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CEPRI

TEST REPORT

CEPRI-EETC08-2020-0726(E)

Client: SHANGHAI CHARDON ELECTRIC LTD.

Object: 8.7/15（17.5）kV cold shrinkable outdoor termination

Type: 15-CSTO/TFK 1×185

Test Category: Type Tests

POWER INDUSTRY QUALITY INSPECTION AND TEST CENTER FOR ELECTRIC EQUIPMENT

Catalogue

Test Report	Power Industry Quality Inspection and Test Center for Electric Equipment		CEPRI-EETC08-2020-0726(E) Total 23 Page 2
Client	SHANGHAI CHARDON ELECTRIC LTD.	Manufacturer	SHANGHAI CHARDON ELECTRIC LTD.
Object	8.7/15（17.5）kV cold shrinkable outdoor termination	Type	15-CSTO/TFK 1×185
Sampling procedure	by the Client	Serial No.	EETC08-20/08/12-001
Test Category	Type Tests	Date	2020.08.14~2021.01.12
Requirements	1. GB/T 12706.4－2008 Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m=1.2 kV) up to 35 kV (U_m=40.5 kV) — Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m=7.2 kV)up to 35 kV (U_m=40.5 kV) 2. 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)		
Conclusion	According to GB/T 12706.4－2008 and IEC 60502-4:2010, type tests were performed on 8.7/15（17.5）kV cold shrinkable outdoor terminations which were provided by SHANGHAI CHARDON ELECTRIC LTD.. All the results were in accordance with the requirements.		
Note	/		

Tested by: 邓凯 邓凯　　周诚 周诚

Checked by: 彭超 彭超　　**Verified by:** 苗付贵 苗付贵

Approved by: 阎孟昆 阎孟昆　　**Date of issue:** 2021-01-21

Test Results

No.	Item	Requirements	Results	Evaluation
1	Sequence 1.1	/	/	/
1.1	AC voltage test	Neither breakdown nor flashover shall occur at 39 kV for 5 min	No breakdown and flashover occurred on the combination samples at 39 kV for 5 min	passed
1.2	DC voltage test	Neither breakdown nor flashover shall occur at 35 kV for 15 min	No breakdown and flashover occurred on the combination samples at 35 kV for 15 min	passed
1.3	AC voltage test under rain	Neither breakdown nor flashover shall occur at 35 kV for 1 min	No breakdown and flashover occurred on the combination samples at 35 kV for 1 min	passed
1.4	Partial discharge test at ambient temperature	The magnitude of the discharge at 15 kV shall not exceed 10 pC	Phase: 1 / 2 / 3 / 4 Voltage (kV): 15 / 15 / 15 / 15 Noise background (pC): 2.0 / 2.0 / 1.8 / 1.8 Discharge (pC): 2.0 / 2.0 / 1.8 / 1.8	passed
1.5	Impulse voltage test at 95 ℃～100 ℃	Neither breakdown nor flashover shall occur at 10 positive and 10 negative impulses of 95 kV	No breakdown and flashover occurred on the combination samples at 10 positive and 10 negative impulses of 95 kV (See Appendix C.1)	passed
1.6	Heating cycle voltage test in air	Neither breakdown nor flashover shall occur during 60 cycles in air at the conductor temperature of 95℃ to 100℃ and 22 kV	No breakdown and flashover occurred on the combination samples during 60 cycles in air at the conductor temperature of 95℃ to 100℃ and 22 kV	passed
1.7	Immersion test	10 cycles in water at the conductor temperature of 95 ℃ to 100 ℃,each cycle lasts for 8h, whereas 5h for heating, 3h for cooling	The Immersion test was finished according to standards	/
1.8	Partial discharge test at 95℃～100℃	The magnitude of the discharge at 15 kV shall not exceed 10 pC	Phase: 1 / 2 / 3 / 4 Voltage (kV): 15 / 15 / 15 / 15 Noise background (pC): 2.1 / 2.1 / 1.4 / 1.4 Discharge (pC): 2.1 / 2.1 / 1.4 / 1.4	passed

No.	Item	Requirements	Results					Evaluation
1.9	Partial discharge test at ambient temperature	The magnitude of the discharge at 15 kV shall not exceed 10 pC	Phase	1	2	3	4	passed
			Voltage (kV)	15	15	15	15	
			Noise background (pC)	1.6	1.6	2.0	2.0	
			Discharge (pC)	1.6	1.6	2.0	2.0	
1.10	Impulse voltage test	Neither breakdown nor flashover shall occur at 10 positive and 10 negative impulses of 95 kV	No breakdown and flashover occurred on the combination samples at 10 positive and 10 negative impulses of 95 kV (See Appendix C.2)					passed
1.11	AC voltage test	Neither breakdown nor flashover shall occur at 22 kV for 15 min	No breakdown and flashover occurred on the combination samples at 22 kV for 15 min					passed
1.12	Examination	It is advised that the accessory is examined for signs of any of the following: (i) cracking in the filling media and/or tape or tube components; (ii) a moisture path across a primary seal; (iii) corrosion and/or tracking and/or erosion; (iv) leakage of an insulating material.	(i) No cracking in the filling media and tape or tube components; (ii) No moisture path across a primary seal; (iii) No evident corrosion, tracking and erosion; (iv) No leakage of an insulating material.					passed
2	Sequence 1.2 and 1.3	/	/					/
2.1	AC voltage test	Neither breakdown nor flashover shall occur at 39 kV for 5 min	No breakdown and flashover occurred on the combination samples at 39 kV for 5 min					passed
2.2	DC voltage test	Neither breakdown nor flashover shall occur at 35 kV for 15 min	No breakdown and flashover occurred on the combination samples at 35 kV for 15 min					passed
2.3	Thermal short-circuit test (screen)	No visible deterioration at 3.0 kA, 1 s, twice	No visible deterioration at 3.094 kA, 1.02 s and 3.011 kA, 1.02 s (See Appendix C.4)					passed

