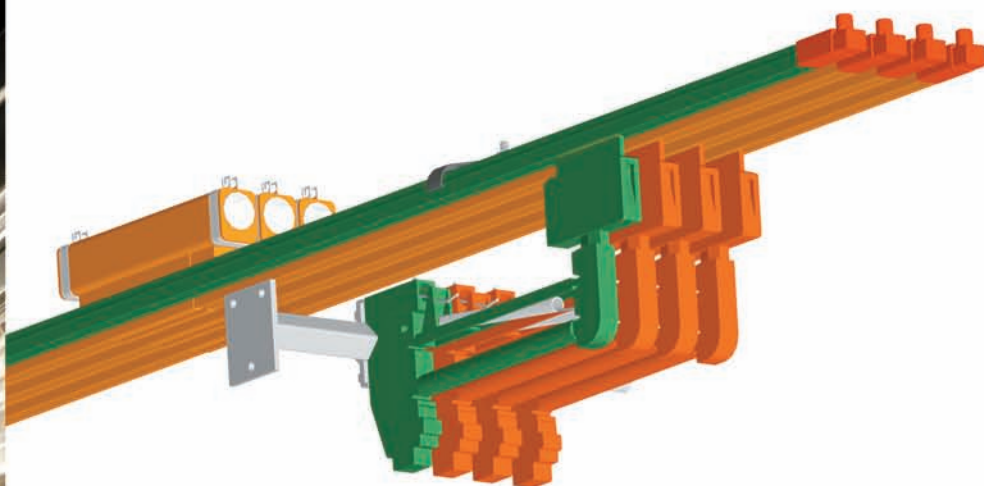


# SAFELEC

*INSULATED CONDUCTOR BARS  
60 up to 400 Amp*



- Finger safe up to IP2
- 60 to 400 Amp conductors in Standard or Medium Heat cover
- Cover shaped to shed water and dust
- Horizontal conductors with contact from underside
- Bar length: 4.5 metres
- Systems up to 150 metres without expansion sections
- Reduced and simple maintenance

**CONDUCTIX**  
**INSUL 8**

© DELACHAUX GROUP



Certificate No. FM 21334

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## SAFELEC INSULATED CONDUCTOR BARS

**INSUL 8** supplies electrical power feed systems for moving machinery. Easy to install and maintain, **the SAFELEC range** ensures a high level of reliability. It has been designed to meet the safety standards demanded in industry.

### Advantages of conductor bars:

- Ability to feed several moving machines from the same conductor system
- Suitable for high amperage
- Feed points can be placed at any location
  - Compactness
  - Long system length possible
- Suitable for both indoor and outdoor use

### SAFELEC features:

- Easy installation, reduced and simple maintenance
  - Protection degree IP2, finger safe
- Insulating covers shaped to shed water and dust
  - Standard PVC cover for normal temperatures
  - Medium Heat cover available for high ambient temperatures
- Expansion sections not required for runs less than 150 m
  - Max travel speed: 200 m/min

### Range of application:

Workshop cranes, iron and steel industry, railways, leisure industry, mines etc.

