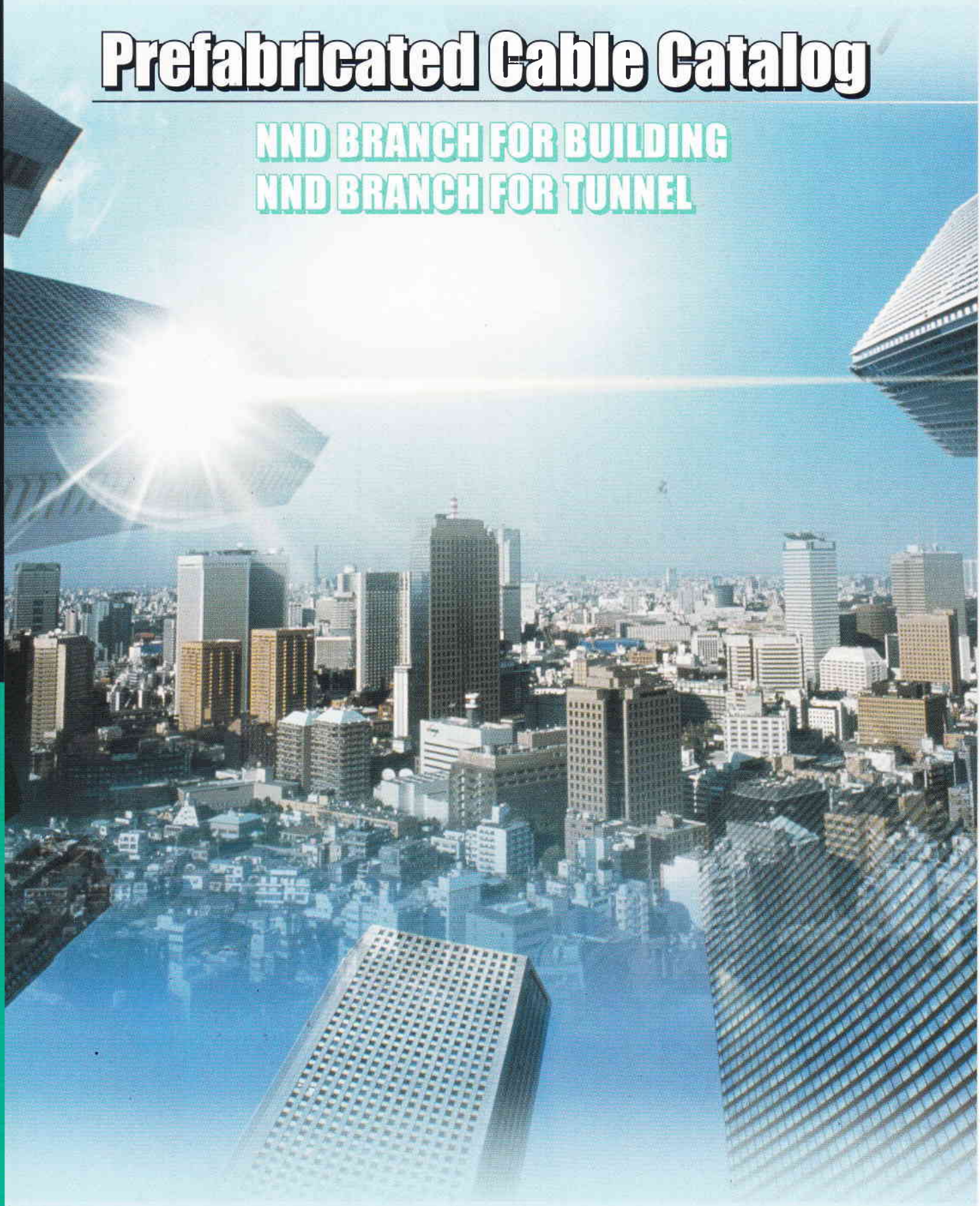
NND PREFAB CABLE

NISHI NIPPON ELECTRIC WIRE&CABLE CO., LTD

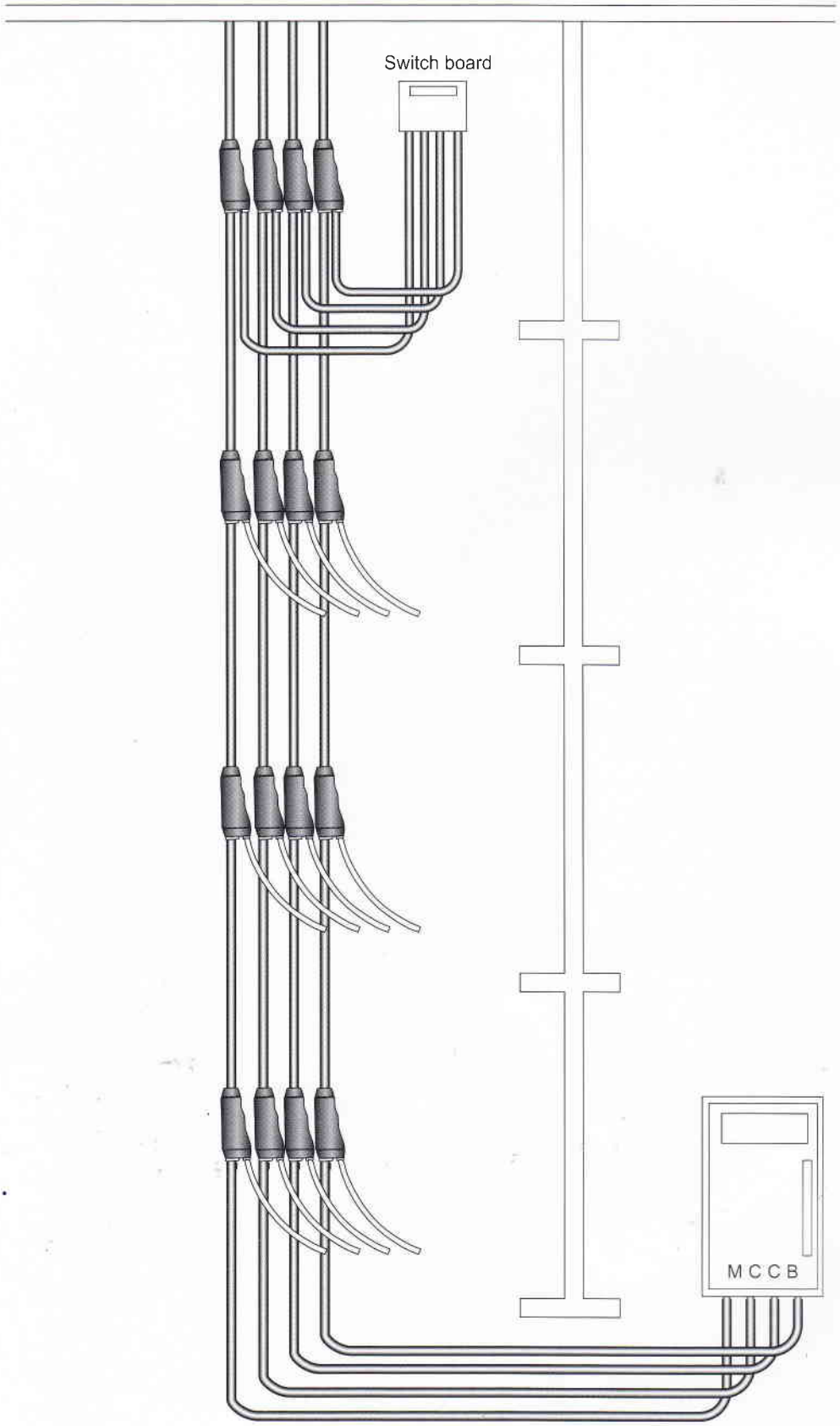
Prefabricated Cable Catalog

NND BRANCH FOR BUILDING
NND BRANCH FOR TUNNEL



NISHI NIPPON ELECTRIC

NND BRANCH SERIES FOR BUILDING



POWER SUPPLY

Advantages

1. Economy
   Total expenses of construction work, including personnel and material expenses, are considerably decreased because of saved manpower at the site.

2. Cutdown of construction period
   Most of the site work is carried out at the factory of NND. It saves time and labor at the site.

3. High quality
   Branch and head-support work that affect the electrical and physical properties of the system are carried out at the factory of NND under severe quality control and a well-arranged working environment.

