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Since 1991
트로리바 전문업체

Insulated Conductor Rails

for electric-power feeding

트로리바 – Trolley bar



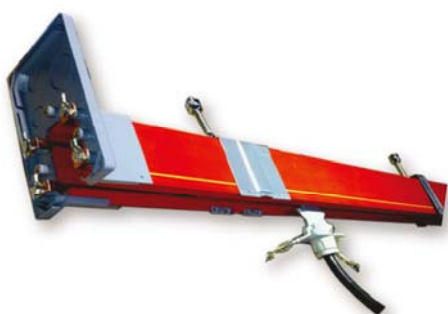
Registered ISO 9001:2008



 LEEYOUNG Ind. Co., Ltd.
주식회사 이영



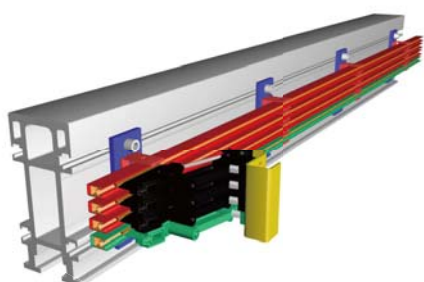
Enclosed type conductor rail (LCL)



Enclosed type conductor rail (MCL)



High current conductor rail (HCL)



Uni-pole conductor rail (UCL)



Compact conductor rail

Enclosed type conductor rail -LCL-

닥트 타입 트로리바는 밀폐형 절연제품으로 이동하는 모든 대차 크레인, 호이스트, 폴러, 스테커 크레인 등에 안전하게 전원공급이 가능한 제품으로 닥트 내부에 동선이 내장되어 있어 동선의 부식이 적으며, 고무커버를 취부하여 옥외 및 분진, 가스, 수분 등이 발생하는 열악한 환경에도 설치가 가능한 제품입니다.

화학적 특성 -Chemical resistant-

가솔린 원유, 벤젠, 황산나트륨, 염산 등에 화학적 내구성을 갖는다.
 gasoline crude, benzene, sodium, sulfate, hydrochloric acid.

기계적 특성 -Mechanical properties-

휨력 [Bending force] : 831 kp/cm² [831 x 14.2psi]
 인장강도 [Tensile strength] : 491 kp/cm², 신률[Elongation] 3.2 %
 파괴강도 [Breaking strength] : 345 kp/cm², 신률[Elongation] 36 %

최대이동속도 -Travel speed-

Straight line : 200 m/min Curved line : 50 m/min
 *more special speed : on requested

전기적 특성 -Electrical properties-

Creepage path : min. 30mm
 Dielectric strength : 31.2 kv/mm
 Surface resistance : 11 x 10¹³ohm x cm(dry)
 Protection class : IP 23 with rubber covering
 Voltage : 600V

The insulated power conductor rail is a totally enclosed conductor system to be used for the safe electric power feeding of Overhead Cranes, Monorail, Hoists, Automated Warehouse, Auto-Door and other mobile applications. The insulated power conductor rail makes up copper lines inside which can be installed rubber-cover to prevent corrosion and dust in harsh environment.

사용온도 -Temperature range-

- 30 °C to + 60 °C (standard design)

최소곡률반경 -Min. curved radius-

Minimum : R = 600 mm

최대곡선길이 -Max. curved length-

Maximum : L = 3,500 mm

전압강하 계산식 -Calculation of Voltage-Drop-

AC : $\Delta u = \sqrt{3} \times J \times l \times Z / 1000$

DC : $\Delta u = 2l \times J \times R / 1000$

Δu = Voltage(V)

J = Amperage(A)

Z = Impedance ohms/1000(m)

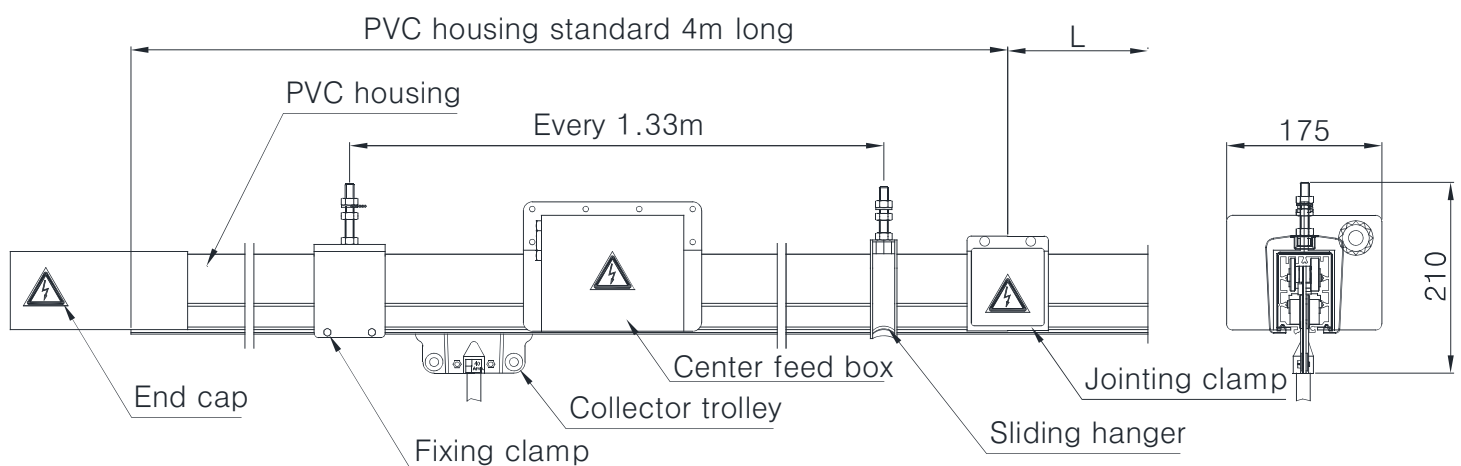
R = Resistance ohms/1000(m)

L = Length(m)

l = L Power feed positioned at end

L/2 Power feed positioned at center

Copper mm ²	Amperes (at 20 °C)			D.C Ohm resistance R in Ohm s per km	Impedance Z by 3~Ohm s per km
	100%ED	60%ED	40%ED		
15	60	66	70	1.233	1.258
25	100	114	123	0.752	0.787
35	140	162	180	0.537	0.585
50	180	210	248	0.375	0.427



※ In accordance with our company's policy of continued improvement, we reserve the right to amend specifications and details at any time.

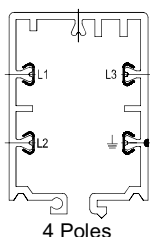
Parts of the Enclosed type conductor rail -LCL-

PVC 덕트 및 도체 -PVC housing w/cu-

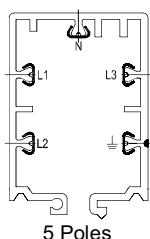
난연성 재질인 PVC 하우징은 기본 4m 이고 4poles에서 7poles까지 사용이 가능하며, 집전장치의 상(Phase) 바뀔을 방지하기 위한 안전한 구조로 되어 있다. 그리고 도체연결 방식은 연결단자를 이용한 볼트 방식으로 사용하여 설치 및 유지보수가 편리하게 되어 있다.

The insulated PVC housing is impact resistant & non-inflammable and standard length is 4000mm. It can take up min.4 poles to max.7 poles that the collector trolley can only be installed in one way and prevents cross phasing.

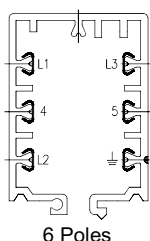
The each copper-conductor will be connected by screw-on method that installation and maintenance are very conveniences.



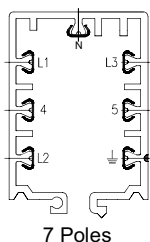
PVC housing with CU & Joint cover				Copper cross section mm^2			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
4 poles	60A	LCL-4001	2.070 kg/m	3 X 15		15	
	100A	LCL-4002	2.490 kg/m	3 X 25		25	
	140A	LCL-4003	2.865 kg/m	3 X 35		35	
	180A	LCL-4004	3.031 kg/m	3 X 50		50	



PVC housing with CU & Joint cover				Copper cross section mm^2			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
5 poles	60A	LCL-5001	2.220 kg/m	3 X 15	15	15	
	100A	LCL-5002	2.730 kg/m	3 X 25	25	25	
	140A	LCL-5003	3.195 kg/m	3 X 35	35	35	
	180A	LCL-5004	3.435 kg/m	3 X 50	50	50	



PVC housing with CU & Joint cover				Copper cross section mm^2			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
6 poles	60A	LCL-6001	2.372 kg/m	3 X 15		15	15
	100A	LCL-6002	2.870 kg/m	3 X 25		25	15
	140A	LCL-6003	3.152 kg/m	3 X 35		35	15
	180A	LCL-6004	3.570 kg/m	3 X 50		50	15



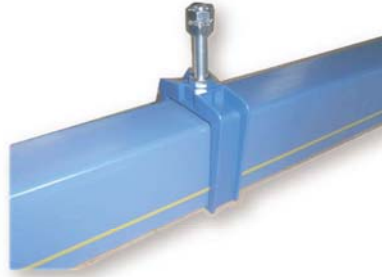
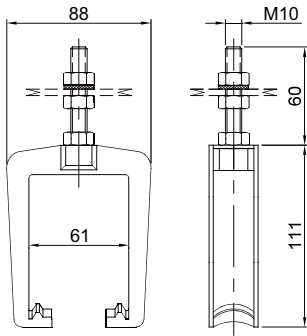
PVC housing with CU & Joint cover				Copper cross section mm^2			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
7 poles	60A	LCL-7001	2.507 kg/m	3 X 15	15	15	15
	100A	LCL-7002	3.115 kg/m	3 X 25	25	25	15
	140A	LCL-7003	3.482 kg/m	3 X 35	35	35	15
	180A	LCL-7004	4.005 kg/m	3 X 50	50	50	15
	280A 140A X 2	LCL-2801	3.872 kg/m	6 X 35		35	

7-pole per
phase 2 conductor
in parallel + earth

유동지지대 -Sliding hanger-

유동지지대는 Bracket에 설치하여 닥트를 지지해 주며 온도변화에 따른 PVC 닥트의 수축 및 이완 작용을 보완할 수 있는 구조로 되어있다. 사용 환경에 따라 직선구간은 1m ~ 1.5m 간격으로, 곡선구간은 0.5m~1m 간격으로 설치 하여야 하며 이동대차의 속력에 따라 설치 간격을 조정하도록 한다.

The hanger is suspended from mounting brackets via M10 Fastening Nut and also shall be slid freely from expansion or shrinkage of the PVC housing depend on ambient temperature condition. Standard distance of hanger supports are Straight-line 1m ~ 1.5m long and Curved-line 0.5m - 1m long. Also, the pitch distance of hanger should be adjusted depend on the running speed.

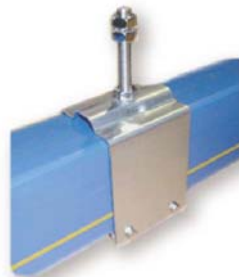
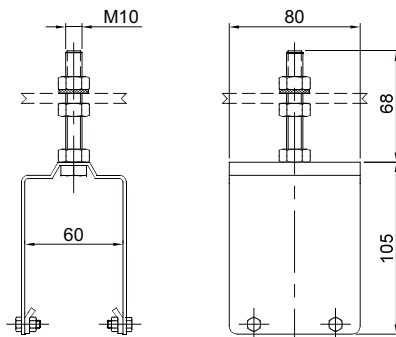


Order No.	LSH-0001
Weight	0.140 kg

고정지지대 -Fixing clamp-

MAIN 전원이 인입되는 인접부위에 설치되어 온도변화에 따른 닥트의 수축 및 이완작용 시 밀림을 방지하는 역할을 한다.

The fixing clamp should be installed for the electric supply at end feeding or center feeding point. It can be prevented shrinkage and expanding of PVC housing depend on temperature condition.

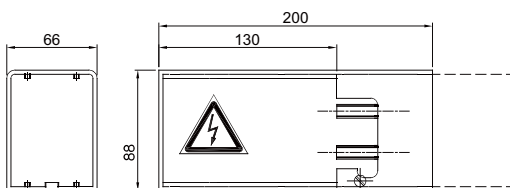


Order No.	LFC-0001
Weight	0.510 kg

끝마개 -End cap-

제품설치 후 한쪽 끝단이나 양쪽 끝단의 마감에 사용된다.

The end-cap should be installed for a safety at the end of the insulated power conductor rail system.

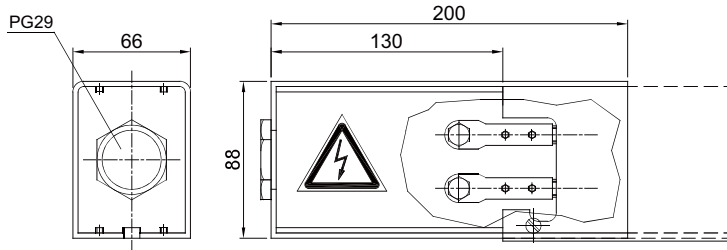


Poles	Order No.	Weight
4, 5 poles	LEC-5001	0.240 kg
6, 7 poles	LEC-7001	0.240 kg

종단 전원인입박스 -End feed box-

MAIN 전원을 끝단에서 공급할 경우 필요한 부품이다.
(최대 길이 80m 이상일 경우 중간전원이 적합함.)

For connecting the electric supply cable to the copper conductor,
it will be installed at the end of the insulated
power conductor rail system.(maximum line length : within 80m long)



Ampere	Order No.			
	4 poles	5 poles	6 poles	7 poles
60A	LEF-4001	LEF-5001	LEF-6001	LEF-7001
100A	LEF-4002	LEF-5002	LEF-6002	LEF-7002

Weight : 0.474 kg (7 poles, 100A.)

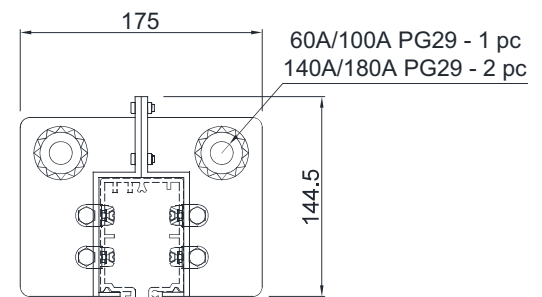
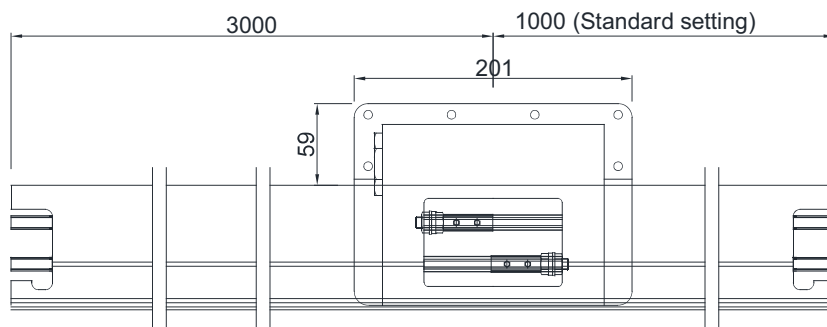
중간 전원인입박스 -Center feed box-

설비의 길이가 길거나 타원형, 곡선구간 또는 분기구간 등 전원공급이
중간에서 필요한 경우 사용되는 부품으로, 설계 시 요구하는 위치에서
전원공급이 가능하다

For connecting the supply cable to the copper conductor, it will be
installed at the center of the insulated power conductor rail system.
(line length : over 80m long,)



<중간전원인입 박스 사용 예>



Ampere	Order No.			
	4 poles	5 poles	6 poles	7 poles
60A	LCF-4001	LCF-5001	LCF-6001	LCF-7001
100A	LCF-4002	LCF-5002	LCF-6002	LCF-7002
140A	LCF-4003	LCF-5003	LCF-6003	LCF-7003
180A	LCF-4004	LCF-5004	LCF-6004	LCF-7004
280A	(140A X 2)			LCF-2801

Weight : 0.88 kg (7 poles, 180A.)

집전기 -Collector trolley-

PVC 하우징에 내장된 도체와 접촉하여 전류를 장치(대차, 호이스트, 크레인 등)에 전달시키는 역할을 한다. PVC 하우징 내부에서 구동되어 이탈현상이 없으며, 도체와의 접촉불량으로 인한 단락 및 ARC 발생이 없다.
 전기용량에 따라 여러 개를 연결하여 고용량의 장치에도 사용이 가능하다.

The collector trolley is operated inside the conductor of PVC housing.

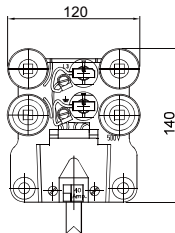
There are no separation from PVC housing and no arc.

According to specification, the current collecting trolley is effected by spring tension and it can be connected with few units for high current.

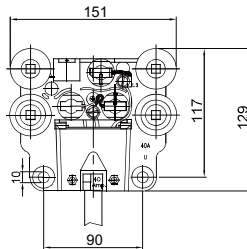


4~5 poles

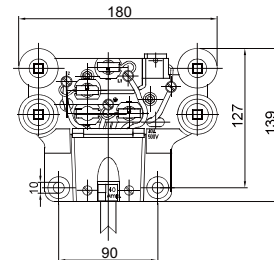
6~7 poles



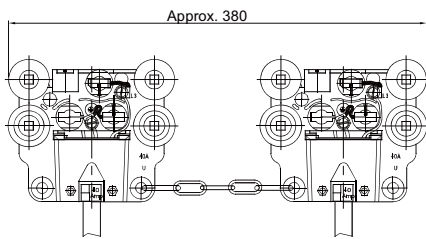
Collector trolley 4 Poles 40A.
Small type.



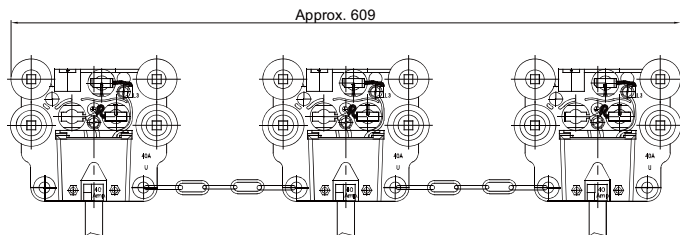
Collector trolley 40A
with 1.5m cable 4.0mm²



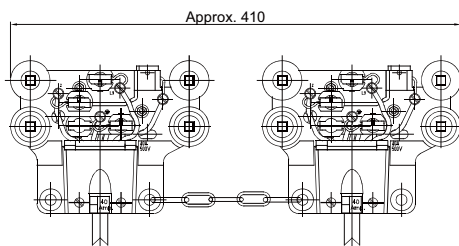
Collector trolley 6 or 7 Poles
40A. With 1.5m cable 4.0mm²



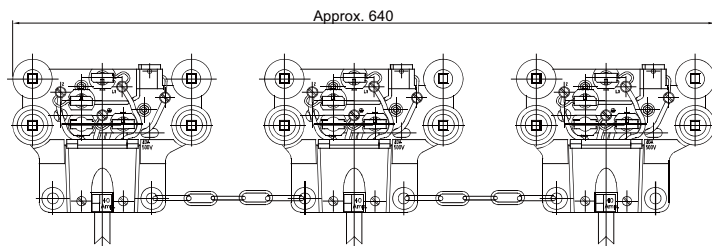
Collector trolley 4 or 5 Poles
Double type.



