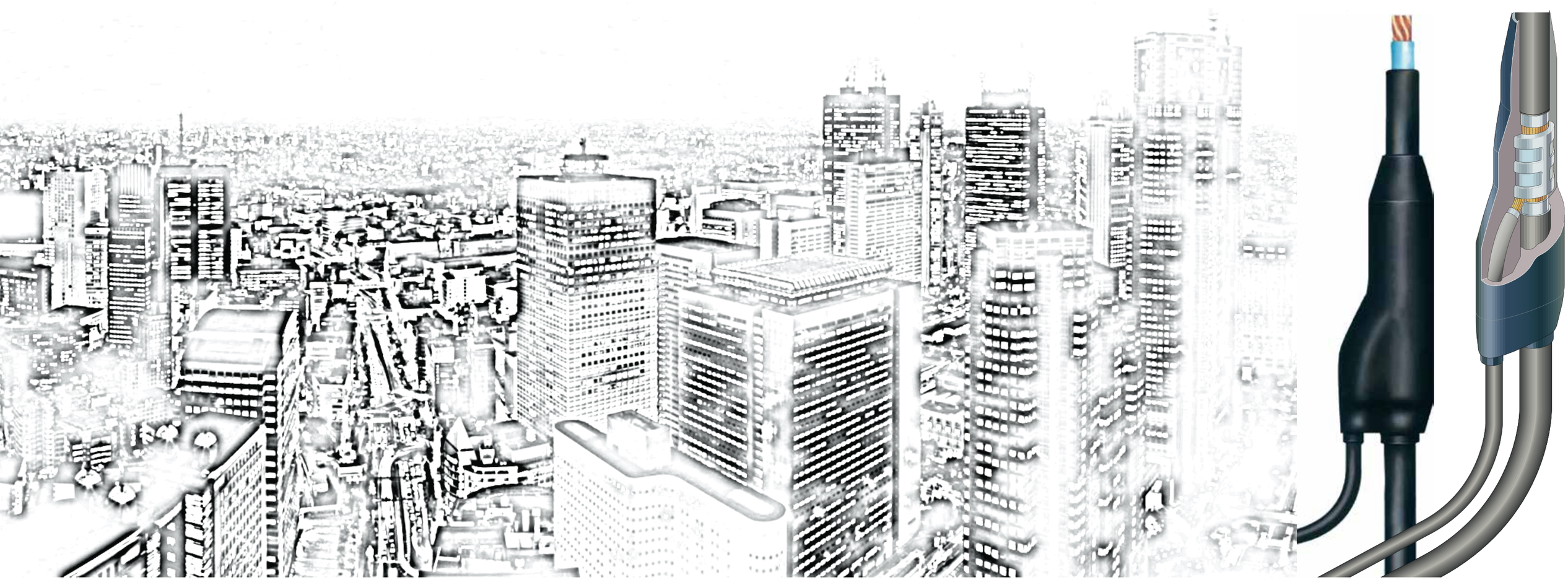
ISE Cable



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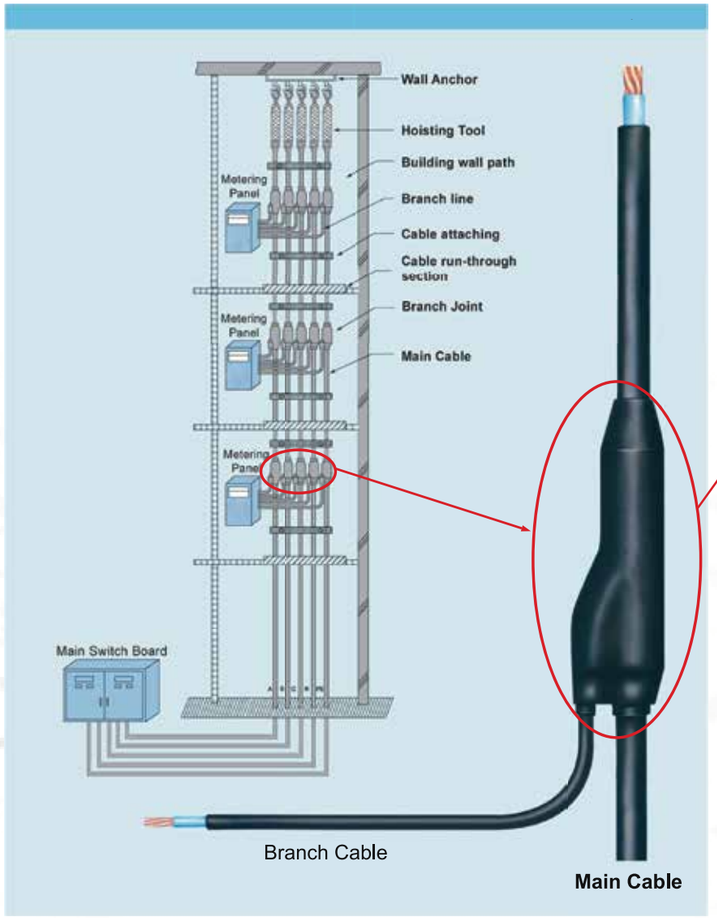
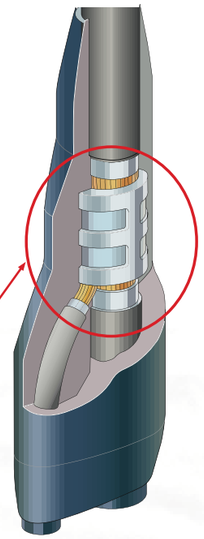
ISE Pre-fabricated PVC

Mould Branch

Cable System

1. iSE - Installation of Drawing of Pre-fabricated Branch Cables





Combination Cable Materials:

a. Copper (Main) - Copper (Branch)

b. Aluminum (Main) - Copper (Branch)

c. Aluminum (Main) - Aluminum (Branch)

Main Cable Copper branched to Aluminum or AAAC by using special 'Alloy Compound' with high torque crimping and PVC Mold.

Cables are complied with IEC 60502-1 and/or IEC60322-1.

2. iSE Pre-fabricated Branch Cable Specifications

a. Insulation resistance ≥ 200Ω, Insulation withstand voltage ≥ 3.5kV/5min.

b. Excellent air tightness and water proofing quality. When immerge branch joint into water, measured insulation resistance between water and cable core, and power frequency withstand voltage meet the requirement of items 1 and 2.

c. Small contact resistance of branch joint. The ratio value of contact resistance vs refference resistance of equal length branch line is equal to or less than 1.2.

d. Large joint short circuit strength. The variation rate of contact resistance ratio after short circuit is equal to or less than 0.2

e. If required, iSE Cable can provide fire-retardant pre-fabricated branch cable, self extinguished time of jacket is equal to or less than 12s and meets IEC60331 as optional.

f. Besides power supply in normal working condition, NH fire resistance type can remain normal operation for 90 minutes under burning condition GB12666.6

