

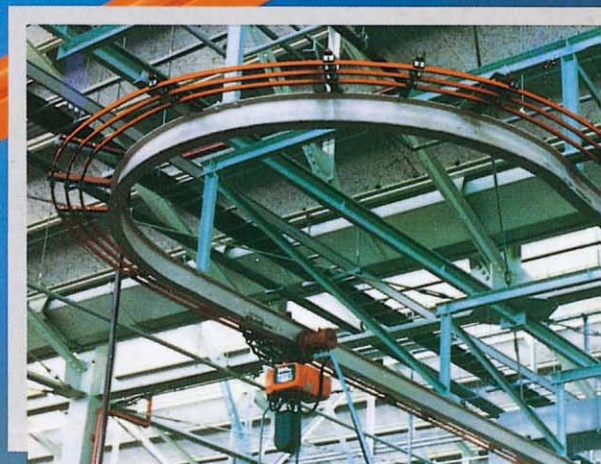
KYEC

Safety Power Rails

Application of Crane · Hoist · Warehouse · Kinds of Assemble Line

Appointed
Mark
KYEC

ISO 9001
Certificated
Since Year
2000



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Introduction :

Being specialized in hoist repair and related innovation, KYEC provide our customers with excellent service based persistent devotion, responsibility and advanced technology.

In order to overcome the difficulties that we have been confronted with part importing, we dedicate ourselves to the production and innovation of parts and components. Also we have obtained numerous patents approved by R.O.C (Taiwan) and overseas countries.

KYEC supply our customers with readily available engineering materials and technical assistance to shorten time of preparation.

Safety power rails

The safety power rails are electrical conductors of various profiles that are used to provide electrical potential to moving systems along a path of travel which have 3-6 poles.

The safety power rails are available for a current load from 60A up to 200A.A mobile electrification technology for moving transportation vehicles and equipment. Common application include: manufacturing robots, material handling systems, hoist and cranes, automated storage facilities and retrieval systems.

Safety power rail systems are available in a variety of configuration depending on applications requirements. Enclosed conductor systems typically enclosed conductors in a protective conduit meeting safety standard.



General technical information

Conversion Table of Horse Power

Full Load Current Table of 3 Phase Alternating

H.P	VOHS	110V	220V	440V	550V	2300V
1/2		4	2	1	0.8	
3/4		5.6	2.8	1.4	1.1	
1		7	3.5	1.8	1.4	
1 1/2		10	5	2.5	2.0	
2		13	6.5	3.3	2.6	
3			9	4.5	4	
5			15	7.5	6	
7 1/2			22	11	9	
10			27	14	11	
15			40	20	16	
20			52	26	21	
25			64	32	26	7
30			78	39	31	8.5
40			104	52	41	10.5
50			125	63	50	13
60			150	75	60	16
75			180	93	74	19
100			246	123	98	25
125			310	155	124	31
150			360	180	144	37
200			480	240	192	48

Check the steps below first to select the correct current (Ampere) of safety power rails and current collector :

1. Calculate the total motor's Horse Power(H.P) required.(ex.10H.P)
2. Make sure the rated voltage(A.C).(ex.220V)
3. Get the current data by checking the above conversion table.(ex.27 Ampere)

Safety Current Table of Conductor Wire Assembling

The safety current of safety power rails would perhaps be affected if the circuit temperature is over 35°C

Copper Conductor Wire			60°C Insulator	75°C Insulator	80°C Insulator	90°C Insulator
Category of Conductor Wire	Dimension mm ²	No. of Wire/Diameter mm	Ampere Capacity(A)			
Single Wire		1.6	20			
		2.0	30			
		2.6	40			
Strand Wire	2.0	7/0.6	20			
	3.5	7/0.8	20			
	5.5	7/1.0	40			
	8	7/1.2	55	65	70	80
	14	7/1.6	80	95	100	110
	22	7/2.0	100	125	135	145
	30	7/2.3	125	150	160	170
	38	7/2.6	145	180	190	205
	50	19/1.8	175	210	220	245
	60	19/2.0	200	240	250	280
	80	19/2.3	230	285	300	330
	100	19/2.6	270	330	350	38
	125	19/2.9	310	380	400	440
	150	37/2.3	360	440	460	505
	200	37/2.6	425	520	550	600
	250	61/2.3	505	615	650	710
	325	61/2.6	590	720	760	830
400	61/2.9	680	825	870	955	
500	61/3.2	765	930	985	1080	

Horse power = total kws/0.75; A = Horse Power×3; (on the assumption 220V)

Total current [A.] ×1.25=proper current

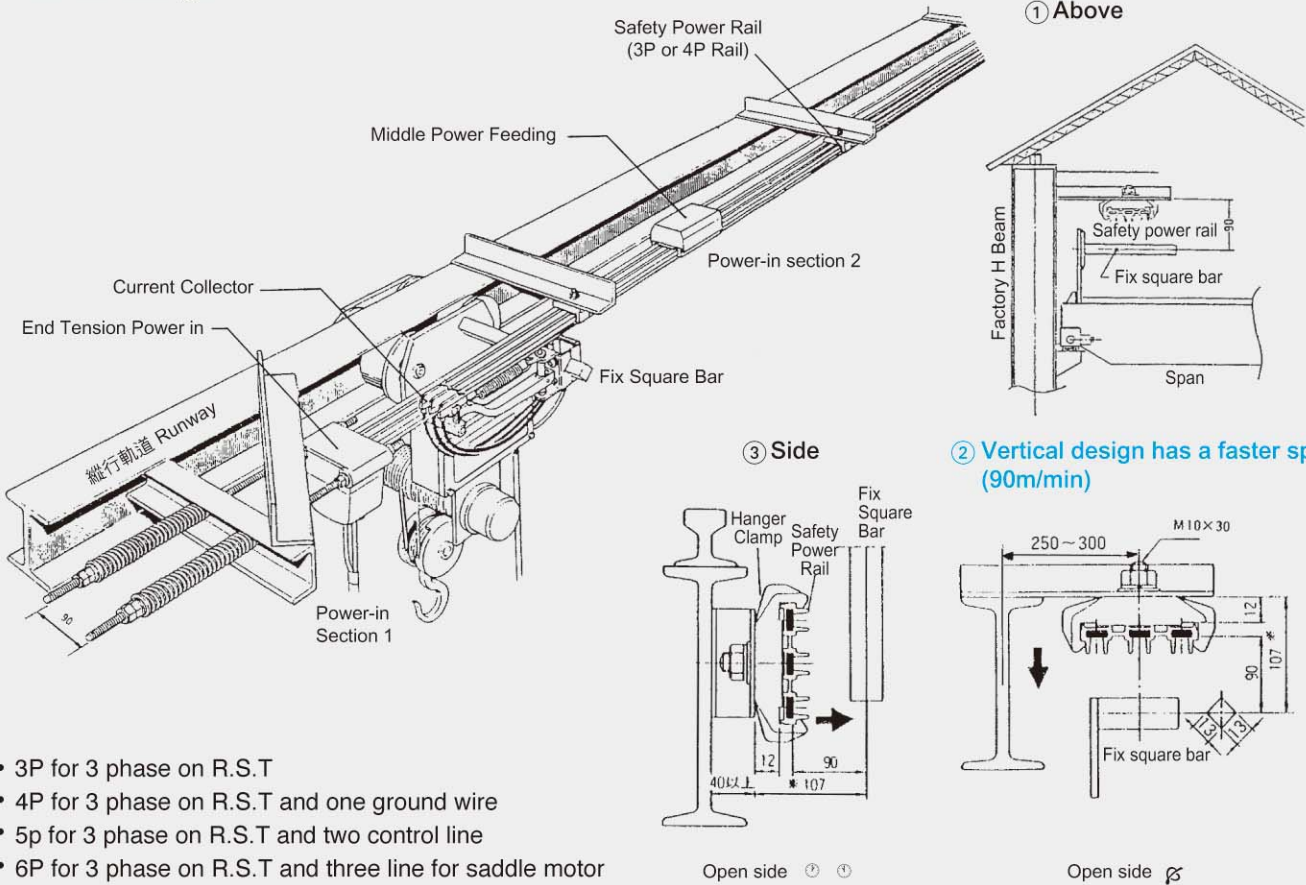
According to the ampere quantity, choose the type of safety power rail:

90A -200A: 3-6P safety power rail

150A: I type safety power rail

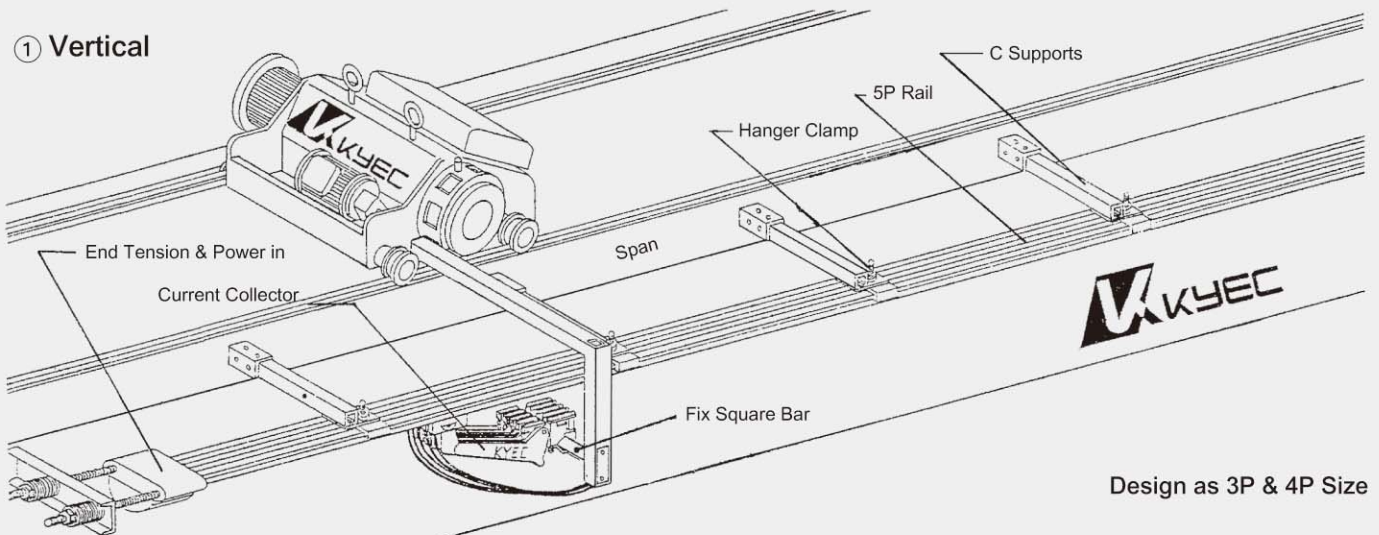
120A 320A 500A 800A: W type safety power rail

