No.DY212543

中国认可
国际互认
检测
TESTING
CNAS L0153

TEST REPORT

Name of product	18/30 (36) kV Screened separable connector
Type Specification	GCA CJB30-630 1×300
Applicant	GCA Co., Ltd.
Testing category	Type Tests

Guangdong Testing Institute Of Product Quality Supervision
GQI
(GDI)

GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION

DECLARATION

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5. **The result of commission test relates only to the sample(s) tested.**

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No.DY212543

Guangdong Testing Institute of Product Quality Supervision

TEST REPORT

Name of product	18/30（36）kV Screened separable connector	Date of manufacturing / expiry	———/———
Type, Specification, Trade mark, Class	GCA CJB30-630 1×300	Batch No.	———/———
Inspected unit	———	No. of testing / sampling plan	YDY21/000657/ ———
Address of inspected unit	———	Testing category	Type Tests
Applicant	GCA Co., Ltd.	Location of sampling	———
Manufacturer	GCA Co., Ltd.	Basic quantity of sampling	———
Address of Manufacturer	19th, South Road 4, Guicheng, Nanhai District, Foshan City, Guangdong Province, China	Way of sample incoming Personnel performing sending / sampling	Customer Sampling Sending (Long Liying)
Quantity of sample	8 pcs	Date of receipt of sample / sampling	2021-06-29/ ———
Status of sample	Good condition	Date(s) of performance of tests	2021-07-02 to 2021-08-18
Testing reference	IEC 60502-4:2010 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).		
Judgment reference	IEC 60502-4:2010 Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um=1,2 kV) up to 30 kV (Um=36 kV) – Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (Um=7,2 kV) up to 30 kV (Um=36 kV). Consigner's technical requirements.		
Conclusion	**The samples were tested according to the testing standards and product technical specifications. All items were tested positive.** Official testing stamp of the institute Date of issue 2021-09-01		
Notes	The 18/30 (36) kV screened separable connector equipped with mechanical cable lug.		

Approved by: Reviewed by: Tested by:

Catalogue

Descriptions of samples, test cables and test circuits

Description of samples		
Name		18/30 (36) kV Screened separable connector
Model		GCA CJB30-630 1×300
Rated voltage, U_0/U (U_m) (kV)		18/30 (36)
No. of cores		Single-core
Description of test cables		
Rated voltage, U_0/U (U_m) (kV)		18/30 (36)
Structure	No. of cores	Single-core
	Screen structure	Phase separation shielding
Conductor	Material	Aluminium
	Shape	Compact circular stranding
	Cross-section	300 mm^2
	External diameter	20.5 mm
Insulation	Material	XLPE
	Thickness	8 mm
	External diameter	38.6 mm
Maximum cable conductor temperature in normal operation		90 ℃
Maximum permissible short-circuit temperature of cable		250 ℃
Screen	Conductor screen thickness	1 mm
	Insulation screen thickness	0.5 mm
	Whether the insulation shield can be stripped	Non strippable
	Insulation screen external diameter	39.6 mm
	Metallic screen	Copper wire
Armour		None
Outer sheath	Material	PE
	External diameter	47.1 mm
Cable marking		NA2XS (F) 2Y 1×300/25
Cable Mamufacturer		SYNERGY CABLES LTD.

Descriptions of samples, test cables and test circuits

Description of test circuits

Test sequence 4.1	Loop 1#	Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-1) + Bushing + Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-2)
	Loop 2#	Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-3) + Bushing + Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-4)
Test sequences 4.2, 4.3	Loop 3#	Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-5)
	Loop 4#	Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-6)
	Loop 5#	Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-7)
Screen resistance and Screen leakage current	Loop 6#	Cold shrinkable termination (Cooperation test) + Cable + 18/30kV Screened separable connector (8-8)

Note:
Before the type tests, a calibration cable with a length of 2 m and the same specification as the test cable was sent by the manufacturer, to determine the conductor temperature by direct measurement for a given current, within the temperature range required for the test (at the maximum cable conductor temperature in normal operation +5 K to 10 K). Method A.3.1 in annex A of IEC 61442 was used as a guide.

Calibration result

Current	765 A
Cable conductor temperature	97.5 ℃
Ambient temperature	32.0 ℃

Test items and results summary			
No.	**Test items**	**Test Requirement**	**Result**
Test sequence 4.1			
1	AC voltage (dry test)	81 kV (4.5 U_0), 5 min	Pass
2	DC voltage (dry test)	72 kV (4 U_0), 15 min	Pass
3	Partial discharge (at ambient temperature)	30 kV (1.73 U_0), ≤ 10 pC	Pass
4	Impulse (at the maximum cable conductor temperature in normal operation +5 K to 10 K)	Power cable temperature: (95~100) ℃ 170 kV, 10 impulses of each polarity	Pass
5	Heating cycles in air	Power cable temperature: (95~100) ℃ 45 kV (2.5 U_0), 30 cycles (8 h total with ≥ 2 h steady and ≥ 3 h cooling)	Pass
6	Heating cycles under water	Power cable temperature: (95~100) ℃ 45 kV (2.5 U_0), 30 cycles (8 h total with ≥ 2 h steady and ≥ 3 h cooling), water height 1 m	Pass
7	Disconnect/connect	Five times. No visible damage to contact	Pass
8	Partial discharge (at ambient temperature)	30 kV (1.73 U_0), ≤ 10 pC	Pass
9	Partial discharge (at the maximum cable conductor temperature in normal operation +5 K to 10 K)	Power cable temperature: (95~100) ℃ 30 kV (1.73 U_0), ≤ 10 pC	Pass
10	Impulse (at ambient temperature)	170 kV, 10 impulses of each polarity	Pass
11	AC voltage (dry test)	45 kV (2.5 U_0), 15 min	Pass
12	Examination	See page 18	Pass
Test sequences 4.2, 4.3			
13	AC voltage (dry test)	81 kV (4.5U_0), 5 min	Pass
14	DC voltage (dry test)	72 kV (4 U_0), 15 min	Pass
15	Thermal short-circuit (screen)	Power cable temperature: (95~100) ℃ I_{sc}: $3.5_0^{+5\%}$ kA/1s, two short-circuits	Pass
16	Thermal short-circuit (conductor)	I_{sc}: $24.5_0^{+5\%}$ kA/2s, two short-circuits	Pass
17	Dynamic short-circuit	I_d: $86.7_0^{+5\%}$ kA, ≥ 10ms	Pass

Test items and results summary

No.	Test items	Test Requirement	Result
18	Disconnect/connect	Five times. No visible damage to contact	Pass
19	Impulse (at ambient temperature)	170 kV, 10 impulses of each polarity	Pass
20	AC voltage (dry test)	45 kV (2.5 U_0), 15 min	Pass
21	Examination	See page 27	Pass
Screen resistance, Screen leakage current			
22	Screen resistance	Before and after thermal aging (120℃, 168 h) ≤ 5 kΩ	Pass
23	Screen leakage current	36 kV (U_m), ≤ 0.5 mA.	Pass

Test sequence 4.1	AC voltage (dry test)

Ambient temperature: 31.3 ℃, Humidity: 75 %, Atmos: 100.5 kPa Date of Test: 2 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $4.5U_0$ (kV)	Actual applied voltage (RMS) (kV)	Duration (min)	Test conditions
Main circuit to earth	Loop 1#	Metallic screen	81	81.1	5	No breakdown, No flashover
	Loop 2#	Metallic screen	81	81.0	5	No breakdown, No flashover

Samples condition before test: New

Result
The test was passed.

Test sequence 4.1	DC voltage (dry test)

Ambient temperature: 31.3 ℃, Humidity: 75 %, Atmos: 100.5 kPa Date of Test: 2 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $4U_0$ (kV)	Actual applied voltage (RMS) (kV)	Duration (min)	Test conditions
Main circuit to earth	Loop 1#	Metallic screen	72	72	15	No breakdown, No flashover
	Loop 2#	Metallic screen	72	72	15	No breakdown, No flashover

Result
The test was passed.

Test sequence 4.1	Partial discharge (at ambient temperature)

Ambient temperature: 31.3 ℃, Humidity: 75 %, Atmos: 100.5 kPa Date of Test: 2 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $1.73U_0$ (kV)	Actual applied voltage (RMS) (kV)	Partial discharge level (pC)	Requirement (pC)
Main circuit to earth	Loop 1#	Metallic screen	30	30.1	< 4	≤ 10
	Loop 2#	Metallic screen	30	30.2	< 4	≤ 10

Note:

1. Ambient noise < 1 pC
2. The test was carried out at ambient temperature.

Result

The test was passed.

