Prefabricated Branch Cable





Brief introduction

With the high–speed development of economy, modern buildings is changing daily, the complication of construction distribution has became a big subject popular concerned by construction design, invest and construction unit. In order to meet the need of the market, and catch up with world's advanced technology, the birth of the Precast Branch Cable brings a new choice for the power supply line in the building, the sketch drawn of the Precast Branch Cable as below:

Main features of FZ series prefabricated branch cable

1.Excellent reliability of power supply safety

2.Simpleness in installation,low requirement to environment,and convenience in construction

3.Excellent shock resistance，air sealing，water proof and flame resistance

4.Free of maintenance

5.Distinctly reducing electric distribution cost

6.Multiple categories and specifcations，flexible option，and combination at Will.

Prefabricated Branch Cable



Variety and model of FZ series prefabricated branch cable

Optional variety and specifications of cable:

YJV: XLPE insulated and PVC sheathed power cable.

ZR–YJV: XLPE insulated and PVC sheathed flame retardant power cable.

NH–YJV: XLPE insulated and PVC sheathed slow–burning power cable.

VV: PVC insulated and sheathed power cable.

ZR–VV: PVC insulated and sheathed flame retardant power cable.

NH–VV: PVC insulated and sheathed slow–burning power cable.

GWDZ–, WDZA–, WDN–, WDZAN–: the new generation of polyolefin sheathed power cable with lowsmoke, low toxicity and halogen free.

G–oxygen series cable

Notes:

1. The cable is single core copper cable with 0.6/lkV rated voltage (U0/U) without special indication.
2. The main cables are electric ones applying black protection cover.
3. Without special indication, the branch cables all apply the same type of electric ones as the main cables.
4. If the branch cable requires model BV–500 wire with colour marks (yellow, red, green, light, blue, yellow/green). It should be specified during ordering.

Variety, type and specification

Standard of main cable and branch cable all takes XLPE or PVC as insulation(IEC, GB, JIS, BS) ,low electric power cable is material PVC packaged.Average trunk cablc is single core or more core twist type cable(two core to five core ofcable),sing[e core cable of branch cablemay according to need to adopt fire–resistant, flame resistant capabilityof cable.

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Main features of FZ series prefabricated branch cable

1. Insulation resistance≥200MΩ;
2.InsulatiOn withstand Voltage≥3.5kV/5min;
3.Excellent air tightness and water proofing quality. When immerge branch joint water, measured insulation resistance between water and cable core, and power frequency withstand voltage meet the requirement of items 1 and2.
4.Litttle contact resistance of branch joint. The ratio value of contact resistance vs reterence resistance of equal length branch line is equal to or less than 1.2;
5.Large joint short circuit strength. The variation rate of contact resistance ratio after short circuit is equal to or less than 0.2;
6. For ZR–YJV type flame–retarded prefabricated branch cable, self extinguishing time of jacket is equal to or less than 12s and meets GB/T18380.3;
7. Besides power supply in normal working condition. NH fire resistance type cable can reamin normal operation for 90min under buming condition and meets GB/T19216.21–2003;
8.Max. working temperature of copper, core of VV type cable is 70℃ and that of YJV type cable 90℃;
9.With excellent corrosive resistance, it can keep from eroding of inorganic salt, oil, base, acid, organic solution and so on;
10. YJV type prefabricated branch cable has excellent themal stability and aging resistance;
11.GWDZ–, WDZA–, WDNA–, WDZAN–clean–type precast branch cable possesses the features suchas low smoke, low–toxic, non–halogen and fire–resistance etc;
12.GZR–YJV oxygen barrier branch cable with high flame retardant and fire resistance that exceeds Antifaming Stamdard A class.

