

# ACT® Prefabricated Branch Cables

## 0.6/1kV Single or Multi-core XPLE Insulated and PVC (or LSZH) Sheathed Cables

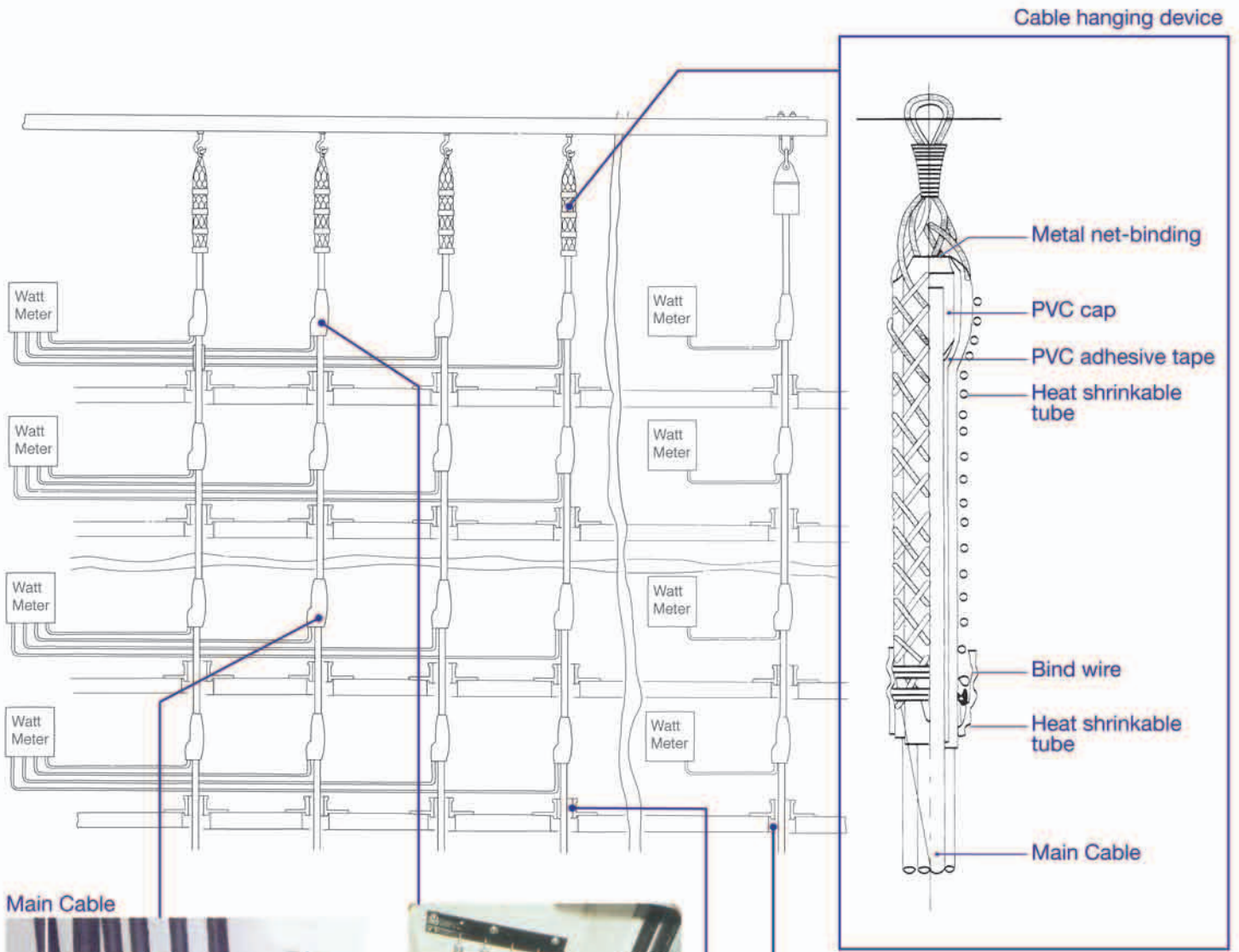
With the rapid growths of the world economy and construction industry, the power distribution system has become one of the major concerns of designers, property developers and contractors. Prefabricated Branch Cables are widely used in the new generation electrical supply system for voltages up to 0.6/1kV. In order to meet the needs of the construction market and advanced technology in the world, the production of prefabricated branch cable offers new options for the traditional power distribution system in buildings, which features its low cost, guaranteed quality of prefabrication in factory, easy on-site installation, power supply in high reliability, maintenance free, high efficiency and high returns.

