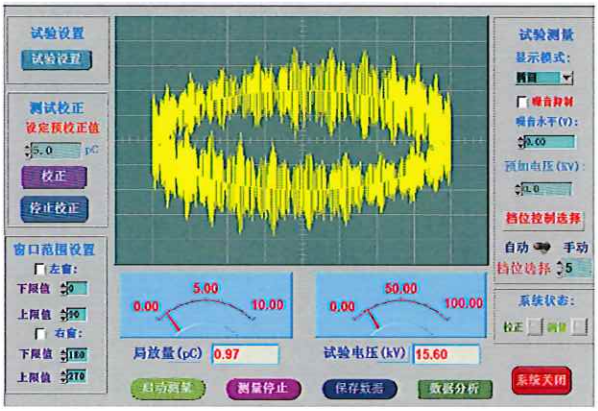
型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2



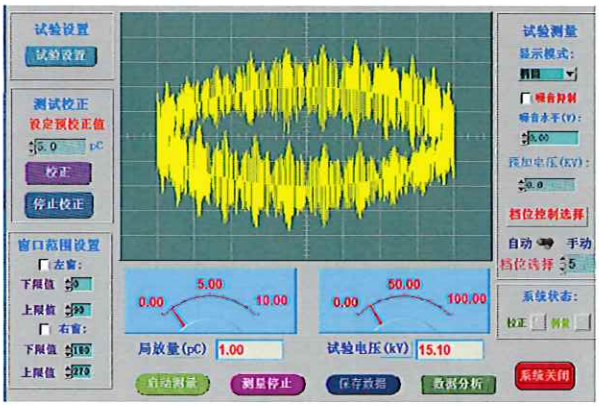
A5：试验回路2局部放电试验背景噪声
The background noise during partial discharge test on test loop 2



A6：试验回路2红芯在15kV下局部放电试验图形
The oscillogram of partial discharge of red core at 15kV on test loop 2



A7：试验回路2黄芯在15kV下局部放电试验图形
The oscillogram of partial discharge of yellow core at 15kV on test loop 2



A8： 试验回路2绿芯在15kV下局部放电试验图形
The oscillogram of partial discharge of green core at 15kV on test loop 2

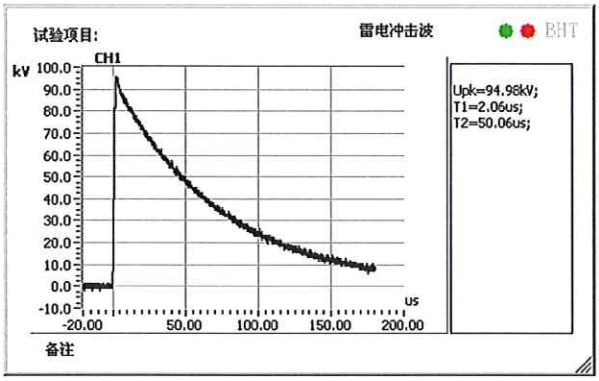
型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

附录B 恒压负荷循环试验后样品冲击电压试验实际耐受电压值及其波形图(95kV，允许±3%偏差)
Annex B The values and oscillograms of impulse voltages test on samples after heating cycles voltage test (95kV, ±3% tolerance)

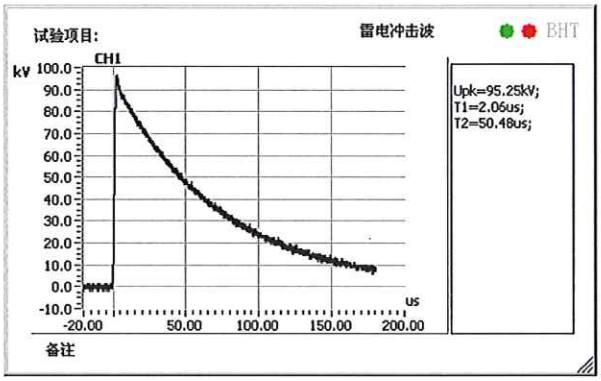
温度：12℃，相对湿度：45%，大气压力：103.5kPa
Ambient temperature:12℃, Relative humidity:45%, Atmosphere: 103.5kPa

kV

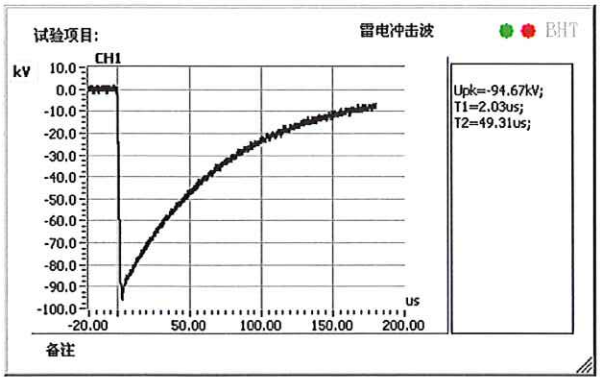
+	94.98	94.15	95.39	95.16	94.82	95.17	95.08	95.18	95.42	95.25
—	94.67	94.67	94.58	95.18	94.28	94.96	95.25	95.24	94.58	94.51



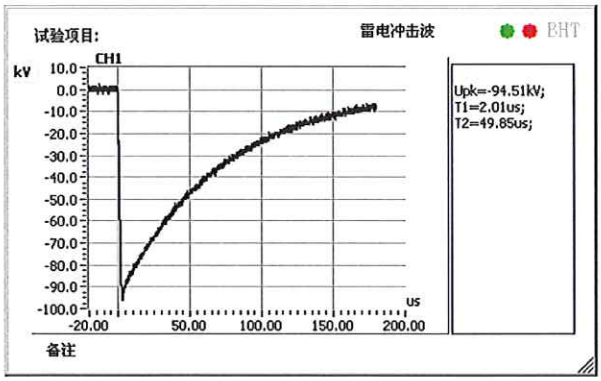
B1:正极性第1次
The 1st positivity lightning impulse waveform