Vertical design

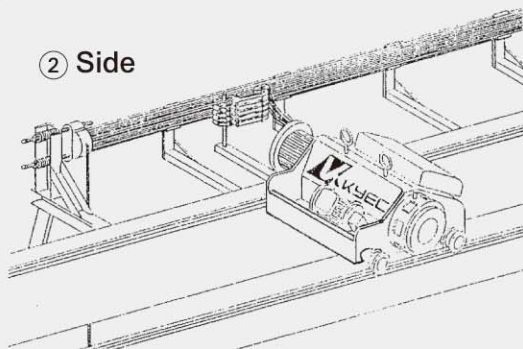


- 3P for 3 phase on R.S.T
- 4P for 3 phase on R.S.T and one ground wire
- 5p for 3 phase on R.S.T and two control line
- 6P for 3 phase on R.S.T and three line for saddle motor

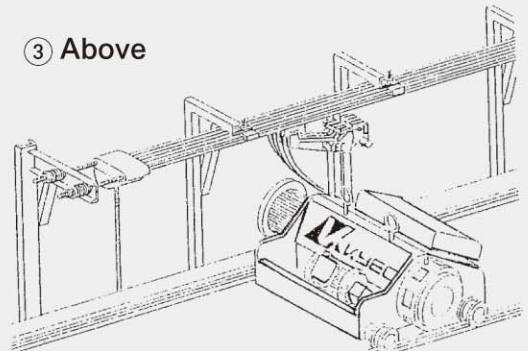
① Vertical



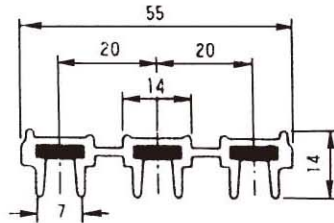
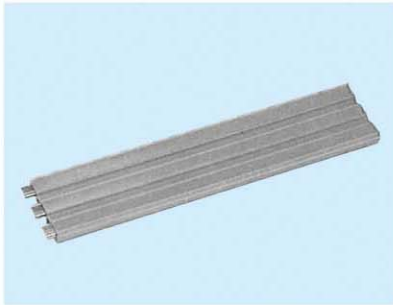
② Side



③ Above



3P Safety power rail

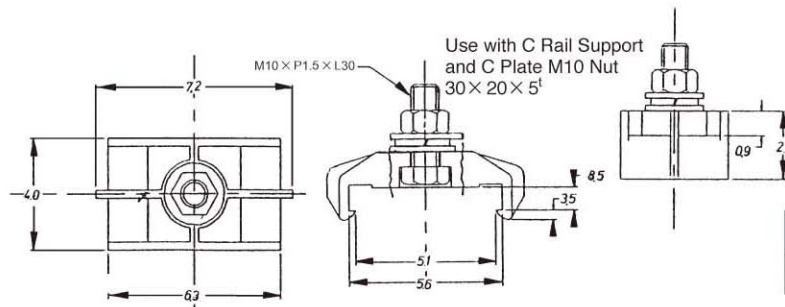
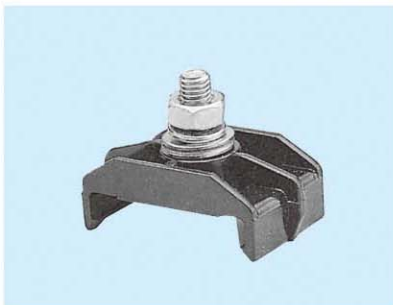


OFC 3N (99.9%)
Conductor rate 100%

KY-AN3010

Three in one

1.03 kg / M

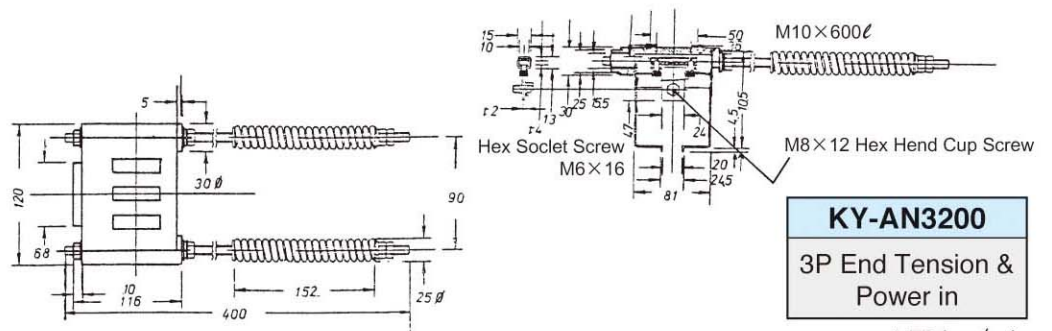
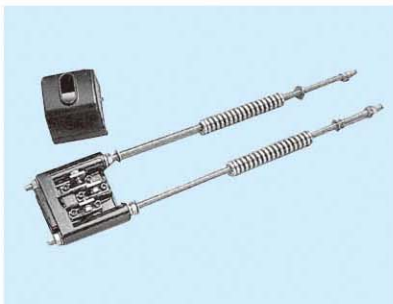


Use with C Rail Support
and C Plate M10 Nut
30 x 20 x 5'

KY-AN3100

3P Hanger Clamp

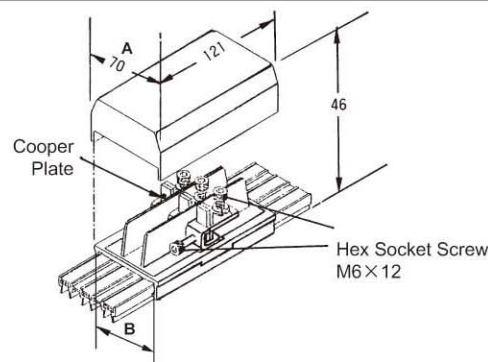
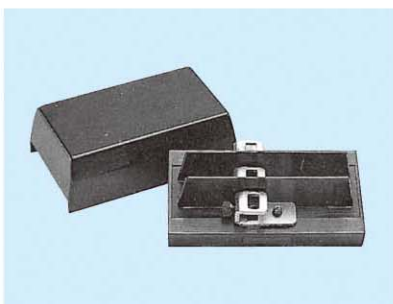
0.075 kg / pic



KY-AN3200

3P End Tension & Power in

1.73 kg / pic

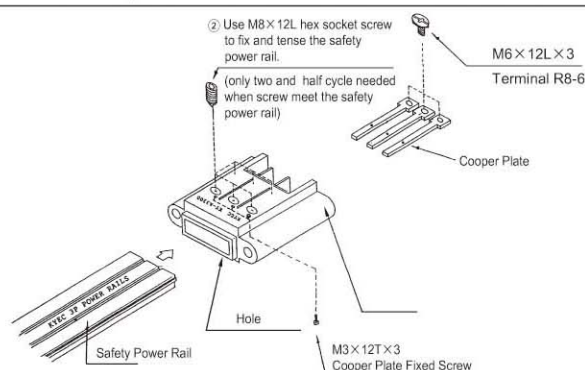
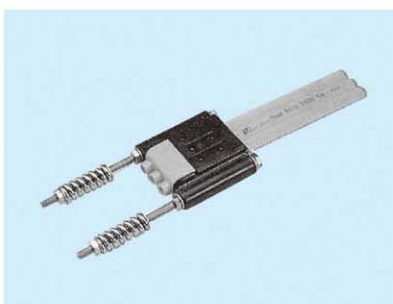


Type	Size	A	B
3P		70	62
4P		90	82
5P		110	102
6P		130	122

KY-AN3300

3P Middle Power Feed-in

0.21 kg / pic



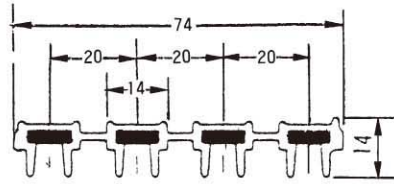
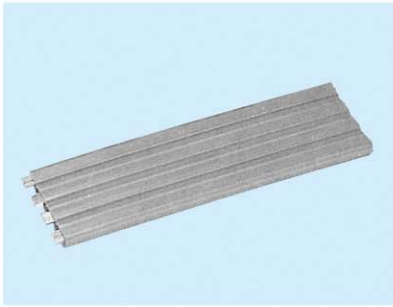
1. Insert safety power rail into the hole
2. Use M8 x 12L hex socket screw to fix and tense the safety power rail. (only two and half cycle needed when screw meet the safety power rail)
3. Power lines fixed with terminals, and fasten the cooper power plate.

KY-AN3200N

3P End Tension & Power in

1.5 kg / pic

4P Safety power rail

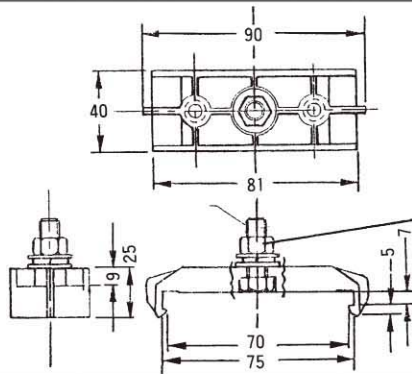
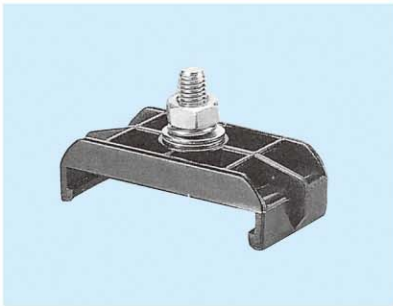


OFC 3N (99.9%)
Conductor Rate 100%

KY-AN4010

(Four in one)

1.4 kg / M

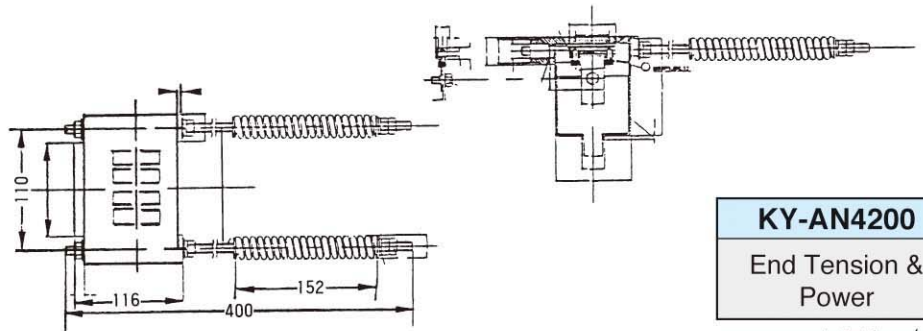
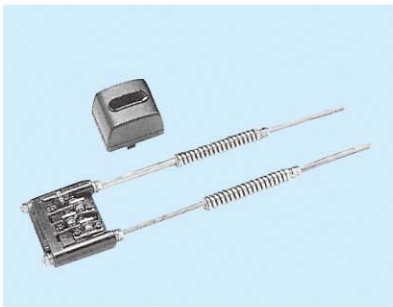


