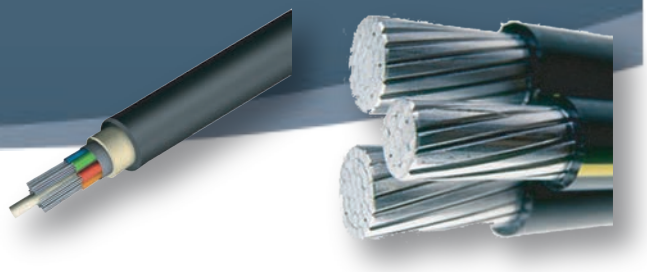
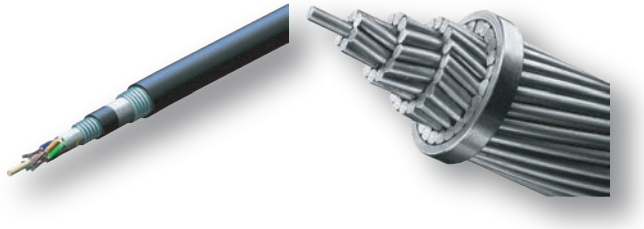
2015

Silverstone Electric

Cable, Conductor OPGW & Accessories





Silverstone Electric, Passion, Wiseness, Action and Quality

www.silverstone-electric.com

Suzhou Silverstone Electric Co., Ltd is a subsidiary of Taishan-Hengxin Group and we are based in China.

Our main function is to service the electrical industry by supplying transmission line and transformation equipment to various contractors, municipalities, power utilities, Telecom companies, and other institutions locally and abroad.

At Silverstone we have the factories, the knowledge and the experience needed to serve the OEM needs from our customers, we aim to be “Your Premium Electric Supplier” with a strong desire to cater quality products comes in a reasonably low price. Proudly to say that Silverstone’s stringent quality assurance systems have gratified to achieve total customized customer satisfaction.

Scope of our products:
Fuse Cutout | Drop Out Fuse | Lightning Arrester | Surge Arrester | Composite Insulators | Porcelain Insulators | Disconnect Switch | Heat Shrink | Cable Accessory | Electric Components | Pad Mount Transformer | Distribution Transformer | Switchgear | Relay Protection Panel | Battery Charger Panel

* Some parameters quoted in our catalogues like the voltage level, frequency and standards are based on China State Grid technical requirments. Products for exportation will comply with IEC Standards or according to customer’s requirements.

CONTENTS

01

Wire : PVC Insulated Wire and Cable

REFERENCE STANDARDS :

The product is manufactured according to the standards of GB5023-1997 and Jb8734-1998 or IEC, BS, DIN and ICEA upon request.

APPLICATION :

The products is suitable for power installation fixed wiring or flexible connection for el-electrical appliances with rated voltage up to and including 450/750V respectively.

OPERATING CHARACTERIES :

- Rated voltage Uo/U : 450/750V\300/500V and 300/300V.
- Max. Permissible continuous operating temperature of the conductor:

  2271EC 07(BV-90) 90°C

  2271EC 08(RV-90) 90°C

  Other models 70°C
- The ambient temperature under installation shall not below 0°C.
- The bending radius of cable:

  D≤25mm ≥4D

  D>25mm ≥6D

  (D-Diameter of the cable)

Silverstone Electric
Silverstone Electric
Silverstone Electric
Silverstone Electric

Wire : PVC Insulated Wire and Cable (Cont...)

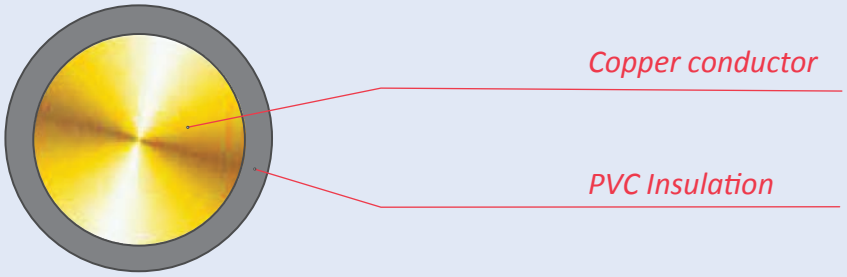
TYPE OF CABLE :

TYPE	RATED VOLTAGE V	NO. OF CORES	NOMINAL CROSS-SECTIONAL AREA OF CONDUCTOR MM^2	STANDARDS
227 IEC 01(BV)	450/750	1	1.5~400	GB5023-1997 IEC60227-1997
227 IEC 02(RV)	450/750	1	1.5~240	
227 IEC 05(BV)	300/500	1	0.5~1	
227 IEC 06(RV)	300/500	1	0.5~1	
227 IEC 07(BV-90)	300/500	1	0.5~2.5	
227 IEC 08(RV-90)	300/500	1	0.5~2.5	
227 IEC 42(RVB)	300/300	2	0.5~0.75	
227 IEC 52(RVV)	300/300	2,3	0.5~0.75	
227 IEC 53(RVV)	300/500	2, 3~24[1])	0.75~6	
BV	300/500	1	0.75~1	JB8734-1998
BLV	450/750	1	2.5~630	
BVR	450/750	1	2.5~240	
BVV	300/500	1	0.75~10	
BLVV	300/500	1	2.5~10	
BVVB	300/500	2, 3	0.75~10	
BLVVB	300/500	2, 3	2.5~10	
RVS	300/300	2	0.5~0.75	
RVP, RVP-90	300/300	1,2	0.08~6	
RVVP	300/300	1, 2~24[1])	0.3~6	

Silverstone Electric

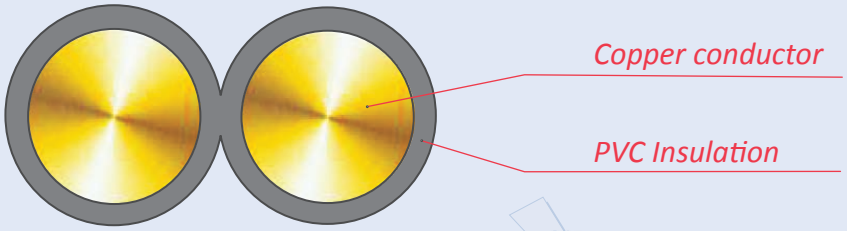
Wire : PVC Insulated Wire and Cable (Cont...)

CABLE STRUCTURE :



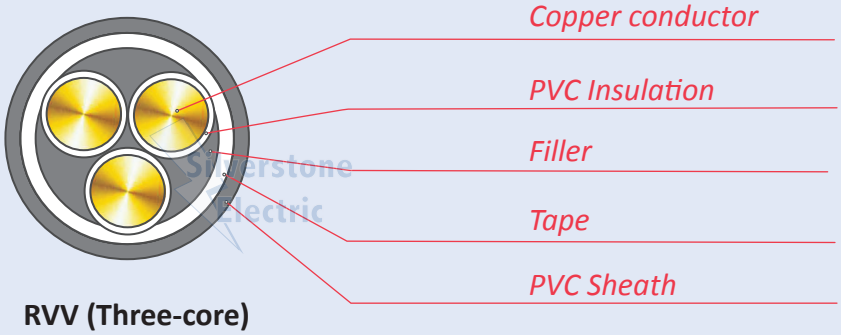
PV, RV-90

Silverstone Electric



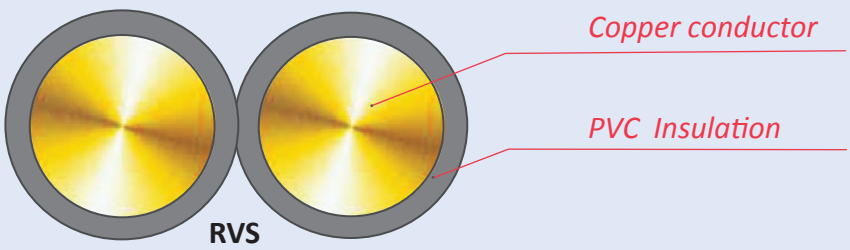
RVB

Silverstone Electric



RVV (Three-core)

Silverstone Electric



RVS

Control Cable : Plastic Insulated Control Cable

REFERENCE STANDARDS :

This product is manufactured according to GB9330 and enterprise standards.

APPLICATION :

For system connection wire of control, signal, protection or measuring with rated voltage up to and including 450/750V

OPERATING CHARACTERIES :

- Rated voltage U0/U : 450/750V.
- Max. Permissible continuous operating temperature of the conductor:

  PVC insulated : 70°C; XLPE insulated : 90°C.
- Upon short circuit (Max. Duration time 5s) the Max. Temperature of conductor not higher than:

  XLPE insulated : 250°C; PVC insulated : 160°C.
- The ambient temperature under installation shall not below 0~C.
- Preferred Permissible bending radium:

  For non-armored cable, not less than 6 times of cable diameter;

  For armored or copper-tape-screened cable, not less than 12 times of cable diameter;

  For screened flexible cable, not less than 6 times of cable diameter.

Silverstone Electric
Silverstone Electric
Silverstone Electric
Silverstone Electric

Control Cable : Plastic Insulated Control Cable (Cont...)

TYPE	RATED VOLTAGE V	NOMINAL CROSS-SECTIONAL AREA OF CONDUCTOR MM²							
		0.5	0.75	1.0	1.5	2.5	4	6	10
		NO. OF CORES							
KVV KYJV KVVP KYJVP	450/750		2~61				2~14		2~10
KVVP2 KYJVP2			4~61				4~14		4~10
KVV22 KYJV22			7~61			4~61	4~14		4~10
KVV32 KYJV32			19~61		7~61		4~14		4~10
KVVR KYJVR			4~61						
KVVRP			4~61		4~48				

TYPE :

TECHNICAL DATA :

- Conductors have three species : First (Solid conductor) (A), Second for fixed installation (B) (Stranded conductor), and Third for moveable requirement (R) (stranded flexible conductor).
- The structure and D.C. resistance.

Silverstone Electric

Control Cable : Plastic Insulated Control Cable (Cont...)

NOMINAL, CROSS-SECTION mm²	CONDUCTOR STRUCTURE		D.C. RESISTANCE OF CONDUCTOR AT 20°C (Ω/km)≤	
	SPECIES	NO./NOMINAL, DIAMETER OF A SIGNAL WIRE mm	UNTINNED WIRE	TINNED WIRE
0.5	3	16/0.20	39.0	40.1
0.75	1	1/0.97	24.5	24.8
0.75	2	7/0.37	24.5	24.8
0.75	3	24/0.20	26.0	26.7
1.0	1	1/1.13	18.1	18.2
1.0	2	7/0.43	18.1	18.2
1.0	3	32/0.20	19.5	20.0
1.5	1	1/1.38	12.1	12.2
1.5	2	7/0.52	12.1	12.2
1.5	3	30/0.25	13.3	13.7
2.5	1	1/1.78	7.41	7.56
2.5	2	7/0.68	7.41	7.56
2.5	3	50/0.25	7.98	8.21
4	1	1/2.25	4.61	4.70
4	2	7/0.85	4.61	4.70
6	1	1/2.76	3.08	3.11
6	2	7/1.04	3.08	3.11
10	2	7/1.35	1.83	1.84

- The screen layer of cables shall be braided with copper wire or applied helically with copper tape.

Silverstone Electric

Fluoroplastic insulated and sheathed control cable

REFERENCE STANDARDS :

This product is manufactured according to enterprise standard Q/320282 DCZ09-2001

APPLICATION :

This product applies for instruments connection or signal transmission of auto-control systems under higher or lower temperature or in various harsh environment in industrial or mining enterprises of metallurgy, electric power, oil, chemistry and so on, with excellent adventages of high or low temperature-resistant, acid-alkali-oil-and-water-proof, and fire-resisting.

TYPE AND NAME :

TYPE	NAME
KFF	Fluoroplastic insulated and sheathed control cable
KFFP	Fluoroplastic insulated and sheathed copper wire braided common shielded control cable
KFFR	Fluoroplastic insulated and sheathed flexible control cable
KFFRP	Fluoroplastic insulated and sheathed-copper-wire braided common shielded flexible control cable

SYMBOL MEANINGS OF SPECIFICATION :

TYPE	SYMBOLS	MEANINGS
Series	K	Control cable
Insulation	F	Fluoroplastic
Sheath	F	Fluoroplastic
Conductor Species	R	Flexible
Common shield	Omitted	Non-shielded
	P	Copper wire braided
	E	Tinned-Copper wire braided
Type	No. of cores x Cross-section of conductor(mm^2)	(2~37) x (0.5~2.5)

CHARACTERISTICS :

- Rated voltage(Uo/U) : 450/750V.
- Permissible continuous Max. operating temperature : 200°C
- Installation ambient temperature : -60°C - +200°C.
- Recommended permissible bending radium not less than 6 time of cable diameter.

Bare Conductor : Copper Stranded Wire

APPLICATION :

This product is suitable for electric transmission line overhead.

TYPE :

TYPE	NAME	CROSS-SECTIONAL AREA mm²
TJ	Copper stranded wire	16~400

TECHNICAL DATA :

NOMINAL CROSS-SECTION mm²	NO./NOMINAL DIAMETER OF A SIGNAL WIRE mm	APPROX. OVERALL DIAMETER mm	D.C. RESISTANCE OF CONDUCTOR AT 20˚C (Ω/km)≤	APPROX. WEIGHT kg/km
16	7/1.70	5.10	1.159	143
25	7/2.14	6.42	0.735	226
35	7/2.52	7.56	0.528	314
50	7/3.00	9.00	0.371	445
70	19/2.14	10.70	0.263	618
95	19/2.52	12.60	0.197	852
120	19/2.80	14.00	0.154	1057
150	19/3.15	15.75	0.121	1339
185	37/2.52	17.64	0.100	1660
240	37/2.85	19.95	0.077	2123
300	37/3.15	21.70	0.064	2594
400	61/2.85	25.65	0.062	3502

Silverstone Electric

Aluminum Stranded Wire and Aluminum Conductor Steel-reinforced

APPLICATION :

The Aluminum Stranded wire and Aluminum Conductor Steel-reinforced apply for electric transmission line overhead.

TYPE :

TYPE	NAME	CROSS-SECTIONAL AREA	STANDARD
TJ	Aluminum stranded wire	16~800	GB1179-83
LGJ	Aluminum conductor steel-reinforced	10/2~800/100	
LGJF	Anticorrosive aluminum conductor steel-reinforced	10/2~800/100	
JL	Aluminum stranded wire	10~800	GB1179-1999
JLHA2, JLHA1	Aluminum alloy stranded wire	16~800	
JL/G1A, JL/G1B, JL/B2A, JL/B2B, JL/G3A	Aluminum conductor steel-reinforced	16~800	
JL/G1AF, JL/G2AF, JL/G3AF	Anticorrosive aluminum conductor steel-reinforced	16~800	
JLHA2/G1A, JLHA2/G1B, JLHA2/G3A	Aluminum alloy conductor steel-reinforced	16~800	
JLHA1/G1A, JLHA1/G1B, JLHA1/G3A	Aluminum alloy conductor steel-reinforced	16~800	
JL/LHA2, JL/LHA1	Aluminum conductor aluminum alloy reinforced	16~800	
JL/LB1A	Aluminum conductor aluminum coated steel-reinforced	16~800	
JLHA2/LB1A, JLHA1/LB1A	Aluminum alloy conductor aluminum-coaled steel-reinforced	16~800	
JG1A, JG1B, JG2A, JG3A	Steel stranded wire	4~63	
JLB1A, JLB1B, JLB2	Aluminum coated steel stranded wire	4~200	

Silverstone Electric

Rubber Cable Type

Tough Rubber Insulated Cables of Rated Voltages up to and including 450/750V

REFERENCE STANDARDS :

GB5013-1997, JB8735-1998

APPLICATION :

This product applies for home appliances, electric tools and other various movable electrical equipments of rated voltage up to and including 450/750V.

TYPE OF CABLE :

TYPE	RATED VOLTAGE V	NUMBER OF CORES	NOMINAL CROSS-SECTION mm²
245IEC53(YZ)	300/500	2,3,4,5	0.75~2.5
245IEC57(YZW)	300/500	2,3,4,5	0.75~2.5
245IEC66(YCW)	450/750	1,2,3,4,5	1.5~25
245IEC81(YH)	-	1	16~95
YQ, YQW	300/300	2,3	0.3~0.5
YZ, YZW	300/500	2,3,4,5 4 6	4~6 1.5~6 0.75~6
YZB, YZWB	300/500	2,3,4,5,6	0.75~6
YC	450/750	1 2 3,4 5 4	1.5~400 1.5~95 1.5~150 1.5~2.5 2.5~150
YCW	450/750	2 3 4	35~95 120~150 2.5~150
RX	300/300	2~3	0.3~4
RXS	300/300	1	0.3~4
RXH	300/300	2~3	0.3~4

Silverstone Electric

Flexible rubber-sheathed cable for mining purposes

APPLICATION :

The flexible rubber-sheathed cable for mining purposes is made for the application in various movable electrical appliance and excavators in mine.

TYPE OF NAME :

TYPE	NAME	APPLICATION
UZ	Drill cables	For drills under well at A.C. Rated voltage up to and including 0.5kV
U	Movable rubber-sheathed flexible cables for mining purposes	For various movable electrical appliances under well at rated A.C. voltage up to and including 1kV
UP	Movable rubber-sheathed flexible cables with screen for mining purposes	For various movable electrical appliances under well at rated A.C. voltage up to and including 1kV
UC	Rubber-sheathed Flexible coalcutter cables	For coal cutters and excavators under well at rated A.C. voltage up to and including 1 kV
UCP	Rubber-sheathed Flexible coalcutter cables with screens	For coal cutters and excavators under well at rated A.C. voltage up to and including 1kV

PRODUCE RANGE OF CABLE :

TYPE	VOLTAGE GRADE	NOMINAL CROSS SECTIONAL AREA OF MAIN CORE mm²	NO. OF CORES		
			MAIN CORE	EARTHING CORE	CONTROL CORE
UZ	0.5	2.5, 4	3 3	1 1	0 1
U, UP	1	4	3 3	1 1	0 1
		6-70	3	1	0
UC, UCP	1	10	3	1	2 0
		16	3	1	3 0
		25-35	3	1	4 0
		50	3	1	7 0

Movable Flexible Cables with Semiconducting Screens for Mining Purposes

APPLICATION :

Mine movable cable with shield and rubber jacket is made for the power transmission and distribution of movable electrical under coal well.

PRODUCE RANGE OF CABLE :

TYPE	NOMINAL CROSS SECTIONAL AREA OF MAIN CORE mm²	NO. OF CORES		
		MAIN CORE	EARTHING CORE	CONTROL CORE
UPQ	10~95	3	1	3

Coal Cutter Flexible Cable with Shield

APPLICATION :

Coal cutter flexible cable with shield and rubber jacker is made for the application in coal cutter and the like.

PRODUCE RANGE OF CABLE :

TYPE	NOMINAL CROSS SECTIONAL AREA OF MAIN CORE mm²	NO. OF CORES		
		MAIN CORE	EARTHING CORE	CONTROL CORE
UCPQ	35~95	3	1	3

Silverstone Electric

FLEXIBLE RUBBER SHEATHED CABLE FOR MINING PURPOSES WITH RATED VOLTAGE 6KV

APPLICATION :

6kV mine flexible cable with rubber jacket is made for the application in the power transmission and distribution system, excavators in mine and hoist-transportators at A.C.

Rated voltage up to and including 6kV.

PRODUCE RANGE OF CABLE :

TYPE	MAIN CORE		EARTHING CORE	
	NO. OF CORES	NOMINAL CROSS SECTION mm²	NO. OF CORES	NOMINAL CROSS SECTION mm²
UGF-6000	3	6	1	6
	3	10	1	10
	3	16	1	16
	3	25	1	16
	3	35	1	16

Silverstone Electric
Silverstone Electric
Silverstone Electric
Silverstone Electric

Rated voltage 1KV to 35KV power cables with extruded insulation

REFERENCE STANDARDS :

The product is manufactured according to the standard of GB 12706 or IEC, BS, DIN and ICEA upon request.

APPLICATION :

The product is suitable for use in power distribution networks or fixed installations for industrial equipments with rated voltage up to and including 35kV.

OPERATING CHARACTERISTICS :

- XLPE Insulated Electrical Cable for rated power frequency voltage Uo /U : 3.6/6kV~26/35kV.
- Max. Permissible continuous operating temperature of conductor : 90°C
- Max. Short-circuit temperature of conductor shall not exceed 250°C (5s Max. Duration)
- The ambient temperature under instillation Shall not below 0°C
- The bending radius of single-core cable shall not less than 20 times of the cable diameter
- The bending radius of three-cores cable shall not less than 15 times of the cable diameter

- XLPE Insulated Electrical Cable for rated power frequency voltage Uo /U : 0.6/1kV
- Max. Permissible continuous operating temperature of conductor : 90°C
- Max. Short-circuit temperature of the conductor shall not exceed 250°C (5s maximum duration).
- The ambient temperature under installation shall not below 0°C
- The bending radius of a cable shall not less than 15 times of the cable diameter.

- PVC Insulated Electrical Cable for rated power frequency voltage Uo /U : 03.6/1kV
- Max.permissible continuous operating temperature of conductor : 70°C
- Max.short-circuit temperature of the conductor shall not exceed : 160°C (5s maximum duration).
- The ambient temperature under installation shall not below 0°C
- The bending radius of a cable shall not be less than 10 times of the cable diameter.

