Data Sheet
110kV TD123II dry type outdoor termination

1. Product Description:

3M 110kV TD123II dry type outdoor termination meets requirement of test and product according to IEC60840 and GB11017.3, one piece, dry type termination made silicone rubber body. The termination is designed to 64/110kV, XLPE insulation, and metallic sheath cable.

Product Feature：

- Designed for 64/110kV class, system voltage: 126kV.
- Meet requirement of IEC60840 and GB11017 standard.
- One piece design without parting line, no debonding.
- Easy to install and wide range of cable size.
- Compact termination body, benefit for installation and fixture space.
- Excellent performance of silicone materials, good creepage performance, UV, contamination and hydrophobic performance.
- Good outdoor performance of big/small skirt.
- Special design for stress cone surface to reduce high stress and optimize stress distribution with thinner insulation thickness.
- Cold shrink technology for top sealing.
- Current collection ring with silicone for creepage performance and bottom sealing.

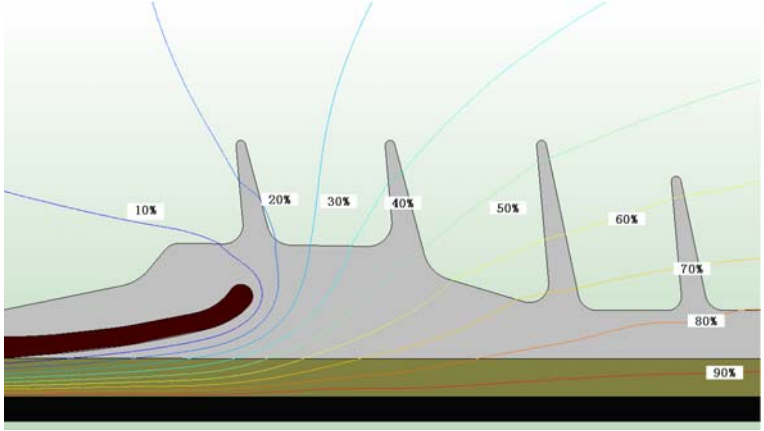
Optimized Product Design：

TD123II dry type termination is designed with stress distribution analysis and material technology, the stress cone designed to minimize surface stress by uniformly redistributing the electrical field over the entire surface of the insulator, it will provide voltage of AC test and impulse test to meet operation requirement for long term and environment.

Silicone Materials:

TD123II dry type termination is use of liquid silicone materials for insulation and stress cone. Track resistance is up to 4.5kV/mm; shorten recover time for hydrophobic performance.

Stress Distribution：



2．Physical & Electrical Properties：

2.1 Silicone Rubber for Insulation:

Test Item	Typical Value	Test Method
Tensile strength	550%	ISO 37
Tear strength	9 N/mm^2	ISO 37
Hardness Shore A	40	ISO 868
Recover time for hydrophobic	5.0h	3M test method No.406
Dielectric constant	2.7	IEC 60250
Dissipation factor	0.003	IEC60250
Dielectric strength	28 kV/mm	IEC60243
Track resistance （4.5kV）	6.0h	IEC60587

2.2 Silicone Rubber for Semi-conductive:

Test Item	Typical Value	Test Method
Tensile Strength	650%	DIN 53 504 S2
Tear Strength	7 N/mm^2	DIN 53 504 S2
Hardness shore A	40	DIN 53 505
Volume resistance	45 Ω • cm	DIN 53482

2.3 Electrical Properties:

Electrical Properties	Typical Value
Rated voltage class U_0/U	64/110kV
Max. permissible system voltage U_m	126kV
Current carrying capability	According to cable
Permissible short-circuit current I_s	According to cable Max：100kA
Max. conductor temperature	
a. operation ℃	90
b. short-circuit 5s ℃	250
With pole centre distance	1100mm
Leakage path	4050
Flash over distance	1420mm
Position of installation	Vertical/horizontally（Indoor）
Pollution layer class	III
power frequency withstand voltage Upw	192kV，6h，No breakdown and flashover
Lightning impulse withstand voltage U_{ps} 1.2/5.0	550kV
Typical test （according to IEC 60840）	Pass
Conductor connection technique	Compression
Weight（not including cable）	Approx. 30kg
Cable conductor cross section	240-630mm^2
Installation range	57-66.5mm

