HARD WORK

ISO 9001

Insulated Conductor Rails/Bars

〈English〉

3-Pole Continuous Type (50/75/100/150/200A)	4-Pole Continuous Type (50/75/100/150/200A)	6-Pole Continuous Type (50/75/100A)
		

I-Single Pole Continuous Type (200A)	W-Single Pole Type (320 / 520A)
	

Ideal for all kinds of applications of :

- **Cranes**
- **Monorails**
- **Automated Storage**
- **Retrieval Systems**
- **Mining Equipment**
- **Amusement Park Rides / Trams**

CAUTION

MAKE CERTAIN POWER SUPPLY IS DISCONNECTED BEFORE INSTALLING, REPAIRING, OR WORKING IN THE PROXIMITY OF ANY ELECTRICAL SYSTEM. ONLY QUALIFIED ELECTRICAL PERSONNEL SHOULD INSTALL OR REPAIR THESE PRODUCTS.

INDEX

Safety Current Table of Copper Busbar

Conductor					Allowable Current	
Material	Spec. mm	No. of Conductor Wire per Phase	Dimension mm^2	Weight kg / m	D.C.	A.C.
Copper Busbar	15x2	1	30	0.27	130	130
	20x2	1	40	0.36	175	175
	20x3	1	60	0.54	220	220
	20x5	1	100	0.89	285	285
	25x3	1	75	0.67	250	250
	25x5	1	125	1.12	325	325
	30x3	1	90	0.80	305	305
	30x5	1	150	1.34	370	370
	30x5	2	300	2.68	700	670
	40x5	1	200	1.78	420	420
	40x5	2	400	3.56	860	800
	40x10	1	400	3.56	715	715
	40x10	2	800	7.12	1400	1230
	50x5	1	250	2.23	590	585
	50x5	2	500	4.45	1150	1030
	50x10	1	500	4.45	875	875
	50x10	2	1000	8.92	1700	1600
	60x5	1	300	2.67	700	700
	60x8	1	480	4.28	875	875
	60x10	1	600	5.34	1000	1000
	60x10	2	1200	10.68	1850	1790
	60x10	3	1800	16.02	2900	2540
	80x10	1	800	7.12	1300	1300
	80x10	2	1600	14.24	2300	2240
	80x10	3	2400	21.37	3400	3310
	80x10	4	3200	28.48	4500	4250
	100x10	1	1000	8.9	1650	1650
	100x10	2	2000	17.8	1825	2735
	100x10	3	3000	26.7	3950	3770
	100x10	4	4000	35.6	5250	5010
	120x10	1	1200	10.7	2100	1920
	120x10	2	2400	21.4	3700	3100
	120x10	3	3600	32.1	5200	4000
	120x10	4	4800	42.8	6600	5280
Copper Bars	10 ϕ	1	78.5	0.706	205	205
	12 ϕ	1	118	1.02		
	16 ϕ	1	201	1.81	400	400
	20 ϕ	1	313	2.82	540	540
Copper Tubes	20/14 ϕ	1	160	1.42	400	400
	30/15 ϕ	1	255	2.27	580	580

Safety Current Table of Conductor Wire Assembling

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	30			
	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	380
	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	1,080

It could affect the conductor wire safety current if the ambient temperature is over 35°C

Characteristic of Conductor Metal

Name	Symbol	Density (g/cm^3) 20°C	Melting Point (°C)	Tensile Strength (Mpa)	Resistance Rate ($\Omega \cdot mm^2/m$) 20°C	① Conductor Rate (% IACS) 20°C	Resistance Temperature Coefficient ($X10^{-3}°C^{-1}$) 20°C
Silver	Ag	10.5	960.5	147	0.0162	106	3.80
Copper	Cu	8.9	1083	196	0.0172	100	3.93
Gold	Au	19.3	1063	98	0.0240	71.6	3.40
Aluminum	Al	2.7	660	78	0.0282	61.0	4.03
Sodium	Na	0.97	97.8	-	0.0460	37.4	5.40
Tungsten	W	19.3	3370	1079	0.0548	31.4	4.50
Molybdenum	Mo	10.2	2600	882	0.0558	30.8	4.70
Zinc	Zn	7.14	419.4	147	0.0610	28.2	3.70
Nickel	Ni	8.9	1452	392	0.0690	24.9	6.00
Iron	Fe	7.86	1535	245	0.100	17.2	5.00
Platinum	Pt	21.45	1755	147	0.105	16.4	3.00
Tin	Sn	7.35	232	24.5	0.114	15.1	4.20
Lead	Pb	11.37	327.5	15.7	0.219	7.9	3.90
Mercury	Hg	13.55	-38.9	-	0.958	1.8	0.89

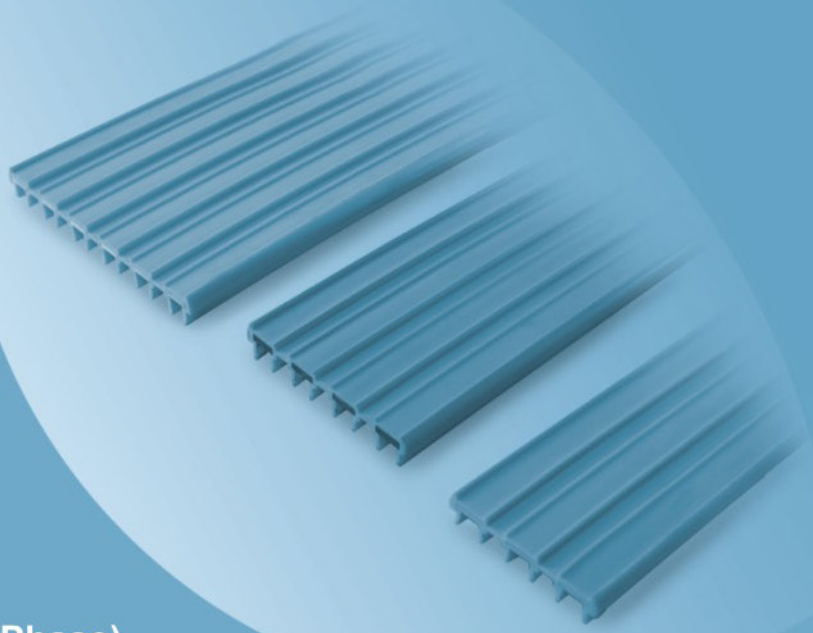
Conversion Table of Horse Power

Full Load Current Table of 3 Phase Alternating Current (A.C.)			
H.P.	230V	460V	575V
1/2	2	1	.6
3/4	2.8	1.4	1.1
1	3.6	1.8	1.4
1-1/2	5.2	2.6	2.1
2	6.8	3.4	2.7
3	9.6	4.8	3.9
5	15.2	7.6	6.1
7-1/2	22	11	9
10	28	14	11
15	42	21	17
20	54	27	22
25	68	34	27
30	80	40	32
40	104	52	41
50	130	65	52
60	154	77	62
75	192	96	77
100	248	124	99
125	312	156	125
150	360	180	144
200	480	240	192

To select the proper current (Ampere) of Insulated Conductor Rails and Current Collector, please check the steps below :

1. Calculate the total motor's Horse Power (H.P.) required. (ex. 10 H.P.)
2. Make sure the rated voltage (A.C.). (ex. 230V)
3. Check the above Conversion Table of Horse Power to get the current. (ex. 28 Ampere)

3P.4P.6P
Insulated Conductor Rails



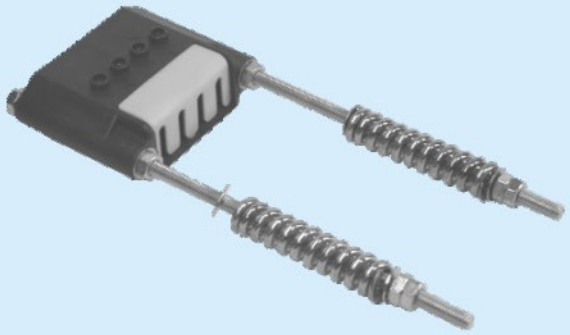
- 3P (3 Pole / Phase)
  50A .75A. 100A. 150A. 200A
  (3P is used for 3 Phase R.S.T.)