Use with C Rail Support
and C Plate M10 Nut
30×20×5^t

KY-AN4100

4P Hanger Clamp

0.083 kg / pic



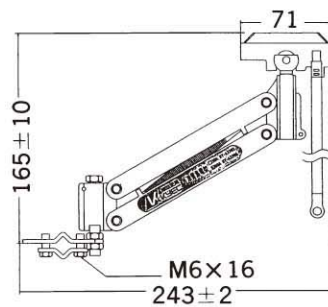
KY-AN4200

End Tension &
Power

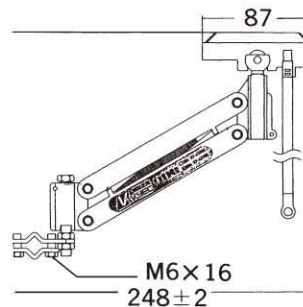
1.74 kg / pic



KY-ANO3703 30Amp



KY-ANO3706 60Amp



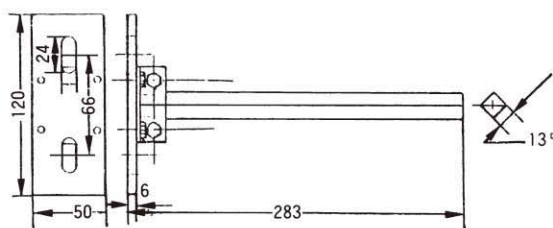
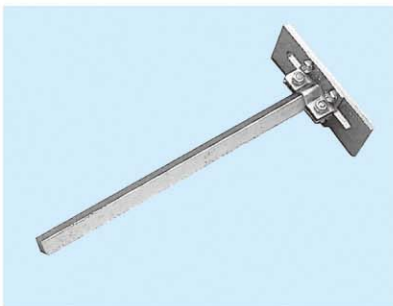
KY-AN3703

KY-AN3706

Current Collector

0.24 kg / pic

0.27 kg / pic

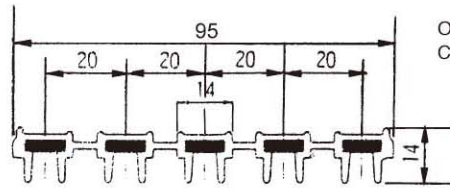
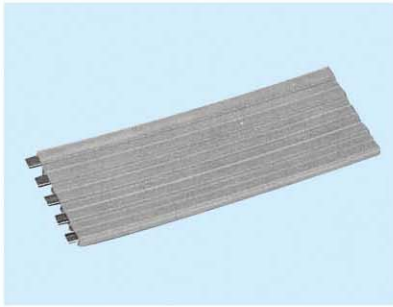


KY-AN3800

Fix Square Bar

0.7 kg / pic

5P Safety power rail

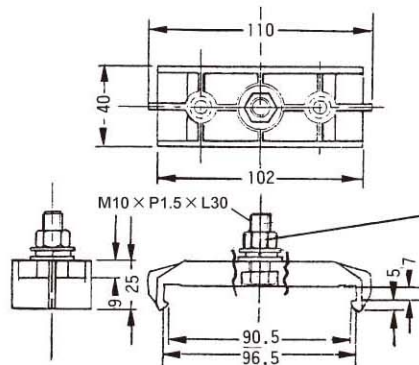
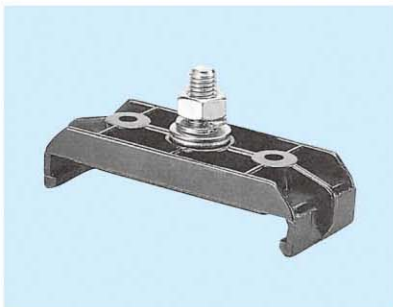


OFC 3N (99.9%)
Conductor rate 100%

KY-AN5009

Five in one

1.7 kg / M

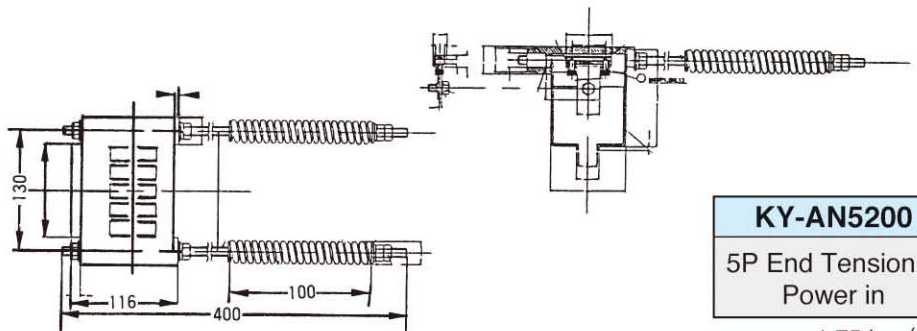


Use with C Rail Support
and C Plate M10 Nut
30×20×5¹

KY-AN5100

Hanger Clamp

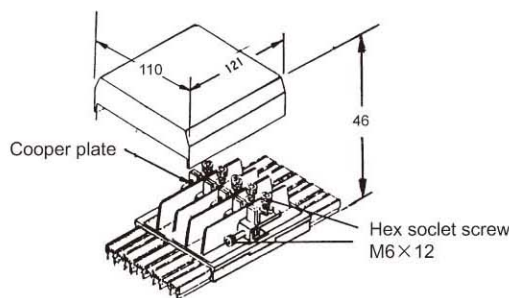
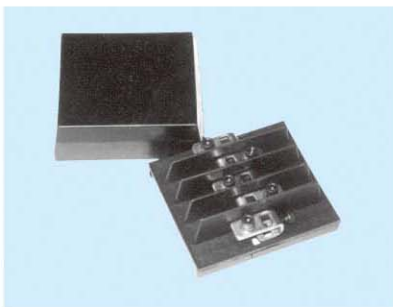
0.09 kg / pic



KY-AN5200

5P End Tension &
Power in

1.75 kg / pic



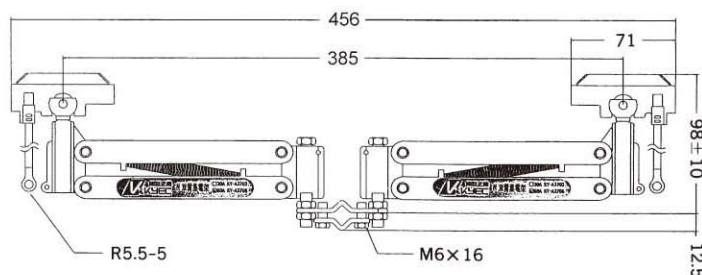
Cooper plate

Hex socket screw
M6×12

KY-AN5300

5P End Tension &
Power in

0.33 kg / pic



R5.5-5

M6×16

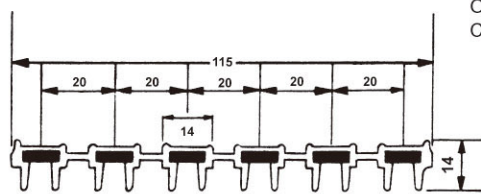
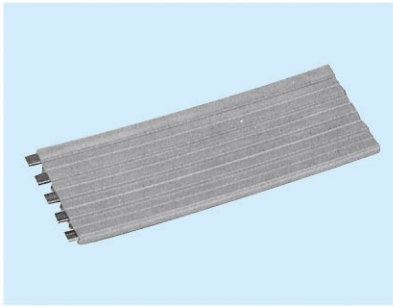
KY-AN3703D

30A Current
Collector

KY-AN3706D

60A Current
Collector

6P Safety power rail

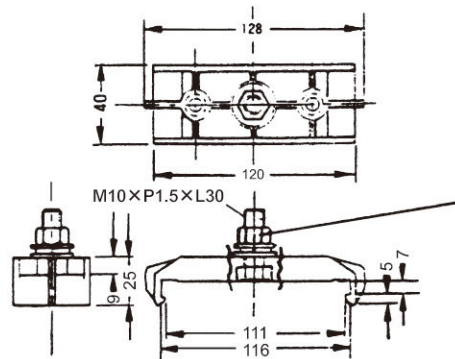
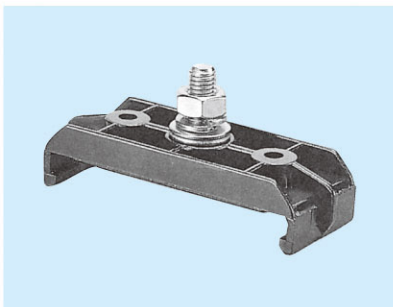


OFC 3N (99.9%)
Conductor Rate 100%

KY-AN6010

Six in one

2.06 kg / M

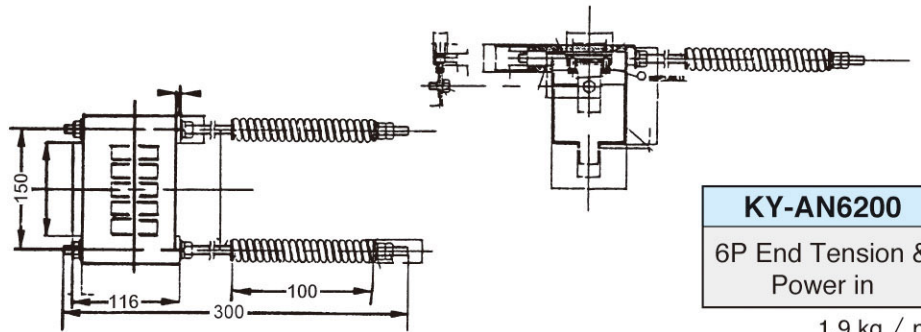
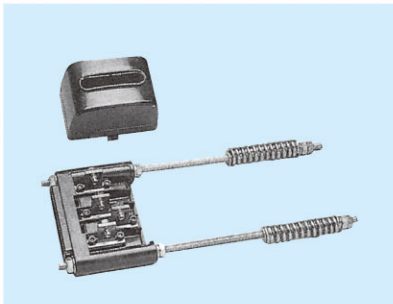