B2:正极性第10次
The 10th positivity lightning impulse waveform



B3:负极性第1次
The 1st negative lightning impulse waveform

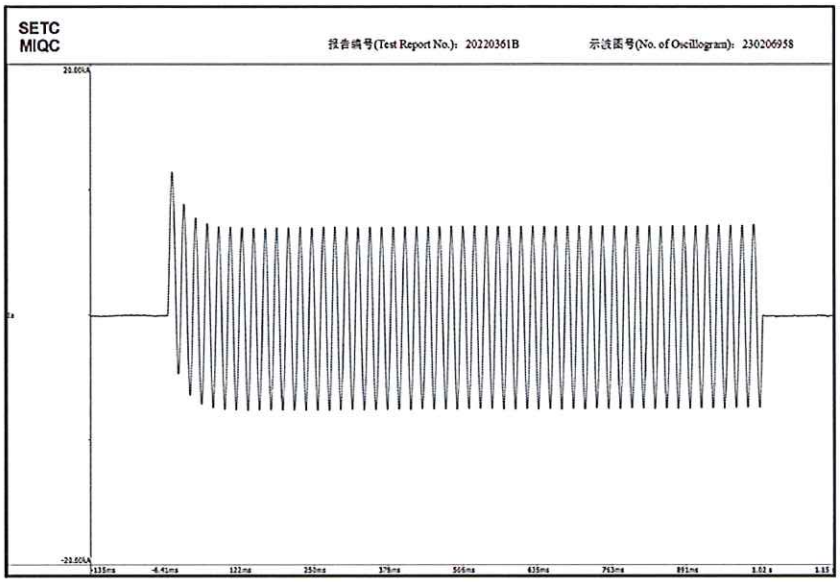


B4:负极性第10次
The 10th negative lightning impulse waveform

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

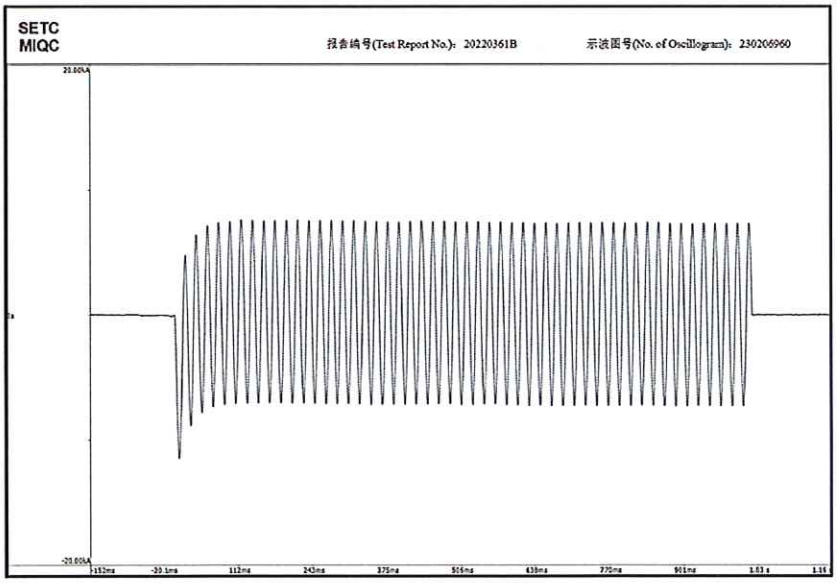
附录C 短路热稳定（屏蔽）电流曲线图

Annex C The graphs of thermal short-circuit (screen) current



短路电流有效值
R.M.S.
value of short-circuit current:
I: 5.12kA
持续时间
Duration time:
t: 1.02s

C1：第1次 The 1st

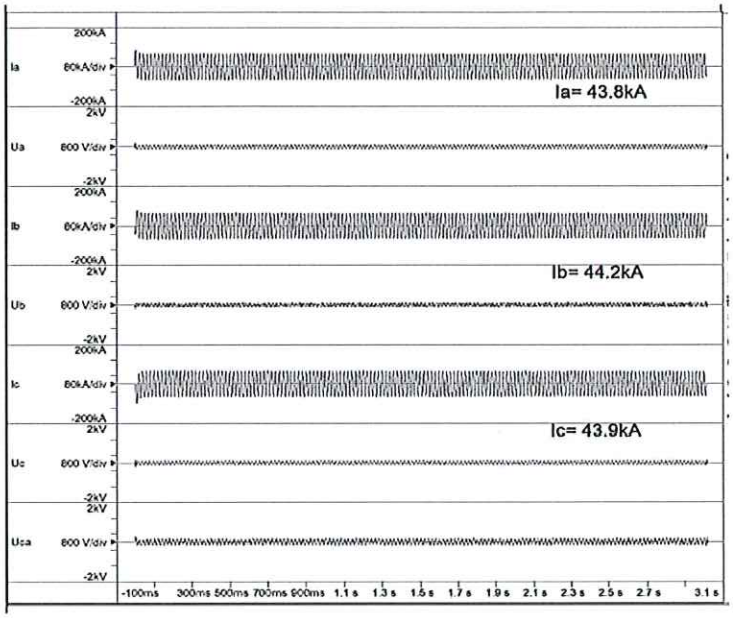


短路电流有效值
R.M.S.
value of short-circuit current:
I: 5.13kA
持续时间
Duration time:
t: 1.02s

C2：第2次 The 2nd

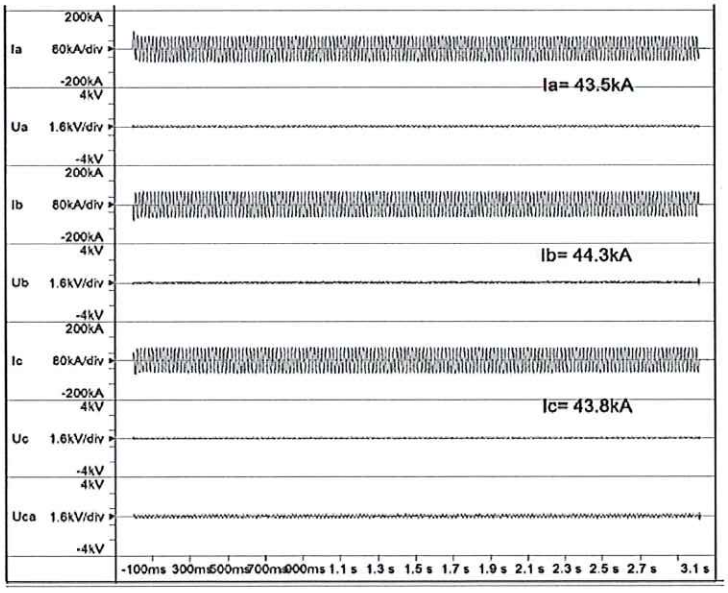
型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

附录D: 短路热稳定（导体）电流曲线图
Annex D The graphs of thermal short-circuit (conductor) current



短路电流有效值
R.M.S.
value of short-circuit current:
I_A: 43.8 kA
I_B: 44.2 kA
I_C: 43.9 kA
持续时间
Duration time:
t:3.02s

D1：第1次 The 1st

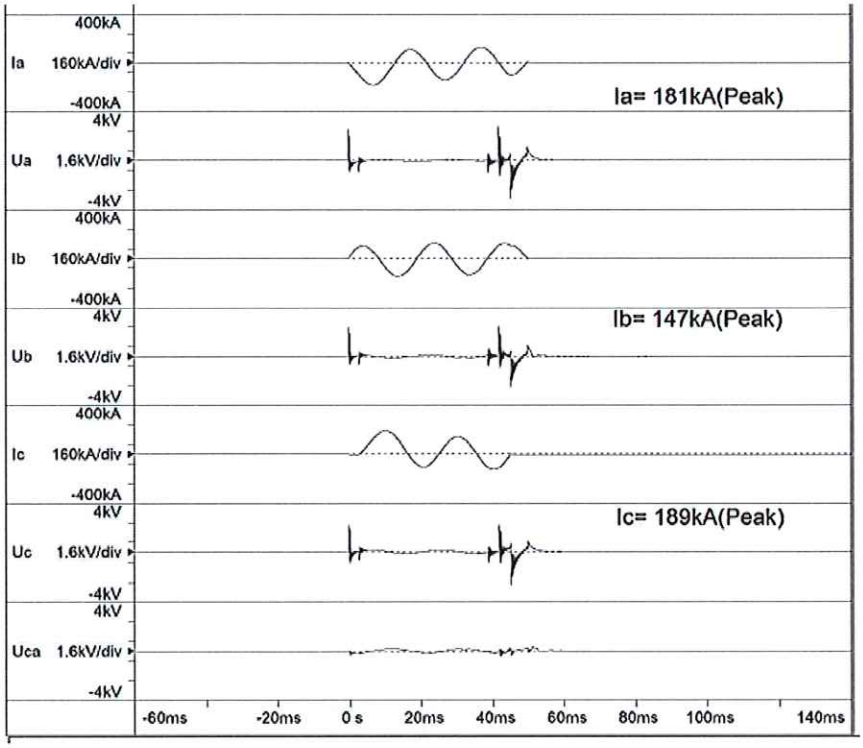


短路电流有效值
R.M.S.
value of short-circuit current:
I_A: 43.5 kA
I_B: 44.3 kA
I_C: 43.8 kA
持续时间
Duration time:
t:3.02s

D2：第2次 The 2nd

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

附录 E 短路动稳定电流曲线图
Annex E The graphs of dynamic short-circuit current



短路电流峰值
Peak value of short-circuit current:
I_A: 181 kA
I_B: 147 kA
I_C: 189 kA
持续时间
Duration time:
t:49.6ms