No.	Item	Requirements	Results	Evaluation
2.4	Thermal short-circuit test (conductor)	No visible deterioration at 24.5kA, 2 s, twice	No visible deterioration at 24.92 kA, 2.03s and 24.92 kA, 2.03s (See Appendix C.5)	passed
2.5	Dynamic short-circuit test	No visible deterioration at 86.5 kA, not less than 10 ms	No visible deterioration at 86.84 kA, 87 ms (See Appendix C.6)	passed
2.6	Impulse voltage test	Neither breakdown nor flashover shall occur at 10 positive and 10 negative impulses of 95 kV	No breakdown and flashover occurred on the combination samples at 10 positive and 10 negative impulses of 95 kV (See Appendix C.3)	passed
2.7	AC voltage test	Neither breakdown nor flashover shall occur at 22 kV for 15 min	No breakdown and flashover occurred on the combination samples at 22 kV for 15 min	passed
2.8	Examination	It is advised that the accessory is examined for signs of any of the following: (i) cracking in the filling media and/or tape or tube components; (ii) a moisture path across a primary seal; (iii) corrosion and/or tracking and/or erosion; (iv) leakage of an insulating material.	(i) No cracking in the filling media and tape or tube components; (ii) No moisture path across a primary seal; (iii) No evident corrosion, tracking and erosion; (iv) No leakage of an insulating material.	passed
3	Sequence 1.5	/	/	/
3.1	Salt fog tests	Neither breakdown nor flashover, no more than three trippings, no substantial damage shall occur at 11 kV for 1000 h	No breakdown, flashover, tripping, substantial damage occurred on the combination samples at 11 kV for 1000 h	passed

No.	Item	Requirements	Results	Evaluation
3.2	Examination	It is advised that the accessory is examined for signs of any of the following: (i) cracking in the filling media and/or tape or tube components; (ii) a moisture path across a primary seal; (iii) corrosion and/or tracking and/or erosion; (iv) leakage of an insulating material.	(i) No cracking in the filling media and tape or tube components; (ii) No moisture path across a primary seal; (iii) No evident corrosion, tracking and erosion; (iv) No leakage of an insulating material.	passed

Content

1. Sequence 1.1 in Table 4 of GB/T 12706.4－2008

1.1 AC voltage test

1.1.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 4 and IEC 61442:2005,clause 4. Neither breakdown nor flashover shall occur at 39 kV for 5 min.

1.2 DC voltage test

1.2.1 Test method

The test was carried out in accordance with GB/T 18889—2002，clause 5 and IEC 61442:2005,clause 5. Neither breakdown nor flashover shall occur at 35 kV for 15 min.

1.3 AC voltage test under rain

1.3.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 4 and IEC 61442:2005,clause 4. Neither breakdown nor flashover shall occur at 35 kV for 1 min.

1.4 Partial discharge test at ambient temperature

1.4.1 Test method

The test voltage shall be raised gradually to and held at 18 kV for 10 s and then slowly reduced to 15 kV. The test shall be carried out in accordance with GB/T 18889—2002,clause 7 and IEC 61442:2005,clause 7.

1.5 Impulse voltage test at 95 ℃～100 ℃

1.5.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 6 and IEC 61442:2005,clause 6. The conductor of the cable shall be heated and stabilized for at least 2 h at a temperature of 95 ℃～100 ℃. Neither breakdown nor flashover shall occur at 10 positive and 10 negative impulses of 95 kV.

1.6 Heating cycle voltage test in air

1.6.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 9 and IEC 61442:2005,clause 9. Each heating cycle in air shall be of at least 8 h duration with at least 2 h at a steady temperature of 5 ℃

to 10 ℃ above the maximum cable conductor temperature in normal operation, followed by at least 3 h of natural cooling to within 10 ℃ of ambient temperature. Neither breakdown nor flashover shall occur during 60 cycles in air at the conductor temperature of 95℃ to 100℃ and 22 kV.

1.7 Immersion test

1.7.1 Test method

The two terminations shall be immersed in water at ambient temperature for a depth not less than $0.03^{+0.02}$m. The test loop shall be erected upside down in water box. The terminations shall be totally immersed in water including the end of the sealing part. The test shall be carried out in accordance with IEC 61442:2005, clause 9. Each heating cycle in air shall be of at least 8 h duration with at least 2 h at a steady temperature of 5 ℃ to 10 ℃ above the maximum cable conductor temperature in normal operation, followed by at least 3 h of natural cooling to within 10 ℃ of ambient temperature. Neither breakdown nor flashover shall occur during 10 cycles in air at the conductor temperature of 95℃ to 100℃.No voltage shall be applied to the test loop.

1.8 Partial discharge test at 95 ℃～100 ℃

1.8.1 Test method

The test voltage shall be raised gradually to and held at 18 kV for 10 s and then slowly reduced to 15 kV. The test shall be carried out in accordance with GB/T 18889—2002, clause 7 and IEC 61442:2005,clause 7. The conductor temperature shall be of 95℃ to 100℃ during the test.

1.9 Partial discharge test at ambient temperature

1.9.1 Test method

The test voltage shall be raised gradually to and held at 18 kV for 10 s and then slowly reduced to 15 kV. The test shall be carried out in accordance with GB/T 18889—2002,clause 7 and IEC 61442:2005,clause 7.

1.10 Impulse voltage test

1.10.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 6 and IEC 61442:2005,clause 6. Neither breakdown nor flashover shall occur at 10 positive and 10 negative impulses of 95 kV.

1.11 AC voltage test

1.11.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 4 and IEC 61442:2005,clause 4. Neither breakdown nor flashover shall occur at 22 kV for 15 min.

1.12 Examination

1.12.1 Test method

It is advised that the accessory is examined for signs of any of the following:(i) cracking in the filling media and/or tape or tube components;(ii) a moisture path across a primary seal;(iii) corrosion and/or tracking and/or erosion;(iv) leakage of an insulating material.

2. Sequence 1.2 and 1.3 in Table 4 of GB/T 12706.4－2008

2.1 AC voltage test

2.1.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 4 and IEC 61442:2005,clause 4. Neither breakdown nor flashover shall occur at 39 kV for 5 min.

2.2 DC voltage test

2.2.1 Test method

The test was carried out in accordance with GB/T 18889—2002， clause 5 and IEC 61442:2005,clause 5. Neither breakdown nor flashover shall occur at 35 kV for 15 min.