Test sequence 4.1	**Impulse (at the maximum cable conductor temperature in normal operation +5 K to 10 K)**

Ambient temperature: 31.3 ℃, Humidity: 75 %, Atmos: 100.5 kPa Date of Test: 2 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Polarity	Applied voltage (peak) (kV)	Actual applied voltage (peak) (kV)	No.	Test conditions
Main circuit to earth	Loop 1#	Metallic screen	Positive	170	169.42~170.76	10	No breakdown, No flashover
			Negative	170	169.98~174.28	10	No breakdown, No flashover
	Loop 2#	Metallic screen	Positive	170	165.48~170.60	10	No breakdown, No flashover
			Negative	170	170.16~171.93	10	No breakdown, No flashover

Note:

1. Stable conductor temperature 97.5 ℃
2. Actual applied voltage (peak)

(kV)

Loop 1#	Positive	169.97	170.31	169.42	169.56	170.04	169.69	170.23	170.76	169.97	170.31
	Negative	173.59	170.26	171.63	174.28	170.75	171.55	169.98	171.22	173.59	170.26
Loop 2#	Positive	165.48	170.18	170.60	169.77	170.42	170.18	170.21	169.83	165.48	170.18
	Negative	170.62	170.82	171.93	170.58	171.23	170.64	171.03	170.16	170.62	170.82

3. Impulse typical oscillograms (see appendix) L21-DY0656-S01~L21-DY0656-S04

Result

The test was passed.

Test sequence 4.1	Heating cycles in air

Ambient temperature: (25.0~32.0) ℃, Humidity: 55 %~72 % Date of Test: 14 July, 2021~24 July, 2021

No. of heating cycles	Require stable conductor temperature (℃)	Heating current (A)	Heating per cycle		Cooling per cycle	Voltage per cycle	
			Total duration (h)	Duration of conductor at stable temperature (h)	Total duration (h)	Total duration (h)	Applied voltage (RMS) $1.73U_0$ (kV)
30	95~100	765	5	2	3	8	45

Note:
1.Test loop Loop 1# + Loop 2#
2. Stable conductor temperature 97.5 ℃

Result
The test was passed, during the test, no breakdown and flashover occured.

Test sequence 4.1	Heating cycles under water						
Ambient temperature: (26.5~32.0) ℃, Humidity: 58 %~70 % Date of Test: 28 July, 2021~7 August, 2021							
No. of heating cycles	Require stable conductor temperature (℃)	Heating current (A)	Heating per cycle		Cooling per cycle	Voltage per cycle	
			Total duration (h)	Duration of conductor at stable temperature (h)	Total duration (h)	Total duration (h)	Applied voltage (RMS) $1.73U_0$ (kV)
30	95~100	765	5	2	3	8	45

Note:
1.Test loop Loop 1# + Loop 2#
2. Stable conductor temperature 97.5 ℃
3.Separable connectors were installed in a vessel so as to have a height of water 1.0 m above the top surface of them. The water were at ambient temperature.

Result
The test was passed, during the test, no breakdown and flashover occured.

Test sequence 4.1	Disconnect/connect		
Ambient temperature: 30.8 ℃, Humidity: 70 %			Date of Test: 9 August, 2021
Samples of disconnect/connect	No. of disconnect/connect	Requirement	Observations
Loop 1#	5	No visible damage to contact	Complied
Loop 2#	5	No visible damage to contact	Complied

Result
The test was passed.

Test sequence 4.1	Partial discharge (at ambient temperature)

Ambient temperature: 30.4℃ , Humidity: 76 %, Atmos: 100.6 kPa Date of Test: 10 August, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $1.73U_0$ (kV)	Actual applied voltage (RMS) (kV)	Partial discharge level (pC)	Requirement (pC)
Main circuit to earth	Loop 1#	Metallic screen	30	30.2	< 3	≤ 10
	Loop 2#	Metallic screen	30	30.1	< 3	≤ 10

Note:

1. Ambient noise < 1 pC
2. The test was carried out at ambient temperature.

Result

The test was passed.

Test sequence 4.1	Partial discharge (at the maximum cable conductor temperature in normal operation +5 K to 10 K)

Ambient temperature: 30.4 ℃, Humidity: 76 %, Atmos: 100.6 kPa Date of Test: 10 August, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $1.73U_0$ (kV)	Actual applied voltage (RMS) (kV)	Partial discharge level (pC)	Requirement (pC)
Main circuit to earth	Loop 1#	Metallic screen	30	29.9	< 4	≤10
	Loop 2#	Metallic screen	30	30.1	< 3	≤10

Note:

1. Ambient noise < 1 pC
2. Stable conductor temperature 97.5 ℃

Result

The test was passed.

Test sequence 4.1	Impulse (at ambient temperature)

Ambient temperature: 30.4 ℃, Humidity: 76 %, Atmos: 100.6 kPa Date of Test: 10 August, 2021

Testing arrangement	Voltage applied to	Earth connected to	Polarity	Applied voltage (peak) (kV)	Actual applied voltage (peak) (kV)	No.	Test conditions
Main circuit to earth	Loop 1#	Metallic screen	Positive	170	171.17~173.33	10	No breakdown, No flashover
			Negative	170	167.83~174.09	10	No breakdown, No flashover
	Loop 2#	Metallic screen	Positive	170	169.96~173.20	10	No breakdown, No flashover
			Negative	170	166.46~173.32	10	No breakdown, No flashover

Note:

1. Actual applied voltage (peak)

(kV)

Loop 1#	Positive	173.33	171.82	172.54	172.29	171.35	171.77	171.17	172.07	172.21	171.28
	Negative	174.09	167.83	171.39	173.46	173.99	169.03	170.14	168.70	169.77	171.59
Loop 2#	Positive	170.70	170.43	171.02	169.96	170.17	171.43	171.97	170.65	173.20	171.32
	Negative	167.01	166.46	168.13	173.32	169.90	168.80	171.93	169.71	169.33	171.47

2. Impulse typical oscillograms (see appendix) L21-DY0656-S05~L21-DY0656-S08

3. The test was carried out at ambient temperature.

Result

The test was passed.

Test sequence 4.1	AC voltage (dry test)

Ambient temperature: 30.4 ℃, Humidity: 76 %, Atmos: 100.6 kPa Date of Test: 10 August, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $2.5U_0$ (kV)	Actual applied voltage (RMS) (kV)	Duration (min)	Test conditions
Main circuit to earth	Loop 1#	Metallic screen	45	45.0	15	No breakdown, No flashover
	Loop 2#	Metallic screen	45	45.0	15	No breakdown, No flashover

Result
The test was passed.

Test sequence 4.1	Examination	
Ambient temperature: 30.4 ℃, Humidity: 76 %, Atmos: 100.6 kPa Date of Test: 10 August, 2021		
Test objects	Requirement	Observations
8-1~8-4 Screened separable connectors	No cracking in the filling media and/or tape or tube components;	Complied
	No moisture path across a primary seal;	Complied
	No corrosion and/or tracking and/or erosion;	Complied
	No leakage of any insulating material.	Complied

Result
The test was passed.

Test sequences 4.2, 4.3	AC voltage (dry test)

Ambient temperature: 31.3 ℃, Humidity: 75 %, Atmos: 100.5 kPa Date of Test: 2 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $4.5U_0$ (kV)	Actual applied voltage (RMS) (kV)	Duration (min)	Test conditions
Main circuit to earth	Loop 3#	Metallic screen	81	80.8	5	No breakdown, No flashover
	Loop 4#	Metallic screen	81	80.5	5	No breakdown, No flashover
	Loop 5#	Metallic screen	81	81.0	5	No breakdown, No flashover

Samples condition before test: New

Result
The test was passed.

Test sequences 4.2, 4.3	**DC voltage (dry test)**					
Ambient temperature: 31.3 ℃, Humidity: 75 %, Atmos: 100.5 kPa					Date of Test: 2 July, 2021	
Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $4U_0$ (kV)	Actual applied voltage (RMS) (kV)	Duration (min)	Test conditions
Main circuit to earth	Loop 3#	Metallic screen	72	72	15	No breakdown, No flashover
	Loop 4#	Metallic screen	72	72	15	No breakdown, No flashover
	Loop 5#	Metallic screen	72	72	15	No breakdown, No flashover

Result
The test was passed.

Test sequences 4.2, 4.3	**Thermal short-circuit (screen)**

Ambient temperature: 31.5 ℃, Humidity: 66 %, Date of Test: 8 July, 2021

No. of short-circuit	Test loop	Test current (A)			Duration (s)	Oscillogram No.	Requirement	Observations
		I_a	I_b	I_c				
1st	A: Loop 3# (screen) B: Loop 4# (screen) C: Loop 5# (screen)	3642	3573	3565	1.04	D21E-DY0656-S4	No visible deterioration	Complied
2nd	A: Loop 3# (screen) B: Loop 4# (screen) C: Loop 5# (screen)	3629	3605	3596	1.04	D21E-DY0656-S5		

Note:
1. Before the test, stable conductor temperature was 97.5 ℃ with 2 h steady.
2. Thermal short-circuit (screen) oscillograms see appendix.