Use with C Rail Support
and C Plate M10 Nut
30×20×5^l

KY-AN6100

6P Hanger Clamp

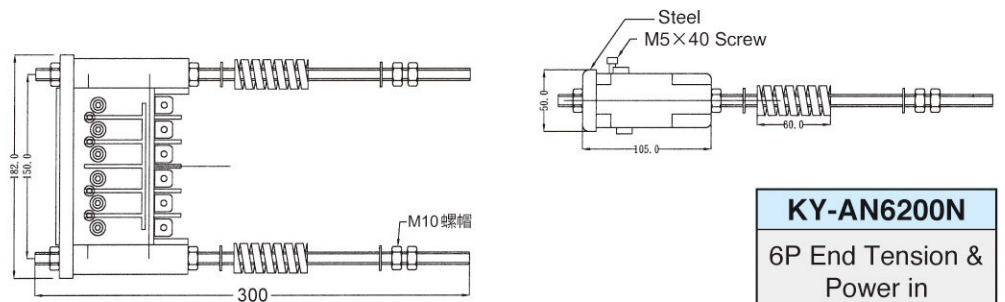
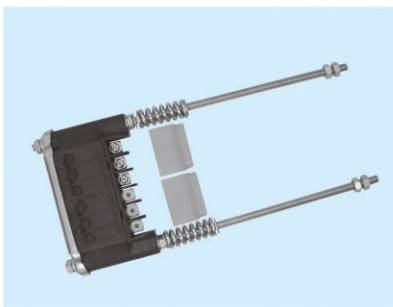
0.1 kg / pic



KY-AN6200

6P End Tension &
Power in

1.9 kg / pic



KY-AN6200N

6P End Tension &
Power in

1.9 kg / pic

KYEC Safety Power Rail Test Result

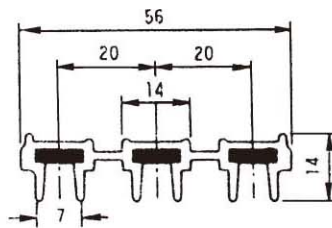
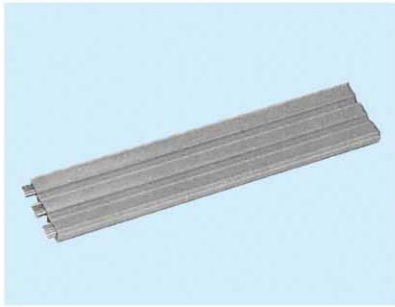
Test Type	Material	Resistance coefficient (R/M)	Durable Potential	Decay of Potential(V/M)	220V/100m Decay Percentage	Temperature
W type 800A	Aluminum	0.000100	6KV×30min	0.08	3.6%	23
W type 500A	Aluminum	0.000107	6KV×30min	0.054	2.5%	23
W type 320A	Aluminum & Cooper	0.000184	6KV×30min	0.059	2.7%	23
3P 90A	Cooper	0.000630	6KV×30min	0.057	2.6%	23
3P 90A	Cooper & Stainless Steel	0.000512	6KV×30min	0.047	2.1%	23
3P 75A	Cooper	0.000882	6KV×30min	0.066	3.0%	23

Assay Institute : Industrial Technology Research Institute

Assay instrument: **Brand & Model :**
ESI 242D
KIKUSUI TOS-8700
TAMA-TDV-20ADS

Name of instrument :
PRECISION RES.MEASUREMENT SYSTEM
WITH AND ING VOLTAGE TESTER
HIGH VOLTAGE DIGITAL METER

3P 200A Parts Diagram

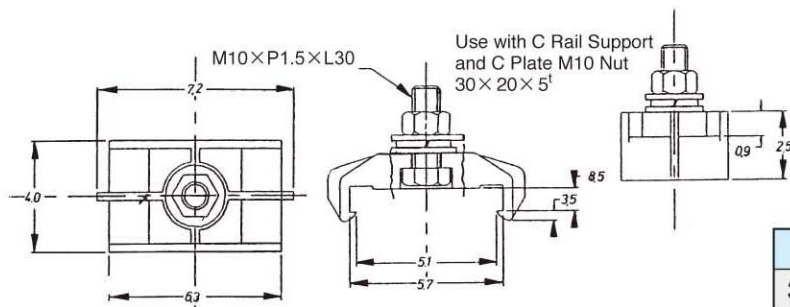
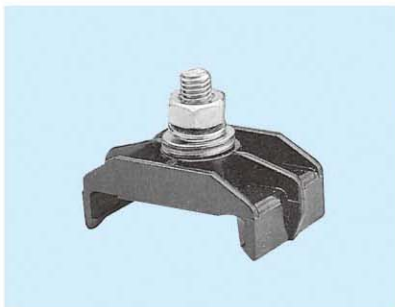


OFC 3N (99.9%)
Conductor Rate 100%

KY-AN3020

Three in one

1.42 kg / M

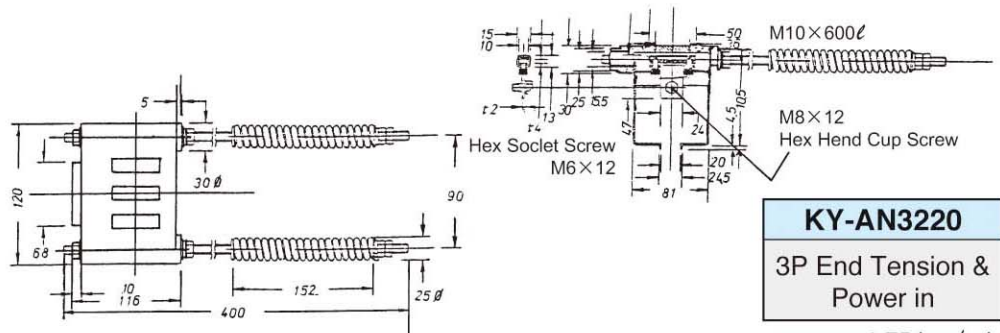


Use with C Rail Support
and C Plate M10 Nut
30×20×5

KY-AN3120

3P Hanger Clamp

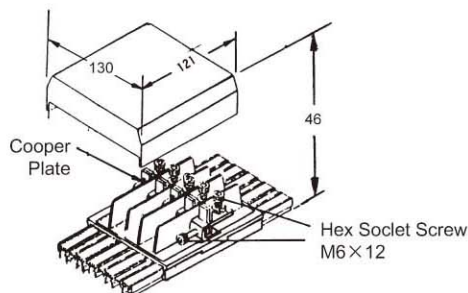
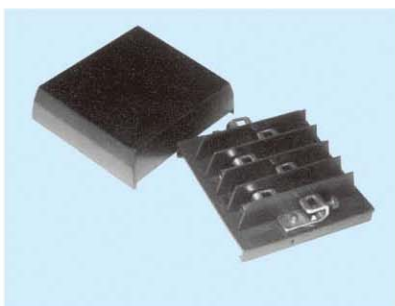
0.075 kg / pic



KY-AN3220

3P End Tension &
Power in

1.75 kg / pic



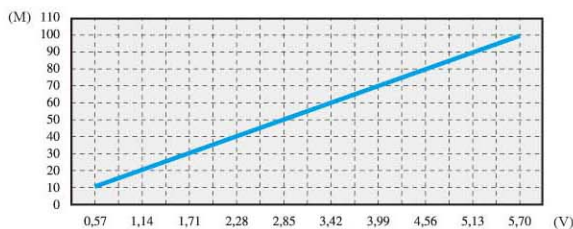
KY-AN6300

6P End Tension &
Power in

0.38 kg / pic

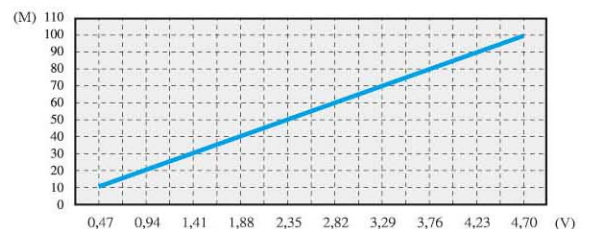
3P 90A (Cooper)

Length(M)	10	20	30	40	50	60	70	80	90	100
Decay of Potential(V)	0,57	1,14	1,71	2,28	2,85	3,42	3,99	4,56	5,13	5,70

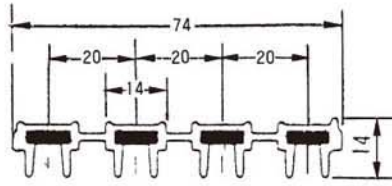


3P 90A (Stainless Steel)

Length(M)	10	20	30	40	50	60	70	80	90	100
Decay of Potential(V)	0,47	0,94	1,41	1,88	2,35	2,82	3,29	3,76	4,23	4,70



4P 200A Parts Diagram

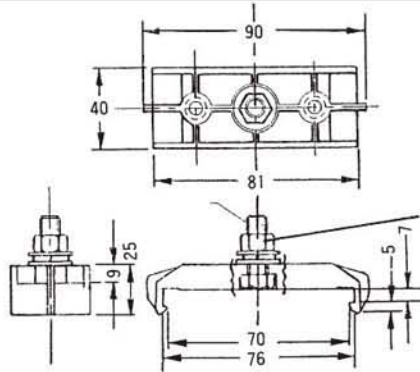


OFC 3N (99.9%)
Conductor Rate 100%

KY-AN4020

Four in one

1.9 kg / M

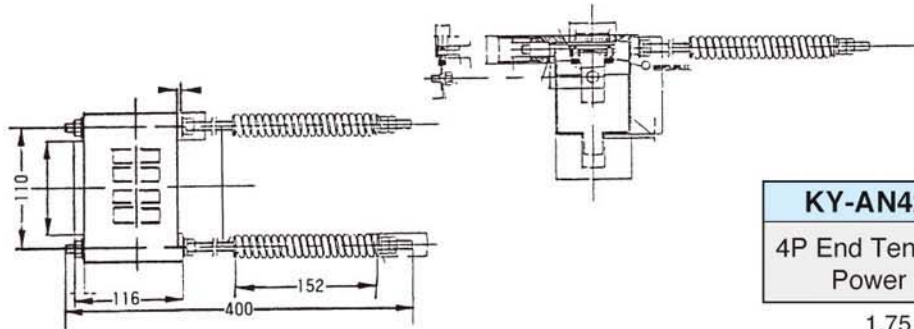


Use with C Rail Support
and C Plate M10 Nut
30 × 20 × 5'