3．Application：

Product:

This termination is used for 64/110kV class, meets requirement for long term performance of indoor and outdoor application. It could connect with equipment or line, for example, switchgear, transformer, bushing, overhead line etc; the termination also could be used in power station and on power tower, the actual application about fixture should be determined by actual design and requirement to environment, termination must be straight and no bending, normally is installed vertically in power station, also could be lean installation like on tower(max. lean angle: 45^0), it could be applied for connection with wire and transformer; some environments without heavy pollution and humidity, horizontal installation could be used. The operation temperature is 90℃, temperature during short circuit is 250℃. The installation should be handled by operators who have intelligence and had been trained and certificated by 3M; the installation should be followed by 3M drawing and instruction and installed on suitable cable.

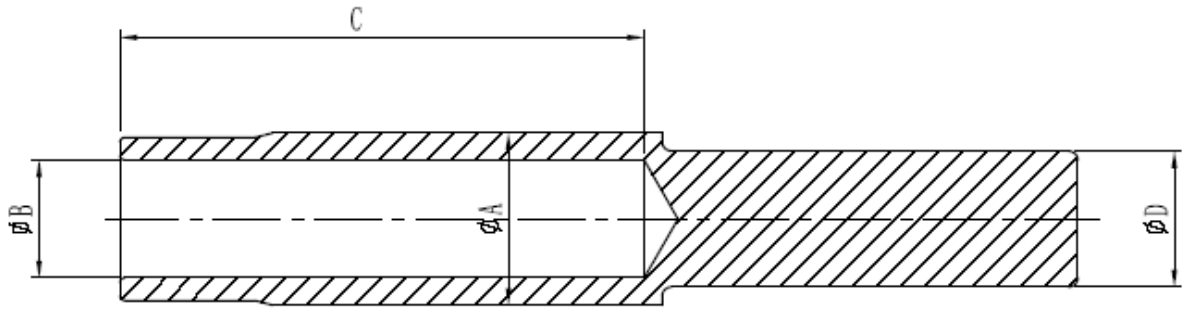
Selection Table：

Termination Selection：

Product	Conductor cross section mm^2	Insulation OD. mm
TD123-Ⅱ	240 - 630	57 – 66.5

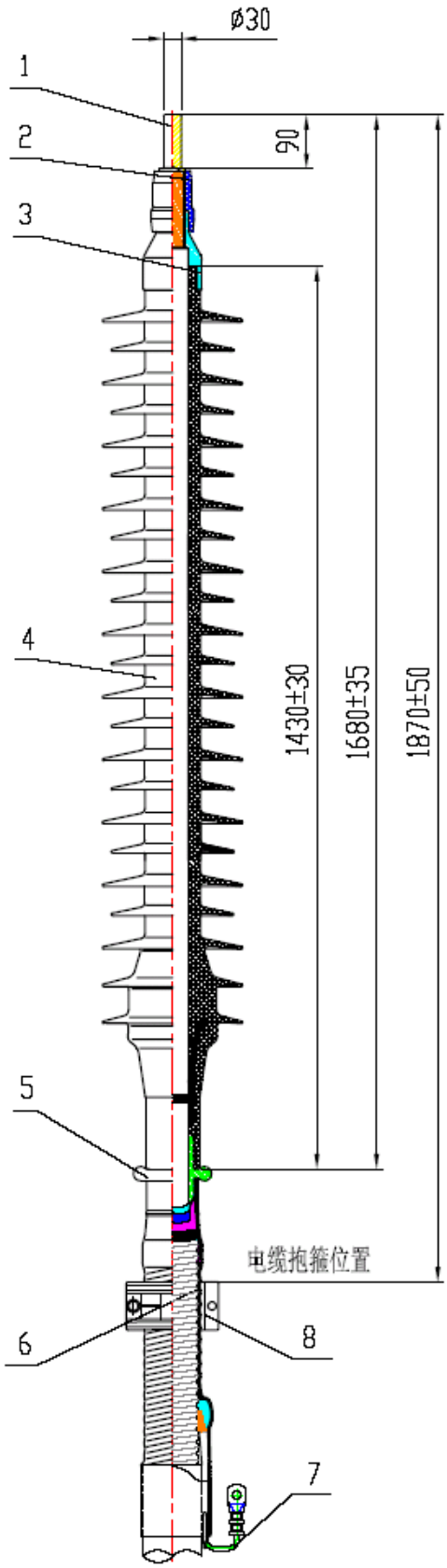
Note：the selection is based on cable insulation OD. and cross section is reference.