g. Maximum working temperature of copper cor of VV type cable is up to 70˚C and that YJV type cable up to 90˚C.

h. With excellent corrosive resistance, it fan keep from eroding of inorganic salt, oil base, acid, organic solution, etc.

i. iSE Cable can provide branch cable with excellent thermal stability and aging resistance.

j. iSE Cable can provide prefabricated safety & clean branch cable of environmental protection with many characteristics such as low toxity, low smoke, halogen free (low halogen), anti-flaming, safety, and cleanness.

k. iSE Cable can provide prefabricated safety & clean branch cable of environmental protection with many characteristics such as low toxity, low smoke, halogen free (low halogen), anti-flaming, safety, cleanness and fireproof, etc.

3. Main Characteristics of 'iSE Prefabricated Branch Cable'

3.1 High Quality for Safety in Power Supply

a. Trunk cable conductor without joint has good continuity and reduce trouble spots. Main Cable conform to IEC60502-1.

b. Branch joins are made through whole course mechanical processing in the factory with high quality automated machineries.

c. Branch joint of rational structure and made through advance NDD workmanship with less contact resistance and will not affected by thermal expansion nor shrinkage.

d. Pressed mold jacket is processed in short time to avoids variation of contact resistant reducing oxidation of copper core at the joint position which is exposed in the air for long time, and comply with JCS4503 or JCS 376.

e. Branch joint has strict technical standard, inspection requirement, and quality control system as well.