Silverstone Electric

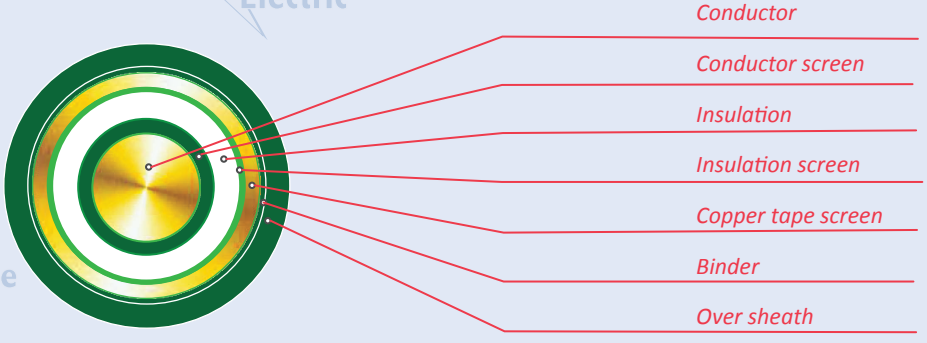
XLPE Insulated electrical cable for rated voltage 3.6/6kV~26/35kV

TYPE OF CABLE :

TYPE	CORES	RATED VOLTAGE KV						
		3.6/6	6/6 6/10	8.7/10 8.7/15	12/30	18/20 18/30	21/35	26/35
		NOMINAL CROSS-SECTION mm²						
YJV YJLV YJY YJLY	1	25-800	25-800	25-800	35-800	50-630	50-630	50-630
	3	25-630	25-630	25-630	35-630	50-630	50-630	50-400
YJV22 YJLV22 YJV23 YJLV23	1	25-800	25-800	25-800	35-800	50-630	50-630	50-630
	3	25-630	25-630	25-630	35-630	50-630	50-630	50-400
YJV32 YJLV32 YJV33 YJLV33	1	25-800	25-800	25-800	35-800	50-630	50-630	50-630
	3	25-630	25-630	25-630	35-630	50-630	50-630	50-400

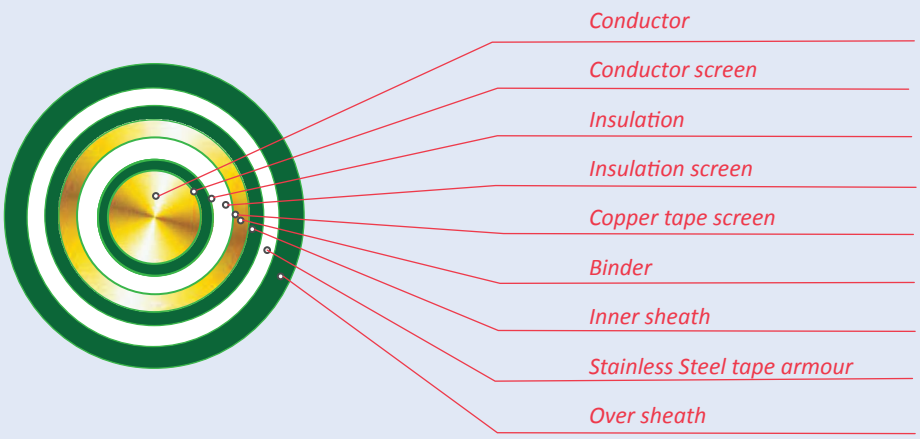
The armored single-core cables are used for D.C. System only. As for A.C. system, the magnetic isolation should be applied on the non-magnetical armored layer or non-magnetical materials should be used

STRUCTURAL DRAWING OF CABLE : (CLICK PICTURE TO ENLARGE) :

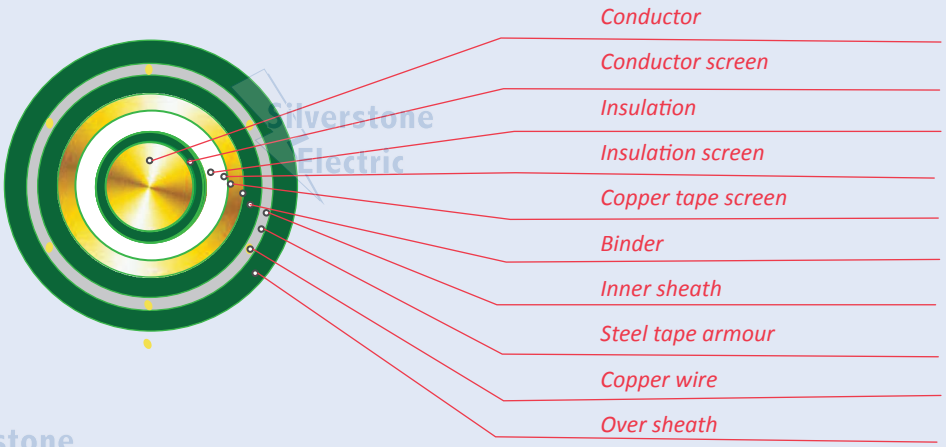


Single core XLPE insulation power cable for rated voltage from 3.6/6kV to 26/35kV

STRUCTURAL DRAWING OF CABLE : (CLICK PICTURE TO ENLARGE) : (Cont...)

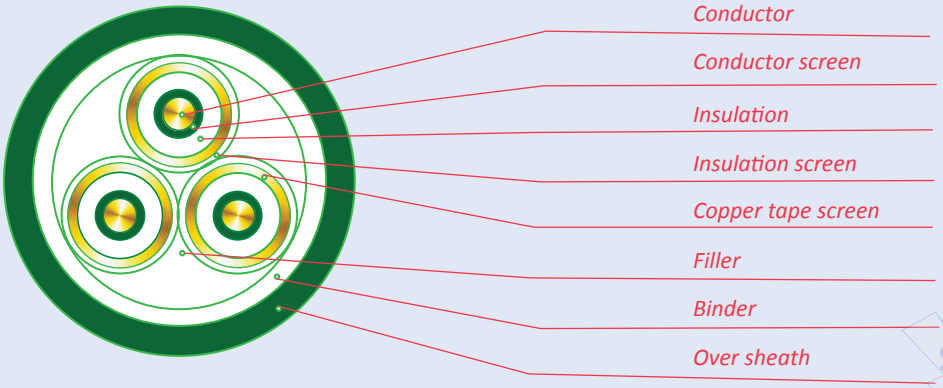


Single core XLPE insulation steel tape armored power cable for rated voltage from 3.6/6kV to 25/35kV

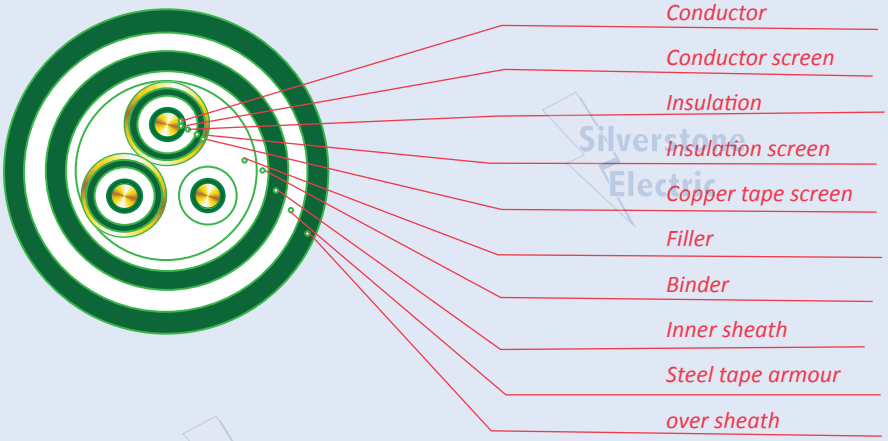


Single core XLPE insulation steel wire armored power cable for rated voltage from 3.6/6kV to 25/35kV

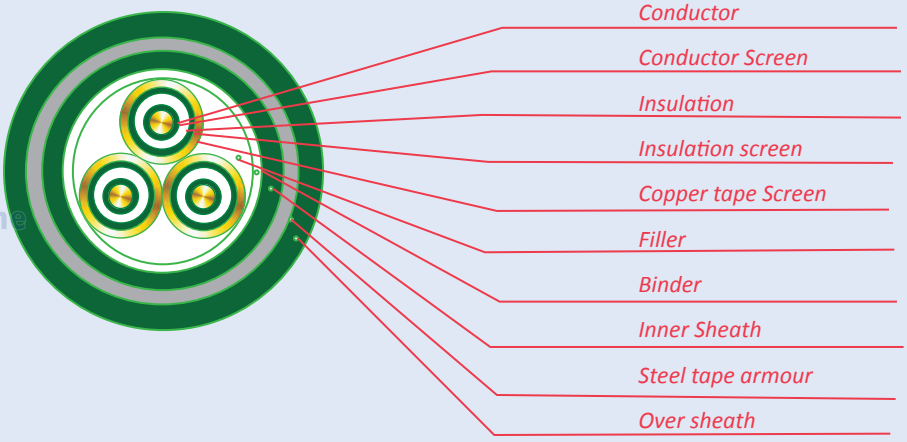
STRUCTURAL DRAWING OF CABLE : (CLICK PICTURE TO ENLARGE) : (Cont...)



Three-core XLPE insulation power cable for rated voltage from 3.6/6kV to 26/35kV



Three-core XLPE insulation steel tape armored power cable for rated voltage from 3.6/6kV to 26/35kV



Three-core XLPE insulation steel wire armored power cable for rated voltage from 3.6/6kV to 26/35kV

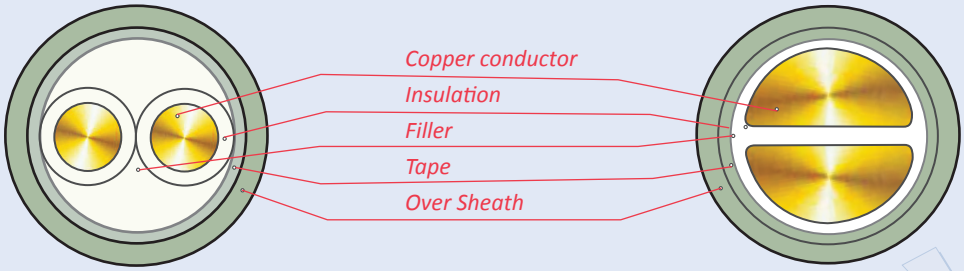
XLPE Insulated electrical cable for rated voltage 0.6/1kV

TYPE AND SPECIFICATION :

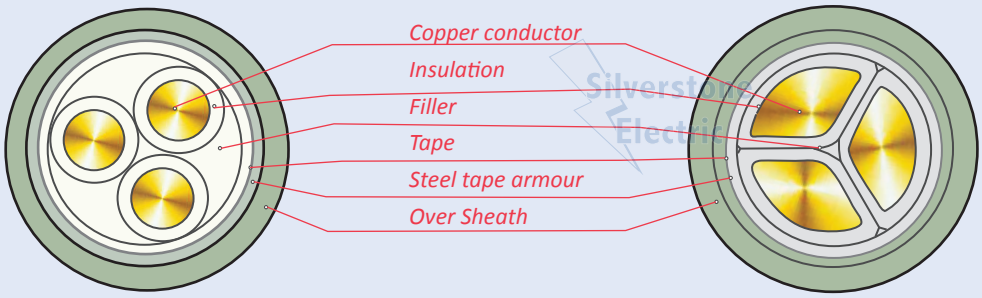
TYPE		CORES	NOMINAL CROSS-SECTION mm²
COPPER CONDUCTOR	ALUMINUM CONDUCTOR		
YJV YJY - YJV22 YJV23	- YJLY YJLY YJLV22 YJLV23	1*	1.5 - 800 2.5 - 800 10 - 800
YJV YJY - YJV22 YJV23 YJV32 YJV33	- YJLV YJLY YJLV22 YJLV23 YJLV32 YJLV33	2	1.5 - 300 2.5 - 300 2.5 - 300 10 - 300
YJV YJY - YJV22 YJV23 YJV32 YJV33	- YJLV YJLY YJLV22 YJLV23 YJLV32 YJLV33	3	1.5 - 400 2.5 - 400 2.5 - 400 10 - 400
YJV YJY - YJV22 YJV23 YJV32 YJV33	- YJLV YJLY YJLV22 YJLV23 YJLV32 YJLV33	4	1.5 - 400 2.5 - 400 2.5 - 400 10 - 400
YJV YJY - YJV22 YJV23 - YJV32 YJV33	- YJLV YJLY - YJLV22 YJLV23 YJLV32 YJLV33	3+1	1.5 - 400 4.0 - 400 1.5 - 400 4.0 - 400 10 - 400
YJV YJY - YJV22 YJV23 - YJV32 YJV33	- YJLV YJLY - YJLV22 YJLV23 YJLV32 YJLV33	5	1.5 - 400 2.5 - 400 1.5 - 400 2.5 - 400 10 - 400
YJV YJY - YJV22 YJV23 - YJV32 YJV33	- YJLV YJLY - YJLV22 YJLV23 YJLV32 YJLV33	4+1	1.5 - 400 4.0 - 400 1.5 - 400 4.0 - 400 10 - 400
YJV YJY - YJV22 YJV23 - YJV32 YJV33	- YJLV YJLY - YJLV22 YJLV23 YJLV32 YJLV33	3+2	1.5 - 400 4.0 - 400 1.5 - 400 4.0 - 400 10 - 400

* The armored single-core cables are used for D.C. System only. As for A.C. System, non-magnetic armor material should be used, or magnetic isolation should be applied.

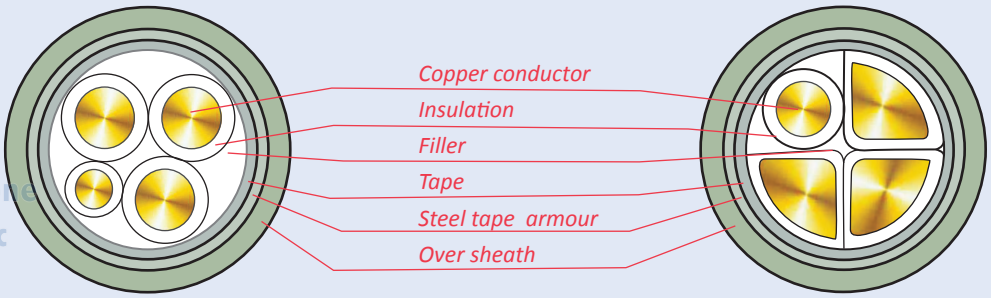
STRUCTURAL DRAWING OF CABLE :



2Cores YJV YJLV YJY YJLY



3Cores YJV22 YJLV22 YJV23 YJLV23



4Cores YJV22 YJLV22 YJV23 YJLV23

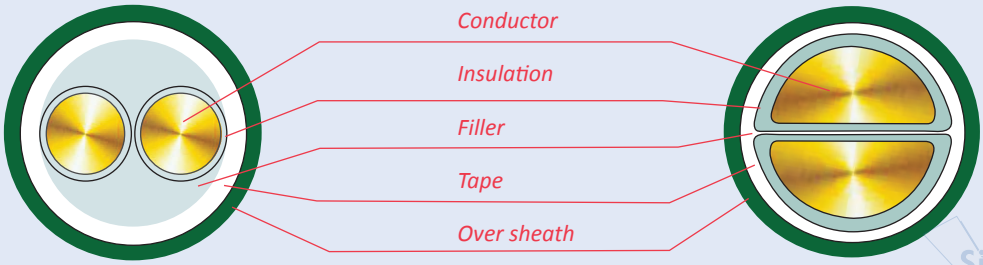
PVC Insulated electrical cable for rated voltage 0.6/1kv

TYPE AND SPECIFICATION :

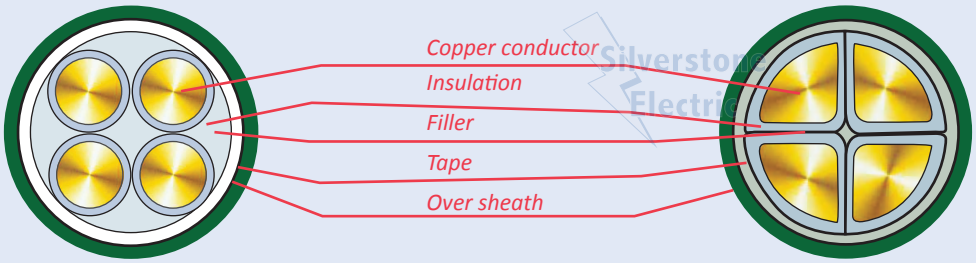
TYPE		CORES	NOMINAL CROSS SECTION mm²
COPPER CONDUCTOR	ALUMINUM CONDUCTOR		
VV VY - VV22 VV23	- VLV VLY VLV22 VLV23	1	1.5 - 800 2.5 - 800 10 - 800
VV VY - VV22 VV23 - VV32 W33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	2	1.5 - 300 2.5 - 300 4.0 - 300 4.0 - 300 10 - 300
VV VY - VV22 VV23 - VV32 VV33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	3	1.5 - 400 2.5 - 400 4.0 - 400 4.0 - 400 10 - 400
VV VY - VV22 VV23 - VV32 VV33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	4	1.5 - 400 2.5 - 400 4.0 - 400 4.0 - 400 10 - 400
VV VY - VV22 VV23 - VV32 VV33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	3+1	1.5 - 400 4.0 - 400 4.0 - 400 4.0 - 400 10 - 400
VV VY VV22 VV23 VV32 VV33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	5	1.5 - 400 2.5 - 400 4.0 - 400 4.0 - 400 10 - 400
VV VY - VV22 VV23 - VV32 VV33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	4+1	1.5 - 400 4.0 - 400 4.0 - 400 4.0 - 400 10 - 400
VV VY - VV22 W23 - VV32 VV33	- VLV VLY - VLV22 VLV23 VLV32 VLV3	3+2	1.5 - 400 4.0 - 400 4.0 - 400 4.0 - 400 10 - 400

* The armored single-core cables are used for D.C. System only. As for A.C. System, nonmagnetic Armour material should be used, or magnetic isolation should be applied.

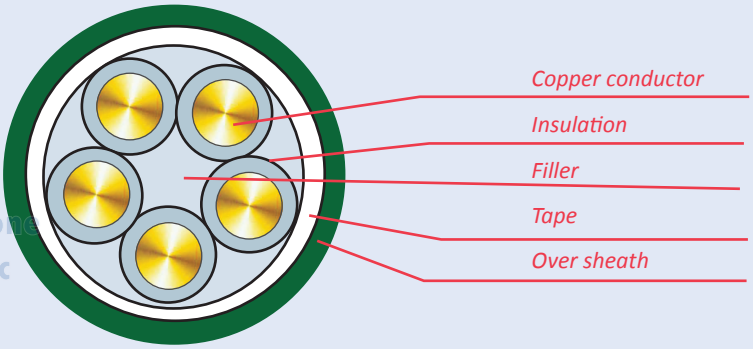
STRUCTURAL DRAWING OF CABLE :



2Cores VV VLV VY VLY



4Cores VV VLV VY VLY



5Cores VV VLV VY VLY

6. Aerial Cable Category

Aerial insulated cable for rated voltage 1kv, 10kv and 35kv

INTRODUCTION :

The products are manufactured by extruding a conductor screen layer, an insulated layer of rough-weather-adaptive XLP or rough-weather-adaptive black HD-PE or PVC, and an insulation screen layer over the compacted copper/aluminum conductor (no conductor screen layer and insulation screen layer for cables of rated voltage 1kV), with the advantage of simple construction, and excellent mechanical, physical and electrical property as well as fine performance of anti-creeping-discharge, rough-weather-adaptive and creepage proof. Compared with bare conductor, the products can be laid more closely to save the line gallery, and have less voltage-drop. Above all the products installed reduce power accidents to insure lives safety.

STANDARD :

The products shall comply with the standards GB 12527-90 and GB 14049-93.

Silverstone Electric

APPLICATIONS :

The products fit for transmitting line and distributing line of rated voltage 1kV, 10kV and 35kV in tall buildings, traveling development area and wooded tract.

OPERATING CHARACTERISTICS :

- The rated voltage of cable has three classes : a. 0.6/1kV b. 10kV c. 35kV
- Continuous permissible operating temperature:

  PVC Insulation : 70°C

  PE Insulation : 70°C

  HDPE Insulation : 75°C

  XLPE Insulation : 90°C
- Max. Temperature of cable under short-circuit (5sec. Max. Duration)

  PVC Insulation : 160°C

  PE Insulation : 130°C

  HDPE Insulation : 150°C

  XLPE Insulation : 250°C
- Laying temperature of cable not less than -20°C.
- Operating ambient temperature of cables : -40~+40~C, Relative bumidity in rainy season not less than 90%
- Permissible bending radius of cable:

  cable for rated voltage up to and including 0.6/1kV;

  bending radius not less than 4D for cable diameter ＜25mm

  bending radius not less than 6D for cable diameter ≥25mm

  cable for rated voltage 10kV and 35kV;

  single-core cable : 20(D+d) ± 5%

  multi-core cable : 15(D+d) ± 5%

NOTE: D-Over all Diameter of cable

d-Over all Diameter of conductor

6. Aerial Cable Category (Cont...)

TYPE OF CABLE :

RATED VOLTAGE	TYPE	NAME	MAIN USAGE
0.6/1	JKV JKLV JKY JKLY JKYJ JKLYJ	Copper conductor, PVC insulated, aerial cable for rated voltage 0.6/1kV Aluminum conductor, PVC insulated, aerial cable for rated voltage 0.6/1kV Copper conductor, PE insulated, aerial cable for rated voltage 0.6/1kV Aluminum conductor, PE insulated, aerial cable for rated voltage 0.6/1kv Copper conductor, XLPE insulated, aerial cable for rated voltage 0.6/1kV Aluminum conductor, XLPE insulated, aerial cable for rated voltage 0.6/1kV	The cables fit for overhead fixed-installation, service line and so on.
10	JKLYJ/Q JKLY/Q JKLGYJ/Q	Aluminum conductor, XLPE thin-insulated, light aerial cable Aluminum conductor, XLPE thin-insulated, light aerial cable Aluminum and steel reinforced conductor, XLPE thin-insulated, light aerial cable	When the overhead fixed laid cables are laid, a certain distance between cables and trees should be taken into account.It is permissible that the cables continually touch the trees when the cables are operating.
10 35	JKYJ JKLYJ JKY JKLY JKLYJ/Q JKLGYJ	Copper conductor, XLPE insulated, aerial cable Aluminum conductor, XLPE insulated, aerial cable Copper conductor, PE insulated, aerial cable Aluminum conductor, PE insulated, aero cable Alumium conductor, natural-color XLPE insulated, aerial cable Aluminum and steel reinforced conductor, XLPE thinly insulated, aerial cable	When the overhead fixed laid cables are laid, a certain distance between cables and trees should be taken into account. It is permissible that the cables quickly touch the trees when the cables are operating.

Silverstone Electric

7. Fire wire and Cable Series

STANDARD :

Electrical performance products, like ordinary wire and cable, flame retardant, fire resistance in line with national standards GB/T18380-2001 (1EC60332:1993), GB/T12666-1990 or national public safety industry standard GA306-2001 the requirements.

USE OCCASIONS :

For a flame retardant, fire resistance, low smoke low halogen, low smoke zero halogen fire safety requirements, which are occasions, such as large-capacity power plants, nuclear power plants, subway, high-rise buildings, lots, and so densely populated.