Result
The test was passed.

Test sequences 4.2, 4.3	**Thermal short-circuit (conductor)**

Ambient temperature: 31.5 ℃, Humidity: 66 %, Date of Test: 8 July, 2021

No. of short-circuit	Test loop	Test current (kA)			Duration (s)	Oscillogram No.	Requirement	Observations
		I_a	I_b	I_c				
1st	A: Loop 3# (conductor) B: Loop 4# (conductor) C: Loop 5# (conductor)	25.2	25.1	25.4	2.03	D21E-DY0656-S2	No visible deterioration	Complied
2nd	A: Loop 3# (conductor) B: Loop 4# (conductor) C: Loop 5# (conductor)	25.0	25.0	25.4	2.01	D21E-DY0656-S3		

Note:
1. The test was carried out at ambient temperature.
2. Thermal short-circuit (conductor) oscillograms see appendix.

Result
The test was passed.

Test sequences 4.2, 4.3	Dynamic short-circuit				
Ambient temperature: 31.5 ℃, Humidity: 66 %,				Date of Test: 8 July, 2021	
Test loop	Test current (peak) (kA) I_d	Duration (ms)	Oscillogram No.	Requirement	Observations
A: Loop 3# (conductor) B: Loop 4# (conductor) C: Loop 5# (conductor)	90.0	31.0	D21E-DY0656-S1	No visible deterioration	Complied

Note:
1. The test was carried out at ambient temperature.
2. Dynamic short-circuit oscillogram see appendix.

Result
The test was passed.

Test sequences 4.2, 4.3	Disconnect/connect		
Ambient temperature: 31.0 ℃, Humidity: 68 %,			Date of Test: 12 July, 2021
Samples of disconnect/connect	No. of disconnect/connect	Requirement	Observations
Loop 3#	5	No visible damage to contact	Complied
Loop 4#	5	No visible damage to contact	Complied
Loop 5#	5	No visible damage to contact	Complied

Result
The test was passed.

Test sequences 4.2, 4.3	Impulse (at ambient temperature)

Ambient temperature: 33.1 ℃, Humidity: 62 %, Atmos: 100.6 kPa Date of Test: 13 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Polarity	Applied voltage (peak) (kV)	Actual applied voltage (peak) (kV)	No.	Test conditions
Main circuit to earth	Loop 3#	Metallic screen	Positive	170	170.20~173.54	10	No breakdown, No flashover
			Negative	170	166.53~174.83	10	No breakdown, No flashover
	Loop 4#	Metallic screen	Positive	170	170.55~173.27	10	No breakdown, No flashover
			Negative	170	167.74~174.83	10	No breakdown, No flashover
	Loop 5#	Metallic screen	Positive	170	169.56~172.85	10	No breakdown, No flashover
			Negative	170	167.74~174.83	10	No breakdown, No flashover

Note:

1. Actual applied voltage (peak)

(kV)

Loop 3#	Positive	170.96	173.24	173.54	172.73	170.20	171.79	171.79	172.85	172.63	172.54
	Negative	166.53	167.74	173.46	172.57	174.83	170.66	170.57	172.11	172.64	172.46
Loop 4#	Positive	172.83	171.67	172.80	172.26	172.57	173.27	170.55	170.76	171.67	172.57
	Negative	171.79	171.02	172.17	173.78	174.83	170.66	169.90	172.11	167.74	169.71
Loop 5#	Positive	169.93	170.31	170.76	169.69	172.29	171.17	172.21	171.79	172.85	169.56
	Negative	170.58	170.64	170.82	170.26	170.75	169.98	167.74	173.46	174.83	168.72

2. Impulse typical oscillograms (see appendix) L21-DY0656-S09~L21-DY0656-S14

3. The test was carried out at ambient temperature.

Result

The test was passed.

Test sequences 4.2, 4.3	AC voltage (dry test)

Ambient temperature: 33.1 ℃, Humidity: 62 %, Atmos: 100.6 kPa Date of Test: 13 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) $2.5U_0$ (kV)	Actual applied voltage (RMS) (kV)	Duration (min)	Test conditions
Main circuit to earth	Loop 3#	Metallic screen	45	45.1	15	No breakdown, No flashover
	Loop 4#	Metallic screen	45	45.0	15	No breakdown, No flashover
	Loop 5#	Metallic screen	45	44.8	15	No breakdown, No flashover

Result
The test was passed.

Test sequences 4.2, 4.3	Examination	
Ambient temperature: 32.0 ℃, Humidity: 66 %		Date of Test: 13 July, 2021
Test objects	Requirement	Observations
8-5~8-7 Screened separable connectors	No cracking in the filling media and/or tape or tube components;	Complied
	No moisture path across a primary seal;	Complied
	No corrosion and/or tracking and/or erosion;	Complied
	No leakage of any insulating material.	Complied

Result
The test was passed.

Screen resistance

Ambient temperature: (27.5~32.3) ℃, Humidity: 58 %~69 % Date of Test: 19 July, 2021~26 July, 2021

Test objects	Requirement		Measurement
8-8 Screened separable connector	Before thermal ageing, screen resistance	≤ 5 kΩ	369 Ω
	Thermal ageing test temperature Thermal ageing test duration	120 ℃±2 ℃ 168 h	Complied
	After thermal ageing, screen resistance	≤ 5 kΩ	324 Ω

Result
The test was passed.

Screen leakage current

Ambient temperature: 33.1 ℃, Humidity: 65 %, Atmos: 100.5 kPa Date of Test: 15 July, 2021

Testing arrangement	Voltage applied to	Earth connected to	Applied voltage (RMS) U_m (kV)	Actual applied voltage (RMS) (kV)	Requirement	Measurement
Main circuit to earth	Loop 6#	Screened separable connector + Metallic screen	36	36.1	≤ 0.5 mA	≤ 0.01 mA

Result
The test was passed.

Appendix

1. Assembly drawing

18/30（36）kV Screened separable connector GCA CJB30-630 assembly drawing.

2. Photos

20 photos in total

3. Test circuit diagrams

AC voltage test circuit diagram;

DC voltage test circuit diagram;

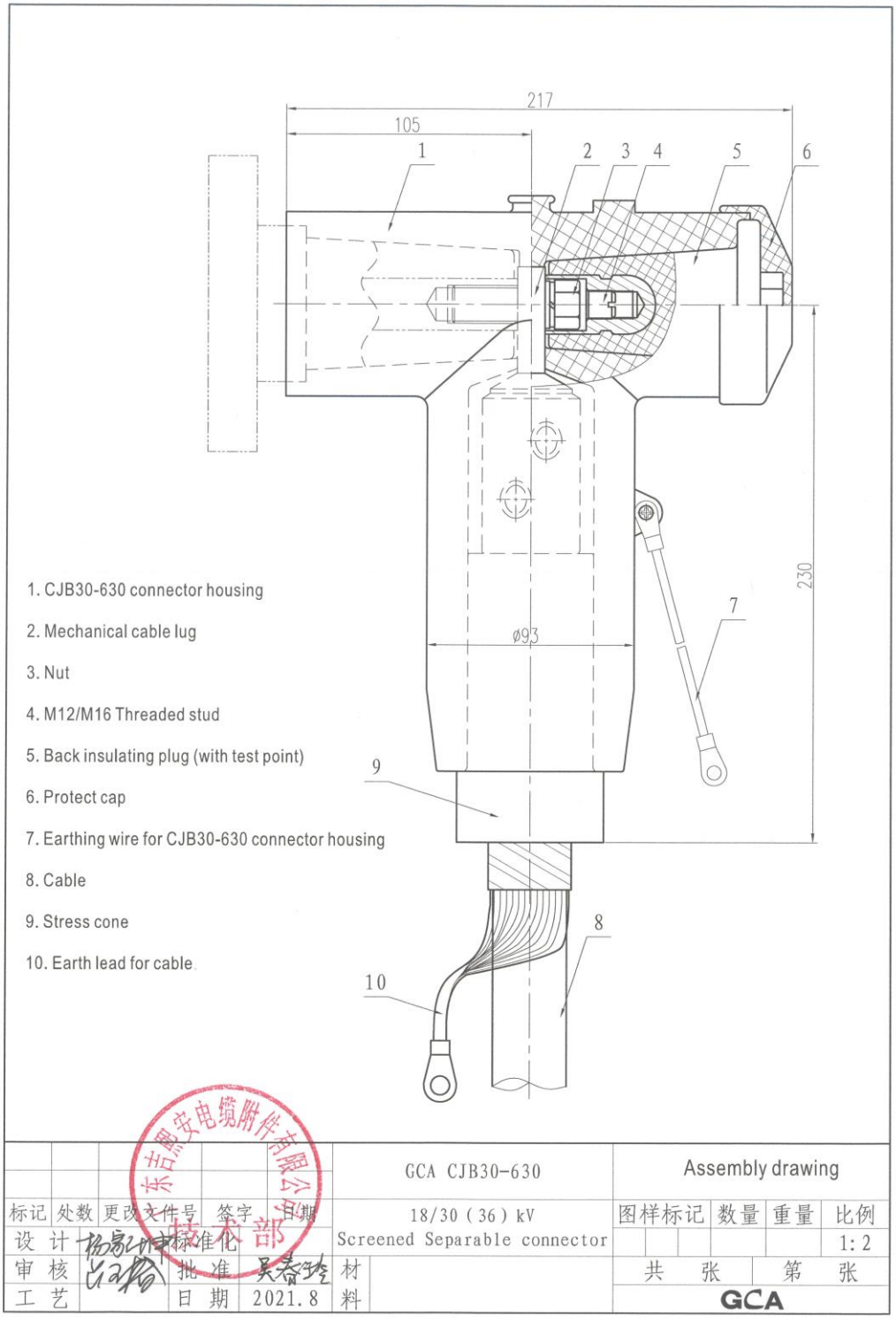
Impulse test circuit diagram;

Thermal short-circuit and dynamic short-circuit test diagram.