KY-AN4120

4P Hanger Clamp

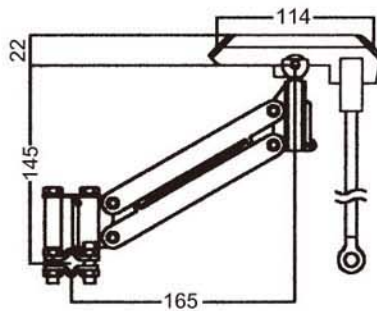
0.083 kg / pic



KY-AN4220

4P End Tension &
Power in

1.75 kg / pic



KY-AN3710

N Current Collector
100A



KY-AN4300

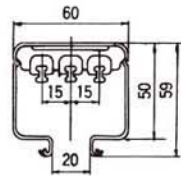
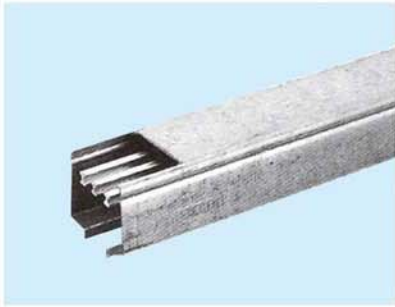
4P End Tension &
Power in

0.34 kg / pic



Clean Brush
Produce
on Demand

High Temperature Durable Box Safety Power Rail



KY-D3003 (6133)

ND3P Straight Line Duct

3 kg / M

KY-D3702 (6175)

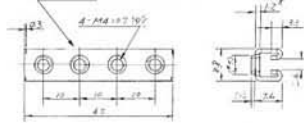
ND3P Trolley 20A

0.7 kg / pic



Conductor Joint

ND3P Cooper Connector



KY-D3500 (61331)

ND3P Coupling Plate

0.3 kg / pic

KY-D3704 (6276)

ND3P Trolley 40A

0.8 kg / pic



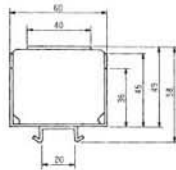
KY-D3100 (6111)

ND3P Hanger

0.3 kg / pic

KY-D3600 (6117)

ND3P Trolley-Pulling Bracket



KY-D3201 (6112)

ND3P End Cap

0.4 kg / pic

KY-D3001 (6001)

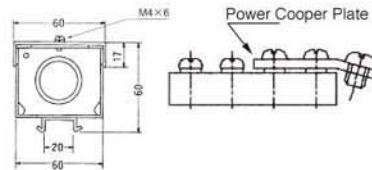
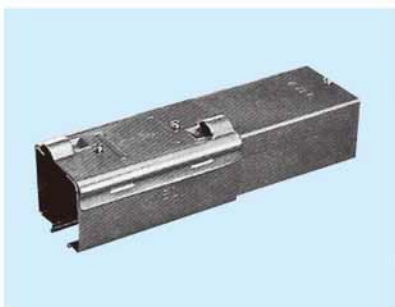
ND3P Trolley Collectors

KY-D3902 (6102)

ND3P Trolley Collectors 20A

KY-D3904 (6104)

ND3P Trolley Collectors 20A



KY-D3200 (6173)

ND3P Feed-in Boxes

1.2 kg / pic

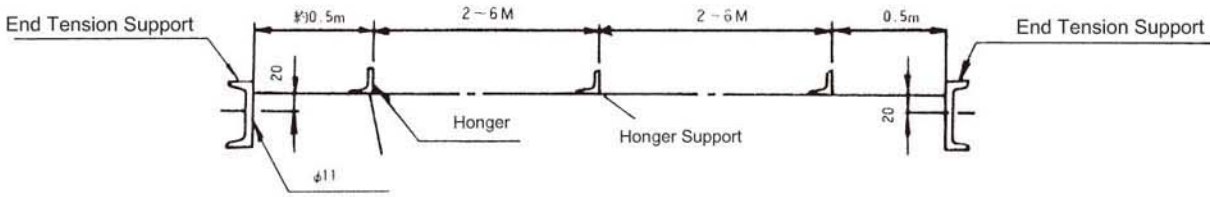
Produce on Demand

Curved Ductc



3P、4P、5P、6P Installments Diagram

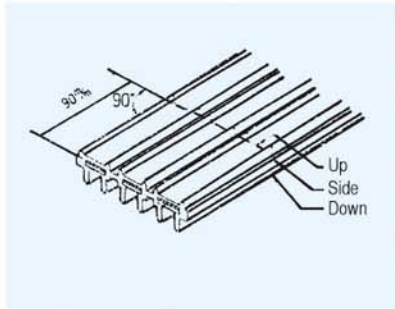
Step 1 Support Design



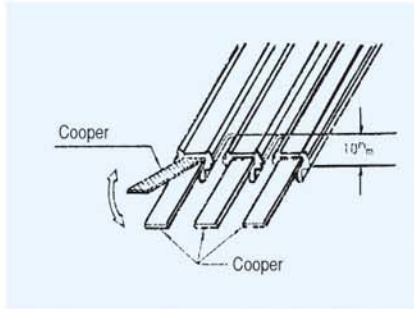
- Remark :
- (1) The side design installment recommended when a camber occurs to the 3-6P safety power rail assembly.
 - (2) The hanger clamps are supposed to be installed every 0.5 meter from the starting point of the turning.
 - (3) The 3-6P tension part for safety power rails must be installed at the place about 10mm higher than the hanger clamp.
 - (4) This step prevents water from flowing to the power-in place along the safety power rails; hence the short circuit won't happen.
 - (5) The silica gel must be coated on the connected place of the power-in part and safety power rail as weather protection.
 - (6) The 3-6P safety power rails are not suitable for outdoor usage or the place with high acid/alkali environments.

Step 2 End tension & Power-in

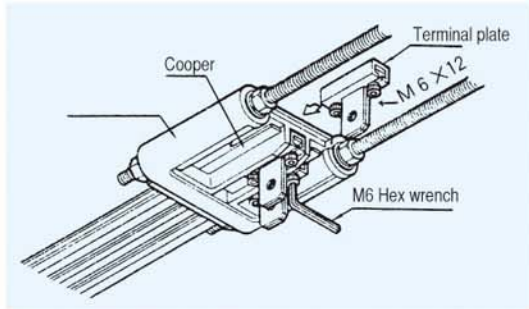
Remark : (1) Install one end on the ground then lift rail up to estimated location and install another.



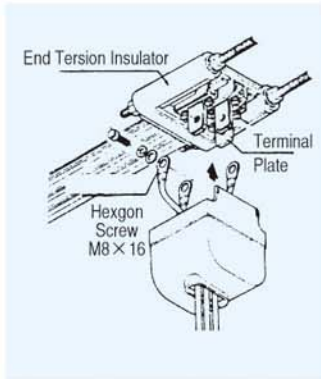
(2) End tension (plastic cut needed): Cut the PVC material at 90mm from the starting point of the end.



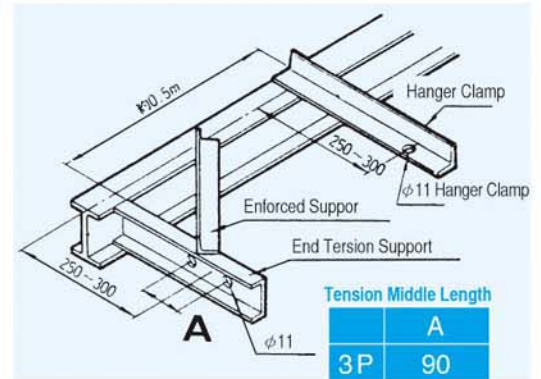
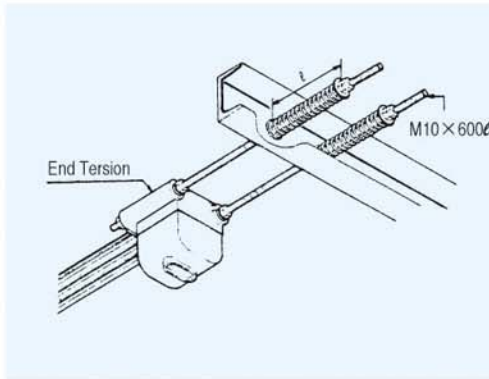
(3) Cut the concave PVC material at 10mm from the point of step (1).



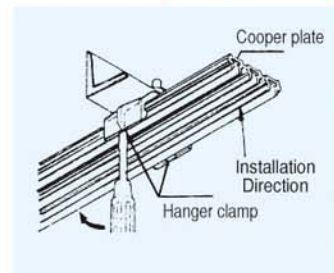
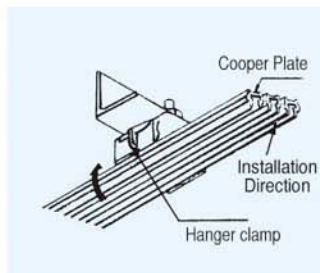
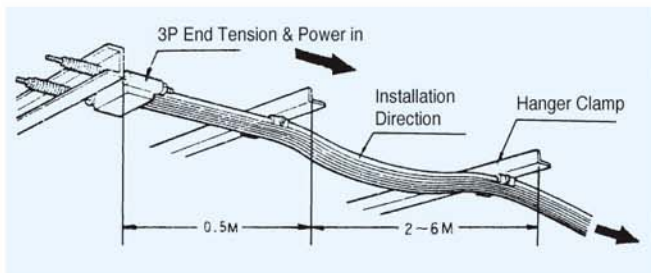
(4) Safety power rail perforated through the End tension, fixed with terminal board (use M6 x 12mm Hex Socket Screws), and bend the cooper in a 90° angle.



(5) Power cable perforated in the connector box first, located with terminal (use M8 x 16mm Hex Socket Screws).
(6) Installment completed.



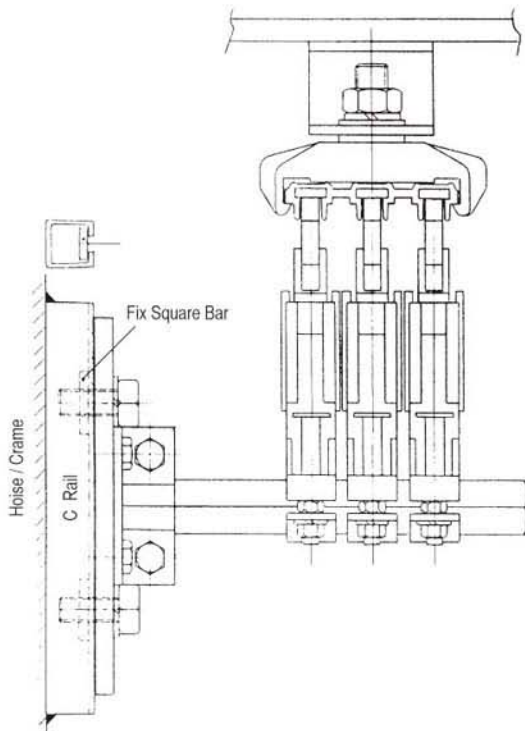
Step 3 Hanger clamp



- Remark :
- (1) Aim the hanger clamp with power rail and push up.
 - (2) Use a slotted screwdriver to dismantle the hanger clamp.