3.2 Reduce COST and Reduce Installation SPACE

a. Small foot print, it will give more facility floor area for other usage of utility and reduce the usage of shaft space.

b. In comparison with bus duct, it will reduce engineering cost, with remarkable comprehensive economic results

c. Very simple installation save installation time. It only take up to 1/20 bus duct installation time, so it will significantly reduce cost.

d. Small bending radius will greatly reduced installation difficulty, and save more intallation space area.

3.3 Excellent Shock Resistance, Air Tightness, Water Proofing Quality, and Fire Resistance

a. Excellent shock resistance compared to bus duct joint which are mechanically connected wil loose upon wall shock. iSE prefabricated branch cable will not be affected, especially passing through buidling sedimentation slots, no measurement needed.

b. Excellent air tightness and water proofing quality. It can normally supply power in wet environment in both open air or underground.

3.4 Maintenance Free

a. Once the prefabricated branch cable installed in a building, it will continue to work without maintenance cost.

b. Prefabricated branch cable system is generally maintenance free.

3.5 Simpler Cable Management

a. Both main cables and branch cable are colour coded for easy phase identification if requested.

b. iSE Cable will wound around a drum and arrange for easy installation at site, so it will increase efficiency of installation on site.

3.6 Multiple Categories and Specifications, Flexible Options, and Combinations

a. Main cable from 10 mm^2 to 1,200 mm^2 and branch cable from 4mm^2 to 300mm^2 can be combined at will.

b. Multiple cable categories, can be choosen according to the demand.

c. Branch joint can be set up branch positions at any positions according to the floor requirement.

Technical Properties of iSE Cable 0.6/1kV, 1 - Core XLPE/PVC Aluminum / Al

Size (mm^2)	Shape	Diameter (mm)	Insulating Thickness (mm)	Cover Thickness (mm)	External Diameter (mm)	Appox. Weight kg / km	AC Test Voltage kV / 5min	Max (20˚C) Resistance Ω/km	⊙⊙⊙⊙ Rated Current (A)	Voltage Drop (V/A.m)x10^{-3}
10	Round dense twisted line	4.05	0.7	1.4	8.9	95	3.5	0.727	59	4.05
16		5.10	0.7	1.4	9.5	120	3.5	1.15	78	2.55
25		6.42	0.9	1.4	11.5	190	3.5	0.727	100	1.63
35		7.56	0.9	1.4	12.0	207	3.5	0.524	125	1.19
50		8.99	1.0	1.4	14.0	245	3.5	0.387	150	0.90
70		10.70	1.1	1.4	16.0	336	3.5	0.268	190	0.65
95		12.46	1.1	1.5	18.0	455	3.5	0.193	230	0.50
120		14.21	1.2	1.5	20.0	550	3.5	0.153	270	0.42
150		15.75	1.4	1.6	22.0	650	3.5	0.124	310	0.37
185		17.64	1.6	1.6	24.0	804	3.5	0.0991	360	0.33
240		20.25	1.7	1.7	27.0	1,021	3.5	0.0754	430	0.29
300		22.68	1.8	1.8	30.0	1,160	3.5	0.0601	495	0.28
400		25.65	2.0	1.9	34.0	1,469	3.5	0.0470	590	0.26
500		28.80	2.2	2.0	37.0	1,829	3.5	0.0366	685	0.25
630		30.20	2.4	2.2	41.0	2,305	3.5	0.0283	800	0.25
800		34.80	2.6	2.3	46.0	2,910	3.5	0.0221	930	0.24
1,000		39.00	2.8	2.4	51.0	3,604	3.5	0.0176	1,050	0.24

