



LUYON CORPORATION

# 15~35KV Termination Kit



*Luyon Corporation*

***21221 Western Ave., #210 Torrance, CA 90501, U.S.A.***



## Advantages of Silicone Rubber Power Cable Accessories

### Feature of silicone rubber:

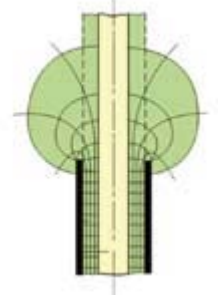
Silicone rubber is a unique synthetic elastomer made from cross-linked polymer which is reinforced with silica. Its characteristics are such that it provides perfect balance of mechanical and chemical properties required by many of today's most demanding applications.

- **High and low temperature stability:** Parts fabricated from silicone rubber steadily keep all room temperature characteristics across a wide temperature range and they are serviceable at temperature ranging from -80 °C to 200 °C.
- **Inertness (no taste or smell).**
- **Wide hardness range:** 10-80 Shore A, gives much freedom to select the desired hardness to best perform a specific function.
- **Chemical resistance:** Silicone rubber resists the effects of many harsh circumstances, resistance to chemical solvents, fuels, oils, water and steam.
- **Weatherability:** Anti-UV ray, anti-aging, etc.
- **Sealing performance:** The good elastic performance can provide excellent sealing ability.
- **Electrical properties:** Silicone polymers have inherently good electrical insulation qualities. They are nonconductive because of their chemical nature as being compounded with the proper fillers and additives, which are used to produce rubber for a wide range of electrical insulation applications. Silicone rubber also has excellent resistance to severe environmental stress; its electrical insulation properties remain unchanged much longer than those of other flexible materials.
- **Hydrophobic and hydrophobic transferability performance.**

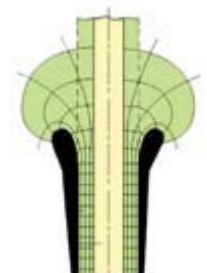
### Why use silicone rubber for power cable accessories:

This series power cable accessories made of silicone rubber with Well designed stress cone inside, it excellently solves the electric field stress at the screen cut edge, can great satisfy the electrical, mechanical and hightemperature performance requirements.

The performances of ultraviolet radiation resistance, aging resistance, weatherability, anti-corrosion, waterproof ensure the cable accessories run stably in some dirty, bad climate environment. The silicone rubber material is superior to other materials (such as EPDM) in weatherability, such as anti-UV, anti-aging, hydrophobic, elasticity, tenacity, etc. It can recover the cable structure without any defects and guarantee no defects occurring during running. Even at high voltage condition, it can reduce the partial discharge to minimum level.



Without stress cone



With stress cone



## Medium Voltage Cold Shrink Power Cable Accessories up to 42kV

### Characteristics:

- **Easy/convenient installation:** Stress cone wholly composed inside the silicone rubber body greatly releases the electric stress at the screen cut edge. Pre-expanding with removable plastic spiral tube inside, the elastic silicone rubber body will shrink automatically and tightly onto the needed position by removing the plastic spiral tube without heating or special tools.
- **Reliable insulation:** Adopting Germany liquid silicone rubber, serving the utilities and industry successfully for 20 years.
- **Superior moisture sealing:** Triplex sealing design and hydrophobic performance of silicone rubber ensure environmental stability.
- **Safety for installing fault:** Consider the design reduces the incidence of installing faults which likely occur.
- **Wide usage:** Possessing a series of superior performances, the cold shrink accessories can be widely used in various regions, especially fire forbidden area, high sea level, cold weather, high-humidity, salt-fog and heavy polluted regions.