Collector trolley 4 or 5 Poles
Triple type.



Collector trolley 6 or 7 Poles
Double type.



Collector trolley 6 or 7 Poles
Triple type.

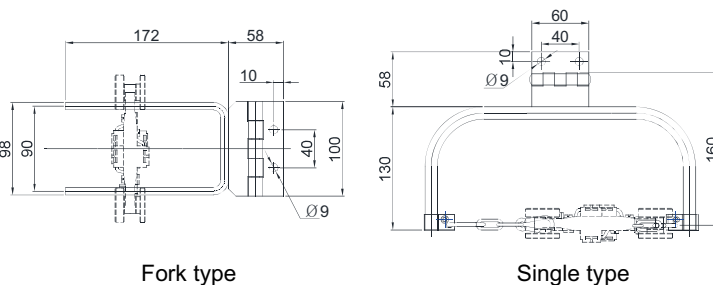
Ampere	4 poles		5 poles		6 poles		7 poles	
	Order No.	Weight	Order No.	Weight	Order No.	Weight	Order No.	Weight
40A	LCT-4401	0.87 kg	LCT-5401	1.05 kg	LCT-6401	1.50 kg	LCT-7401	1.70 kg
40A(Small type)	LCTS-4401	0.84 kg						
80A	LCT-4801	1.76 kg	LCT-5801	2.12 kg	LCT-6801	3.02 kg	LCT-7801	3.42 kg
120A	LCT-4120	2.65 kg	LCT-5120	3.19 kg	LCT-6120	4.93 kg	LCT-7120	5.13kg

집전기걸이 -Towing arm-

이동하는 장치의 구조물에 부착되어 집전기를 끌고 다니는 역할을 하며, 집전기의 사양에 맞는 제품을 사용한다.

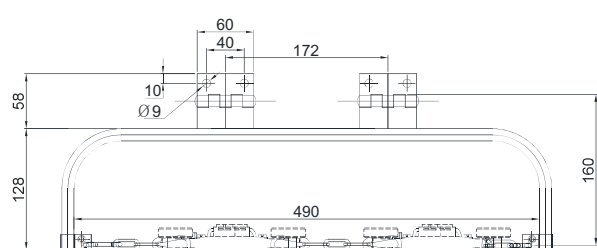
The towing arm is installed(attached) to the moving machinery and also connected with the collector trolley via chains.

Poles	Order No.	Weight
Fork type	LTA-4001	0.25 kg
Single type	LTA-1001	0.45 kg
Double type	LTA-2001	0.65 kg
Triple type	LTA-3001	1.75 kg
Single spring type	LSTA-001	1.80 kg

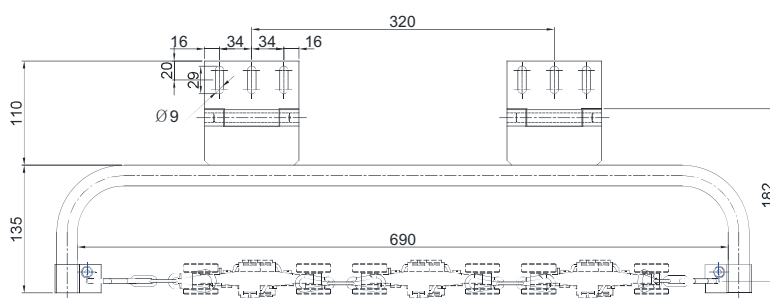


Fork type

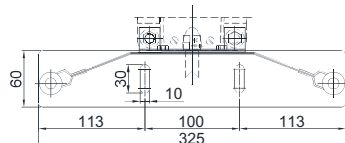
Single type



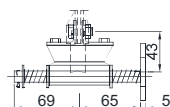
Double type



Triple type



Single spring type

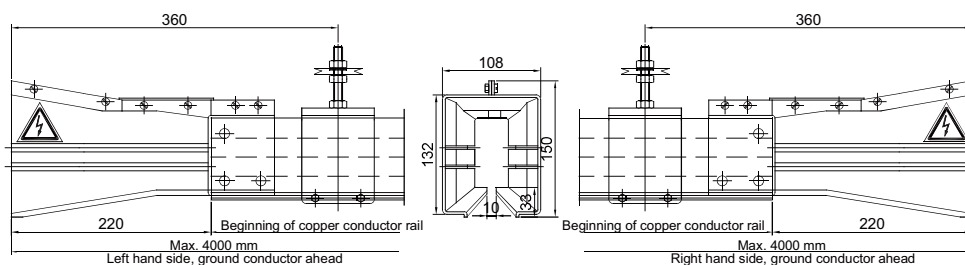


나팔관 -Entry & Exit Transfer guides-

기계 및 설비의 분기구간 등에 사용되며 집전기의 진/출입이 가능한 구조로 되어 있으며, 나팔관 사용시에는 Single spring type의 집전기 걸이를 사용하여야 한다.

These units are for the passage of collector trolley through conductor transfer on the turn or slide switch.

When you apply the entry and exit guide units, you should use the single spring type for collector trolley.



Weight : 0.72 kg

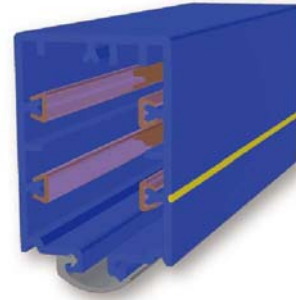
Ampere	poles	Left	Right	Ampere	poles	Left	Right
60A	4-5poles	LEG-5001	LEG-5111	100A	4-5poles	LEG-5002	LEG-5112
	6-7poles	LEG-7001	LEG-7112		6-7poles	LEG-7002	LEG-7112
140A	4-5poles	LEG-5003	LEG-5113	180A	4-5poles	LEG-5004	LEG-5114
	6-7poles	LEG-7003	LEG-7113		6-7poles	LEG-7004	LEG-7114

고무커버 -Rubber cover-

분진, 수분, 가스등으로 인한 도체부식을 방지하기 위해 사용되며,
 특히 옥외설치 시 비 혹은 눈 등으로 인한 하우징 내부의 수분 침투를
 방지하기 위해 사용된다.

* IP23 (with rubber cover).

This rubber cover is recommended for all outdoor
 installations and specific industries, e.g. Concrete/Brick
 works, Galvanizing plant, Coal storage and/or in order to
 prevent a dust, moisture and occurrence of corrosion.



Order No.	LRC-1001
Weight	0.105 kg

Spare parts

연결단자 -Screw on connector-

PVC 하우징 한 본당 필요한 수량만큼 공급되며, 공급되는 닥트의 사양에 맞추어 사용된다.

The screw on connector will be used for the connection of copper conductor.

For 15 sqmm(60A) Order No. LSC-0060 Weight : 0.018kg	30	For 25 sqmm(100A) Order No. LSC-0100 Weight : 0.020 kg	30	For 35, 50 sqmm(140A, 180A) Order No. LSC-0140 Weight : 0.030kg	48

연결덮개 -Jointing clamp-

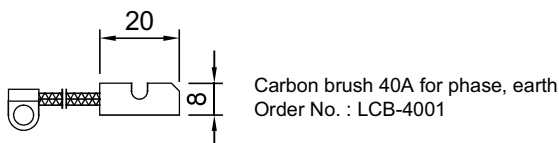
PVC 하우징 한 본당 1개씩 공급되며 공급되는 닥트의 사양에 맞추어 사용된다.

The jointing clamp will be used for a connection of PVC housing.

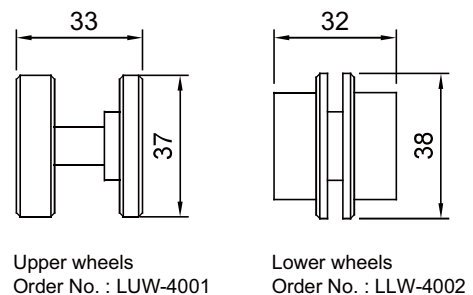
92	150
107	107
For 4,5 poles 60, 100A Order No. : LJC-4001 Weight : 0.114 kg	For 4,5 poles 140, 180A and 6,7 poles Order No. : LJC-7001 Weight : 0.190 kg



집전기용 카본 브러쉬 -Carbon brush-

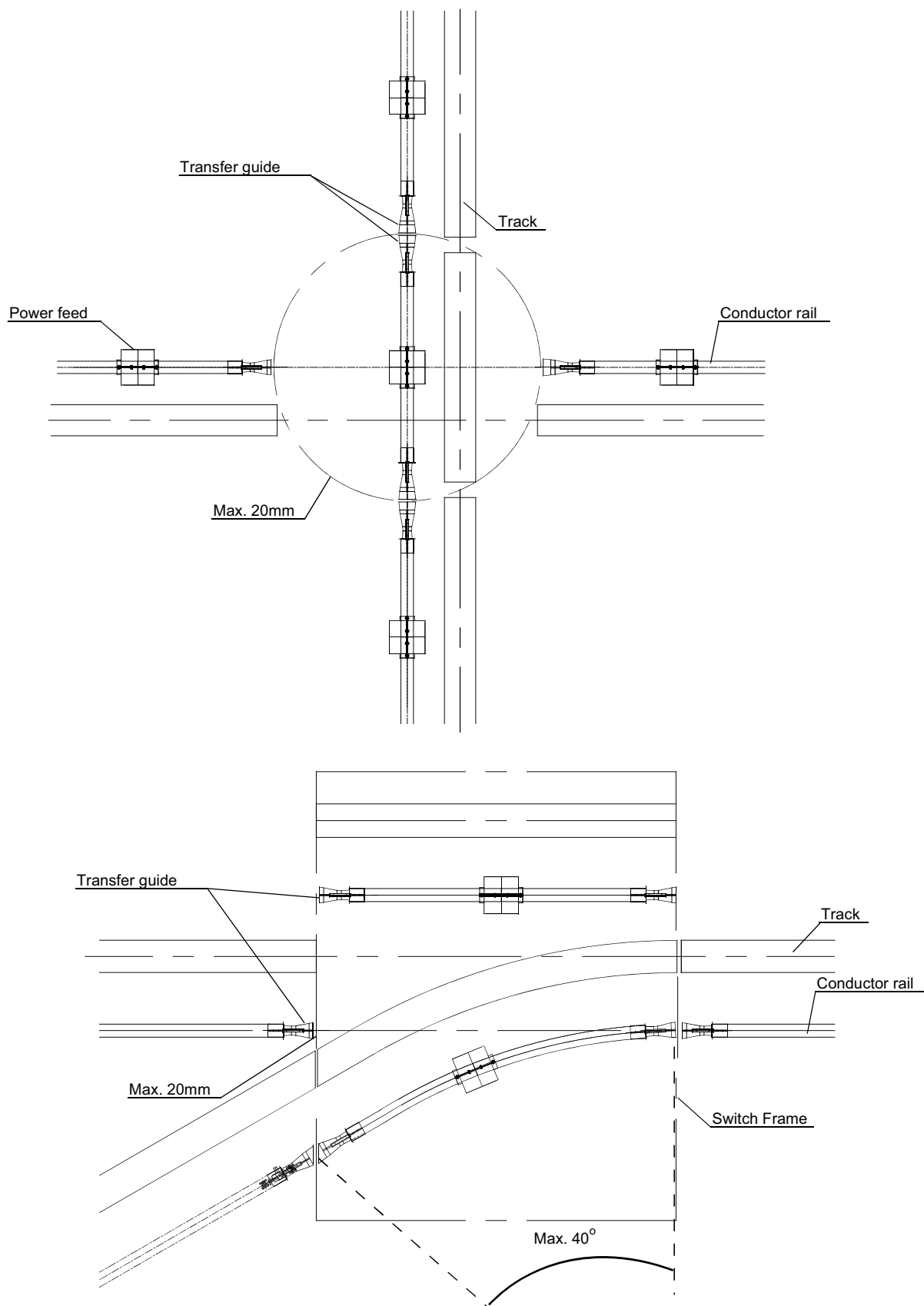


집전기용 휠 -Wheel-



분기구간

(Transfer and switch arrangements in Insulated power conductor rail system installations)



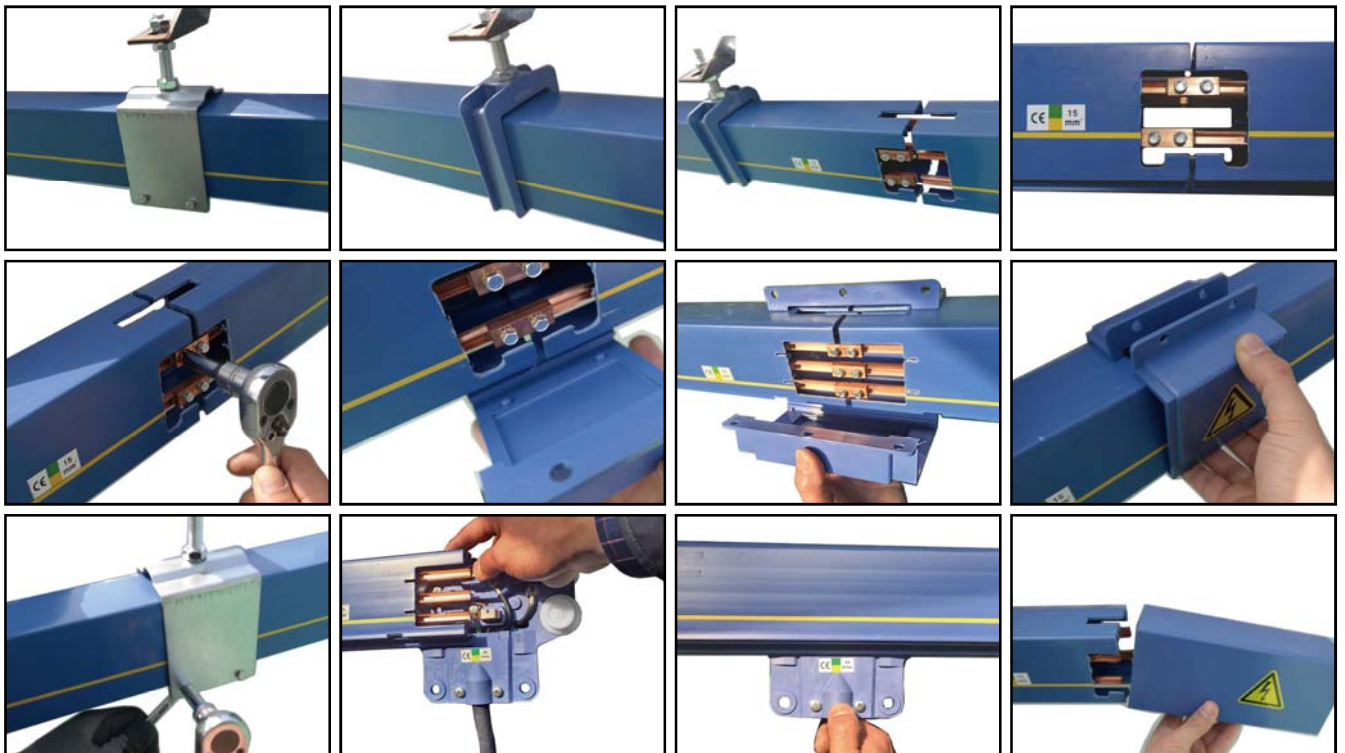
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설치 및 점검

Installation and maintenance of the insulated power conductor rail.

설치 -Installation-

1. 인입전원의 위치를 확인 후 브라켓을 부착하기 위한 거리를 산정한다.
 2. 브라켓 제작 시 유동지지대를 취부시키기 위해 볼트 규격 M10 size의 장공형태로 제작하여 구조물에 수직, 수평을 맞추어 용접 혹은 조립식으로 부착한다.
 3. 유동지지대 및 고정지지대를 브라켓에 조립 시 수평 및 수직을 맞추어 취부한다.
 4. 닥트를 유동 및 고정지지대에 취부하며 도체 연결 시 닥트 한쪽 면의 노란 실선(접지선)이 연속적으로 이어지게 설치되어야 한다. 닥트의 취부가 끝난 후, 도체와 도체를 볼트타입의 콘넥터로 연결 후 연결덮개를 조립한다.
 5. 닥트 및 도체의 연결이 끝난 후, 한쪽 끝 또는 중앙에 전원 공급박스를 설치하고, 대차 및 크레인 이 점지하여 있는 위치에 집전기 걸이를 부착하여 집전기를 취부한다.
 6. 끝마개를 이용하여 한쪽 또는 양쪽 끝단을 마무리하고, 필요 시 고무카바를 하우징 하부에 취부한다.
 7. 전원 공급 박스에 인입(Main)전원을 연결하고 집전기와 대차의 전원을 연결한다.
1. To check the Location of electric supply and then check the Length for bracket installation.
 2. To install the Brackets, it should be made with M10 size hole and also mounted horizontal and vertically on the construction in order to install the sliding hanger and fixing clamp.
 3. Sliding hanger & Fixing clamp should be installed on bracket by horizontal & vertically.
 4. The PVC housing should be installed on sliding & fixing clamp. Then the yellow line(for earth) of PVC housing should be connected continuously, like a line. The screw on connector should be connected for the copper conductor at first and then jointing clamp / fixing clamp should be mounted on PVC housing lately.
 5. After a connection of copper conductor and PVC housing, end feed box or center feed box for the electric power connection should be mounted at center or end of PVC housing and the collector trolley should be installed & connected with moving machine via trolley arm.
 6. To finish installation, the end plate should be installed for the electrical safety at the end. If the rubber covering is needed, it can be installed at bottom of PVC housing.
 7. To supply electric power, please connect between the feed box and input power cable after the connection of collector trolley with a control pannel of moving machine.



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설치 후 점검사항 -Checking point-

1. 닥트의 설치상태가 주행레일과 수직 및 수평이 맞는지 확인한다.
2. 닥트가 Sliding이 잘되도록 유동지지대가 부착되어 있는지 확인한다.
3. 닥트의 노란 실선(접지선)이 연속적으로 이어져 있는지 확인한다.
4. 집전기 주행 시 장애물이 없는지 확인한다.