### SAFELEC complies with the following international standards:

NFC 20-010, NFC 63-010, NFC 32-070, VDE 0470, BSEN 60529, DIN 53438

## TYPICAL APPLICATIONS



Conveyor System



Roller Coaster



Multipole Feed System



Bridge Construction Crane

Water Treatment Works



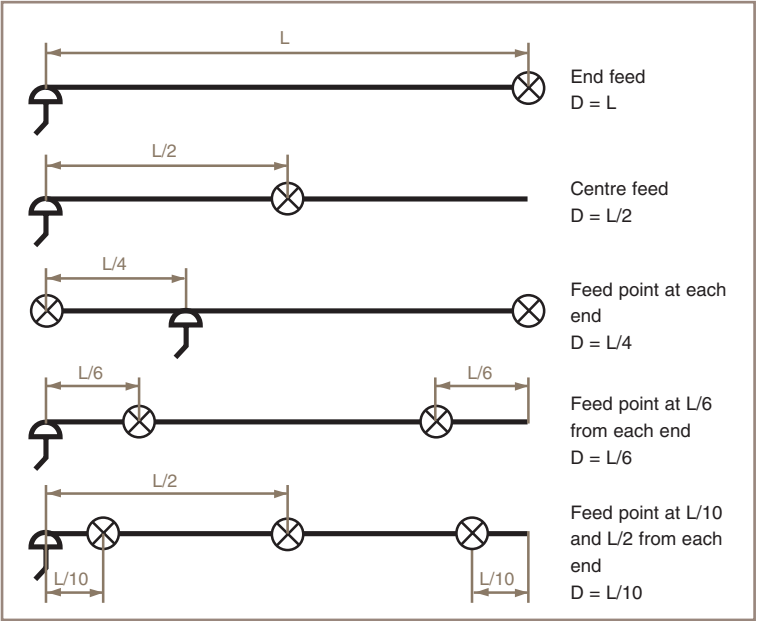
SELECTION OF CONDUCTORS

Volt drop calculation <sup>3</sup>U:

- 3-Phase AC
- Single Phase AC
- Continuous current DC
- $\sup 3U = 3 \times I \times D \times Z$
- $\sup 3U = 2 \times I \times D \times Z$
- $\sup 3U = 2 \times I \times D \times R$

$\sup 3U\% = (\sup 3U \times 100) / U^n$

- Where:
- <sup>3</sup>U: volt drop in Volts
- <sup>3</sup>U%: volt drop in % of nominal voltage
- U<sup>n</sup>: nominal supply voltage in Volts
- I: maximum current in Amps
- D: see opposite diagram
- R: resistance in Ohms per metre
- Z: impedance in Ohms per metre



TECHNICAL DATA

FACTOR “K”						
	Duty	100%	80%	60%	40%	20%
	Ta					
Standard cover	25°C	1.000	1.118	1.291	1.581	2.236
	35°C	0.905	1.011	1.168	1.430	2.023
	45°C	0.798	0.892	1.030	1.261	1.784
	55°C	0.674	0.754	0.870	1.066	1.508
Medium Heat cover	65°C	0.775	0.866	1.000	1.225	1.732
	75°C	0.707	0.791	0.913	1.118	1.581
	85°C	0.632	0.707	0.816	1.000	1.414

The maximum permissible continuous current rating of the conductor bar depends on the duty factor of the cranes and the maximum ambient temperature Ta. It can be established using the following formula:

I allowable = nominal current x K

## SAFELEC 2 TECHNICAL DATA

CONDUCTOR BAR COVER	STANDARD	MEDIUM HEAT
Material	PVC	BAYBLEND
Dielectric strength	180 KV/cm	240 KV/cm
Surface resistivity	$10^{11}\Omega$	$>10^{14}\Omega$
Volume resistivity	$>10^{15}\Omega/\text{cm}$	$>10^{16}\Omega/\text{cm}$
Vicat softening temperature (never expose PVC cover to temperatures in excess of 80°C)	84°C	120°C
Flame-test	Self extinguishing	Self extinguishing
Oxygen index	54%	24%
Specific density	1.5 g/cm <sup>3</sup>	1.15 g/cm <sup>3</sup>

CONDUCTOR BAR	GALVANISED STEEL			COPPER			ALUMINIUM / STAINLESS STEEL		
Nominal current	60A	100A	125A	160A	250A	400A	200A	315A	400A
Cross sectional area	50mm <sup>2</sup>	63mm <sup>2</sup>	93mm <sup>2</sup>	50mm <sup>2</sup>	63mm <sup>2</sup>	93mm <sup>2</sup>	104mm <sup>2</sup>	120mm <sup>2</sup>	156mm <sup>2</sup>
Maximum system voltage (AC) (contact Insul-8 for other voltages) (DC) (contact Insul-8 for other voltages)	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V
Resistance R (for DC) at 20°C (Ω/m)	0.003584	0.002867	0.001933	0.000342	0.000274	0.000184	0.000301	0.000261	0.000199
Impedance Z (for AC) at 20°C (Ω/m)	0.003604	0.002891	0.001968	0.000364	0.000300	0.000221	0.000325	0.000288	0.000234
Maximum allowable ambient temperature for 100% duty cycle	25°C	25°C	25°C	25°C	25°C	25°C	25°C	25°C	25°C
Bar length	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m
Support pitch Standard	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm
Lateral	1125mm	1125mm	1125mm	1125mm	1125mm	1125mm	1125mm	1125mm	1125mm
Minimum pitch centres Standard	43mm	43mm	43mm	43mm	43mm	43mm	43mm	43mm	43mm
Lateral	60mm	60mm	60mm	60mm	60mm	60mm	60mm	60mm	60mm
Expansion sections: not required for runs less than	150m	150m	150m	150m	150m	150m	150m	150m	150m
Minimum bending radius: (horizontal only)	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m