Step 4 Repeat the step 2 End tension & Power-in

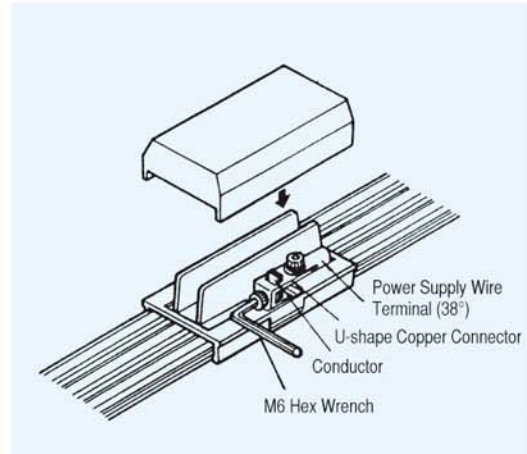
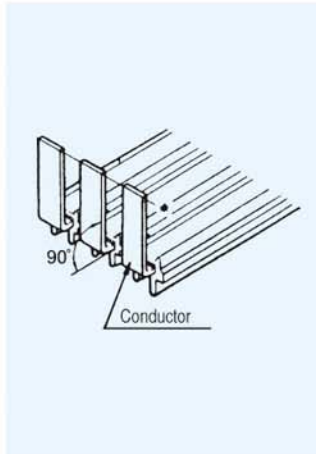
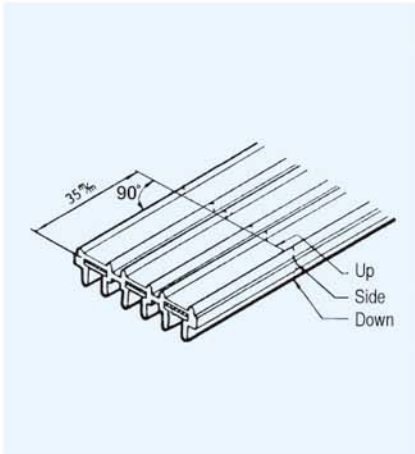
Step 5 Fix square bar/current collector



Remark:

- (1) Fix square bar could be welded on the crane or screw used.
- (2) Fix square bar's angle is supposed to be mounted. One diagonal of the bar must be parallel to ground and safety power rail, another is vertical.
- (3) Length could be cut as demand.
- (4) If carbon brushes worn, just replace a new one.

3P Rail connector and middle power in



- (1) Cut off the PVC material at 35mm from the end of safety power rail.
- (2) Bend upward copper material in vertical 90°angle.
- (3) Insert both sides of 90°vertical angle safety power rail into middle power feeding and connect both sides by screwing up M6 inner hexagon screw bolt on U type copper connector.



Mini current collector

Produce on Demard

Current Collector Unit

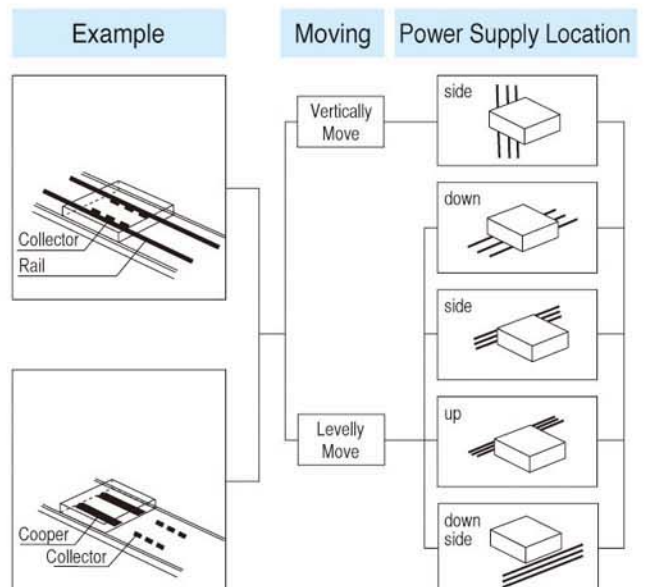
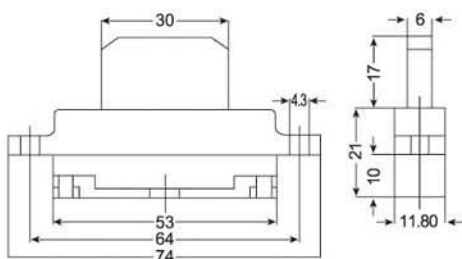
Transit & Test System



DH-6832

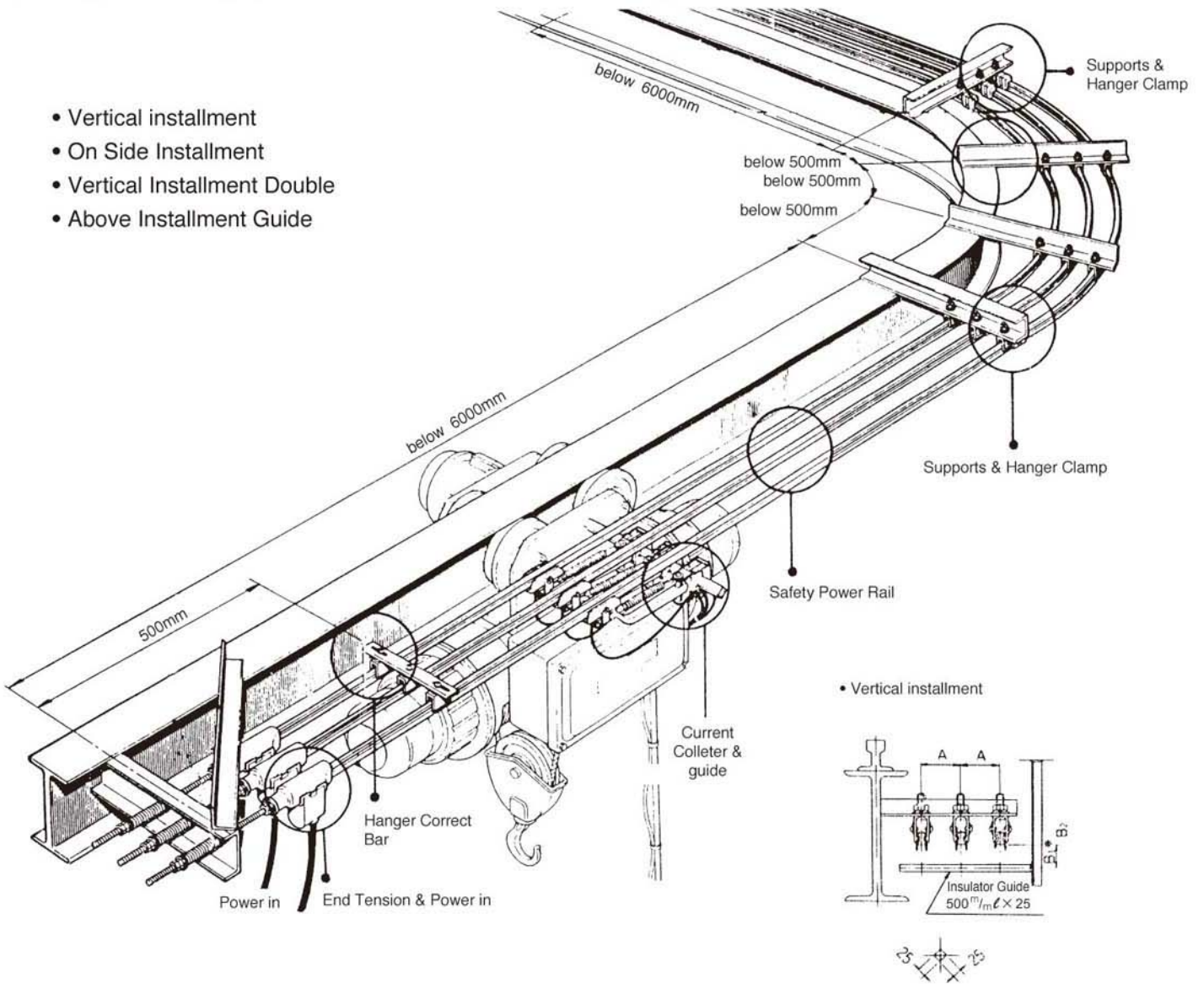


DH-6813

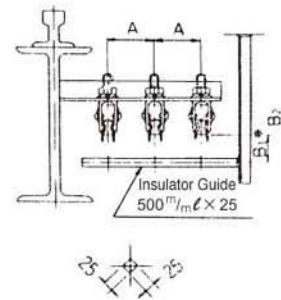


I type safety power rail installment diagram

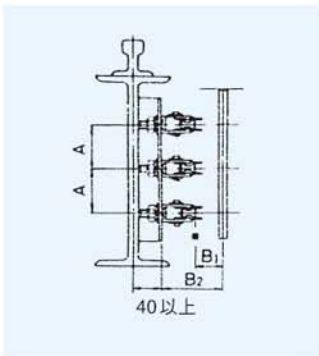
- Vertical installment
- On Side Installment
- Vertical Installment Double
- Above Installment Guide