E1: 短路动稳定电流曲线图 The graphs of dynamic short-circuit current

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

附录F 短路动热稳定试验后样品冲击电压试验实际耐受电压值及其波形图(95kV，允许±3%偏差)

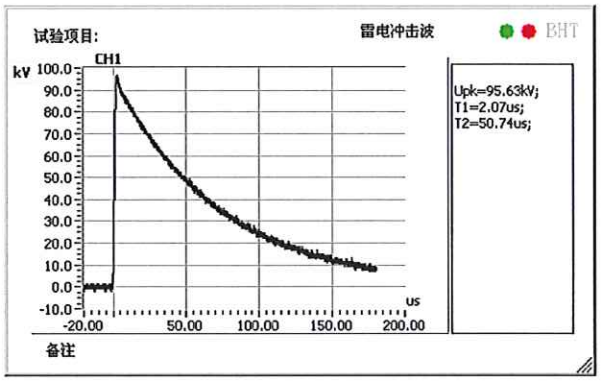
Annex F The values and oscillograms of impulse voltages test on samples after thermal and dynamic short-circuit test (95kV, ±3% tolerance)

温度：10℃，相对湿度：46%，大气压力：103.2kPa

Ambient temperature:10℃, Relative humidity: 46%, Atmosphere: 103.2kPa

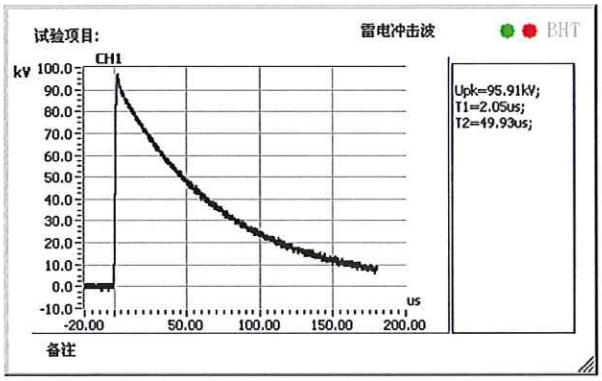
kV

+	95.63	95.86	95.83	95.51	95.09	95.65	95.66	94.58	95.61	95.91
—	94.58	94.93	93.97	94.62	94.85	94.85	94.26	94.77	95.17	94.85



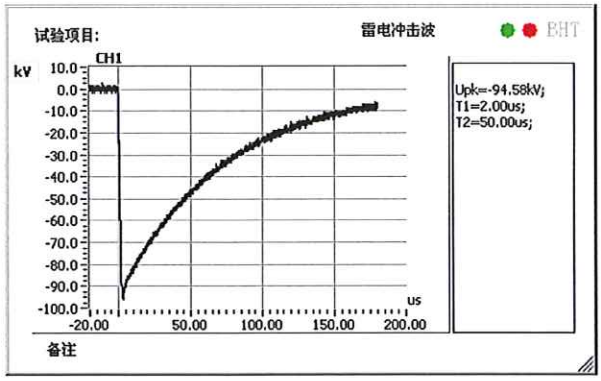
F1:正极性第1次

The 1st positivity lightning impulse waveform



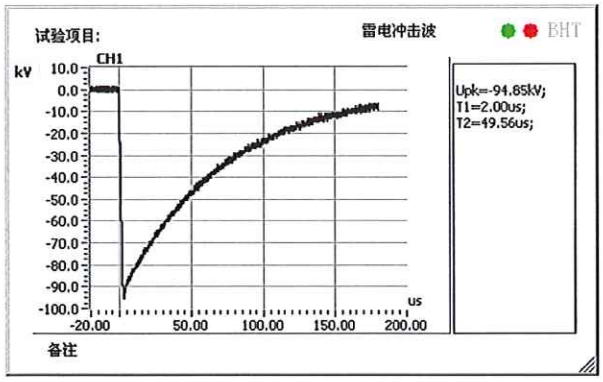
F2:正极性第10次

The 10th positivity lightning impulse waveform



F3:负极性第1次

The 1st negative lightning impulse waveform



F4:负极性第10次

The 10th negative lightning impulse waveform

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

附录G 试验照片

Annex G Photos about testing

G1: 样品外观 The appearance of the sample

G2：样品局部放电试验及交流耐压试验
Partial discharge test and AC voltage test on the sample

G3：冲击电压试验 Impulse voltage test

型号和规格 Type and size	GHD-15HWLS 3×400	报告编号 Reference No.	CT22-03938-2

附录H 试验电缆的标识 Annex H Identification of test cable

额定电压$U_0/U(U_m)$ Rated voltage	8.7/15(17.5) kV	
结构: Construction	芯数 Core number	三芯 Three-core
	屏蔽结构 Screened	分相屏蔽 Individually screened
导体: Conductor	材料 Material	铜 Copper
	形状 Shape	紧压圆形绞合 Stranded compacted circular
	截面 Cross-sectional area	400mm^2
	外径 Overall diameter	22.6mm
绝缘: Insulation	材料 Material	交联聚乙烯 XLPE
	厚度 Thickness	4.5mm
	外径 Overall diameter	33mm
屏蔽: Screen	绝缘屏蔽厚度 Thickness of insulation screen	0.8mm
	绝缘屏蔽是否可剥离 Strippability for insulation screen	可剥离 Strippable
	绝缘屏蔽外径 Overall diameter of insulation screen	34.6mm
	金属屏蔽 Metallic screen	铜带屏蔽 Copper tape
铠装: Armour	结构和材料 Construction and Material	双层钢带 Two steel tapes
外护套: Oversheath	材料 Material	聚氯乙烯 PVC
	外径 Overall diameter	91.2mm
电缆标示: Cable marking	YJV22-8.7/15 3×400	

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检测
TESTING
CNAS L0207

220008343840

报告编号
Reference№ CT22-03938-3

检 测 报 告
Test Report

样品名称 Name of sample	8.7/15kV冷缩中间接头 8.7/15kV cold shrinkable straight joint
样品型号 Type of sample	GHD-15JTLS
委托方 Consigner	航大电气有限公司 ZGHD ELECTRIC CO., LTD.
试验类型 Kind of test	型式试验 Type test

上海国缆检测股份有限公司
SHANGHAI NATIONAL CENTER OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE CO., LTD

国家电线电缆质量检验检测中心
CHINA NATIONAL CENTRE OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE

TICW 国缆检测

地址：上海市宝山区真陈路888号 邮编：200444
电话：021-65493333 传真：021-65490171
电子邮箱：ewec@ticw.com.cn
报告查询网站：www.ticw.com.cn

上海国缆检测股份有限公司
国家电线电缆质量检验检测中心
检测报告

Shanghai National Center of Testing and Inspection for Electric Cable and Wire Co.,Ltd
China National Centre of Testing and Inspection for Electric Cable and Wire
Test Report