**ACT®** prefabricated branch cables are used in the new generation electrical supply system for voltages up to 0.6/1kV. It's widely used in power supply and distribution system of residential buildings, offices, hotels, markets, hospitals, factories buildings and lighting system of highways, railways tunnel and bridges.

The major benefits of **ACT®** prefabricated branch cables include:

1. It can simplify the traditional power distribution system. No junction boxes are required in tee-off the branch cables at site. It can minimize the adverse effects caused by the harsh environment or improper installation.
2. It can minimize the material use to save cost on the power distribution system.
3. It has highest reliability and fits all kinds of situations in particular to the most essential premises.
4. The branch cable is the prefabricated cable, which has the standardized appearance, structure and technical features. The prefabricated cable joints have good performance in insulation to harsh environments of high humidity, salt fog and acid & alkali condition.

# Installation Diagram



Branch cable joints with fixing and clamping apparatus



Cable brackets and terminals



Fixing device to floor slab



Fixing device passing through the floor slab

# Advantages

## Achieved a safe and highly reliable power distribution system

1. Joint free main cable, good continuity and reducing failures.
2. The branch cable joints are prefabricated in a fully automated production line that greatly reduces the non-conformities generated by man-made causes.
3. The branch cable joints are manufactured in a controlled and well-managed production process, which makes the cable joints with a small contact resistance and non-sensitive to temperature fluctuation.
4. The branch cable joint with excellent air-tightness is achieved. This prevents the copper conductor from easily oxidizing by air.
5. Type and routine tests in witnessed and accredited by independent laboratory, have been conducted at factory. Prior to delivery, a factory test report on routine tests shall be submitted to substantiate the compliance of specifications and standards.
6. Branch joints are produced by strictly observing the related technical specification and inspection requirements, with stringent QA system implemented.

## Easy installation and high adaptability to environment

1. Small space occupation, benefiting the effectively use of building area. Without specific requirements on spatial size of building is needed.
2. Small footprint for installation is required. Surface installations on wall or trays.
3. Easy installation with low technical requirements (only one cable hoist is needed).
4. Short installation time, only 1/10 to 1/20 of the installation time for bus bar system. This means low labor intensity for installation of prefabricated branch cables.
5. Small bending radius, greatly reducing the operation difficulties and spatial requirement.

### Highly flexible for cable specifications and combinations

1. Main cable is available from 10mm<sup>2</sup> to 1000mm<sup>2</sup>, while branch cable is selectable from 6mm<sup>2</sup> to 400mm<sup>2</sup>.
2. A variety of cable types can be selected to specific customer requirements.

### Good shock resistance, air-tightness, waterproofing and fire resistance

1. Good shock resistance: bus duct joints as connected mechanically can become loose after the wall body is vibrated. However, prefabricated branch cables won't be affected by vibration.
2. Excellent air-tightness and waterproofing performance of prefabricated branch cables ensuring normal power supply in humid environment and underground.
3. Fireproof prefabricated branch cables maintain the power supply when the cable is burning.

### Maintenance free

1. If the prefabricated branch cable is installed properly, no maintenance work is needed.

### Low power distribution costs

1. Due to the lower costs on prefabrication, on-site installation and maintenance, the power distribution costs of adopting the prefabricated branch cables would significantly be reduced in compared to bus duct.

# Cable Types and Specifications

Type of cables for ACT® Prefabricated Branch Cables with KEMA certifications

Item	Type	Types of cable	IEC Standard	British Standard
1	6U81Y	<p><b>Single-core XLPE Insulated PVC Sheathed Cables (0.6/1kV)</b></p> <p>Cu/XLPE/PVC</p> <p>Conductor: Class 2 plain annealed copper wires, stranded.</p> <p>Insulation: XLPE</p> <p>Outer sheath: PVC</p>	IEC 60502-1	BS 7889
2	6181Y	<p><b>Single-core PVC Insulated and Sheathed Cables (0.6/1kV)</b></p> <p>Cu/PVC/PVC</p> <p>Conductor: Class 2 plain annealed copper wires, stranded.</p> <p>Insulation: PVC</p> <p>Outer sheath: PVC</p>	IEC 60502-1	BS 6346
3	6181B	<p><b>Single-core XLPE Insulated LSZH Sheathed Flame Retardant Cables (0.6/1kV)</b></p> <p>Cu/XLPE/LSZH</p> <p>Conductor: Class 2 plain annealed copper wires, stranded.</p> <p>Insulation: XLPE</p> <p>Outer sheath: LSZH</p>	IEC 60502-1 IEC 60332 IEC 61034 IEC 60754	-
4	6181B-FR	<p><b>Single-core XLPE Insulated LSZH Sheathed Fire Resistant Cables (0.6/1kV)</b></p> <p>Cu/FR/XLPE/LSZH</p> <p>Conductor: Class 2 plain annealed copper wires, stranded.</p> <p>Fire proof: Mica tape</p> <p>Insulation: XLPE</p> <p>Outer sheath: LSZH</p>	IEC 60502-1 IEC 60331-21+(X)	BS 6387 in Cat. C.W.Z.