2.3 Thermal short-circuit test (screen)

2.3.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 10 and IEC 61442:2005,clause 10. At the beginning of the test, the cable conductor shall be heated to reach a steady temperature of 5 ℃ to 10 ℃ above the maximum cable conductor temperature in normal operation and shall last for at least 2 h. Then two short-circuits shall be applied to the screen. The short-circuit current and duration time shall be specified as the agreement between manufacturer and user according to the actual short-circuit condition of the power grid. Between the two short-circuits, the test loop shall be allowed to cool to a temperature less than 10 ℃ above its temperature prior to the first short-circuit. There shall be no visible deterioration on the samples.

2.4 Thermal short-circuit test (conductor)

2.4.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 11 and IEC 61442:2005,clause 11. Two short-circuits shall be applied using AC to raise the conductor temperature to the maximum permissible short-circuit temperature(250℃) of the cable within 5 s. Between the two short-circuits, the test loop shall be allowed to cool to a temperature less than 10 ℃ above its temperature prior to the first short-circuit. There shall be no visible deterioration on the samples.

2.5 Dynamic short-circuit test (conductor)

2.5.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 12 and IEC 61442:2005,clause 12. The dynamic short-circuit current value shall be 2.5 times of the thermal short-circuit value when the thermal short-circuit time equals 1s. There shall be no visible deterioration on the samples after the short-circuit lasts for at least 10ms.

2.6 Impulse voltage test

2.6.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 6 and IEC 61442:2005,clause 6. Neither breakdown nor flashover shall occur at 10 positive and 10 negative impulses of 95 kV.

2.7 AC voltage test

2.7.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 4 and IEC 61442:2005,clause 4. Neither breakdown nor flashover shall occur at 22 kV for 15 min.

2.8 Examination

2.8.1 Test method

It is advised that the accessory is examined for signs of any of the following:(i) cracking in the filling media and/or tape or tube components;(ii) a moisture path across a primary seal;(iii) corrosion and/or tracking and/or erosion;(iv) leakage of an insulating material.

3. Sequence 1.5 in Table 4 of GB/T 12706.4—2008

3.1 Salt fog tests

3.1.1 Test method

The test shall be carried out in accordance with GB/T 18889—2002, clause 13 and IEC 61442:2005,clause 13. Throughout the test duration, the mist spray shall be sprinkled at a rate of (0.4 ± 0.1)L/h/m^3 and its conductivity shall be (1 600 ± 200) mS/m. Neither breakdown nor flashover, no more than three trippings, no substantial damage shall occur at 11 kV for 1000 h.

3.2 Examination

3.2.1 Test method

It is advised that the accessory is examined for signs of any of the following:(i) cracking in the filling media and/or tape or tube components;(ii) a moisture path across a primary seal;(iii) corrosion and/or tracking and/or erosion;(iv) leakage of an insulating material.

Appendix A Object Parameters

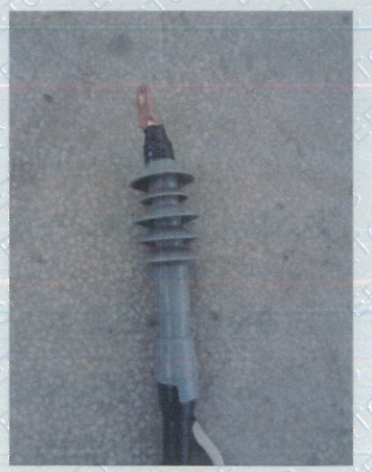
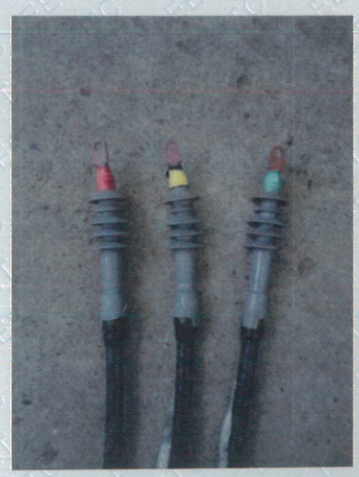
A.1 Sample information

The sample was received by Power Cable Station on 12/08/2020. The sample was in good condition with the factory number and the date of manufacture not provided.

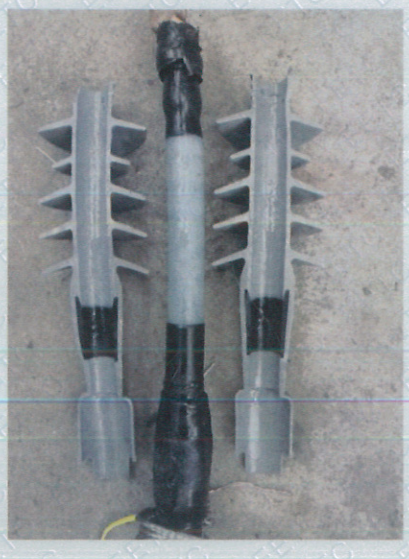
A.2 The number and installation of samples

According to GB/T 12706.4—2008, it was required that eight sets of terminations to be tested were installed by the manufacturer on four length of cables forming No.1, NO.2, NO.3 and No.4 combination samples on which the type tests sequence 1.1, 1.2 and 1.3 were carried out. Four sets of straight joints were also installed by the manufacturer on the combination samples. The cable used in the combination samples was a XLPE insulated single-core cable for rated voltage 8.7/15 kV, a cross-section of 185sq.mm. In addition, another six sets of terminations to be tested were installed by the manufacturer on three length of cables forming combination samples on which the type tests sequence 1.5 were carried out.