**Application:** 1-core or 3-core XLPE cable termination and joint up to 26/35(42)kV

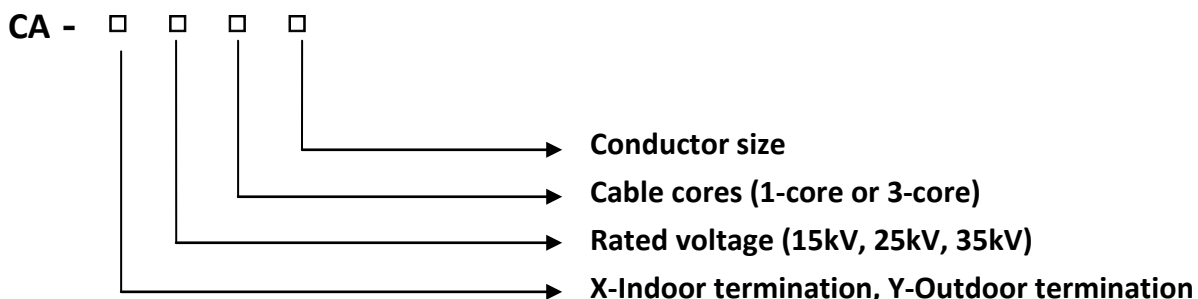
**Note:** For product selection and testing, we follow the classification for rated voltage  $U_0/U(U_m)$  as referred to in IEC and CENELEC standards:

$U_0$  is the rated power frequency voltage between phase conductor and earth or metallic screen for which the cable accessories is designed.

$U$  is the rated power frequency voltage between phase conductors for which the cable accessories is designed.

$U_m$  is the maximum value of the highest system voltage for which the cable accessories may be used.

### Selection guide:





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**All types:** Indoor termination, outdoor termination and straight through joint.



Cold shrink indoor termination



Cold shrink outdoor termination



Cold shrink straight through

## Technical data table for medium voltage cold shrink power cable accessories

U0/U(Um)	8.7/5(7.5)kV	12/20(24)kV	26/35(42)kV
Test item			
A.C. voltage withstand test	No flashover, no breakdown at 39kV for 5min.	No flashover, no breakdown at 54kV for 5min.	No flashover, no breakdown at 117kV for 5min.
Partial discharge test	15kV, <2pC	20kV, <2pC	45kV, <2pC
Heating cycles voltage test	63 cycles at the temperature of 95-100°C, 23kV	63 cycles at the temperature of 95-100°C, 30kV	63 cycles at the temperature of 95-100°C, 65kV
Impulse voltage withstand test at 95-100°C	No flashover, no breakdown at 10 positive and 10 negative impulses at 95kV	No flashover, no breakdown at 10 positive and 10 negative impulses at 125kV	No flashover, no breakdown at 10 positive and 10 negative impulses at 200kV
15min, A.C. voltage withstand test	23kV, 15min. no flashover, no breakdown	30kV, 15min. no flashover, no breakdown	65kV, 15min. no flashover, no breakdown



Cold shrink termination and joint are under testing

## Technical data table for medium voltage cold shrink power cable accessories

Test object	$U_0/U(U_m)$	8.7/5(7.5)kV	12/20(24)kV	26/35(42)kV
	Test item			
For indoor termination	Humidity test.	No flashover, tracking, erosion or mechanical damage at 300h, 11kV	No flashover, tracking, erosion or mechanical damage at 300h, 15kV	No flashover, tracking, erosion or mechanical damage at 300h, 32.5kV
For outdoor termination	Salt fog test	No flashover, tracking, erosion or mechanical damage at 11kV for 1000h	No flashover, tracking, erosion or mechanical damage at 15kV for 1000h	No flashover, tracking, erosion or mechanical damage at 32.5kV for 1000h
For joint	Heating cycles voltage test	63 cycles, 33 cycles in air, 30 cycles under water at 95-100°C, 23kV	63 cycles, 33 cycles in air, 30 cycles under water at 95-100°C, 30kV	63 cycles, 33 cycles in air, 30 cycles under water at 95-100°C, 65kV

Above proved technical data table is according to IEC60502-4, GB/T 12706.4 standard. Meantime above products meet CENELEC HD 629.1 S1.