Selection for connection bolt：



Cross Section mm^2	OD. for compression (A) mm		Inner diameter (B)mm		Hole depth (C) mm		Connection OD. (D) mm	
	Cu	Al	Cu	Al	Cu	Al	Cu	Al
240	32	32	21	21	116	116	30	30
300	32	36	23.5	23.5				
400	36	42	26	26				
500	42	44	28	28				
630	44	/	34	/		/		/

Product Drawing：（Typical Value）



1 出线端子 / Connection Bolt Crimping
2 冷缩密封管/ PST Sealing Tube On Top
3 橡胶密封帽/ Silicone End Cap
4 干式终端本体 / Termination Body
5 电流收集环/ Leakage Current Collector
6 热缩管/ Heat Shrink Sleeve
7 接地线/ Earthing Cable
8 电缆抱箍/ Cable Clamp

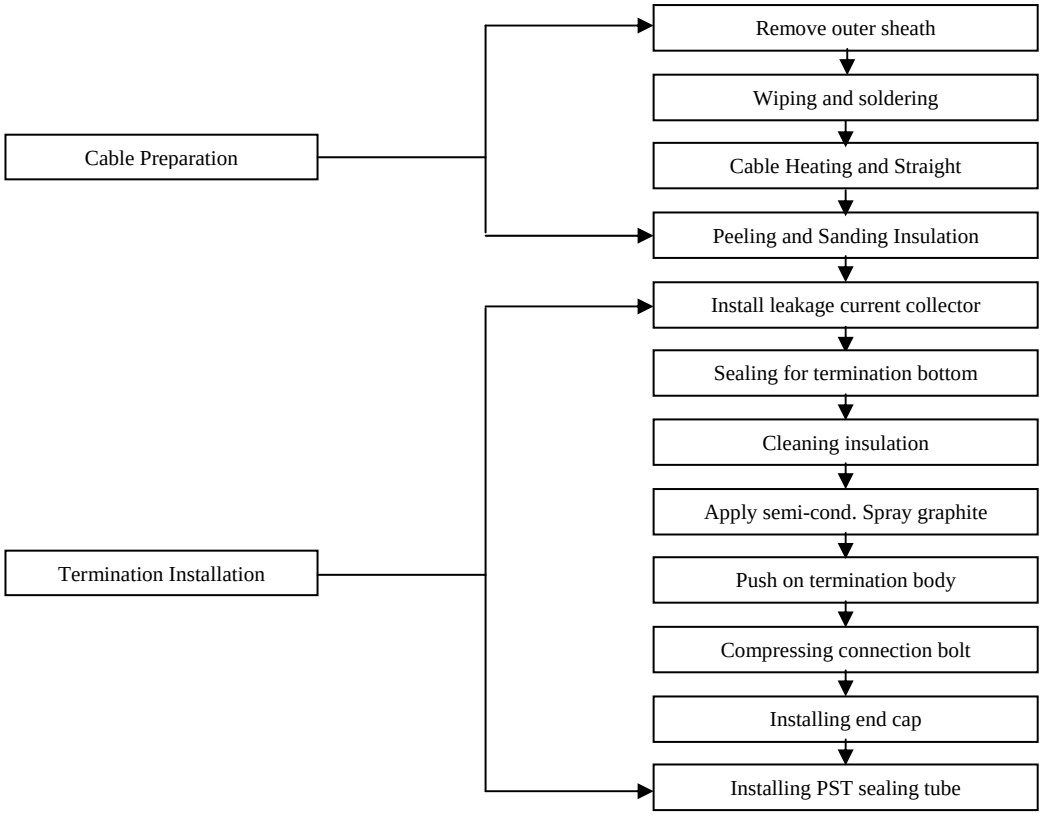
4. Typical Test：

Test standard：GB/T 11017.3-2002、IEC60840

Test Item	Test Requirement	Test Result
Partial Discharge	No detectable discharge from the test object at 96kV	1.2pC
Heating cycle voltage test	As per clause 3.2 of this report	Pass