A.3 Photograph of samples

		
The appearance of the sample	After salt fog test (the front view)	After salt fog test (the rear view)

A.4 Photograph of dissected samples



Appendix B The Main Test Devices

No.	Name/ Type/ Specification	Serial No.	Measurement Range	Uncertainty / Accuracy class / Maximum Permissible Error	Calibration Institute	Valid Date
1	TRF300-0.002 AC voltage measurement system	110650	(0~300) kV	Grade 3	National high voltage measurement station	2022.07.14
2	JFD-2H PD measurement system	20041202	(0.5~1000) pC	Class 10	National high voltage measurement station	2021.05.19
3	FY Ⅰ 900/600 Weakly damped capacitive voltage divider	11165-2-1	(0~900) kV	Class 3	National high voltage measurement station	2022.06.29
4	CY2009 Data collected system	SJCJ11008	20A~300 kA	Class 1	The 29th Metrology and Testing Center of the Ministry of Machinery Industry (Tianshui)	2021.02.27
5	LCC-V Heating cycle monitoring system	DLRXH02	(0~3000) A	Class 3	National high voltage measurement station	2024.10.26
6	287C Digital voltage meter	31470016	(0~700) V	Class 1	Vkan Certification & Testing Co., Ltd. Measuring Center	2021.05.10
7	DDS-307 conductivity meter	610508110058	(0~2000) mS/m	Class 3.0	Vkan Certification & Testing Co., Ltd. Measuring Center	2021.07.13

Appendix C Waveforms

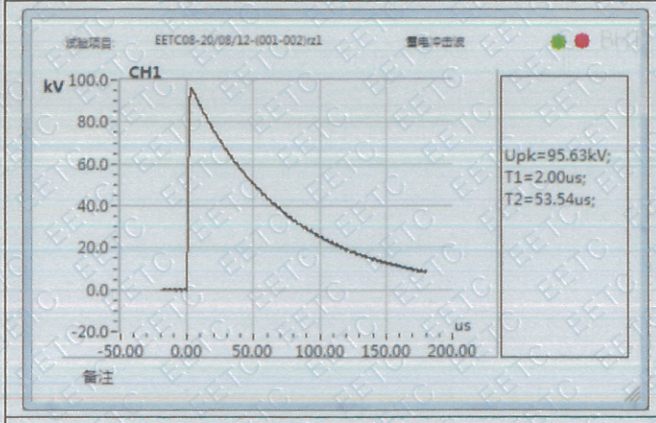
C.1 The values and waveforms of impulse voltage on the combination samples before heating cycles voltage test

C.1.1 The values of impulse voltage test

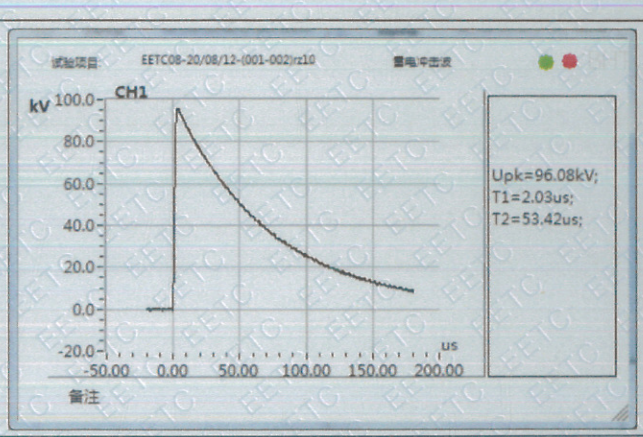
Ambient temperature: 31.8℃ Relative humidity: 65% Atmosphere: 0.1002MPa

Positive polarity（kV）	95.6	96.1	96.1	95.4	95.5	96.6	95.5	95.0	96.1	96.1
Negative polarity（kV）	94.2	95.2	94.8	96.9	95.0	96.2	95.5	95.3	96.9	94.6

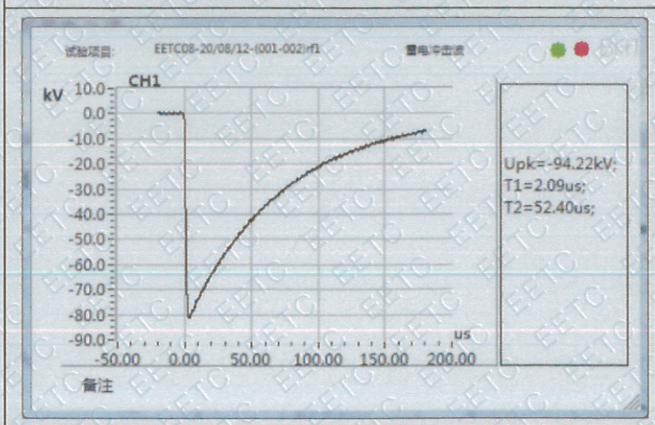
C.1.2 The waveforms of impulse voltage test



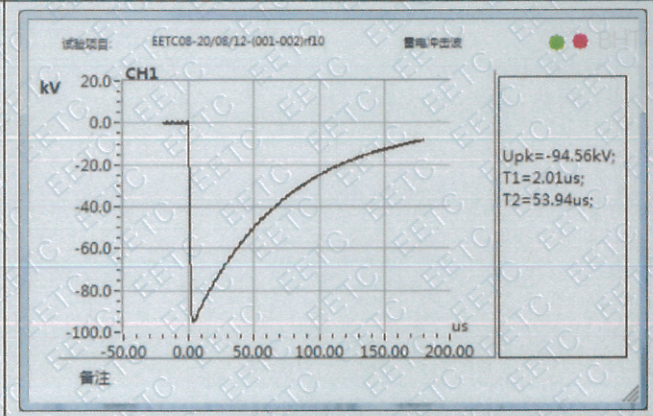
The 1st positive impulses waveform



The 10th positive impulses waveform



The 1st negative impulses waveform



The 10th negative impulses waveform

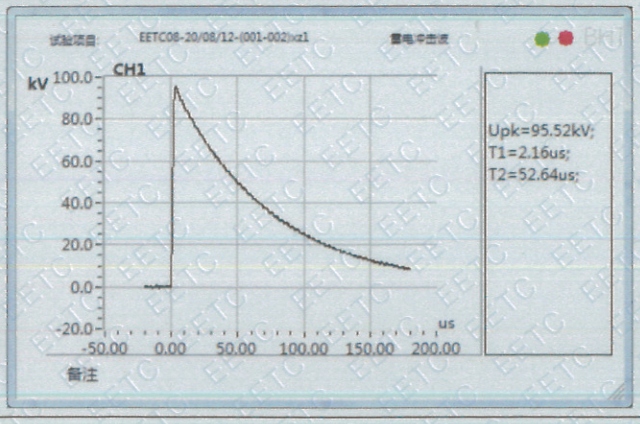
C.2 The values and waveforms of impulse voltage on the combination samples after heating cycles voltage test