Technical Properties of iSE Cable 0.6/1kV, 1 - Core XLPE/PVC Copper / Cu

Size (mm^2)	Shape	Diameter (mm)	Insulating Thickness (mm)	Cover Thickness (mm)	External Diameter (mm)	Appox. Weight kg / km	AC Test Voltage kV / 5min	Max (20˚C) Resistance Ω/km	Rated Current (A)	Voltage Drop (V/A.m)x10^{-3}
10	Round dense twisted line	3.7	0.7	1.4	8.9	150	3.5	1.83	85	2.0
16		4.7	0.7	1.4	9.5	215	3.5	1.15	113	1.3
25		5.9	0.9	1.4	11.5	310	3.5	0.727	150	0.84
35		7.0	0.9	1.4	12.0	410	3.5	0.524	181	0.63
50		8.5	1.0	1.4	14.0	570	3.5	0.387	228	0.49
70		10.1	1.1	1.4	16.0	770	3.5	0.268	290	0.36
95		11.7	1.1	1.5	18.0	1,030	3.5	0.193	347	0.29
120		13.2	1.2	1.5	20.0	1,280	3.5	0.153	410	0.24
150		14.7	1.4	1.6	22.0	1,590	3.5	0.124	470	0.21
185		16.4	1.6	1.6	24.0	1,950	3.5	0.0991	530	0.19
240		18.6	1.7	1.7	27.0	2,490	3.5	0.0754	640	0.16
300		20.8	1.8	1.8	30.0	3,140	3.5	0.0601	725	0.15
400		24.1	2.0	1.9	34.0	4,140	3.5	0.0470	845	0.131
500		26.9	2.2	2.0	37.0	5,140	3.5	0.0366	980	0.120
630		30.2	2.4	2.2	41.0	6,440	3.5	0.0283	1,150	0.111
800		34.8	2.6	2.3	46.0	8,450	3.5	0.0221	1,380	0.104
1,000		39.0	2.8	2.4	51.0	10,600	3.5	0.0176	1,605	0.088

Technical Properties of iSE Cable 0.6 /1kV, 1 - Core XLPE/PVC Copper Clad Aluminum / CCA

Size (mm_2)	Shape	Diameter (mm)	Insulating Thickness (mm)	Cover Thickness (mm)	External Diameter (mm)	Appox. Weight kg / km	AC Test Voltage kV / 5min	Max (20˚C) Resistance Ω/km	Rated Current (A)
10	Round dense twisted line	4.8	0.7	1.0	10.3	132.1	3.5	1.83	70
16		6.1	0.7	1.0	11.6	180.0	3.5	1.15	97
25		7.6	0.9	1.2	13.3	255.4	3.5	0.727	120
35		8.7	0.9	1.2	14.8	328.2	3.5	0.524	150
50		10.6	1.0	1.4	17.1	432.7	3.5	0.387	180
70		12.8	1.0	1.4	19.0	578.7	3.5	0.268	230
95		14.8	1.1	1.6	21.7	766.9	3.5	0.193	280
120		16.1	1.2	1.6	23.4	904.1	3.5	0.153	325
150		18.0	1.4	1.8	25.0	1111.7	3.5	0.124	375
185		20.0	1.6	2.0	29.0	1429.7	3.5	0.0991	430
240		23.2	1.7	2.2	32.4	1796.0	3.5	0.0754	515
300		25.4	1.8	2.4	34.6	2237.2	3.5	0.0601	595
400		31.4	2.0	2.6	41.0	2820.7	3.5	0.0470	700
500		34.9	2.2	2.8	45.1	3502.0	3.5	0.0366	810
630		39.8	2.4	2.8	50.7	4389.5	3.5	0.0283	950
800		45.1	2.6	2.8	56.8	5490.3	3.5	0.0221	1,090

Technical Properties of iSE Cable 0.6 /1kV, 1 - Core XLPE/PVC A.L. - R.E. / Rare Earth