PRODUCT NAME, TYPE AND USE :

NAME	MODEL	LEVEL	SCOPE
Flame Retardant Series	ZR	IV A IV B IV C I A I B IC II A II B II C III A III B III C	35kv and below of AC rated voltage plastic insulated flame retardant power cables, AC rated voltage 450/750V and below flame-retardant plastic insulated control cable and AC rated voltage 450/750V and below flame-retardant plastic insulated cables
Fire Series	NH	I A I B II A II B III A III B IV A IV B	AC rated voltage plastic insulated fireproof power cables 0.6/1kV, AC rated voltage 450/750V and below the plastic insulation resistant control cable and AC rated voltage 450/750V and below the plastic insulation fire-resistant cables.

Fire wire and Cable Series (Cont...)

FLAME-RETARDANT PERFORMANCE LEVEL TECHNICAL REQUIREMENTS :

FLAME RETARDANT GRADE \ PROJECT		CHAR HEIGHT				SMOKE TOXICITY (CONCENTRATION) mg/L	SMOKE DENSITY (MINIMUM LIGHT TRANSMITTANCE) %
		TEST CONDITIONS			TECHNOLOGY INDICATORS		
		VOLUME OF THE SAMPLE NON-METALLIC L/m	TEMPERATURE IN FIRE ˚C	TIME FOR FIRE min			
Flame I	I A	7.0	>815	40	≤2.5	≥12.4	≥80
	I B	3.5					
	I C	1.5		20			
Flame II	II A	7.0		40			≥60
	II B	2.5					
	II C	1.5		20			
Flame III	III A	7.0		40		≥6.15	≥20
	III B	3.5					
	III C	1.5		20			
Flame IV	IV A	7.0		40		-	-
	IV B	3.5					
	IV C	1.5		20			

NOTE : IV A, IV B, IV C Can be expressed as, respectively, A, B, C

Silverstone Electric

7. Fire wire and Cable Series (Cont...)

FIRE RESISTANCE LEVEL AND TECHNICAL REQUIREMENTS :

FLAME RETARDANT GRADE \ PROJECT		FIRE-RESISTANT PROPERTIES				SMOKE TOXICITY (CONCENTRATION) mg/L	SMOKE DENSITY (MINIMUM LIGHT TRANSMITTANCE) %
		TEST CONDITIONS			TECHNOLOGY INDICATORS		
		SAMPLE APPLIED VOLTAGE (U_0/U)/V	TEMPERATURE IN FIRE ˚C	TIME FOR FIRE min			
Flame I	I A	Voltage specified value of the product	950-1000	90	3A Fuse is not blown	≥12.4	≥80
	I B		750-800				
Flame II	II A		950-1000				≥60
	II B		750-800				
Flame III	III A		950-1000			≥6.15	≥20
	III B		750-800				
Flame IV	IV A		950-1000			-	-
	IV B		750-800				

NOTE : IV A, IV B Can be expressed as, respectively, A, B

Silverstone Electric

Prefabricated branch cable class

RATED VOLTAGE PLASTIC INSULATED COPPER 0.6/1KV PREFABRICATED BRANCH CABLE

PRODUCTS :

Rated voltage plastic insulated copper 0.6/1kV prefabricated branch cable can be widely used in residential, office buildings, hotels, hospitals, shopping malls, factories, and other power distribution systems. The main cable conductor, connector, extension cable conductor joint structure is reasonable, minimal contact resistance, thermal expansion and contraction are not affected. And has excellent shock resistance, good air tightness and water resistance, wet environment in the normal power supply, can also be laid in the open air and buried. Small area of floor space, is conducive to the efficient use of floor space, easy to install.

Products, the enterprise standard Q/320282GADI3, standard reference used GBI2706 and JISC2810 standards.

Allow long-term working temperature of cable conductor is: XLPE insulated 90°C; 70°C PVC insulated

Allow short-circuit temperature of cable conductor: XLPE 250°C, the duration of no more than 5 seconds.

PVC insulated 160°C, the duration of no more than 5 seconds.

Flame retardant cable can effectively prevent the spread of flame; low smoke zero halogen cable does not produce toxic gases when burned, produces only a small amount of smoke; fire resistant cables in the 750-800°C (or 950-1000°C) under fire conditions, can be maintained Running 90min.

CABLE TYPE, NAME :

MODEL	NAME
FZ-VV	Copper core PVC insulated PVC sheathed prefab branch cable
FZ-ZR-VV	Flame-retardant copper core PVC insulated PVC sheathed prefab branch cable
FZ-NH-VV	Copper core PVC insulated PVC sheathed fire resistance prefab branch cable
FZ-YJV	Copper core XLPE insulated PVC sheathed prefab branch cable
FZ-ZR-YJV	Copper core XLPE insulated PVC sheathed flame retardant prefabricated branch cable
FZ-NH-YJV	Copper core XLPE insulated PVC sheathed fire prefabricated branch cable
FZ-WL-ZR-YJE	PVC insulated copper sheathed halogen flame retardant polyolefin prefabricated branch cable
FZ-DL-NH-YJE	Copper conductor PVC insulated fire-resistant low smoke zero halogen polyolefin sheathed prefab branch cable
FZN-VV	Copper core PVC insulated twisted type prefabricated branch cable
FZN-ZR-VV	Copper conductor PVC insulated PVC sheathed flame retardant twisted type prefabricated branch cable
FZN-NH-VV	Copper core PVC insulated PVC sheathed fire twisted type prefabricated branch cable
FZN-YJV	Copper core XLPE insulated PVC sheathed twisted type prefabricated branch cable
FZN-ZR-YJV	Copper core XLPE insulated PVC sheathed flame retardant twisted type prefabricated branch cable
FZN-NH-YJV	Copper core XLPE insulated PVC sheathed fire twisted type prefabricated branch cable
FZN-WL-ZR-YJE	Copper core PVC insulation sheath halogen flame retardant polyolefin-based system for branch cable twisted
FZN-DL-NH-YJV	Copper core PVC insulated PVC sheathed low halogen fire on behalf of smoke twisted type prefabricated branch cable

PREFABRICATED BRANCH CABLE TRUNK CABLE AND FEEDER CABLE SPECIFICATIONS :

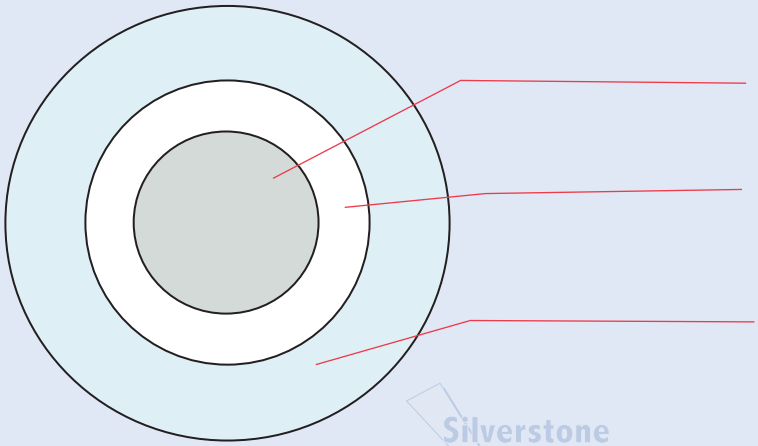
TRUNK CABLE SECTION (mm^2)	FEEDER CABLE SECTION (mm^2)													
10	6	10												
16	6	10	16											
25	6	10	16	25										
35	6	10	16	25	35									
50	6	10	16	25	35	50								
70	6	10	16	25	35	50	70							
95	6	10	16	25	35	50	70	95						
120	6	10	16	25	35	50	70	95	120					
150	6	10	16	25	35	50	70	95	120	150				
185	6	10	16	25	35	50	70	95	120	150	185			
240	6	10	16	25	35	50	70	95	120	150	185	240		
300	6	10	16	25	35	50	70	95	120	150	185	240	300	
400	6	10	16	25	35	50	70	95	120	150	185	240	300	400
500	6	10	16	25	35	50	70	95	120	150	185	240	300	400
630	6	10	16	25	35	50	70	95	120	150	185	240	300	400

Silverstone Electric
Silverstone Electric
Silverstone Electric
Silverstone Electric

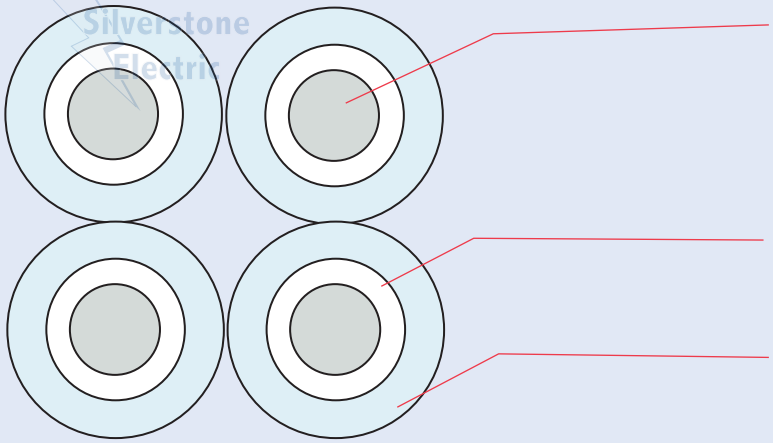
PREFABRICATED BRANCH CABLE STRUCTURE :

Standard trunk cables and extension cables are based on models with the corresponding insulation and sheath materials, with reference to IEC, GB, JIS and other standards made of low-voltage power cable. General Cable is a single trunk or multi-core twisted (two core five-core cable), Extension cable with single core cables. The structural characteristics are as follows:

1. NON-FIRE RESISTANT CABLE STRUCTURE :

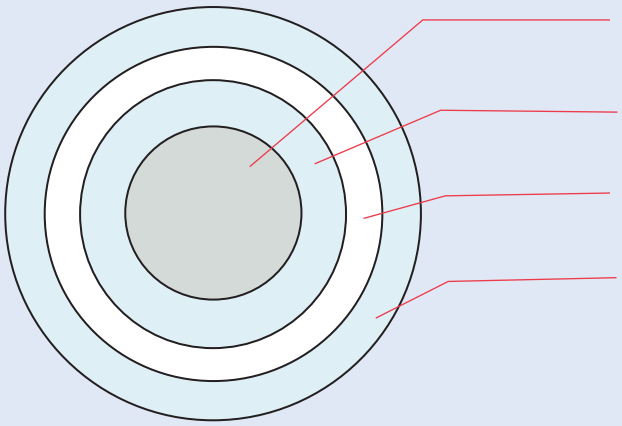


Single-core cable

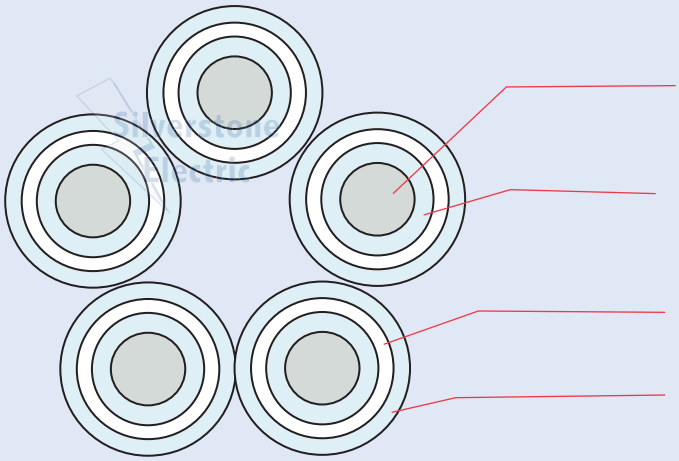


Four core twisted cable

2. FIRE-RESISTANT CABLE STRUCTURE :



Single-core cable

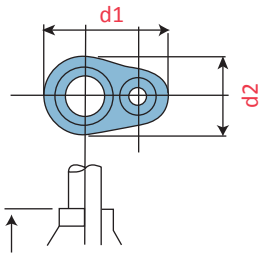


Five core twisted cable

Silverstone Electric

3. THE STRUCTURE OF THE BRANCH CONNECTOR :

Prefabricated branch cable connection part of the body using special PVC or synthetic materials, such as cable connections shown on the right branch of the body.

TRUNK CABLE (mm^2)	EXTENSION CABLES mm^2	REFERENCE DIMENSION (mm)			SCHEMATIC TAP
		d1	d2	L	
10	~10	54	35	95	
16	~16				
25	~25				
35	~35				
50	~50	57	38	95	
70	~70				
95	~95				
120	~120	78	52	145	
150	~150				
185	~185				
240	~240	96	70	160	
300	~300				
400	~400				
500	~400	106	80	170	
630	~400				

Silverstone Electric

MAIN TECHNICAL PERFORMANCE PREFABRICATED BRANCH CABLE :

NO.	PROJECT	PERFORMANCE REQUIREMENTS		
1	Insulation	AC 3.5kV/5min		
2	Insulation resistance	≥200MΩ		
3	Branch joint resistance ratio	Branch joint resistance ratio kj≤1.2		
4	Short circuit test	After a short circuit ratio of rate of change of DC resistance Yj≤0.2		
5	Thermal cycling test	Determination of the value of 25 cycles: ≤75°C No. 26-125 cycles measured values, the temperature rise of less than 25 cycles measured value +8°C		
6	Flame Retardant	Ignition off within 15 seconds		
7	Enhance the fitting	Tensile pull	24h, 2 times the weight does not place the	
		Insulation voltage	3.5kV/5min	
		Insulation resistance	≥200MQ	
8	Molded plastic	Room temperature	Tensile pull	≥10MPa
			Elongation	≥120%
		Heating	Tensile pull	Before heating 85%
			Elongation	Before heating 80%
		Oil	Tensile pull	Before heating 85%
			Elongation	Before heating 860%
		Cold-resistant	Test is not broken	
		Heat distortion	Thickness reduction rate of less than 50%	

Silverstone Electric

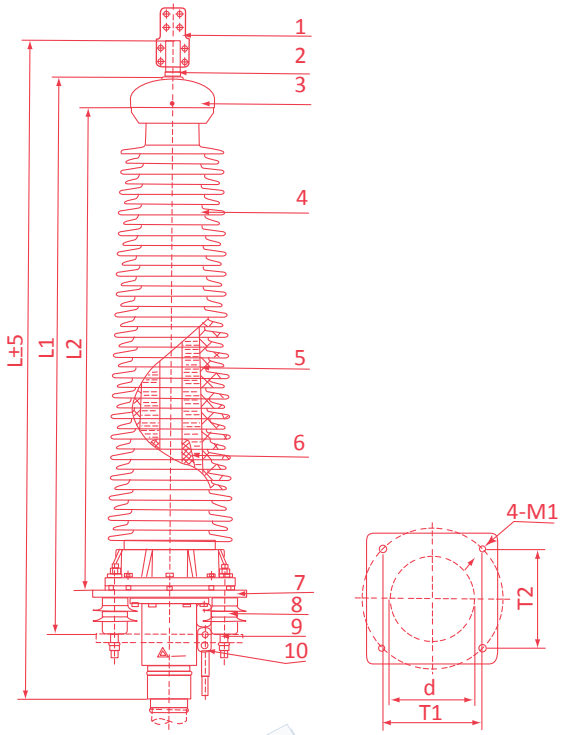
Outdoor Porcelain Termination

- It is made up of porcelain insulator with insulating oil in it and with long reliable steady-going running history. The stress-relief cone is prefabricated.
- Cable section: 95~2500mm² particularly suitable for chemical industry, steel industry, power industry, littoral area and the area far from the center of the city.
- The porcelain insulator is made of high electricity performance porcelain with big and small skirts and long creepage distance (One piece mud of 66~110kV porcelain insulator).
- The structure and the method of sealing are reliable and make sure no leakage.
- The earthing of the stress-relief cone is reliable. Easy to install.
- There is a check hole in the base plate.
- According user's needs, we can install a set against explode.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)	(IV)(mm)
52/66	52	72.5	130	325	2248
64/110	64	126	160	550	3910
76/132	76	145	190	650	4500
127/220	127	252	318	1050	7810
290/500	290	550	580(60min)	1550	17100

Outdoor Porcelain Termination (Cont...)



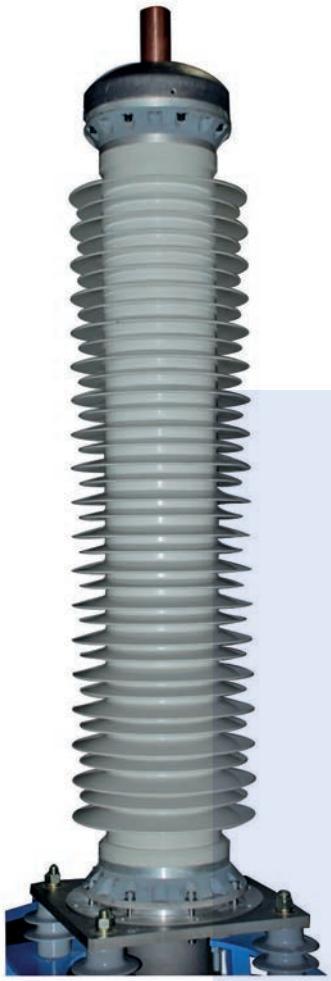
MAIN PARTS :

1. Terminal lug
2. Pole
3. Screen
4. Porcelain
5. Insulating fluid filled
6. Stress-relief cone
7. Base plate
8. Support insulation
9. Tail
10. Earth electrode

INSTALLATION DIMENSION :

L1	L2	L	M1	T1	T2	d
1475	1325	2000	M20	320	320	Φ250
1475	1325	2000	M20	320	320	Φ250
1620	1470	2110	M20	320	320	Φ250
2600	2320	3200	M30	450	450	Φ320
6250	5810	6798	M30	600	600	Φ450

Composite Outdoor Termination

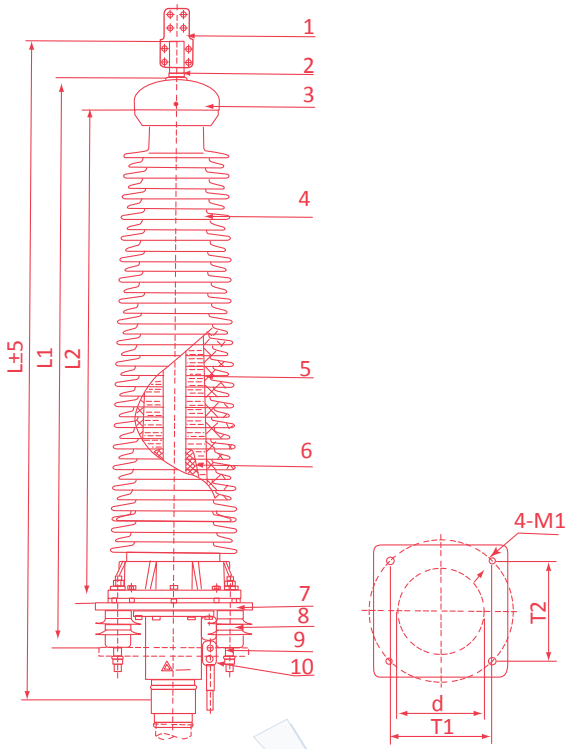


- It is made up of epoxy tube cover Silicone Insulator with insulating oil in it, suitable for outdoor or contamination area. The stress-relief cone is prefabricated.
- Cable cross section: 95~2500mm^2 Excellent vibration-resistance performance, no danger in explosion. Its weight is so light and easy to install. Suitable for the littoral area and the area near the center of the city.
- Its weight is less than 30% of porcelain insulator with the same rated voltage. It is easy to load and unload for transportation.
- Excellent capability of ultraviolet resistance, aging resistance Weather resistance and anticorrosion.
- The earthing of the stress-relief cone is reliable.
- According user's needs,we can afford straight or taper products.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)	(IV)(mm)
52/66	52	72.5	130	325	2248
64/110	64	126	160	550	3910
76/132	76	145	190	650	4500
127/220	127	252	318	1050	7810
290/500	290	550	580(60min)	1550	17100

Composite Outdoor Termination (Cont...)



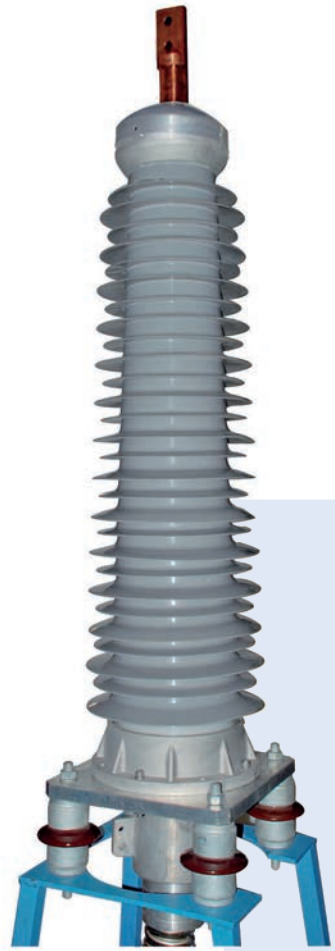
MAIN PARTS :

1. Terminal lug
2. Pole
3. Screen
4. Composite tube
5. Insulating fluid filled
6. Stress-relief cone
7. Base plate
8. Support insulation
9. Tail
10. Earthing electrode

INSTALLATION DIMENSION :

L1	L2	L	M1	T1	T2	d
1350	1210	2000	M20	320	320	Φ250
1350	1210	2000	M20	320	320	Φ250
1460	1310	2110	M20	320	320	Φ250
2402	2170	3200	M30	390	390	Φ320
4600	4200	5210	M30	700	700	Φ450

Outdoor Termination of Rigid Support and Dry Type

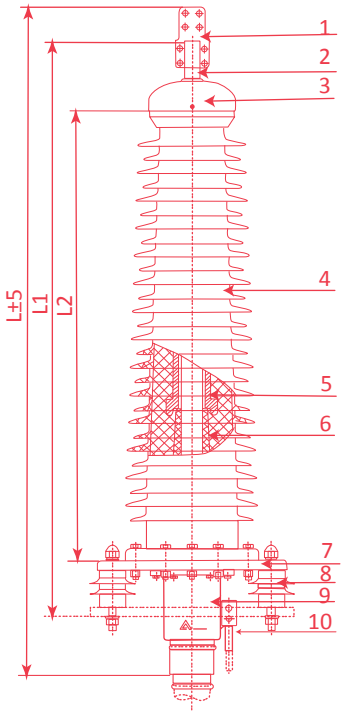


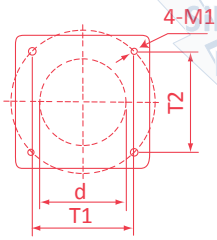
- The main insulating materiel of the product is made of epoxy tube and silicone without oil and porcelain, easy to installation and maintenance.
- The stress-relief cone structure with spring inside keep a stabilization press between stress-relief cone and cable/epoxy.
- It is as strong as porcelain structure, which is particularly suitable for littoral area and the area near the center of the city.
- It can be divided to compress-in and plug-in style as the hardware changes.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)	(IV)(mm)
52/66	52	72.5	130	325	2248
64/110	64	126	160	550	3910
76/132	76	145	190	650	4500
127/220	127	252	320	1050	7810

Outdoor Termination of Rigid Support and Dry Type (Cont...)