C.2.1 The values of impulse voltage test

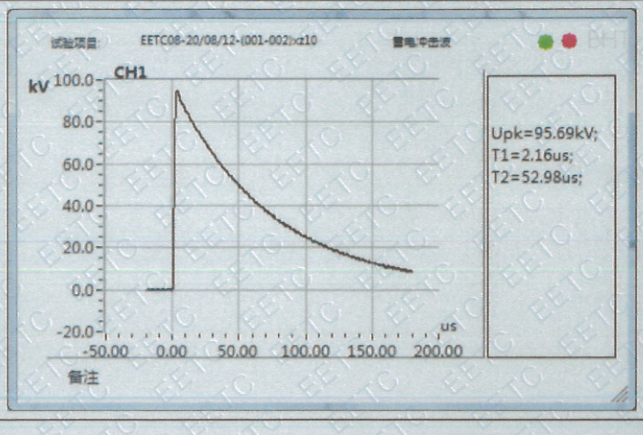
Ambient temperature:15.0℃ Relative humidity:57% Atmosphere: 0.1004MPa

Positive polarity（kV）	95.5	94.9	95.7	95.5	94.6	94.9	94.7	95.7	94.7	95.7
Negative polarity（kV）	95.0	94.2	95.2	95.8	95.5	95.8	95.3	95.5	94.7	94.7

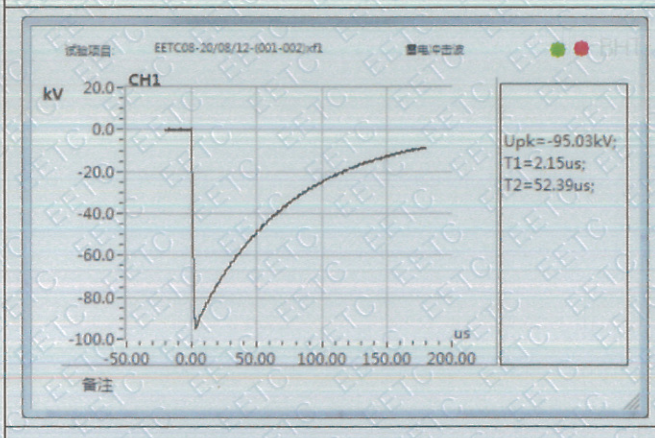
C.2.2 The waveforms of impulse voltage test



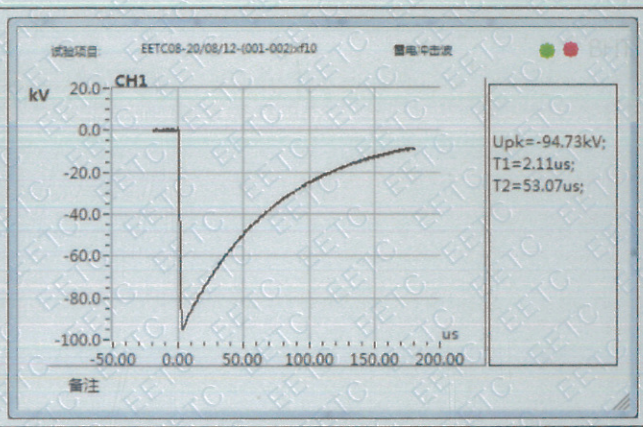
The 1st positive impulses waveform



The 10th positive impulses waveform



The 1st negative impulses waveform



The 10th negative impulses waveform

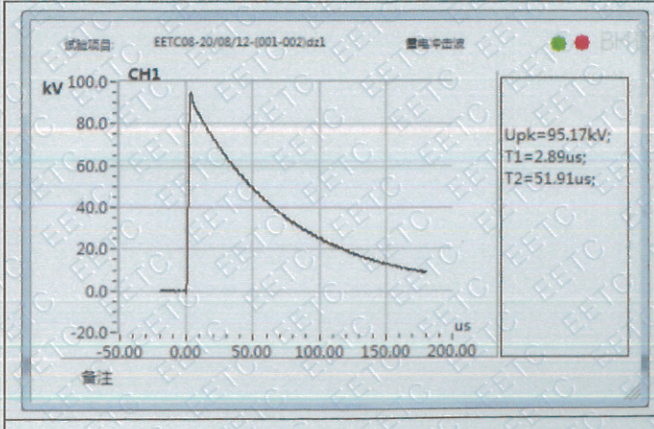
C.3 The values and waveforms of impulse voltage on the combination samples after thermal and dynamic short-circuit tests

C.3.1 The values of impulse voltage test

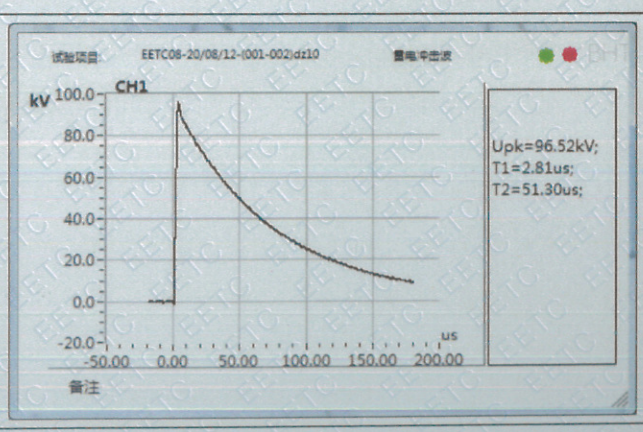
Ambient temperature:9.5℃ Relative humidity: 66% Atmosphere: 0.1012MPa

Positive polarity (kV)	95.2	95.9	96.0	96.0	94.7	95.8	95.6	95.6	96.5	96.5
Negative polarity (kV)	94.6	96.2	95.0	95.2	95.1	95.5	95.3	94.9	95.4	95.3