운용 시 점검사항

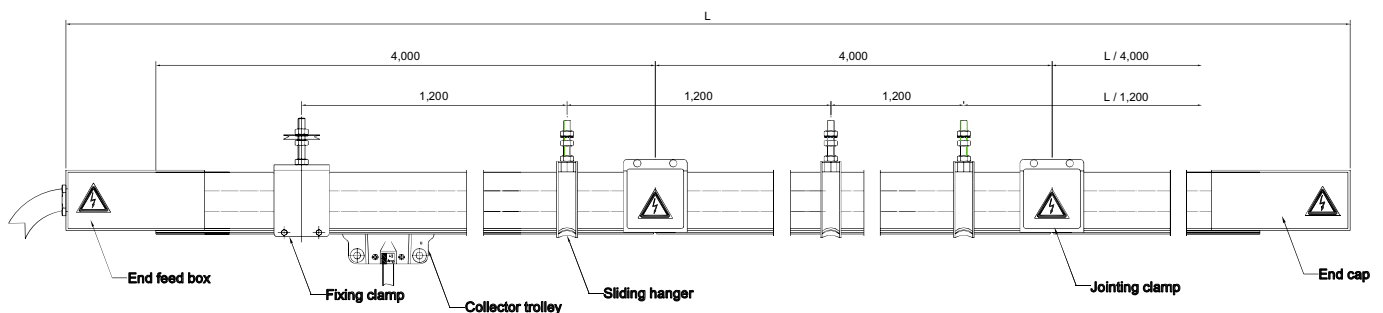
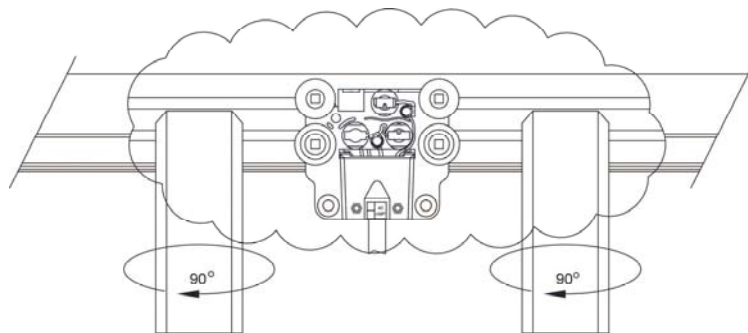
1. 정기 점검 시 또는 주기적으로 집전기의 상태를 점검한다.
2. 카본 브러시의 일반적인 주행거리는 약 5,000km이나, 현장 여건 및 환경에 따라 차이가 있으므로 점검 시 마모상태를 확인하여 필요 시 교체하도록 한다.

집전기 점검방법

PVC닥트의 끝단이나 레일의 연결부에서 집전기를 빼내어 점검이 가능하나 상황이 여의치 않을 경우 PVC닥트의 폭보다 조금 넓은 나무토막 등을 집전기의 앞뒤로 삽입 후 나무토막을 비틀어 하우징을 강제로 벌린 후 집전기를 꺼낼 수 있으며, 집전기를 삽입 시에는 상(Phase) 바뀔 위험이 없도록 방향을 확인하고 꺼낼 때와 같은 방법으로 하우징을 벌린 후 집전기의 각 브러시가 바른위치에 가도록 확인하며 집전기를 삽입 후 나무토막을 제거하면 된다.
(긴급상황 시 조치법으로 보다 안전에 유의하여 조치한다.)

Specially, you can remove the collector at the middle of PVC housing as follows picture.

- Prepare 2 pcs of wood plate which width is bigger than housing width
 - Insert the wood plates at the right and left side of collector
 - Turn over each plate to 90 angle and then you can draw out the collector
 - After replacement, it can be installed the reverse procedure
- Above procedure, you should be careful for a safety.



Parts of the Aluminum type conductor rail -ACL-

알루미늄 하우징 -Aluminum housing-

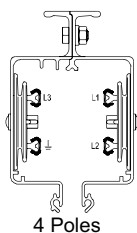
주위온도가 60℃ 이상의 고온인 현장에서 사용하며 최대 100℃까지 사용이 가능함.

PVC닥트와 호환이 가능하여 4poles에서 7poles까지 사용이 가능.

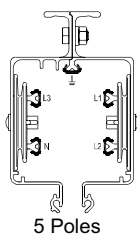
*PVC닥트와 연결 시 Junction unit(Length = 2m)이 필요함.

The Aluminum Power conductor rail(ACL) is supplied in standard with 4 ~ 7poles and used for max.100℃ ambient temperature. Also, it can be possible to be combined with PVC Power conductor rail. If you want to apply both system, please contact us.

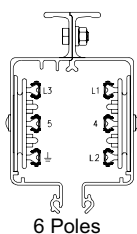
*When it is applied with PVC housing, the Junction unit(Length=2m) should be needed for combined system.



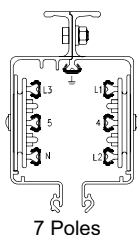
Aluminum housing with CU & Joint cover				Copper cross section mm ²			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
4 poles	60A	ACL-4001	3.880 kg/m	3 X 15		15	
	100A	ACL-4002	4.150 kg/m	3 X 25		25	
	140A	ACL-4003	4.450 kg/m	3 X 35		35	
	180A	ACL-4004	5.350 kg/m	3 X 50		50	



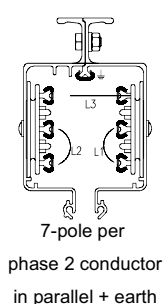
Aluminum housing with CU & Joint cover				Copper cross section mm ²			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
5 poles	60A	ACL-5001	4.015 kg/m	3 X 15	15	15	
	100A	ACL-5002	4.375 kg/m	3 X 25	25	25	
	140A	ACL-5003	4.765 kg/m	3 X 35	35	35	
	180A	ACL-5004	5.250 kg/m	3 X 50	50	50	



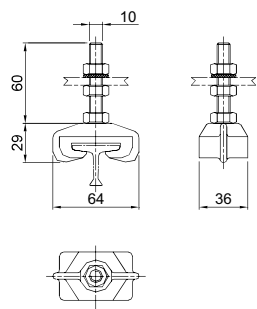
Aluminum housing with CU & Joint cover				Copper cross section mm ²			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
6 poles	60A	ACL-6001	4.285 kg/m	3 X 15		15	15
	100A	ACL-6002	4.420 kg/m	3 X 25		25	15
	140A	ACL-6003	4.720 kg/m	3 X 35		25	15
	180A	ACL-6004	5.070 kg/m	3 X 50		25	15



Aluminum housing with CU & Joint cover				Copper cross section mm ²			
Poles	Ampere	Order No.	Weight	L1,L2,L3	N	Earth	Control line
7 poles	60A	ACL-7001	4.420 kg/m	3 X 15	15	15	15
	100A	ACL-7002	4.645 kg/m	3 X 25	25	25	15
	140A	ACL-7003	5.035 kg/m	3 X 35	35	25	15
	180A	ACL-7004	5.520 kg/m	3 X 50	50	25	15
	280A 140A X 2	ACL-2801	4.005 kg/m	6 X 35		25	

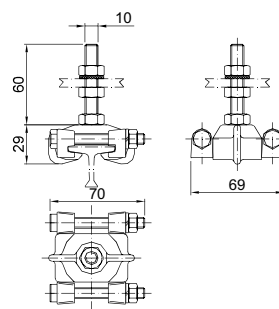


유동지지대 -Sliding hanger-



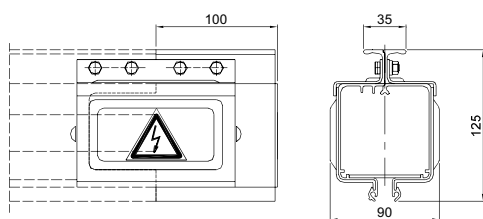
Order No.	ASH-0001
Weight	0.165 kg

고정지지대 -Fixing clamp-



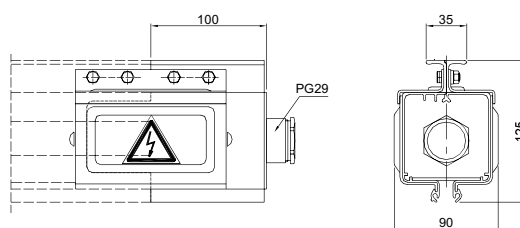
Order No.	AFC-0001
Weight	0.325 kg

끝마개 -End cap-



Order No.	AEC-0001
Weight	0.490 kg

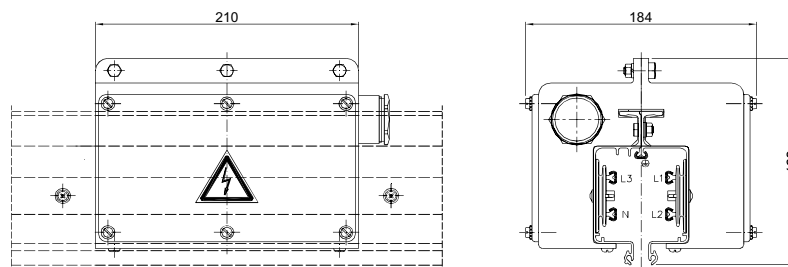
종단 전원인입 박스 -End feed box-



	Poles			
Ampere	4poles	5poles	6poles	7poles
60A	AEF-4001	AEF-5001	AEF-6001	AEF-7001
100A	AEF-4002	AEF-5002	AEF-6002	AEF-7002

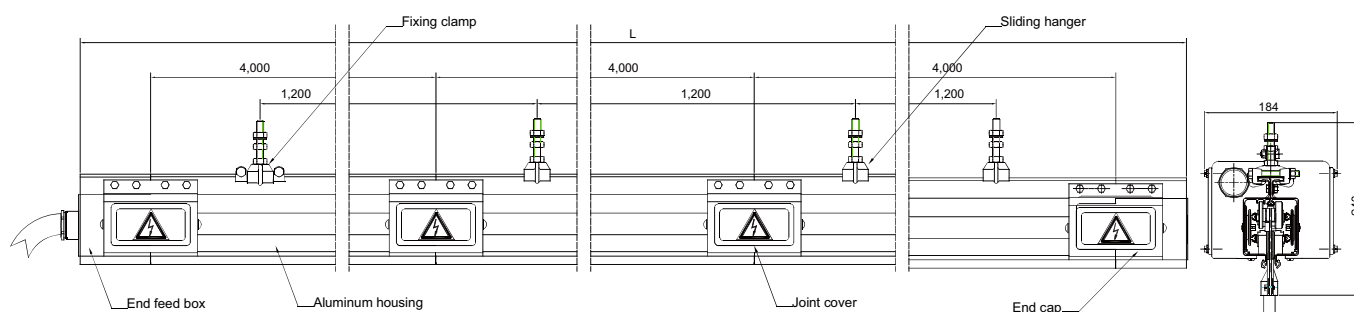
Weight: 0.74 kg (7 poles, 100A)

중간 전원인입 박스 -Center feed box-



Ampere	Poles	Order No.	Ampere	Poles	Order No.	Ampere	Poles	Order No.	Ampere	Poles	Order No.
60A	4poles	ACF-4001	100A	4poles	ACF-4002	140A	4poles	ACF-4003	180A	4poles	ACF-4004
	5poles	ACF-5001		5poles	ACF-5002		5poles	ACF-5003		5poles	ACF-5004
	6poles	ACF-6001		6poles	ACF-6002		6poles	ACF-6003		6poles	ACF-6004
	7poles	ACF-7001		7poles	ACF-7002		7poles	ACF-7003		7poles	ACF-7004

Weight: 1.95 kg (7 poles, 180A)



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Enclosed type conductor rail (MCL)

PVC 덕트 -PVC housing-

밀폐형 PVC 하우징이므로 단락 및 감전사고의 위험성이 없어, 안전성에 대한 신뢰도가 크게 향상됨. 난연성 PVC 재질로 화재 예방에 효과적임. 4poles 에서 7poles까지 사용할 수 있으므로 전원 및 제어선의 동시 사용이 가능함.

The PVC housing of MCL is impact resistant and non-inflammable and has advantage from accidents of short and electric shock. Also, this system can be used the electric power and control line at the same time.

도체 -Copper-

소요되는 길이 만큼 이음매 없이 사용하므로 ARC발생이 전혀 없음. Date 및 신호 전송이 가능함. 50,80,125,160A 용량의 도체를 사용하며, 필요에 따라 병렬연결로 더 큰 용량도 사용가능.

There is no Arc because the copper is jointless. It is possible to transmit for a data & signal and to use for a parallel system. There has 50, 80, 125, 160A current capacity.

집전기 -Collector trolley-

하우징 내부에서 구동하므로 집전기의 이탈현상이 전혀 없음. 도체의 이음매가 없기 때문에 집전기의 카본 브러쉬 마모율이 낮으며 고속주행이 가능함.
 (분당 250m 이상 가능 - Collector type에 따라 다름)

The collector trolley can not be a breakaway from housing inside and also can be a moving of high speed running.
 (over 250m/min. depend on the collector trolley)
 The abrasion rate of carbon brush is low due to a jointless copper conductor.

특이사항 -Advantage-

PVC하우징 유동 지지대를 사용하므로 충격 및 진동을 흡수하고, 수축 및 이완작용도 충분히 보상함. 고무커버를 취부할 경우 열악한 환경조건(분진,수분,가스)에서도 설치 가능함. 옥외설치 시에도 동작기능이 매우 양호하며 좁은 공간에도 설치가 용이함. 반 영구적으로 유지보수가 줄어 간접비가 절감되며 생산성이 크게 향상됨.

The Sliding hanger can be protected vibration and complemented shrinkage and expanding depend on ambient temperature condition.
 The Rubber covering can be installed in harsh environments.
 It can be installed at outside, narrow space and also reduced the cost due to a using of semipermanent.

화학적 특성 -Chemical resistant-

가솔린 원유, 벤젠, 황산나트륨, 염산 등에 화학적 내구성을 갖는다.
 gasoline crude, benzene, sodium, hydrochloric acid

최소곡률반경 -Min. curved radius-

Minimum : R = 800 mm

기계적 특성 -Mechanical properties-

휨 력(Bending force) : 831kp/cm²(831 x 14.2psi)
 인장강도(Tensile strength) : 491kp/cm², 신률(Elongation) 3.2%
 파괴강도(Breaking strength): 345kp/cm², 신률(Elongation) 36%

최대곡선길이 -Max. curved length-

Maximum : L = 3,500 mm

전기적 특성 -Electrical properties-

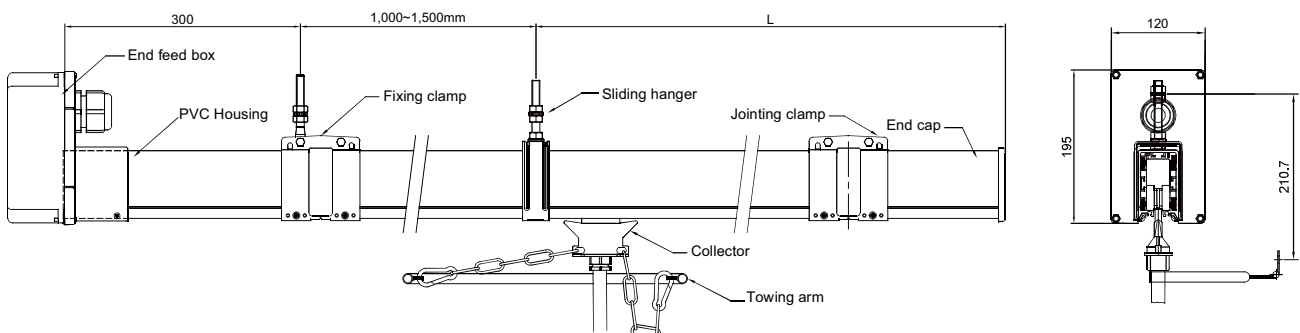
Voltage : 600V
 Creepage path : min. 30mm
 Dielectric strength : 31.2kv/mm
 Surface resistance : 11 x 10¹³ohm x cm(dry)

사용온도 -Temperature range-

-30℃ to +60℃(standard design)

최대이동속도 -Travel speed-

Straight line : 250 m/min
 *more special speed : on requested



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Parts of the Enclosed type conductor rail -MCL-

PVC 닥트 -PVC Housing-

4poles에서 최대 7poles까지 사용 가능하며 동선의 이음매가 없어
접전기가 내부 구동 중 ARC발생이 없음.

50A, 80A, 125A, 160A 동선의 사용이 가능하며 필요시 병렬연결로 최대 320A 사용 가능함.

표준길이가 4m인 하우징 설치 시, 편리함을 위해 하우징 한쪽면에 노란색의
접지선이 표시되어 있으므로 쉽게 설치가 용이함.

하부에 고무카바를 취부하여 분진, 습기 등이 심한 환경에서도 사용이 가능함
좁은 공간에서도 설치가 가능하며 동선 및 하우징은 반영구적으로 사용이 가능함.
접전기의 교환 시 상(Phase)의 바뀔을 방지하기 위한 안전한 설계로 되어있음.

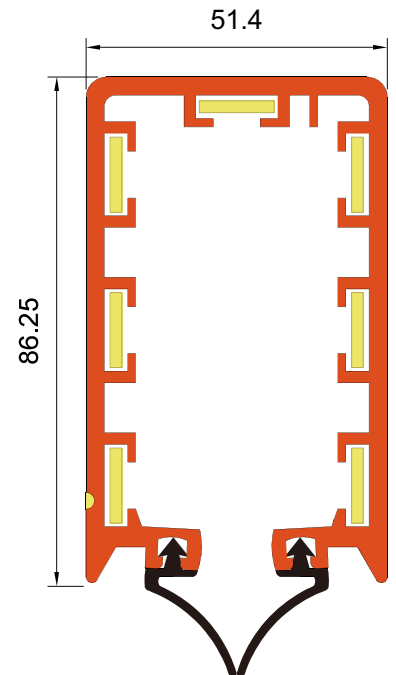
It can be used for 4 to 7poles, non-Arc due to jointness of copper,
for 50, 80, 125 & 160A and also max.320A with parallel connection.

There is yellow line for an earthing conductor beside housing.

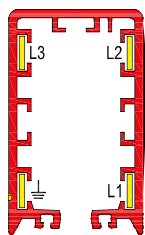
It is easy an installation and standard length is 4m long.

The rubber-covering can be installed in harsh environments, narrow space &
outside area and also the housing & copper can be used for a semipermanent.

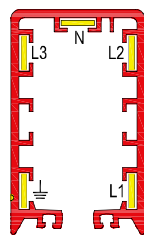
In order to prevent a changing of phase, it is safe structure when
the position of collector is changed.



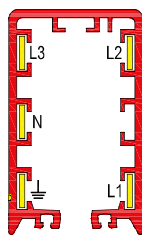
Order No.	표준길이 (Standard length)	재질 (Material)
MCL7	4,000mm	난연성 PVC (non-inflammable)



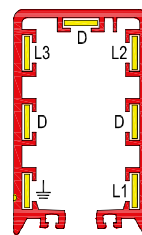
Standard 4-pole



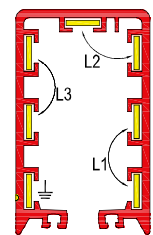
Standard 5-pole



5-pole with cuves



Standard 7-pole



7-pole per phase
2 conductor

도체 -Copper conductor-

재질은 CU로써, 전류용량은 50A, 80A, 125A, 160A가 있으며, 고용량 필요 시에는 각 용량별로
병렬 연결하여 250A, 320A도 사용이 가능함.

도체의 이음매가 없어 전도율이 높아 제어선 및 Date 전송용으로 적합하며,
브러쉬의 마모율이 적으며, 고속의 설비에도 적용이 가능함.

주문 시 사양에 따라 1pole 에 1 roll로 포장이 되기에 설치가 용이함.

It can be used for 50,80,125 & 160A and also 320A(max.)from parallel system.

This system is advantage for control and data transmission due to a jointless.

It can be applied high speed and the abrasion rate of carbon brush is low.

Also it can be packed 1 roll according to a request of line length.