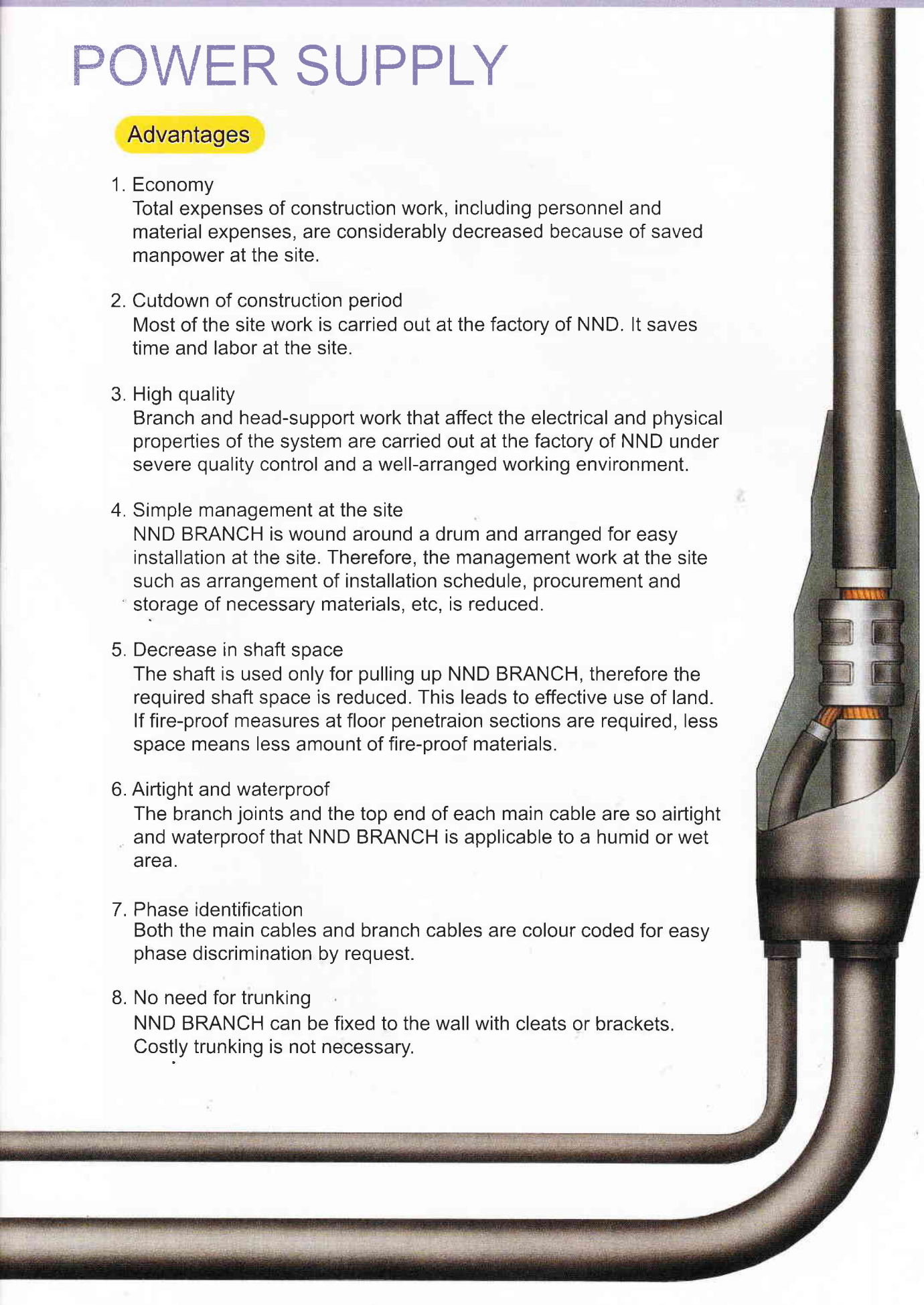
4. Simple management at the site
   NND BRANCH is wound around a drum and arranged for easy installation at the site. Therefore, the management work at the site such as arrangement of installation schedule, procurement and storage of necessary materials, etc, is reduced.

5. Decrease in shaft space
   The shaft is used only for pulling up NND BRANCH, therefore the required shaft space is reduced. This leads to effective use of land. If fire-proof measures at floor penetraion sections are required, less space means less amount of fire-proof materials.

6. Airtight and waterproof
   The branch joints and the top end of each main cable are so airtight and waterproof that NND BRANCH is applicable to a humid or wet area.

7. Phase identification
   Both the main cables and branch cables are colour coded for easy phase discrimination by request.

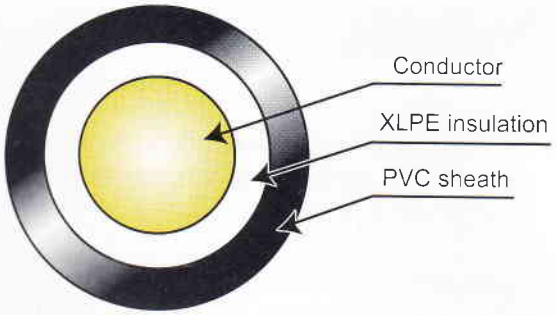
8. No need for trunking
   NND BRANCH can be fixed to the wall with cleats or brackets. Costly trunking is not necessary.



TYPE OF CABLES

Standard main cables and branch cables are Copper Conductor XLPE insulated and PVC Sheathed 0.6/kV Single Core Cables according to IEC60502-1, and flame retardant to IEC60332-1.

Fire resistant cables and halogen-free low-smoke cables are also available.
The construction and characteristics of cables are as follows.