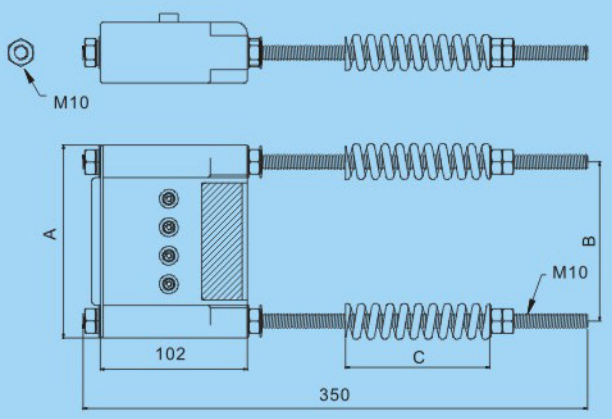
- 4P (4 Pole / Phase)
  50A. 75A. 100A. 150A. 200A
  (4P is used for 3 Phase R.S.T & GROUND)

- 6P (6 Pole / Phase)
  50A. 75A. 100A
  (6P is used for 3 Phase
  R.S.T. & 3 Main Motors)

Illustration for 3P.4P.6P
Standard Export Packing

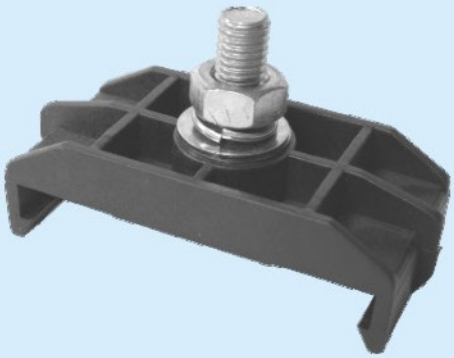
End Tension & Power In

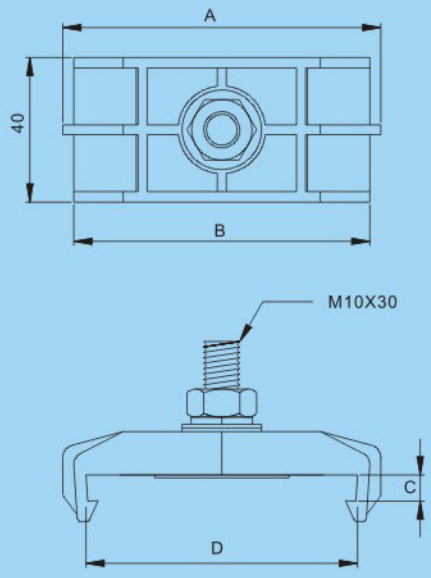




Part No.	Type	Weight (kg)	A	B	C
H300	3P	1.38	115	90	100
H400	4P	1.53	134	110	100
H600	6P	1.68	180	150	100

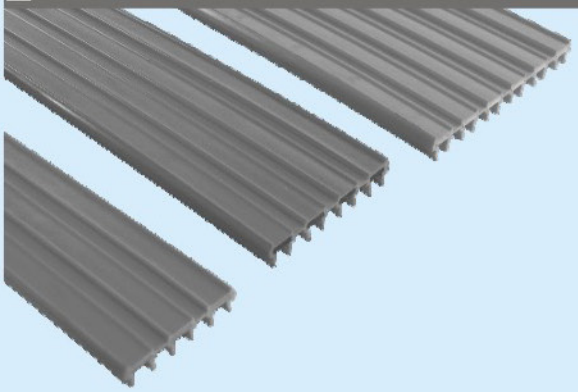
Hanger Clamp





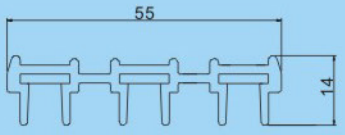
Part No.	Type	Weight (kg)	A	B	C	D
H301	3P	0.071	70	63	8.3	56
H401	4P	0.075	88	82	8.3	75
H601	6P	0.088	130	126	8.3	116

Insulated Conductor Rails

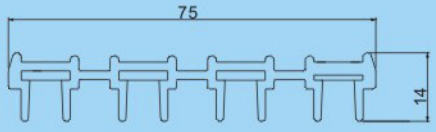


Material of Conductor : Copper
Material of Insulator : PVC (Up to 60°C)

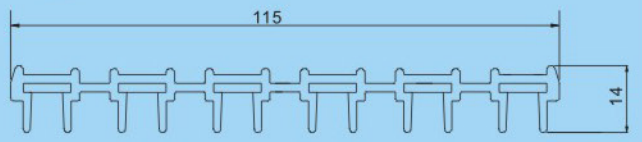
3P



4P



6P



3P-Continuous Insulated Conductor Rails

Part No.	Rating	Length	Weight (kg)
H302-50A	600V · 50Amp	1m	0.72
H302-75A	600V · 75Amp	1m	0.82
H302-100A	600V · 100Amp	1m	1.07
H302-150A	600V · 150Amp	1m	1.35
H302-200A	600V · 200Amp	1m	1.44

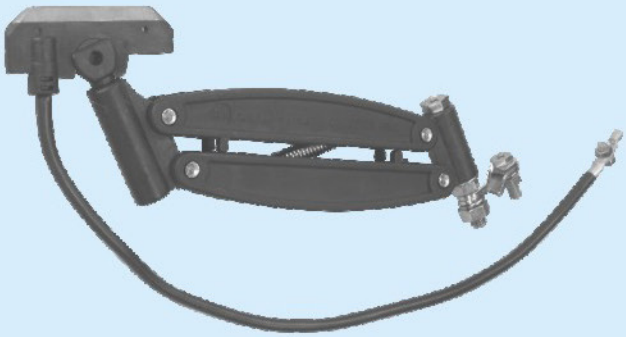
4P-Continuous Insulated Conductor Rails

Part No.	Rating	Length	Weight (kg)
H402-50A	600V · 50Amp	1m	0.88
H402-75A	600V · 75Amp	1m	1.00
H402-100A	600V · 100Amp	1m	1.27
H402-150A	600V · 150Amp	1m	1.62
H402-200A	600V · 200Amp	1m	1.74

6P-Continuous Insulated Conductor Rails

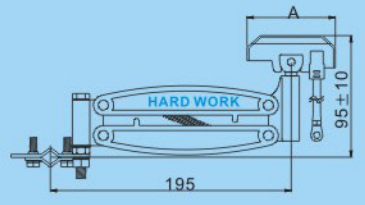
Part No.	Rating	Length	Weight (kg)
H602-50A	600V · 50Amp	1m	1.56
H602-75A	600V · 75Amp	1m	1.61
H602-100A	600V · 100Amp	1m	2.14

Current Collector

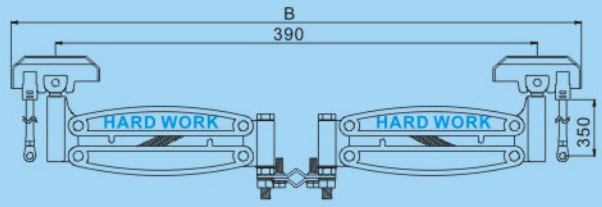


Part No.	Rating	Weight (kg)	A	B
H303-30A	600V · 30Amp	0.27	71	461
H303-60A	600V · 60Amp	0.30	87	477
H303-100A	600V · 100Amp	0.45	117	508

Single Side Current Collector



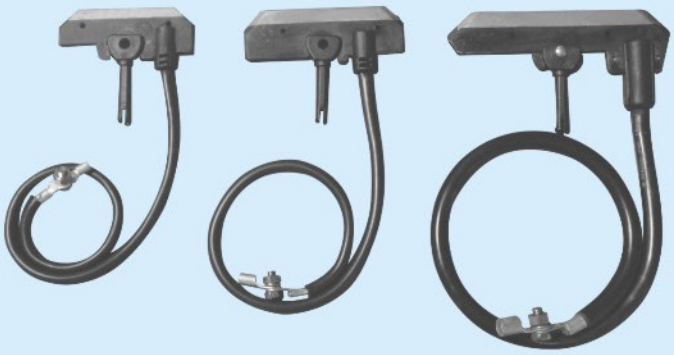
Double Sides Current Collector

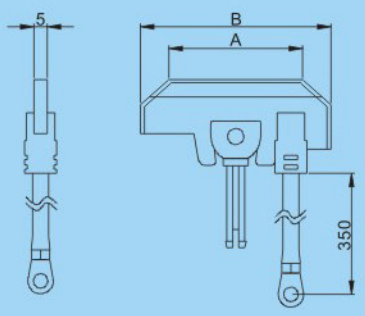


- Double Sides Current Collector is used for the application in special design of irregular or circle connection at a large amount of current flow.

Collector

- Collector is only for replacement that is a consuming parts of Current Collector.