Order No.	Ampere
MCU50	50A
MCU80	80A
MCU125	125A
MCU160	160A



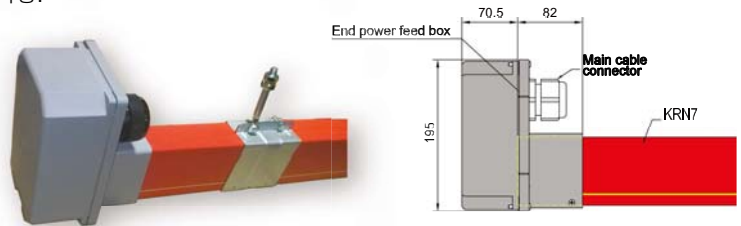
종단 전원인입 박스 -End feed box-

종단 전원 인입 박스 :

설비의 전체 소요길이가 짧은 경우(80m이하)에 끝단에서 전원공급시 사용.

End feed box : To use for power supply installed at the end of line (within 80m long)

Order No.	최대 사용 가능 사양 (max. copper conductors mounted)	
	4poles	7poles
MEF40	MCU125	MCU80
MEF60	MCU160	MCU80



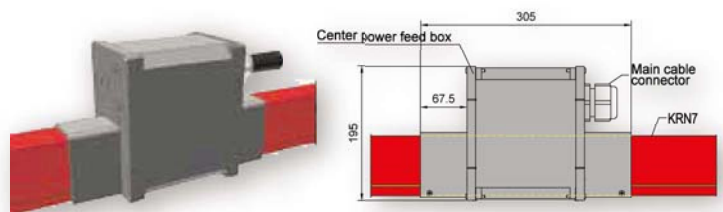
중간 전원인입 박스 -Center feed box-

중간 전원 인입 박스 :

설비의 전체 소요길이가 길거나, 타원형의 Curved구간, 분기장치 및 전원공급이 중간에서 필요한 경우 사용.

Center feed box : To use for power supply installed at the center of line (installation: over 80m long, endless line system, curve system etc.)

Order No.	Poles
MCF4	4 Poles
MCF7	7 Poles



중간 전원인입용 하우징 -Housing for center feeding-

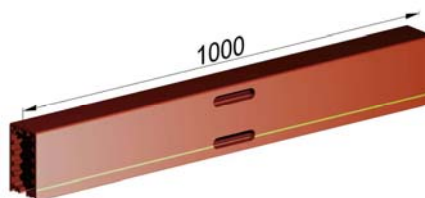
중간 전원 인입 박스 사용시 필요한 하우징.

길이 : 1,000mm

In order to use the center power feed box, this housing is needed.

Length : 1,000mm

Order No.	Poles
MHF4	4 Poles
MHF7	7 Poles



중간 전원인입용 단자 -Feed connector-

중간에서 전원 공급 시 중간전원공급용 하우징에 조립되어 MAIN전원을 결선하는 부속.

For the center power feed box, the feed connector should be installed in housing.

Order No.	Ampere	Order No.	Ampere
MFC80	50A, 80A	MFC160	125A, 160A

Parallel connector

Order No.	Ampere	Order No.	Ampere
MPC160	50A, 80A	MPC320	125A, 160A



유동지지대 -Sliding hanger-

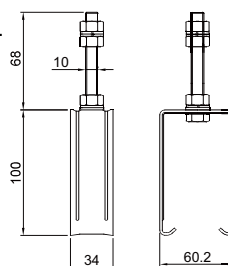
절연을 위하여 PVC로 제작된 하우징의 경우 주위온도에 따른 수축 및 팽창이 발생 될 수 있어 이를 보상하기 위하여 하우징의 하부를 지지하는 형태로 되어 있음.
볼트규격 : M10 x L70mm 설치간격 : 1.2m ~ 2m

The sliding hanger is complemented shrinkage and expanding depend on temperature condition.

Bolt size : M10 x L70mm

Pitch distance of hanger supports: : 1.2m ~ 2m

Order No.	MSH
-----------	-----



고정지지대 -Fixing clamp-

전원(power)을 인입하는 인접위치에서 하우징을 고정시키기 위하여 설치함.

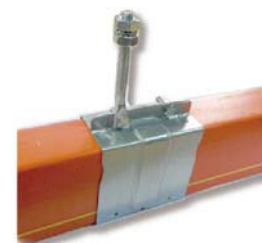
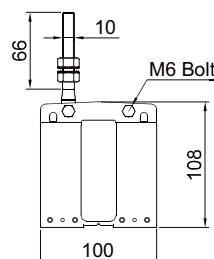
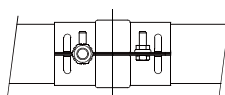
볼트규격 : M10 x L70mm 설치수량 : 끝단 전원공급시 1개
중간부분 전원공급시 2개

The fixed clamp should be installed nearby the electric supply at end feed / or center feed point.

Bolt size : M10 x L70mm

Q'ty: 1 piece at end power feed box

2 pieces at center power feed box



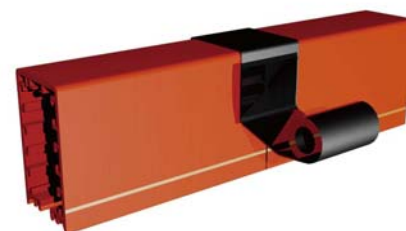
Order No.	MFC
-----------	-----

절연테이프 -Insulating tape-

PVC하우징 연결시 이음매 부분의 절연을 목적으로 사용되는 폭 50mm의 테이프.

To use for connection of PVC housing in order to insulate.

Order No.	MIT
-----------	-----

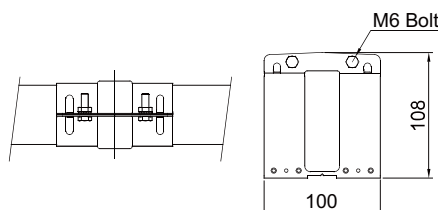


연결덮개 -Jointing clamp-

PVC하우징의 연결시 사용.

To use for a connection of PVC housing.

Order No.	MJC
-----------	-----



집전기 -Collector trolley-

도체에 흐르는 전류를 이동하는 대차에 전달시키는 구동장치.

The collector trolley is delivering the current flowing through copper conductor to the moving device.

1. 집전기 삽입 시 상(Phase) 바뀔을 방지하기 위한 구조로 되어있으며 Top wheel 및 집전기의 Double 연결 시 작업이 쉽게 되어있다.

1. The collector is safe structure in order to prevent phase changing and also can be connected with additional collector easily.

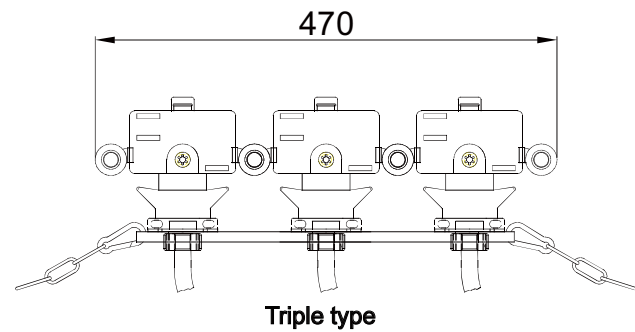
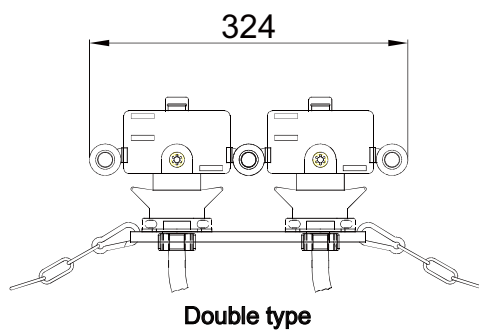
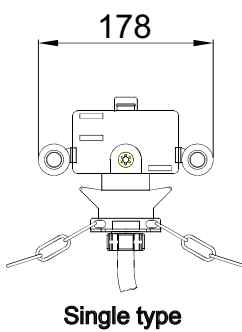
2. 브러쉬의 마모한계선이 표시되어 있어 교환시기를 쉽게 알 수 있다.

2. Carbon brush can be checked easily for a maintenance period due to an indication line of abrasion on brush.



MNL Collector
(Standard)

Order No.	Type	Order No.	Type
MNL7-4-35	4poles, Single	MNL7-7-35	7poles, Single
MNL7-4-70	4poles, Double	MNL7-7-70	7poles, Double
MNL7-4-100	4poles, Triple	MNL7-7-100	7poles, Triple



도체삽입용 도구 #1 -Copper pulling-cassette-

롤로 말려 있는 동 도체를 하우징에 삽입 시 도체가 풀리거나
 엉키지 않도록 해주는 장치이다.

This device can be used when the copper roll is inserted into
 the housing. the copper rolls will be rolled off smoothly
 and this device can prevent tangling

Order No.	MCP-C
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도체삽입용 도구 #2 -Copper pulling-block-

설비의 길이에 따라서 동 도체를 손으로 밀어 넣을 수 없기에
 도체의 끝부분을 볼트로 체결하여 외부에서 로프등을 이용하여
 도체를 삽입해주는 장치이다.

In order to smoothen the pulling of the copper conductor into
 the housing, this tool is recommended to use.

The end of copper conductor is bolted with this tool
 that is inserted conductor into the housing

Order No.	MCP-P
-----------	-------

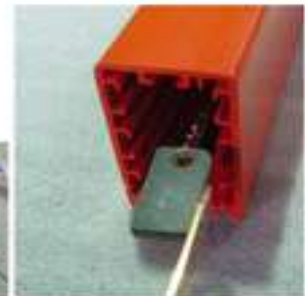


도체삽입용 도구 #3 -Copper straightener-

125A이상의 도체를 사용할 시 둥글게 말려있는 도체의 모양을
 직선으로 잡아주어 PVC housing 내부에 도체 삽입이 수월하도록
 해주는 장치이다.

It is strongly recommended to use this tool for the
 easy inserting of the copper conductors 125A
 and 160A in the Multiconductor.

Order No.	MCP-S
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설치 -Installation Guides-

1. 인입전원 위치 및 브라켓 취부거리 확인.

- MAIN전원의 위치를 확인 후 부착시킬 거리를 산정한다.

2. 브라켓 취부

- 브라켓 제작 시 닥트 유동 지지대를 취부시키기 위해 볼트 규격 M10size 장공형태로 제작하여 구조물에 수직, 수평을 맞추어 용접 혹은 조립식으로 부착한다

3. PVC 하우징 유동 지지대 및 고정 지지대의 부착

- 브라켓에 취부할 때 수평 및 수직을 맞추면서 취부한다.

4. PVC 하우징 및 도체의 삽입

- 하우징을 유동 지지대에 삽입할 때는 한쪽 면의 실선이 연속적으로 이어지게 삽입한다.
- 하우징을 거치 후 하우징 연결덮개로 하우징과 하우징을 연결한다.
- 하우징의 연결이 끝난 후 한쪽 끝에서 소요되는 길이만큼의 도체를 반대쪽 끝으로 밀어 넣는다.

5. 전원공급 박스의 설치

- 도체의 삽입이 끝난 후 한쪽 끝 또는 중앙에 전원 공급박스를 설치하고 대차가 정지하여 있는 위치에 집전기 걸이를 부착시키고 집전기를 취부한다.
- 끝마개를 이용하여 한쪽 끝 또는 양끝을 마무리 한다.

6. 고무커버의 취부

- 하우징 밑면의 양쪽 홈에 고무커버를 취부한다.

7. 전원 연결

- 전원 공급박스에 MAIN전원을 인입하고 집전기와 대차의 전원도 연결한다.

8. 시운전 및 확인

- 전원을 공급하여 시운전을 실시하며 구동상태 등을 확인하여 이상이 없을 시 작업을 마친다.

1. Check the power feed box position and the installed distance of bracket

2. Bracket installation

- Bracket to be mounted should be made an oblong hole of M10 size and mounted horizontally and vertically on the construction in order to install the sliding hanger /or fixing clamp.

3. The sliding and fixed hanger should be installed

- horizontally and vertically for PVC housing.

4. PVC housing and copper conductor installation

- Install continuously the yellow line of PVC housing, as a straight line
- After installation, the jointing clamp should be installed between housing and housing.
- And then the copper conductor should be inserted in the PVC housing at the end of side.

5. Power feed box and Collector connection.

- The power feeding box should be installed at the end of any one side /or center of PVC housing with fixing clamp.
- The towing arm and collector with cable should be installed with the moving device and then the end plate should be mounted at the end of any one side.

6. Rubber covering

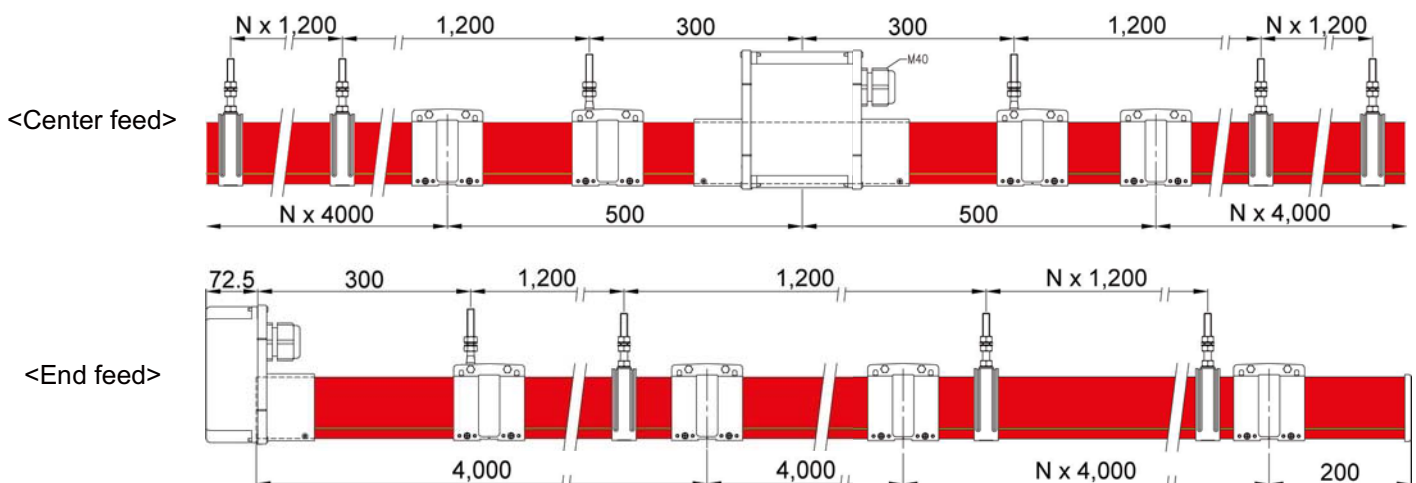
- It can be installed at bottom of PVC housing.

7. Power supply

- Power cable should be connected with power feed box.

8. Operating and checking

- Please check operating. If there is no problem, you can finish installation.



※ In accordance with our company's policy of continued improvement, we reserve the right to amend specifications and details at any time.

점검사항 -Check points-

설치완료 시

- 하우징의 설치상태가 주행레일과 수직 및 수평이 맞도록 설치되었는가?
- 하우징의 노란 실선이 연속적으로 이어져 있는가?
- 집전기의 주행 시 주변에 장애물이 없는가?
- 전원 결선 시 올바른 상(Phase)이 연결되었는가?

운용 시

- 집전기의 상태점검.
- 집전기의 카본브러쉬 상태점검.
- 카본브러쉬의 주행거리:약 5,000km
(주행속도 및 사용환경에 따라 상이 할 수 있습니다.)

집전기의 점검 및 교체 방법

- 집전기의 점검 및 교체 시 하우징의 끝단에서 실시하면 되나 상황이 여의치 않을 경우 아래 그림과 같이 하우징의 중간부에서 점검이 가능하다.

하우징의 폭보다 조금 넓은 나무토막 등을 집전기의 앞뒤로 삽입 후 나무토막을 비틀어 하우징을 강제로 벌린 후 집전기를 꺼낼 수 있으며 집전기를 삽입 시에는 같은 방법으로 하우징을 벌린 후 집전기의 각 브러쉬가 바른위치에 가도록 확인하며 집전기를 삽입 후 나무토막을 제거하면 된다.

(긴급상황 시 조치법으로 보다 안전에 유의하여 조치한다.)

Specially, you can remove the collector at the middle of PVC housing as follows picture.

- Prepare 2 pcs of wood plate which width is bigger than housing width
- Insert the wood plates at the right and left side of collector
- Turn over each plate to 90 angle and then you can draw out the collector
- After replacement, it can be installed the reverse procedure

Above procedure, you should be careful for a safety.

Finish installation

- Check installation of PVC housing horizontally and vertically as a straight line.
- Check a straight line for the yellow line of PVC housing continuously
- Check an obstruction for traveling of collector trolley
- Check correct position for power supply wiring

Check for operating

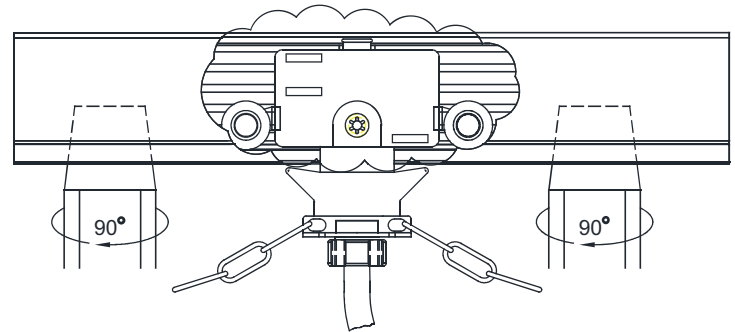
- Check the collector condition
- Check the carbon brush condition

* Note :

Life time of carbon brush
 approx. 5,000km(depends on system condition)

Checking and replacement for the collector

If you want to check and repair for the collector, you can change at the end of side normally.

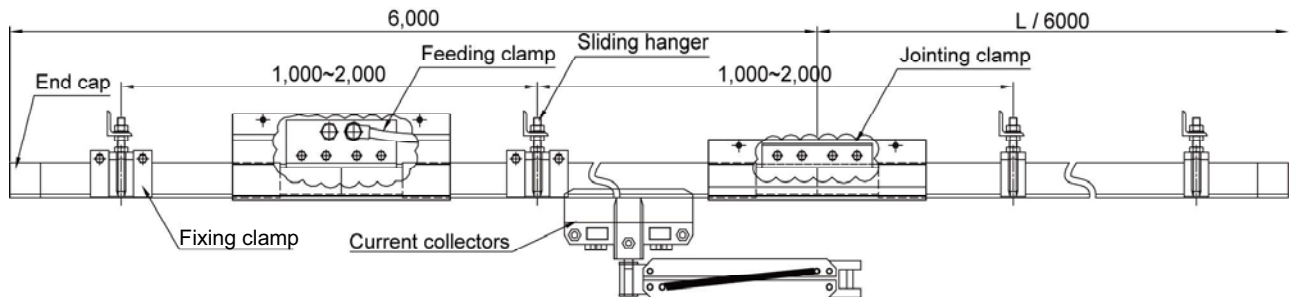


■ 특수설비적용

하우징타입 트로리바의 경우 필요 시 곡선 등의 특수한 환경에도 적용이 가능하며 다른 여러 설비에도 적용이 가능하도록 항상 연구 검토 중에 있습니다. 단 특수설비의 경우 전문가에 의해 설계 및 설치가 되어야 하기에 반드시 제품 문의 후 적용되어야 합니다.