4. Oscillograms

Impulse typical oscillograms	L21-DY0656-S01~L20-DY0656-S14
Dynamic short-circuit oscillograms	D21E-DY0656-S1
Thermal short-circuit (conductor) oscillograms	D21E-DY0656-S2, D21E-DY0656-S3
Thermal short-circuit (screen) oscillograms	D21E-DY0656-S4, D21E-DY0656-S5

Assembly drawing



Photos of samples	
	
8-1~8-2	8-3~8-4
	
8-5	8-6
	
8-7	8-8

Photos of tests

AC voltage

DC voltage

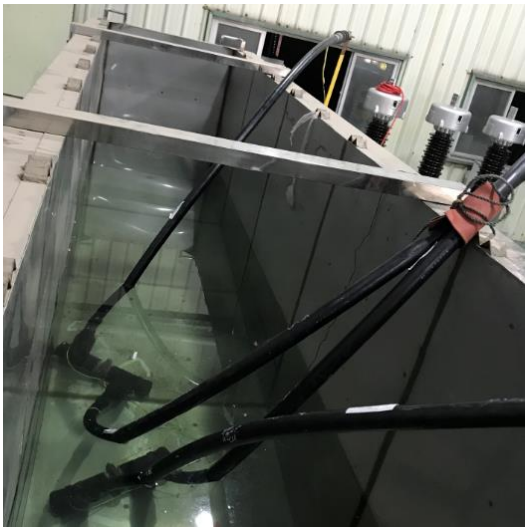
Partial discharge

Impulse

Screen leakage current

Photos of tests

Heating cycles in air

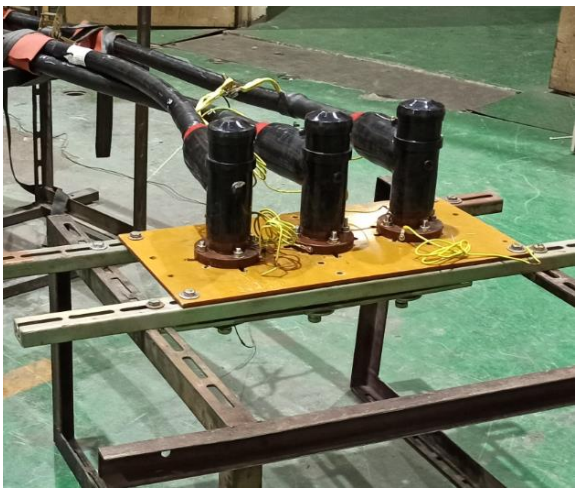


Heating cycles under water

Photos of tests

Thermal short-circuit (screen)

Before test



After test

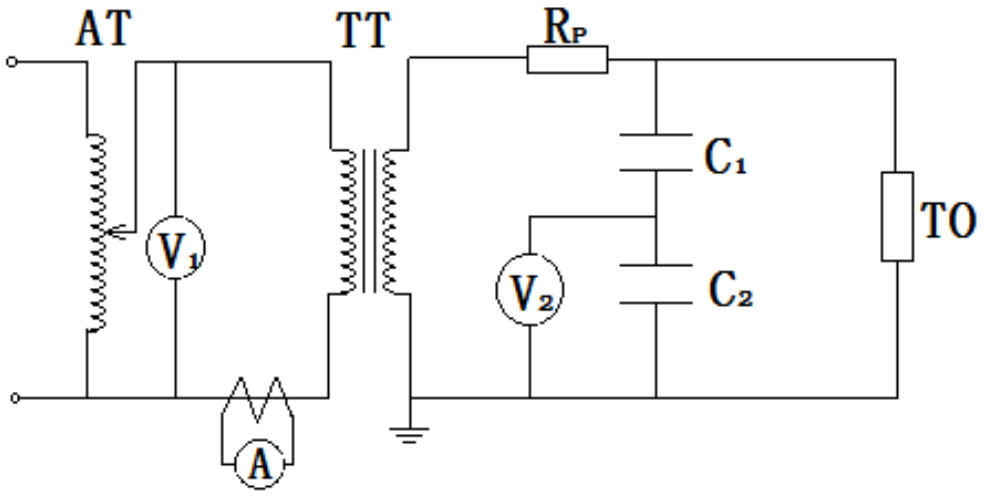
Photos of tests

Thermal short-circuit (conductor) and Dynamic short-circuit

Before test

After test

AC voltage test circuit diagram

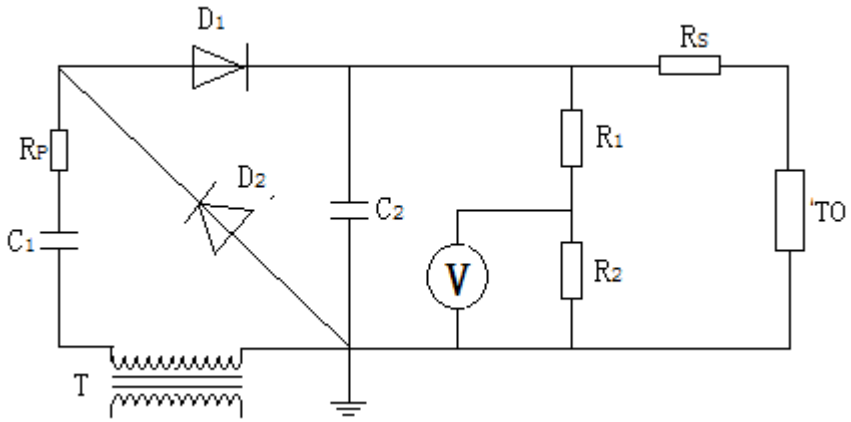


AT: Voltage regulator TT: Power frequency transformer V_1: Voltmeter A: Ammeter

R_P: Protective resistance TO: Test object C_1: HV arm capacitance C_2: LV arm capacitance

V_2: Peak voltmeter

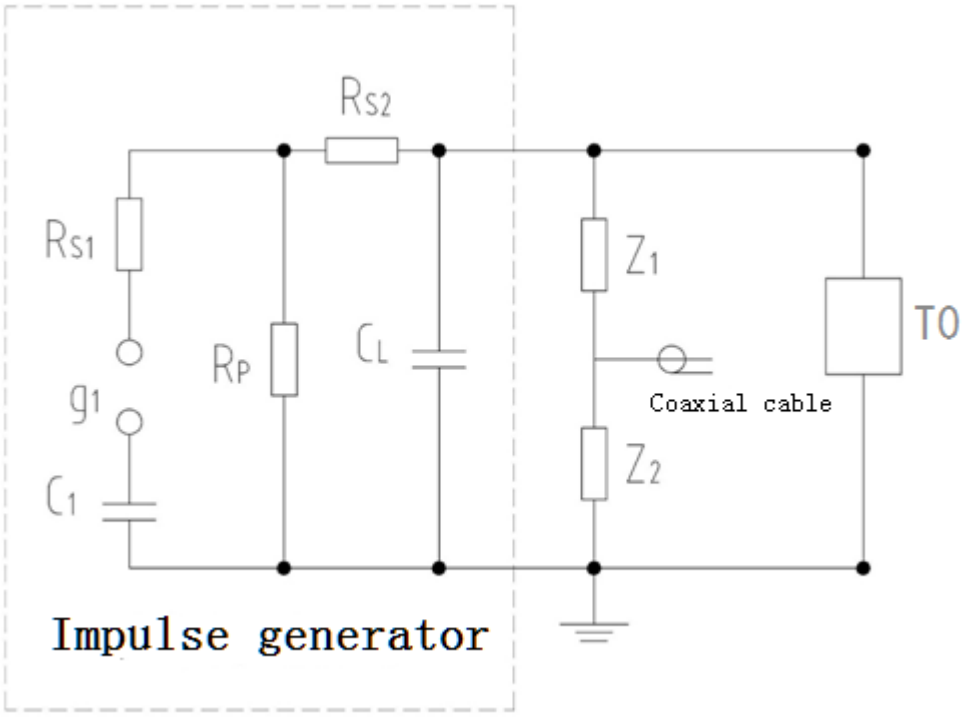
DC voltage test circuit diagram



T: Voltage regulator D1, D2: Rectifier element C_1, C_2：Generator capacitance V: Voltmeter