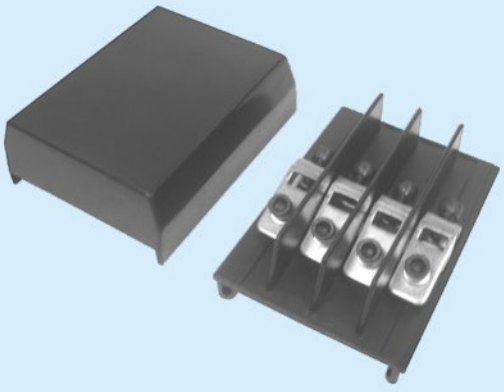


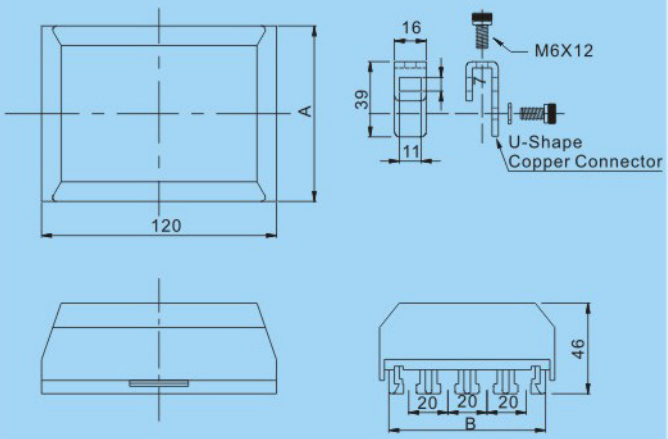


Part No.	Rating	Weight (kg)	A	B	C
H304-30A	600V · 30Amp	0.065	52	65	350
H304-60A	600V · 60Amp	0.095	71	85	350
H304-100A	600V · 100Amp	0.180	90	117	400

Middle Power Feeding

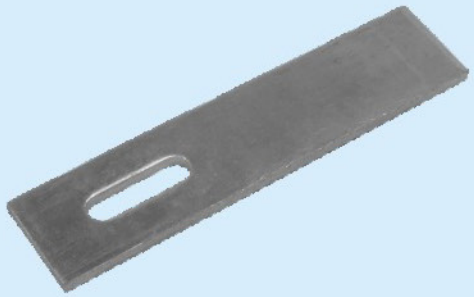
- Middle Power Feeding is used for connecting the Insulated Conductor Rails that will be extended or the length of the Insulated Conductor Rails is over 100 meters to avoid voltage dropping.

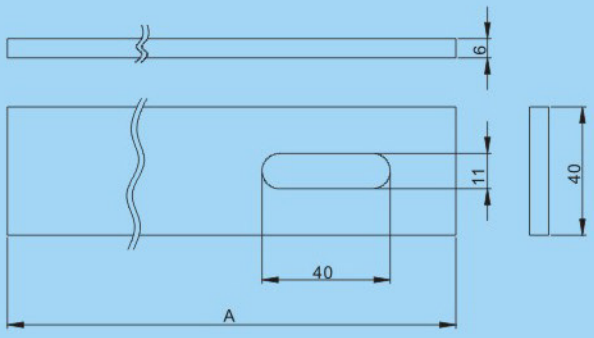




Part No.	Type	Weight (kg)	A	B
H305	3P	0.22	70	61
H405	4P	0.31	90	81
H605	6P	0.36	130	121

Supports

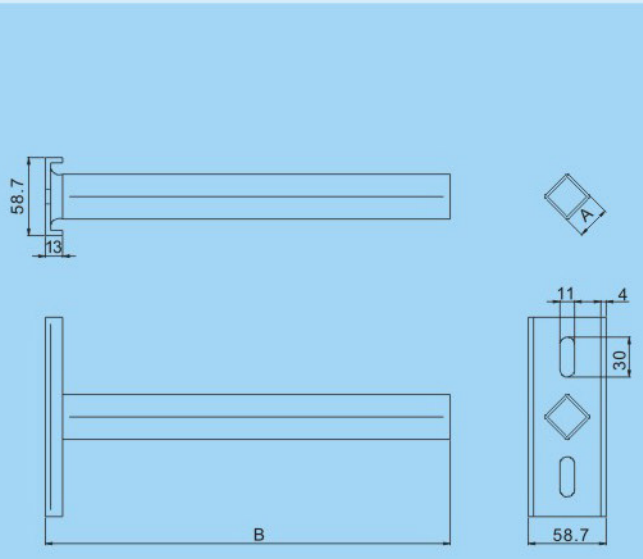




Part No.	Type	Weight (kg)	A
H306	3P/4P / 6P	0.30	168

Fix Square Bar

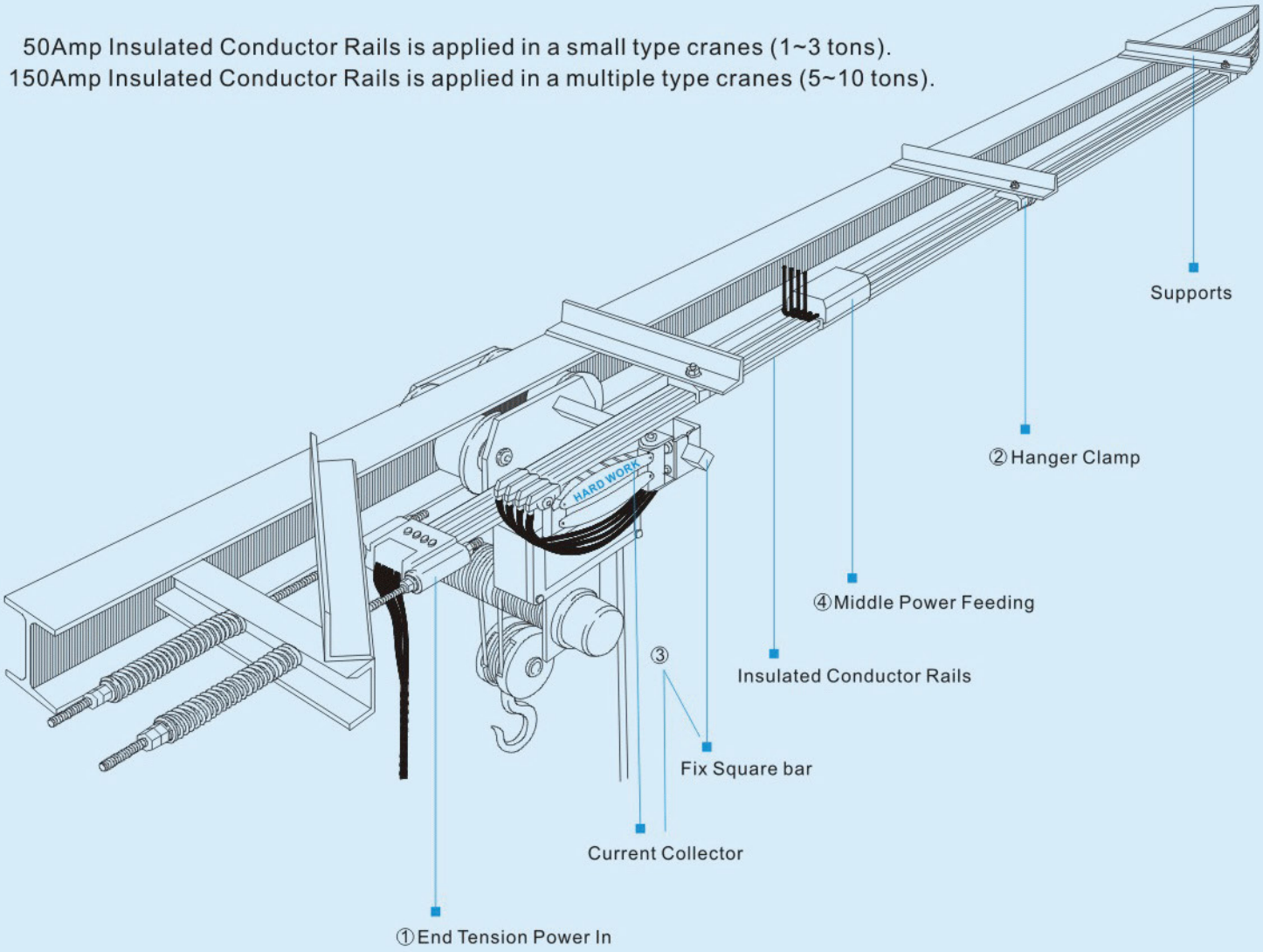
- H307 Fix Square Bar is used for 3P, 4P & 6P Insulated Conductor Rails System.
  HI07 Fix Square Bar is used for I-Type & W-Type Insulated Conductor Rails System.