High voltage test hall

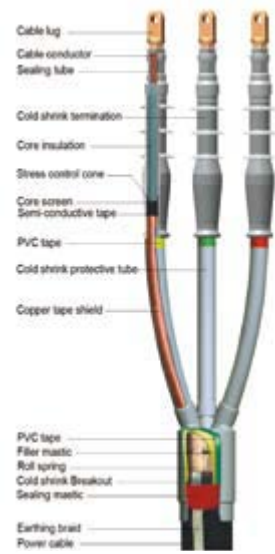
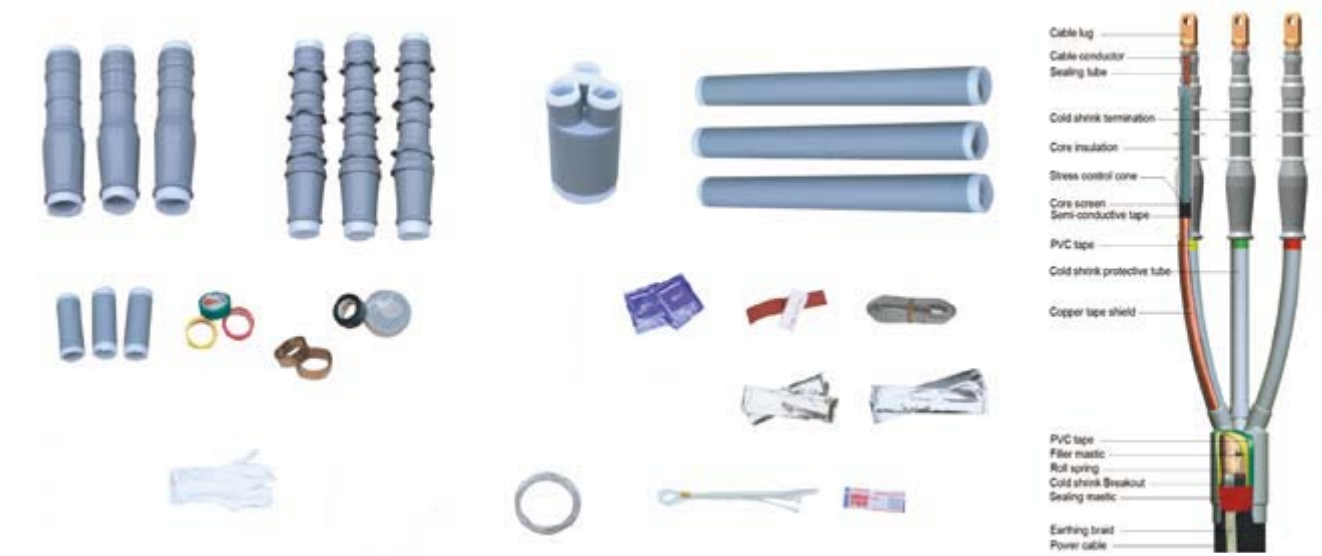


## Cold shrink termination for XLPE cable

### Main components:

Cold shrink indoor/outdoor termination insulation body, cold shrink 3-core breakout, cold shrink protective tube, cold shrink sealing tube, PVC tape, roll spring/copper bind wire, semi-conductive tape, cleaning tissue, silicone grease, abrasive paper, copper braid, sealing mastic tape, filler mastic tape, nylon tier, cotton gloves, tapeline.

Aluminum/Copper/Bi-metal lug, Support insulator, Tee bracket can be supplied as per specification.

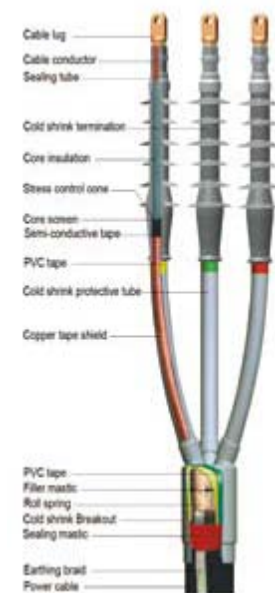


Cold shrink indoor termination

### Selection table:

Suitable for 1-core & 3-core.