R_P, Rs: Protective resistance TO: Test object R_1: HV arm resistance R_2: LV arm resistance

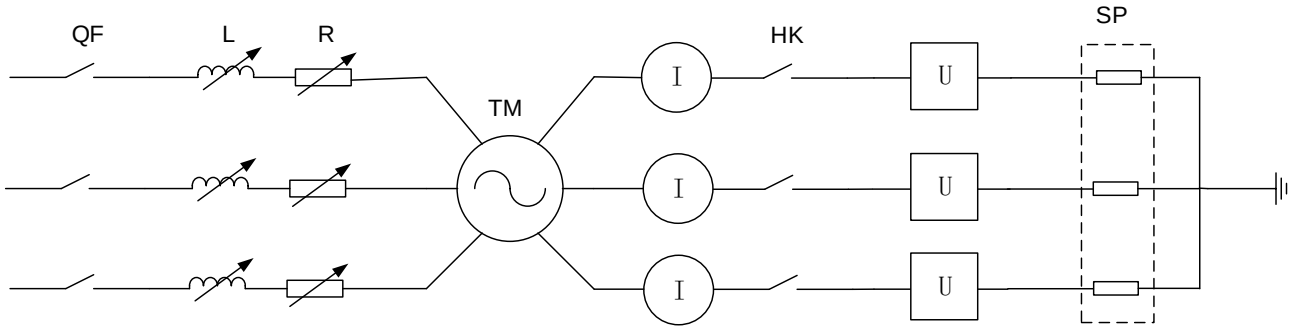
Impulse test circuit diagram



C_1: Generator capacitance g_1: Discharge gap R_{S1}: Internal series resistance R_{S2}: Front resistance

R_P: Tail resistance C_L: Load capacitance Z_1, Z_2: Voltage divider impedance TO: Text object

Thermal short-circuit and dynamic short-circuit test diagram



QF : Master breaker

L : Reactor

R : Resistor

TM : Test power supply

HK : Making switch

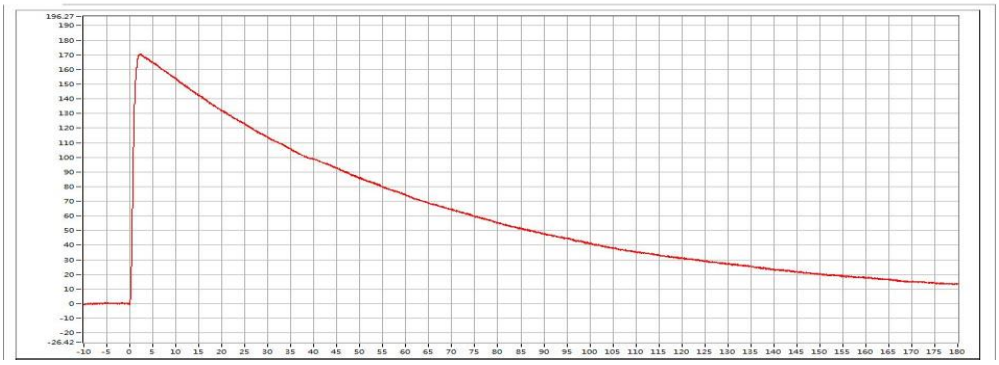
I : Current measurement

U : Voltage measurement

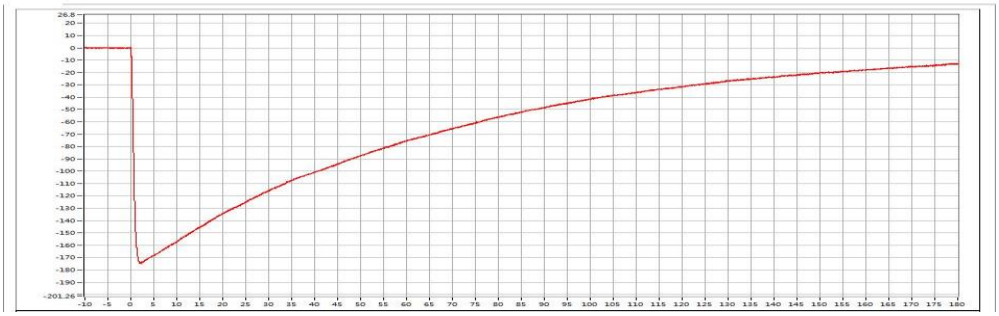
SP : Test specimen

Impulse typical oscillograms

Loop 1# (before heating cycles in air):

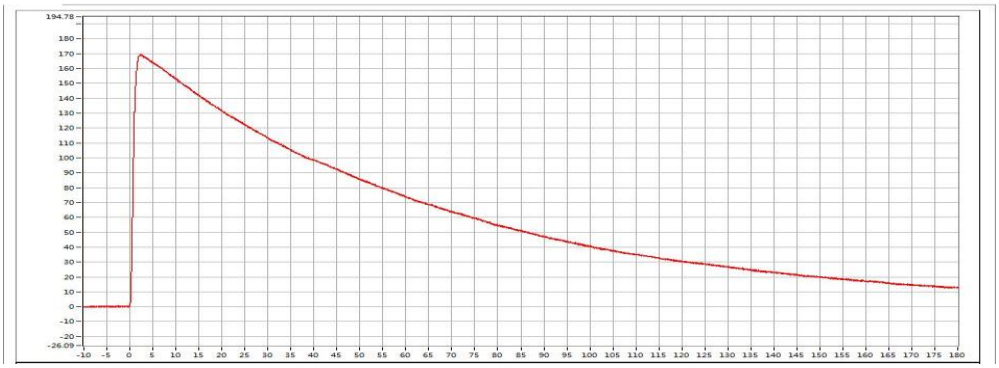


(170kV Positive) L21-DY0656-S01

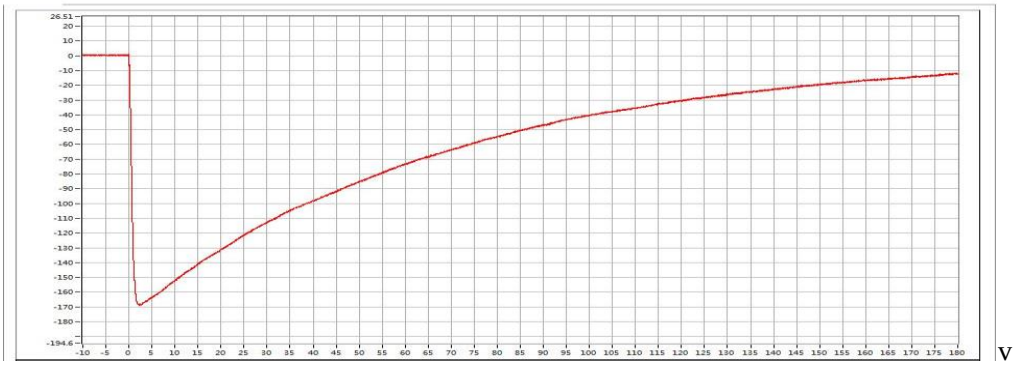


(170kV Negative) L21-DY0656-S02

Loop 2# (before heating cycles in air):