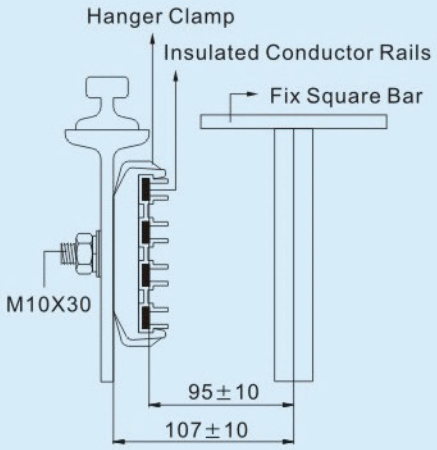
Part No.	Weight (kg)	A	B
H307	0.63	13	230
HI07	0.80	25	310

3P . 4P . 6P
Insulated Conductor Rails Outline Design

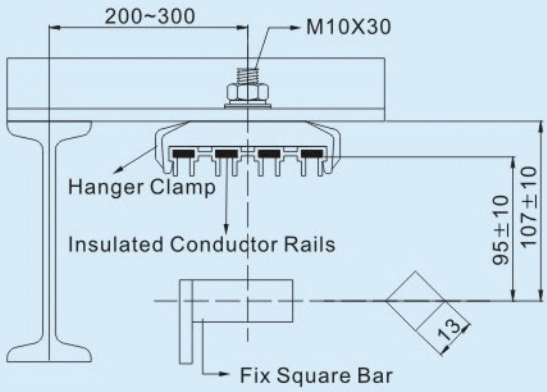
50Amp Insulated Conductor Rails is applied in a small type cranes (1~3 tons).
150Amp Insulated Conductor Rails is applied in a multiple type cranes (5~10 tons).



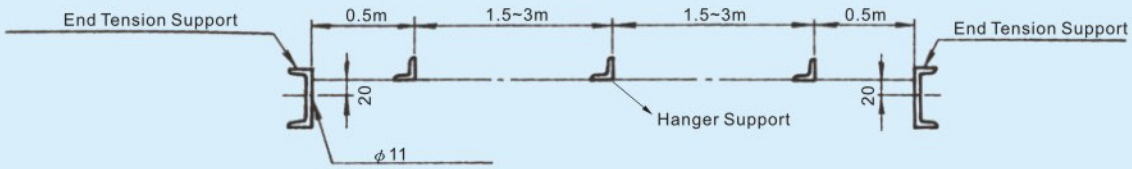
Side Installation



Vertical Installation



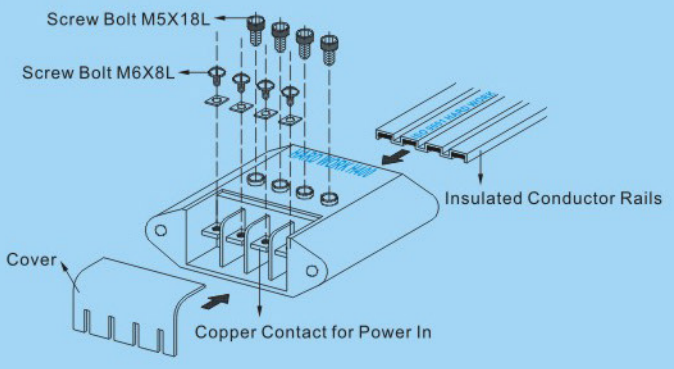
Supports Design



- The Side Installation is necessary if the 3P.4P.6P Insulated Conductor Rails is mounted at a radian.
- To install a Hanger Clamp in each 0.5 meter from the start point of the radian.
- The End Tension & Power In of 3P.4P.6P Insulated Conductor Rails have to be installed 5mm higher than the Hanger Clamp to avoid water flowing down to make short circuit.
- ★ The weathered protection is required if 3P.4P.6P Insulated Conductor Rails is applied in outdoors.

① How to install End Tension & Power In

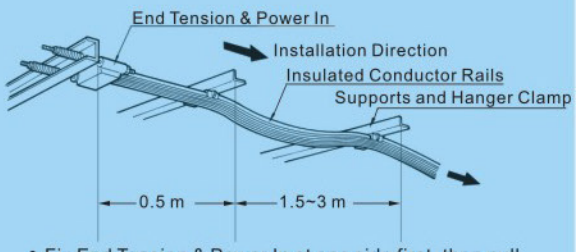
A



Installation Procedures :

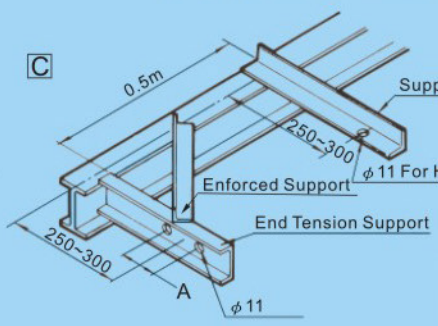
1. Insert Insulated Conductor Rails to the bottom of End Tension & Power In.
2. Use Screw Bolt M5X18L provided to fix Insulated Conductor Rails.
3. Connect Power Supply wire terminal with Copper Contact by Screw Bolt M6X8L, then place the Cover to complete the installation procedures.

B



- Fix End Tension & Power In at one side first, then pull Insulated Conductor Rails straight and fix it with the other End Tension & Power In at the other side.

C

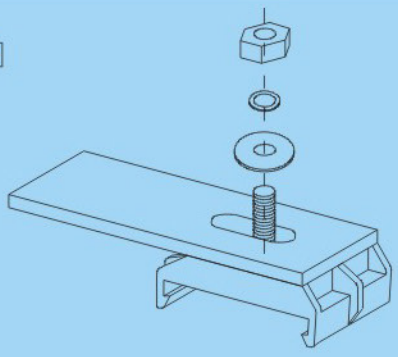


Center to Center Distance of End Tension & Power In

	A
3P	90
4P	110
6P	150

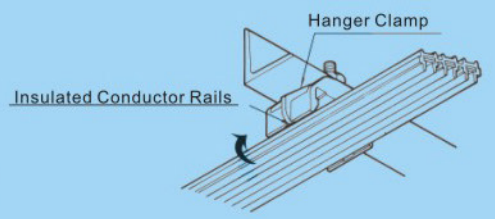
② How to Install Hanger Clamp

A



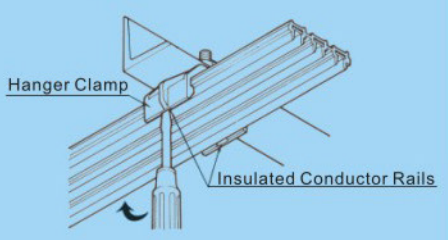
- Fix Hanger Clamp on Supports by Washer and Nut.

B



- Push upward and mount Insulated Conductor Rails on Hanger Clamp.

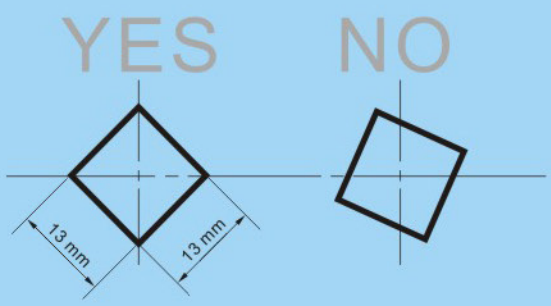
C



- Slightly pry up Insulated Conductor Rails at both sides from Hanger Clamp by a flat screwdriver if necessary.

③ How to install Fix Square Bar and Current Collector

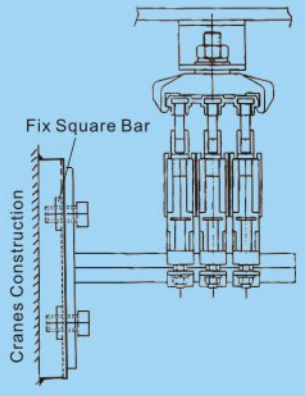
A



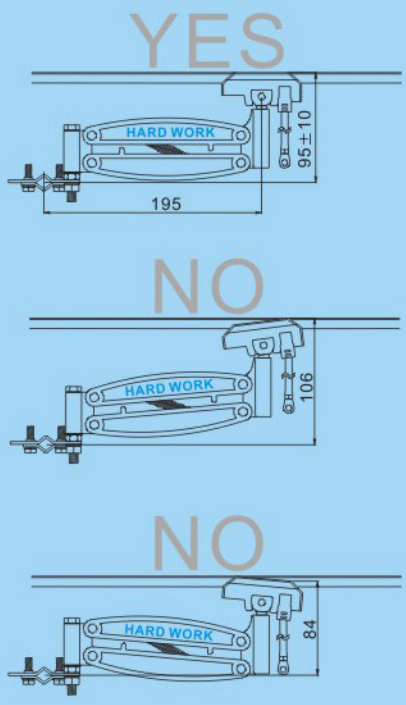
- Fix Square Bar shall be installed in the center.

C

1. Mount Fix Square Bar on Cranes Construction by welding or screw bolt.
2. Fix Square Bar shall be installed in parallel with Insulated Conductor Rails.
3. Cut the length of Fix Square Bar if it is too long to use.



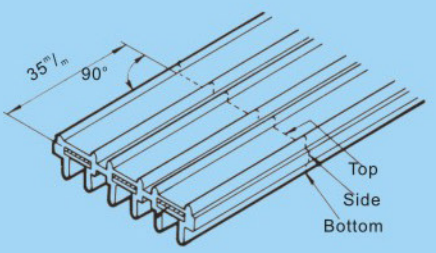
B



- The most proper distance between Insulated Conductor Rails and Fix Square Bar is 95mm.