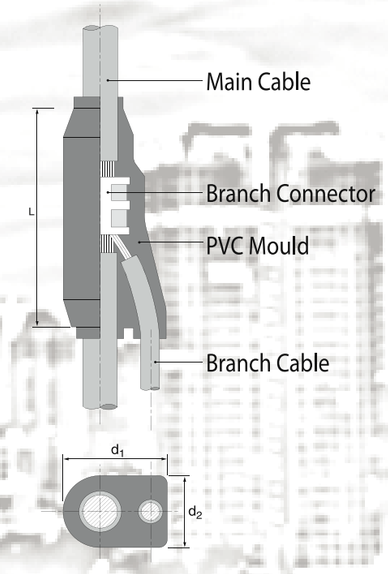
Nominal Cross sectional area of conductor (mm^2)	Dia. Of conductor (mm)	Insulation thickness (mm)	Thickness of sheath (mm)	Approx. overall diameter of cable (mm)	Approx weight of cable (kg/km)	Resistance at 20°C Ω/km	Resistance of insulation MΩ/km	Current rating	
								In the air (A)	Direct in soil (A)
10	3.80	0.7	1.5	8.0	95	≤ 3.08	≥ 0.523	60	75
16	4.80	0.7	1.5	8.9	120	≤ 1.91	≥ 0.431	80	100
25	6.00	0.9	1.5	10.4	190	≤ 1.20	≥ 0.444	115	130
35	7.00	0.9	1.5	11.5	207	≤ 0.868	≥ 0.379	140	150
50	8.40	1.0	1.5	13.0	245	≤ 0.641	≥ 0.355	170	180
70	10.00	1.1	1.5	14.0	336	≤ 0.443	≥ 0.335	215	225
95	11.60	1.1	1.5	16.4	455	≤ 0.320	≥ 0.29	275	270
120	13.00	1.2	1.5	17.8	550	≤ 0.253	≥ 0.282	320	305
150	14.60	1.4	2.0	20.6	650	≤ 0.206	≥ 0.294	370	340
185	16.20	1.6	2.0	22.5	804	≤ 0.164	≥ 0.303	415	375
240	18.40	1.7	2.0	24.9	1021	≤ 0.125	≥ 0.283	490	435
300	20.60	1.8	2.5	27.3	1238	≤ 0.100	≥ 0.263	565	495
400	23.80	2.0	2.5	34.1	1455	≤ 0.0778	≥ 0.243	640	555

4. Structure of iSE Branch Cable

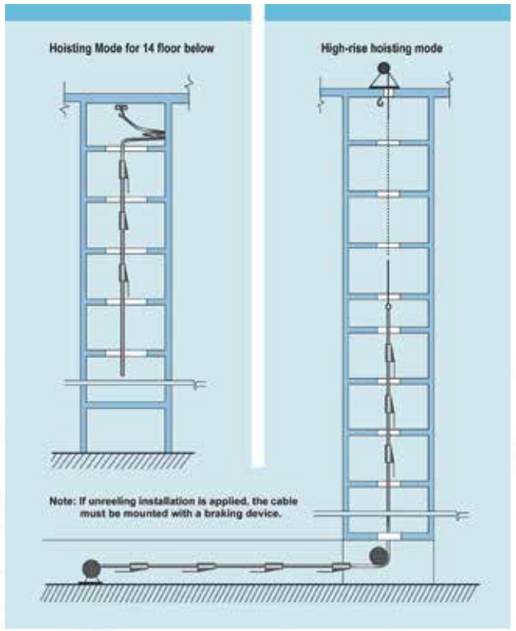
iSE Branch Cable connectors are produced based on Japanese JCS376 Standards, and the joints have three types U, C and O. Please refer to the diagram for branch connectors that are made of PVC or PVC composite material.