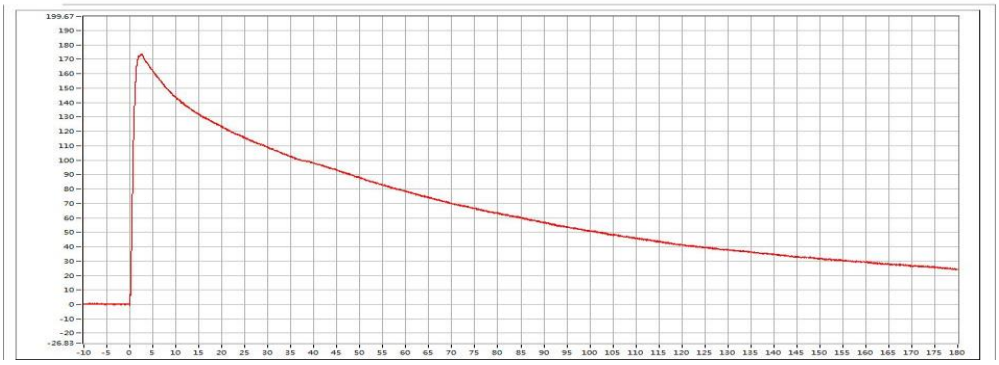
(170kV Positive) L21-DY0656-S03



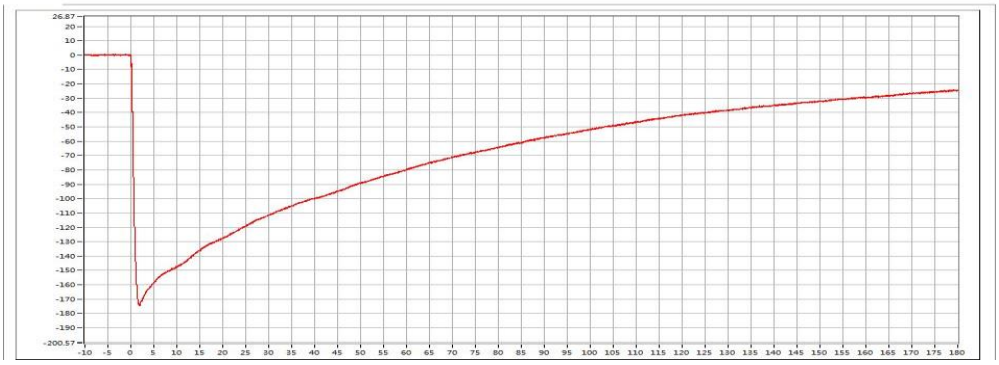
(170kV Negative) L21-DY0656-S04

Impulse typical oscillograms

Loop 1# (after heating cycles unde water):

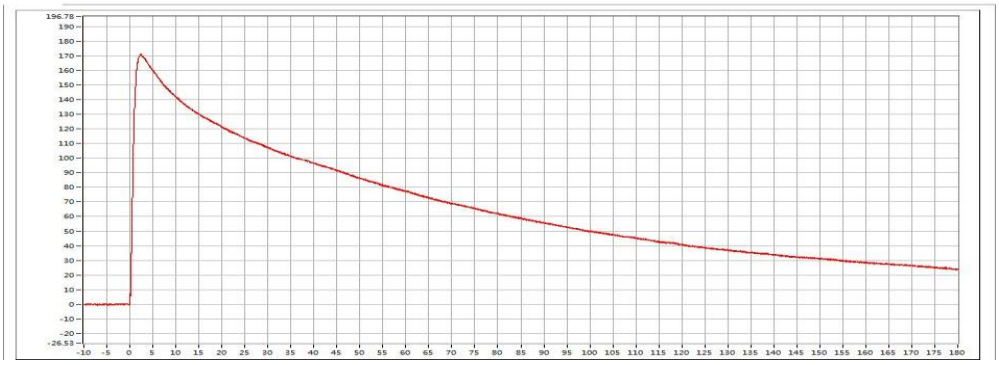


(170kV Positive) L21-DY0656-S05

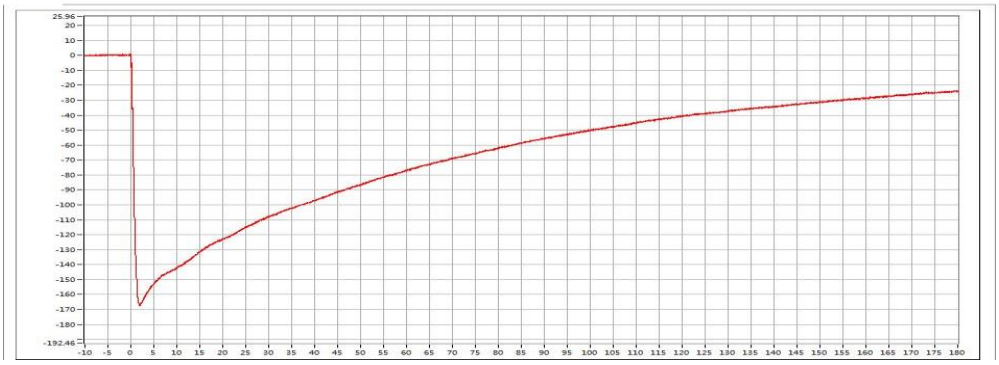


(170kV Negative) L21-DY0656-S06

Loop 2# (after heating cycles unde water):



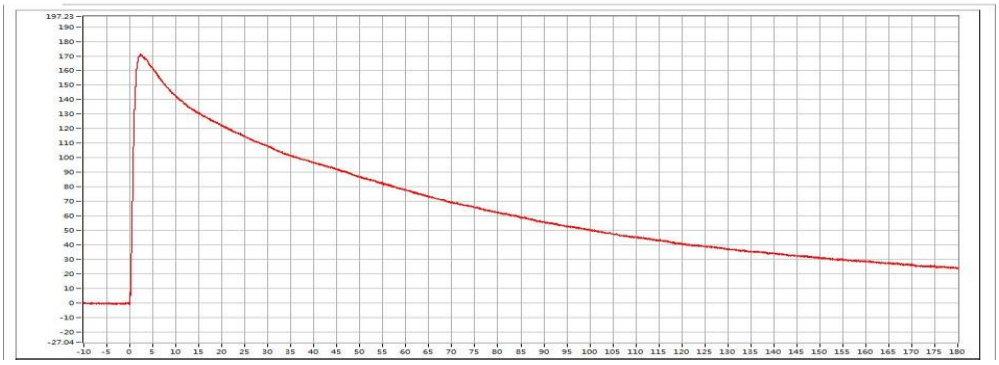
(170kV Positive) L21-DY0656-S07



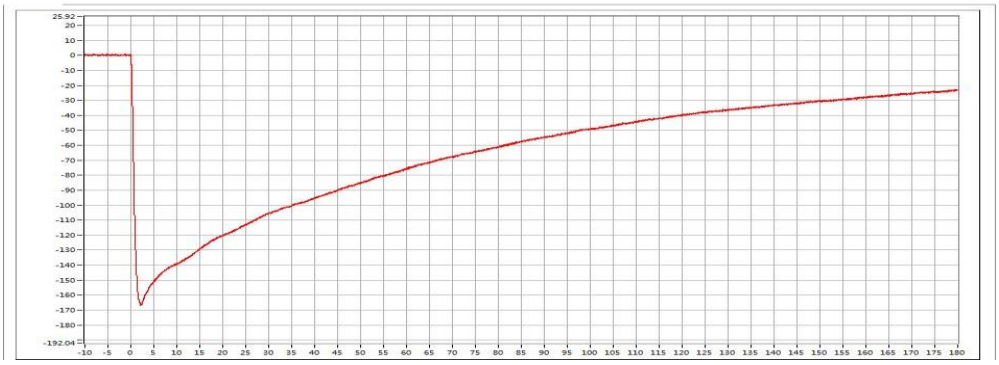
(170kV Negative) L21-DY0656-S08

Impulse typical oscillograms

Loop 3# (after thermal and dynamic short-circuit):

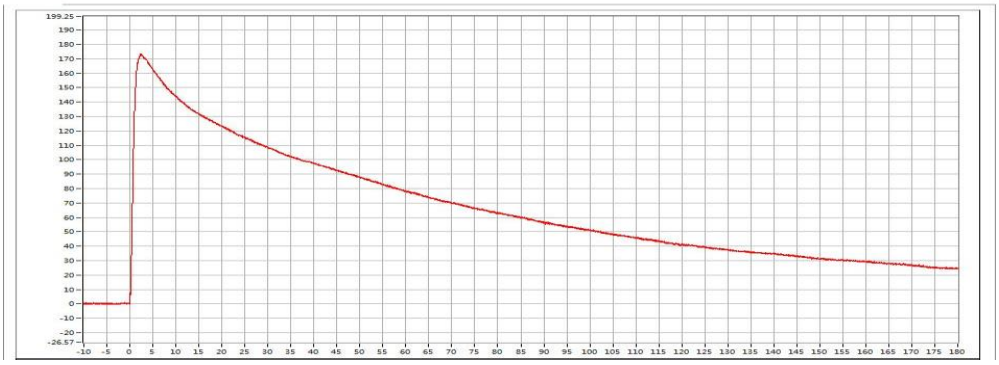


(170kV Positive) L21-DY0656-S09

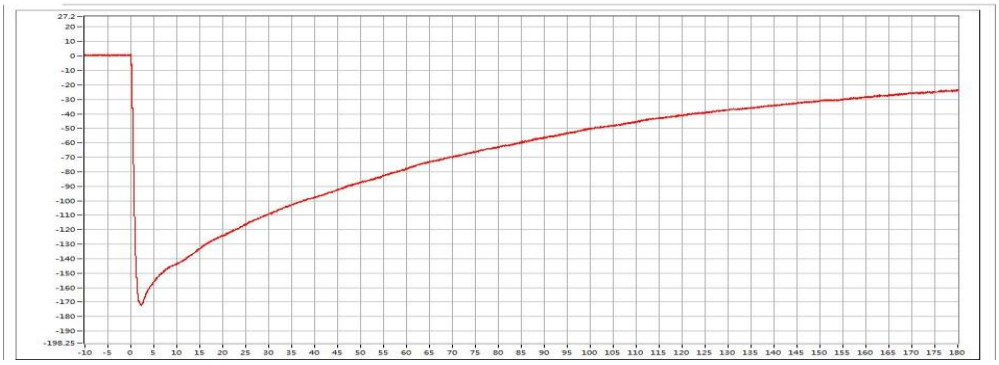


(170kV Negative) L21-DY0656-S10

Loop 4# (after thermal and dynamic short-circuit):