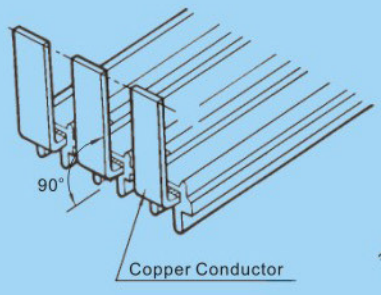
④ How to install Middle Power Feeding

A



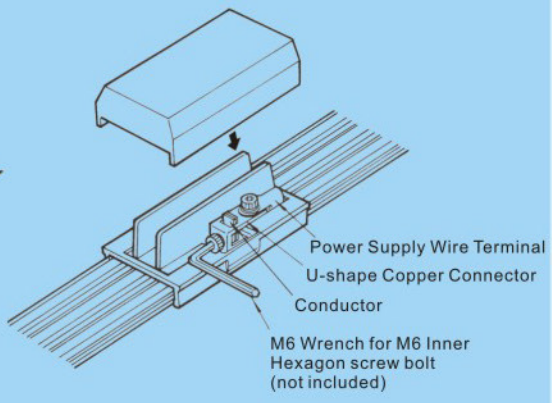
- Cut off insulated plastic PVC material at 35mm from the end of Insulated Conductor Rails.

B



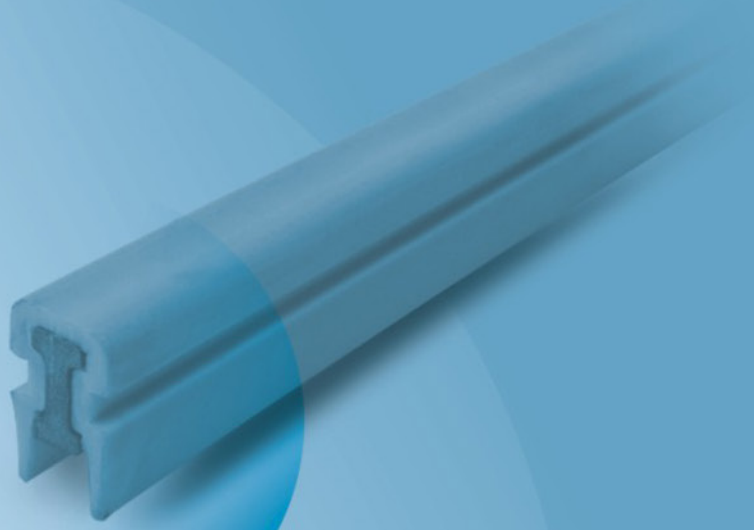
- Bend upward copper conductor material at a 90° vertical angle.

C



- Insert both sides of 90° vertical angle Copper Conductor into Middle Power Feeding and connect both sides of 90° vertical angle Copper Conductor by screwing up M6 Inner Hexagon screw bolt on U-shape Copper Connector.

I-Type
Insulated Conductor Rails

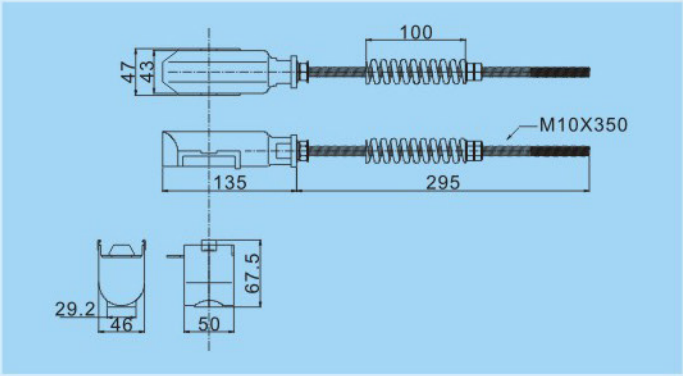


- I-Type Insulated Conductor Rails 200A

- Various of Application in Installation frame for I-Type Insulated Conductor Rails illustrated below:

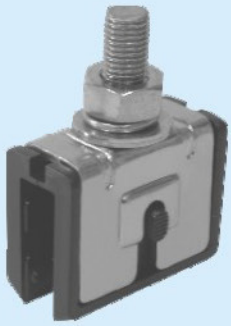
S type | Line Case | Around type | Curve Case

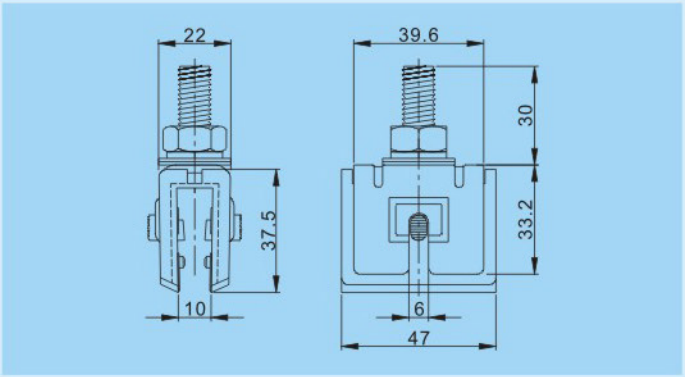
I-Type End Tension & Power In



Part No.	Weight (kg)
HI00	0.65

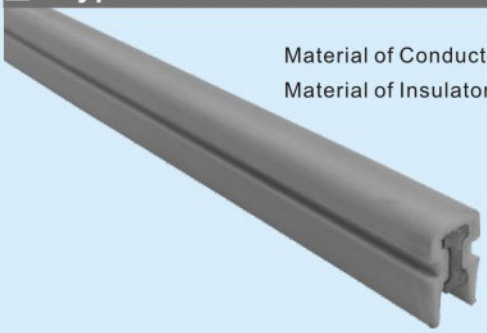
I-Type Hanger Clamp



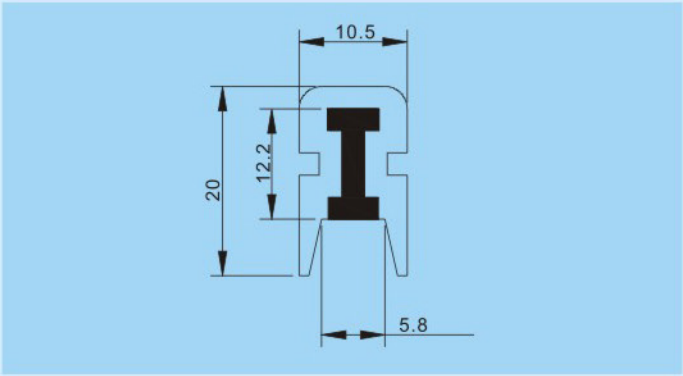


Part No.	Weight (kg)
HI01	0.11

I-Type Insulated Conductor Rails

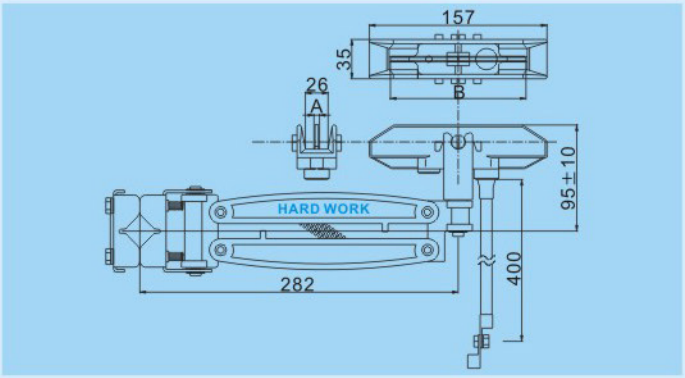


Material of Conductor : Copper
Material of Insulator : PVC (Up to 60°C)



Part No.	Rating	Length	Weight (kg)
HI02-200A	600V · 200Amp	1m	0.55

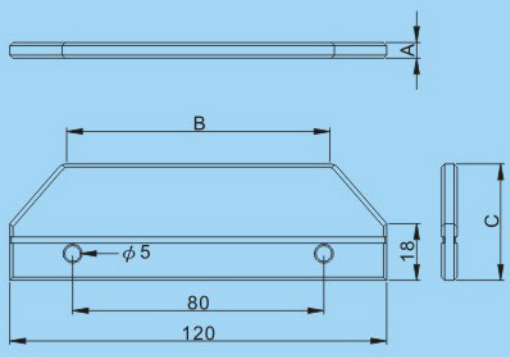
I-Type Collector Shoe



Part No.	Rating	Weight (kg)	A	B
HI03-40A	600V · 40Amp	0.90	5	76
HI03-100A	600V · 100Amp	1.05	5	120

I-Type Collector

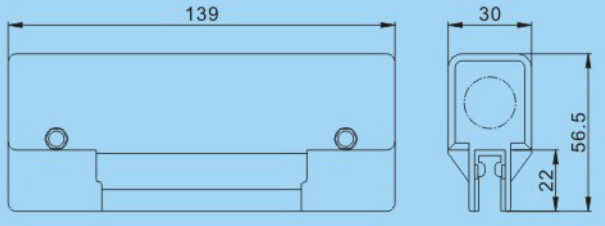
- I-Type Collector is only for replacement that is a consuming parts of I-Type Collector Shoe.