Voltage	Part No. of cold shrink body		Cable conductor Size (mm <sup>2</sup> )	Cable core insulation outer dia. range (mm)
	Indoor	Outdoor		
8.7/15(17.5)kV / 12/20(24)kV	CA-X2511	CA-Y2511	25-60	15-21
	CA-X2512	CA-Y2512	70-120	19-25
	CA-X2513	CA-Y2513	150-240	23-31
	CA-X2514	CA-Y2514	300-400	29-37
	CA-X2515	CA-Y2515	500-800	37-46
26/35(42)kV	CA-X3516	CA-Y3516	50-95	31-35
	CA-X3517	CA-Y3517	120-185	35-39
	CA-X3518	CA-Y3518	240-400	39-47
	CA-X3519	CA-Y3519	500-800	46-57



Cold shrink outdoor termination



## Cold shrink straight through joint for XLPE cable

### Main components:

Cold shrink straight through joint body, PVC phase color tape, copper sock, roll spring/copper bind wire, PVC tape, armour cast, silicone grease, copper braid, waterproof tape, cleaning tissue, cotton & rubber gloves, abrasive paper, tapeline.

Aluminum/Copper/Bi-metal connector can be supplied as per specification.



### Selection table:

Voltage	Cable cores	Part No. of cold shrink body	Cable conductor size (mm <sup>2</sup> )	Cable core insulation outer dia. range (mm)
8.7/15(17.5)kV / 12/20(24)kV	1-core or 3-core	CA-Z 25-60	25-60	15-21
		CA-Z 70-120	70-120	19-25
		CA-Z 150-240	150-240	23-31
		CA-Z 300-400	300-400	29-37
		CA-Z 500-800	500-800	37-46
26/35(42)kV	1-core or 3-core	CA-Z 50-95	50-95	31-35
		CA-Z 120-185	120-185	35-39
		CA-Z 240-400	240-400	39-47
		CA-Z 500-800	500-800	46-57





## **Cold shrink power cable components** Characteristics:

Easy and quick installation, no special tools or heat required, suitable for a wide range of cable size.

No specific user skills or craftsmanship required.

Excellent resistance to ozone and UV radiation, acid

### **Cold shrink 3-core breakout**

Cold shrink breakout, pre-expanded and mounted on removable inner-supporting plastic spiral tube, is designed to protect the phase leg crutch of 3-core medium voltage power cable up to 42kV from exposure to moisture, contamination, corrosion, ozone, UV, physical contact and other hazards.

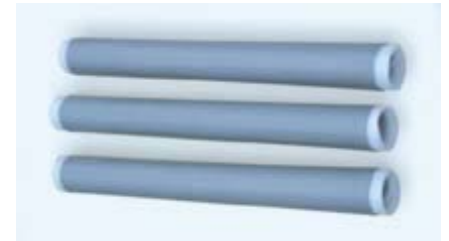


### **Characteristics:**

- Easy and quick installation, no special tools or heat required, suitable for a wide range of cable size.
- No specific user skills or craftsmanship required.
- Excellent resistance to ozone and UV radiation, acid

### **Cold shrink tube**

Cold shrink silicone rubber insulation tube is pre-expanded and mounted on removable inner-supporting plastic spiral tube, which is designed to protect the phase leg of medium voltage power cable up to 42kV from exposure to moisture, contamination, corrosion, ozone, UV, physical contact and other hazards operation environment.





## Medium Voltage Pre-molded Power Cable Accessories up to 42Kv

### Characteristics:

- One-piece design with integrated stress cone.
- Quick and easy push-on installation.
- Long time storage, quick delivery.
- Waterproof lug special for outdoor termination.
- High quality silicone rubber, reliable insulation.
- Wide usage.
- All products can be 100% tested before leaving factory.
- Suitable for XLPE cable up to 42kV.