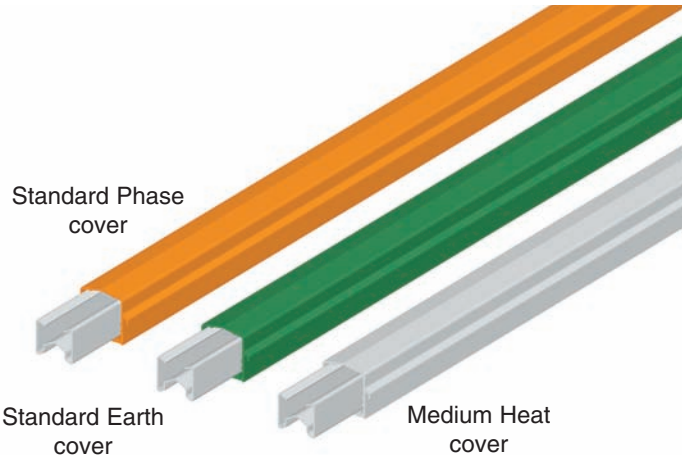
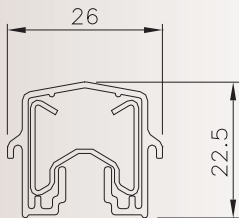
An accurate choice of conductors can be made when all the following information is known:

- The type of current: single or three phase AC ; continuous (DC)
- The maximum current power and duty cycle
- The allowable volt drop for the machines being supplied
- The ambient temperature
- Environment (dusty, coastal, humid, acidic etc.)



GALVANISED STEEL CONDUCTOR BARS

CURRENT RATING	60A	100A	125A
Standard Phase cover (orange)	310001	310101	310201
Standard Earth cover (green)	310002	310102	310202
Medium Heat cover (grey)	310003	310103	310203
	Phase Earth 310056	310156	310256
Weight (Kg)	2.34	2.76	3.76



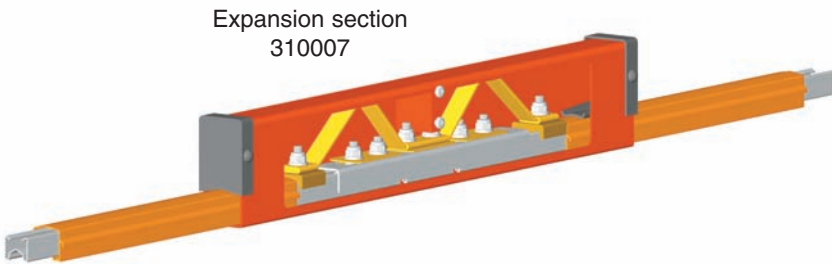
EXPANSION SECTIONS

CURRENT RATING	60A	100A	125A
Standard Phase cover (orange)	310007	310107	310207
Standard Earth cover (green)	310008	310108	310208
Medium Heat cover (grey)	310009	310109	310209
	Phase Earth 310058	310158	310258
Weight (Kg)	3.06	3.32	4.20

Expansion sections are required on all systems over 150m long.

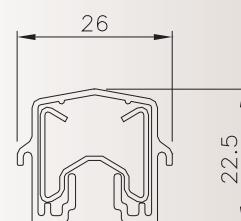
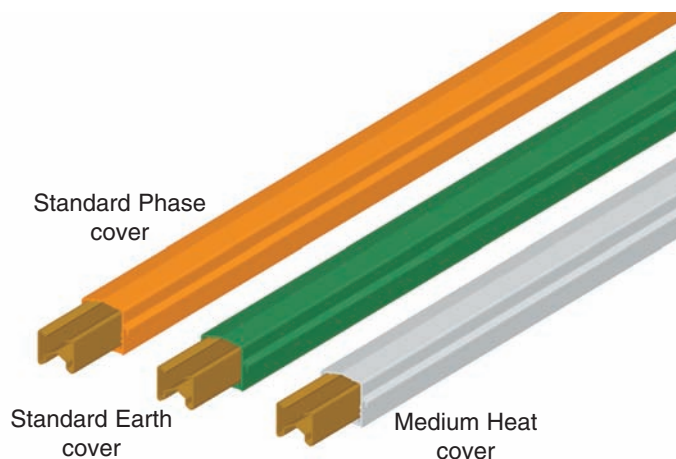
The maximum gap of the expansion section is 50mm.