Part No.	Rating	Weight (kg)	A	B	C
HI04-40A	600V · 40Amp	0.08	5	50	33
HI04-100A	600V · 100Amp	0.13	5	85	37

I-Type Middle Power Feeding

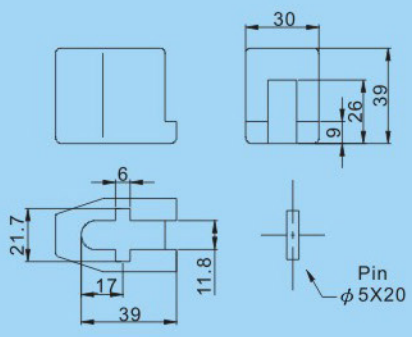
- I-Type Middle Power Feeding is used for connecting I-Type Insulated Conductor Rails that will be extended or the length of I-Type Insulated Conductor Rails is over 100 meters to avoid voltage dropping.



Part No.	Weight (kg)
HI05	0.28

I-Type Fixed End Insulator

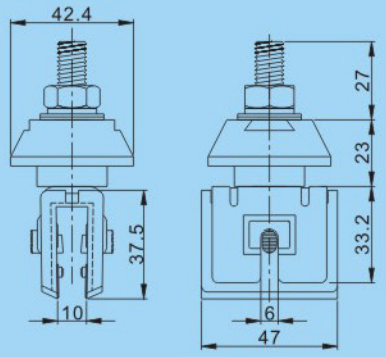
- Use I-Type Fixed End Insulator instead of I-Type End Tension & Power In at one end if the length of I-Type Insulated Conductor Rails is installed less than 30 meters, in order to save the material cost if necessary.



Part No.	Weight (kg)
HI06	0.05

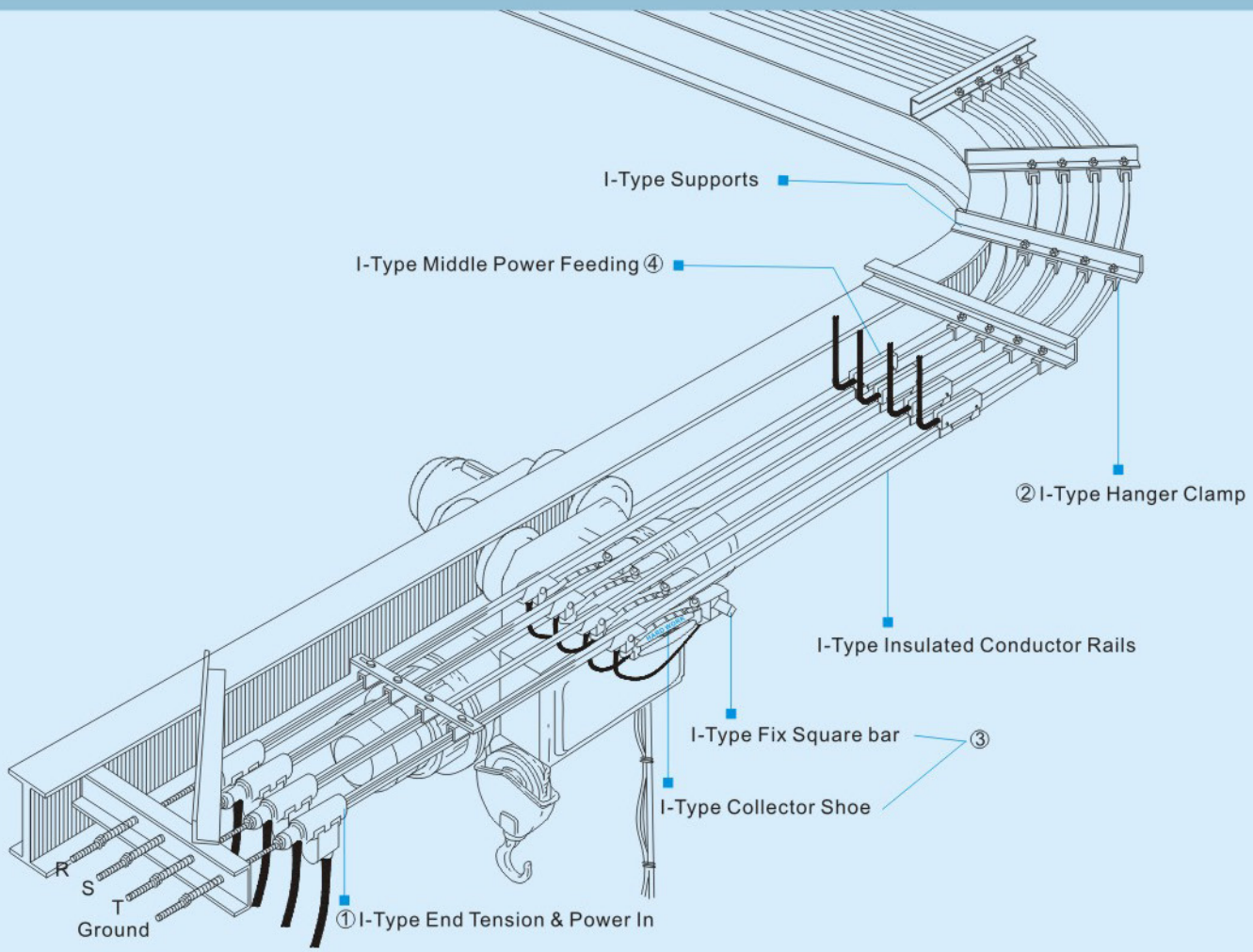
I-Type Insulator Hanger

I-Type Insulator Hanger is an option for installation outdoors and in dusty places.

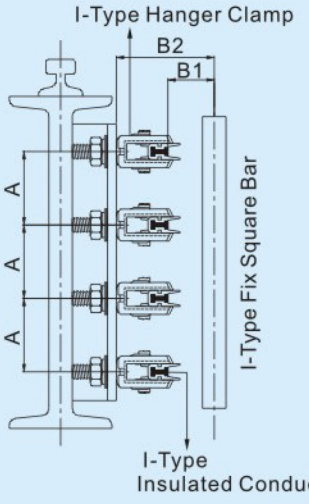


Part No.	Weight (kg)
HI08	0.15

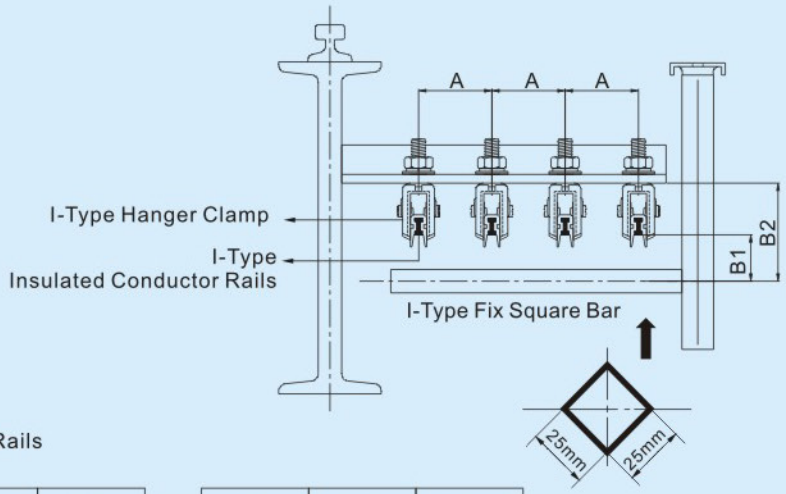
I-Type
Insulated Conductor Rails Outline Design