In case of the special application, for example, curved lines, horizontal installation, special conditions and so on, if you want to use our enclosed-type conductor rail, we would be appreciated to get your contact.

HIGH CURRENT CONDUCTOR RAIL (HCL)



고용량 트로리바 특징 -Advantages of HCL-

주식회사 이영의 고용량 트로리바(HCL) 제품은 설치와 유지보수 시 제품의 조립과 분해가 매우 손쉽게 설계, 제작되었으며, Carbon brush가 접촉되는 면의 재질이 동과 스테인레스로 선택이 가능하여 해안 같은 부식이 우려되는 환경에도 적용이 가능합니다.

The High current conductor rail(HCL) of the LEEYOUNG Ind. Co., Ltd. has advantages which was designed for installation and maintenance easily. Also, the carbon brush in contact with surface of the materials of the copper and stainless steel can be selected depends on environment condition, i.e. Heavy industrial factory, offshore & corrosion area and etc..

■ 적용분야 -Fields of application-

- 모노레일(Mono-rail)
- 갠트리 크레인(Gantry cranes of offshore)
- 천정형 크레인(Overhead cranes)
- 자동화창고의 스테커 크레인(Stacker cranes)
- 데이터 전송용(Data transmission)
- 스팅거 시스템(Stinger system for maintenance of trains)

■ 전기적 특성 -Electrical properties-

- Dielectric strength : 30 ~ 40 kv/mm
- Surface resistance : $11 \times 10^{13} \text{ohm} \times \text{cm(dry)}$
- Protection class : IP23
- Voltage : 1000V

■ 사용온도 -Electrical properties-

- 30℃ + 60℃ (표준설비)

■ 최대 이동속도 -Travel speed-

- Max. 600m/min. (직선구간)

■ 전압강하 계산식 -Calculation of Voltage drop

$$\text{AC : } \Delta u = \sqrt{3} \times J \times l \times Z / 1000$$

$$\text{DC : } \Delta u = 2l \times J \times R / 1000$$

$$\Delta u = \text{Voltage(V)}$$

$$J = \text{Amperage(A)}$$

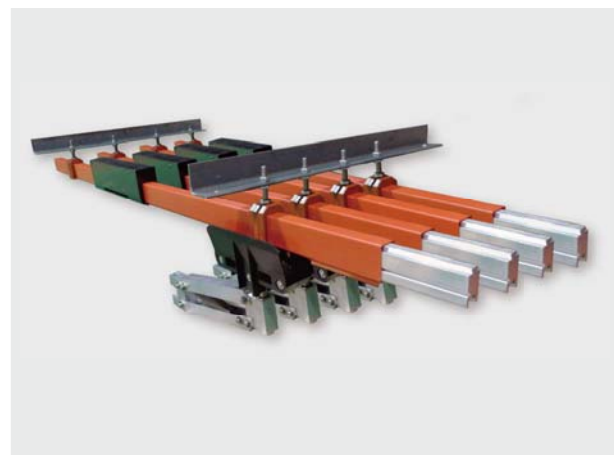
$$Z = \text{Impedance ohms / 1000(m)}$$

$$R = \text{Resistance ohms / 1000(m)}$$

$$L = \text{Length(m)}$$

$$I = L \text{ 끝단 전원인입시}$$

$$L/2 \text{ 중간 전원인입시}$$



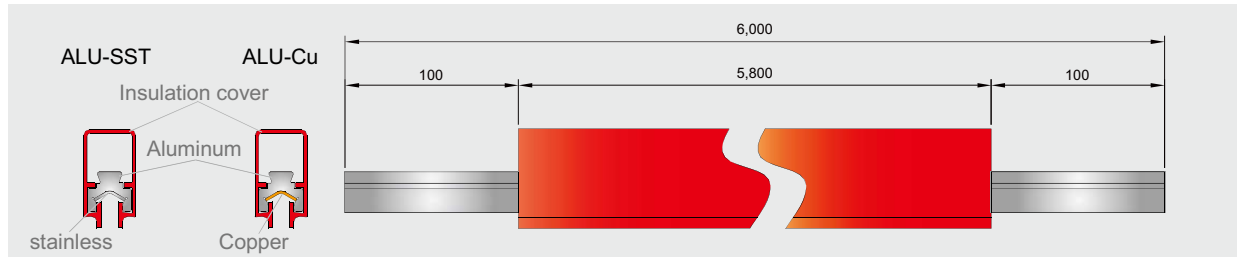
Parts of the HIGH CURRENT CONDUCTOR RAIL (HCL)

■ Insulated conductor rail

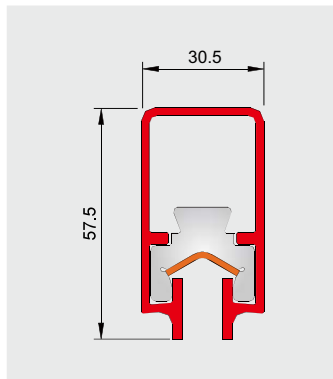


표준공급길이는 6m 이며
그 외에는 요청에 의해 공급된다.

The standard length: 6,000mm(max.)
Special length: on request

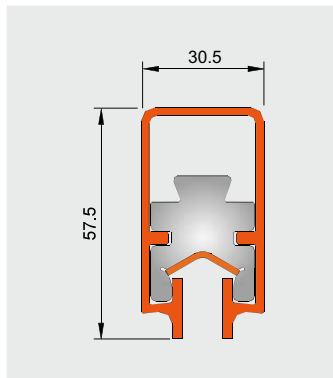


Conductor rail - 500A



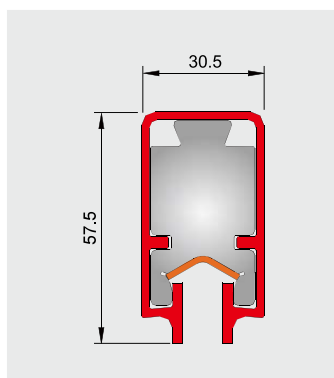
Conductor rail type		Alu-Cu	Alu-SST
Insulation cover		PVC	PVC
Standard length		6,000mm	6,000mm
Protection class		IP 23	IP 23
With 100mm phase distance	I max [35 °C]	500A	500A
	Z [Ω / km]	0.182	0.182
Cross section (mm²)	Alu	320	320
	Cu	25	-
	SST	-	30
Weight		1.58 kg/m	1.54 kg/m
Temperature range (ambient)	Min.	-30 °C	-30 °C
	Max.	+60 °C	+60 °C
Order No.	Phase	HCL-50011	HCL-50021
	Earth	HCL-50012	HCL-50022

Conductor rail - 750A



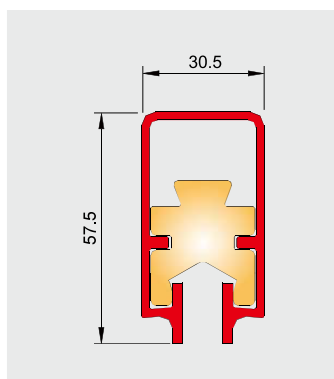
Conductor rail type		Alu-Cu	Alu-SST
Insulation cover		PVC	PVC
Standard length		6,000mm	6,000mm
Protection class		IP 23	IP 23
With 100mm phase distance	I max [35 °C]	750A	750A
	Z [Ω / km]	0.17	0.17
Cross section (mm²)	Alu	500	500
	Cu	25	-
	SST	-	30
Weight		2.05 kg/m	2.02 kg/m
Temperature range (ambient)	Min.	-30 °C	-30 °C
	Max.	+60 °C	+60 °C
Order No.	Phase	HCL-75011	HCL-75021
	Earth	HCL-75012	HCL-75022

Conductor rail - 1000A



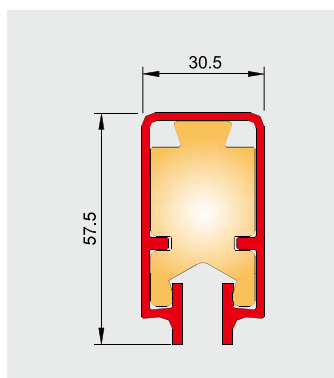
Conductor rail type		Alu-Cu	Alu-SST
Insulation cover		PVC	PVC
Standard length		6,000mm	6,000mm
Protection class		IP 23	IP 23
With 100mm phase distance	I max [35 °C]	1000A	1000A
	Z [Ω / km]	0.147	0.147
Cross section (mm²)	Alu	900	900
	Cu	25	-
	SST	-	30
Weight		3.14 kg/m	3.10 kg/m
Temperature range (ambient)	Min.	-30 °C	-30 °C
	Max.	+60 °C	+60 °C
Order No.	Phase	HCL-10011	HCL-10021
	Earth	HCL-10012	HCL-10022

Conductor rail - 1300A



Conductor rail type		Copper
Insulation cover		PVC
Standard length		6,000mm
Protection class		IP 23
With 100mm phase distance	I max [35 °C]	1300A
	Z [Ω / km]	0.128
Cross section (mm²)	Cu	620
Weight		5.85 kg/m
Temperature range (ambient)	Min.	-30 °C
	Max.	+60 °C
Order No.	Phase	HCL-13011
	Earth	HCL-13012

Conductor rail - 1600A



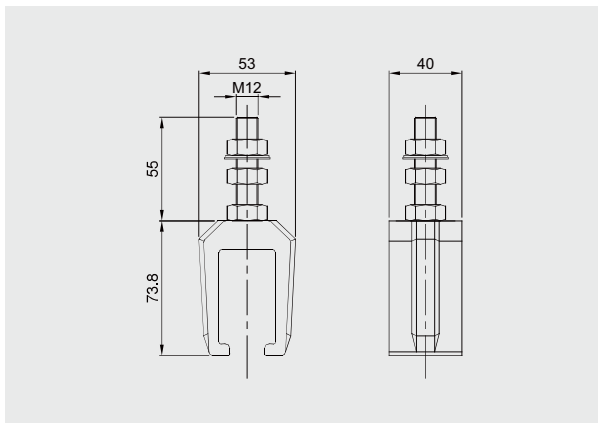
Conductor rail type		Copper
Insulation cover		PVC
Standard length		6,000mm
Protection class		IP 23
With 100mm phase distance	I max [35 °C]	1600A
	Z [Ω / km]	0.102
Cross section (mm²)	Cu	900
Weight		8.10 kg/m
Temperature range (ambient)	Min.	-30 °C
	Max.	+60 °C
Order No.	Phase	HCL-16011
	Earth	HCL-16012

Accessories

■ Sliding hanger

Conductor-rail을 지지하기 위한 용도로 사용된다.
설치간격: 1m ~ 2m

The sliding hanger is used for supporting the conductor rail.
Pitch distance: 1m ~ 2m

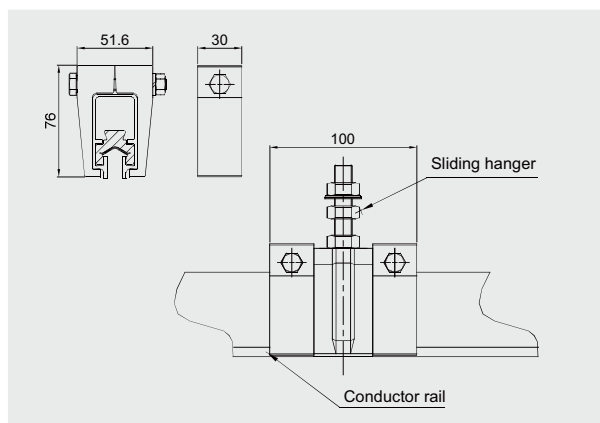


Order No.	Weight
HSB-0001	0.20 kg

■ Fixing clamp

전원 인입부나 Expansion unit 같은 Conductor-rail의 흔들림이나 움직임을 방지하기 위한 용도로 사용한다.

The fixing clamp should be installed near by the electric supply or the expansion unit in order to prevent shake and movement of the conductor rail.

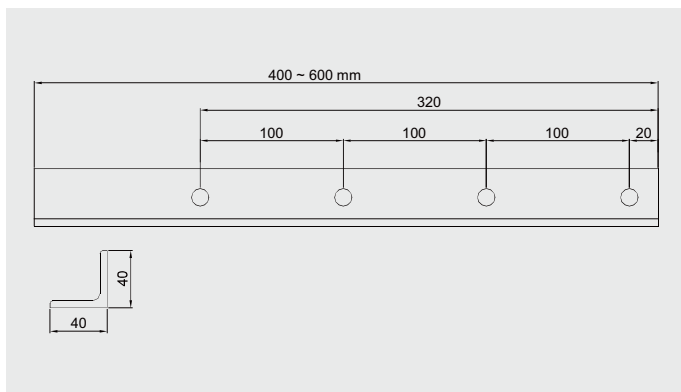


Order No.	Weight
HFC-0001	0.36 kg

■ Bracket

Sliding hanger 또는 Fixing clamp 를 걸기 위한 용도로 사용되며 용접 또는 볼트를 이용하여 설치한다.

The bracket should install by welding or bolting and also for Sliding hanger and Fixing clamp

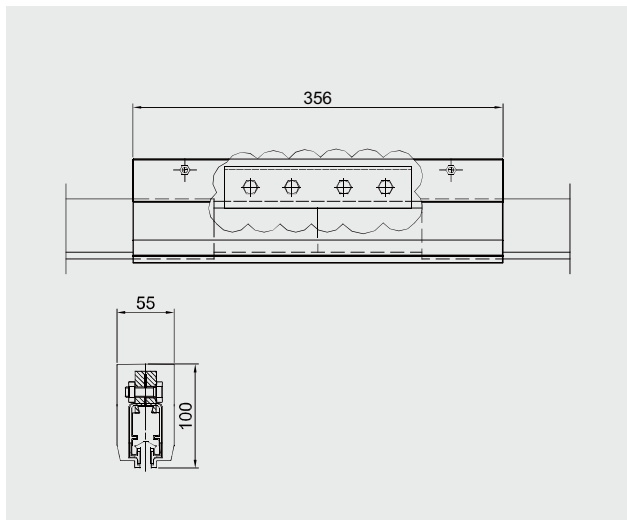


Length	Order.No	Weight
400mm	HBR-4001	1.20 kg
500mm	HBR-5001	1.50 kg
600mm	HBR-6001	1.80 kg

■ Jointing clamp

Conductor-rail 을 연결하는 용도로 Connector 와 Joint-cover, 볼트가 세트로 공급된다.

The jointing clamp is used for connecting the conductor rail. It is including Joint-cover and connector with bolt

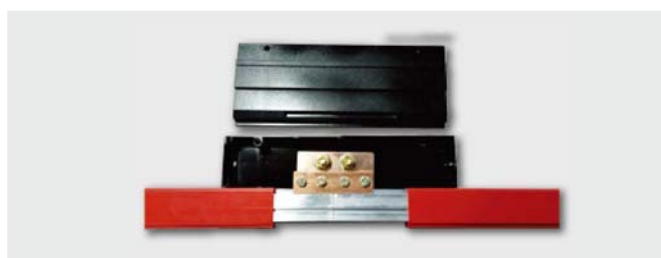
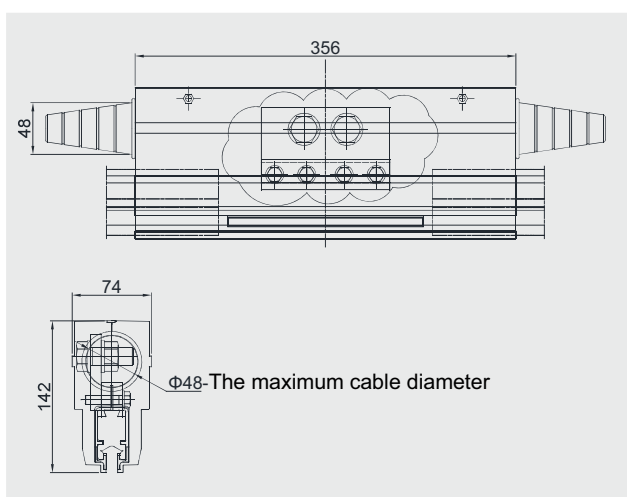


Ampere	Order.No	Material	Weight
500A, 750A	HJC-7501	Aluminum	0.80kg
1000A	HJC-1001	Copper	1.13kg
1300A	HJC-1301	Copper	1.54kg
1600A	HJC-1601	Copper	1.65kg

■ Feeding clamp

Conductor-rail 에 전원을 인입하기 위한 용도이며, 표준위치는 끝단에서 1m 지점에 가공하여 공급한다.

The feeding clamp is used for power supply and located at 1m long(standard) from end of conductor rail.

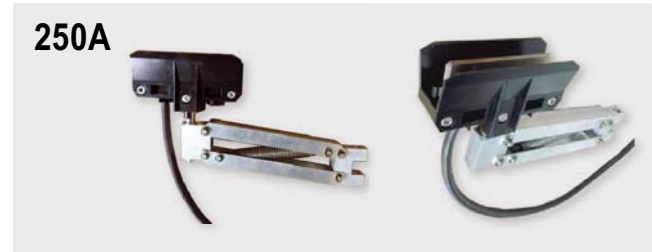
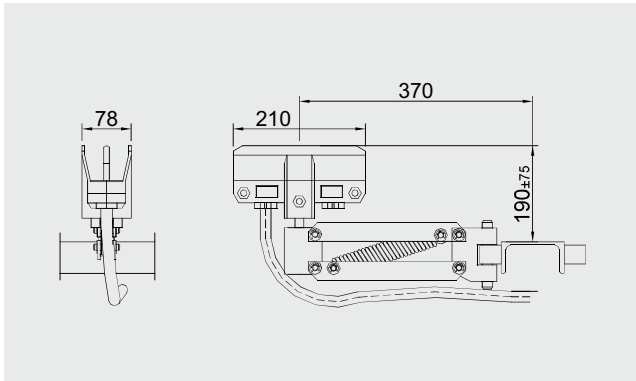


Ampere	Order.No	Material	Weight
500A, 750A	HFC-7501	Aluminum	1.52kg
1000A	HFC-1001	Copper	2.28kg
1300A	HFC-1301	Copper	2.94kg
1600A	HFC-1601	Copper	3.18kg

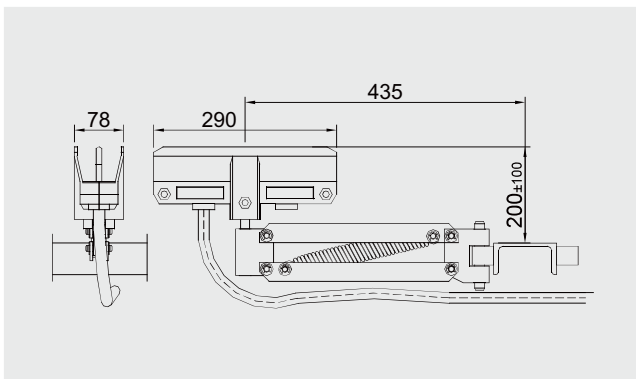
■ Current Collectors

장비의 전류량에 따라 선택한다.

The current collectors can be selected depends on load-current of system.