试验类型 Kind of test			型式试验 Type Test		报告编号 Reference No.	CT22-03938-3
样品名称 Name of sample			8.7/15kV冷缩中间接头 8.7/15kV cold shrinkable straight joint			
型号规格 Type and Size			GHD-15JTLS 3×400		检测日期 Date of test	2022-11-14 ～ 2023-02-07
委托方	Consigner	名 称 Name	航大电气有限公司 ZGHD ELECTRIC CO.,LTD.			
		地 址 Address	浙江省乐清市乐清湾港区乐商创业园 Yueshang Pioneer Park, Yueqing Bay Port Area, Yueqing City, Zhejiang Province			
		电话号码 Tel.	13764387888	邮政编码 P.C.	325600	单位编号 Unit No. 700993
生产单位	Manufacturer	名 称 Name	航大电气有限公司 ZGHD ELECTRIC CO.,LTD.			
		地 址 Address	浙江省乐清市乐清湾港区乐商创业园 Yueshang Pioneer Park, Yueqing Bay Port Area, Yueqing City, Zhejiang Province			
		电话号码 Tel.	13764387888	邮政编码 P.C.	325600	单位编号 Unit No. 700993
来样方式 Delivering mode			送样 Supplied by consigner	接收状态 Sample state at receiving	正常 Normal	收样日期 Receiving date 2022-10-26
检测依据 Test standard			见第2页 See page 2			
判定依据 Verdict standard			见第2页 See page 2			
检测结论 Conclusion			样品进行了GB/T 12706.4—2020和IEC 60502-4:2010标准要求的全部项目检测，经检测该样品符合GB/T 12706.4—2020和IEC 60502-4:2010标准要求。 All items for the sample have been carried out according to GB/T 12706.4—2020 and IEC 60502-4:2010, and the sample is qualified for the requirements of GB/T 12706.4—2020 and IEC 60502-4:2010.			
备 注 Note			1. 短路热稳定试验和短路动稳定试验不在本机构认可范围内，为分包项目，分包单位为上海电器设备检测所有限公司（CMA资质认定证书号为180008221885）和上海电气输配电试验中心有限公司（CMA资质认定证书号为220008349257），其它试验项目在本中心试验基地—上海市杨浦区军工路1000号开展。Thermal short-circuit test and dynamic short-circuit test are not accredited and are subcontract items. The subcontractor is Shanghai Testing & Inspection Institute for Electrical Equipment Co., Ltd. (CMA Certificate No. 180008221885) and Shanghai Electric Power Transmission & Distribution Testing Centre Co., Ltd. (CMA Certificate No. 220008349257). The other test items have been carried out at our test base No. 1000, Jungong Road, Yangpu district, Shanghai. 2. 样品名称和型号规格由委托方提供。The name and type and size of the sample are provided by consigner. 3. 短路热稳定试验(屏蔽，5kA，1s，2次)试验要求由委托方提供。 The requirements of thermal short-circuit test(screen, 5kA, 1s, two short-circuits)is provided by consigner.			
主 检 Tested by	贺金红 He Jinhong 贺金红	审 核 Checked by	王子强 Wang Ziqiang 王子强	批 准 Approved by	李闯 Li Chuang 李闯	
日期 Date	2023.02.08	日期 Date	2023.02.08	日期 Date	2023.2.8	

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

检 测 依 据：
Test standard:

1. GB/T 12706.4—2020 额定电压1kV(U_m=1.2kV)到35kV(U_m =40.5kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到35kV(U_m =40.5kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1kV(U_m =1.2kV) up to 35kV (U_m =40.5kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6kV(U_m =7.2kV) up to 35kV (U_m =40.5kV)
2. IEC 60502-4:2010 额定电压1kV(U_m =1.2kV)到30kV(U_m =36kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到30kV(U_m =36kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)

判 定 依 据：
Verdict standard:

1. GB/T 12706.4—2020 额定电压1kV(U_m=1.2kV)到35kV(U_m =40.5kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到35kV(U_m =40.5kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1kV(U_m =1.2kV) up to 35kV (U_m =40.5kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6kV(U_m =7.2kV) up to 35kV (U_m =40.5kV)
2. IEC 60502-4:2010 额定电压1kV(U_m =1.2kV)到30kV(U_m =36kV)挤包绝缘电力电缆及附件 第4部分：额定电压6kV(U_m =7.2kV)到30kV(U_m =36kV)电力电缆附件试验要求
Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) –Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

1. 样品描述 Sample description

本试验共有两个试验回路，具体如下
Tests are carried out on two test loops, and details as follows:

1.1 试验回路1 Test loop 1

试验回路1包含一套8.7/15kV冷缩中间接头(一套测试样品)，一套8.7/15kV冷缩户外终端，一套8.7/15kV冷缩户内终端和一根三芯长度10米的电力电缆，电缆的型号规格为YJV22-8.7/15 3×400。

The test loop 1 comprises one 8.7/15kV cold shrinkable straight joint (one test sample), one 8.7/15kV cold shrinkable outdoor termination, one 8.7/15kV cold shrinkable indoor termination and a 10m three cores power cable. Type and size of the cable is YJV22-8.7/15 3×400.

1.2 试验回路2 Test loop 2

组成同试验回路1（一套测试样品）。
Assemblied same as test loop 1 (one test sample).

2. 试验程序 Test sequences

2.1试验回路1和试验回路2均按GB/T 12706.4—2020中表3规定的接头试验程序2.1和IEC 60502-4:2010 表6规定的试验程序2.1进行试验。

Test loop 1 and test loop 2 are tested according to test sequence 2.1 of joint given in table 3 of GB/T 12706.4—2020 and test sequence 2.1 given in table 6 of IEC 60502-4:2010.

2.2 试验回路1完成接头试验程序2.1后，再按GB/T 12706.4—2020中表3规定的试验程序2.2和2.3和IEC 60502-4:2010 表6规定的试验程序2.2和2.3进行试验。

Test loop 1 is tested according to test sequence 2.2 and 2.3 of joint given in table 3 of GB/T 12706.4—2020 and test sequence 2.2 and 2.3 of joint given in table 6 of IEC 60502-4:2010 after completing test sequence 2.1 of joint .

2.3 试验项目中检验（检查）项目结果“无异常”，是指试验后无以下任一现象：

The “no abnormality” in test result of examination in test item means the any of following phenomena shall not appear after testing:

(Ⅰ) 填充物和/或带材或管件有裂纹； cracking in the filling media and/or tape or tube components;

(Ⅱ) 主要密封部位有贯穿性潮湿通道； a moisture path across a primary seal;

(Ⅲ) 腐蚀和/或漏电痕迹、电蚀，最后导致附件的损坏；

corrosion and/or tracking and/or erosion which would, in time, lead to failure of the accessory;

(Ⅳ) 任何绝缘材料渗漏。leakage of any insulating material.

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
1	试验程序 Sequence 2.1				
1.1	交流耐压试验(39kV，5min) AC voltage test (39kV, 5min)		不击穿 No breakdown	两个样品均未击穿 No breakdown for two samples	P
1.2	直流耐压试验 (负极性，35kV，15min) DC voltage test (Negative polarity, 35kV, 15min)		不击穿 No breakdown	两个样品均未击穿 No breakdown r for two samples	P
1.3	局部放电试验(15kV) Partial discharge(15kV)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.4	冲击电压试验 (95～100℃，95kV，正负极性各 10 次) Impulse voltage test (95～100℃, 95kV, 10 impulses of each polarity)		不击穿 No breakdown	两个样品均未击穿 No breakdown for two samples	P
1.5	空气中恒压负荷循环试验 (22kV。加热循环至少 8h，95℃～100℃至少 2h，自然冷却至少 3h，共 30 次热循环) Heating cycles test in air (22kV. Heating cycle at least 8h, 95℃～100℃ at least 2h, natural cooling at least 3h, total 30 heating cycles)		不击穿 No breakdown	两个样品均未击穿 No breakdown for two samples	P
1.6	水中恒压负荷循环试验 (22kV。加热循环至少 8h，95℃～100℃至少 2h，自然冷却至少 3h，共 30 次热循环。中间接头整体浸水，水面高出中间接头 1m，离中间接头 100mm 处，在电缆上开 50mm 宽的圆环，剥除环内金属屏蔽外部所有护层及填充。) Heating cycles test under water (22kV. Heating cycle at least 8h, 95℃～100℃ at least 2h, natural cooling at least 3h, total 30 heating cycles. While the straight joints were immersed in water, the height of the water was 1m above the test object.		不击穿 No breakdown	两个样品均未击穿 No breakdown for two samples	P