Side Installation



Vertical Installation

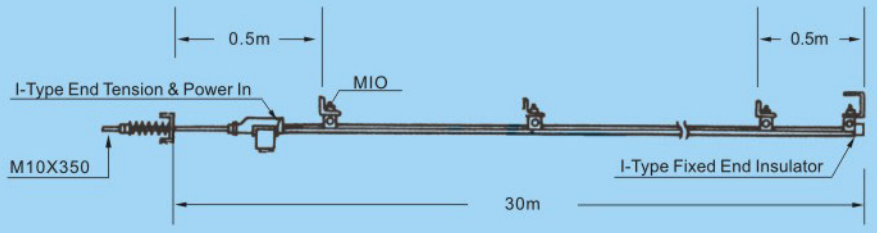


A	Minimum	75mm
	standard	100mm

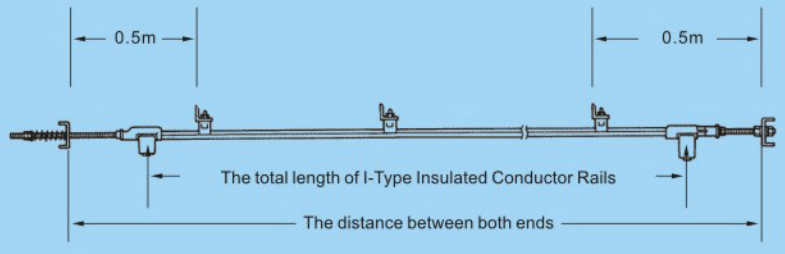
B	B1	95mm
	B2	130mm

Supports Design

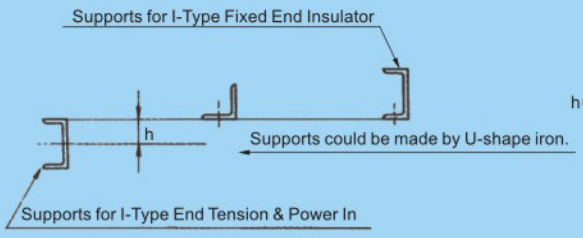
Installation Design for I-Type Insulated Conductor Rails in 30 meters

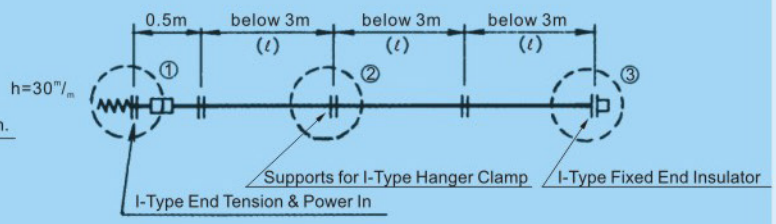


Installation Design for I-Type Insulated Conductor Rails above 30 meters

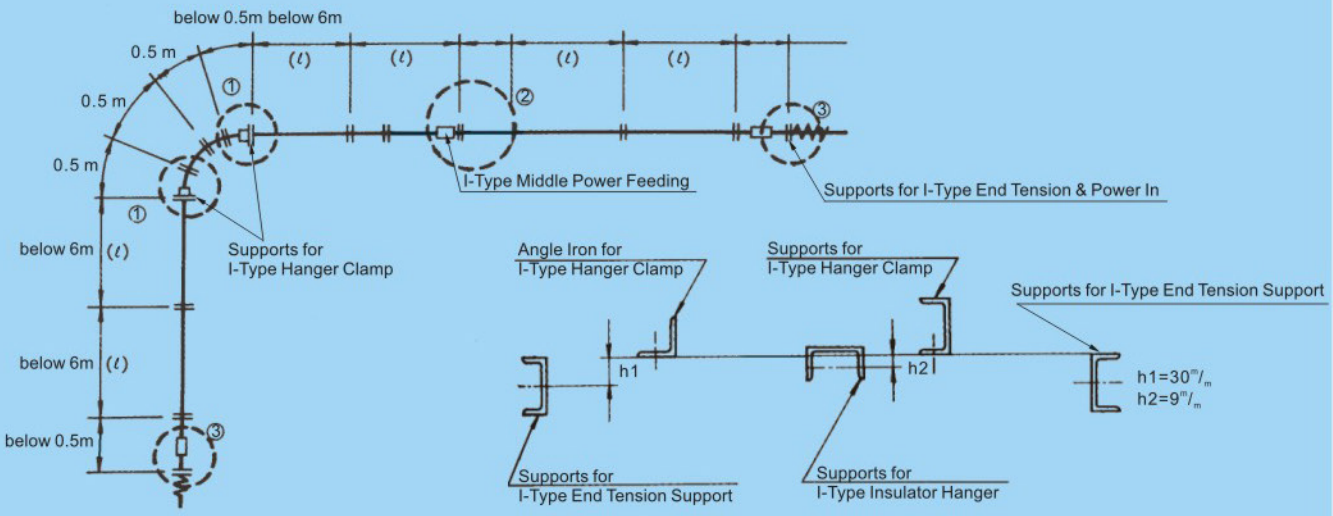


Line Case

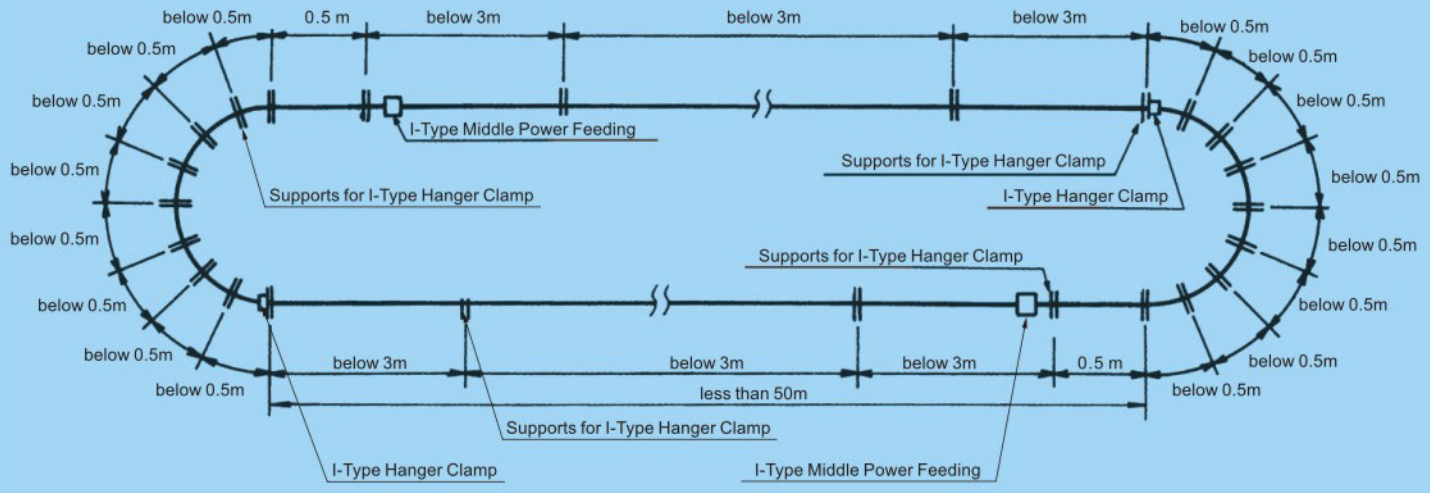




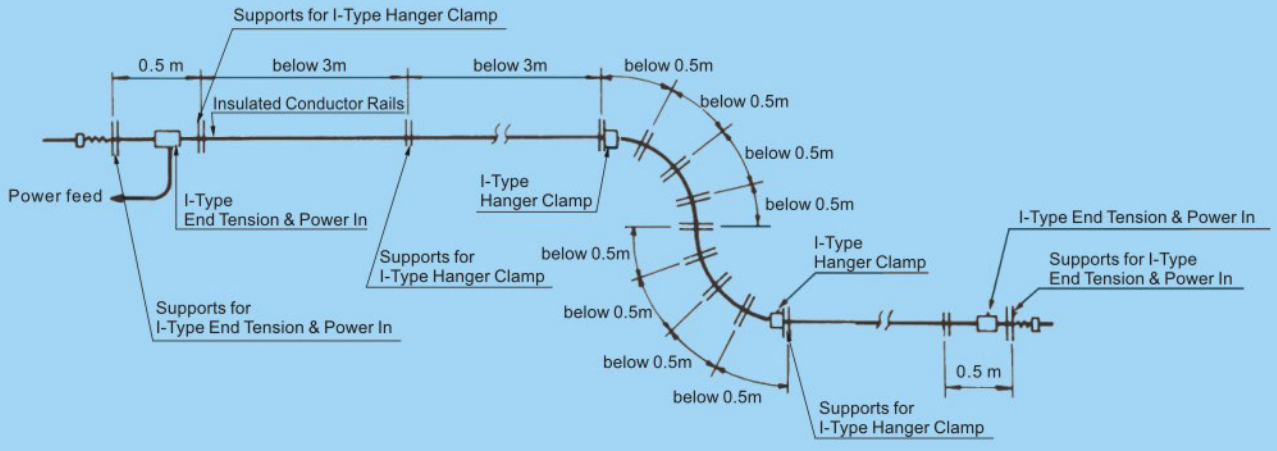
Curve Case



Around type

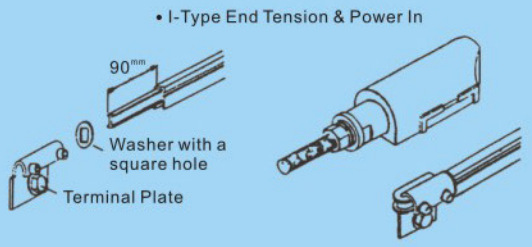


"S" type



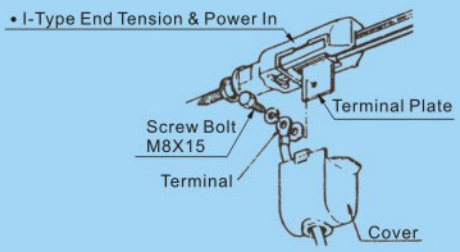
① How to install I-Type End Tension & Power In