MAIN PARTS :

1. Terminal lug
2. Pole
3. Screen
4. Composite insulating tube
5. High Voltage electrode
6. Stress-relief cone
7. Base plate
8. Support insulation
9. Tail
10. Earth electrode

INSTALLATION DIMENSION :

L1	L2	L	M1	T1	T2	d
1570	1200	1925	M20	320	320	Φ250
1670	1300	2025	M20	320	320	Φ250
1670	1300	2025	M20	320	320	Φ250
2690	2320	3045	M30	390	390	Φ320

Outdoor Termination with Prefabricated Silicone Rubber

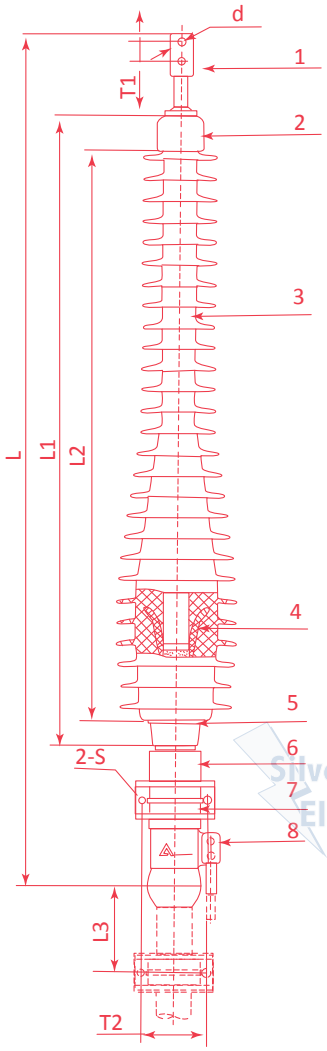
- It is integrated, made of excellent electricity performance liquid silicone, without oil, no explosion.
- It is particularly suitable for Cable section 95~2500mm², high density population district, inside power station and high altitude area, serious contaminative area.
- The stress-relief cone and the skirts are prefabricated of excellent electricity performance liquid silicone, without vertical line on its surface, so that it can safely and stably running in bad weather area and serious contaminative area.
- Simple structure, small, light, Its weight is less than 10% of porcelain insulator with the same rated voltage. easy to install and no maintenance.
- The outer surface of the highest electric field part is covered with skirts.
- Excellent vibration-resistance performance, installed with vertical or incline.
- Dry style so that there is no oil leakage accident happened.
- The creepage scale is over 31mm/kV. Special dimension product for special area can be delivered at any time.
- Metal tube in the tail make more rigidity, suitable all kind of weather environment.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)	(IV)(mm)
52/66	52	72.5	130	325	2248
64/110	64	126	160	550	3910
76/132	76	145	190	650	4500

Silverstone Electric

Outdoor Termination with Prefabricated Silicone Rubber (Cont...)



MAIN PARTS :

1. Pole
2. Screen
3. Prefabricated insulating tube
4. Stress-relief cone
5. Collect current ring
6. Tail
7. Clamping (2 piece)
8. Earthing electrode

INSTALLATION DIMENSION :

L	L1	L2	L3	N	d	T1	T2	S
1780	1262	1120	200	2	Φ17	45	150	13x18
1980	1462	1320	200	2	Φ17	45	150	13x18
2225	1707	1565	200	2	Φ17	45	150	13x18

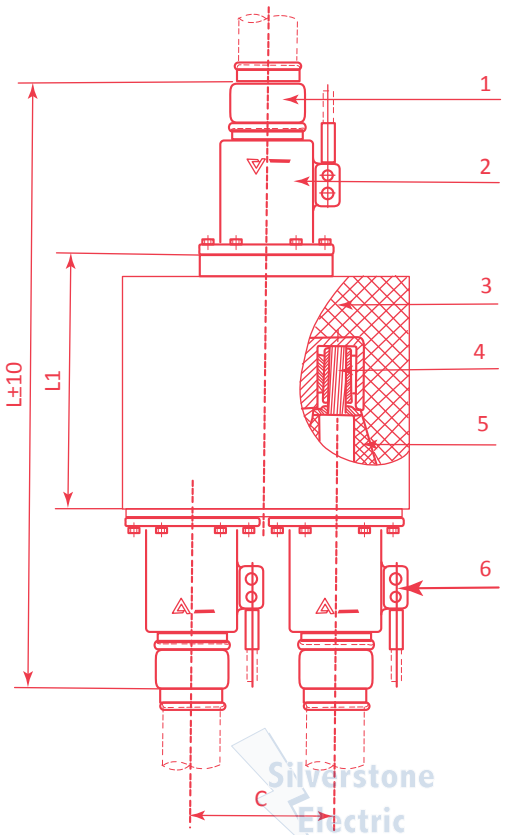
Branch Joint of Solid Insulation and Dry Type

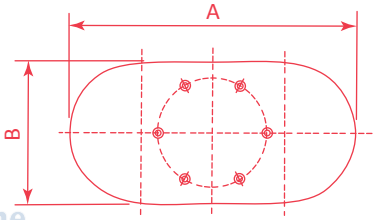
- It is particularly suitable for branch joint of 66kV~220kV extruded cable section 95~2500mm². It can be installed in house, cable's tunnel or cable's well.
- It is made of epoxy and silicone rubber insulator without oil. Plug-in style of connect conductor. Dry type, Compact structure, takes little space to install. Easy to install and no maintenance.
- FRP can be added according to different environment.
- It can be obligated one or two lines according to needs. Easy to connect different cable sizes.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)
52/66	52	72.5	130	325
64/110	64	126	160	550
76/132	76	145	190	650

Branch Joint of Solid Insulation and Dry Type (Cont...)





MAIN PARTS :

1. Seal at tail
2. Tail
3. Epoxy part
4. Plug-in parts
5. Stress-relief cone
6. Earthing electrode

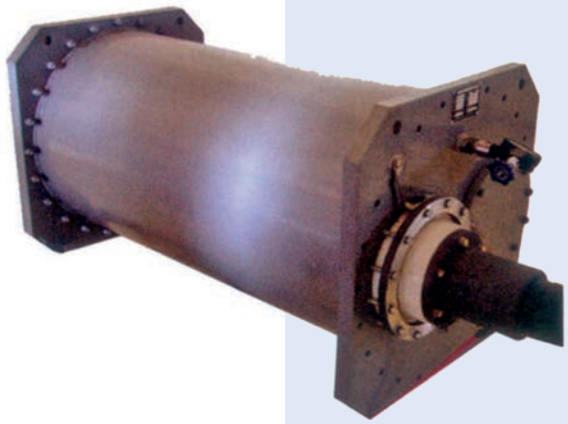
INSTALLATION DIMENSION :

L	L1	A	B	C
960	350	450	240	230
1040	450	510	260	250
1040	450	510	260	250

Silverstone Electric

Cable Branch Joint

- It can be used for extruded cable branch range from 240~2500mm^2 cable branch, making the mode of connection simple and saving great amount of investment.
- The case is full of SF6, installed with explosion-resistance theca, pressure meter, annunciator and charge/release valve. Case and bushing are assembled in the factory and plug-in termination is installed at the locale and is stuck into the bushing after being tested.
- The case can be fulled in oil substitute SF6.



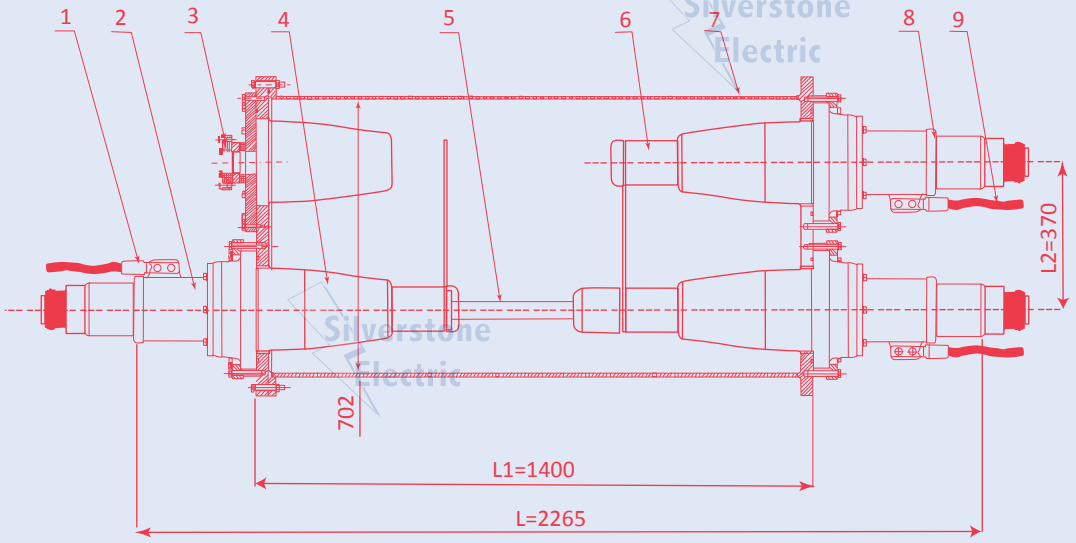
MAIN PARTS :

1. Earthing electrode
2. Tail
3. Reduce expense in blast (spare hole)
4. Epoxy
5. Conductor inside
6. Branch connect
7. Sealing case
8. Seal at tail
9. Soft earthing wire

Silverstone Electric

Cable Branch Joint (Cont...)

- Fully insulated, fully sealed, anticorrosion.
- Compact design, plug-in termination.
- Easily installed and maintenance-convenient.
- If one cable is wrong, the other two can run normally after pulling out the bad termination and plug the stop-end. 3 cables can resume running so as to pullout the stop-end, plug in the termination which was maintained.
- Each cable can be tested individually.
- It can be obligated one or two lines according to work needs. Easy to connect different section.
- The case has passed the explosion-proof test specified in the standard, with high running reliability.
- It can be used for a joint in an oldder cable line.



Silverstone Electric

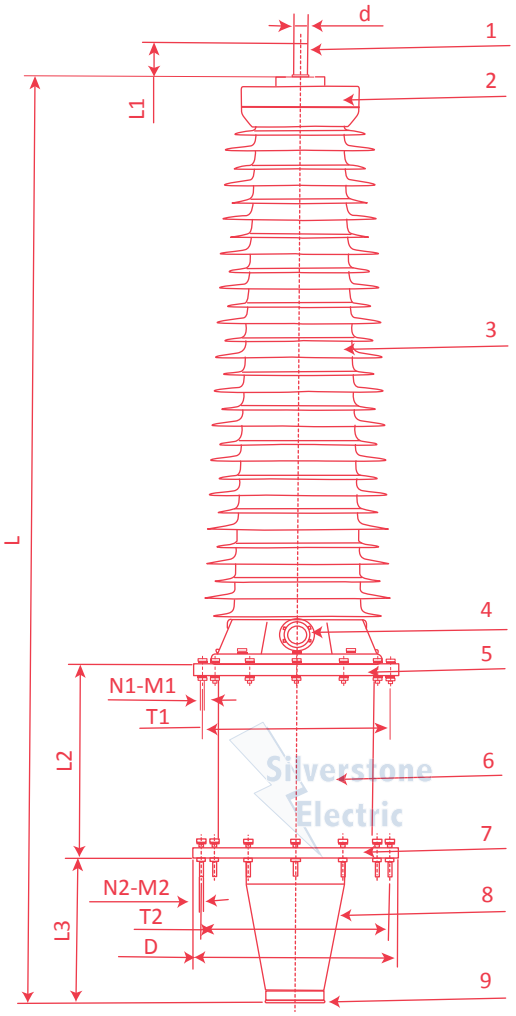
Dry Bushing of Transformer

- Apply producing technology of high voltage cable accessories to transformer bushing.
- The main insulation of bushing is special epoxy; the control element of electric field is special stress-relief cone. Take the lead in developing geometric stress-relief cone bushing in the world.
- The out insulation made of silicone.
- Technology standard complies with GB/T4109, IEC60137.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)	(IV)(mm)
64/110	64	126	160	550	3910

Dry Bushing of Transformer (Cont...)



MAIN PARTS :

1. Pole
2. Close cover
3. Composite insulating tube
4. Temperature measure
5. Fix (connect) flange
6. Hoist base (choose)
7. Fix (connect) flange
8. Epoxy part

INSTALLATION DIMENSION :

L	L1	L2	L3	d	D	T1	T2	N1/N2	M1/M2
2151	80	450	335	Φ28 ~ Φ60	Φ420	Φ385	Φ385	12	M12

Silverstone Electric

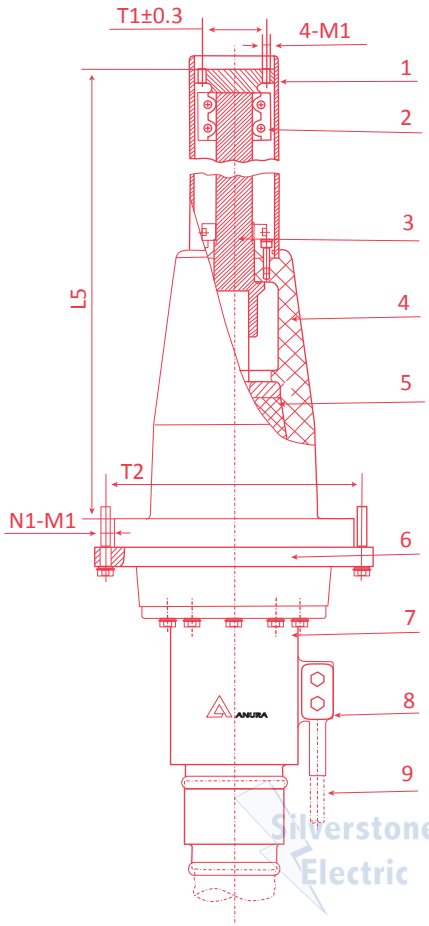
Plug-in/Fixed Cable Termination

- It is made up of prefabricated stress-relief cone and epoxy bushing without insulating oil. The pole can be divided into compress-in and plug-in style.
- Cable cross section: 95~2500mm^2. It is suitable for kinds of GIS or transformer. Whether SF6 or all kind of insulative oil can be used outer insulation of our products.
- The press of the spring compress on the cone wall of the bushing, so that the press of interface is kept permanently during the course of running.
- The termination is dry style without oil.
- The earthing is reliable and the installation is easy.

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)
52/66	52	72.5	130	325
64/110	64	126	160	550
76/132	76	145	190	650
127/220	127	252	318	1050
290/500	290	550	580(60min)	1550

Fixed GIS Termination



MAIN PARTS :

1. Screen
2. Pole base
3. Pole
4. Epoxy tube
5. Stress-relief cone
6. Fix flange
7. Tail
8. Earthing electrode
9. Earthing cable

	STRUCTURE TYPES
1	Plug-in GIS Termination, 470 type
2	Plug-in GIS Termination, 757 type
3	Fixed GIS Termination, 470 type
4	Fixed GIS Termination, 757 type

Change the length of pole bring the four lengths product that all according to IEC60859 or 62271-209@IEC2007.

INSTALLATION DIMENSION :

NOTE : L can be expanded to meet the connecting dimension of oil termination.

L5	M1	M2	N1	T1	T2
310	M10	M10	8	80 ± 1.0	270 ± 0.5
470/757	M10	M12	12	80 ± 1.0	320 ± 0.5
470/757	M10	M12	12	80 ± 1.0	320 ± 0.5
620/960	M12	M16	16	110 ± 1.0	582 ± 0.5
960/1400	M12	M16	20	110 ± 1.0	640 ± 0.5

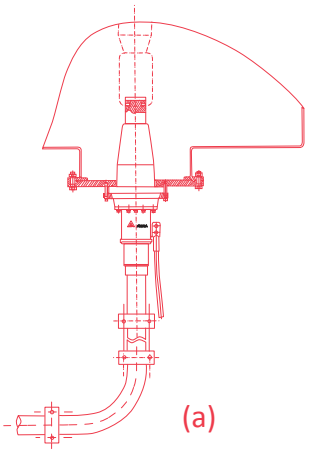
Oil or SF6 Transformer Dry Type Termination

- It is improved on tradition termination to meet new requirements of electric system and assembly dimensions of it comply with IEC60859 or 62271-209 © IEC2007. Please Note it in order.
- It is suitable for Cable cross section: 95~2500mm² and oil or SF6 transformer.
- The epoxy bushing of Ankura-YJZGGCB can be installed and debugged beforehand. The only need on to pump in or out air, saving plenty of time.

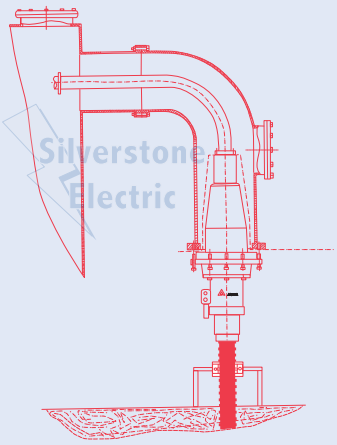
  The facility and the termination can be tested respectively. It is easy testing after finishing cable system installation and checking fault.

Silverstone Electric

EXAMPLE OF APPLICATION :



(a)



(b)

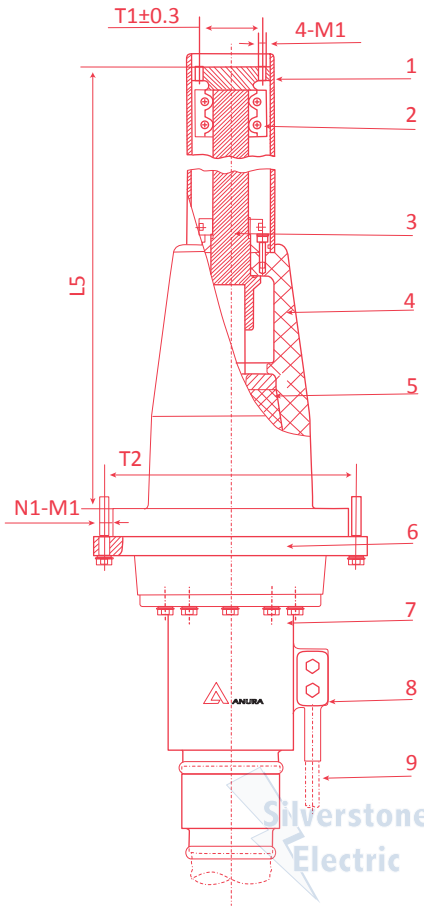
Silverstone Electric
Silverstone Electric

ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)
52/66	52	72.5	130	325
64/110	64	126	160	550
76/132	76	145	190	650
127/220	127	252	318	1050
290/500	290	550	580(60min)	1550

Silverstone Electric

Oil or SF6 Transformer Dry Type Termination (Cont...)



MAIN PARTS :

1. Screen
2. Pole base
3. Pole
4. Epoxy tube
5. Stress-relief cone
6. Fix flange
7. Tail
8. Earthing electrode
9. Earthing cable

	STRUCTURE TYPES
1	Plug-in GIS Termination, 470 type
2	Plug-in GIS Termination, 757 type
3	Fixed GIS Termination, 470 type
4	Fixed GIS Termination, 757 type

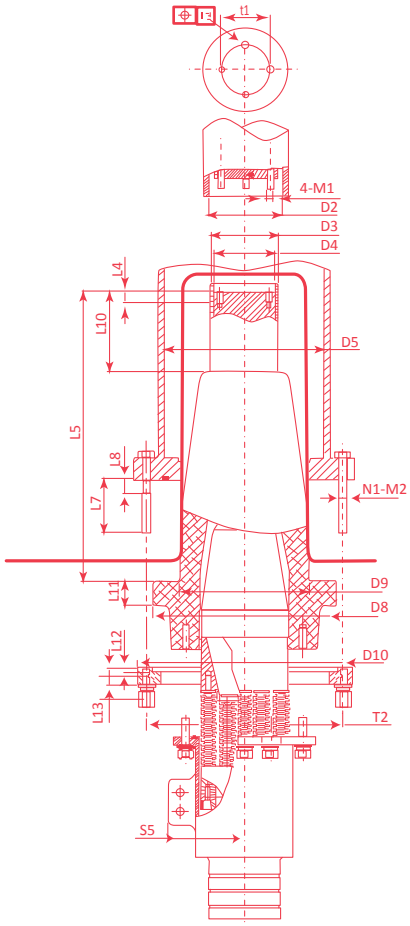
Change the length of pole bring the four lengths product that all according to IEC60859 or 62271-209 & IEC2007.

INSTALLATION DIMENSION :

NOTE : L can be expanded to meet the connecting dimension of oil termination.

L5	M1	M2	N1	T1	T2
310	M10	M10	8	80 ± 1.0	270 ± 0.5
470/757	M10	M12	12	80 ± 1.0	320 ± 0.5
470/757	M10	M12	12	80 ± 1.0	320 ± 0.5
620/960	M12	M16	16	110 ± 1.0	582 ± 0.5
960/1400	M12	M16	20	110 ± 1.0	640 ± 0.5

Install Dimension of Termination



INSTALL DIMENSION OF TERMINATION

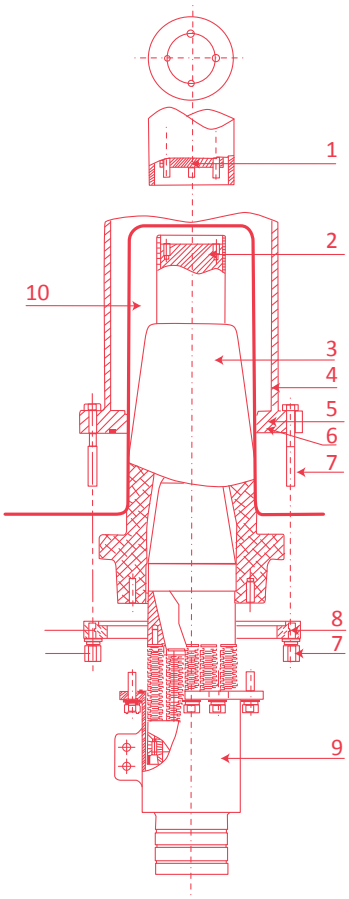
- It is improved on tradition termination to meet new requirements of electric system and assembly dimensions of it comply with IEC60859 or 62271-209© IEC2007. Please Note it in order.
- It is suitable for Cable cross section: 95~2500mm² and oil or SF6 transformer.
- The epoxy bushing of Ankura-YJZGGCB can be installed and debugged beforehand. The only need on site is to install the termination . There is no need to pump in or out air, saving plenty of time.
- The facility and the termination can be tested respectively. It is easy testing after finishing cable system installation and checking fault.