The expansion section is 4.5m long and is installed in place of one length of conductor bar.



## COPPER CONDUCTOR BARS

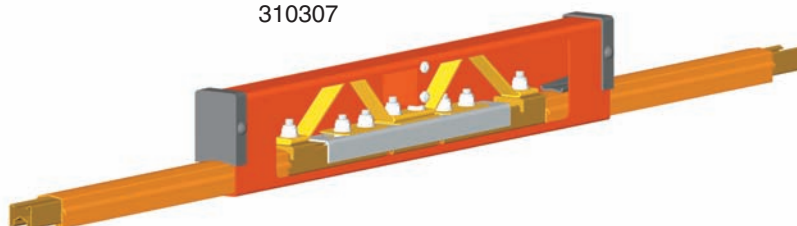
CURRENT RATING	160A	250A	400A
Standard Phase cover (orange)	310301	310401	310501
Standard Earth cover (green)	310302	310402	310502
Medium Heat cover Phase (grey) Earth	310303 310356	310403 310456	310503 310556
Weight (Kg)	2.76	3.04	4.40



## EXPANSION SECTIONS

CURRENT RATING	160A	250A	400A
Standard Phase cover (orange)	310307	310407	310507
Standard Earth cover (green)	310308	310408	310508
Medium Heat cover Phase (grey) Earth	310309 310358	310409 310458	310509 310558
Weight (Kg)	3.28	3.86	4.74

Expansion section  
310307



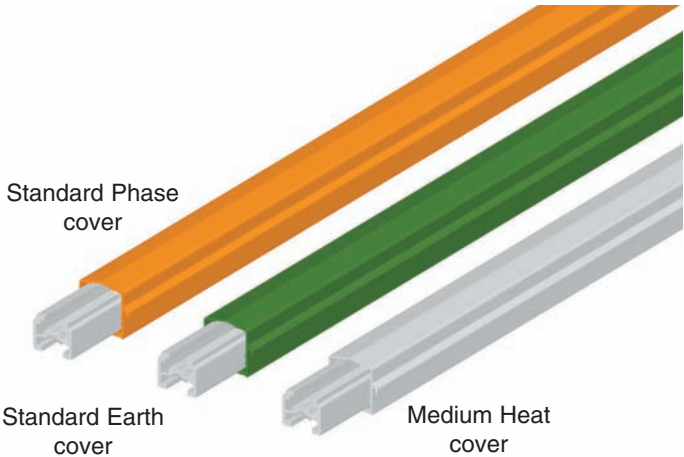
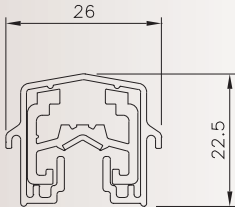
Expansion sections are required on all systems over 150m long.

The maximum gap of the expansion section is 50mm.

The expansion section is 4.5m long and is installed in place of one length of conductor bar.

ALUMINIUM / STAINLESS STEEL CONDUCTOR BARS

CURRENT RATING	200A	315A	400A
Standard Phase cover (orange)	310601	310701	399101
Standard Earth cover (green)	310602	310702	399102
Medium Heat cover Phase Earth (grey)	310603	310703	399103
	310656	310756	399156
Weight (Kg)	2.12	2.18	2.50



EXPANSION SECTIONS

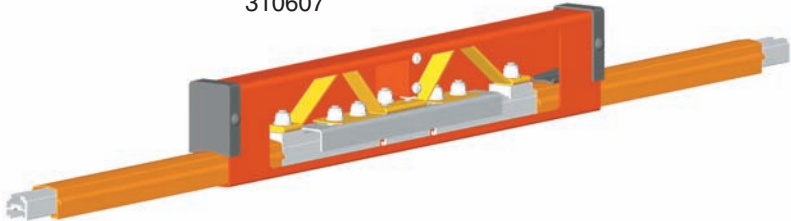
CURRENT RATING	200A	315A	400A
Standard Phase cover (orange)	310607	310707	399107
Standard Earth cover (green)	310608	310708	399108
Medium Heat cover Phase Earth (grey)	310609	310709	399109
	310658	310758	399158
Weight (Kg)	3.23	3.43	3.80

Expansion sections are required on all systems over 150m long.

The maximum gap of the expansion section is 50mm.

The expansion section is 4.5m long and is installed in place of one length of conductor bar.