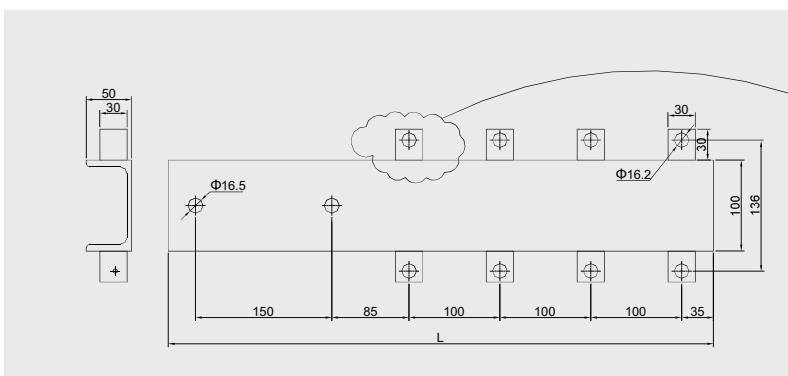


Ampere	Order No.		Weight
250A	PHASE	HCC-25011	3.35 kg
	EARTH	HCC-25012	3.35 kg

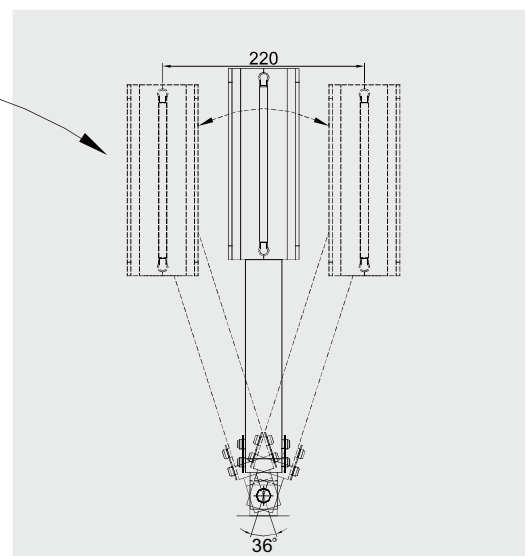


Ampere	Order No.		Weight
500A	PHASE	HCC-50011	4.09 kg
	EARTH	HCC-50012	4.09 kg

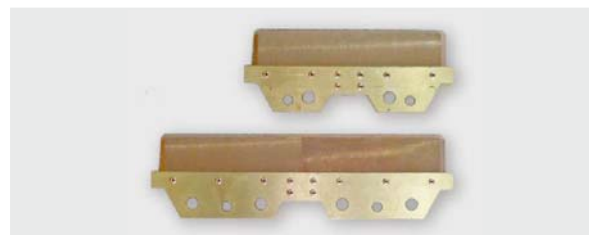
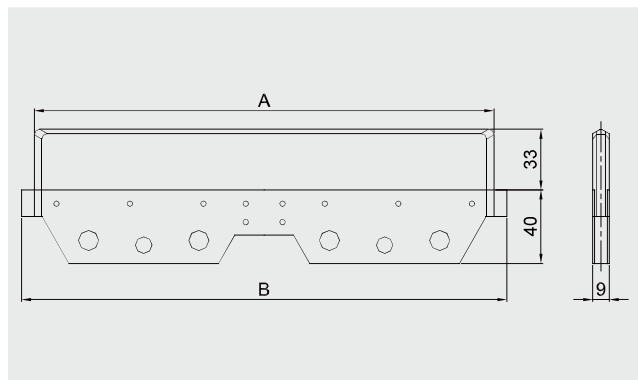
■ Mounting - Bar for collector



Length	Order.No	Weight
600mm	HCM-6001	5.60 kg
700mm	HCM-7001	6.50 kg



■ Carbon brush

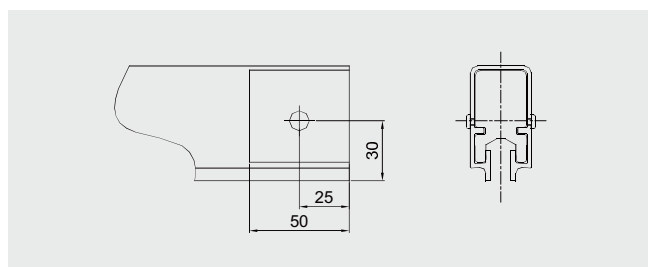


Ampere	A / B	Order.No	Weight
250A	170/184 (mm)	HCB-2501	0.62 kg
500A	250/264 (mm)	HCB-5001	0.97 kg

■ End cap

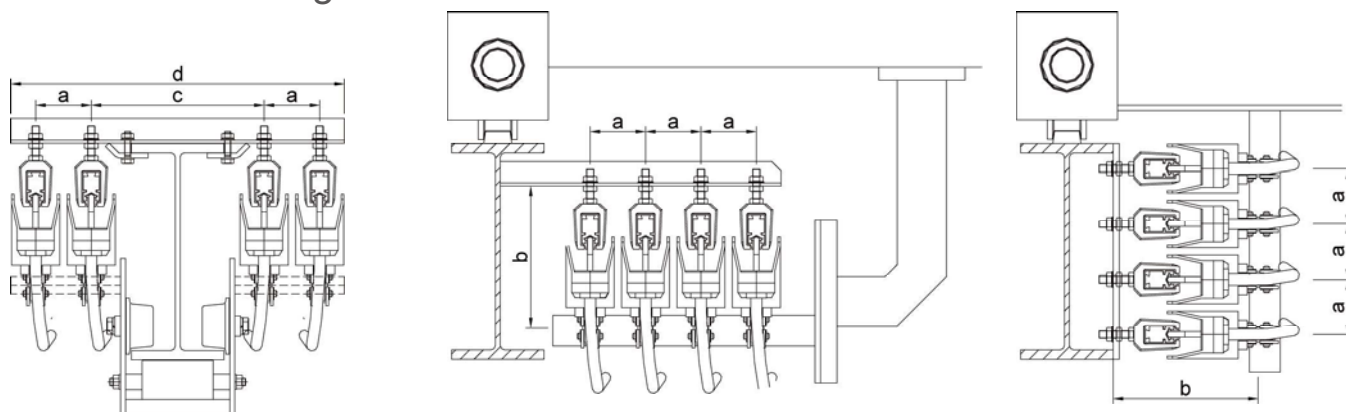
Conductor-rail의 끝 마감용으로 사용하며, 요구수량 만큼 조립하여 공급한다.

The end cap is used for end of the conductor-rail.



Order No.	Weight
HEC-0001	0.07 kg

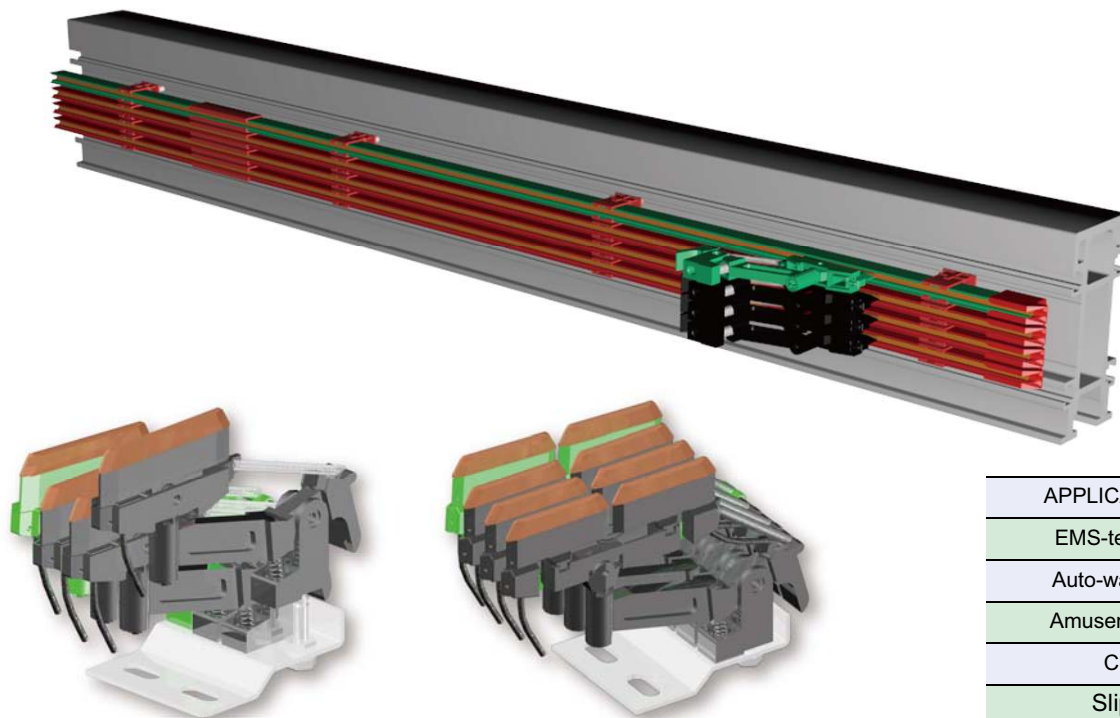
Installation drawing



Single collector	a	b	c	d
250A	100mm	250mm	280mm	540mm
500A	100mm	260mm	280mm	540mm

Uni-pole conductor line

- 주식회사 이영의 유니폴컨덕터레일은 표준길이 6m이며 V형상의 도체는 Brush의 접촉면을 크게 하여, 고속주행에도 안정적인 뿐만 아니라 최소반경 300mm 곡선 Line 에도 적용 가능합니다. 그리고 1개의 Line에 구간을 나누어 서로 다른 전압을 인입할 수 있어 검사설비등 다양한 전압을 요구하는 설비에도 적용이 가능합니다.
고속이동이 가능한 EMS, RGV 설비 등에 주로 사용되며 그 외에도 놀이기구나 크레인, Slipping등에 많이 사용됩니다.
- The uni-pole(UCL) of LEEYOUNG Ind. Co., Ltd. which is the standard length 6,000mm and the contact surface of 'V' shape copper is stable with the collector brush.
Also, the UCL is available to apply at narrow space, high speed(400m/min.) and minimum radius-300mm of curved line.
Additionally, this is suitable to apply complicated test systems which are necessary different voltage even though one line system.
A typical example, there are EMS(Electronic Monorail system), RGV(Rail Guided Vehicle), Slipping of crane, equipments of amusement park and so on.



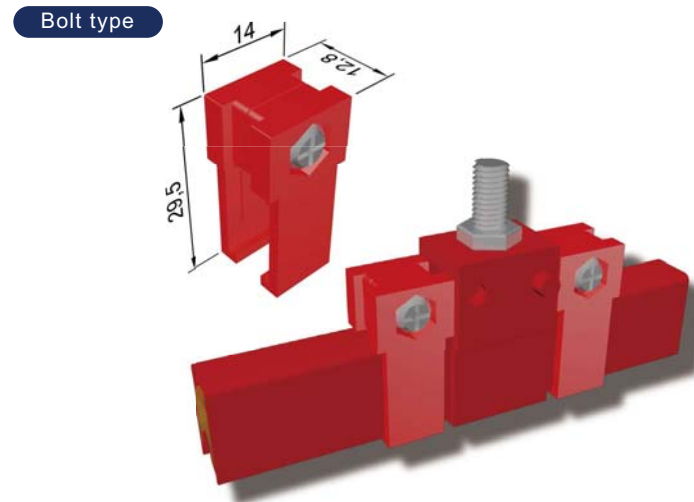
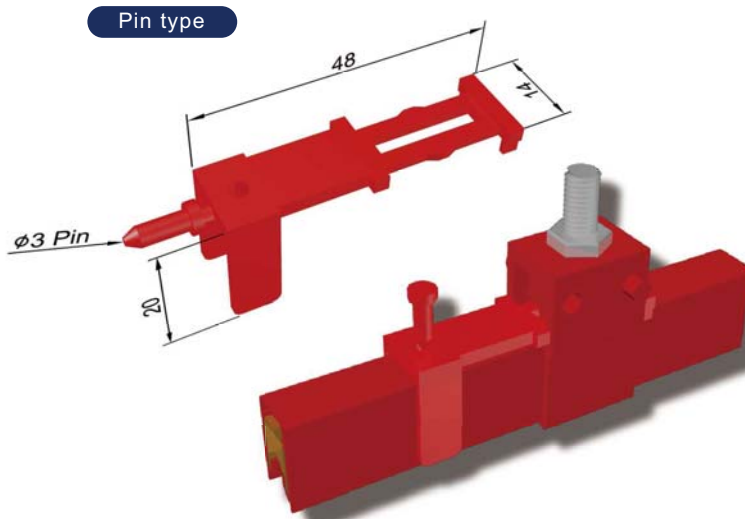
APPLICATIONS
EMS-technology
Auto-warehouse
Amusement rides
Crane
Slipping

TECHNICAL DATA	
Insulation cover	non-inflammable PVC
Insulation cover color	Phase -Red color Earth-Green color
Standard length	6,000mm
Phase-/ Hanger distance	15mm / max. 800 mm
Voltage	max. 690V
Amperage (100% duty cycle at 35°C)	100 A (copper)
Conductor bar cross-section & material	25 mm ² / C = copper
Ambient temperature	- 30 °C up to + 60 °C
Travel speed	400 m/min(max.)
Protection class	IP23
Smallest curve radius	Vertical= 300mm / Horizontal = 500mm
Resistant against	fuel, mineral oil, greases, sodium hydroxide, hydrochloric acid (concentrated), sulphuric acid

Fixing clamp

- Transfer cap 또는 전원 인입부등 레일의 밀림이나 유격이 없어야 하는 곳에 사용하는 부품으로 Hanger와 함께 사용되며 레일 뒷면에 3mm의 홈을 가공하여 고정한다.

- The fixing clamp is used to fix the Transfer cap or end feed. It should be used with a sliding hanger and make a hole(3mm) at back side of conductor rail.

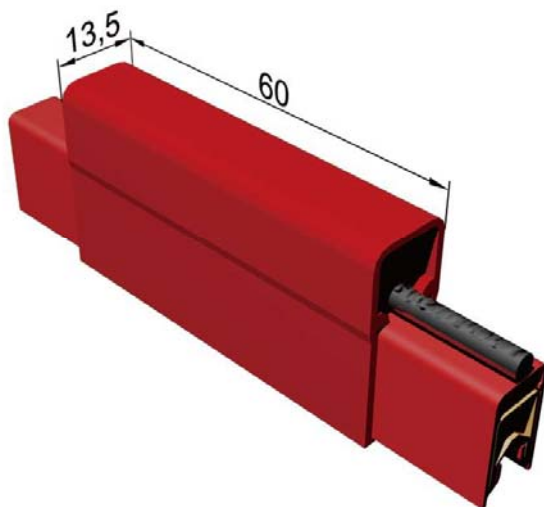


Type	Pin type	Bolt type
Art. No.	UFC 00001	UFC 00002
Weight	0.002 kg	0.003 kg
Material	non-inflammable Polycarbonate	non-inflammable Polycarbonate, Steel

Center feed unit

- 통전레일의 중간에 전원인입이 필요할 경우 사용되며 메인케이블은 터미널을 사용하여 볼트로 결선 됩니다.

- The electrical supply can be supplied the power at center of conductor rail. The power cable is terminal type and is connected by bolt.



Type	Bolt
Art. No.	UCF 01004
Current load capacity	max. 100A(100% ED)
Weight	0.030 kg
Available cables	< 16mm ²
Bolt	M4
Material - Cover	non-inflammable Polycarbonate

*Cable은 공급에서 제외됩니다.(필요시 별도 문의)

*The power cable is not included. If you require, please notice us.

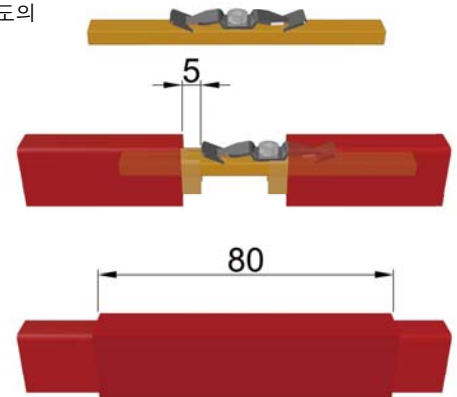
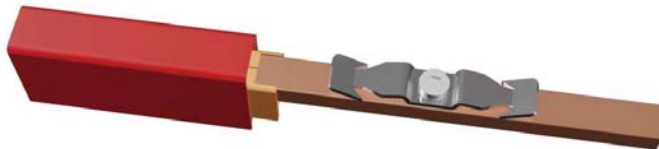
Joiner & Cover

- Rail의 연결은 볼트방식과 클램프 방식이 있으며 현장에서 설치가 용이한 제품으로 선택하여 사용됩니다.

- The rail connector has clamp type & bolt type.
It can be selected depends on site condition.

Clamp type

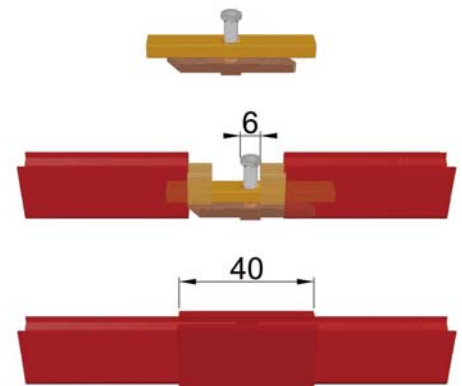
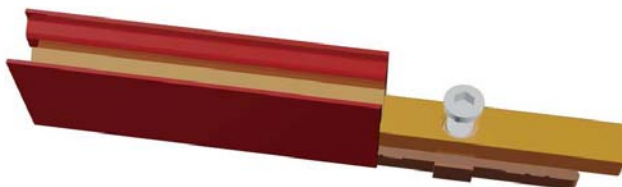
- Clamp type의 연결단자는 통전레일의 연결 부위가 붙어 있어 고속 주행이 용이하며 시공 시 별도의 공구 없이 연결이 가능합니다.(도체의 뒷면은 별도 가공이 필요함)
- The connector of clamp type is advantageous in high-speed system.
Because both coppers should be kept close.
And, it can be installed without tool during installation.
(* Back side of the conductor must need extra processing.)



- 설치 - 연결 부위의 양쪽에 위치한 행거는 최소 100mm~200mm 간격을 두고 설치해야 하며 직선구간에만 사용이 가능합니다.
(부품의 특성상 재사용은 어렵습니다.)
- Instruction - In the connecting point, the sliding hanger should be installed in both directions min. 100mm ~ max. 200mm.
Preferable for quick installation and do not use in bending line.(Recommend not reusable.)

Bolt type

- Bolt type의 연결단자는 도체의 노출된 방향에서 볼트를 사용하여 연결하는 방식으로 설비의 연장 및 유지보수시 작업이 편리합니다.
- The connector of bolt type is advantageous for maintenance and extension of systems.