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Technical specifications

1. Parameters of 0.6/lkV single core YJV cable

Conduetor			Nominal thickness of insulation (mm)	Nominal thickness of sheath (mm)	Overall diameter of conductor (mm)	Approx. weight (kg/km)	A.C test voltage (kV)	Max DC, resistance of conductor at 20℃ (Ω/km)	Rated current (A) ○○○	Rated current (A) ○○	(V/A m) $\times 10^{-3}$
Nominalcross-sectional area of conductor (mm^2)	Shape and structure	Diameter (mm)									
10	Press tightly and made by pulling	4.0	0.7	1.4	9.0	150	3.5	1.83	85	75	2.0
16		5.0	0.7	1.4	9.5	215	3.5	1.15	113	100	1.3
25		6.0	0.9	1.4	11.5	310	3.5	0.727	150	132	0.84
35		7.0	0.9	1.4	12.0	410	3.5	0.524	181	164	0.63
50		8.2	1.0	1.4	14.0	570	3.5	0.387	265	196	0.49
70		9.8	1.1	1.4	16.0	770	3.5	0.268	290	255	0.36
95		11.6	1.1	1.5	18.0	1030	3.5	0.193	347	310	0.29
120		12.9	1.2	1.5	20.0	1280	3.5	0.153	410	360	0.24
150		14.3	1.4	1.6	22.0	1590	3.5	0.124	470	419	0.21
185		16.1	1.6	1.6	24.0	1950	3.5	0.0991	530	479	0.19
240		18.3	1.7	1.7	27.0	2490	3.5	0.0754	640	565	0.16
300		20.6	1.8	1.8	30.0	3140	3.5	0.0601	725	643	0.15
400		23.6	2.0	1.9	34.0	4140	3.5	0.0470	845	771	0.131
500		26.6	2.2	2.0	37.0	5140	3.5	0.0366	980	940	0.120
630		30.2	2.4	2.2	41.0	6440	3.5	0.0283	1150	1130	0.111
800		34.8	2.6	2.3	46.0	8450	3.5	0.0221	1380	1300	0.104
1000		39.0	2.8	2.4	51.0	10600	3.5	0.0176	1605	1490	0.098

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2. Parameters of 0.6/1kV single core VV cable

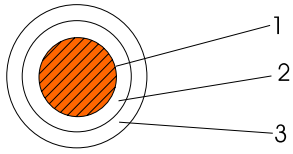
Conduetor			Nominal thickness of insulation (mm)	Nominal thickness of sheath (mm)	Overall diameter of conductor (mm)	Approx. weight (kg/km)	A.C test voltage (kV)	Max DC, resistance of conductor at 20℃ (Ω/km)	Rated current (A) ○○○	Rated current (A) ○○○	(V/A m) × 10^{-3}
Nominalcross-sectional area of conductor (mm^2)	Shape and structure	Diameter (mm)									
10	Press tightly and made by pulling	4.0	0.7	1.4	9.0	150	3.5	1.83	71	61	2.0
16		5.0	0.7	1.4	10.0	215	3.5	1.15	94	81	1.3
25		6.0	0.9	1.4	11.3	310	3.5	0.727	122	105	0.84
35		7.0	0.9	1.4	12.3	410	3.5	0.524	151	130	0.63
50		8.2	1.0	1.4	14.0	570	3.5	0.387	183	158	0.49
70		9.8	1.1	1.4	15.7	770	3.5	0.268	231	199	0.36
95		11.6	1.1	1.7	18.4	1030	3.5	0.193	284	245	0.29
120		12.9	1.2	1.7	19.8	1280	3.5	0.153	327	282	0.24
150		14.3	1.4	1.8	22.8	1590	3.5	0.124	368	317	0.21
185		16.1	1.6	1.8	25.1	1950	3.5	0.0991	437	377	0.19
240		18.3	1.7	1.8	28.5	2490	3.5	0.0754	522	450	0.16
300		20.6	1.8	2.1	32.0	3140	3.5	0.0601	606	522	0.15
400		23.6	2.0	2.2	35.4	4140	3.5	0.0470	732	631	0.131
500		26.6	2.2	2.3	40.0	5140	3.5	0.0366	854	736	0.120
630		30.2	2.4	2.4	46.0	6440	3.5	0.0283	1024	833	0.111
800		34.8	2.6	2.6	50.0	8450	3.5	0.0221	1206	1040	0.104
1000		39.0	2.8	2.6	52.0	10600	3.5	0.0176	1379	1220	0.098

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3.Clean cable takes new generation of polyolefin plastic as insulation sheathed material. It has many characteristics. Such as fire retardant, low smoke, low toxicity and halogen free. It overcomes the defects on traditional cables that contained halogen, traced the developing trend tightly. The main cable and branch cable of precast branch cable both adopts clean cable, branch also applies low smoke, low toxicity and halogen free new type plastic.