Expansion section 310607



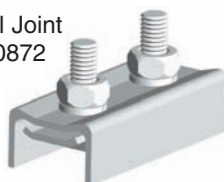


## JOINTS

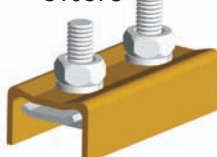
JOINT		Weight (Kg)
Steel	310872	0.049
Copper	310873	0.044
Aluminium	310874	0.032
Heavy Duty Copper	399549	0.2

JOINT COVER	
Standard Phase cover (orange)	310850
Standard Earth cover (green)	310851
Heavy Duty cover	399541
Medium Heat cover black green	310855 310856
Weight (Kg)	0.027

Steel Joint  
310872



Copper Joint  
310873



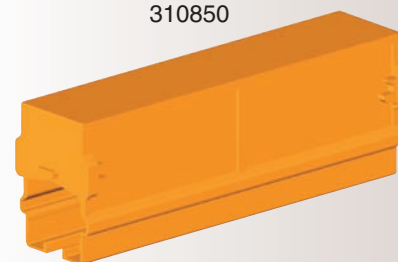
Aluminium Joint  
310874



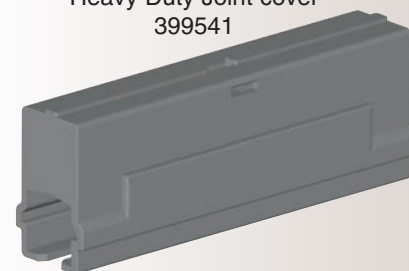
Heavy Duty Copper Joint  
399549



Standard Phase cover  
310850



Heavy Duty Joint cover  
399541



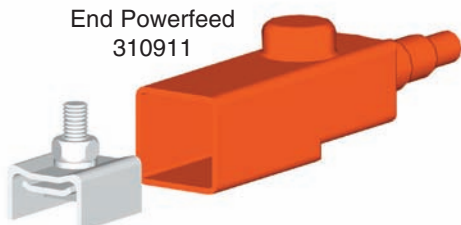
JOINTING COMPOUND	Weight (Kg)
310932	0.225

## JOINTING COMPOUND

Jointing compound should be applied to the contact surfaces of the joint and bar at every joint on copper and aluminium systems. One tube is sufficient for over 300 connections.

## POWERFEEDS: END POWERFEED

End Powerfeed  
310911



UP TO 100A	Weight (Kg)
310911	0.037

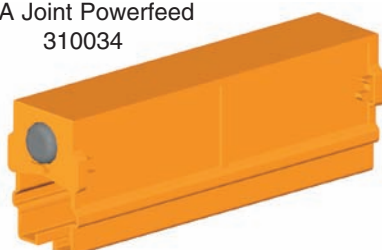
Powerfeed installed in place of an end cover.

Maximum cable connection size: 16mm<sup>2</sup>

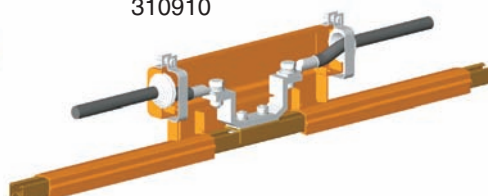
## POWERFEEDS: JOINT POWERFEED

CURRENT RATING	UP TO 60A	UP TO 250A	UP TO 400A
Standard cover (orange)	310034	310910	310912
Medium Heat cover (red)	310066	310913	310915
Weight (Kg)	0.028	0.25	0.30

60A Joint Powerfeed  
310034



250A Joint Powerfeed  
310910



Powerfeed for connection of one or two flexible cables.

310910 has single cable connection.

310912 has double cable connection.

Powerfeed is usually installed in place of a joint.