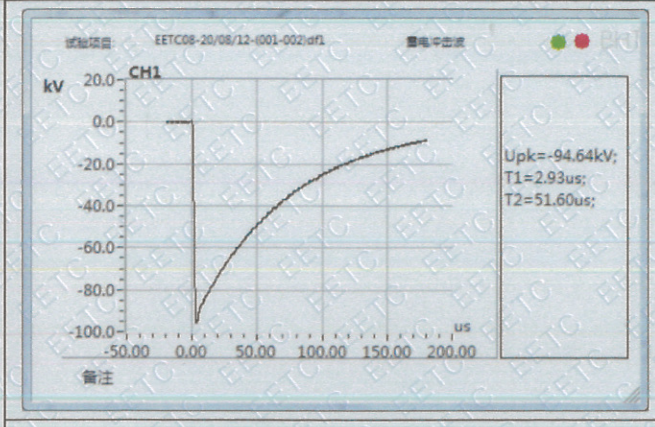
C.3.2 The waveforms of impulse voltage test



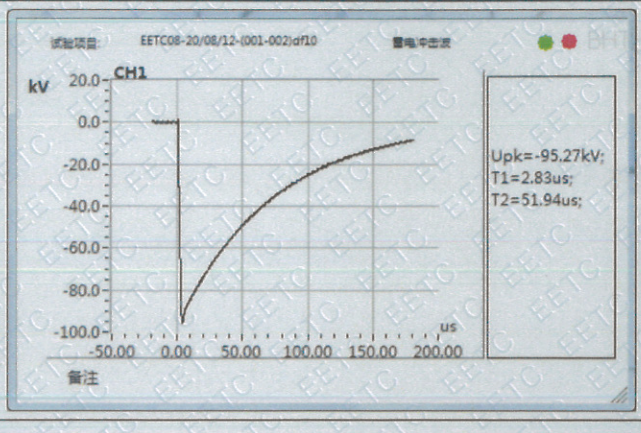
The 1st positive impulses waveform



The 10th positive impulses waveform



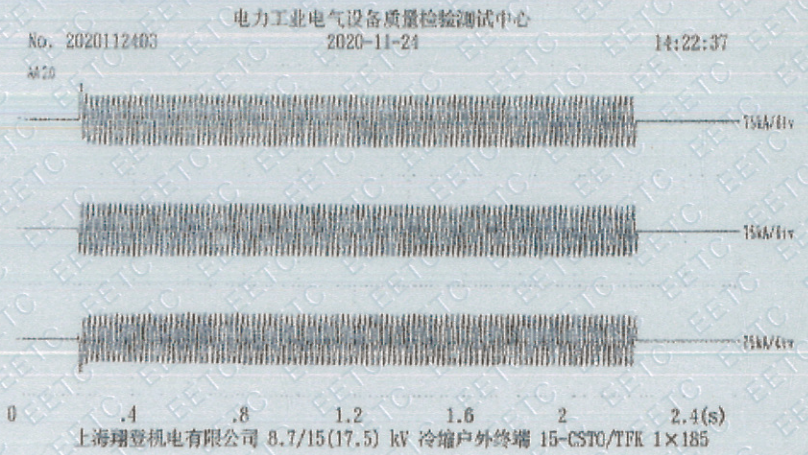
The 1st negative impulses waveform



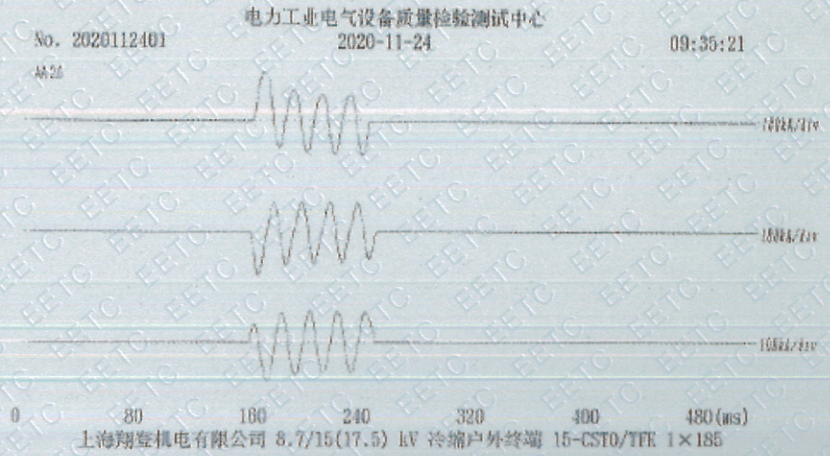
The 10th negative impulses waveform

C.4 The waveform of thermal short-circuit tests of the combination samples (screen)

C.5 The waveform of thermal short-circuit tests of the combination samples (conductor)



C.6 The waveform of dynamic short-circuit tests of the combination samples



Appendix D Other Information

D.1 Sample packing list

CHARDON GROUP

15/25kV Cold Shrink Termination Kit Packing List

No.	Product Name	QTY	Unit	Remark
1	Cold shrink termination	1	PC	
2	Sealing tape	3	PCS	
3	Silicone lubricant	1	PC	
4	Paper towel	1	PC	
5	PVC tape	1	PC	
6	Silicone tape	1	PC	
7	Sandpaper belt	2	PCS	
8	Gloves	1	Pair	
9	Installation Instructions	1	PC	
10	Packing List	1	PC	

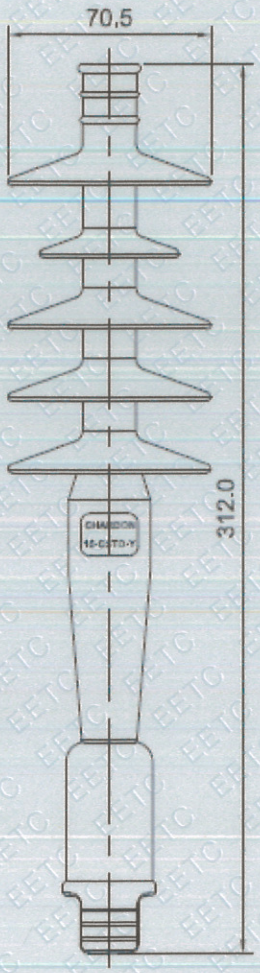
Part NO:

REV: A

D.2 Identification of test cable (specified in GB/T 12706.2－2008)

rated voltage $U_0/U(U_m)$		8.7/15(17.5)kV
construction	core	single-core
	construction of screen	single-phase screen
conductor	material	copper
	type	round compact stranded
	cross section	185 mm^2
	diameter	16.1 mm
insulation	material	XLPE
	thickness	4.5 mm
	diameter	26.9mm
screen	thickness of conductor screen	0.7 mm
	thickness of insulation screen	0.8 mm
	strippability of insulation screen	strippable
	diameter of insulation screen	28.5 mm
	metallic screen	copper tape
armour		/
oversheath	material	PVC
	diameter	36.1mm
mark of cable		YJV-8.7/15 1×185

D.3 Main structure dimensions of the samples



NO.	Item	Parameter	Unit	Remark
A	Height of connector	312.0	mm	
B	Width of connector	70.5	mm	
C	Maximum Value of The Highest System Voltage (Um)	17.5	kV	
D	Application Environment Altitude	≤1000	m	

Product Name	15kV Cold Shrink Termination
Product Model	15-CSTO
Manufacturer	SHANGHAI CHARDON ELECTRIC LTD.

D.4 Installation Description

CHARDON GROUP

15kV Cold Shrinkable Termination INSTALLATION

DESCRIPTION

The Chardon Cold Shrinkable Termination offers easy installation and reliable performance when terminating indoor and outdoor medium voltage cables. Made from high quality, UV resistant, silicone rubber, the Chardon Cold Shrinkable termination offers a combination of durability and high performance in the field.
The Chardon Cold Shrinkable Terminations include a stress controlling compound housing, preassembled on a plastic "hold out" tube. As the plastic hold out is removed, the stress-relief housing shrinks onto the cable. Chardon terminations are easy to install, and have a wide application range. No tools or heat sources are required. The products are designed to last the entire life of the cable.
The Chardon Cold Shrinkable terminations are tested according to IEEE Standard 48 and IEC 60502 .

ORDERING INSTRUCTIONS:

Standard Voltage Class	Part Number	Cable Insulation O.D. Range
15kV	15-CSTO -A	13.2– 17.0
	15-CSTO -B	16.8 – 27.0
	15-CSTO -C	25.3 – 50.0

COLD SHRINKABLE TERMINATION KIT CONTENT:

- - Cold shrinkable termination
- - Paper towel
- - Silicone lubricant
- - Sealing tape
- - PVC tape
- - Sandpaper belt
- - Gloves
- - Installation & Operating instructions
- - Cable lug (Optional)
- - Grounding kit (Optional)

CAUTION: All associated apparatus must be de-energized during installation and/or maintenance.

DANGER: Do not touch or move energized product by hand. Failure to follow this instruction may result in serious or fatal injury, as well as damage to the product.

SAFETY INFORMATION

STEP 3

STEP 2

- Sand off the sharp corners of the Cu conductive shield with coarse sandpaper and secure with copper tape.
- Use coarse sandpaper to grind the cable jacket about 25mm to rough the surface.
- Clean cable jacket and Cu conductive shield.
- Wrap 1 lap sealing tape onto the cable jacket about 15mm.
- Measure down 25mm from top of the cable jacket use constant-force spring to fix ground braid onto Cu conductive shield.

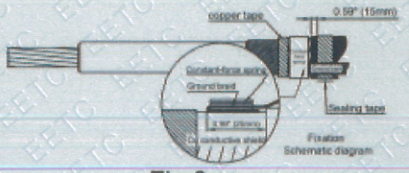


Fig.2

STEP 3

- Measure down 85mm from top of the Cu conductive shield wrap the sealing tape onto the ground braid.
- The height of the tape is 5mm (min) higher than that of the cable jacket.
- Wrap the PVC tape on top of it by 4 laps.
- Proceed to step B.

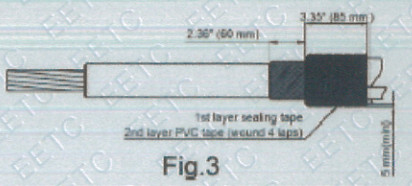


Fig.3

Wire Shielded Cable / JNC Cable

STEP 1

- Measure down from top of the cable as shown in Fig.4 . Remove cable jacket (if jacketed cable is used) to expose neutral wires.
- Use copper wire to lash the neutral wires. Use coarse sandpaper to grind the cable jacket about 25mm to rough the surface.
- Clean cable jacket and Neutral wires.
- Wrap 1 lap sealing tape onto the cable jacket about 15mm.

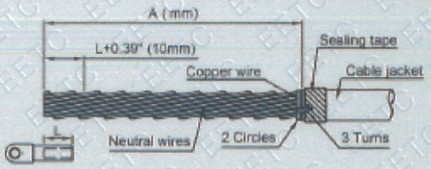


Fig.4

Part Number	15-A	15-B	15-C
Cable Insulation O.D. Range	13.2– 17.0	16.8 – 27.0	25.3 – 50.0
A (mm)	240	260	285

STEP 2

- Bend neutral wires down and parallel to cable.
- Use copper wire to secure neutral wires to cable jacket as shown in Fig.5.

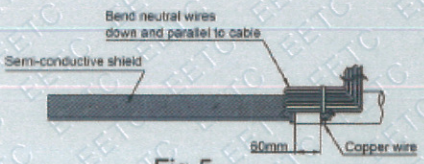


Fig.5

STEP 2

- Sand off the sharp corners of the Cu conductive shield with coarse sandpaper and secure with copper tape.
- Use coarse sandpaper to grind the cable jacket about 25mm to rough the surface.
- Clean cable jacket and Cu conductive shield.
- Wrap 1 lap sealing tape onto the cable jacket about 15mm.
- Measure down 25mm from top of the cable jacket use constant-force spring to fix ground braid onto Cu conductive shield.