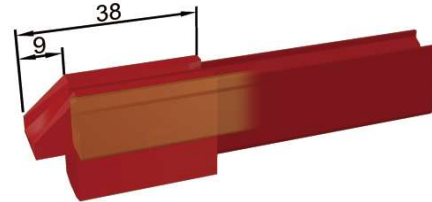
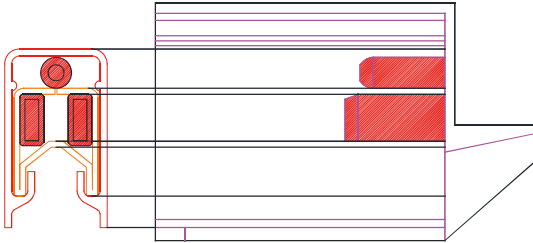
- 설치 - 연결 부위의 양쪽에 위치한 행거는 최소 100mm~200mm 간격을 두고 설치해야 하며 직선 또는 곡선 구간에 사용이 가능합니다.
부품의 재사용이 가능하며 레일의 연결부에 6mm 간격이 생깁니다.
- Instruction - in the connecting point, the sliding hanger should be installed in both directions min. 100mm ~ max. 200mm.
It can be used re-usable several times and 6mm gap remains between the end of conductor rails.
Also, the bolt type joiner can be used for curved conductor rail.

Type	Clamp type	Bolt type
Art. No.	UJC 00803	UJB 00804
Current load capacity	max. 100A(100%ED)	max. 100A(100%ED)
Weight	0.021 kg	0.023 kg
Material - Joiner	Brass + Steel	Brass + Copper
Material - Cover	non-inflammable Polycarbonate	

Transfer cap(End cap)

- 통전레일의 끝단에 End cap용과 Guide용 으로 사용됩니다.
*전원인입용으로 사용할 수 없습니다.

- The transfer cap is used for end of conductor line.
And it can be used transfer & switch line.
- It cannot be used for power feeding.

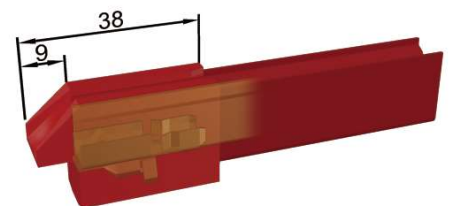
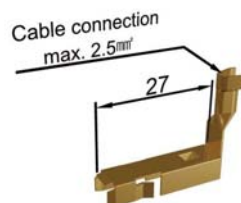
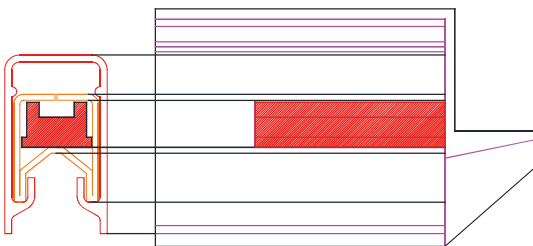


Type	Cap
Art. No.	UTC 00001
Current load capacity	N/A
Weight	0.003 kg
Available cables	-
Material	non-inflammable Polycarbonate

Transfer cap & Feeding

- 통전레일의 끝단 부 End cap 용 또는 Guide용 으로 전원인입이 필요할 경우 사용됩니다.

- The transfer cap & feeding is used end of conductor line with power feeding.
And it can be used transfer & switch line with power feeding.
- Depend on purpose, we can supply the transfer cap parts.



Type	Feed
Art. No.	UTF 00002
Current load capacity	max. 25A (100% ED)
Weight	0.006 kg
Available cables	< 2.5mm ²
Material	non-inflammable Polycarbonate, Copper

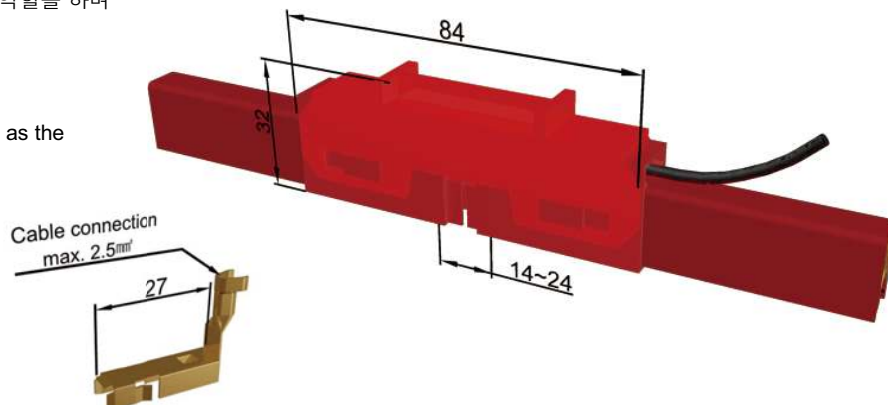
*Cable은 공급에서 제외됩니다.(필요시 별도 문의)

*The power cable is not included. If you require, please notice us.

Isolating assembly

- Rail의 온도변화에 따른 수축팽창을 보상하는 역할을 하며 메인케이블의 연결을 선택할 수 있습니다.

- The isolating assembly has the same function as the conductor rail expansion.
 Also, it can be installed the power cable.



Type	Without feeding	Feeding
Art. No.	UCI 00001	UCI 00002
Current load capacity	-	max. 25 A(100% ED)
Weight	0.017 kg	0.023 kg
Available cables	-	< 2.5mm ²
Material	non-inflammable Polycarbonate	non-inflammable Polycarbonate + Copper

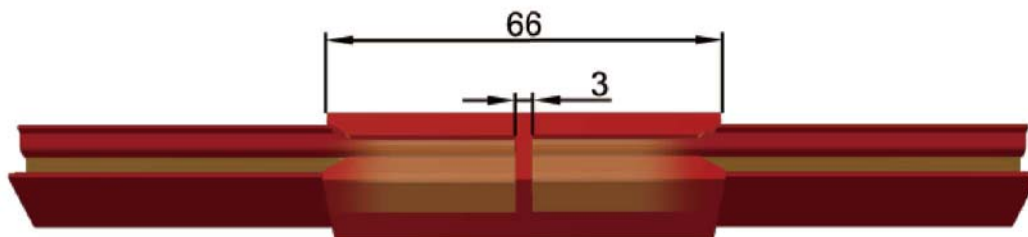
*Cable은 공급에서 제외됩니다.(필요시 별도 문의)

*The power cable is not included. If you require, please notice us.

Separation piece(3mm)

- 통전구간의 필요위치에 설치되어 설치구간의 양측 전원을 차단하는 부품입니다. 서로 다른 전압을 사용하는 경우 사용됩니다.

- The separation unit is available to interrupt the power at conductor rail.
 In this case, there is used for required different voltage and current.

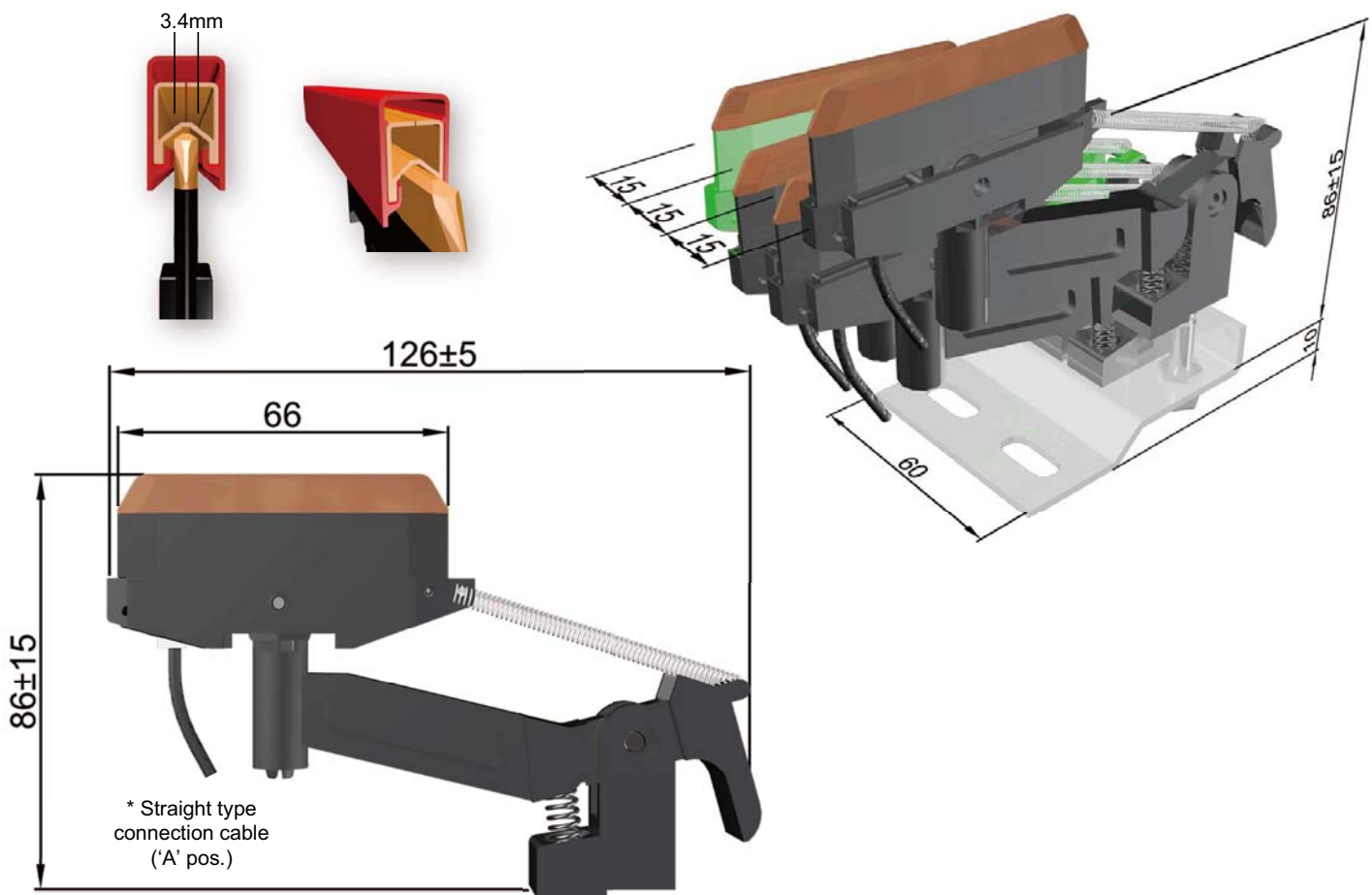


Art. No.	USP 00003
Weight	0.009 kg
Material	non-inflammable Polycarbonate

Collector

- 통전레일과 접촉하여 전원을 필요설비에 전달시키는 역할을 합니다. 전기적인 안전성과 Carbon brush의 마모율을 중시하여 내구성을 강화한 제품으로 유지보수의 편리성을 지닌 제품입니다.

- The collector operates in contact with the conductor rail to serve the current to the equipments.
The carbon brush of collector designed to a height that is not exposed to the outside for safety.
Additionally, the collector is available to replace separately, and to be interchanged instead of the other products.
The collector body is made of plastic of strong material which has strong durability.



<Fig.1>

Type	Phase	Ground
Art. No.	UCT 10025	UCT 10026
Current load	max. : 1 straight plug - 25A	
*Connection cable	Plug / 2.5mm ² cable	
Voltage	< 690V	
Weight	0.045 kg	
Phase distance	15mm(Also available 14mm)	
Lift and swivel	+/- 15 mm	
Material	non-inflammable Polycarbonate + graphite (in Germany)	

*Connection cable 은 별도 구매항목 입니다.

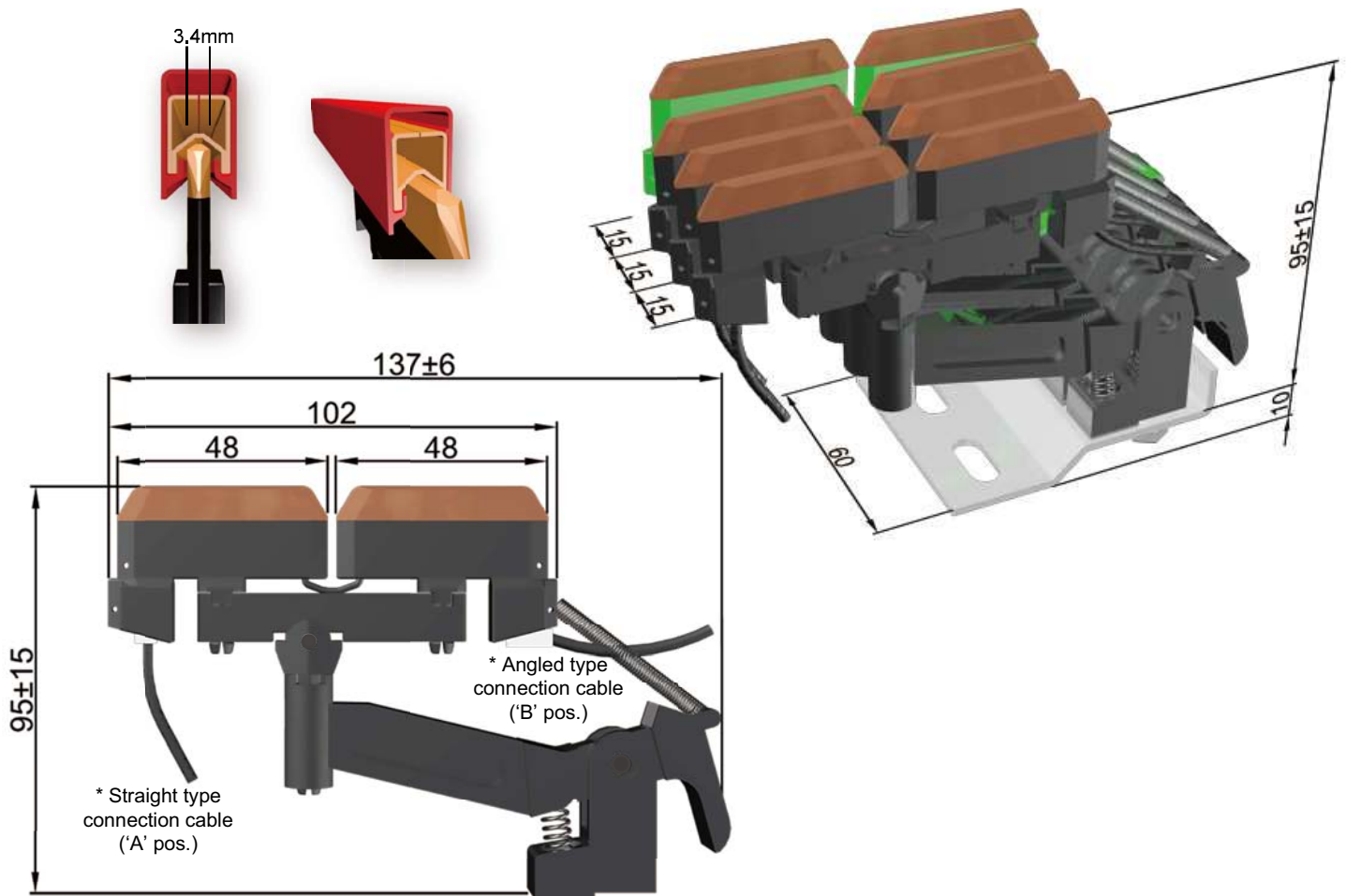
*Connection cable makes an order separately.

※ In accordance with our company's policy of continued improvement, we reserve the right to amend specifications and details at any time.

Collector(Dual type)

- 듀얼타입의 Carbon brush가 구성되어 분기구간이나 절연구간에서 전원공급이 끊어지지 않는 목적으로 사용에 적합합니다.

- This collector consists of 2 carbon brush that it is purposed to connect the power for the transfer & switch line continuously.



<Fig.2>

Type	Phase	Ground
Art. No.	UCT 20025	UCT 20026
Current load	1 straight plug - 25A or 2 straight and angled plug - 40A	
*Connection cable	Plug / 2.5mm ² cable	
Voltage	< 690V	
Weight	0.055 kg	
Phase distance	15mm(Also available 14mm))	
Lift and swivel	+/- 15 mm	
Material	non-inflammable Polycarbonate + graphite (in Germany)	

*Connection cable 은 별도 구매항목 입니다.

*Connection cable makes an order separately.

Connection cable

- 집전기와 대차의 전기 결선을 위한 케이블로 집전기의 연결은 플러그 방식으로 되어 있어 조립이 간편한 구조입니다. 두타입의 케이블은 정해진 위치에만 사용이 가능합니다.

- The connection cable which will be connected between the collector and a terminal of equipment is plug type at the collector for convenient installation.

Straight - type



The straight - type must be connected with 'A' position
(Fig1. page11 / Fig2. page12)

Angled - type



The angled - type must be connected with 'B' position
(Fig2. page12)

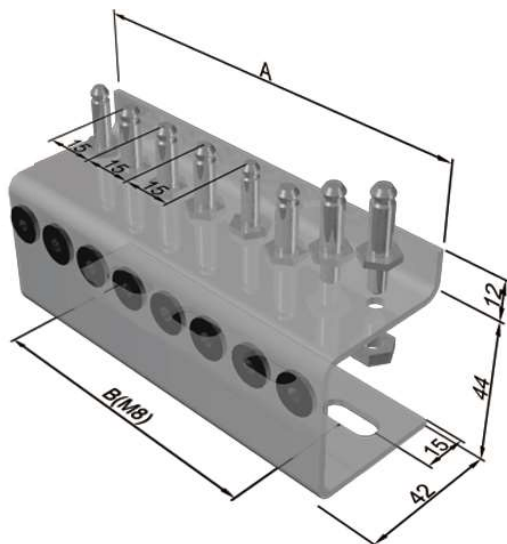
Type	Straight - type		Angled - type	
Art. No.	UCC 10001	UCC 20001	UCC 10002	UCC 20002
Length	1000mm	2000mm	1000mm	2000mm
Current load capacity	max. 25A(2.5mm ²)			
Weight	0.035kg/m	0.068kg/m	0.035kg/m	0.068kg/m

Base plate for collector

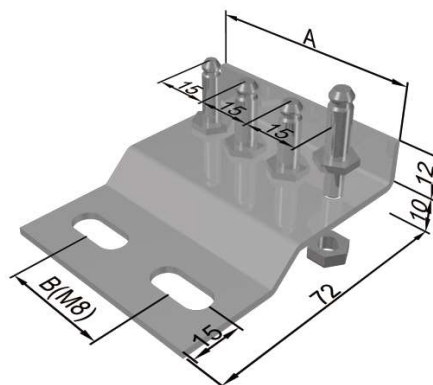
- 집전기를 대차에 부착하기 위한 부품으로 집전기의 조립 및 분해가 쉬운 구조로 되어있습니다.

- The base plate is convenient frame for installation of the collector.

"C" type



"L" type



Type	"A"	"B"	C-Type		L-Type	
			Art. No.	Weight	Art. No.	Weight
4 Poles.	60mm	30mm	UBP 10004	0.152kg	UBP 20004	0.108kg
5 Poles.	75mm	45mm	UBP 10005	0.190kg	UBP 20005	0.135kg
6 Poles.	90mm	60mm	UBP 10006	0.229kg	UBP 20006	0.163kg
7 Poles.	105mm	75mm	UBP 10007	0.267kg	UBP 20007	0.190kg
8 Poles.	120mm	90mm	UBP 10008	0.305kg	UBP 20008	0.217kg

Material : Galvanized Iron

※ In accordance with our company's policy of continued improvement, we reserve the right to amend specifications and details at any time.

Curved conductor rail

- 커브구간에 적용 시 요청하는 곡률반경에 맞게 제작공급되며 수평방향과 수직방향 모두 사용이 가능합니다.
- The curved conductor rail can be served required radius and used horizontally and vertically.