A



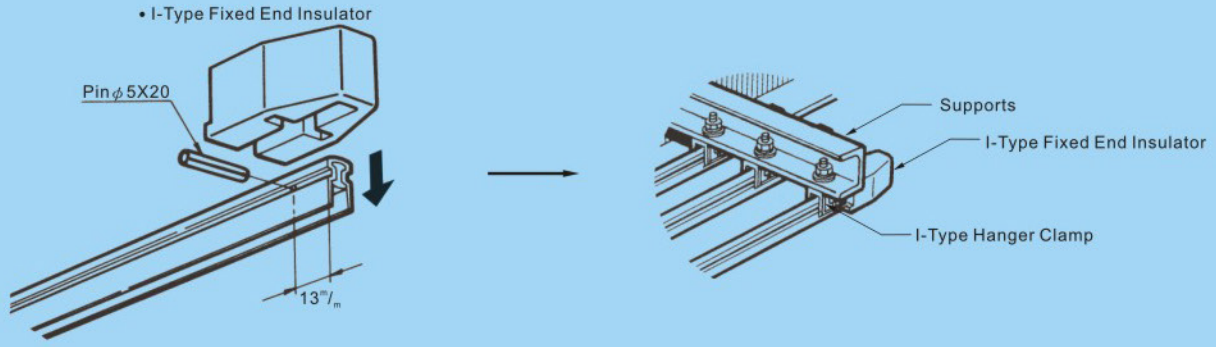
1. Cut off insulated plastic PVC material at 90mm from the end of I-Type Insulated Conductor Rails.
2. Put Washer and Terminal Plate into Copper Conductor material of I-Type Insulated Conductor Rails, then bend backward Copper Conductor material and touch with Terminal Plate.
3. Place Cover on and complete.

B



1. Connect Power Cable Wire with Terminal Plate and then place Cover on I-Type Insulated Conductor Rails.

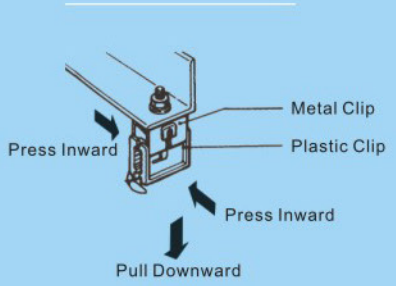
Use I-Type Fixed End Insulator instead of I-Type End Tension & Power In if the total length of I-Type Insulated Conductor Rails is installed in 30 meters.



• Drill a hole ϕ 5 at 13mm from the end of I-Type Insulated Conductor Rails for inserting Pin ϕ 5x20.

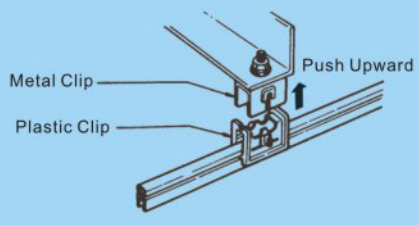
② How to install I-Type Hanger Clamp

A



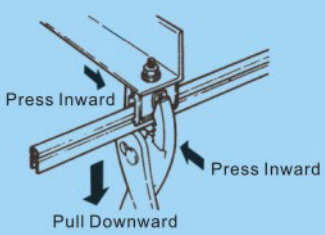
1. Take out Plastic Clip from Metal Clip first.

B



2. Mount Plastic Clip on I-Type Insulated Conductor Rails and then install it together on Metal Clip.

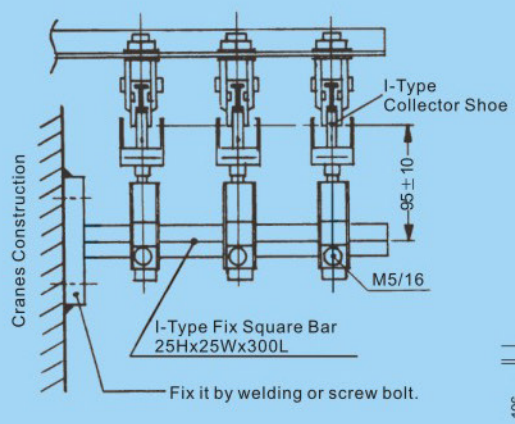
C



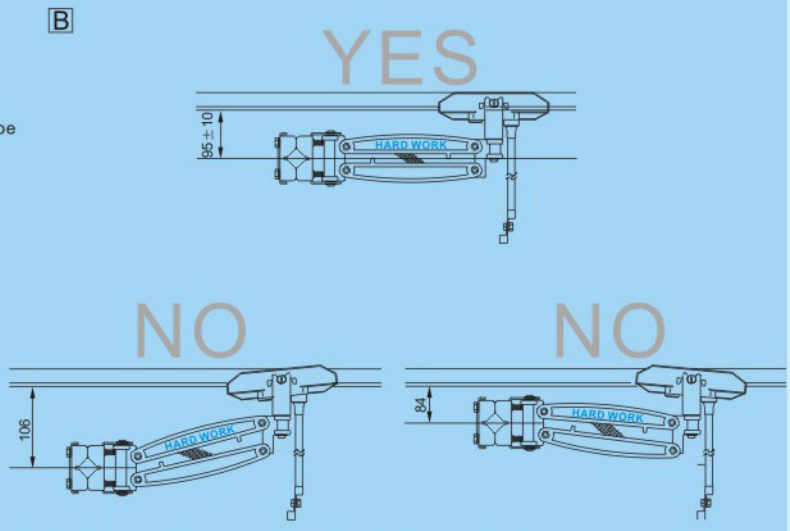
3. Use tool to clip inward Plastic Clip and pull I-Type Insulated Conductor Rails out together if necessary.

③ How to install I-Type Fix Square Bar and I-Type Insulated Conductor Rails.

A

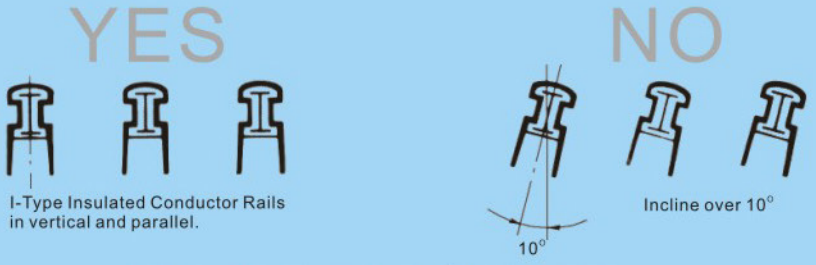


B



1. I-Type Fix Square Bar shall be installed in parallel with I-Type Insulated Conductor Rails.
2. Cut the length of I-Type Fix Square Bar if it is too long to use.

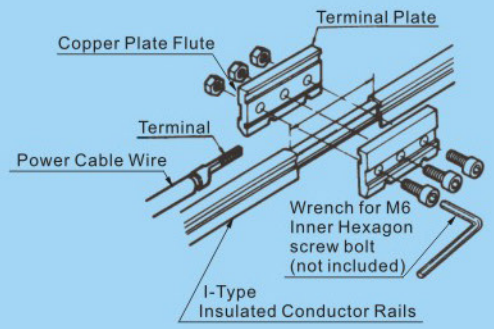
＊Caution:



1. It is not allowed to incline over 10° when install I-Type Insulated Conductor Rails.
2. If I-Type Insulated Conductor Rails still incline after installation, then it is required to adjust forcedly.

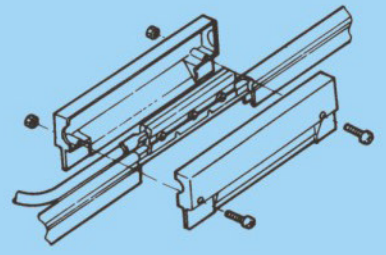
④ How to install I-Type Middle Power Feeding.

A



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 ϕ 5mm through both Copper Plate and Copper conductor of I-Type Insulated Conductor Rails at the bottom and insert pins to connect and fix them.

B



1. Connect Power cable wire and screw up Cover.

A Specialist in Safe/Reliable Power and Data Transfer Systems for Moving Equipment

Insulated Conductor Rails

Spring Cable Reels

Flat Cable
Festoon Systems

W-Type
Insulated Conductor
Rails

Push Button Pendant

Energy Chain Systems

Agent :

2018 / 01 / 2000