One Branch

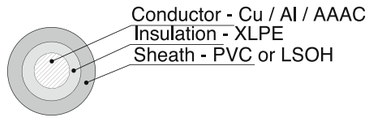
Main Cable (mm^2)	Branch Cable min (mm^2)	Branch Cable max (mm^2)	Dimension (approx.) d1 (mm)	d2 (mm)	L (mm)
10	6	10	40	35	120
16	6	16			
25	6	25			
35	16	25	49	42	125
50	16	35			
70	16	50			
95	16	50	60	48	125
120	16	95			
150	16	120			
185	16	120			
240	16	185	72	56	150
300	16	185			
400	25	240			
500	25	240	80	52	175
630	25	240			
800	25	240	94	78	185
1,000	25	240			



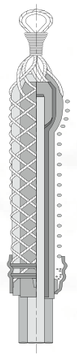
5. Method for Installing iSE Pre-fabricated Branch Cable



Branch Cabling Specifications



Cable Grip (optional)



iSE Branch cable can be terminated with a water proof compound and end-cap reinforced with heat shrinkable tube.

iSE unique steel constructed cable grip is employed to support each barnch cable during and after the installation process.

iSE Branch Cable is easily supported with recognized fixing methos such as those employed with PVC/SW/PVC cables.

6. Current Rating and Voltage drop

Current rating and the voltage drop are calculated under the following conditions:

1. Conductor temperature : 90°C
2. Ambient temperature : 40°C
3. Cable arrangement (single core) S = 2D 

4. Power factor cos θ = 0.8
5. Vd = Voltage drop

$$Vd = K \times I \times L \times Vo \ (V)$$

where; I : Current (A)
L : Route length (m)
Vo : Voltage drop in the tahble (V/A*m)
K : Coefficient depending on the distribution system in the case of 3-phase, 4-lines
K = 1 : Between each phase core and the neutral core
K = √3 : Between hase cores

Short Circuit Current calculation formula:

$$I = 224\frac{A}{\sqrt{t}}\sqrt{log\frac{234+\theta_1}{234+\theta_0}}$$

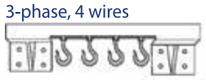
I = Short-circuit current (A)
A = Cross-sectional area (mm²)
t = Short-circuit duration time (sec.)
θ_0 = Max. continuous operating temp. : 90°C
θ_1 = Max. temperature at short-circuit : 260°C

7. Accessories for Branch Cable

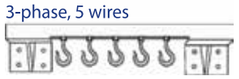
Cable Grip or Hoisting Tool

Cable Bracket

3-phase, 4 wires

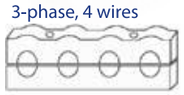


3-phase, 5 wires

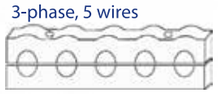


Clamping & Fixing

3-phase, 4 wires



3-phase, 5 wires



There are 3 major accessories (optional) for iSE Cable, and they are:

1. ***Cable Grip or Hoisting Tool*** is a hanging device installed at the top of main cable, and it will be very useful during installation to hoist the branch cable for vertical layout in high-rise buildings.
2. ***Cable Bracket*** is a hook device to fix the cable grip at the top of main cable, so it will keep the cable position in its place after installation
3. ***Clamping and Fixing*** is a tool that will keep the cable on the wall in a proper position and share to hold part of cable's weight.

8. Useful Information for Branch Cable Project

1. Main Cable

- Number of core x cable size (current): 1c x ... mm² (... Ampere)
- Total lenght of main cable: ... meter

2. Branch Cable

- Number of core x cable size (current): 1c x ... mm² (... Ampere)
- Total lenght of main cable: ... meter

3. Phase Color Identification

Identification for phase : ☐ **RED** ☐ **GREEN** ☐ **YELLOW** ☐ **BLACK**

4. Number of Level in Building

- Distance from floor slap to slap: ... meter
- Off-set / Panel at any floor: (...) floor/level & (...) meter to off-set / panel

5. Distance of Branch:

- First branch from top floor/level : ... meter
- Distance between branch to branch : ... meter
- Last branch (lowest floor/level) to Main Switch Panel : ... meter

9. Certification Standards

The biggest cable manufacturer in Shanghai (China) produce iSE-Cable Branch under strict quality control under accreditation of ISO 9001 and ISO 14001 certificate for both quality and environment quality assurance. iSE-Cable comply with IEC 60502-1 and IEC 60322-1 standard for branch cable, and fhe manufacturer has acquired many international certification such as: KEMA, CNAS, CE, etc, and iSE Cable is being produced based on those standards.