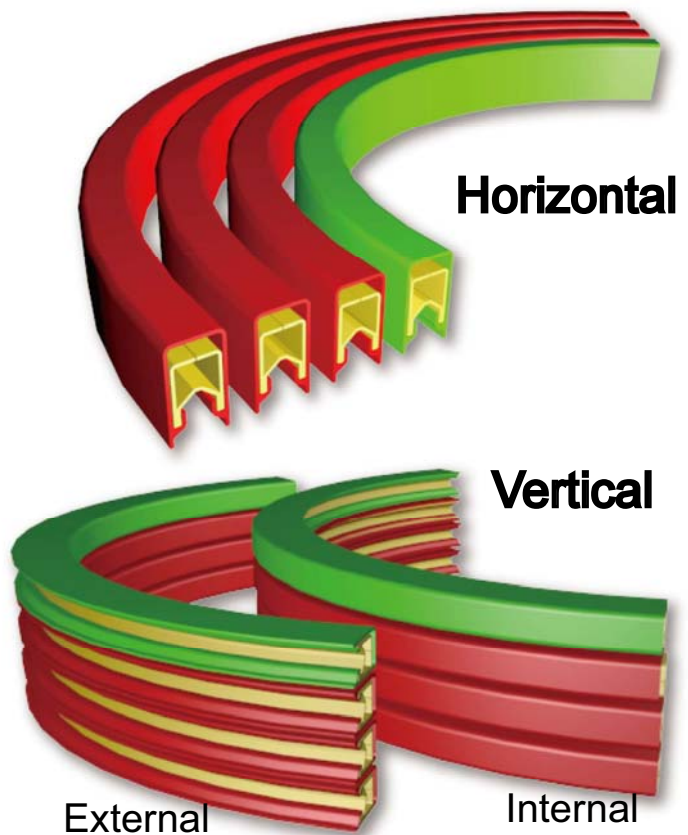
Note:

Bending tool 을 이용하여 제작시 Bending strips를 사용해야 합니다.

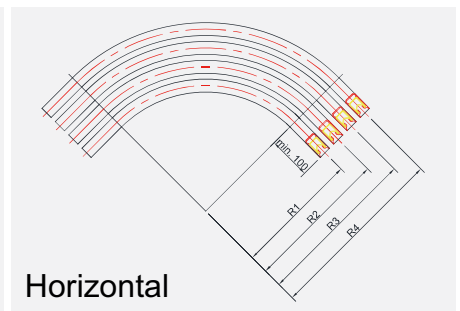
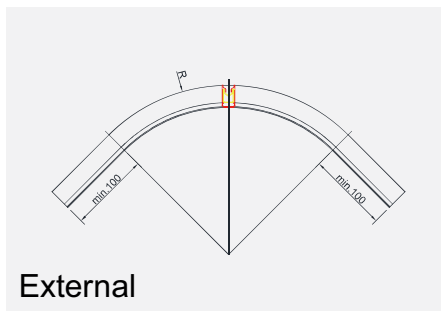
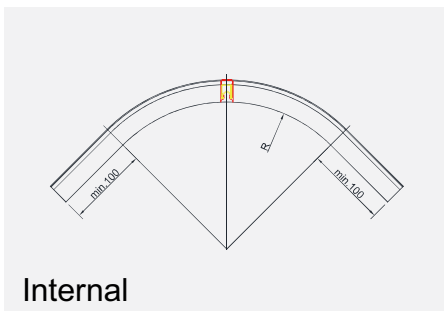
Note:

When you use bending tool for making a curved conductor line, you must use bending strips.

최소반경(Minimum radius) :
 Horizontal : 500mm
 Vertical : 300mm



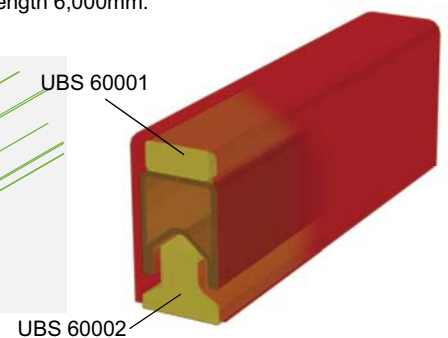
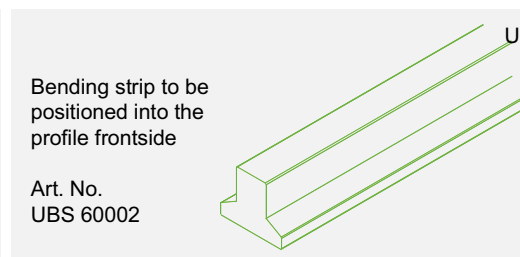
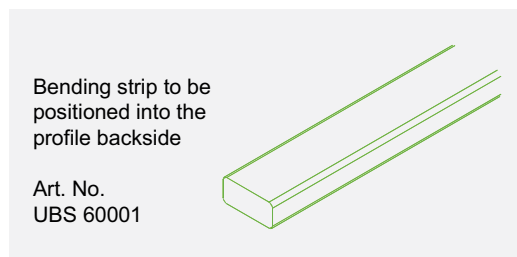
Curved profiles



Bending strips

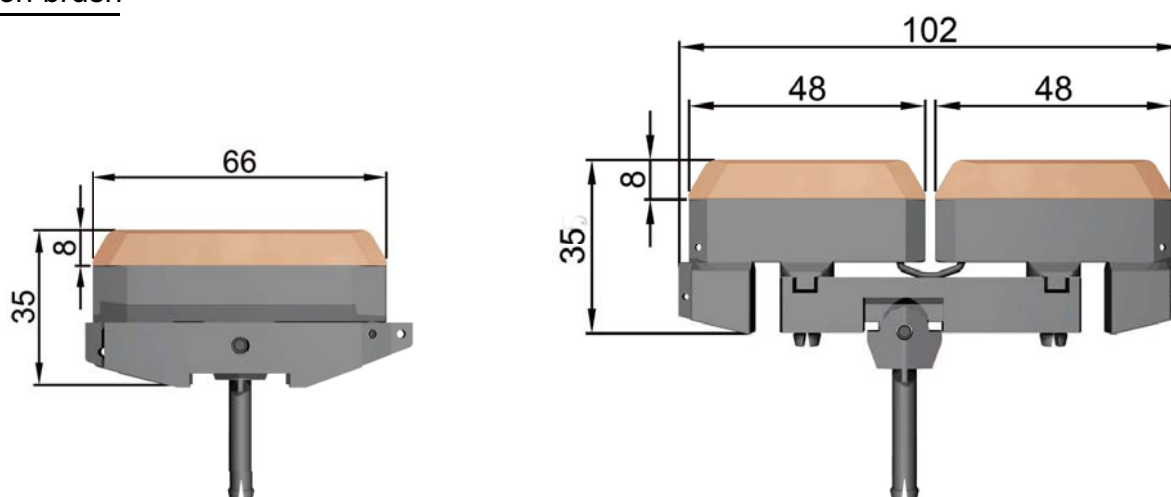
- Conductor rail의 Bending시 레일의 변형을 막기위해 사용되며 길이 6m로 공급된다.

- The bending strips is purposed to prevent variation of conductor rail for bending curve and standard length 6,000mm.



※ In accordance with our company's policy of continued improvement, we reserve the right to amend specifications and details at any time.

Carbon brush



Type	Single		Dual	
	Phase	Earth	Phase	Earth
Art. No.	UCB 10025	UCB 10026	UCB 20040	UCB 20041
Weight	0.0020kg		0.029kg	
*Connection cable	Plug / 1 x 2.5mm ² cable(25A)		Plug / 1 x 2.5mm ² cable(25A) , 2 x 2.5mm ² cable(40A)	
Material of cabon	Graphite (in Germany)			

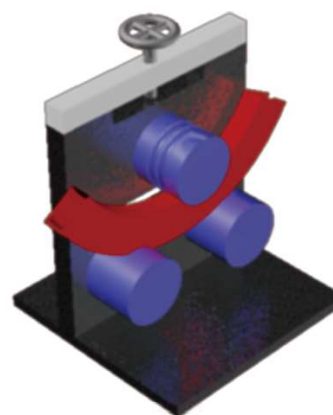
*Connection cable 은 별도 구매항목 입니다.

*Connection cable makes an order separately.

Tool

Bending tool

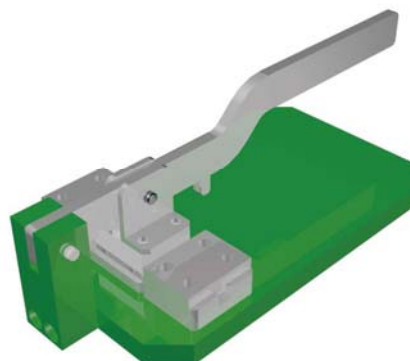
- Conductor rail 의 Curve 작업시 사용됩니다.
- The bending tool will be used for making curve of conductor rail.



Art. No. UBT 00001

Punching tool

- Conductor rail 의 끝단의 마감 작업시 사용됩니다.
- The punching tool will be used for end of copper.



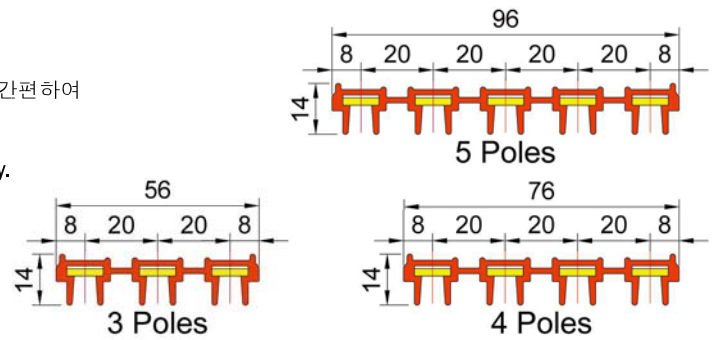
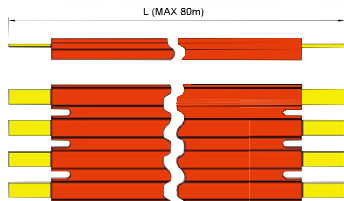
Art. No. UPT 00001

COMPACT BAR

■ Compact bar

설치공간이 협소하거나 굴곡이 많은 설비에도 쉽게 적용이 가능하며 시공이 간편하여 어떠한 조건에서도 설치가 가능함.

The compact bar can be installed for narrow space and curved system easily.



Ampere	Order No.		
	3 Poles	4 Poles	5 Poles
60A	LY5603	LY5604	LY5605
90A	LY5903	LY5904	LY5905

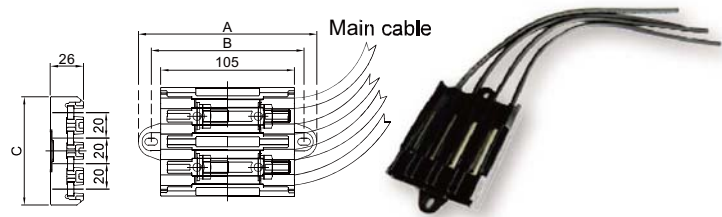
*80m 이상 필요 시 문의 바람.
(For over 80m length, please contact us.)

■ Feed in joiner

Compact bar에 전원을 인입해주는 급전장치

The feed in joiner is for power supply.

Order No.	Poles	A(mm)	B(mm)	C(mm)
LY5613	3 Poles	140	120	65
LY5614	4 Poles	140	120	85
LY5615	5 Poles	146	126	105

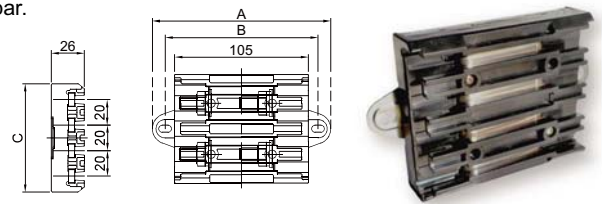


■ Joiner

Compact bar와 Compact bar를 연결하는 장치로 기존 설비의 연장이나 보수시 사용하며 설비의 길이가 길어 Tension unit을 사용 할 시에는 사용할 수 없다.

The Joiner is used for a connecting between compact bar and the other compact bar.

Order No.	Poles	A(mm)	B(mm)	C(mm)
LY5623	3 Poles	140	120	65
LY5624	4 Poles	140	120	85
LY5625	5 Poles	146	126	105



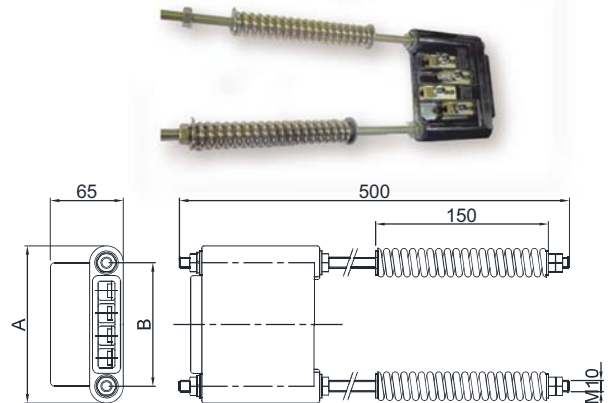
■ Tension unit

Compact bar의 온도변화에 따른 휨 방지 부품으로 설비의 양단 끝에 설치되며 필요 시 급전용으로도 사용이 가능하다.

The tension unit is accessory which is to prevent bending from temperature.

It can be installed to both side and also used for power supply.

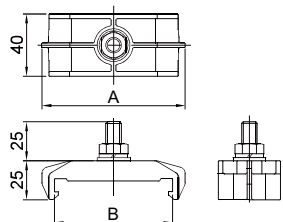
Order No.	Poles	A(mm)	B(mm)
LY-CB3P-TU	3 Poles	120	90
LY-CB4P-TU	4 Poles	140	110
LY-CB5P-TU	5 Poles	160	130



■ Hanger clamp

Compact bar에 를 측면 또는 수평으로 고정시키기 위한 부속으로 Bracket과 조립하여 고정한다.

The hanger clamp is used for compact bar to install on the top or the side.

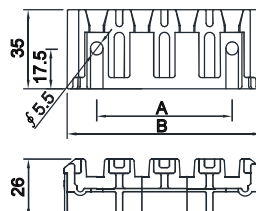


Order No.	Poles	A(mm)	B(mm)
LY5773	3 Poles	72	56
LY5774	4 Poles	92	76
LY5775	5 Poles	112	96

■ End cap

Compact bar의 끝 마감용으로 사용한다

The end cap is used for end of the Compact bar.



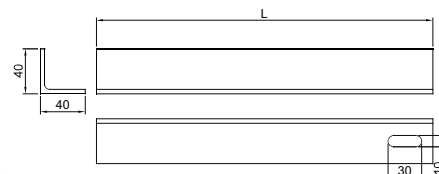
Order No.	Poles	A(mm)	B(mm)
LY5633	3 Poles	40	66
LY5634	4 Poles	60	86
LY5635	5 Poles	80	106

■ Bracket

Hanger clamp를 고정시키기 위한 부속으로 구조물에 용접 또는 볼트를 사용 하여 설치된다.

The bracket should install by welding or bolting and also for hanger clamp.

Order No.	L(mm)
LY-CB-BK-400	400
LY-CB-BK-500	500

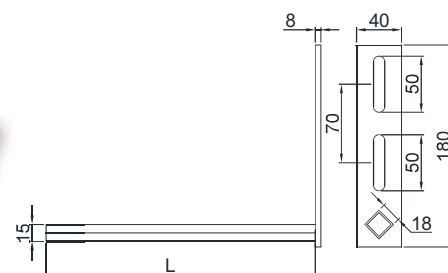


■ Mounting bar

장비에 부착하여 Collector를 취부하기 위한 부속.

The mounting bar is used for the collector to assemble the equipments.

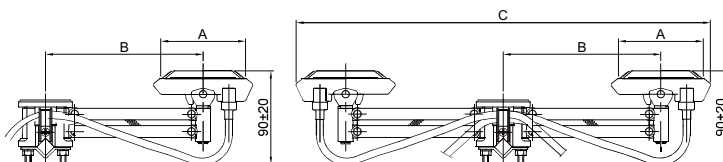
Order No.	L(mm)
LY-CB-MB-250	250
LY-CB-MB-300	300



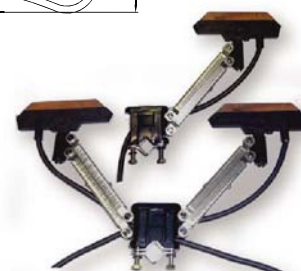
■ Collector

이동대차 및 호이스트에 부착하여 Compact bar에서 기기로 급전하는 장치.

The collector is installed to the moving machines or hoist and delivered to the device for current flowing.



Ampere	Poles	Rating	A(mm)	B(mm)	C(mm)
LY5690	Single	1P 600V 30A	68	140	
LY5691	Double	1P 600V 60A	68	140	348
LY5692	Single	1P 600V 60A	85	140	
LY5693	Double	1P 600V 120A	85	140	365





자동창고 스택커 크레인
Automatic warehousing stacker crane



물류 창고 및 생산설비의 물류운송설비
Electronic Monorail (EMS) system
Rail Guided Vehicle (RGV)
Automatic Guided Vehicle (AGV) system



물류 창고 및 생산설비의 물류운송설비
Electronic Monorail (EMS) system
Rail Guided Vehicle (RGV)
Automatic Guided Vehicle (AGV) system



조선소나 항공&헬기 격납고등의 대형 자동도어
The applied pictures of big door



세탁기 냉장고 등 가전제품의 테스트 설비
Electronic product testing line



크레인&호이스트
[Crane & Hoist] 철근 및 콘크리트 공장, 발전소 등 다양한 산업현장의 크레인 및 호이스트에 적용.



산처리 설비의 크레인
Hoist of acid and processing

자동차 시트 생산설비
Car-seat forming line

알루미늄 압출 설비
Aluminum puller



물재생센터의 슬러지 수집기
Sludge collector in sewage-treatment works

댐 수문용 호이스트
Hoist for floodgate

교량 하부의 점검대차
Maintenance-equipment in bridge inspection

Special application



천문대
Observatory

랩핑기계
Wrapping machine

슬립링
Slipring

REQUEST FOR QUOTATION (견적문의)

1. Customer 고객정보	Company 회사명	Name 이름
2. Address 주 소		Tel: e-mail:
3. Attention of 관심품목		
4. Type of crane/machine to be electrified 적용분야		
5. Electrical data 필요사양		
Voltage	Volts	Phases
		Hz
6. Length of conductor system 설비길이		
7. Number of conductors required 사용극		
Power lines	control lines	neutral(ground)
8. Service environment 사용환경		
Indoor(옥내)		Outdoor(옥외)
9. Special site conditions(humidity, dust, chemical influence etc.) 특수환경 조건(습도, 먼지, 화학적 특성 etc.)		
10. Temperature conditions 주변온도		°C min. °C max.
11. Power suppling points 전원 인입 위치		
12. Number of cranes/machines electrified from the one system LINE 당 사용 크레인 or 이동대차등의 수량		
13. Ampere load of each crane/machine 크레인 or 이동대차등의 한대당 필요 용량(Ampere)		
14. Travelling speed of machinery 이동속도		
Remarks 기타		

[illegible]



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www.leeyoung.kr(English)

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