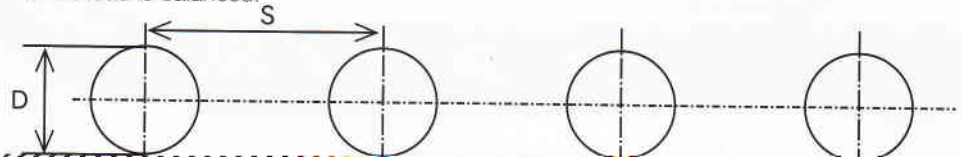
IEC STANDARD PUB. 60502-1

Conductor			Thickness of insulation	Thickness of sheath	Approx. overall diameter	Approx. Weight	A.C. test voltage	Max. conductor resistance (20℃)
Size (mm^2)	Shape (No./mm)	Diameter (mm)	(mm)	(mm)	(mm)	(Kg/Km)	(KV/5min)	(Ω/Km)
10	Compact round stranded	4.05	0.7	1.4	9	150	3.5	1.83
16		4.7	0.7	1.4	10	215	3.5	1.15
25		5.9	0.9	1.4	11	310	3.5	0.727
35		7.0	0.9	1.4	12	410	3.5	0.524
50		8.2	1.0	1.4	13	570	3.5	0.387
70		9.7	1.1	1.4	15	770	3.5	0.268
95		11.4	1.1	1.5	17	1,030	3.5	0.193
120		12.8	1.2	1.5	19	1,280	3.5	0.153
150		14.3	1.4	1.6	21	1,590	3.5	0.124
185		15.8	1.6	1.6	23	1,950	3.5	0.0991
240		18.3	1.7	1.7	26	2,490	3.5	0.0754
300		20.5	1.8	1.8	29	3,140	3.5	0.0601
400		23.3	2.0	1.9	32	4,140	3.5	0.0470
500		26.4	2.2	2.0	36	5,140	3.5	0.0366
630		30.1	2.4	2.2	40	6,440	3.5	0.0283
800		34.8	2.6	2.3	46	8,450	3.5	0.0221
1000		39.0	2.8	2.4	51	10,600	3.5	0.0176

TECHNICAL DATA

Conductor Size (mm^2)	Current rating			Voltage drop Cable installation S=2D V/A · m × 10^{-3}			Voltage drop Cable installation S=D V/A · m × 10^{-3}		
	Single-core Basic (A)	4-cores S=2D ρ=0.95 (A)	4-cores S=D ρ=0.80 (A)	cosθ=0.8	cosθ=0.85	cosθ=0.9	cosθ=0.8	cosθ=0.85	cosθ=0.9
10	89	85	72	1.97	2.07	2.17	1.94	2.05	2.15
16	119	113	95	1.27	1.33	1.39	1.25	1.31	1.37
25	158	150	126	0.836	0.870	0.903	0.809	0.848	0.884
35	191	181	152	0.625	0.648	0.667	0.599	0.625	0.648
50	279	265	223	0.483	0.497	0.508	0.457	0.474	0.489
70	305	290	244	0.360	0.367	0.371	0.335	0.344	0.352
95	365	347	292	0.283	0.285	0.284	0.257	0.262	0.265
120	432	410	345	0.242	0.241	0.238	0.216	0.219	0.219
150	495	470	396	0.212	0.210	0.205	0.186	0.187	0.186
185	558	530	446	0.186	0.182	0.176	0.161	0.160	0.158
240	674	640	539	0.161	0.156	0.148	0.136	0.134	0.130
300	763	725	611	0.146	0.140	0.131	0.121	0.118	0.113
400	889	845	712	0.132	0.125	0.115	0.107	0.103	0.0978
500	1,032	980	825	0.121	0.114	0.104	0.0966	0.0924	0.0864
630	1,211	1,150	968	0.112	0.104	0.0941	0.0881	0.0835	0.0772
800	1,453	1,380	1162	0.106	0.0981	0.0874	0.0825	0.0775	0.0710
1000	1,689	1,605	1352	0.102	0.0934	0.0825	0.0784	0.0732	0.0665

Note: Current rating is calculated under the following conditions;
1. In air, ambient temperature: 40℃
2. Cable formation;
   The decrease rate "ρ" by cable formation is multiplied to the current lating.
   It is decided by D and S of the figure below.
3. The load is balanced.



Branch joint

1. Connecting the conductor

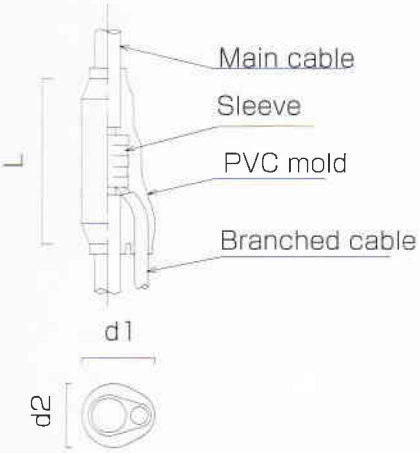
   To joint main cable and branch cable with copper connector.

2. Insulation

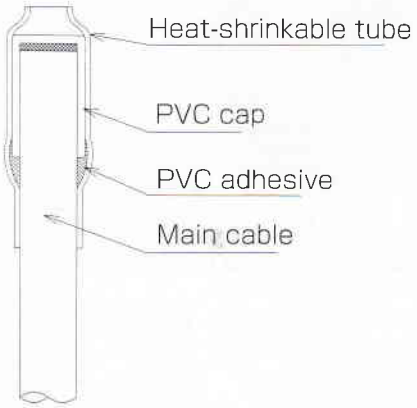
   Branch joints are injection-molded with PVC.