INSTALATION MEASUREMENT CHART :

U(kV)	D2 min	D3 max	D4 min	D5 min	D8	D9 max	D10 max	L4 min	L5 ± 1.0	L7 min
66	101	99	100	300	245	188	298	20	310/583	90
110	112	110	100	300	298	196	348	20	470/757	100
132	112	110	100	300	298	215	348	20	470/757	100
220 (IEC60859)	202	200	140	400	454	375	500	21	620/960	110
220 (IEC62271-209)	202	200	140	480	559	440	620	21	620/960	90
500	252	250	140	540	617	500	690	25	960/1400	130

Install Dimension of Termination (Cont...)

INSTALL DIMENSION OF TERMINATION



GIS INSTALATION COMPONENTS :

1	Connection interface(up)	*	
2	Connection interface(down)		*
3	Epoxy bushing		*
4	Case	*	
5	Flange	*	
6	Seal ring	*	
7	Fixing screws	*	
8	Flange of fixing		*
9	Tail		*
10	SF6 or oil	*	

INSTALATION MEASUREMENT CHART :

L8 max	L10 min	L11	L12	L13	T1 ± 0.2	T2 ± 0.2	N1	M1	M2	S5 min
30	55	30	5	25	80 ± 1.0	270 ± 0.5	8	10	10	120
30	55	40	5	25	80 ± 1.0	320 ± 0.5	12	10	12	132
30	55	40	5	25	80 ± 1.0	320 ± 0.5	12	10	12	132
30	105	40	5	25	110 ± 1.0	582 ± 0.5	16	12	16	180
30	105	40	5	25	110 ± 1.0	582 ± 0.5	16	12	16	180
30	105	60	5	40	110 ± 1.0	640 ± 0.5	20	12	20	218

Grounding Case/Grounding Protective Case

The type Ankura-JDX suits direct grounding of the outer sheath of cable with single core and 3 phrases. The type Ankura-JDBX suits protective grounding of the outer sheath of cable with single core and 3 phrase.

- The body of the case is made of stainless steel board and special insulation material with high mechanical intensity and excellent insulation and good sealing property.
- The inner patchboard has good conductivity with little resistance.
- The type JDBX is equipped with type BHQ arrester so as to ensure that the cable can run safely and reliably .
- The case can be installed by straight burying or hung on wall.

Silverstone Electric

ELECTRIC PERFORMANCE :

ITEMS	TESTING ITEMS	TECHNOLOGY REQUIREMENTS
1	D.C withstand voltage test (type test)	No breakdown or flashover shall occur at 20kV, 1min
2	Impulse voltage test (type test)	No breakdown or flashover shall occur at 10 positive and 10 negative impulse voltages of 40kV.
3	Insulation resistance between the connect row and outer shell test (Routine test)	≥ 20M Ω
4	Connect row contacting resistance test (Routine test)	≤ 20 μ Ω

Silverstone Electric
Silverstone Electric
Silverstone Electric

Cross-interlinked Case

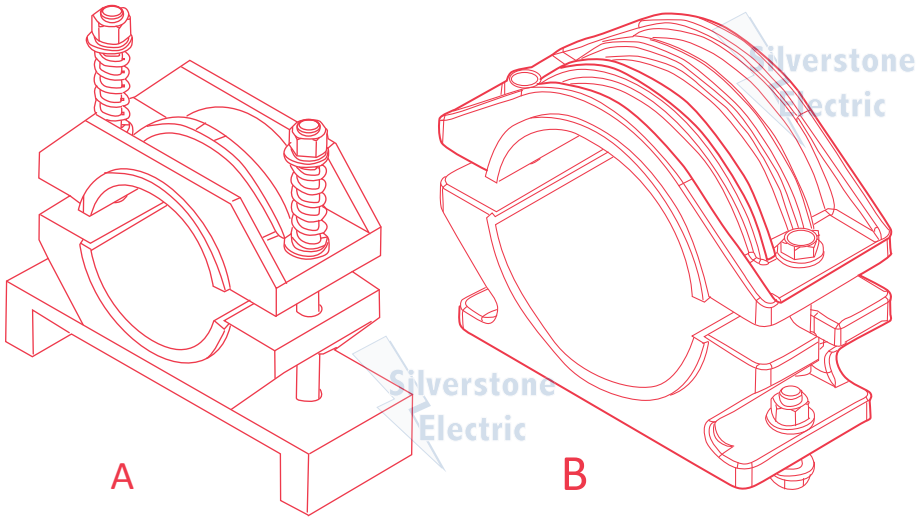
Functions as restraining metal sheath and sectionalizing joint of both sides are assaulted by rising of voltage, Control the inductive voltage of the metal sheath, reduce and dispel one layer of annular electric current, improve capacity of sending of cable, prevent protective layer of cable from puncturing, guarantee that the cable can run safely and reliably.

THE PERFORMANCE OF ANBQ ARRESTOR :

ITEMS	TESTING ITEMS	TECHNOLOGY REQUIREMENTS	
		ANBQ-I	ANBQ-II
1	Max frequency reaction over voltage of cable screen	6kV	12kV
2	2ms rectangular impulse current withstand	400A	400A
3	U500kA: U1mA	k≤2.5	k≤2.5
4	Volume	65kV	65kV
5	Reference voltage of D.C	1 mA (Remnant Viltage) ≥4.5kV	1 mA (Remnant Viltage) ≥9kV
6	8/20 μ s impulse current test(20 times)	5kA (Remnant Viltage) ≤9.5kV	5kA (Remnant Viltage) ≤19kV

Cross-interlinked Case (Cont...)

- We have (sale) all kind of Clampings.
- Use and characteristic:
- The body of the case is made of stainless steel board and special insulation material with high mechanical intensity and excellent insulation and good sealing property.



SPECIFICATION LIST :

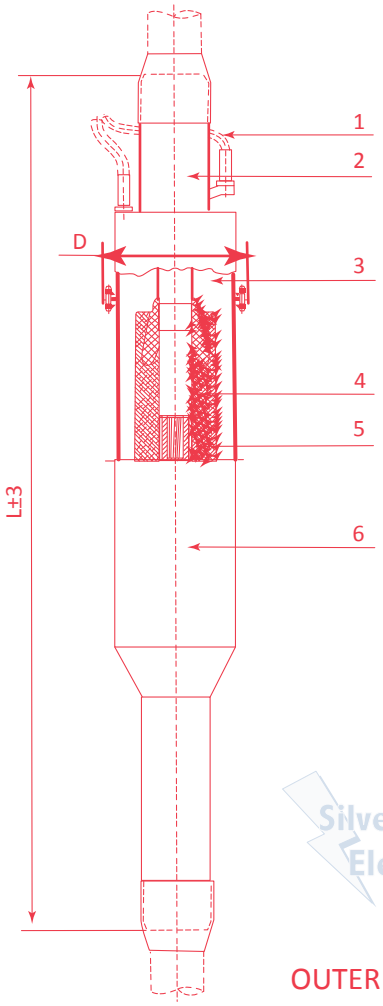
	(mm)	110kV (mm²)	220kV (mm²)	500kV (mm²)			
Ankura-DJ-01	Φ75-Φ85				Φ14-150	2-M12x150	170x80x126
Ankura-DJ-02	Φ86-Φ105	240-630	240-630		Φ14-150	2-M12x150	180x150x136
Ankura-DJ-03	Φ106-Φ135	1000-1800	500-1600	240-1000	Φ14-190	2-M12x190	220x80x189
Ankura-DJ-03	Φ120-Φ135	1400-1800	1000-1600	630-1000	Φ14-190	2-M12x190	220x80x180
Ankura-DJ-04	Φ130-Φ155	1800-2500	1400-2500	1000-1600	Φ14-190	2-M12x80	250x100x201
Ankura-DJ-05	Φ140-Φ165	2500	2000-2500	1400-2500	Φ14-230	2-M12x190	260x120x214
Ankura-DJ-06	Φ150-Φ170		2500	1800-2500	Φ14-190	2-M12x80	265x100x219

Straight Joint/Insulated Joint

- This is a single-piece slip-over joint. The main insulation of the joint is wholly prefabricated structure, integrating the insulating, high voltage screen and stress-relief cone.
- The out shell of the joint is made of thick metal tube and the out layer is covered with insulated layer with high density, ensuring the high intensity mechanical protection, insulating and anticorrosion. It is equipped additionally with protective FRP (fibre-reinforce-platic) box which is filled with water-resistance sealing material and suitable for burying with vertical and the location that may be water immersed.
- The outer screen of main insulating is made of extruding technology. The main insulation is wholly prefabricated. Installed by mechanical per-expanded technology at locale.
- The outer protection is made of insulating material shell. It has excellent mechanical protection, sealing property and against magnetization. Reasonable design, compact structure, install easily and running reliably.
- Many patent and Reasonable design in it, install esaily and running reliably.
- As earthing terminal with metallic shell previously connects with soft-annealed wire, its waterproofness comes better.

Silverstone Electric

Straight Joint / Insulated Joint (Cont...)



MAIN PARTS :

1. Coaxial cable
2. Short insulating case
3. Insulated waterproof glue
4. One-piece slip-over rubber
5. Copper connector and conductor of a cable
6. Long insulating case

OUTER DIMENSIONS :

	L	D
52/66	1700	Φ250
64/110	1700	Φ250
76/132	1700	Φ250
127/220	2100	Φ320
290/500	2860	Φ590

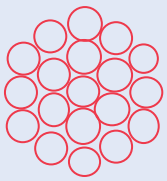
ELECTRIC PERFORMANCE :

RATED VOLTAGE	Uo(kV)	Um(kV)	30min(kV)	BIL(kV)
52/66	52	72.5	130	325
64/110	64	126	160	550
76/132	76	145	190	650
127/220	127	252	318	1050
290/500	290	550	580(60min)	1550

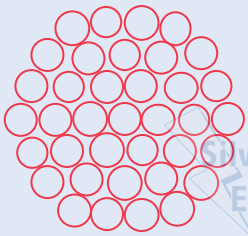
Bear Standard Conductor

Aluminum Stranded Conductor and Aluminum Stranded Conductors Steel-reinforced:

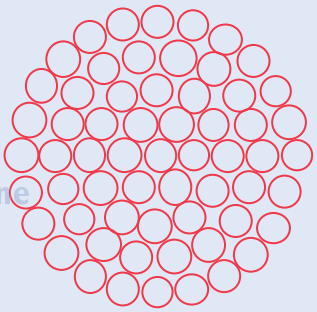
7(1+6) Al



19(1+6+12) Al



37(1+6+12+18) Al



61(1+6+12+18+24) Al

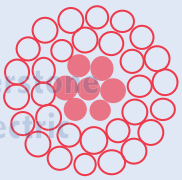
6Al/1St

12Al/7St

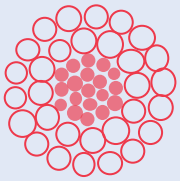
18Al/1St

24Al/7St

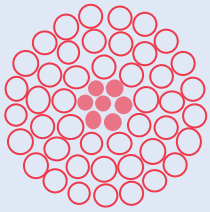
26Al/7St



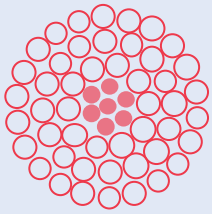
30Al/7St



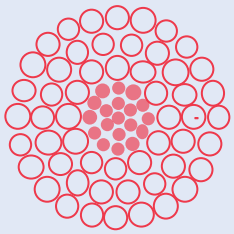
30Al/19St



45Al/7St



48Al/7St



54Al/19St

Bear Standard Conductor (Cont...)

Aluminum Stranded Conductor and Aluminum Stranded Conductors Steel-reinforced:

The product is used in the field of aerial power line.

MANUFACTURING STANDARDS :

The standard is IEC207-1966, GB1179-83 which is similar to IEC209-1966.

TYPE & SPECIFICATION :

- Refer to Table 1 about the type of cable

TABLE : 1

TYPE	NAME
LJ	Aluminum Stranded Conductor
LGJ	Aluminum Stranded Conductors Steel-reinforced
LGJF	Corrosion-proof Aluminum Stranded Conductors Steel-reinforced

Aluminum Stranded Conductor and Aluminum Stranded Conductors Steel-reinforced

- Specification of cable is stipulated in Table 2 and Table 3.

ALUMINUM STRANDED CONDUCTOR :

TABLE : 2

NOMINAL CROSS-SECTIONAL -AREA mm^2	CONSTRUCTION (NO./DIA) mm	OUTER DIA. mm	D.C.RESISTANCE AT 20°C (NO MORE THAN) Ω/km	CALCULATED BREAKING LOAD N	CALCULATED WEIGHT kg/km	DELIVERY LENGTH (NO LESS THAN) m	CONTINUOUS CARRYING CAPACITY A
16	7/1.70	5.10	1.802	2840	44	4000	111
25	7/2.15	6.45	1.127	4355	70	3000	147
35	7/2.50	7.50	0.8332	5760	94	2000	180
50	7/3.00	9.00	0.5786	7930	136	1500	227
70	7/3.60	10.80	0.4018	10950	195	1250	284
95	7/4.16	12.48	0.3009	14450	261	1000	338
120	19/2.85	14.25	2.373	19420	334	1500	390
150	19/3.15	15.75	0.1943	23310	407	1250	454
185	19/3.50	17.50	0.1574	28440	503	1000	518
210	19/3.75	18.75	0.1371	32260	577	1000	575
240	19/4.00	20.00	0.1205	36260	657	1000	610
300	37/3.20	22.40	0.09689	46850	820	1000	707
400	37/3.70	25.90	0.07247	61150	1097	1000	851
500	37/4.16	29.12	0.06733	76370	1387	1000	982
630	61/3.63	32.67	0.04577	91940	1744	800	1140
800	61/4.10	36.90	0.03588	115900	2225	800	1340

ALUMINUM STRANDED CONDUCTOR STEEL-REINFORCED

TABLE : 3

NOMINAL CROSS-SECTIONAL -AREA mm²	CONSTRUCTION (NO./DIA) mm		OUTER DIA. mm	D.C. RESISTANCE AT 20°C (NO MORE THAN) Ω/km	CALCULATED BREAKING LOAD N	CALCULATED WEIGHT kg/km	DELIVERY LENGTH (NO LESS THAN) m	CONTINUOUS CARRYING CAPACITY A
	Al.	ST.						
10/2	6/1.50	1/1.50	4.50	2.706	4120	13	3000	87
16/3	6/1.85	1/1.85	5.55	1.779	6130	65	3000	110
25/4	6/2.32	1/2.32	6.96	1.131	9290	103	3000	125
35/6	6/2.72	1/2.72	8.16	0.8230	12630	141	3000	145
50/8	6/3.20	1/3.20	9.60	0.5946	16870	195	2000	212
50/30	12/2.32	7/2.32	11.60	0.5692	42620	372	3000	250
70/10	6/3.80	1/3.80	11.40	0.4217	23390	275	2000	255
70/40	12/2.72	7/2.72	13.60	0.4141	58300	511	2000	340
95/15	26/2.15	7/1.67	13.61	0.3058	35000	381	2000	350
95/20	7/4.16	7/1.85	13.87	0.3019	37200	409	2000	360
95/55	12/3.20	7/3.20	16.00	0.2990	78110	708	2000	420
120/7	18/2.90	1/2.90	14.50	0.2422	27570	379	2000	380
120/20	26/2.38	7/1.85	15.07	0.2496	41000	467	2000	390
120/25	7/4.72	7/2.10	15.74	0.2345	47880	527	2000	400
120/70	12/3.60	7/3.60	18.00	0.2364	98370	896	2000	505
150/8	18/3.20	1/3.20	16.00	0.1989	32860	461	2000	442
150/20	24/2.78	7/1.85	16.67	0.1980	46630	549	2000	450
150/25	26/2.70	7/2.10	17.10	0.1939	54110	601	2000	470
150/35	30/2.5	7/2.50	17.50	0.1962	65020	676	2000	500
185/10	18/3.60	1/3.60	18.00	0.1572	40880	584	2000	497
185/25	24/3.15	7/2.10	16.67	0.1542	59420	706	2000	525
185/30	26/2.98	7/2.32	18.88	0.1592	64320	733	2000	525
185/45	30/2.80	7/2.80	19.60	0.1564	80190	848	2000	522
210/10	18/3.80	1/3.80	19.00	0.1411	45140	651	2000	523
210/25	24/3.33	7/2.22	19.98	0.1380	65990	789	2000	560
210/35	26/3.22	7/2.50	20.38	0.1363	74250	854	2000	590

Silverstone Electric

Bear Standard Conductor (Cont...)

TABLE : 3 (Cont...)

NOMINAL CROSS-SECTIONAL -AREA mm²	CONSTRUCTION (NO./DIA) mm		OUTER DIA. mm	D.C. RESISTANCE AT 20°C (NO MORE THAN) Ω/km	CALCULATED BREAKING LOAD N	CALCULATED WEIGHT kg/km	DELIVERY LENGTH (NO LESS THAN) m	CONTINUOUS CARRYING CAPACITY A
	Al.	ST.						
210/50	30/2.98	7/2.98	20.86	0.1381	90830	961	2000	600
240/30	24/3.60	7/2.40	21.60	0.1181	75620	922.2	2000	610
240/40	22/3.42	7/2.66	21.66	0.1209	83370	964.3	2000	610
240/55	30/3.20	7/3.20	22.40	0.1198	102100	1108	2000	640
300/15	42/3.00	7/1.67	23.01	0.09724	68060	940	2000	650
300/20	45/2.93	7/1.95	23.43	0.09520	75680	1002	2000	655
300/25	48/2.85	7/2.22	23.76	0.09433	83410	1058	2000	690
300/40	24/3.99	7/2.66	23.94	0.09614	92220	1133	2000	705
300/50	26/3.83	7/2.98	24.26	0.09636	103400	1210	2000	725
300/70	30/3.60	7/3.60	25.20	0.09463	128000	1402	2000	740
400/20	42/3.51	7/1.95	26.91	0.07104	88850	1286	1500	800
400/25	45/3.33	7/2.22	26.64	0.07370	95940	1295	1500	800
400/30	48/3.22	7/2.50	26.82	0.07389	103900	1349	1500	810
400/50	54/3.07	7/3.07	27.63	0.07232	123400	1511	1500	815
400/65	26/4.42	7/3.44	28.00	0.07236	135200	1611	1500	850
400/95	30/4.16	19/2.50	29.14	0.07087	171300	1860	1500	873
500/35	45/3.75	7/2.50	30.00	0.05712	119500	1642	1500	920
500/45	38/3.60	7/2.80	30.00	0.05912	128100	1688	1500	920
500/65	54/3.44	7/3.44	30.96	0.05760	154000	1897	1500	935
630/45	45/4.20	7/2.80	33.60	0.04633	148700	2060	1500	1025
630/55	48/4.12	7/3.20	34.32	0.04514	164400	2209	1500	1060
630/80	54/3.87	19/2.32	34.32	0.04551	192900	2388	1500	1120
800/55	45/4.80	7/3.20	38.40	0.03547	191500	2690	1200	1220
800/70	48/4.63	7/3.60	38.58	0.03574	207000	2791	1200	1223
800/100	54/4.33	19/2.60	38.98	0.03635	241100	2991	1200	1240

Silverstone Electric

MAIN MECHANICAL PERFORMANCE OF CABLE

- Refer to table 4 about the mechanical performance of round aluminum wire
- The mechanical property of galvanized steel wire and the technical requirement of zinc coating. (see Table 5)

TABLE : 4

NOMINAL DIAMETER mm	MIN. TENSILE STRENGTH				MAX. RESISTIVITY AT 20°C Ωmm²/m	WRAPPING TEST
	BEFORE STRANDING		AFTER STRANDING			
	N/mm²	kgf/mm²	N/mm²	kgf/mm²		
1.25	200	20.4	190	19.4		
1.26~1.50	193	19.7	183	18.7		
1.51~1.75	188	19.2	178	18.2		
1.76~2.00	184	18.8	176	17.9		
2.01~2.25	180	18.4	172	17.5		
2.26~2.50	176	18.0	168	17.1		
2.51~2.75	173	17.6	164	16.7	0.028264	Wind test sample at round rod whose diameter is equal to that of sample eight turns, then unwind six turns, then wind sample at the rod tightly again. There should be no breaking on aluminum stranded conductors when checked by visual examination.
2.76~3.00	169	17.2	160	16.3		
3.01~3.25	166	16.9	157	16.0		
3.26~3.50	164	16.7	154	15.9		
3.51~3.75	162	16.5	152	15.7		
3.76~4.20	160	16.3	153	15.5		
4.26~5.00	159	16.2	151	15.4		

Silverstone Electric

Bear Standard Conductor (Cont...)

TABLE : 5

NOMINAL DIAMETER mm	MIN. STRESS AT 1% N/mm²	MIN. TENSILE STRENGTH N/mm²		MIN. WEIGHT OF ZINC COATING G/mm²	NO.OF IMMERSION IN 1 MINUTE (NO LESS THAN)	ADHESION OF COATING	
		BEFORE STRANDING	AFTER STRANDING			DIA. OF TEST RODMM	WRAPPING
1.25~1.50	1172	1310	1244	183	2	4d	(1) Wind 8 turns tightly. (2) Winding result: No crack on coating dropped off when rubbed by finger.
1.51~1.75	1172	1310	1244	198	2		
1.76~2.25	1172	1310	1244	214	2.5		
2.26~2.75	1138	1310	1244	229	3		
2.76~3.00	1138	1310	1244	244	3.5		
3.01~3.50	1103	1310	1244	244	3.5		
3.51~3.80	1103	1310	1244	259	4	5d	

- Thermal Resistant Aluminum Alloy Stranded Conductor and Thermal
- Resistant Aluminum Alloy Stranded Conductor Steel-reinforced

Silverstone Electric

THERMAL RESISTANT ALUMINUM ALLOY STRANDED CONDUCTOR AND THERMAL RESISTANT ALUMINUM ALLOY STRANDED CONDUCTOR STEEL-REINFORCED

MANUFACTURING STANDARDS :

Q/09TDL030-1999

USES AND CHARACTERISTICS :

The product is used in aerial transmission line. Max. Continuous operating temperature can be 150. The transmission capacity of this product increases 60%.