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
	Expose the cores of the cable at the entry to the accessory by removing an annulus of the oversheath, together with any bedding or filling material for a distance of 50 mm, at a point which will be within the water and between 100mm from the exterior of the joint.)				
1.7	局部放电试验 Partial discharge				
1.7.1	局部放电试验(15kV, 95～100℃) Partial discharge(15kV, 95～100℃)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.7.2	局部放电试验(15kV,环境温度) Partial discharge(15kV, ambient temperature)	pC	≤10	≤1.8 (灵敏度Sensitivity：1.8)	P
1.8	冲击电压试验 (室温，95kV，正负极性各 10 次) Impulse voltage test (ambient temperature，95kV, 10 impulses of each polarity)		不击穿 No breakdown	两个样品均未击穿 No breakdown for two samples	P
1.9	交流耐压试验(22kV，15min) AC voltage test (22kV, 15min)		不击穿 No breakdown	两个样品均未击穿 No breakdown for two samples	P
1.10	检验（检查） Examination		/	样品无异常 No abnormality on the sample	N
2	试验程序 Sequence 2.2+2.3				
2.1	交流耐压试验(39kV，5min) AC voltage test (39kV, 5min)		不击穿 No breakdown	样品未击穿 No breakdown for the sample	P
2.2	直流耐压试验 (负极性，35kV，15min) DC voltage test (Negative polarity, 35kV, 15min)		不击穿 No breakdown	样品未击穿 No breakdown for the sample	P
2.3	短路热稳定试验 (屏蔽，5kA，1s，2 次) Thermal short-circuit test (Screen, 5kA, 1s, two short-circuits)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration	P

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
2.3.1	短路试验前导体加热 Conductor heating before carrying out the short-circuit test		应对导体加热并在95℃~100℃下至少稳定 2h The conductor shall be heated and stabilized for at least 2h at 95℃~100℃	导体温度稳定在95℃~100℃，并保持2h Conductor temperature is stabilized for 2h at 95℃～100℃	P
2.3.2	第一次短路试验 The 1st short-circuit test		/	5.12kA, 1.02s	N
	短路试验前屏蔽温度 Temperature of screen before carrying out the 1st short-circuit test	℃	/	81.5	N
	--短路试验后屏蔽最高温度 The highest temperature of screen after carrying out the 1st short-circuit test	℃	/	100.3	N
2.3.3	第二次短路试验 The 2nd short-circuit test		/	5.13kA, 1.02s	N
	--短路试验前屏蔽温度 Temperature of screen before carrying out the 2nd short-circuit test	℃	/	81.7	N
	--短路试验后屏蔽最高温度 The highest temperature of screen after carrying out the 2nd short-circuit test	℃	/	100.5	N
2.4	短路热稳定试验 (导体，42.8kA，3s，2 次) Thermal short-circuit test (conductor, 42.8kA, 3s, two short-circuits)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration for the sample (环境温度 ambient temperature：13℃)	P
2.5	短路动稳定试验 (185.3kA，至少 10ms，1 次) Dynamic short-circuit test (185.3kA, at least 10ms, One short-circuit)		无可见损伤 No visible deterioration	样品未见损伤 No visible deterioration for the sample (环境温度 ambient temperature：13℃)	P

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict.

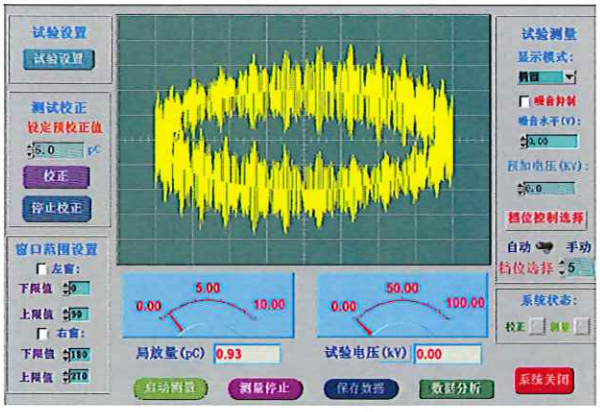
型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

序号 No.	检测项目 Test Items	单位 Unit	技术要求 Requirements	检测结果 Test Results	单项评定 Verdict
2.6	冲击电压试验 (室温，95kV，正负极性各 10 次) Impulse voltage test (ambient temperature，95kV, 10 impulses of each polarity)		不击穿 No breakdown	样品未击穿 No breakdown for the sample	P
2.7	交流耐压试验(22kV，15min) AC voltage test (22kV, 15min)		不击穿 No breakdown	样品未击穿 No breakdown for the sample	P
2.8	检验（检查）Examination		/	样品无异常 No abnormality on the sample	N
	以下为试验图形和照片 Following oscillograms and photos about testing				

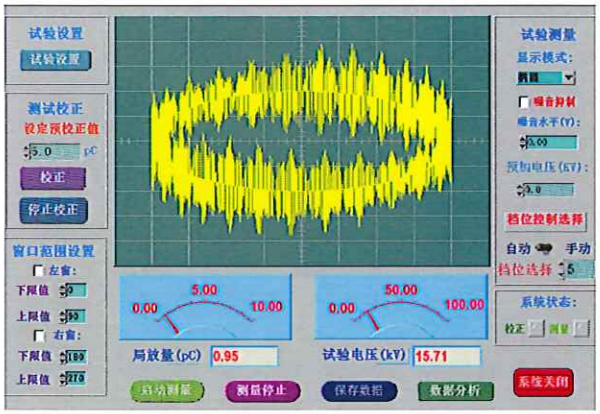
注：“单项评定”符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: “P” means this item does meet the requirement, “F” means this item does not meet the requirement, “N” means this item does not require to the verdict.

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

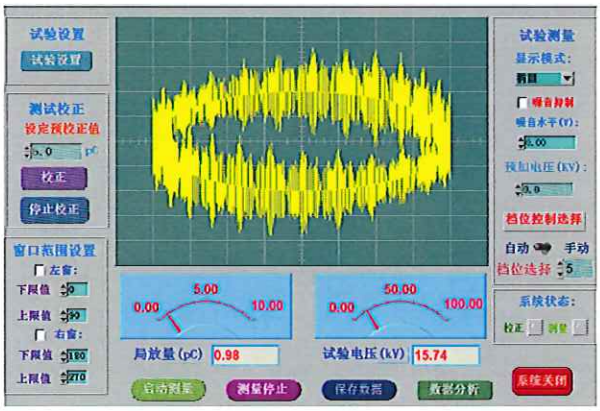
附录A 恒压负荷循环试验后局部放电试验图形（环境温度）
Annex A Oscillograms of partial discharges on the sample after heating cycles test (ambient temperature)



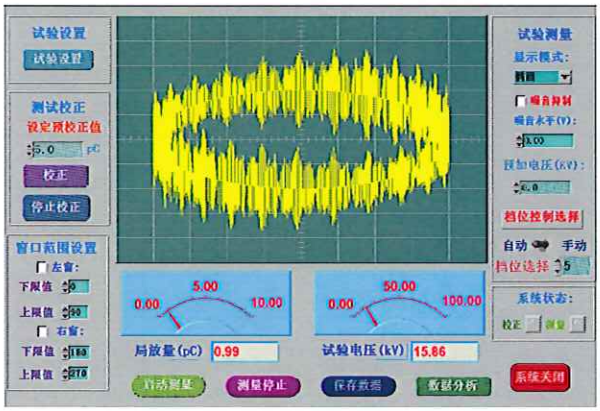
A1：试验回路1局部放电试验背景噪声
The background noise during partial discharge test on test loop 1



A2: 试验回路1红芯在15kV下局部放电试验图形
The oscillogram of partial discharge of red core at 15kV on test loop 1