For XLPE/PVC Cable

Branch Mold



Top End



One-Branch

Main Cable Size (㎟)	Branch Cable Min. (㎟)	Branch Cable Max. (㎟)	Dimensions (Approx.) d1 (㎜)	d2 (㎜)	L (㎜)	Number of Plate
10	6	10	40	35	100	M-00
16	6	16				
25	6	25				
35	10	25				
50	16	25	49	41	110	M-01
70	16	35				
95	16	50				
120	16	95	60	47	130	M-02
150	16	95				
185	16	95				
240	16	120	72	56	136	M-03
300	16	120				
400	25	120				
500	25	240	79	52	140	M-04
630	25	240				
800	25	240	94	78	155	M-05
1000	25	240				

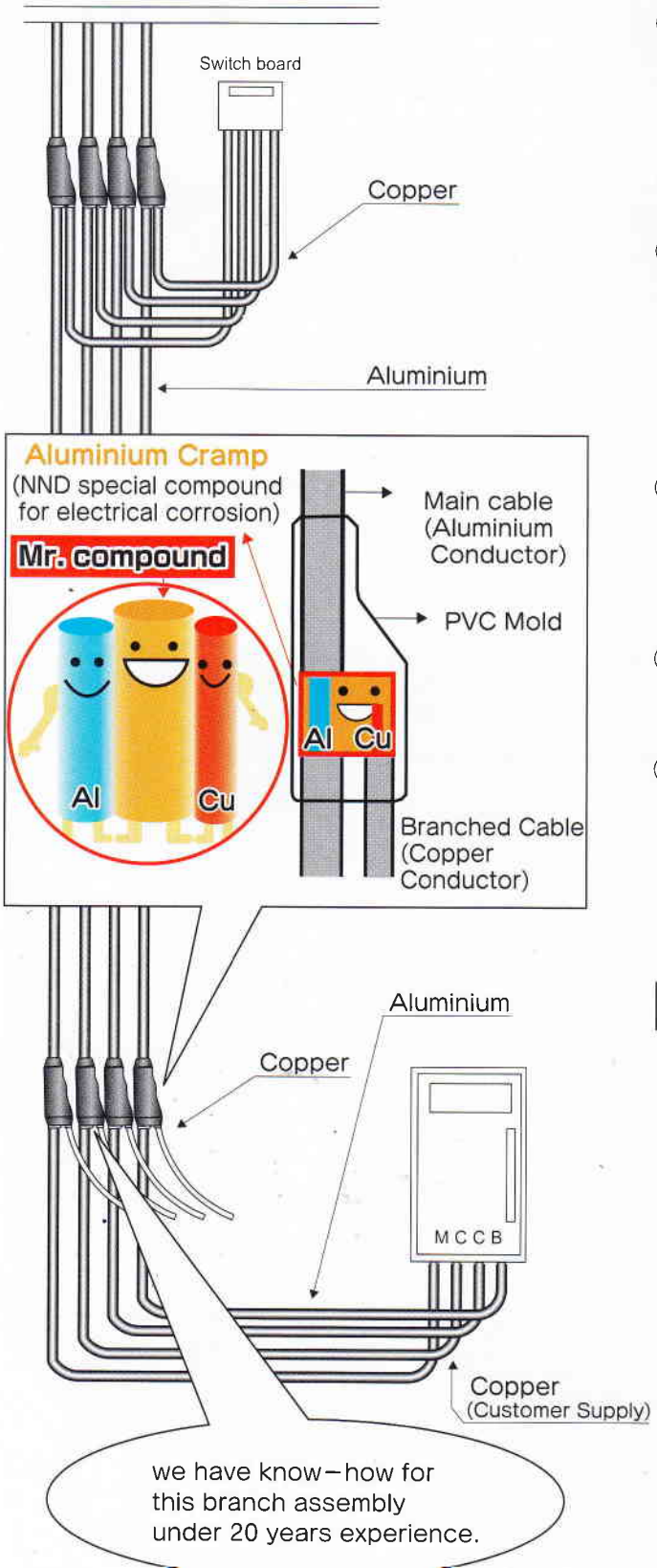
Two-Branches

Main Cable Size (㎟)	Branch Cable Min. (㎟)	Branch Cable Max. (㎟)	Dimensions (Approx.) d1 (㎜)	d2 (㎜)	L (㎜)	Number of Plate
35	10	16	60	47	130	M-02
50	10	16				
70	10	16				
95	10	16				
120	10	25				

Aluminium Branch Cable

(Prefabricated Branch Cable for Building)

Specifications



Advantages

① Cost & Time Saving

a) Material cost can be saved.
b) Easy installation can reduce labour cost at site. Because..
- Prefabrication is made at NND factory
- Easy handling owing to light weight

② Easy connection with switchboard

Since Aluminium branch cable system uses copper branch cable, connection with a switchboard is in the same way as all copper branch cable system. Aluminium cable (Main Cable) is jointed to copper cable (Branch Cable) with a branch mold.

③ Prefabrication in NND factory

Molding is done by NND Factory, fully controlled by Japanese management, who warrants the quality and delivery on time.

④ Power company prefers NND products.

Reliable quality satisfies power company.

⑤ As like long time favoured all copper branch cable.