PROPERTIES :

- Relative conductance : 58% IACS Max. resistivity at 20˚C : 0.029726 Ω.mm²/m
- After heating to 230˚C for 1h, and cooling to room temperature, the tensile strength remained should not less than 90%.
- Linear expansion coefficient is 0.000023 1/˚C
- Temperature coefficient of resistance is 0.0039 1/˚C

Silverstone Electric

ALUMINUM STRANDED CONDUCTOR AND ALUMINUM STRANDED CONDUCTORS STEEL-REINFORCED :

SPECIFICATION :

- Thermal resistant aluminum alloy stranded conductor

TABLE : 6

NOMINAL CROSS-SECTIONAL mm²	CONSTRUCTION (NO./DIA) mm	CALCULATED CROSS-SECTION mm²	OVERALL DIAMETER mm	MAX. D.C. RESISTANCE AT 20°C Ω/k°	CALCULATED BREAKING LOAD N	CALCULATED WEIGHT kg/km	MIN. DELIVERY LENGTH m
35	7/2.50	34.36	7.50	0.8763	5125	94.2	2000
50	7/3.00	49.48	9.00	0.6085	7380	135.7	1500
70	7/3.60	71.25	10.80	0.4226	10289	195.4	1250
95	7/4.16	95.14	12.48	0.3165	13287	260.9	1000
120	19/2.85	121.21	14.25	0.2496	18079	334.0	1500
150	19/3.15	148.07	15.75	0.2043	21381	408.0	1250
185	19/3.50	182.80	17.50	0.1655	26396	503.7	1000
210	19/3.75	209.85	18.75	0.1442	30302	578.2	1000
240	19/4.00	238.76	20.00	0.1267	33343	657.9	1000
300	37/3.20	297.57	22.40	0.1019	42969	821.6	1000
400	37/3.70	397.83	25.90	0.07622	57447	1098.5	1000
500	37/4.16	502.90	25.12	0.06030	70230	1388.6	1000
630	41/3.63	631.30	32.67	0.04803	86362	1746.8	800
800	61/4.10	805.36	36.90	0.03765	106549	2228.4	800

- Thermal resistant aluminum alloy stranded conductor steel-reinforced

Bear Standard Conductor (Cont...)

TABLE : 7

NOMINAL CROSS-SECTION mm²	CONSTRUCTION (NO./DIA.) mm		CALCULATED CROSS-SECTION mm²			OVERALL DIAMETER mm	MAX. D.C. RESISTANCE AT 20°C Ω/km	CALCULATED BREAKING LOAD N	CALCULATED WEIGHT kg/km	MIN. DELIVERY LENGTH m
	AL.	ST.	AL.	ST.	TOTAL					
240/30	24/3.60	7/2.40	244.29	31.67	257.06	21.60	0.1242	73170	923	2000
240/40	26/3.42	7/2.66	238.85	38.90	277.75	21.66	0.1271	80570	965	2000
240/50	30.3.20	7/3.20	241.27	56.30	297.57	22.40	0.1260	98770	1109	2000
300/15	42/3.00	7/1.67	296.88	15.33	312.21	23.01	0.1032	64580	941	2000
300/20	45/2.93	7/1.95	303.42	20.91	324.33	23.43	0.1001	72140	1003	2000
300/25	45/2.85	7/2.22	306.21	27.10	333.31	23.76	0.0992	79840	1060	2000
300/40	24/3.99	7/2.65	300.09	38.90	338.99	23.94	0.1011	89880	1134	2000
300/50	26/3.83	7/2.98	299.54	48.82	348.36	24.26	0.1013	101100	1211	2000
300/70	30/3.60	7/3.60	305.36	71.25	376.61	25.20	0.09953	125000	1403	2000
400/20	42/3.51	7/1.95	406.40	20.91	427.31	26.91	0.07471	86280	1287	1500
400/25	45/3.33	7/2.22	391.91	27.10	419.01	26.64	0.07751	91330	1297	1500
400/35	48/3.22	7/2.50	390.88	34.36	425.24	26.82	0.07772	98520	1351	1500
400/50	24/3.07	7/3.07	399.73	51.82	451.55	26.73	0.07606	117920	1513	1500
400/65	26/4.42	7/3.44	398.94	65.06	464.00	28.00	0.07610	130400	1612	1500
400/95	30/4.16	19/2.50	407.75	93.27	501.02	29.14	0.07454	166100	1961	1500
500/35	45/3.75	7/2.50	497.01	34.36	531.37	30.00	0.06112	114700	1644	1500
500/45	48/3.60	7/2.80	488.58	41.10	531.68	30.00	0.06218	123300	1690	1500
500/65	54/3.44	7/3.44	501.88	65.06	566.94	30.96	0.0606	148000	1899	1500
630/45	45/4.20	7/2.80	623.45	41.10	666.55	33.60	0.04873	140700	2601	1500
630/55	48/4.12	7/3.44	639.92	56.30	696.22	34.32	0.04747	156200	2210	1200
630/80	54/3.87	7/2.80	635.19	80.32	715.51	34.82	0.0479	187800	2190	1200
800/55	45/4.80	7/3.20	639.92	56.30	870.60	38.40	0.03731	181800	2691	1200
800/70	48/4.63	7/3.60	808.15	71.25	379.40	33.53	0.03759	197400	2793	1000
800/100	54/4.33	19/2.60	795.17	100.88	896.05	38.98	0.0383	231600	2995	1000
1440/120	84/4.67	19/2.80	1438.81	116.99	1555.80	51.36	0.0213	344500	4928	700

Silverstone Electric

MATERIAL :

- Thermal resistant aluminum alloy round wire should be in accordance with the standard Q/09TDL029-1999 Thermal Resistant Aluminum Alloy Round Wire of Relative Conductance 58% IACS.
- Galvanized steel wire should be in accordance with the standard GB3428-82 Galvanized Steel Wire which is used in Aluminum Stranded Conductors Steel-reinforced.

HARD COPPER STRANDED CONDUCTOR :

MANUFACTURING STANDARDS :

Q/09TDL016

USES AND CHARACTERISTICS :

The product is used in aerial power line and power system of electrical railway.

Silverstone Electric

ALUMINUM STRANDED CONDUCTOR AND ALUMINUM STRANDED CONDUCTORS STEEL-REINFORCED

NAME AND MANUFACTURING RANGE:

Name : Hard Copper Stranded Conductor
Type : TJ
Manufacturing Range : 10-500mm²

PROPERTIES:

Main Properties of Round Copper Single Wire (see Table 8)

Silverstone Electric

TABLE : 8

DIA. OF SINGLE WIRE mm		CROSS-SECTION OF CONDUCTOR mm²	TENSILE STRENGTH N/mm²		CONDUCTOR RESISTIVITY AT 20˚C Ω.mm²/m	WEIGHT kg/km
NORMAL VALUE	TOLERANCE		MIN. VALUE BEFORE STRANDING	MIN. VALUE AFTER STRANDING		
1.35	±0.03	1.43	422	392	0.01796	12.7
1.50		1.77				15.3
1.75		2.41				21.5
2.00		3.14			0.01777	28.0
0.225		3.98				35.4
2.50		4.41				43.7
2.70		5.94				52.9
3.00		7.07				62.9
3.25	±0.04	8.30				73.8

NOTE : 1. The diameter is allowed to have a middle value. Its deviation is allowed one of the next bigger diameter.
Resistivity of the conductor at 20°ê shall be selected 0.01796?Π°§mm²/m, if the normal diameter is less than 2.00mm.

Bear Standard Conductor (Cont...)

THE CONSTRUCTION :

Specification, Construction And Technical Data. (See Table 9) :

TABLE : 9

NOMINAL CROSS-SECTIONAL mm²	SINGLE WIRE		OVERALL DIAMETER OF THE STRAND mm	CALCULATED BREAKING LOAD KN	CONDUCTOR D.C. RESISTANCE AT 20˚C Ω./km	CONTINUOUS CARRYING CAPACITY A	CALCULATED WEIGHT kg/km
	NO.	DIA. mm					
50	19	1.80	9.0	19.38	0.3781	250	437
70	19	2.10	10.5	26.38	0.2747	310	596
95	19	2.50	12.5	37.79	0.1939	380	845
120	19	2.80	14.0	46.90	0.1546	440	1060
127	19	2.92	14.6	51.00	0.1422	470	1163
150	37	2.25	15.8	58.98	0.1232	510	1337
185	37	2.50	17.5	72.81	0.09981	585	1649
240	61	2.25	20.3	97.23	0.07490	700	2209
300	61	2.50	22.5	120.04	0.06067	800	2725
400	61	2.89	26.0	160.42	0.04540	960	3640
500	61	3.23	29.1	200.38	0.03635	1110	4545

NOTE : 1. The weight of stranded conductor is calculated with the density 8.9kg/dm3 and average lay ratio.

2. Refer to the line, the wind speed is 0.6m/s, the ambient temperature is 35, max. temperature of aerial transmission strand is 70, 60Hz and below. In the special laying situation of static air, the capacity shall reduce about 30% in average.

DELIVERY LENGTH :

- The delivery length of stranded conductors shall be as stipulated in the tables. The allowed tolerance for delivery length of any strands is within 5% of the total length signed in the contract, the length for each short strand shall be not less than 1/3 of the standard delivery one. The delivery length can be decided through negotiation by both parties.
- The strands shall be delivered in drum and packed carefully. The short strands shall be delivered in coiling and tied up at least three points and packed carefully.

ORDERING METHOD :

- Please indicate the type, size, number and product standard when ordering. For example, if ordering 20T steel-reinforced aluminum stranded conductor with a cross-sectional area of 50/8mm2 can be indicated as: LGJ-50/8mm2 20T GB1179-83.

Silverstone Electric

Aerial Optical Cables along Electrical Power Lines

INTRODUCTION :

Aerial optical cables along electrical power lines include: OPGW (optical fiber composite overhead ground wires), OPPC (optical phase conductor), MASS (metallic armoured self supporting cable), ADSS (all dielectric self supporting cable) and OPAC (optical attached cable).

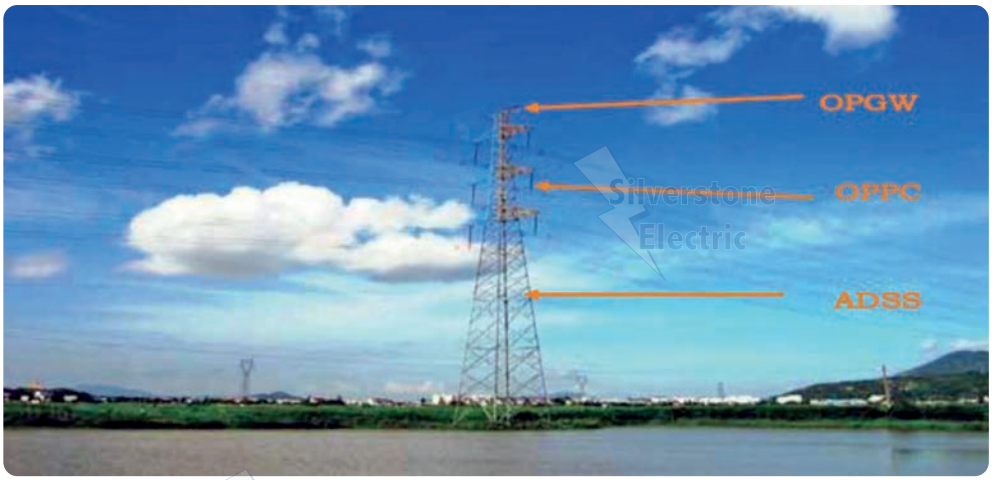
In this introduction, OPGW, OPPC and ADSS, will be mainly introduced.

OPGW cables, installed on the top of power poles or towers, have the dual performance functions of standard ground wires with communication capabilities.

OPPC cables, installed at the positions of power transmission phase conductors, have the dual performance functions of standard phase conductors with communication capabilities.

ADSS cables, installed at proper positions of power poles or towers, are a kind of non-metal optical cables suspended directly between two points without need of other supporting elements.

If you are interesting in or have any request on MASS and OPAC, please contact us without any hesitations, you will get a quick response.



GENERAL DESIGN REQUIREMENTS :

TCI's products are complied with relevant international standards and national and industrial standards of China, including but not limited to following standards:

GB/T ： National standard of PRC；

DL/T ： Electrical power industrial standards of PRC；

YD/T ： Post and telecom industrial standard of PRC；

JB/T ： Mechanical industrial standard of PRC (PRC: the People's Republic of China).

STANDARDS AND SPECIFICATIONS :

RELEVANT STANDARDS ABOUT OPTICAL FIBERS :

ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.651	Characteristics of a 50/125 um multimode graded index optical fiber cable
ITU-T G.652	Characteristics of a single-mode optical fiber cable
ITU-T G.653	Characteristics of a dispersion-shifted single mode optical fiber cable
ITU-T G.654	Characteristics of a cut-off shifted single-mode optical fiber and cable
ITU-T G.655	Characteristics of a non-zero dispersion-shifted single-mode optical fiber and cable
ITU-T G.656	Characteristics of a fiber and cable with non-zero dispersion for wideband optical transport
GB/T 9771	Single mode fiber series for communication
GB/T 12357	Multi mode fiber series for communication
GB/T 15972.1	General specification of optical fibers, Part 1: General specification (eq. IEC793-1-1 : 1995)
GB/T 15972. 2	General specification of optical fibers, Part 2: Test methods of size parameter (eq. IEC793-1-2 : 1998)
GB/T 15972.3	General specification of optical fibers, Part 3: Test methods of mechanical properties (eq. IEC793-1-3 : 1995)
GB/T 15972.4	General specification of optical fibers, Part 4: Test methods of transmission and optical characteristics (eq. IEC 793-1-4 : 1995)
GB/T 15972.5	General specification of optical fibers, Part 5: Test methods of environment characteristics (eq. IEC793-1-5 : 1995)

RELEVANT STANDARDS ABOUT OPTICAL CABLES :

IEC 60794-4	Optical fiber cables -Part 4: Sectional Specification--Aerial optical cables along electrical power lines
IEC 60794-4-1	Optical fiber cables - Part 4-1: Aerial optical cables for high- voltage power lines
IEEE Std P1222	IEEE standard for all-dielectric self-supporting fiber optic cable
IEEE 1138	IEEE standard construction of composite fiber optic overhead ground wire (OPGW) for use on electric utility power lines
GB/T 18899	All dielectric self supporting optical fiber cables
GB/T 7424.4	Optical cables, Part 4 : Sectional specification-Optical fiber composite overhead ground wires
DL/T 788	All dielectric self supporting optical fiber cables
DL/T 832	Optical fiber composite overhead ground wires
DL/T 767	Technical specification and test methods for ADSS preforming fittings
DL/T 766	Technical specification and test methods for OPGW preforming fittings

Silverstone Electric

Aerial Optical Cables along Electrical Power Lines (Cont...)

RELEVANT STANDARDS ABOUT RAW MATERIALS :

IEC 60888	Zinc-coated steel wires for stranded conductors
IEC 61232	Aluminum-clad steel wires for electrical purposes
IEC 60104	Aluminum-magnesium-silicon alloy wire for over-head line conductors
IEC 60889	Hard-drawn aluminum wire for overhead line conductors
IEC 61394	Overhead lines - characteristics of greases for aluminum, aluminum alloy and steel bare conductors
DIN 48200 T8	Specification for materials of aluminum clad steel wires
DIN 48200 T6	Specification for materials of aluminum alloy wires.
ASTM B416	Standard specification for concentric-lay-stranded aluminum-clad steel conductors
GB/T 17937	Aluminum-clad steel wires for electrical purposes (idt. IEC 61232, 1993)
GB/T 17048	Hard-drawn aluminum wire for overhead line conductors (eqv. IEC 60889, 1993)
GB/T 4239	Stainless steel and heat resist cold-rolled steel strip
JB/T 8134	Aluminum-magnesium-silicon alloy wire for over-head line conductors (idt IEC 60104)
YD/T 839.3	Filling and flooding compound for communication cables and optical cables.

GENERAL DESIGN REQUIREMENTS :

NO.	DESIGN PERFORMANCES	OPGW	OPPC	ADSS
1	Fiber count and type	•	•	•
2	Detail description of optical cables designing	•	•	•
3	Overall diameter (mm)	•	•	•
4	Calculating cross section area for RTS (mm^2)	•	•	•
5	Calculated mass (kg/km)	•	•	•
6	RTS - (kn)	•	•	•
7	MAT - Max allowable texsile strength (kn)	•	•	•
8	Average tension in a year (N/mm^2) [or average stress in a year N/mm^2]	•	•	•
9	Yang's modulus (Elatic modulus) (N/mm^2)	•	•	•
10	Linear expansion coefficient (1/°C)	•	•	•
11	DC resistance (Ω/km)	•	•	-
12	Short current capacity I^2T/ ($kA^2 \cdot s$)	•(1)	-	-
13	Safe continual current-carrying capacity (A)	-	•	-
14	Storage and operating temperature range (°C)	•	•	•
15	Strain margin (%)	•	•	•
16	Outer layer stranding direction	•	•	-
17	Tracking resistant sheath (if applicable)	-	-	•

(1) Operation temperature range of optical cable under short-circuit current will be dicided by supplier.

OPGW/OPPC Structure Design

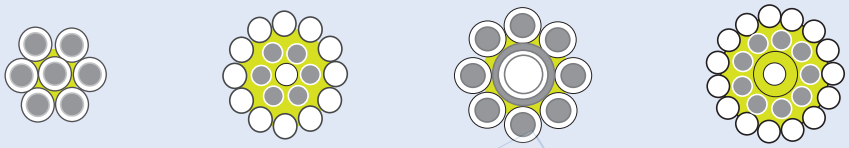
DESCRIPTION :

According to position of optical fiber unit, it could be classified into central tube type and eccentric tube type.

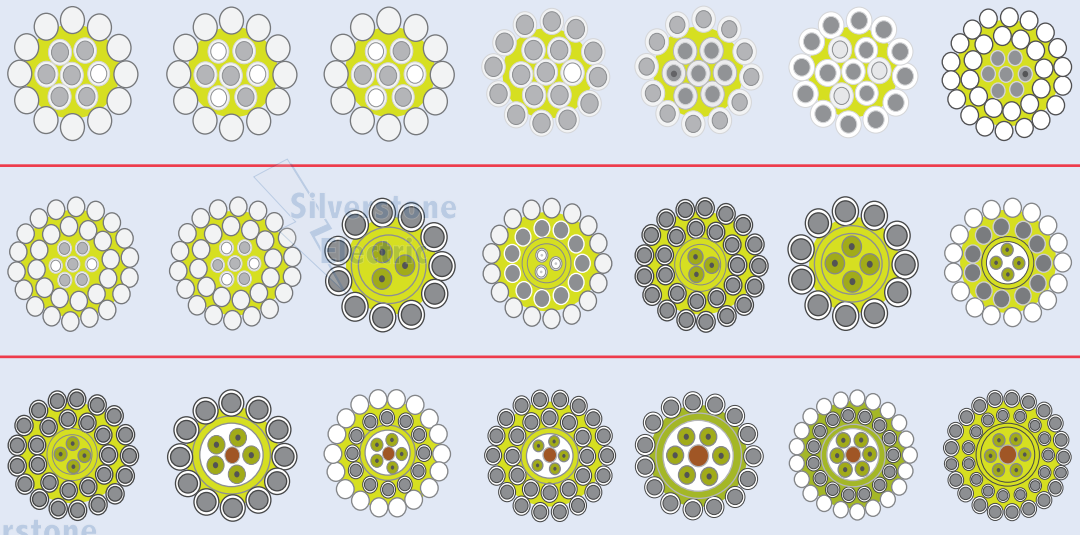
- Optical unit is classified into stainless steel tube with optical fibers, and aluminum clad stainless steel tube.
- According to customer's requirements or requirements of optical transmission system, determine fiber type and count in the optical tube
- According to customer's detail requirements to optical fiber type and count, determine quantity of optical unit, it could be 1, 2 or 3 (maximum at present).
- According to customer's detail requirements to cable mechanical, electrical performance and span, tensile strength, sag and weather condition, the stranded layer could be one layer or multi layers, stranded wires could be ACS (aluminum clad steel) wires or composition of ACS wires with aluminum or aluminum alloy wires.
- In order to ensure the operation life, the interstice of stranded wires should be covered with anti-erosion grease (IEC 60394).

Silverstone Electric

STRUCTURE DRAWING OF CENTRAL OPTICAL FIBER UNIT TYPE :



STRUCTURE DRAWING OF ECCENTRIC (STRANDED) OPTICAL FIBER UNIT TYPE :



SUS Tube Optical Unit | Aluminum Clad SUS tube Optical Unit | ACS Wires | Aluminum Alloy Wires | Anti-erosion Grease

NOTE: SUS tube refers to stainless steel tube

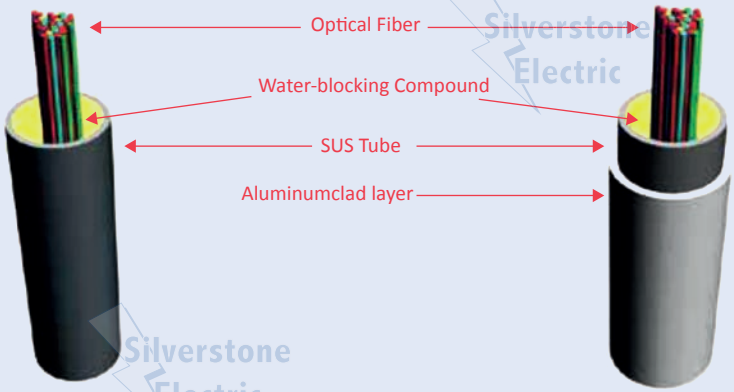
OPGW/OPPC Structure Design (Cont...)

OPTICAL FIBER UNIT :

Types of optical fiber unit of OPGW/OPPC could be classified into two types, they are SUS tube type and aluminum clad SUS tube type. The SUS tube is manufactured by laser welding-drawing technique, and optical fibers and water-blocking compound are introduced into tube at the same time of welding-drawing in process, forming optical unit.