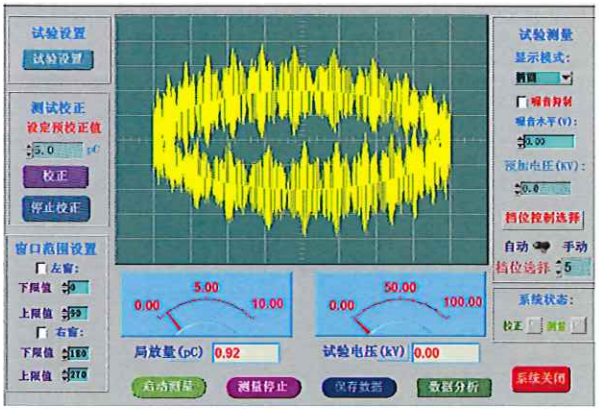


A3：试验回路1黄芯在15kV下局部放电试验图形
The oscillogram of partial discharge of yellow core at 15kV on test loop 1

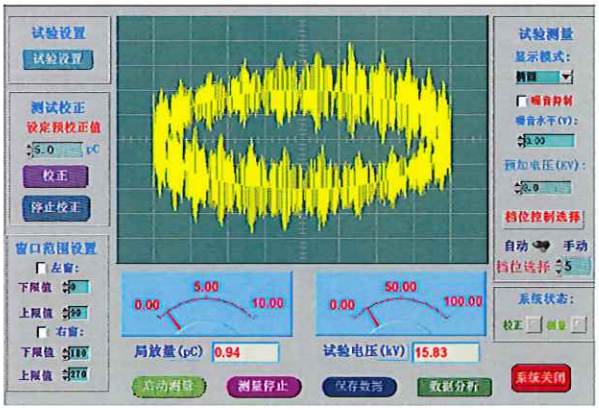


A4：试验回路1绿芯在15kV下局部放电试验图形
The oscillogram of partial discharge of green core at 15kV on test loop 1

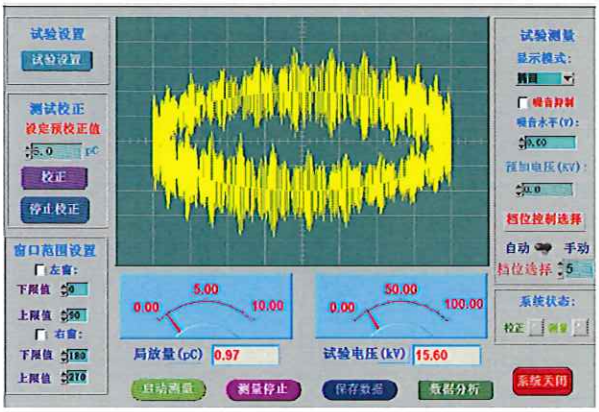
型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3



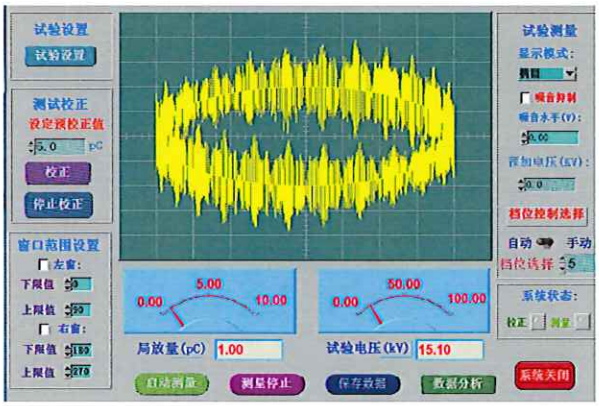
A5：试验回路2局部放电试验背景噪声
The background noise during partial discharge test on test loop 2



A6：试验回路2红芯在15kV下局部放电试验图形
The oscillogram of partial discharge of red core at 15kV on test loop 2



A7：试验回路2黄芯在15kV下局部放电试验图形
The oscillogram of partial discharge of yellow core at 15kV on test loop 2



A8： 试验回路2绿芯在15kV下局部放电试验图形
The oscillogram of partial discharge of green core at 15kV on test loop 2

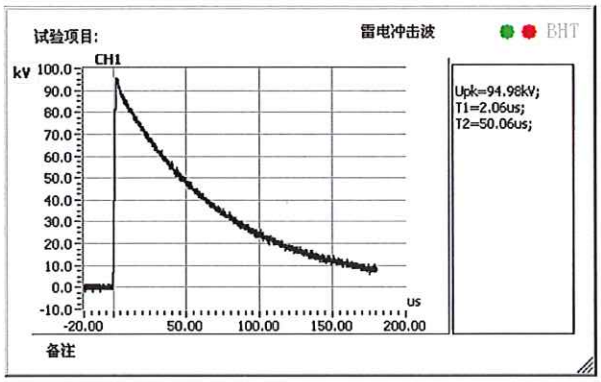
型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录B 恒压负荷循环试验后样品冲击电压试验实际耐受电压值及其波形图(95kV，允许±3%偏差)
Annex B The values and oscillograms of impulse voltages test on samples after heating cycles voltage test (95kV, ±3% tolerance)

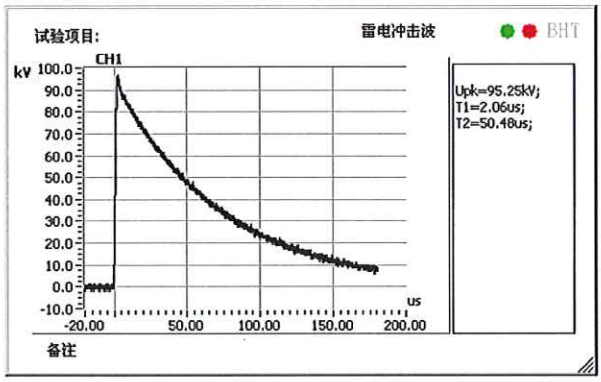
温度：12℃，相对湿度：45%，大气压力：103.5kPa
Ambient temperature:12℃, Relative humidity:45%, Atmosphere: 103.5kPa

kV

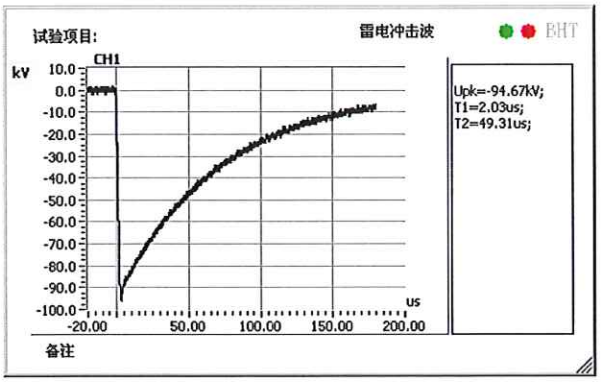
+	94.98	94.15	95.39	95.16	94.82	95.17	95.08	95.18	95.42	95.25
—	94.67	94.67	94.58	95.18	94.28	94.96	95.25	95.24	94.58	94.51



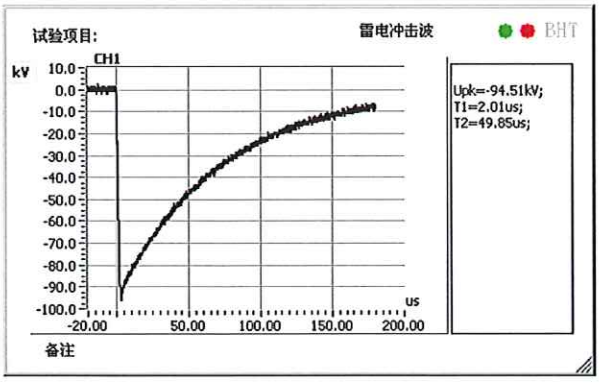
B1:正极性第1次
The 1st positivity lightning impulse waveform