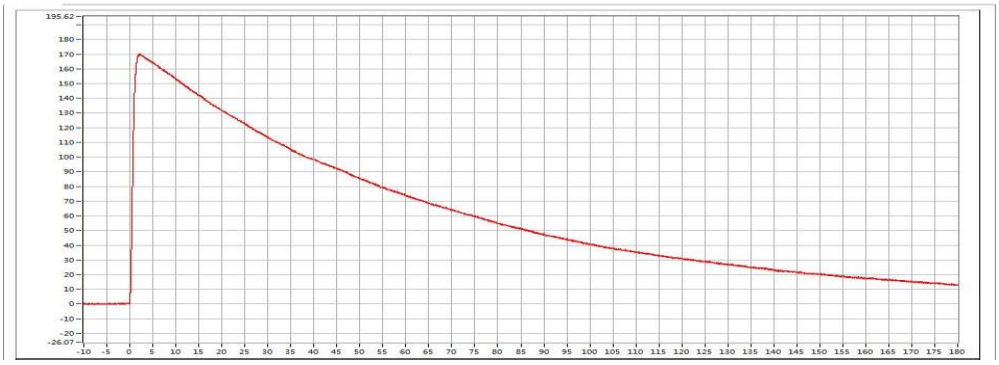
(170kV Positive) L21-DY0656-S11



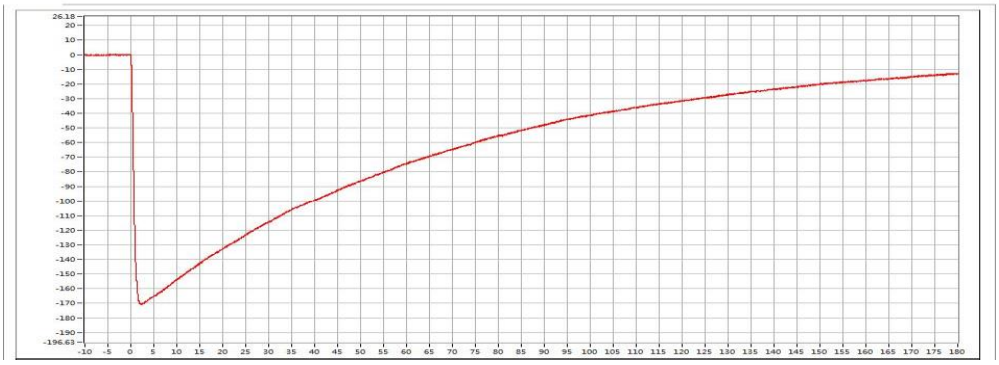
(170kV Negative) L21-DY0656-S12

Impulse typical oscillograms

Loop 5# (after thermal and dynamic short-circuit):