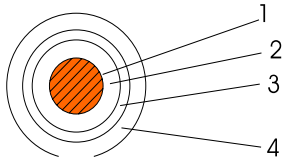
Code name:cleaning cable: GWDZ–, WDZA–, WDN–, WDZAN–.

Structure of non halogen fire resistance clean–type precast branch cable



1. conductor 2. insulation (XLPE)
3. sheath (low smoke, non–toxic, non–halogen polyolefin)

Structure of non halogen fire–resistant clean–type precast branch cable



1. conductor 2. flame retardant coating 3. insulation (XLPE)
4. sheath (low smoke, non–toxic, non–halogen polyolefin)

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Prefabricated Branch Cable

Parameters of 0.6/1kV single cleaning prefabricated branch cable(GWDZ–,WDZA–,WDN–,WDZAN–)

Wire			Nominal thickness of insulation (mm)	Nominal thickness of sheath (mm)	Approximate total outer diameter (mm)	20℃ maximum conductor resistance (Ω/Km)	Approximum weight (kg/km)	●●●● Rated current (A)	●● ●● Rated current (A)	(V/A m) ×10^{-3}
Nominal cross–sectional area of conductor (mm^2)	structure (No./mm)	Approximate outer diameter (mm)								
10	7/1.35	4.05	0.7	1.4	9.5	1.83	155	85	75	2.0
16	C.R.S	4.7	0.7	1.4	10.0	1.15	210	113	10	1.3
25	C.R.S	5.9	0.9	1.4	11.5	0.727	310	150	132	0.84
35	C.R.S	7.0	0.9	1.4	12.5	0.524	410	181	164	0.63
50	C.R.S	8.0	1.0	1.4	14.0	0.387	560	265	196	0.49
70	C.R.S	9.7	1.1	1.4	16.0	0.268	765	290	255	0.36
95	C.R.S	11.4	1.1	1.4	17.5	0.193	1010	347	310	0.29
120	C.R.S	12.8	1.2	1.5	19.5	0.153	1270	410	360	0.24
150	C.R.S	14.3	1.4	1.6	22	0.124	1580	470	419	0.21
185	C.R.S	15.8	1.6	1.6	24	0.0991	1930	530	479	0.19
240	C.R.S	18.3	1.7	1.7	26	0.0754	2490	640	565	0.16
300	C.R.S	20.5	1.8	1.8	29	0.0601	3090	725	643	0.15
400	C.R.S	23.3	2.0	1.9	32	0.0470	4070	845	771	0.131
500	C.R.S	26.4	2.2	2.0	36	0.0366	5050	980	940	0.120
630	C.R.S	30.2	2.4	2.2	40	0.0283	6350	1,150	1130	0.111

Order Notice

In order to design the precast branch cable you need, please provide the following documents:
1. System figure
Length of vertical main cable and each branch cable and layout of branch connection.
2. Distribution system
Single–phase 2–wire, single–phase 3–wire, 3–phase 3–wire, 3–phase 4–wire and 3–phase 5–wire.
3. Vertical main cable (XLPE/PVC cable)
Cable model, single core or twisted single–core, wire size, connecting through or not.
4.(XLPE/PVC) Branch cable (XLPE/PVC single core cable)
Wire size
5.Laying method
Drawing from ground or laid down from house top.
6.Upper support
Using cable clamps or sling hanging insulated equipme
7. Accessories Clamp，bracket，etc.
8. Cable bobbin
Dimension and gross weight of the bObbin permitted.
9.Other items needed to specifled you think.

Laying method

The pre–fab combined branch cable with vertical main cable should be laid according to the following essentials usually:

1.Put the cable bobbin on the paying off rack (usually, put the bobbin downstairs and draw the cable up);

2.Connect the lifting cord with the cable through the windlass;

3.Run the windlass to lift the cable;

4.Hang the cable net cover on the sling hook prepared before when it reach the house top.