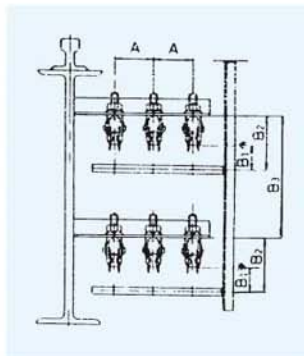
• Vertical installment



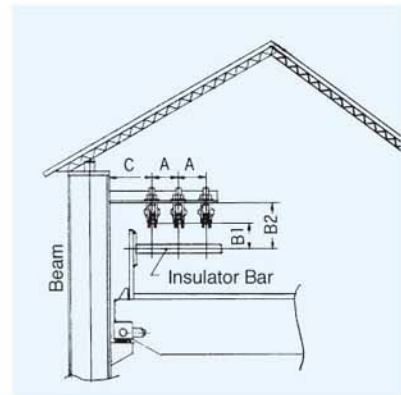
• On Side Installment



• Vertical Installment Double



• Above installment

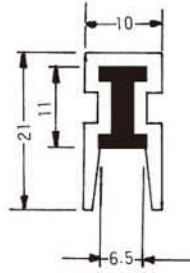


A	min	75
	standard	100

B	B 1	95
	B 2	130
	B 3	290

C	min	150
	standard	200

I type safety power rail Parts Diagram

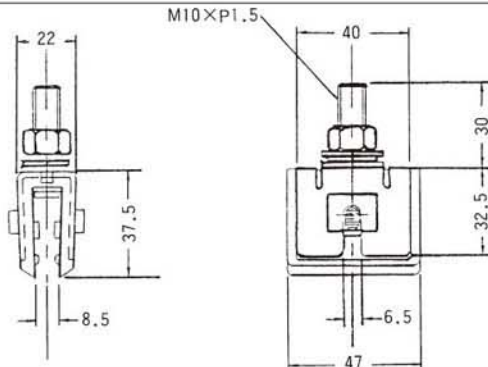


OFC 3N (99.9%)
Conductor rate 100%

KY-AN1015

"I" Type Rail

0.47 kg / M

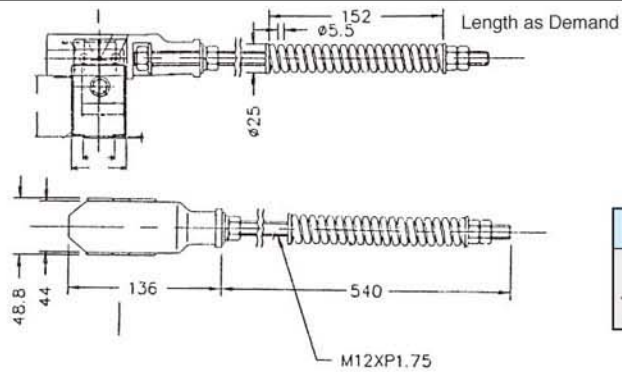


Use with C Rail Support
and C Plate M10 Nut
30 × 20 × 5¹

KY-AN1100

**"I" Type
Hanger Clamp**

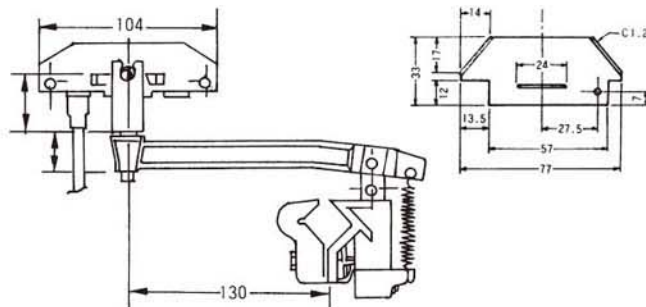
0.11 kg / pic



KY-AN1200

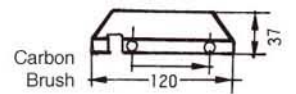
**"I" Type End
Tension & Power in**

1.1 kg / pic



• **KY-AN1904 40Amp**

• **KY-AN1910A 100Amp**



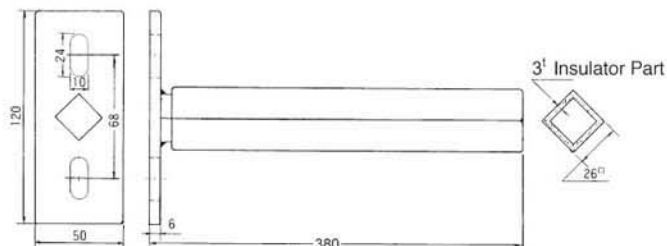
Carbon
Brush

KY-AN1704A

KY-AN1710A

40Amp
100Amp

Current Collector

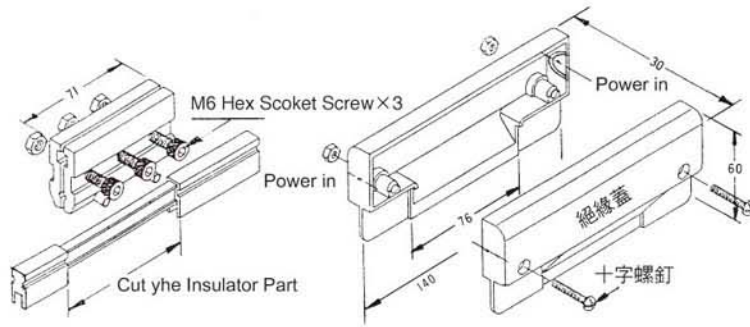


KY-AN1800 380L

KY-AN6800 500L

Insulator Guide

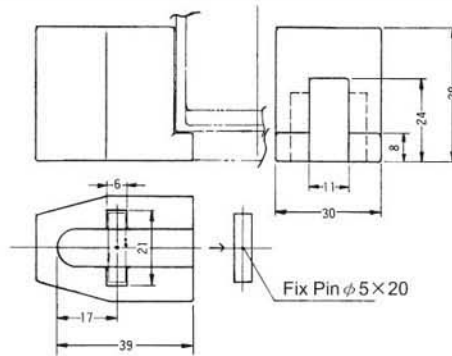
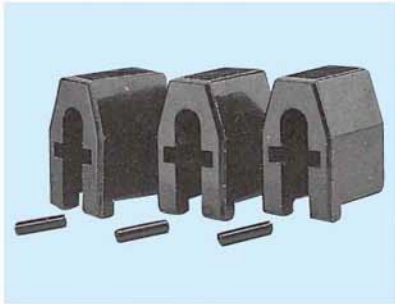
1.45 kg / pic
1.82 kg / pic



KY-AN1300

"I" Type Middle power feed in

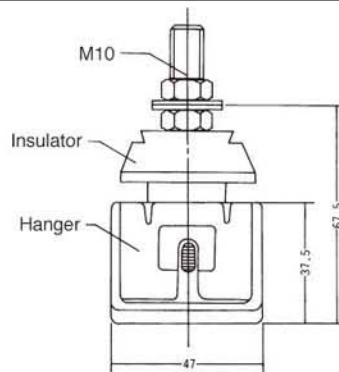
0.28 kg / pic



KY-AN1600

Fixed end insulator

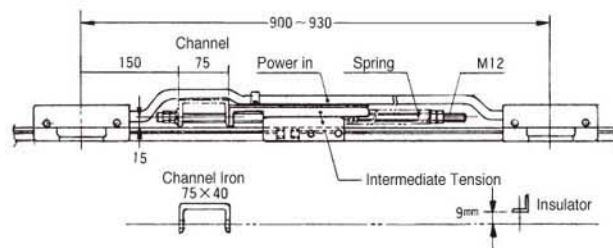
0.07 kg / pic



KY-AN1100S

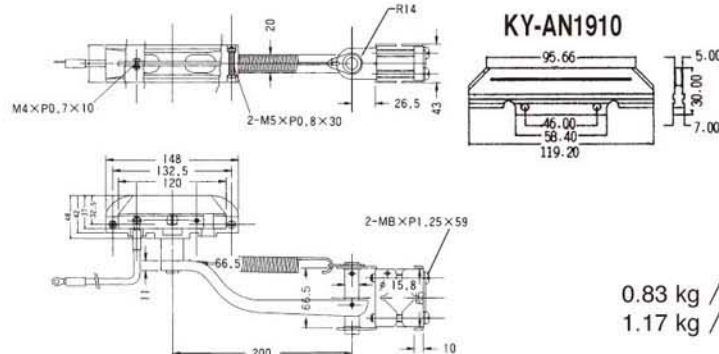
"I" Type Insulator hanger

0.15 kg / pic



Produce on Demand

Intermediate tension insulator



0.83 kg / pic
1.17 kg / pic

KY-AN1704

KY-AN1706

KY-AN1710

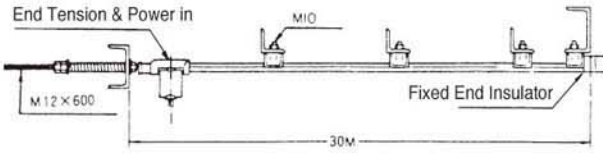
40Amp
100Amp

Current Collector

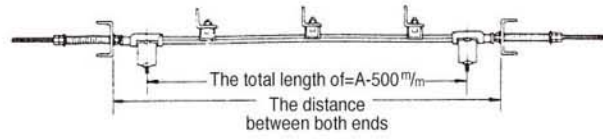
I type safety power rail installment diagram

Step 1 Support Design

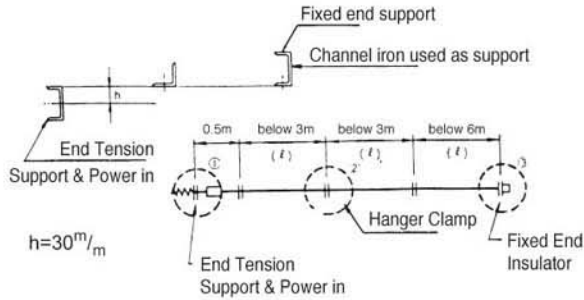
A. installment for I type in 30 meters



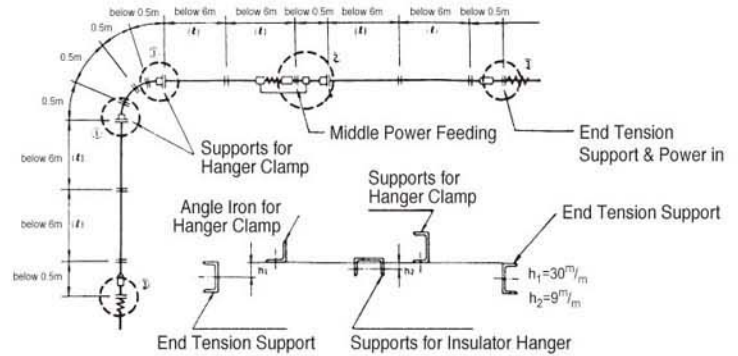
B. installment for I type over 30 meters