### Technical data table for pre-molded medium voltage power cable accessories

U <sub>0</sub> /U <sub>m</sub> Test item	8.7/5(7.5)kV	12/20(24)kV	26/35(42)kV
A.C. voltage withstand test	No flashover, no breakdown at 39kV for 5min.	No flashover, no breakdown at 54kV for 5min.	No flashover, no breakdown at 117kV for 5min.
Partial discharge test	15kV, <2pC	20kV, <2pC	45kV, <2pC
Heating cycles voltage test	63 cycles at the temperature of 95-100°C, 23kV	63 cycles at the temperature of 95-100°C, 30kV	63 cycles at the temperature of 95-100°C, 65kV
Thermal short-circuit test	No deformation or welding at 31.0kA, 2.02s and 31.1kA, 2.02s	No deformation or welding at 31.0kA, 2.03s and 31.0kA, 2.02s	No deformation or welding at 31.0kA, 2.03s and 30.8kA, 2.04s
15min, A.C. voltage withstand test	23kV, 15min. no flashover, no breakdown	30kV, 15min. no flashover, no breakdown	65kV, 15min. no flashover, no breakdown
Dynamic short-circuit test	No deformation or welding at 112.3kA, 60ms	No deformation or welding at 111.3kA, 60ms	No deformation or welding at 112.2kA, 60ms

## Technical data table for special test of pre-molded power cable accessories

Test object	$U_0/U(U_m)$	12/20(24)kV	26/35(42)kV	26/35(42)kV
	Test item			
For indoor termination	Humidity test.	No flashover, tracking, erosion or mechanical damage at 300h, 11kV	No flashover, tracking, erosion or mechanical damage at 300h, 15kV	No flashover, tracking, erosion or mechanical damage at 300h, 32.5kV
For outdoor termination	Salt fog test	No flashover, tracking, erosion or mechanical damage at 11kV for 1000h	No flashover, tracking, erosion or mechanical damage at 15kV for 1000h	No flashover, tracking, erosion or mechanical damage at 32.5kV for 1000h
For joint	Heating cycles voltage test	63 cycles, 33 cycles in air, 30 cycles under water at 95-100°C, 23kV	63 cycles, 33 cycles in air, 30 cycles under water at 95-100°C, 30kV	63 cycles, 33 cycles in air, 30 cycles under water at 95-100°C, 65kV

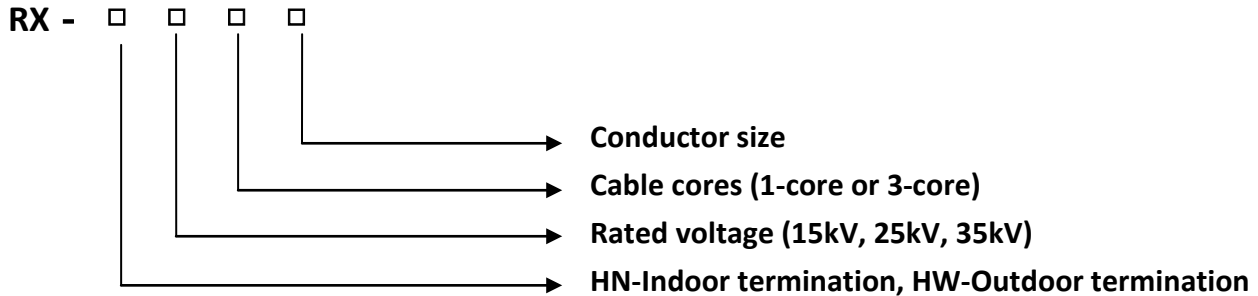
Above proved technical data table is according to IEC60502-4, GB/T 12706.4 standard. Meantime above products meet CENELEC HD 629.1 S1.



110kV dry termination is under testing in national testing center

## Pre-molded termination for XLPE cable

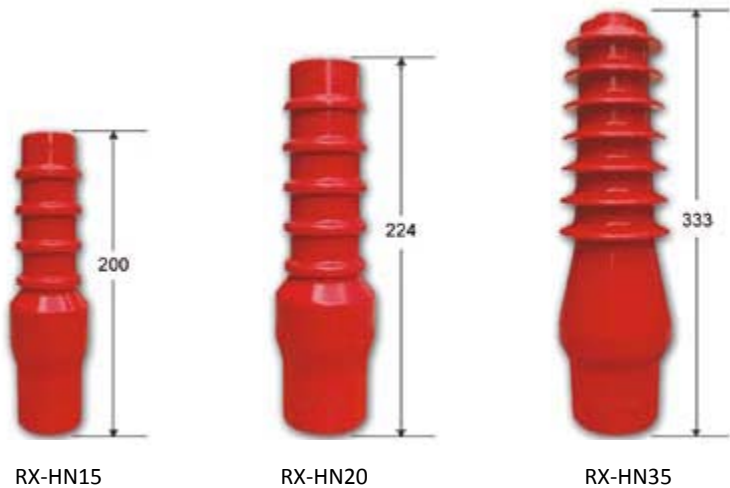
Selection guide:



**Example:**

35kV, cable cross section of 240mm<sup>2</sup>, 3-core, pre-molded indoor termination: RX HN 35-3×240

## Indoor termination



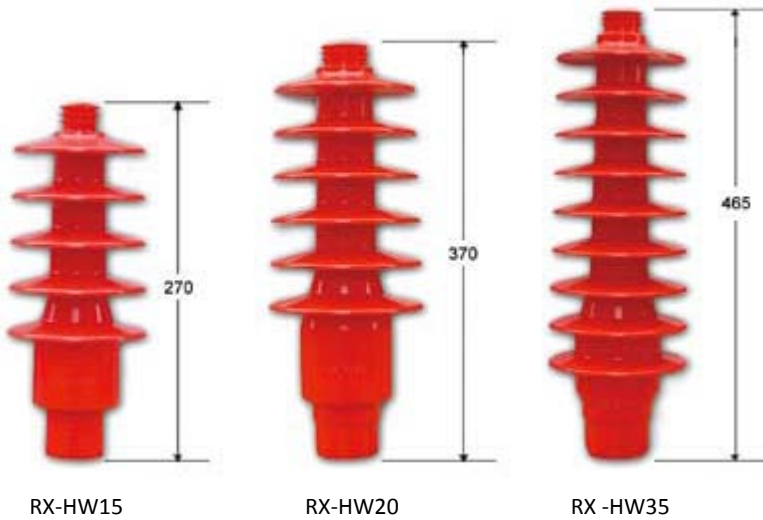
20kV indoor termination used in Iran

## Selection table

RX-HN15		RX-HN20		RX-HN35	
Conductor size (mm <sup>2</sup> )	Core insulation outer dia. min/ max(mm)	Conductor size (mm <sup>2</sup> )	Core insulation outer dia. min/ max(mm)	Conductor size (mm <sup>2</sup> )	Core insulation outer dia. min/ max(mm)
25	15.0-41.0	35-50	19.0-41.0	50-70	30.0-61.0
35-50		70-95		95-120	
70-95		120-150		150-185	
120-150		185		240	
185-240		240		300	
300		300		400	
400		400		500	
500		500		630	
630				800	



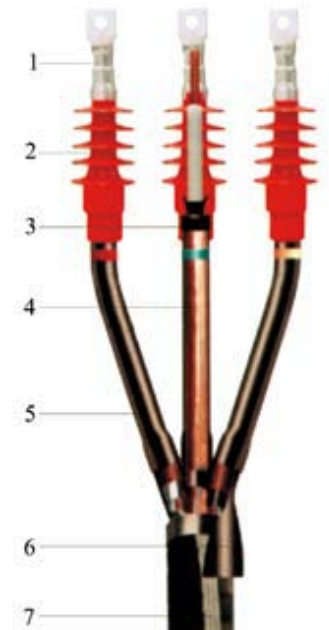
## Outdoor termination



15kV outdoor termination  
used in Guangzhou



20kV outdoor termination  
used in Iran



- 1.cable lug
- 2.pre-molded outdoor termination
- 3.semi-conductive tape
- 4.copper tape screen
- 5.heat shrinkable protective tube
- 6.heat shrinkable breakout
- 7.copper braid

## Selection table

RX-HW15		RX-HW20		RX-HW35	
Conductor size (mm <sup>2</sup> )	Core insulation outer dia. min/ max(mm)	Conductor size (mm <sup>2</sup> )	Core insulation outer dia. min/ max(mm)	Conductor size (mm <sup>2</sup> )	Core insulation outer dia. min/ max(mm)
25	15.0-41.0	35-50	19.0-41.0	50-70	30.0-61.0
35-50		70-95		95-120	
70-95		120-150		150-185	
120-150		185		240	
185-240		240		300	
300		300		400	
400		400		500	
500		500		630	
630				800	