5.Fix the inter part;

6.Connect the branch joint with the ammeter or breaker;

7.Connect the joint with the horizontal main cable or main cable board.

Construction notice

The following should be paid attention to during the installation of precast combined branch cable:

1.Confirm method before carrying (the vehicle size, the park, etc)；

2.Confirm that if the precast branch can get across the perforation safely;

3.Take precautions to prevent branch perforation from being broken during lifting;

4.Don' t add tension to the branch during lifting;

5.The intensity of lifting cord should be more than four times the weight of the cable;

6.Consider the countermeasure to keep away from rain and disposal of the empty bobbin before;

7.The cable should be fixed immediately in proper way after lifted, so as to prevent it from falling and breaking;

8. The iron clamp is forbidden in single core cable.

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Rated current & voltage fall

When design trunk line, except the cable carrying capacity, we should think the voltage fall. If in the middle of trunk line has a few branch, the voltage fall from power source to final load should be calculated according to each branch spacing as following:

$Ed=KZ\sum_n I_n l_n=KZ\sum_n L_n i_n$ [V]

公式中 ,Ed: 电压降[V](相连接)

K: 配电常数

单相 2线式:K=2

单相 3线式:K=1

三相 4线式:K=1

三相 5线式:K=1

$i_n I_n$: 区间n的负载电流[V]

$i_n L_n$: 区间n的长度[Km]

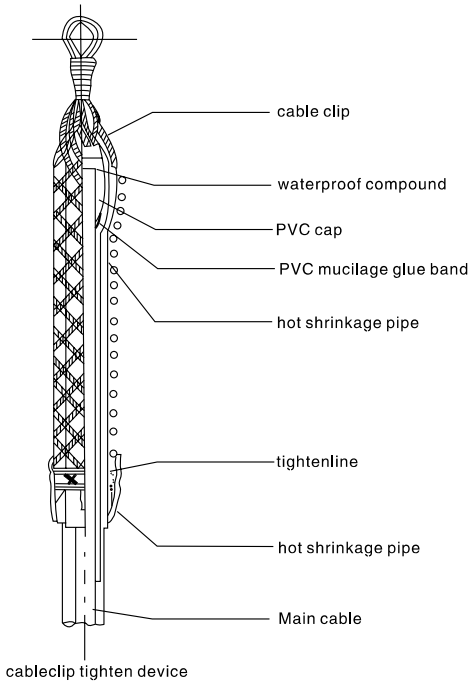
Z: 电缆的阻抗[Ω/km]=Rcos θ +Xsin θ

R: 交流阻抗[Ω/km]

X: 电抗[Ω/km]