Aluminium branch cable still boasts the belows.
a) Airtight and waterproof
b) Decrease shaft space
c) Regular maintenance free

See the difference of the weight

- Lightness of Aluminium cable helps you to handle more easily on transportaion and at site.

Weight Comparison between Al & Cu

Conductor (mm^2)	Apprx. Cable Weight (Kg./Km)	
	Aluminium	Copper
120	500	1,280
150	630	1,590
185	740	1,950
240	940	2,490
300	1,160	3,140
400	1,490	4,140
500	1,900	5,140
630	2,370	6,440
800	2,950	8,450
1,000	3,750	10,600

Aluminium Cable Specification

No.of core	Conductor			Nominal thickness of insulation	Nominal thickness of sheath	Approx. overall diameter	Maximum conductor resistance @20℃	Maximum packing length	Approx. cable weight	Current carrying capacity in air @30℃		Current carrying capacity in air @40℃	
	Nominal sectional area	Wire composition	Approx. outer diameter							(Spacing=1d)	(Spacing=2d)	(Spacing=1d)	(Spacing=2d)
	mm²	No./mm	mm	mm	mm	mm	Ω/km	m	kg/km	A	A	A	A
1	120	CRS	13.1	1.2	1.5	19	0.253	1200	500	285	340	260	310
1	150	CRS	14.7	1.4	1.6	21	0.206	1000	630	325	390	300	364
1	185	CRS	16.1	1.6	1.6	23	0.164	1000	740	402	450	356	453
1	240	CRS	18.6	1.7	1.7	26	0.125	1000	940	450	540	418	501
1	300	CRS	20.7	1.8	1.8	28.5	0.100	1000	1160	515	620	475	569
1	400	CRS	23.0	2.0	1.9	31	0.0778	1000	1490	605	720	569	662
1	500	CRS	26.6	2.2	2.0	35.5	0.0605	1000	1900	705	845	645	774
1	630	CRS	30.2	2.4	2.2	40	0.0469	500	2370	815	985	751	895
1	800	CRS	33.7	2.6	2.3	44	0.0367	500	2950	945	1150	871	1050
1	1000	91/3.74	41.14	2.8	2.4	52	0.0291	500	3750	1125	1380	1025	1260

CRS : Compacted round stranded
Tolerance of overall diameter of sheath : Up to 20mm : ± 1.0mm
20mm and above : ± 5%

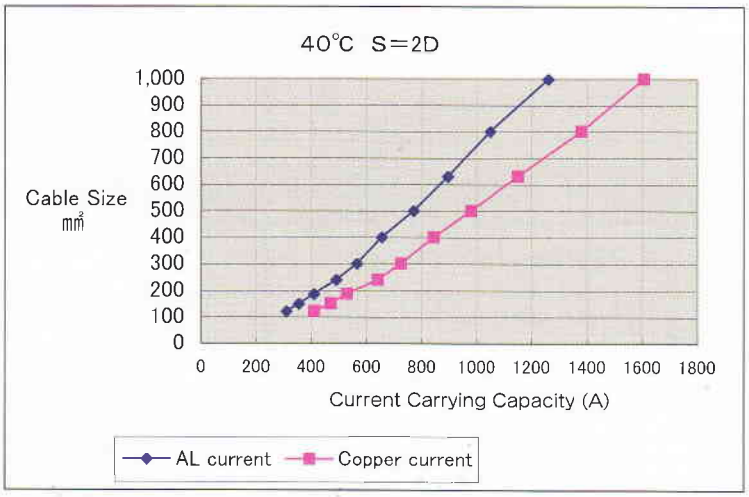
d=Cable overall diameter

【Comparison of Current Carrying Capacity @40℃ between Al & Cu cable】

*2 size-bigger Al cable than Cu is chosen to meet with
the difference of Current Carrying Capacity between Al & Cu.

Conductor (mm²)	S=2D @40℃	
	Aluminium	Copper
120	310	410
150	364	470
185	453	530
240	501	640
300	569	725
400	662	845
500	774	980
630	895	1,150
800	1,050	1,380
1,000	1,260	1,605

※ Applied to size 1,000 mm² or below



Main Cable (Aluminium)

XLPE/PVC Cable, in accordance with IEC60502-1, 60332-1

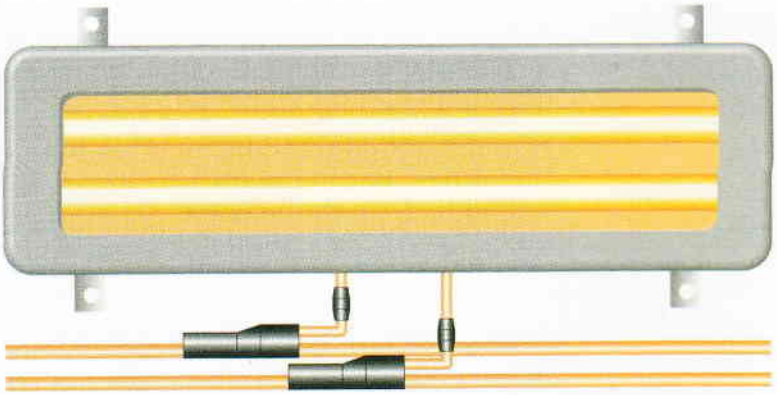
Branch Cable (Copper)