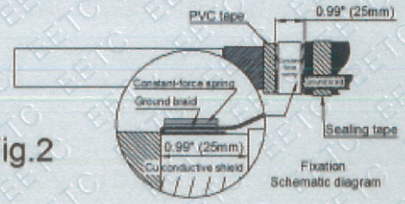
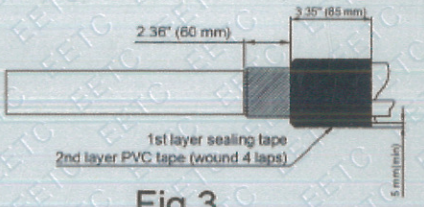


Fig.2

STEP 3

- Measure down 85mm from top of the Cu conductive shield wrap the sealing tape onto the ground braid.
- The height of the tape is 5mm (min) higher than that of the cable jacket.
- Wrap the PVC tape on top of it by 4 laps.
- Proceed to step B.



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- Use copper wire to lash the neutral wires. Use coarse sandpaper to grind the cable jacket about 25mm to rough the surface.
- Clean cable jacket and Neutral wires.
- Wrap 1 lap sealing tape onto the cable jacket about 15mm.

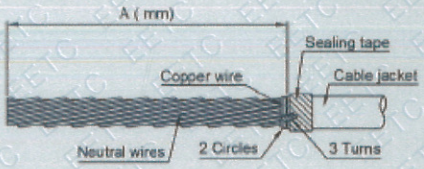

Fig.4

Part Number	15-A	15-B	15-C
Cable Insulation O.D. Range	13.2– 17.0	16.8 – 27.0	25.3 – 50.0
A（mm）	320	340	345

STEP 2

- Bend neutral wires down and parallel to cable.
- Use copper wire to secure neutral wires to cable jacket as shown in Fig.5.

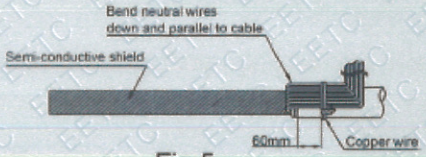

Fig.5

STEP 3

- Keep the 60mm semi-conductive shield and remove excess .
- Measure down 85mm from top of the neutral wires wrap the sealing tape.
- The height of the tape is 5mm (min) higher than that of the cable jacket.
- Wrap the PVC tape on top of it by 4 laps.
- Proceed to step B.

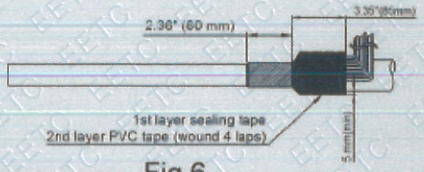

Fig.6

NOTE: Ensure that all parts of the cable are not damaged. If there is any irreparable damage, a new cable needs to be made .If there is any impurity or slight damage on the surface of the insulation , it can be polished with fine sandpaper.

B. Install Termination

STEP 1

- Polish and clean thoroughly the insulation by using sandpaper belt and paper towel then apply the silicone lubricant around the dotted line area.

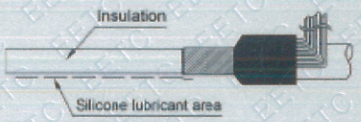

Fig.7

STEP 2

- Mark insulation shield for 60mm on the PVC tape
- Place the cold shrink termination onto the cable, aligning the mark with the end of the hold out tube . Take out the hold out tube to complete the installation.

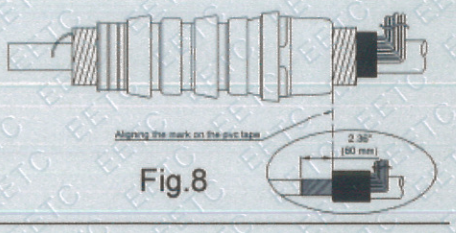

Fig.8

STEP 3

- Apply silicone lubricant to skirt and PVC area.

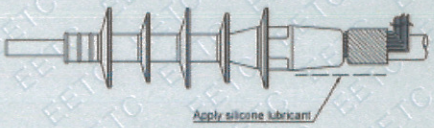

Fig.9

STEP 4

- Pull down the skirt over the PVC tape to seal the cable entrance.

Fig.10

C. Install Compression Connector

STEP 1

- Keep the "L+0.39"(10mm)" insulation and remove the excess part.
- Remove the insulation to expose the bare conductor according to lug depth "L" as shown in Fig.11.

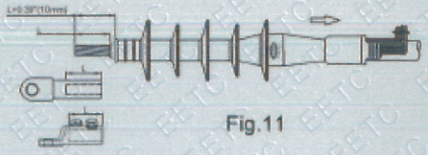

Fig.11

STEP 2

- Clean the exposed conductor by using a wire brush.
- Place the connector on the exposed conductor and Install it.

Fig.12

STEP 3

- Wrap the sealing tape between the insulation and connector.

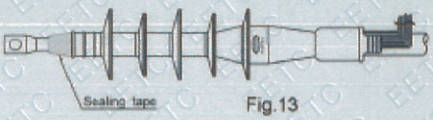

Fig.13

CHARDON

STEP 3

- Apply silicone lubricant to skirt and PVC area.

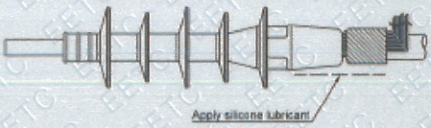

Fig.9

STEP 4

- Pull down the skirt over the PVC tape to seal the cable entrance.

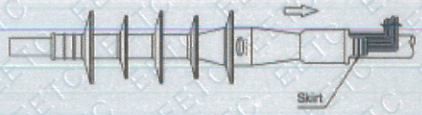

Fig.10

C. Install Compression Connector

STEP 1

- Keep the "L+0.39"(10mm)" insulation and remove the excess part.
- Remove the insulation to expose the bare conductor according to lug depth "L" as shown in Fig.11.

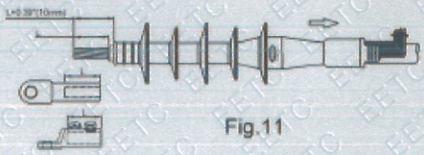
Fig.11

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- Clean the exposed conductor by using a wire brush.
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Fig.12

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- Wrap the sealing tape between the insulation and connector.

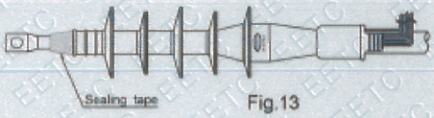

Fig.13