cos θ : 负载功率因数

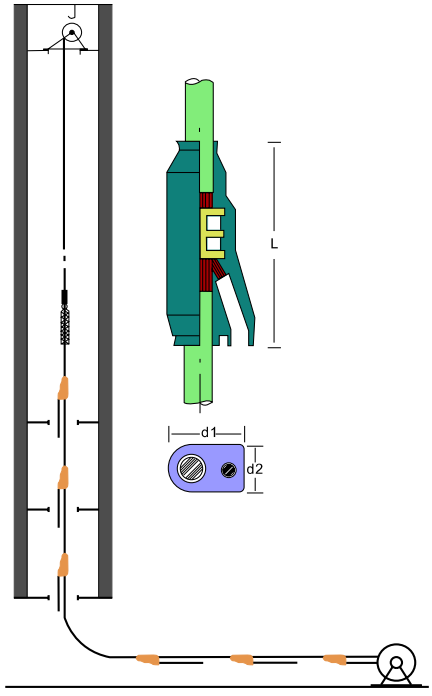
$\sin\theta = \sqrt{1-\cos^2\theta}$



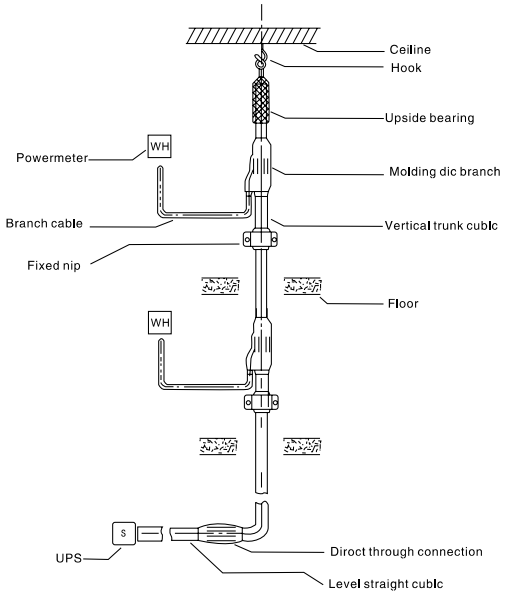
Top of cable

The top of main cable usually use waterproof compound adhesive on the head, then cover the PVC cap strengthened by a thermal shrinkage pipe to achieve permanent use.

Prefabricated Branch Cable



Branch cable installation sketch



IEC,GB standard cable

Trunk Cable	Branch Cable	Reference dimension		
mm^2	mm^2	d1	d2	L
16	–16	50	35	90
25	–25			
35	–35			
50	–50			
70	–70			
95	–95	60	45	110
120	–120			
150	–150			
185	–185			
240	–185			
300	–300	90	70	150
400	–300			
500	–300			

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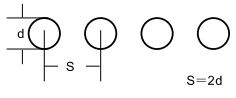
echnical Data

0.6/1KV YJV、VV、XR–YJV、ZR–VV

Conduetor		Diameter	Insulated thickness	Thickness of sheath	Outer diame–ter (about)	Weight (about)	AC test voltage	20℃Max. Conductor DC voltage	40℃Current carrying qu–antity
Nominal cross –sectional area of conductor	No.&diameter of wire or type								
mm^2	NO./mm	mm	mm	mm	mm	Kg/km	Kv/5min	Ω/km	A
6	7/1.04	3.1	0.7	1.4	8.0	105	3.5	3.08	61
10	7/1.35	3.7	0.7	1.4	8.5	150	3.5	1.83	85
16	Rotundity tight twisting wire	4.7	0.7	1.4	9.5	210	3.5	1.15	113
25		5.9	0.9	1.4	11.0	310	3.5	0.727	150
35		7.0	0.9	1.4	12.0	410	3.5	0.524	180
50		8.5	1.0	1.4	13.5	555	3.5	0.387	265
70		10.1	1.1	1.4	15.0	760	3.5	0.268	290
95		11.7	1.1	1.4	17.0	1,020	3.5	0.193	345
120		13.2	1.2	1.6	19.0	1,260	3.5	0.153	405
150		14.7	1.4	1.6	21.0	1,570	3.5	0.124	460
185		16.4	1.6	1.6	23.0	1,920	3.5	0.0991	530
240		18.6	1.7	1.7	26.0	2,470	3.5	0.0754	640
300		20.8	1.8	1.8	29.0	3,090	3.5	0.0601	725
400		24.1	2.0	2.0	32.0	4,080	3.5	0.0470	845
500		26.9	2.2	2.2	36.0	5,080	3.5	0.0366	970
630		30.2	2.4	2.4	40.0	6,390	3.5	0.0283	1120

Ampacity laying correction coefficient

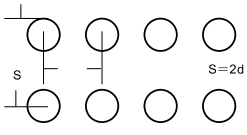
Single laying: correction coefficient =1.0



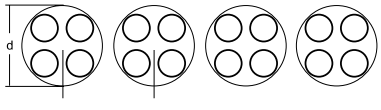
Twist type single root laying: correction coefficient =0.8



Double laying: correction coefficient =0.9



Twist type many root laying: correction coefficient =0.76



Ampacity temperature correction coefficient

Environment Temperature		Correction Coefficient
℃	70℃	90℃
10	1.41	1.26
15	1.35	1.22
20	1.29	1.18
25	1.22	1.14
30	1.15	1.09
35	1.08	1.04
40	1.00	1.00
45	0.91	0.94
50	0.81	0.89

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