1. Alternative cable types, sheathing materials or armouring can also be manufactured to specific customer specifications.

2. (X) includes IEC 60754, IEC 60684, IEC 61034 and IEC 60332

3. Multi-core branch cables are available on request.

4. Anti-termite layer can be provided upon request.

## Cable Joints

The prefabricated cable joints are assembled under a proprietary specification. Factory tests in witnessed and accredited by independent laboratory, have been conducted to prove all cable joints to have satisfactorily passed all type tests. Prior to delivery to site, a factory test report on routine tests shall be submitted to ensure the branch cables to meet all specifications and standards.

## Specifications of Main Cables & Branch Cables

Main Cable (mm <sup>2</sup> )	Branch Cable (mm <sup>2</sup> )										
	6	16	25	35	50	70	95	120	150	185	240
10											
16	10	16									
25	10	16									
35	10	16	25								
50	10	16	25	35							
70	10	16	25	35	50						
95	10	16	25	35	50						
120	10	16	25	35	50	70					
150	10	16	25	35	50	70	95				
185	10	16	25	35	50	70	95				
240	10	16	25	35	50	70	95	120			
300	10	16	25	35	50	70	95	120			
400	10	16	25	35	50	70	95	120	150		
500	10	16	25	35	50	70	95	120	150	185	
630	10	16	25	35	50	70	95	120	150	185	
800	10	16	25	35	50	70	95	120	150	185	240
1000	10	16	25	35	50	70	95	120	150	185	240

1. The rated voltage (U<sub>o</sub>/U) of main and branch cables are 0.6/1kV, unless otherwise specified.
2. Same cable type shall be used for the main and branch cable, unless otherwise specified.
3. Sheath colour: black.
4. Core colour: (1-core : nature XLPE) ; (4-core : brown, grey, black and green/yellow) and (4+1-core: brown, grey, black, blue and green/yellow).
5. Other configurations are also available on request.

## Operation Conditions

1. The maximum working temperature for conductor of prefabricated branch cables
  - PVC insulation: 70°C
  - Cross-linked PE insulation: 90°C
2. The limiting conductor temperature when short circuit ( in not more than 5sec ) are:
  - PVC insulation: 160°C
  - Cross-linked PE insulation: 250°C
3. The minimum bending radius is 8 – 12OD, outer diameter of the cables.
4. To ensure the cable system with a sufficient strength, the conductor area of the main cable shall not be less than 10mm<sup>2</sup> if the prefabricated branch cable is laid vertically. However, the conductor area can be selected on the basis on the actual needs if the branch cable is laid horizontally.
5. The type and size of branch cable shall be selected in according to the rated load and required working conditions.

## Precautions for Prefabricated Branch Cables when Installation

1. To make sure the branch cable can safely pass through the concrete opening when hoisting the cable.
2. Adopting preventive measures to minimize the possibility of damaging the cable parts when pulling it up.
3. Don't impose additional tension on branch cable when uplifting.
4. The steel wire for hoisting the branch cable, shall be with tension capacity at least of 4 times the weight of cable.
5. The branch cable should be fixed immediately when hoisting is completed.