- The CO2 gas laser of line is driven by RF, and the output beam has single mode pattern with good energy concentration, makes the best weld seam quality.
- The welding-drawing process plays a roll of defects screen, passing through an on-line eddy-current detection, defects such as dummy welding, leaky welding etc could be completely gotten rid of.
- Adopt our unique technique, excess length of optical fibers in tube could be controlled precisely, uniformity of excess length is better than ±0.2‰.
- With unique excellent water block performance. For 1m of optical unit, under 3m of water height, after 1 hr., no water will be penetrated at another end of optical unit.
- Maximum fiber count of a tube is depended on size of SUS tube and structure of OPGW, it could be optimized by careful design
- According to customer's requirement, proper thickness of aluminum could be covered to SUS tube optical fiber unit, forming aluminum clad stainless steel tube optical unit.

STRUCTURE DRAWING OF OPTICAL FIBER UNIT :



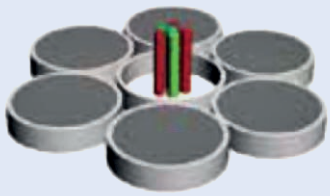
OPTICAL FIBER UNIT SPECIFICATION :

SIZE OF SUS TUBE (mm)	CENTRAL OPTICAL FIBER UNIT TYPE		STRANDED OPTICAL FIBER UNIT TYPE	
	MAX. FIBER COUNT	MAX. EXCESS LENGTH	MAX. FIBER COUNT	MAX. EXCESS LENGTH
2.5	12	5.0%	24	2.6%
2.7	20	5.0%	30	2.7%
3.0	30	5.0%	36	3.3%
3.2	36	5.0%	48	3.0%
3.3	40	5.0%	48	3.9%
3.4	40	6.0%	48	4.0%
3.6	48	6.0%	48	4.7%
3.8	48	6.5%	48	5.2%

Typical Structure and Parameter of OPGW

Some structures and characteristics of typical representative OPGW are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or directly contact the Company.

CENTRAL OPTICAL FIBER SUS TUBE STRUCTURE (PARTS) :

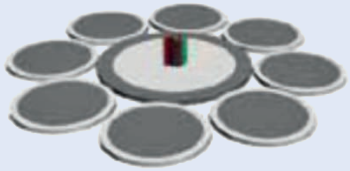
STRUCTURE DRAWING	STRUCTURE: CENTRAL OPTICAL FIBER SUS TUBE STRUCTURE WITH SINGLE STRANDED LAYER		
	Optical Cables Type Model	OPGW-1C1/36 (M48/R60-13)	OPGW-1C1/48 (M68/R85-25)
	Max. fiber count	36	48
	Tube size	ϕ 3.2 mm	ϕ 3.8 mm
	Cable diameter	ϕ 9.6 mm	ϕ 11.4 mm
	Cross-section carry area	48.25 mm^2	68.05 mm^2
	Cable weight	342 kg/km	475 kg/km
	Rated Tensile Strength (RTS)	60 kN	85 kN
	DC resistance at 20°C	1.782 Ω/km	1.264 Ω/km
	Short current capacity (40~200°C)	12 $kA^2 \cdot s$	25 $kA^2 \cdot s$
	Linear expansion coefficient	13.0X10^{-6}/°C	13.0X10^{-6}/°C
	Young's modulus	162.0 kN/mm^2	162.0 kN/mm^2

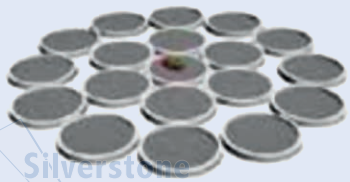
STRUCTURE DRAWING	STRUCTURE: CENTRAL OPTICAL FIBER SUS TUBE STRUCTURE WITH DOUBLE STRANDED LAYERS		
	Optical Cables Type Model	OPGW-2C1/30 (M127/R160-80)	OPGW-2C1/40 (M163/R205-132)
	Max. fiber count	30	40
	Tube size	ϕ 3.00 mm	ϕ 3.40 mm
	Cable diameter	ϕ 15.00 mm	ϕ 17.00 mm
	Cross-section carry area	127.23 mm^2	163.43 mm^2
	Cable weight	874 kg/km	1116 kg/km
	Rated Tensile Strength (RTS)	159 kN	205 kN
	DC resistance at 20°C	0.678 Ω/km	0.528 Ω/km
	Short current capacity (40~200°C)	80 $kA^2 \cdot s$	132 $kA^2 \cdot s$
	Linear expansion coefficient	13.0X10^{-6}/°C	13.0X10^{-6}/°C
	Young's modulus	162.0 kN/mm^2	162.0 kN/mm^2

Typical Structure and Parameter of OPGW(L)

Some structures and characteristics of typical representative OPGW are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or directly contact the company.

CENTRAL OPTICAL FIBER ALUMINUM CLAD SUS TUBE STRUCTURE (PARTS) :

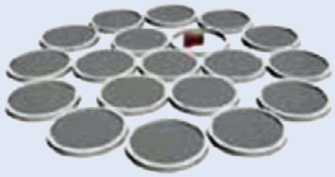
STRUCTURE DRAWING	STRUCTURE: CENTRAL OPTICAL FIBER ALUMINUM CLAD SUS TUBE STRUCTURE WITH SINGLE STRANDED LAYER		
	Optical Cables Type Model	OPGW(AL-Tube)-1 S36(M75/R68-33)	OPGW(AL-Tube)-1 S36(M88/R83-43)
	Max. fiber count	36	48
	Tube size	ϕ 6.20 mm	ϕ 6.20 mm
	Cable diameter	ϕ 11.40 mm	ϕ 12.30 mm
	Cross-section carry area	75.24 mm^2	87.90 mm^2
	Cable weight	430 kg/km	513 kg/km
	Rated Tensile Strength (RTS)	67 kN	83 kN
	DC resistance at 20°C	0.714 Ω/km	0.646 Ω/km
	Short current capacity (40~200°C)	32 $kA^2 \cdot s$	43 $kA^2 \cdot s$
	Linear expansion coefficient	14.3X10^{-6}/°C	14.0X10^{-6}/°C
	Young's modulus	130.8 kN/mm^2	135.3 kN/mm^2

STRUCTURE DRAWING	STRUCTURE: CENTRAL OPTICAL FIBER ALUMINUM CLAD SUS TUBE STRUCTURE WITH DOUBLE STRANDED LAYERS		
	Optical Cables Type Model	OPGW(AL-Tube)-2S 36(M160/R170-130)	OPGW(AL-Tube)-2S 36(M171/R183-147)
	Max. fiber count	36	36
	Tube size	ϕ 6.20 mm	ϕ 6.20 mm
	Cable diameter	ϕ 16.60 mm	ϕ 17.00 mm
	Cross-section carry area	160.19 mm^2	171.01 mm^2
	Cable weight	990 kg/km	1061 kg/km
	Rated Tensile Strength (RTS)	170 kN	183 kN
	DC resistance at 20°C	0.420 Ω/km	0.399 Ω/km
	Short current capacity (40~200°C)	129 $kA^2 \cdot s$	146 $kA^2 \cdot s$
	Linear expansion coefficient	13.5X10^{-6}/°C	13.5X10^{-6}/°C
	Young's modulus	147.3 kN/mm^2	148.3 kN/mm^2

Typical Structure and Parameter of OPGW

Some structures and characteristics of typical representative OPGW are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or directly contact the Company.

STRANDED OPTICAL FIBER SUS TUBE STRUCTURE (PARTS) :

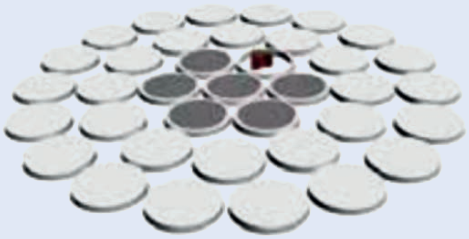
STRUCTURE DRAWING	STRUCTURE: STRANDED OPTICAL FIBER SUS TUBE STRUCTURE WITH DOUBLE STRANDED LAYERS		
	Optical Cables Type Model	OPGW-2S1/24 (M89/R111-39)	OPGW-2S1/48 (M150/R189-111)
	Max. fiber count	24	48
	Tube size	ϕ 2.50 mm	ϕ 3.40 mm
	Cable diameter	ϕ 12.60 mm	ϕ 16.40 mm
	Cross-section carry area	88.76 mm^2	150.11 mm^2
	Cable weight	615 kg/km	1026 kg/km
	Rated Tensile Strength (RTS)	111 kN	188 kN
	DC resistance at 20°C	0.972 Ω/km	0.575 Ω/km
	Short current capacity (40~200°C)	39 $kA^2 \cdot s$	111 $kA^2 \cdot s$
	Linear expansion coefficient	13.0X10^{-6}/°C	13.0X10^{-6}/°C
	Young's modulus	162.0 kN/mm^2	162.0 kN/mm^2

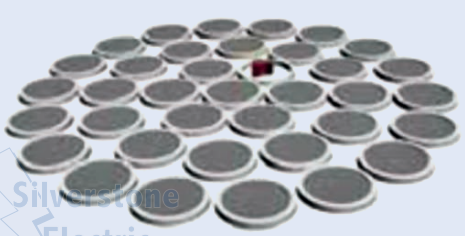
STRUCTURE DRAWING	STRUCTURE: STRANDED OPTICAL FIBER SUS TUBE STRUCTURE WITH DOUBLE STRANDED LAYERS		
	Optical Cables Type Model	OPGW-2S1/24 (M107/R133-57)	OPGW-2S1/48 (M150/R92-190)
	Max. fiber count	24	48
	Tube size	ϕ 2.50 mm	ϕ 3.20 mm
	Cable diameter	ϕ 12.60 mm	ϕ 16.40 mm
	Cross-section carry area	88.76 mm^2	150.11 mm^2
	Cable weight	381 kg/km	631 kg/km
	Rated Tensile Strength (RTS)	54 kN	92 kN
	DC resistance at 20°C	0.471 Ω/km	0.279 Ω/km
	Short current capacity (40~200°C)	66 $kA^2 \cdot s$	190 $kA^2 \cdot s$
	Linear expansion coefficient	17.4X10^{-6}/°C	17.4X10^{-6}/°C
	Young's modulus	97.6 kN/mm^2	97.7 kN/mm^2

Typical Structure and Parameter of OPGW (Cont...)

Some structures and characteristics of typical representative OPGW are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or directly contact the company.

STRANDED OPTICAL FIBER SUS TUBE STRUCTURE (PARTS) :

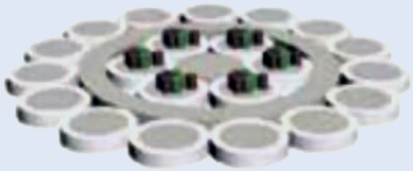
STRUCTURE DRAWING	STRUCTURE: STRANDED OPTICAL FIBER SUS TUBE STRUCTURE WITH THREE STRANDED LAYERS	
	Optical Cables Type Model	OPGW-3S1/36 (M281/R128-714)
	Max. fiber count	36
	Tube size	ϕ 3.00 mm
	Cable diameter	ϕ 22.10 mm
	Cross-section carry area	280.80 mm^2
	Cable weight	980 kg/km
	Rated Tensile Strength (RTS)	128 kN
	DC resistance at 20°C	0.132 Ω/km
	Short current capacity (40~200°C)	714 kA^2 • s
	Linear expansion coefficient	19.7X10^{-6}/°C
	Young's modulus	81.2 kN/mm^2

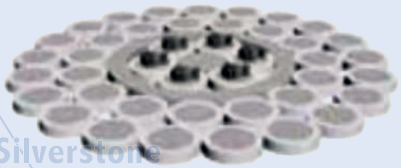
STRUCTURE DRAWING	STRUCTURE: STRANDED OPTICAL FIBER SUS TUBE STRUCTURE WITH THREE STRANDED LAYERS	
	Optical Cables Type Model	OPGW-3S1/24 (M214/R269-227)
	Max. fiber count	24
	Tube size	ϕ 2.70 mm
	Cable diameter	ϕ 19.35 mm
	Cross-section carry area	214.26 mm^2
	Cable weight	1462 kg/km
	Rated Tensile Strength (RTS)	269 kN
	DC resistance at 20°C	0.404 Ω/km
	Short current capacity (40~200°C)	227 kA^2 • s
	Linear expansion coefficient	13.0X10^{-6}/°C
	Young's modulus	162.0 kN/mm^2

Typical Structure and Parameter of OPGW

Some structures and characteristics of typical representative OPGW are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or directly contact the Company.

STRANDED LOOSE TUBE ALUMINUM OPTICAL UNIT STRUCTURE (PART):

STRUCTURE DRAWING	STRUCTURE: DOUBLE LAYER STRANDED LOOSE TUBE ALUMINUM OPTICAL UNIT STRUCTURE		
	Optical Cables Type Model	OPGW(L-AL-Tube)-2S 48(M107/R95-85)	OPGW(AL-Tube)-2S 48(M125/R117-111)
	Max. fiber count	48	48
	Tube size	ϕ 10.0 mm	ϕ 10.0 mm
	Cable diameter	ϕ 15.10 mm	ϕ 16.1 mm
	Cross-section carry area	107.18 mm^2	125.44 mm^2
	Cable weight	605 kg/km	726 kg/km
	Rated Tensile Strength (RTS)	94.5 kN	116.5 kN
	DC resistance at 20°C	0.489 Ω/km	0.443 Ω/km
	Short current capacity (40~200°C)	84 $kA^2 \cdot s$	111 $kA^2 \cdot s$
	Linear expansion coefficient	14.4X10^{-6}/°C	14.1X10^{-6}/°C
	Young's modulus	128.8 kN/mm^2	133.6 kN/mm^2

STRUCTURE DRAWING	STRUCTURE: DOUBLE LAYER STRANDED LOOSE TUBE ALUMINUM OPTICAL UNIT STRUCTURE		
	Optical Cables Type Model	OPGW(L-AL-Tube)-2S 48(M210/R219-277)	OPGW(L-AL-Tube)-2S 48(M260/R278-407)
	Max. fiber count	48	48
	Tube size	ϕ 10.0 mm	ϕ 10.0 mm
	Cable diameter	ϕ 20.10 mm	ϕ 22.1 mm
	Cross-section carry area	210.27 mm^2	259.75 mm^2
	Cable weight	1285 kg/km	1611 kg/km
	Rated Tensile Strength (RTS)	218.8 kN	278.5 kn
	DC resistance at 20°C	0.309 Ω/km	0.263 Ω/km
	Short current capacity (40~200°C)	277 $kA^2 \cdot s$	406 $kA^2 \cdot s$
	Linear expansion coefficient	13.6X10^{-6}/°C	13.5X10^{-6}/°C
	Young's modulus	145.0 kN/mm^2	148.3 kN/mm^2

Typical Structure and Parameter of OPPC

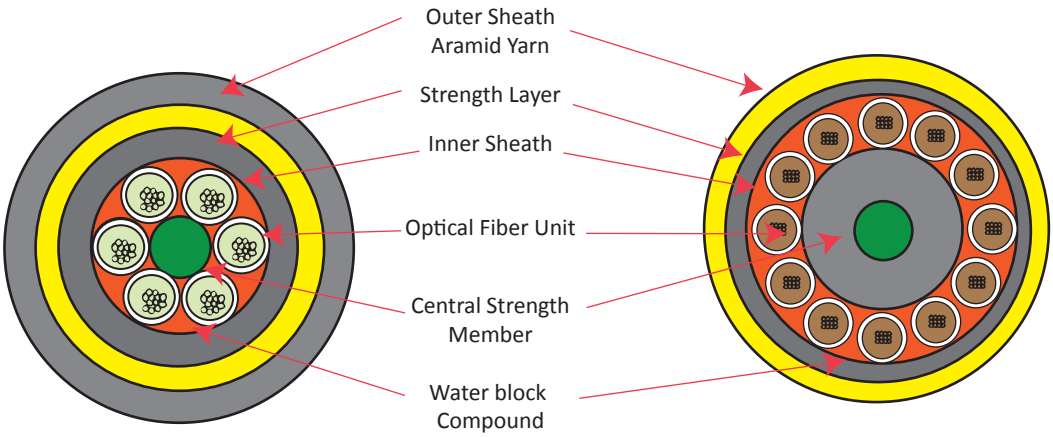
Some structures and characteristics of typical representative OPGW are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or directly contact the company.

STRANDED OPTICAL FIBER SUS TUBE STRUCTURE (PARTS) :

STRUCTURE DRAWING	STRUCTURE: STRANDED OPTICAL FIBER SUS TUBE STRUCTURE WITH DOUBLE STRANDED LAYERS		
	Optical Cables Type Model	OPPC-2S 1/24(M88/R47-257)	OPPC-2S 1/48(M155/R82-362)
	Max. fiber count	24	48
	Tube size	ϕ 2.50 mm	ϕ 3.20 mm
	Cable diameter	ϕ 12.60 mm	ϕ 16.70 mm
	Cross-section carry area	29.85	52.39
	Section area of electrical Aluminum	58.90	102.64
	Total cross section area	88.76 mm^2	155.02 mm^2
	Cable weight	381 kg/km	652 kg/km
	Rated Tensile Strength (RTS)	47 kN	82 kN
	DC resistance at 20°C	0.418 Ω/km	0.240 Ω/km
	Safe current-carrying capacity	257 A	362 A
	Linear expansion coefficient	17.1X10^{-6}/°C	17.0X10^{-6}/°C
	Young's modulus	91.7 kN/mm^2	91.8 kN/mm^2
	Corresponding wires model	LGJ-50/30	LGJ-95/55

STRUCTURE DRAWING	STRUCTURE: STRANDED OPTICAL FIBER SUS TUBE STRUCTURE WITH THREE STRANDED LAYERS		
	Optical Cables Type Model	OPPC-3S 1/30(M238/R83-502)	OPPC-3S 1/30(M287/R87-363)
	Max. fiber count	30	30
	Tube size	ϕ 2.80 mm	ϕ 2.70 mm
	Cable diameter	ϕ 20.40 mm	ϕ 22.45 mm
	Cross-section carry area	40.09	37.17
	Section area of electrical Aluminum	198.16	250.15
	Total cross section area	238.25 mm^2	287.32 mm^2
	Cable weight	835 kg/km	960 kg/km
	Rated Tensile Strength (RTS)	83 kN	87 kN
	DC resistance at 20°C	0.137 Ω/km	0.110 Ω/km
	Safe current-carrying capacity	502 A	572 A
	Linear expansion coefficient	19.3X10^{-6}/°C	20.0X10^{-6}/°C
	Young's modulus	73.8 kN/mm^2	69.7 kN/mm^2
	Corresponding wires model	LGJ-185/35	LGJ-240/40

ADSS Cable Structure Design



2~72 Fiber Design **72~144 Fiber Design**

DESCRIPTION :

Our ADSS design is a kind of typical stranded loose tube design, which including two typical structures with maximum (but not limited to) fiber count of 72 and 144. We could make special design according to customer's requirement.

- Central strength member, normally adopt FRP (YD/T 1181.1), also plays the role of anti bend break member. For maximum 144 fiber design, proper materials could be covered on outside of the FRP.
- Adopting loose tube design as fiber unit, normally, PBT (GB/T118.12001) is used as tube materials. Optical fibers with proper excess length and filling compound with excellent water-block performance are put or filled into the tubes.
- Black PE (GB/T 15065) is placed outside of stranded optical units, forms cable core, water-block compound (YD/T 839.9) is placed in the interstice of the cable core.
- Maximum operation tensile strength could be calculated according to customer's requirement to cable strength or according to weather condition and span-sag requirement, thus the quantity of aramid yarn should be used could be determined. The yarn is applied with balanced- torque, could also play the role of bullet-proof.
- According to international and national standards, the outer sheath of ADSS could be classified into class-A and class-B, which is suited for spatial potential environments of below and above 12kV respectively.

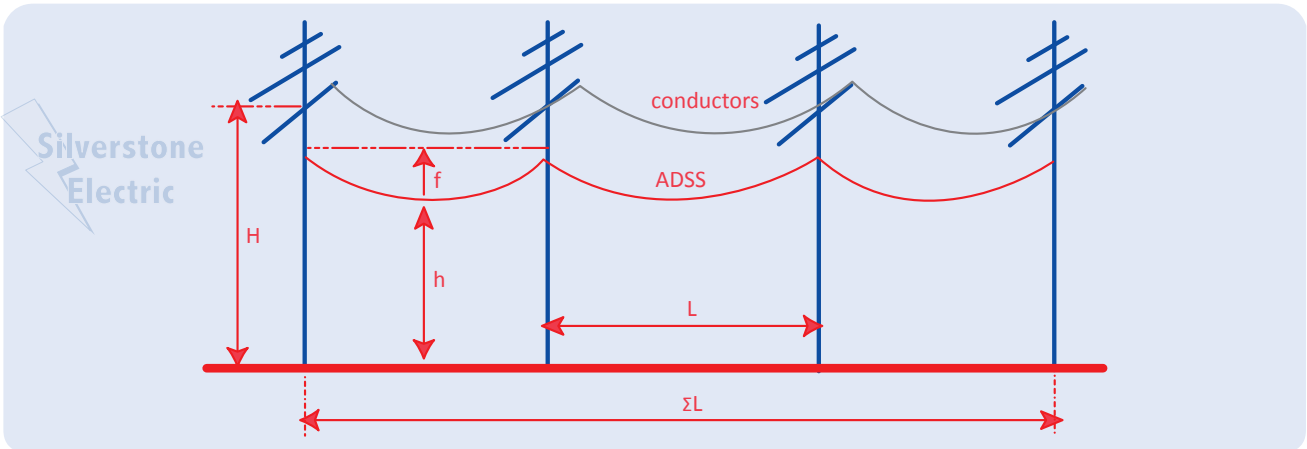
ADSS CABLE APPLICATION DESIGN :

DESCRIPTION :

In most instances, ADSS cables are installed at existing power lines. The only way for ADSS installation is to suit existing poles/tower condition to find limited available space for installation.