Line Case

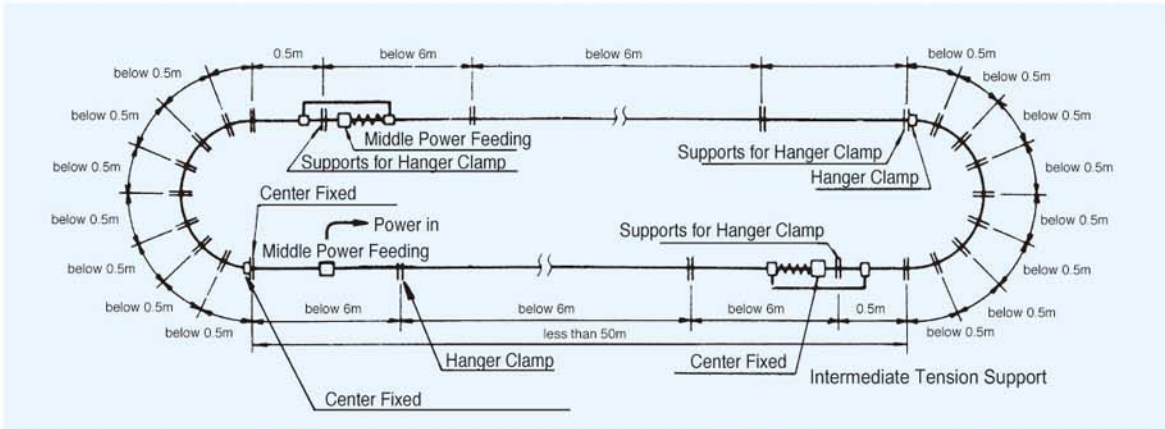


Curve Case

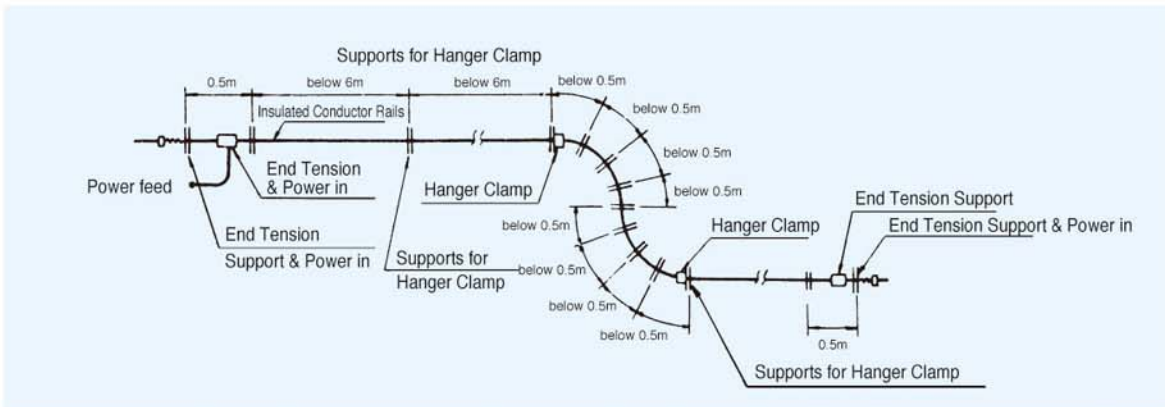


Around type

End Tension Support



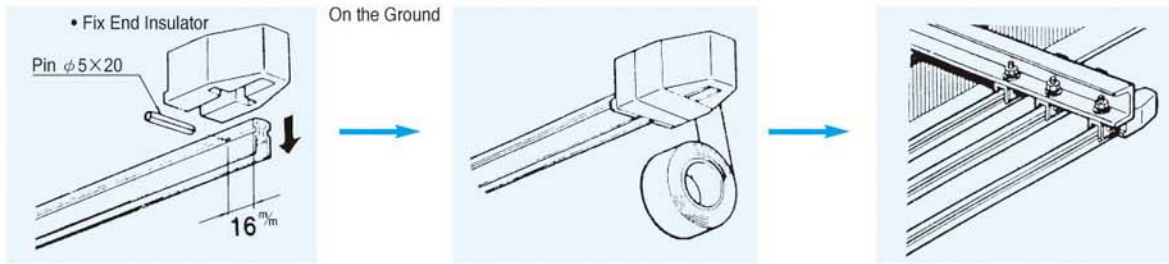
"S" type



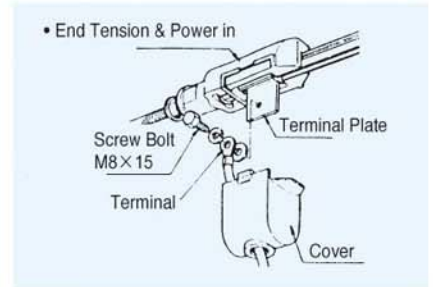
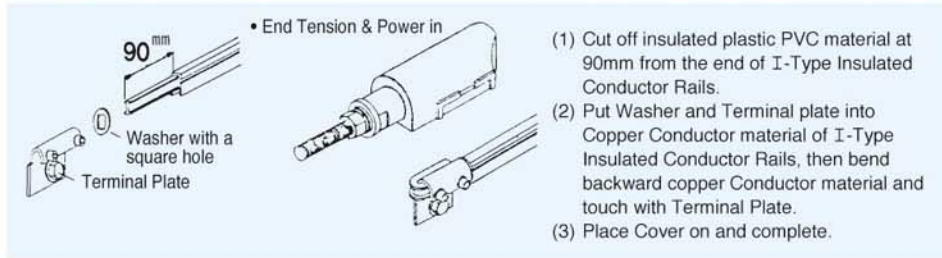
Around & Relief type

1. Distance of each hanger clamp must be under 0.5m in around type.
2. The way to pull up rail is use traverse table put on the saddle's beam, pull up the rail when crane moves. (As the commentary picture no.3 shown in end cover)

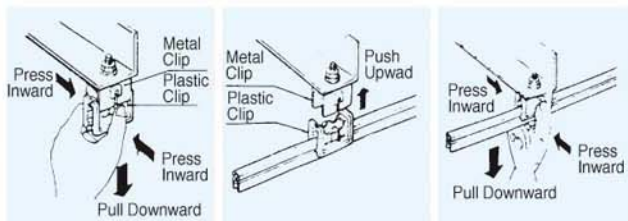
Step 2 Length in 30M



Length over 30M

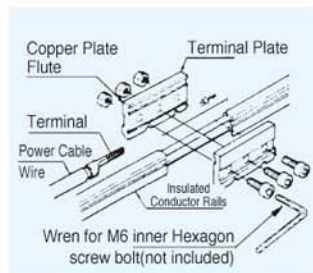


Step 3 Set & Hanger Clamp



- Use tool to clip inward Plastic Clip and pull I-Type Insulated Conductor Rails out together if necessary.

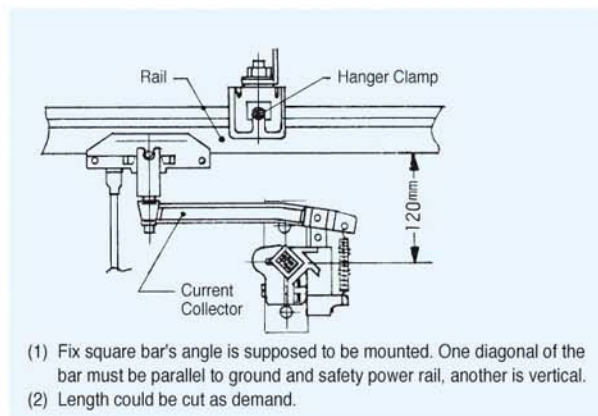
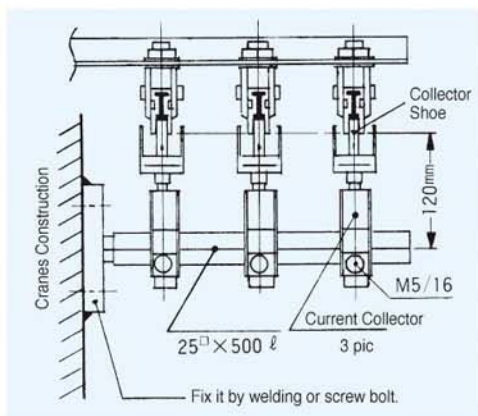
Middle power feed in



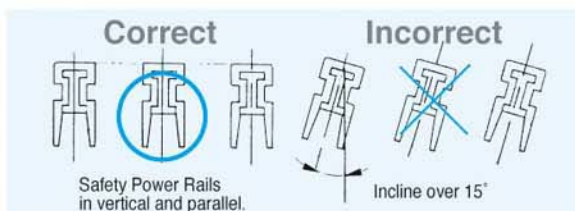
- (1) Cut off 80mm long of insulated material PVC in the middle of I-Type Insulated Conductor Rails for supplying power.
- (2) Contact Copper Conductor of I-Type Insulated Conductor Rails by two piece of Copper Plate and fix it by M6 inner hexagon screw bolt.
- (3) Drill two holes $\phi 5$ mm through both Copper Plate and Copper conductor of I-Type Insulated Conductor Rails at the bottom and insert pins to connect and fix them.

Step 4 Set, End Tension & Power in

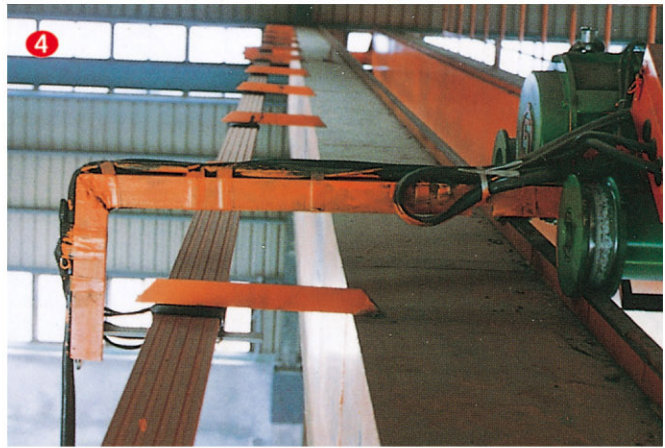
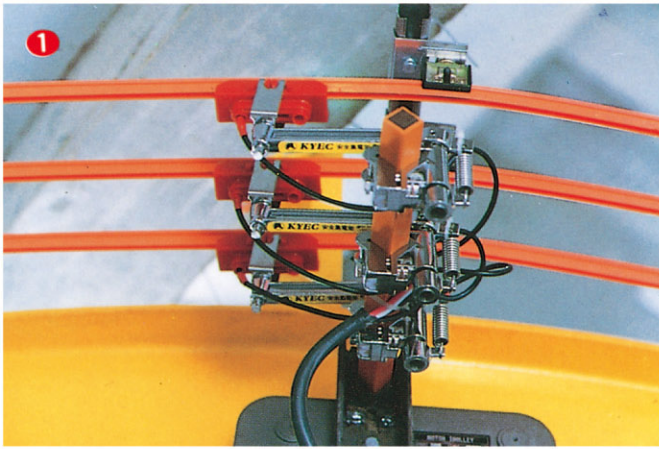
Step 5 Set, guide & Current Collector



* Caution



- (1) It is not allowed to incline over 15 $^\circ$ when install I-Type Insulated Conductor Rails.
- (2) If I-Type Insulated Conductor Rails Still incline after installation, then it is required to adjust forcibly.



Commentary

- ① Current Collector Set ③ Around Set ⑤ Amusement Grounds
- ② For Hoist ④ For Hoist ⑥ Warehouse

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