## Construction Diagram

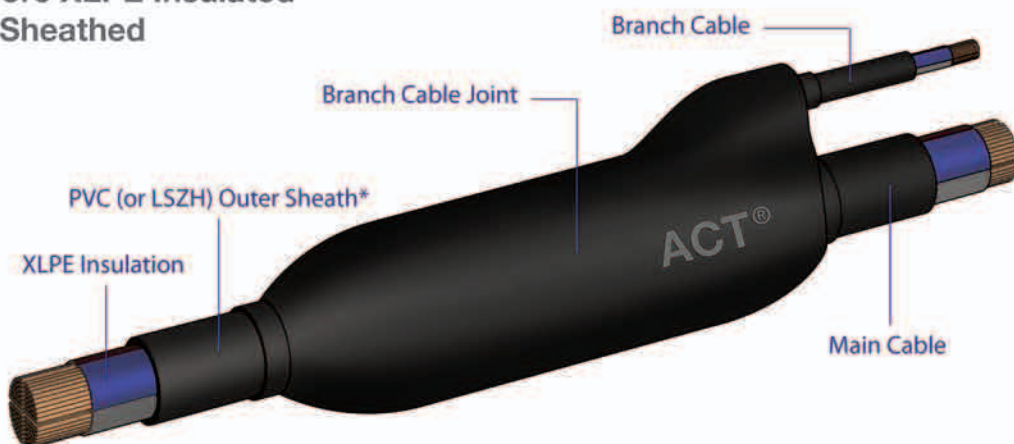
0.6/1kV Single-core XLPE Insulated  
PVC (or LSZH) Sheathed  
Branch Cable



0.6/1kV Single-core XLPE Insulated  
LSZH Sheathed Fire Resistant  
Branch Cable



0.6/1kV Multi-core XLPE Insulated  
PVC (or LSZH) Sheathed  
Branch Cable



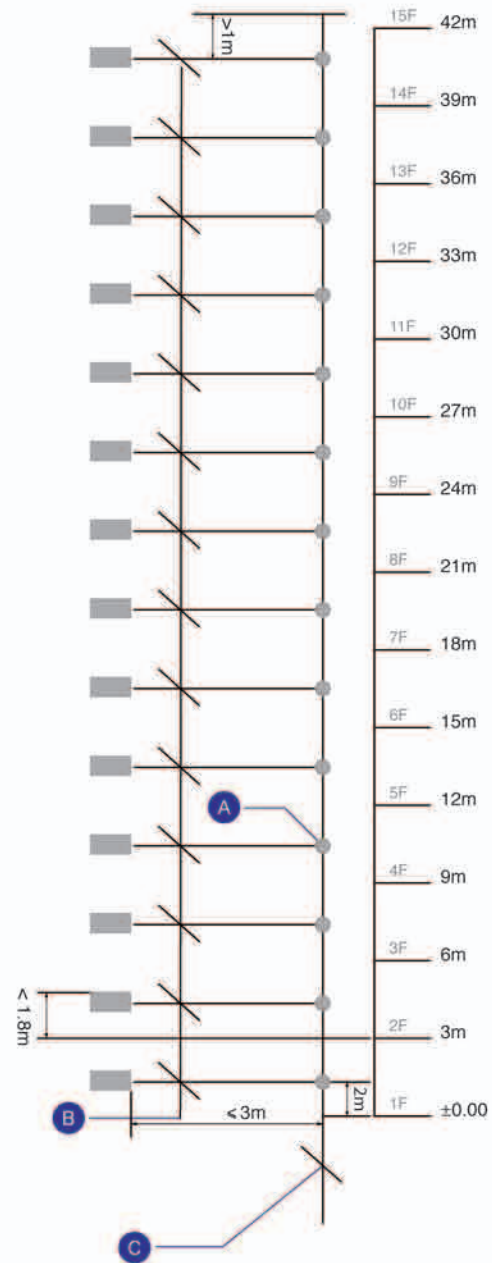
Remarks :

1. Multi-core branch cables are available on request.
2. (\*) Anti-termite layer can be provided on request.



# Requirements for Ordering of Branch Cables

1. Schematic drawings showing the length and dimension of main and branch cables.
2. Type, specifications of main cable and branch cables.
3. Distribution system (single-phase two-wire, single-phase three-wire, three-phase four-wire, three-phase five wire).
4. Installation method : Pull up the cable or lower down the cable.



- A** Branch Joint : 630mm<sup>2</sup> Tee-off 70mm<sup>2</sup>
- B** Branch Cable : 1 x 70mm<sup>2</sup> (Cu/XLPE/PVC)
- C** Main Cable : 1 x 630mm<sup>2</sup> (Cu/XLPE/PVC)

## Operation Data

### Standards

Power cables (single and multi-core)

### XLPE/PVC

• IEC 60502-1 • BS 7889 • IEC 60332 • GB/T12706-1

### XLPE/LSZH

• IEC 60502-1 • IEC 60332 • IEC 61034 • IEC 60754

### FR/XLPE/LSZH

• IEC 60502-1 • IEC 60331-21 • IEC 60332 • IEC 61034  
• IEC 60754 • BS 6387 CWZ

### Product Certification

KEMA-KEUR and CCA (CENELEC).