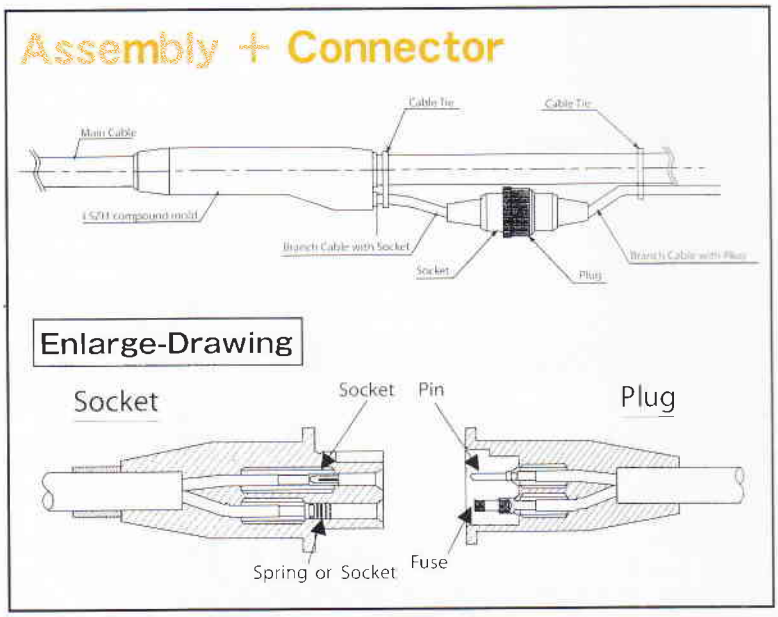
XLPE/PVC Cable, in accordance with IEC60502-1, 60332-1

Branch Joint

Conductor Joint: Sleeve in accordance with JIS C2801
Mold of Branch Section: Black coloured PVC in accordance with JIS C2801

TUNNEL LIGHTING





Standard		Performance complied with standard	
BS6387 Cat. C.W.Z.	Cat. C	Resistance to 950℃ fire for 3 hours.	
	Cat. W	After 650℃ fire for 15 min., resistance to water spray with 650℃ fire for 15 min.	
	Cat. Z	Resistance to 950℃ fire for 15 min. with mechanical shock each 30 sec.	
IEC 60529 :2001	IP68	1st Characteristic "6"	Continue decompression condition of 2Kpa for 8 hours, and no dust accumulation.
		2nd Characteristic "8"	No inundation during immersion for 24 hours under waterproof pressure 0.3Mpa.

BS6387 C.W.Z. : Performance requirements for cables required to maintain circuit integrity underfire conditions.

IEC 60529:2001 : Degrees of protection provided by closures (IP Code)

Characteristic

① Performance

meet the specific requirement of
BS6387C.W.Z. : Fire resistance
IEC 60529 : IP68 Waterproof

② Material

Material is Low Smoke Zero Halogen.

③ High Quality

Branch Assembly & Connector are Prefabricated at the factory under severe quality control and the well-arranged working environment.

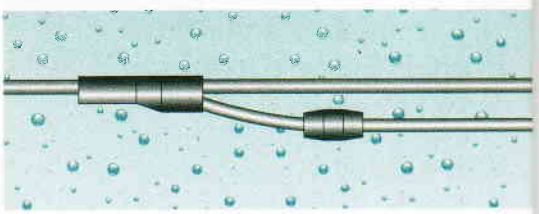
④ Cost Saving

It can be saved the labor cost and time at the site by quick and easy Installation.

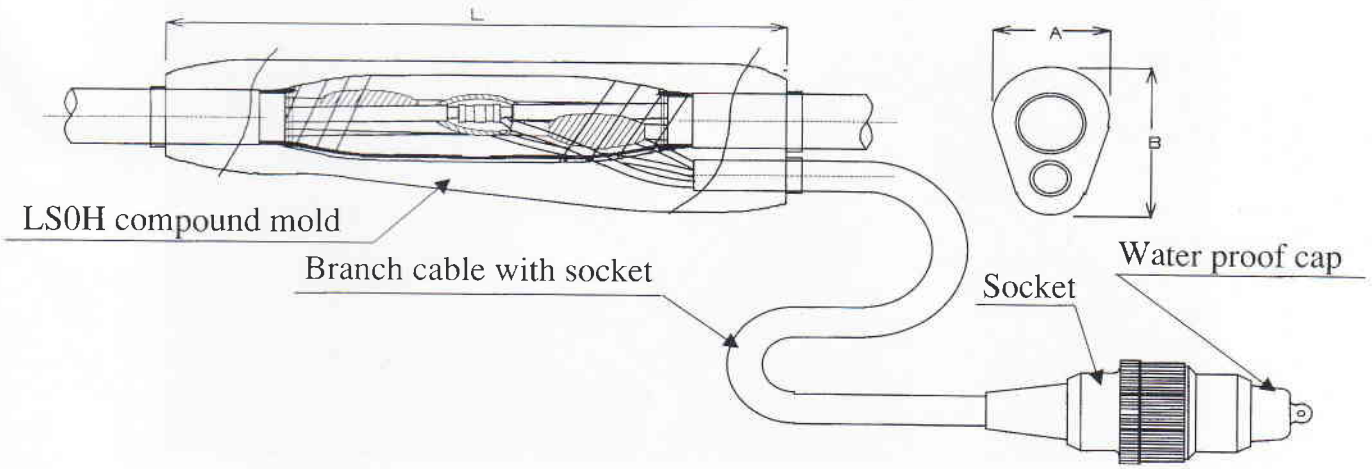
⑤ Performance of Fuse (Up to 15A)