B2:正极性第10次
The 10th positivity lightning impulse waveform



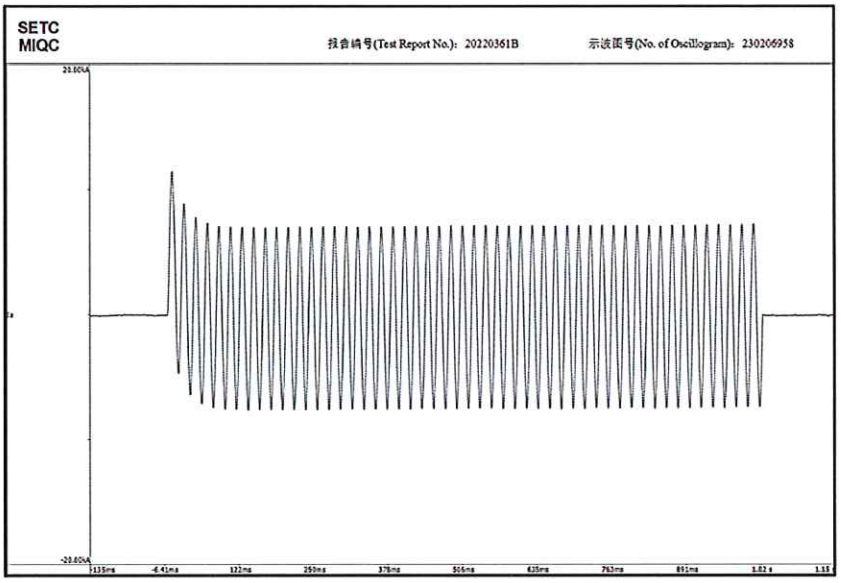
B3:负极性第1次
The 1st negative lightning impulse waveform



B4:负极性第10次
The 10th negative lightning impulse waveform

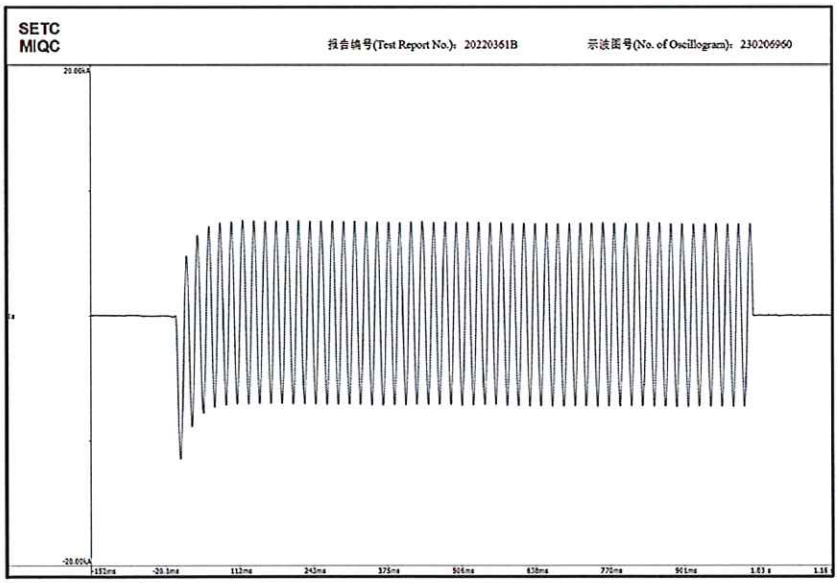
型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录C 短路热稳定（屏蔽）电流曲线图
Annex C The graphs of thermal short-circuit (screen) current



短路电流有效值
R.M.S.
value of short-circuit current:
I: 5.12kA
持续时间
Duration time:
t: 1.02s

C1：第1次 The 1st

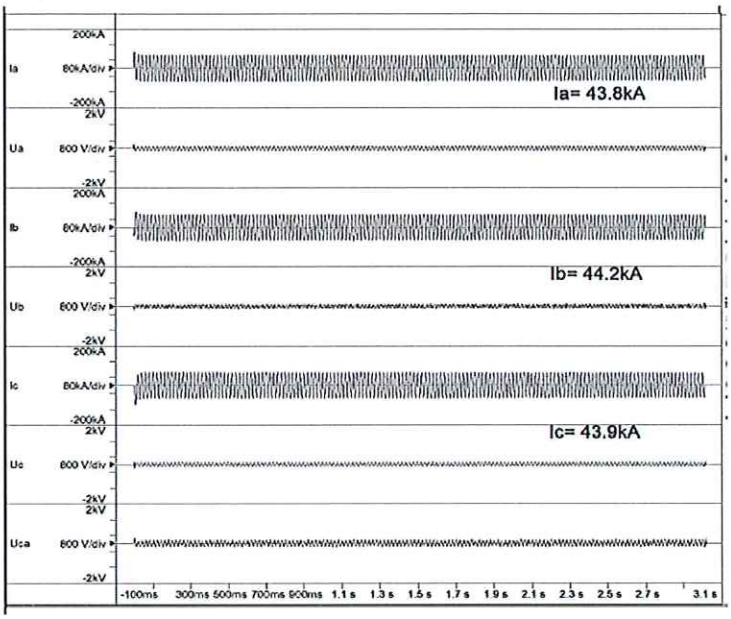


短路电流有效值
R.M.S.
value of short-circuit current:
I: 5.13kA
持续时间
Duration time:
t: 1.02s

C2：第2次 The 2nd

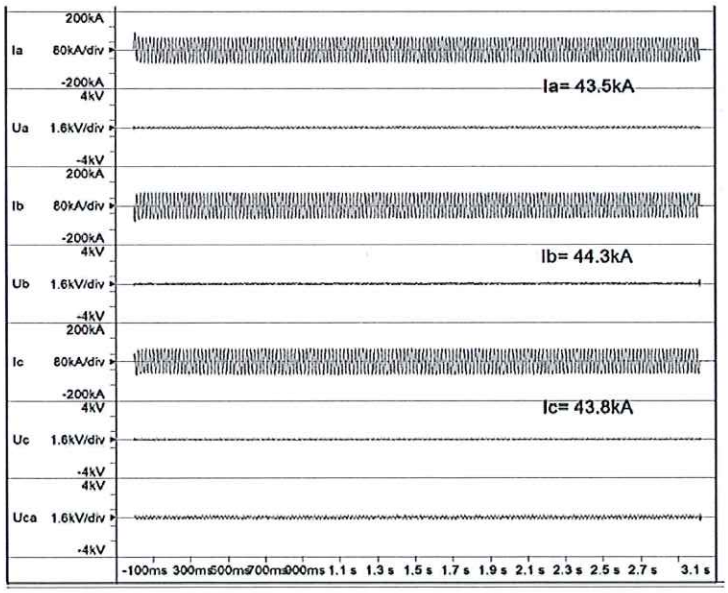
型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录D: 短路热稳定（导体）电流曲线图
Annex D The graphs of thermal short-circuit (conductor) current



短路电流有效值
R.M.S.
value of short-circuit current:
I_A: 43.8 kA
I_B: 44.2 kA
I_C: 43.9 kA
持续时间
Duration time:
t:3.02s