Partial discharge test at high temperature	No detectable discharge from the test object at 96kV	1.2pC
Partial discharge test at ambient temperature	No detectable discharge from the test object at 96kV	1.2pC
Lightning impulse withstand test	No breakdown or flashover should occur at 10 positive and 10 negative impulses of 550kV	Pass
Power frequency voltage test after impulse voltage test	No breakdown or flashover should occur at 160kV for 15min	Pass
Power frequency voltage wet withstand test	No breakdown or flashover should occur at 185kV for 1min	Pass
Radio influence voltage test	Radio influence voltage should not exceed 450 μV at 1MHz and 81kV	110 μV

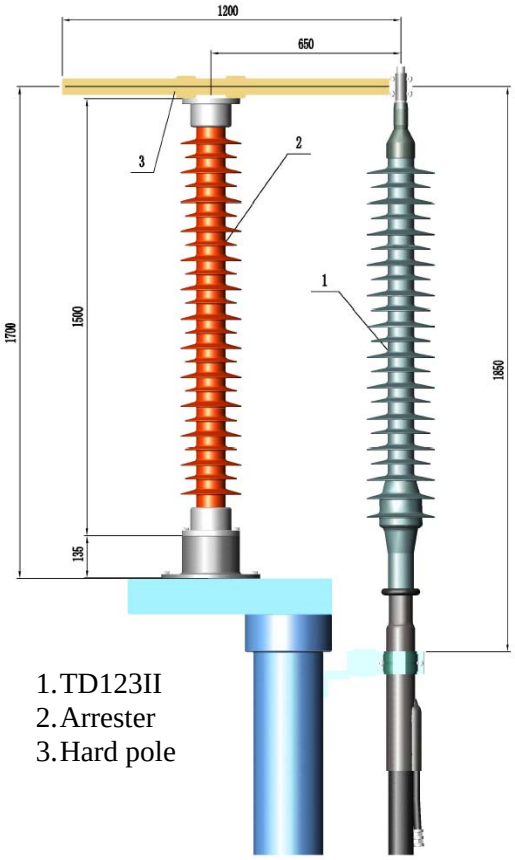
5. Installation：

The installation drawing is in package. Installation workflow as below, detail please read instruction:

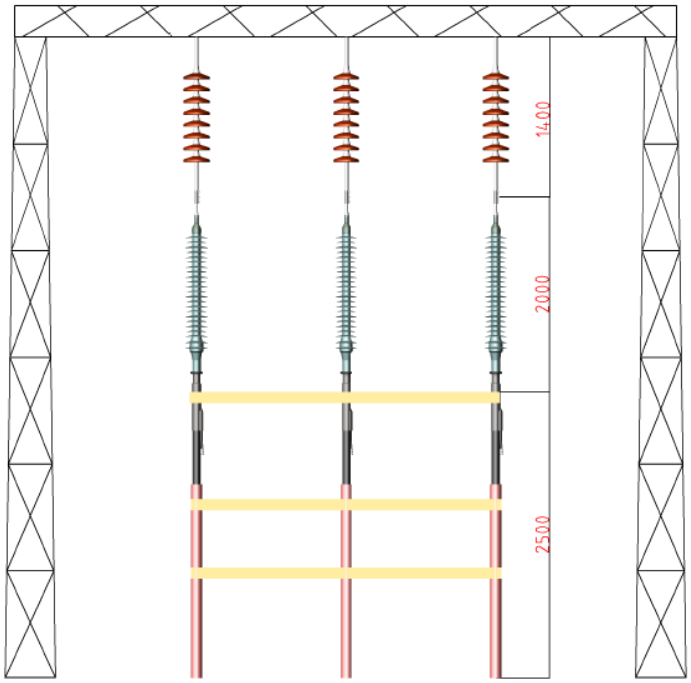


Typical Application：

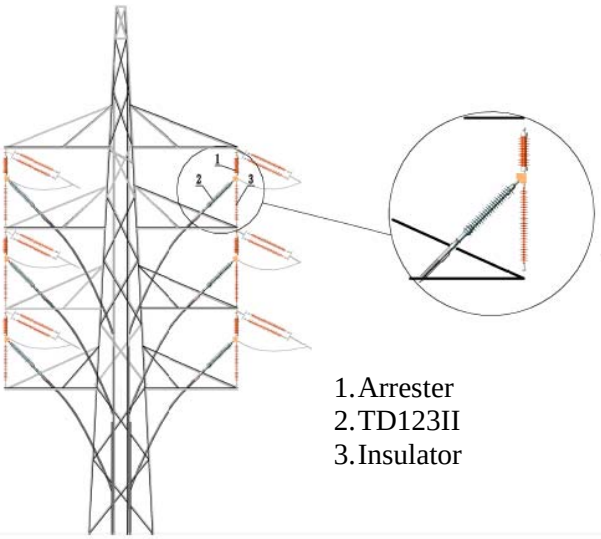
1. Application in Power Station：



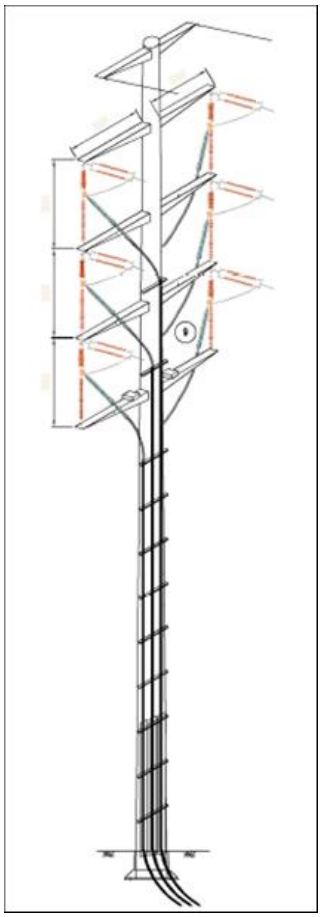
1. TD123II
2. Arrester
3. Hard pole



2. Application on Tower：



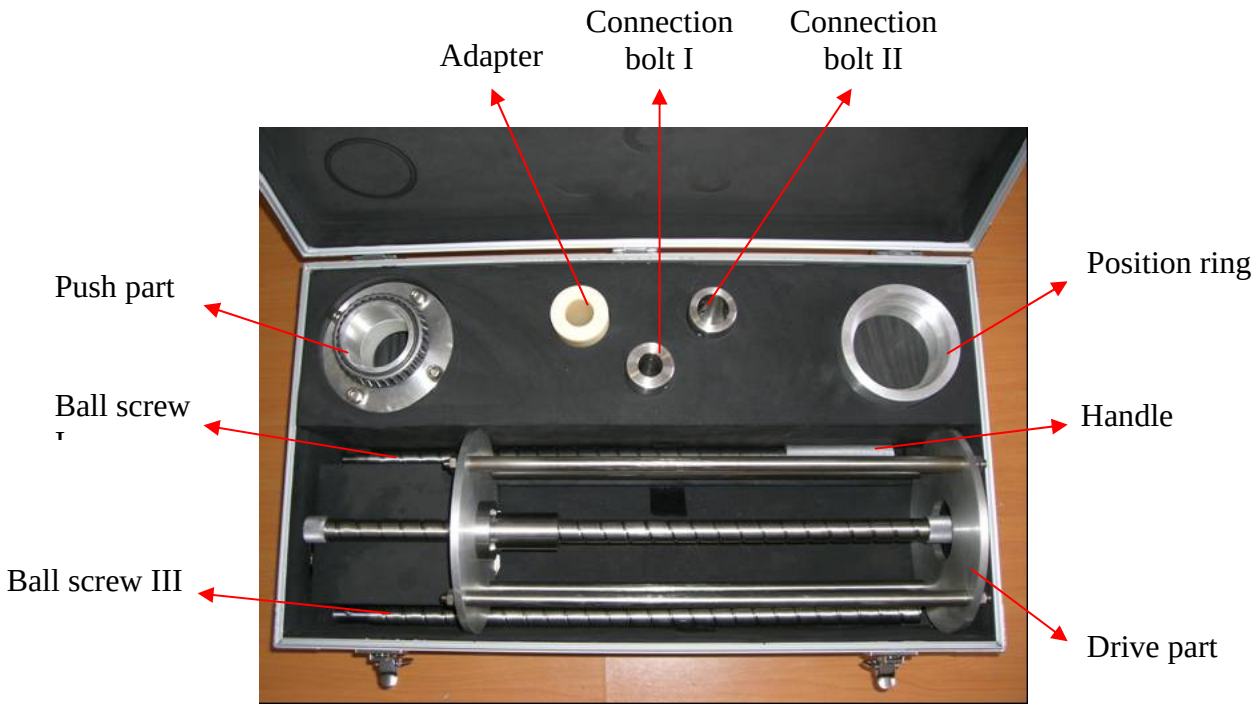
1. Arrester
2. TD123II
3. Insulator



Note：

1. The fixture of termination is designed according to the height of tower, see above figure, it could be fixed together with arrester and insulator, the end of termination should be also fixed on tower.
2. After fixing on tower, the termination should be straight and no bending, it could be leaned, but no less than 45^0, the bottom of termination should be fixed following cable line.
3. Termination must be connected with hard pole and more short connection wire will be better.

Installation Tools：



Installation Tools List：

Item	Part Description	Pic
1	Ball screw Ⅰ	1
2	Ball screw Ⅲ	1
3	Drive part	1
4	Push part	1
5	Adapter	1
6	Connection bolt Ⅰ	1
7	Connection bolt Ⅱ	1
8	Handle	1
9	Position ring	1

6. Maintenance:

The components of TD123IItermination are not impaired by freezing or heating up to 43℃ due to ambient temperatures found in storage or shipping. Normal storage and stock rotation are recommended. The manufacture date could be found in certificate in package.

The termination can be used before following date:

1. Termination body: 5 years.
2. Tape and others: 3 years

IMPORTANT NOTICE TO PURCHASER:

All statement, technical information and recommendations related to the Seller's products are based on information believed to be reliable but the accuracy or completeness thereof is not guaranteed. Before utilizing the product, the user should determine the suitability of the product for its intended use. The user assumes all risks and liability whatsoever in connection with such use.

3M China Limited R&D Center
222 Tian Lin Road, Shanghai 200233 P. R. China, Fax: (86-21)2205173, Tel: (86-21)22105335