Build in fuse inside connector for better protection of the lighting and for easy trouble shoot the problem.

IEC 60529 (IP68)



Branch cable detailed drawing

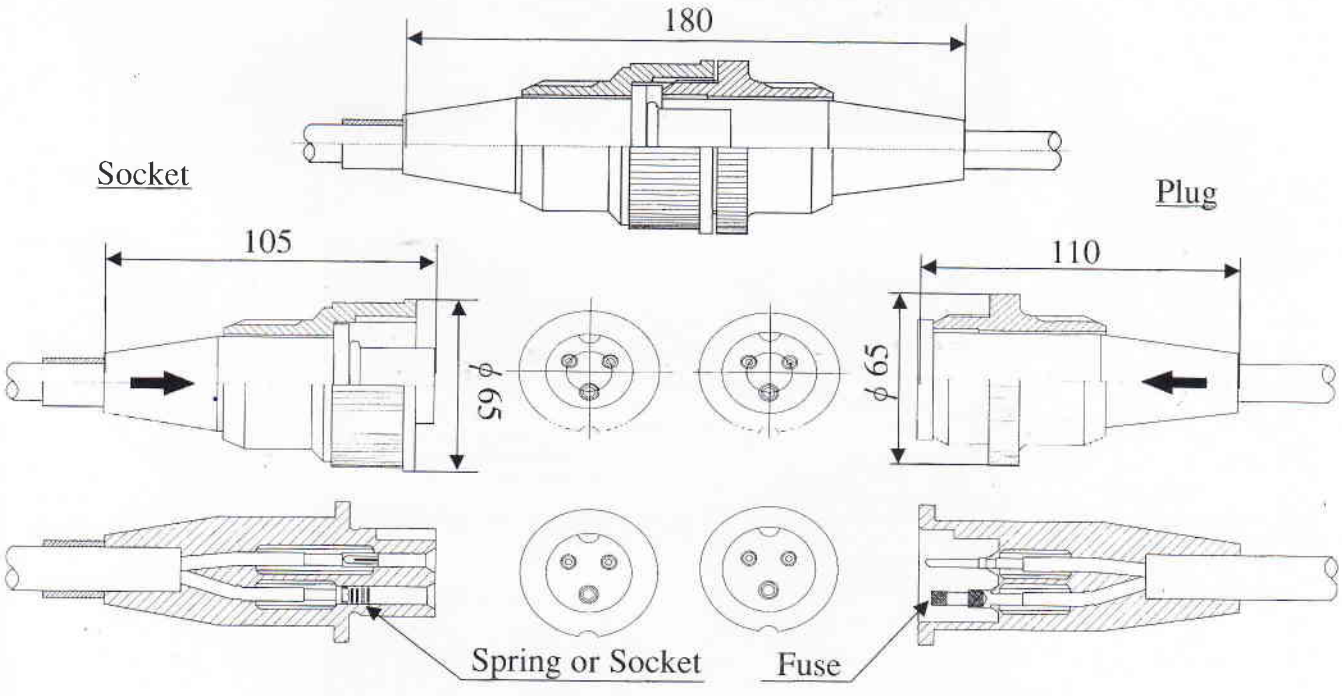


DIMENSION

UNIT:Approx.mm

Main cable	Size	Branch cable	Size	L	A	B
FR/SWA/LSOH	5C×35mm²	FR/LSOH	3C×2.5mm²	300	65	80
FR/SWA/LSOH	5C×25mm²	FR/LSOH	3C×2.5mm²	300	65	80
FR/SWA/LSOH	5C×16mm²	FR/LSOH	3C×2.5mm²	270	52	70
FR/SWA/LSOH	5C×10mm²	FR/LSOH	3C×2.5mm²	270	52	70
FR/SWA/LSOH	5C×6mm²	FR/LSOH	3C×2.5mm²	270	52	70
FR/SWA/LSOH	5C×4mm²	FR/LSOH	3C×2.5mm²	230	46	58
FR/SWA/LSOH	5C×2.5mm²	FR/LSOH	3C×2.5mm²	230	46	58

Fire proof connector detailed drawing



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