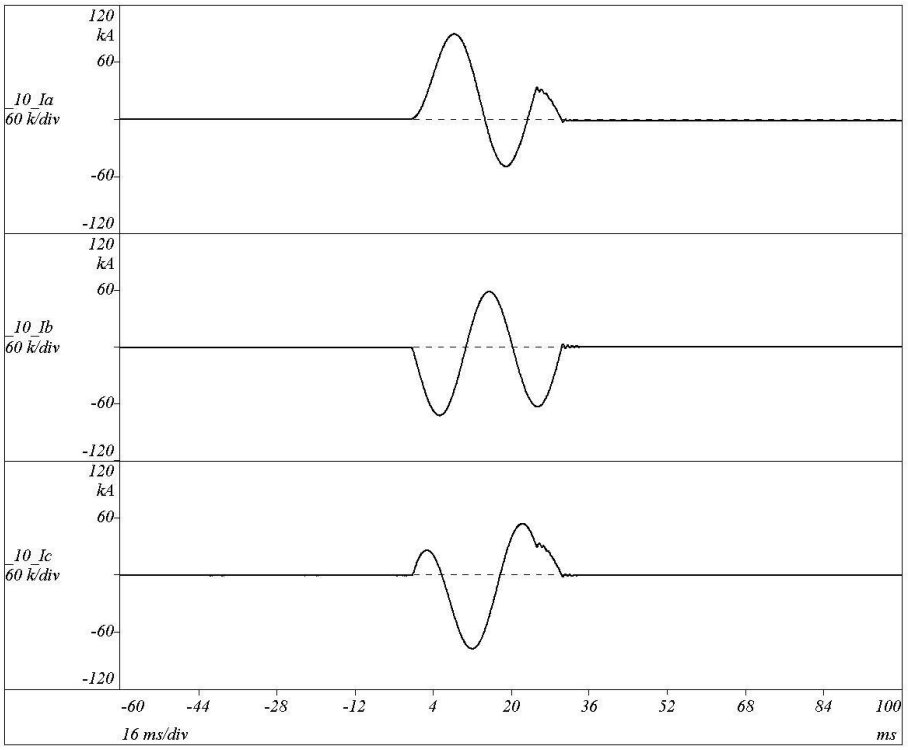


(170kV Positive) L21-DY0656-S13



(170kV Negative) L21-DY0656-S14

Dynamic short-circuit oscillograms



Dynamic short-circuit

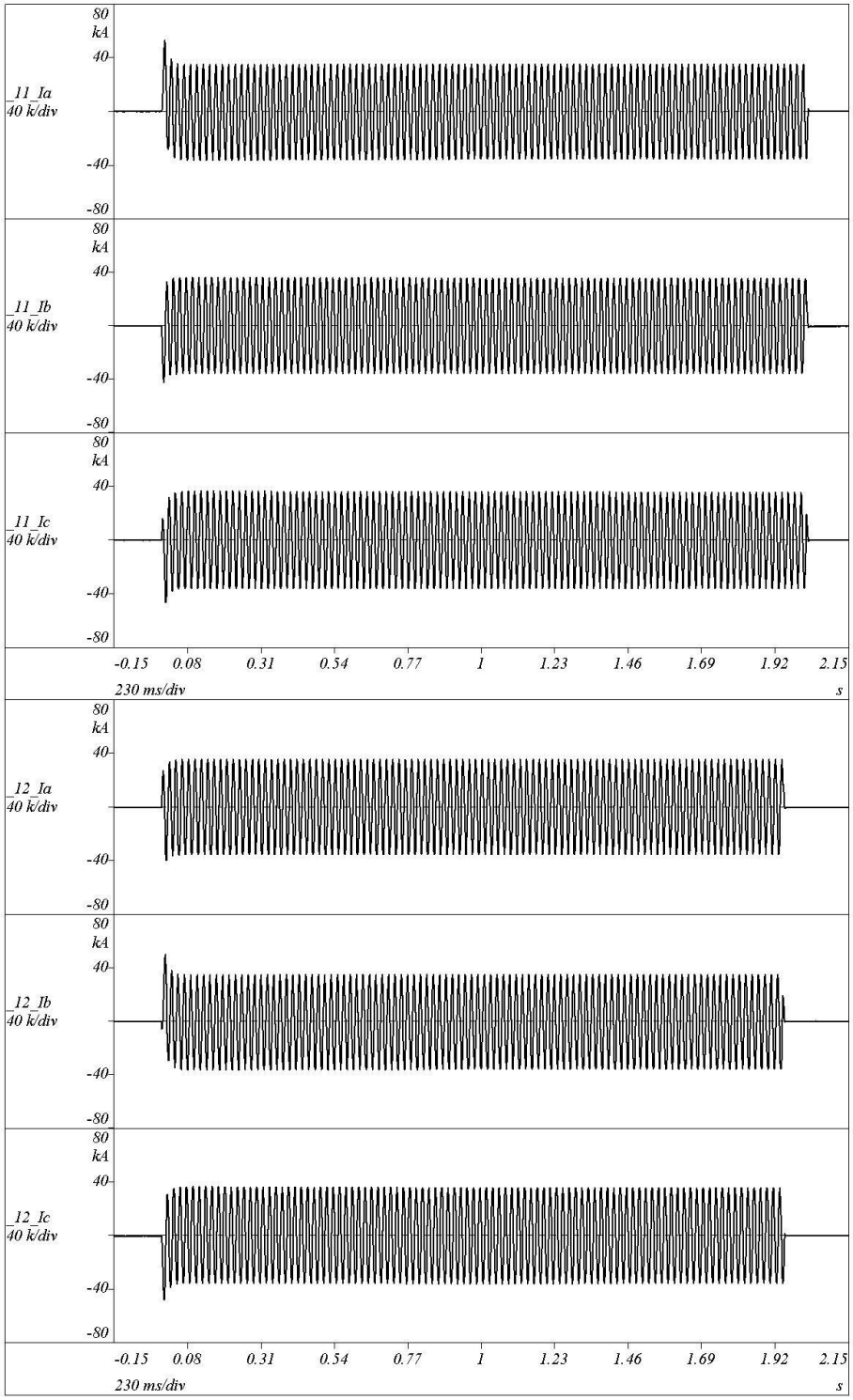
conductor
Idy

I_p=90.0kA

Duration:31.0ms

D21E-DY0656-S1

Thermal short-circuit (conductor) oscillograms



Thermal short-circuit
（conductor）

conductor
Ith-1

I_a=25.2kA
I_b=25.1kA
I_c=25.4kA

I_p=52.7kA

I^2t=1314MA^{2}s

Duration:2.03s

D21E-DY0656-S2

conductor
Ith-2

I_a=25.0kA
I_b=25.0kA
I_c=25.4kA

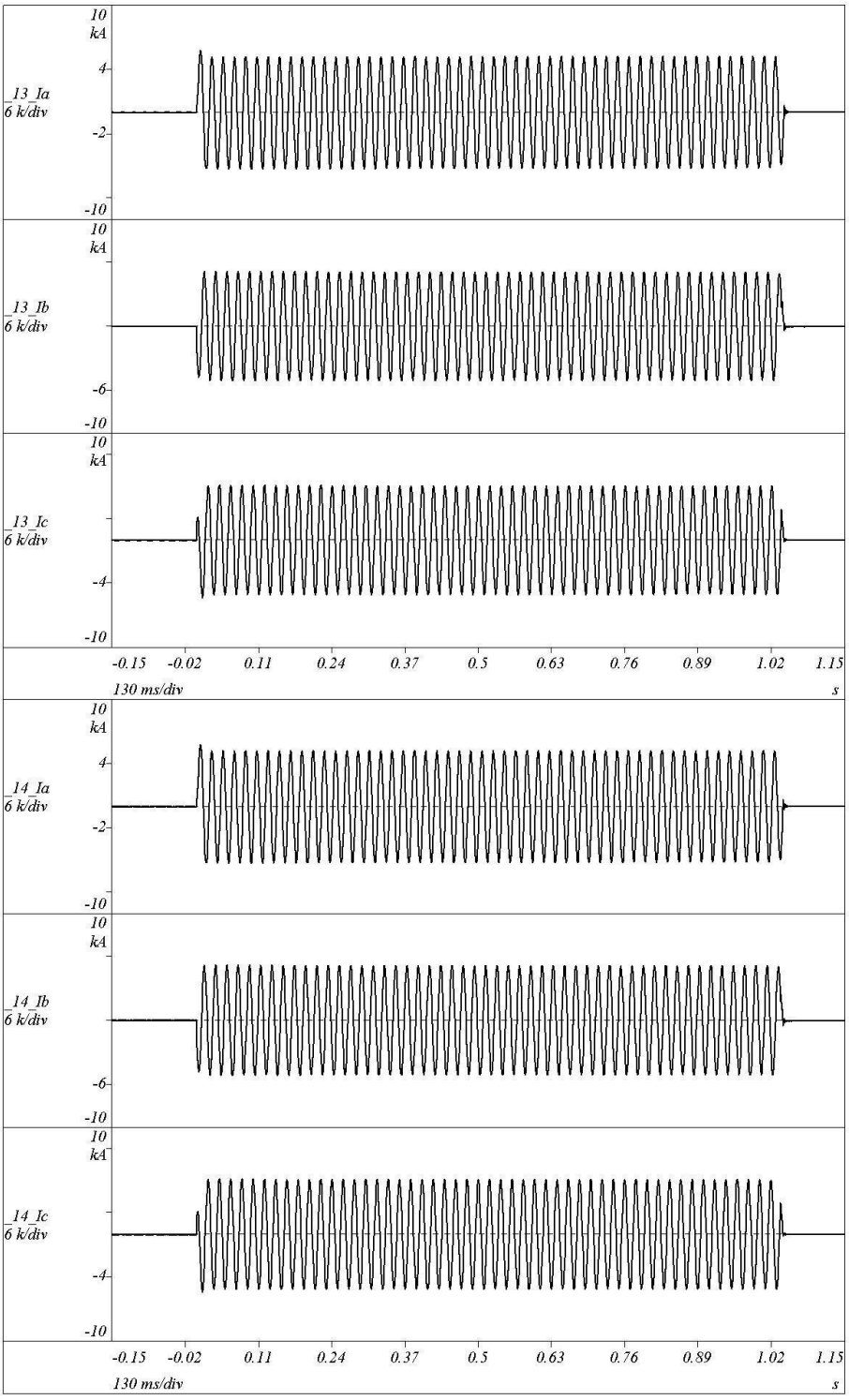
I_p=48.0kA

I^2t=1307MA^{2}s

Duration:2.01s

D21E-DY0656-S3

Thermal short-circuit (screen) oscillograms



Thermal short-circuit
（screen）

screen
Ith-1

I_a=3642A
I_b=3573A
I_c=3565A

I_p=5771A

I^2t=14.1MA^{2}s

Duration:1.04s

D21E-DY0656-S4

screen
Ith-2

I_a=3629A
I_b=3605A
I_c=3596A

I_p=5771A

I^2t=13.9MA^{2}s

Duration:1.04s

D21E-DY0656-S5

List of main test equipments			
Cl.	Device name	No. of equipment	Term of validity
1	Air pressure meter	03041	2021-08-19
2	Alarm digital hygrothermograph	C24E052	2021-12-09
3	Power-frequency testing transformer without PD	C28G351	2022-05-20
4	Impulse voltage generator	Ac.03Fw001	2021-08-24
5	Multichannel digital PD integrative analysis system	C24E089	2021-09-07
6	Calibration pulse generator	C24F003	2022-04-22
7	DC high-voltage generator	C28G269	2021-08-25
8	Electric parameter detector	C28E049-01	2022-03-08
9	Digital multimeter	24194	2022-07-12
10	Heating cycles system	C24G199	2021-12-24
11	Heating cabinet	03037	2023-03-08
12	Instantaneous recorder	C28E032-02	2021-12-24
13	Data acquisition recorder	C24E004-02	2021-12-15

Notions:

1.Testing location/ address: No.68, XiHu East Road, ShiLong Town, Dongguan City, Guangdong Province, China

2.Address of applicant: 19th, South Road 4, Guicheng, Nanhai District, Foshan City, Guangdong Province, China

3.Environmental conditions (if applicable):

Temperature （25.0~32.0） ℃， Humidity 55%~72% ， Other ——

4.Sampling procedure (if applicable): ——

5.The interpretation of the deviation(s) from standard method(s) (if applicable): ——

6.The interpretation of the measurement uncertainty of the result(s) (if applicable): ——

7.Subcontractitems and subcontractor (if applicable): ——

广东产品质量监督检验研究院

GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION

Guangdong Testing Institute of Product Quality Supervision (In Short GQI), also called Guangzhou Electrical Safety Testing Institute, Guangdong Testing and Certification Institute, was set up in September, 1983. It is a public institution affiliated to Guangdong Administration for Market Regulation (Administration for Intellectual Property).

GQI is a legal third party institute specializing in product testing, inspection and certification;it is subordinate to Guangdong Administration for Market Regulation (Administration for Intellectual Property); it is a national-level testing and inspecting organization accredited by China National Accreditation Service for Conformity Assessment (CNAS); it is an international CB testing laboratory recognized by International Electro-technical Commission System for Conformity Testing and Certification of Electro-technical Equipment and Components(IECEE); it is the national compulsory CCC testing organization designated by Certification and Accreditation Administration of the People's Republic of China(CNCA).

GQI currently undertakes commitment of 10 national supervision and testing centers, which are:

- China National Quality Supervision and Testing Center for Safety of Electrical Products China National Quality Supervision and Testing Center for Furniture (Guangdong)
- China National Quality Supervision and Testing Center for Smart Grid Transmission and Distribution Equipment(CEST)
- China National Quality Supervision and Testing Center for Paintings and Dopes (Guangdong)
  China National Quality Supervision and Testing Center for Food (Guangdong)
- China National Quality Supervision and Testing Center for Machinery Safety
- China National Quality Supervision and Testing Center for Fire Fighting Products (Guangdong)
- China National Quality Supervision and Testing Center for Solar Energy Photovoltaic Products (Guangdong)
- China National Quality Supervision and Testing Center for Cables and Wires (Guangdong)
  China National Quality Supervision and Testing Center for Industrial Robots (Guangdong)

The Mark of Conformity

The Assurance of Quality

Head Quarter

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