Besides optical transmission performance design, two aspects of ADSS application design are:

- Span-tension-sag design of ADSS
- Installation position consideration of ADSS



ADSS Cable Application Design

H ：The name height of pole or tower, namely the distance between lowest horizontal structure to the foundation of the pole or tower;

h ：Required minimum distance of ADSS cable to ground;

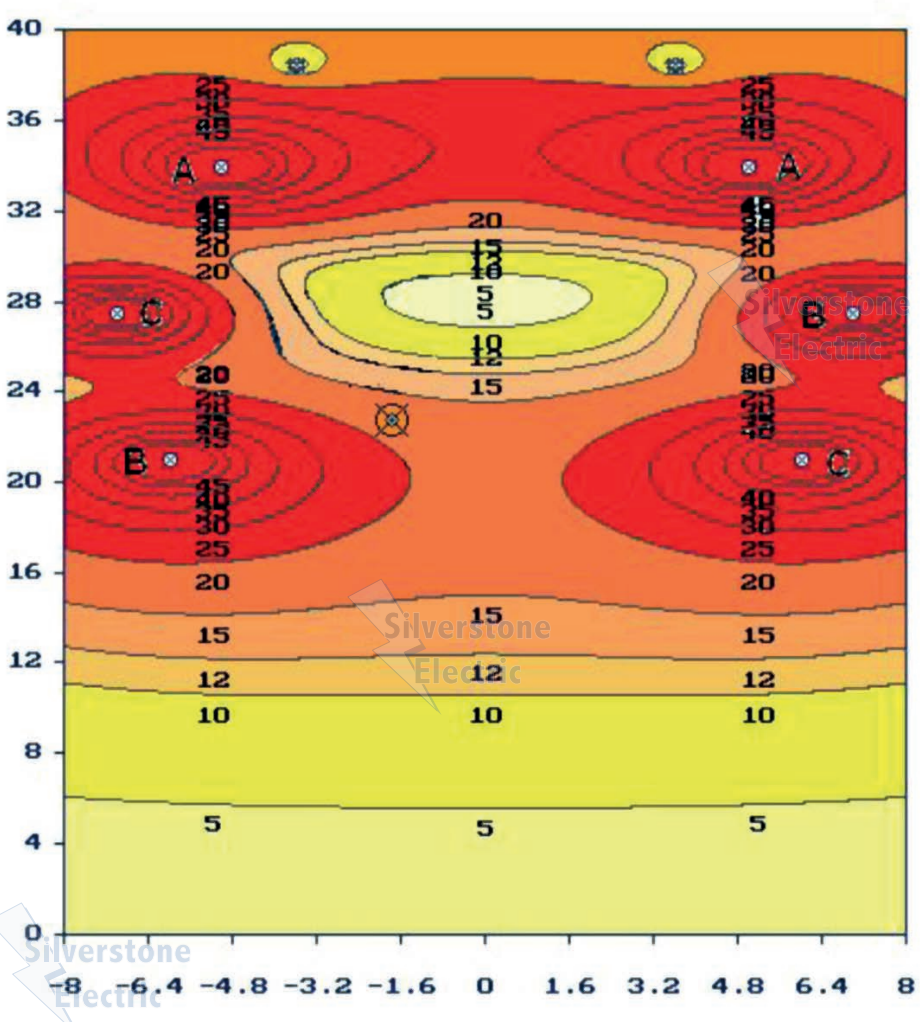
f ：Maximum vertical sag of ADSS cable;

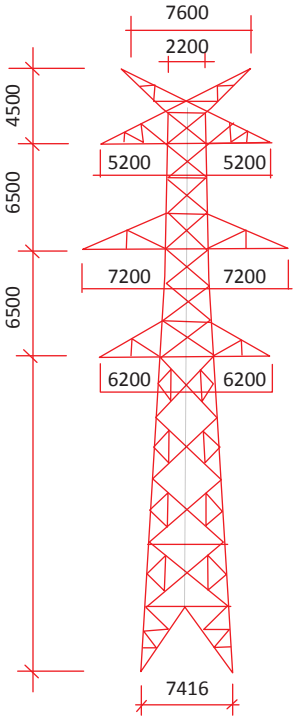
L ：Span;

ΣL：Total length between two tension fittings

ADSS CABLE APPLICATION DESIGN :

ADSS INSTALLATION POSITION DESIGN :





Silverstone Electric

ADSS Cable Application Design (Cont...)

DESCRIPTION :

To one individual pole or tower, the detail installation position design of ADSS cable is of great importance. An installation position not rightly suitable will influence cable operation life at least, or even leads a quick electric erode to cable.

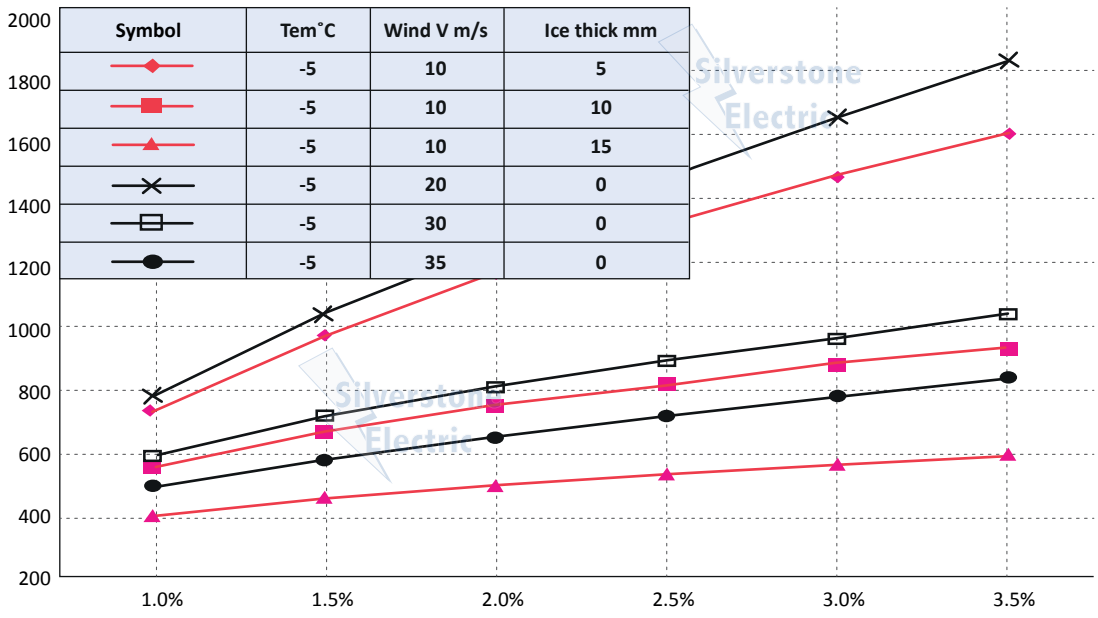
We could provide spatial potentials distribution around the poles and towers, if it is required by customers. In such case, following information should be available at least:

- Voltage of the system and its possible maximum value;
- Main structure size drawing of the pole or tower;
- Diameter or type model of conductors and overhead ground wires;
- Phase arrangement of conductors on the pole or tower;
- The spacing size of split conductors (if it is the case);
- The length of Insulator string

Silverstone Electric

ADSS CABLE APPLICATION DESIGN :

SPAN-TENSION-SAG DESIGN FOR ADSS CABLES :



ADSS cables have so-called “variable span” characteristics.

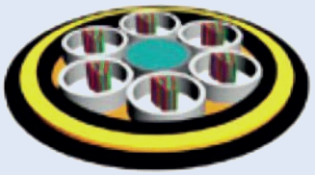
- In case of fixed operational tension at two cable ends is required, allowable span for ADSS cables will increase along with increasing of allowable sag;
- Under different weather conditions, the allowable span of same ADSS cable will reduce along with increasing of weather load to the cable.

On request, we could provide span-tension-sag characteristics of ADSS cable for customers.

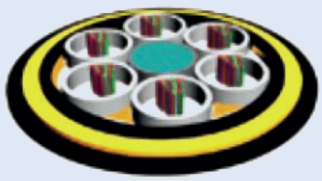
Typical Structure and Parameter of ADSS

Some structures and characteristics of typical representative ADSS are shown in the below list, however, they do not represent the whole products of the company. If you have any requests, please contact local representative office or contact the company directly.

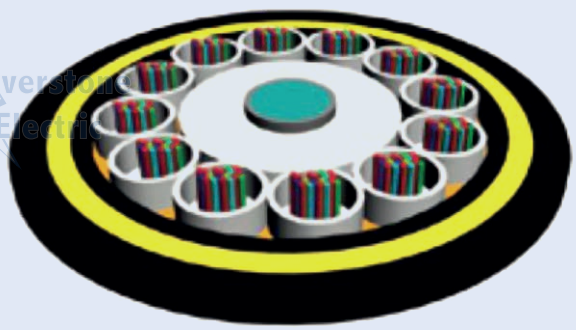
ADSS WITH GRADE A SHEATH (PARTS) :

STRUCTURE DRAWING	ORDER TYPE MODEL	ADSS-PE 24 M15.5 / A	ADSS-PE48 M17.7 / C	ADSS-PE72 M21.2 / D
	Fiber count	24	48	72
	Size of tube	ϕ 2.1 mm	ϕ 2.6 mm	ϕ 3.0 mm
	Cable diameter	ϕ 13.4 mm	ϕ 14.9 mm	ϕ 16.4 mm
	Cable weight	139 kg/km	172 kg/km	209 kg/km
	RTS	38.8 kN	44.3 kN	56.6 kN
	Linear expansion coefficient	$2.2X10^{-6}$/°C	$2.0X10^{-6}$/°C	$1.8X10^{-6}$/°C
	Young's modules	16.5 kN/mm²	17.5 kN/mm²	18.6 kN/mm²

ADSS WITH GRADE B SHEATH (PARTS) :

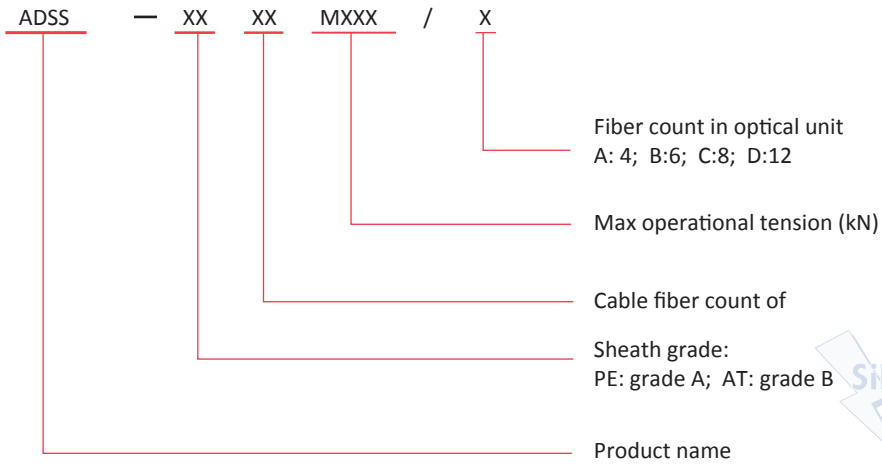
STRUCTURE DRAWING	ORDER TYPE MODEL	ADSS-AT 24 M14 / A	ADSS-AT48 M15.2 / C	ADSS-AT72 M21.2 / D
	Fiber count	24	48	72
	Size of tube	ϕ 2.1 mm	ϕ 2.6 mm	ϕ 3.0 mm
	Cable diameter	ϕ 13.2 mm	ϕ 14.3 mm	ϕ 16.3 mm
	Cable weight	146 kg/km	169 kg/km	220 kg/km
	RTS	35 kN	37.9 kN	52.9 kN
	Linear expansion coefficient	$4.5X10^{-6}$/°C	$4.8X10^{-6}$/°C	$3.6X10^{-6}$/°C
	Young's modules	15.5 kN/mm²	14.9 kN/mm²	17.9 kN/mm²

ADSS WITH GRADE B SHEATH (PARTS) :

STRUCTURE DRAWING	ORDER TYPE MODEL	ADSS-AT144 M12.3 / D
	Fiber count	144
	Size of tube	ϕ 3.0 mm
	Cable diameter	ϕ 20.7 mm
	Cable weight	344 kg/km
	RTS	30.8 kN
	Linear expansion coefficient	$3.5X10^{-6}$/°C
	Youmng's modules	6.22 kN/mm²

Ordering Information

TYPE MODEL EXPLAINING :



We could provide user structure design and type selection, if information is provided as below:

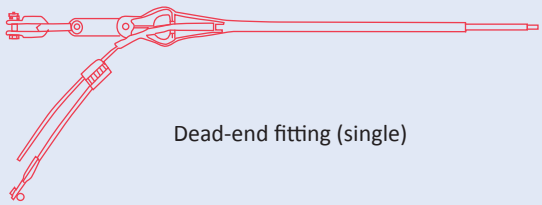
WEATHER CONDITION						
	TEMPERATURE (˚C)		WIND SPEED (M/S)		ICE THICK (MM)	
Lowest temperature						
Average temperature of year						
Max. wind speed						
Ice thickness						
Highest temperature						
Installation						
ELECTRIC LINE CONDITION						
System voltage*	kV		Type model/diameter* of ground wire			mm
Length of insulator string*	mm		Type model/diameter* of conductor			mm
Name height of pole/tower	m		Split conductor/split spacer (y/no)			mm
Representative span*	m		Initial sag of wires*			%
Max. span*	m		Max. sag of wire*			%
MAIN INSTALLATION OPERATION REQUIREMENT TO ADSS CABLE						
Installation sag*	%	Max. sag	%	Min distance avove ground*		m
MAIN TRANSMISSION REQUIREMENT TO ADSS CABLE						
Fiber count*		Fiber type*				
Attenuation*	dB/km (@1310nm);		dB/km (@1550nm);			
Chromatic dispersion	ps/nm.km (@1310nm);		ps/nm.km (@1550nm);			

NOTE 1 : In some case, detail information of poles and towers and cross section drawing of line is needed.

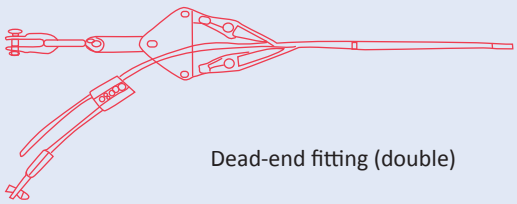
NOTE 2 : "*" represents information must be provided.

Hardware and Fittings for OPGW

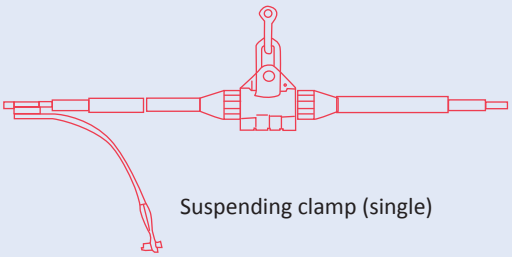
The drawings below are shown with no detail size. If you have any requests, please contact local representative office or contact the company directly.



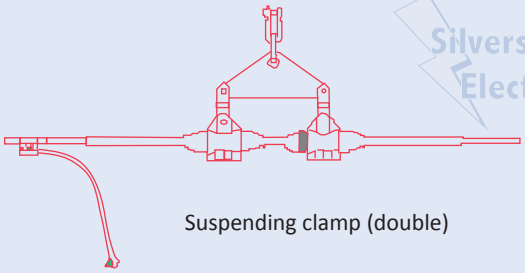
Dead-end fitting (single)



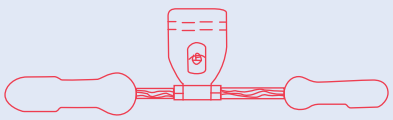
Dead-end fitting (double)



Suspending clamp (single)



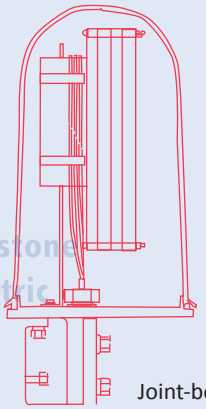
Suspending clamp (double)



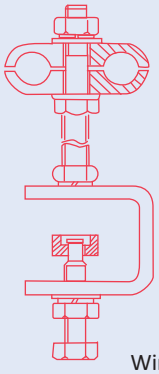
Protection wires

Vibration damper

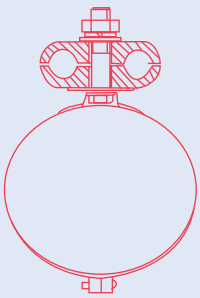
Earth wires



Joint-box



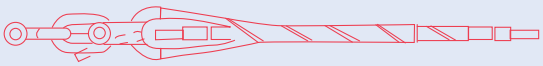
Wire clamp for tower



Wire clamp for pole

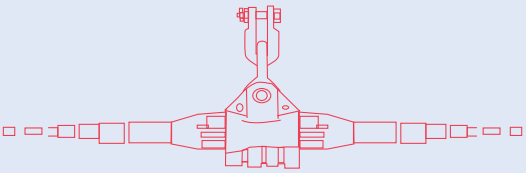
Hardware and Fittings for ADSS

The drawings below are shown with no detail size. If you have any requests, please contact local representative office or contact the company directly.

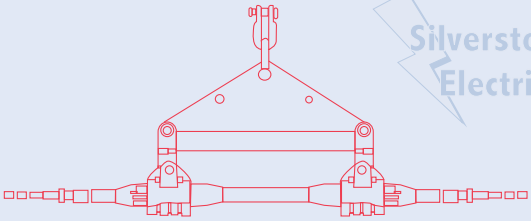


Dead end clamp with double stranded

Dead end clamp with single stranded

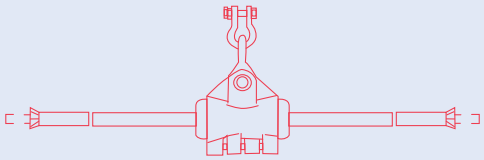


Suspending clamp (single)



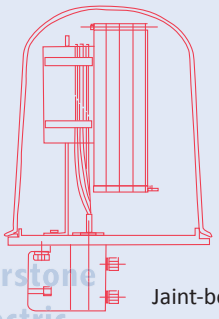
Suspending clamp (double)

Spiral vibration reducer

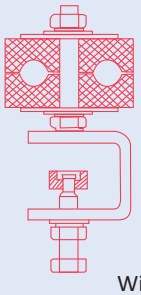


Tangent clamp

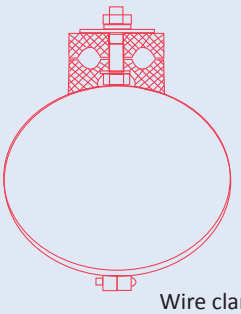
Corona-resist ring



Jaint-box



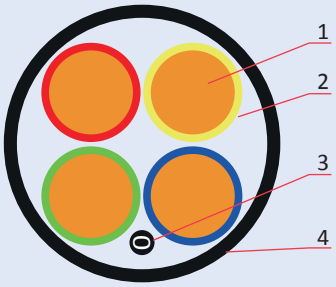
Wire clamp for tower



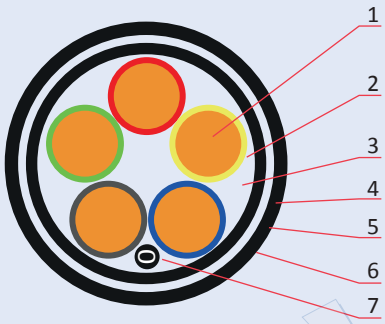
Wire clamp for pole

Optical Composite Low-voltage Cable

CROSS SECTION DRAWING:



OPLC without armor



Armored OPLC

Silverstone Electric

Figure 1 1 - Conductor 2 - Insulator 3 - Optical unit 4 - Sheath

Figure 2 1 - Conductor 2 - Insulator 3 - Filling material 4 - Inner bedding 5 - Steel armored layer 6 - Sheath 7 - Optical unit

FEATURES OF OPLC (OPTICAL FIBER COMPOSITE LOW VOLTAGE CABLE) :

① Integration of optical fiber and power cable, avoid twice cabling, decrease construction cost for network;

② Providing multi-kinds transmission means, high-flexibility, high-expandability, and wide applicability.

③ Broadband accessible.

④ Excellent shock resistance and crush resistance performance.

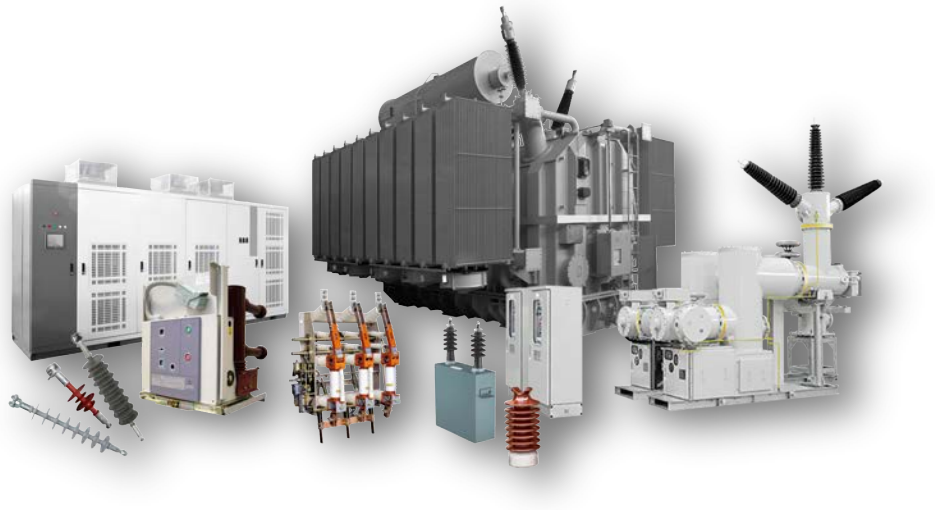
⑤ Without electric-magnetic interference between optical unit and power cable, has long term compatibility under operating temperature.

Used for construction of electricity and fiber to the home (FTTH) for intelligent community and intelligent building, realize synchronous transmission of power and communication.

Silverstone Electric

Silverstone Electric

Your Premium Electric Supplier



Suzhou Silverstone Electric Co., Ltd
Export Office: 2 Kecheng Road, Suzhou Industrial Park, Jiangsu, China

Factory Unit 1: Dongfeng Industrial Zone, Wenzhou, Zhejiang, China
Factory Unit 2: Lianhuashan Road, Xintai, Shandong, China
Factory Unit 3: Qinghu Crossing, Jiangshan, Zhejiang, China
Factory Unit 4: Lishui Industrial Zone, Zhejiang, China

Transformer, Protection, Control, Meter and Battery Charger Panel:
Ph: +86 180 1358 5569
Fax: +86 512 62816463
Email: info@silverstone-electric.com

CT, PT and Power Line Equipments:
Ph: +86 1333 800 8160
Email: fiona.fei@silverstone-electric.com

Ph: +86 1333 800 8096
Email: vicky.liu@silverstone-electric.com

Ph: +86 1333 800 8367
Email: summer.cao@silverstone-electric.com