D1：第1次 The 1st

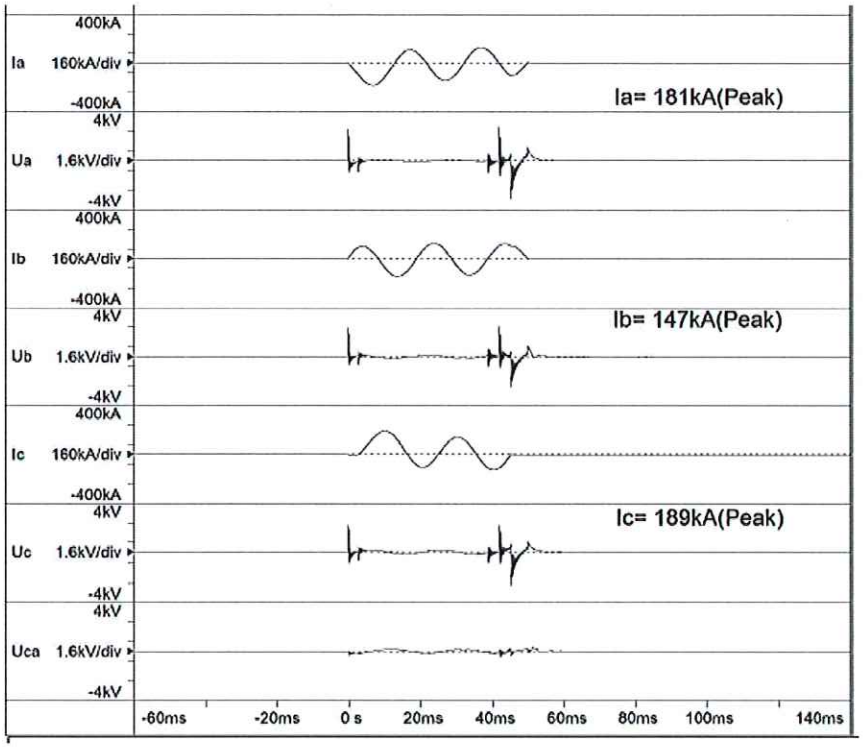


短路电流有效值
R.M.S.
value of short-circuit current:
I_A: 43.5 kA
I_B: 44.3 kA
I_C: 43.8 kA
持续时间
Duration time:
t:3.02s

D2：第2次 The 2nd

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录 E 短路动稳定电流曲线图
Annex E The graphs of dynamic short-circuit current



短路电流峰值
Peak value of short-circuit current:
I_A: 181 kA
I_B: 147 kA
I_C: 189 kA
持续时间
Duration time:
t:49.6ms

E1: 短路动稳定电流曲线图 The graphs of dynamic short-circuit current

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录F 短路动热稳定试验后样品冲击电压试验实际耐受电压值及其波形图(95kV，允许±3%偏差)

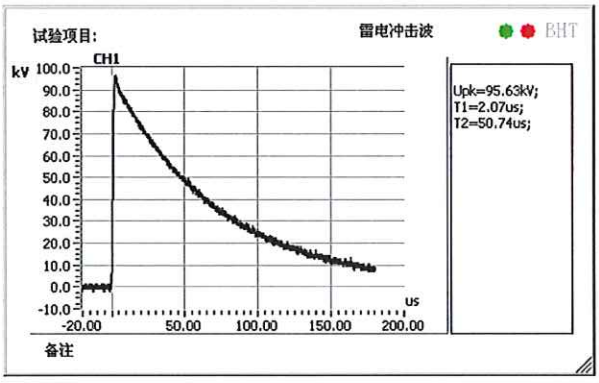
Annex F The values and oscillograms of impulse voltages test on samples after thermal and dynamic short-circuit test (95kV, ±3% tolerance)

温度：10℃，相对湿度：46%，大气压力：103.2kPa

Ambient temperature:10℃, Relative humidity: 46%, Atmosphere: 103.2kPa

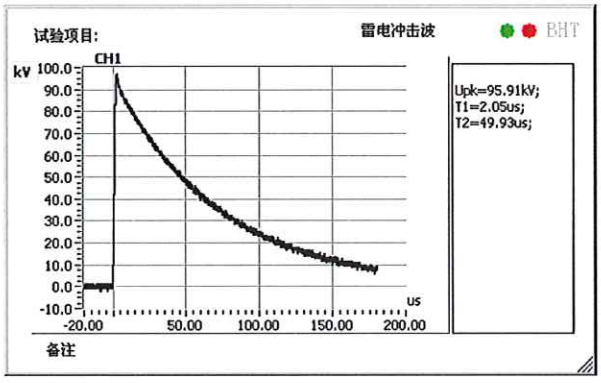
kV

+	95.63	95.86	95.83	95.51	95.09	95.65	95.66	94.58	95.61	95.91
—	94.58	94.93	93.97	94.62	94.85	94.85	94.26	94.77	95.17	94.85



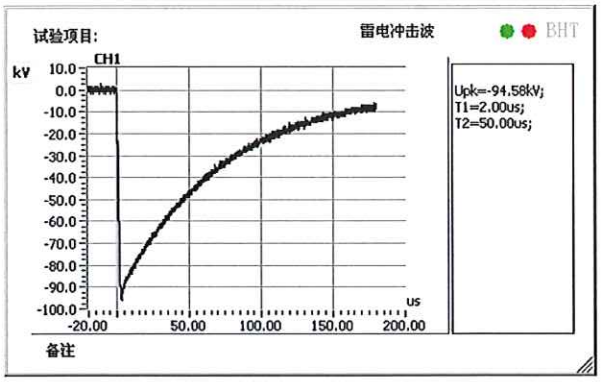
F1:正极性第1次

The 1st positivity lightning impulse waveform



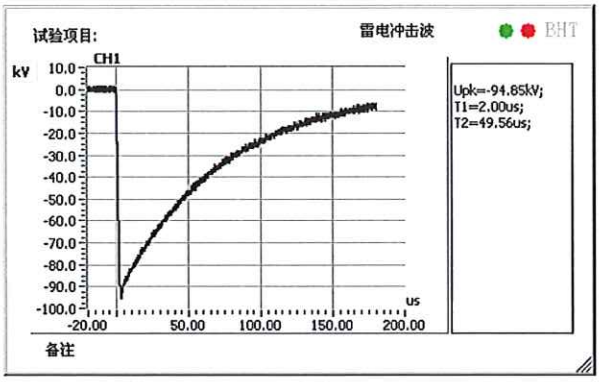
F2:正极性第10次

The 10th positivity lightning impulse waveform



F3:负极性第1次

The 1st negative lightning impulse waveform



F4:负极性第10次

The 10th negative lightning impulse waveform

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录G 试验照片

Annex G Photos about testing

G1: 样品外观 The appearance of the sample

G2：样品局部放电试验及交流耐压试验
Partial discharge test and AC voltage test on the sample

G3：冲击电压试验 Impulse voltage test

型号和规格 Type and size	GHD-15JTLS 3×400	报告编号 Reference No.	CT22-03938-3

附录H 试验电缆的标识 Annex H Identification of test cable

额定电压$U_0/U(U_m)$ Rated voltage	8.7/15(17.5) kV	
结构： Construction	芯数 Core number	三芯 Three-core
	屏蔽结构 Screened	分相屏蔽 Individually screened
导体： Conductor	材料 Material	铜 Copper
	形状 Shape	紧压圆形绞合 Stranded compacted circular
	截面 Cross-sectional area	400mm^2
	外径 Overall diameter	22.6mm
绝缘： Insulation	材料 Material	交联聚乙烯 XLPE
	厚度 Thickness	4.5mm
	外径 Overall diameter	33mm
屏蔽： Screen	绝缘屏蔽厚度 Thickness of insulation screen	0.8mm
	绝缘屏蔽是否可剥离 Strippability for insulation screen	可剥离 Strippable
	绝缘屏蔽外径 Overall diameter of insulation screen	34.6mm
	金属屏蔽 Metallic screen	铜带屏蔽 Copper tape
铠装： Armour	结构和材料 Construction and Material	双层钢带 Two steel tapes
外护套： Oversheath	材料 Material	聚氯乙烯 PVC
	外径 Overall diameter	91.2mm
电缆标示： Cable marking	YJV22-8.7/15 3×400	