### Range of Size

1-core: 10 mm<sup>2</sup> ~ 1000 mm<sup>2</sup>

4-core: 10 mm<sup>2</sup> ~ 300 mm<sup>2</sup>

(3+1)-core: 3 x 10 + 6 mm<sup>2</sup> ~ 3 x 300 + 150 mm<sup>2</sup>

(4+1)-core: 4 x 10 + 6 mm<sup>2</sup> ~ 4 x 240 + 120 mm<sup>2</sup>

### Applications

For uses in high-rise buildings for power distribution.

Also excellent for uses in car and railway tunnels.

Surface installations on wall or trays.

Easy to install and safe to use.

Excellent resistance to water and moisture.

Good shock resistance and flame retardant.

Maintenance free for reliable and durable services.

### Constructions

#### Conductor

Class 2 plain annealed copper wires, stranded.

#### Insulation / XLPE

Sheath / PVC or LSZH polymer

#### Fire Proof

MICA tape wrapped on each conductor (when applicable)

#### Armouring

It is possible to incorporate galvanized steel tape or wire armour on the main and branch cables for special applications with mechanical protection. The joint assembly on the other hand can only incorporate galvanized steel tape or aluminum tape armour.

#### Core Colour

1-core: Natural XLPE

4-core: Brown, grey, black and blue.

(4+1)-core: Brown, grey, black, blue and green/yellow

Sheath Colour: Black

#### Installation

For single core branch cables, the distance (S) must be bigger than or equal to twice of main cable outer diameter (D)  
S > 2D

#### Technical Data

#### Operating Temperature

90 °C

**The Current Ratings and Voltage Drop figures refer to Technical Data Table 1 to 7**

## Technical Data

**Table 1 : 0.6/1kV 1-core XLPE/PVC Prefabricated Brach Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>A.C. Voltage Test</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( kV/5min )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
10	9.0	3.5	1.3	93	2.0	150
16	9.5	3.5	1.15	120	1.3	210
25	11.0	3.5	0.727	155	0.84	310
35	12.0	3.5	0.524	195	0.63	410
50	14.0	3.5	0.387	235	0.49	555
70	15.0	3.5	0.268	295	0.36	760
95	17.0	3.5	0.193	370	0.29	1020
120	19.0	3.5	0.153	430	0.24	1260
150	21.0	3.5	0.124	495	0.21	1570
185	23.0	3.5	0.0991	570	0.19	1920
240	26.0	3.5	0.0754	680	0.16	2470
300	29.0	3.5	0.0601	790	0.15	3090
400	32.0	3.5	0.0470	920	0.131	4080
500	36.0	3.5	0.0366	1080	0.120	5080
630	40.0	3.5	0.0283	1260	0.111	6390
800	46.0	3.5	0.0221	1450	0.104	8450
1000	51.0	3.5	0.0176	1650	0.098	10600

**Table 2 : 0.6/1kV 1-core PVC/PVC Prefabricated Branch Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>A.C. Voltage Test</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( kV/5min )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
10	9.0	3.5	1.83	70	2.0	150
16	10.0	3.5	1.15	97	1.3	215
25	11.3	3.5	0.727	120	0.84	310
35	12.3	3.5	0.524	150	0.63	410
50	14.0	3.5	0.387	180	0.49	570
70	15.7	3.5	0.268	230	0.36	770
95	18.4	3.5	0.193	280	0.29	1030
120	19.8	3.5	0.153	325	0.24	1280
150	22.8	3.5	0.124	375	0.21	1590
185	25.1	3.5	0.0991	430	0.19	1950
240	28.5	3.5	0.0754	515	0.16	2490
300	32.0	3.5	0.0601	595	0.15	3140
400	35.4	3.5	0.0470	700	0.131	4140
500	40.0	3.5	0.0366	810	0.120	5140
630	46.0	3.5	0.0283	950	0.111	6440
800	50.0	3.5	0.0221	1200	0.104	8450
1000	52.0	3.5	0.0176	1400	0.098	10600

**Table 3 : 0.6/1kV 4-core XLPE/PVC Prefabricated Branch Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
4 x 10	18.6	1.83	65	2.0	620
4 x 16	20	1.15	84	1.3	860
4 x 25	20	0.727	110	0.84	1270
4 x 35	26	0.524	135	0.63	1680
4 x 50	28	0.387	170	0.49	2270
4 x 70	33	0.268	215	0.36	3110
4 x 95	36	0.193	265	0.29	4170
4 x 120	37	0.153	310	0.24	5150
4 x 150	39.5	0.124	350	0.21	6410
4 x 185	45	0.0991	405	0.19	7840
4 x 240	54	0.0754	480	0.16	10080
4 x 300	58	0.0601	595	0.15	12610

**Table 4 : 0.6/1kV 4-core PVC/PVC Prefabricated Branch Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
4 x 10	18.6	1.83	60	2.0	682
4 x 16	20.8	1.15	80	1.3	1010
4 x 25	24.7	0.727	101	0.84	1411
4 x 35	27.1	0.524	126	0.63	1835
4 x 50	28.2	0.387	153	0.49	2435
4 x 70	32	0.268	196	0.36	3271
4 x 95	36.7	0.193	238	0.29	4338
4 x 120	43	0.153	276	0.24	5383
4 x 150	47.7	0.124	319	0.21	6712
4 x 185	52.7	0.0991	364	0.19	8207
4 x 240	59.4	0.0754	430	0.16	10850
4 x 300	65.2	0.0601	497	0.15	13647

**Table 5 : 0.6/1kV (3+1)-core XLPE/PVC Prefabricated Branch Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
3 x 10 + 1 x 6	16.4	1.83	68	2.0	503
3 x 16 + 1 x 10	18.5	1.15	91	1.3	727
3 x 25 + 1 x 16	22.3	0.727	116	0.84	1092
3 x 35 + 1 x 16	24.8	0.524	144	0.63	1476
3 x 50 + 1 x 25	25.9	0.387	174	0.49	1907
3 x 70 + 1 x 35	29.9	0.268	224	0.36	2612
3 x 95 + 1 x 50	33.7	0.193	271	0.29	3489
3 x 120 + 1 x 70	37.5	0.153	315	0.24	4448
3 x 150 + 1 x 70	41.6	0.124	363	0.21	5383
3 x 185 + 1 x 95	46.7	0.0991	415	0.19	6711
3 x 240 + 1 x 120	51.9	0.0754	490	0.16	8561
3 x 300 + 1 x 150	57.0	0.0601	565	0.15	11080

**Table 6 : 0.6/1kV (4+1)-core XLPE/PVC Prefabricated Branch Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
4 x 10 + 1 x 6	18	1.83	68	2.0	619
4 x 16 + 1 x 10	20.7	1.15	91	1.3	911
4 x 25 + 1 x 16	24.6	0.727	116	0.84	1359
4 x 35 + 1 x 16	26.8	0.524	144	0.63	1749
4 x 50 + 1 x 25	28.5	0.387	174	0.49	2387
4 x 70 + 1 x 35	30.6	0.268	224	0.36	3280
4 x 95 + 1 x 50	34.7	0.193	271	0.29	4407
4 x 120 + 1 x 70	38.1	0.153	315	0.24	5580
4 x 150 + 1 x 70	42.6	0.124	363	0.21	6803
4 x 185 + 1 x 95	47.4	0.0991	415	0.19	8158
4 x 240 + 1 x 120	53.2	0.0754	490	0.16	10850

**Table 7 : 0.6/1kV (4+1)-core PVC/PVC Prefabricated Branch Cable**

<b>Area of Conductor</b>	<b>Nominal Overall Diameter</b>	<b>Max. Conductor DC Resistance at 20°C</b>	<b>Current Carrying Capacity at 40°C</b>	<b>Voltage Drop</b>	<b>Approx. Gross Weight</b>
( mm <sup>2</sup> )	( mm )	( Ω / km )	( A )	( V/A.m x 10 <sup>-3</sup> )	( kg / km )
4 x 10 + 1 x 6	18	1.83	52	2.0	720
4 x 16 + 1 x 10	20.7	1.15	70	1.3	1055
4 x 25 + 1 x 16	24.6	0.727	88	0.84	1578
4 x 35 + 1 x 16	26.8	0.524	110	0.63	1988
4 x 50 + 1 x 25	28.5	0.387	133	0.49	2683
4 x 70 + 1 x 35	30.6	0.268	170	0.36	3609
4 x 95 + 1 x 50	34.7	0.193	207	0.29	4836
4 x 120 + 1 x 70	38.1	0.153	240	0.24	6055
4 x 150 + 1 x 70	42.6	0.124	277	0.21	7,384
4 x 185 + 1 x 95	47.4	0.0991	316	0.19	8911
4 x 240 + 1 x 120	53.2	0.0754	374	0.16	11414