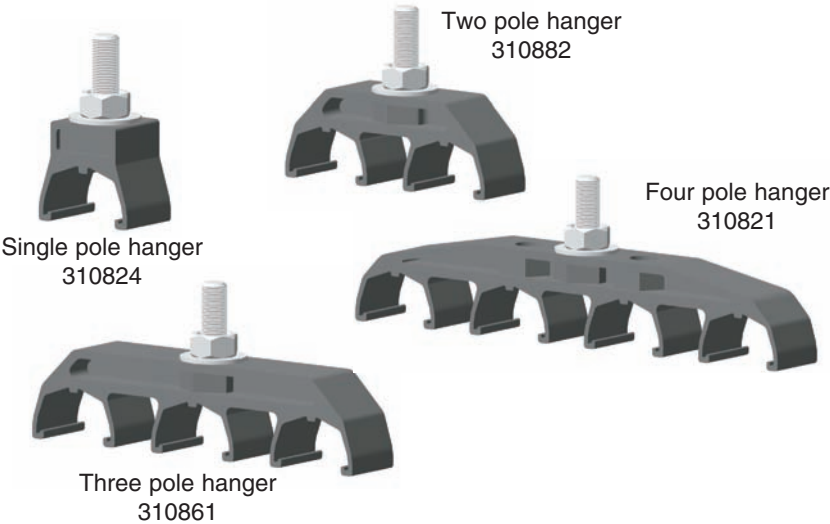
Maximum cable connection size:

60A	–	10mm <sup>2</sup>
250A	–	95mm <sup>2</sup>
400A	–	150mm <sup>2</sup>

HANGER CLAMPS: STANDARD MOUNT

	STANDARD (BLACK)	POLYCARBONATE (RED)	WEIGHT (Kg)
Single pole	310824	310829	0.03
Two pole	310882	310899	0.04
Three pole	310861	310871	0.05
Four pole	310821	310857	0.057

Standard hangers are acetyl.  
Maximum support spacing is 1.5m.

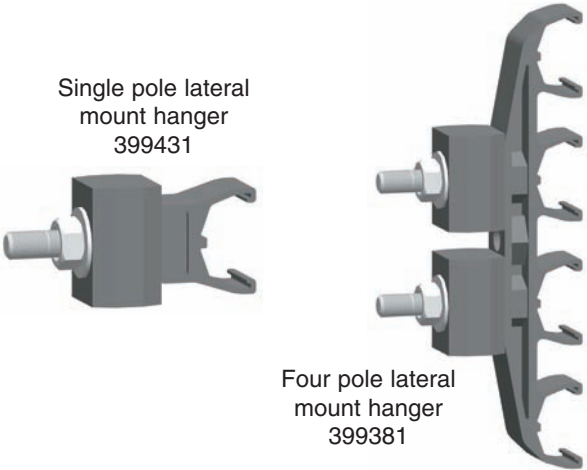


HANGER CLAMPS: LATERAL MOUNT

	STANDARD (BLACK)	POLYCARBONATE (RED)	WEIGHT (Kg)
Single pole	399431	399434	0.05
Two pole	399432	399435	0.06
Three pole	399433	399436	0.07
Four pole	399381	399382	0.12
Four pole (without spacer)	310835	310859	0.08

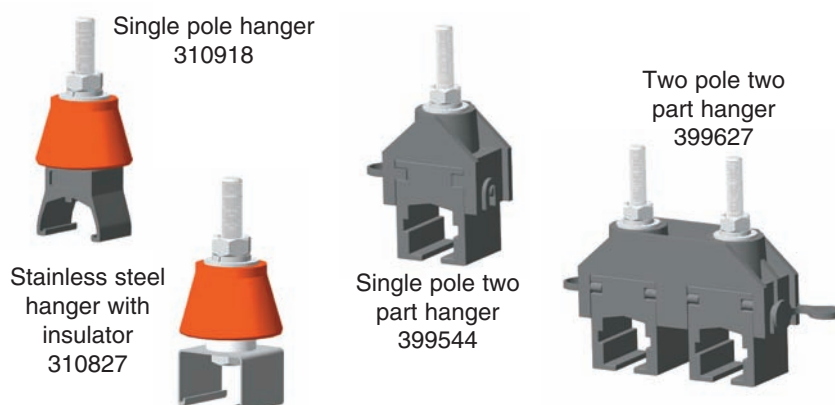
Lateral mount hangers are supplied with  
20mm spacers to provide clearance for  
joint covers.

Maximum support spacing is 1.125m.



## HANGER CLAMPS: WITH INSULATOR

			WEIGHT (Kg)
Single pole	(Black)	310918	0.10
Single pole	(Red)	310834	0.10
Single pole	Stainless steel	310827	0.106
Single pole	Two part	399544	0.08
Two pole	Two part	399627	0.174



In particularly dusty or humid environments, hangers with insulator should be used.

## ANCHOR CLAMPS

		WEIGHT (Kg)
Standard	310832	0.06
With insulator	310969	0.12
Lateral mount	399383	0.10
Without top bolt (two required per anchor point)	310831	0.05

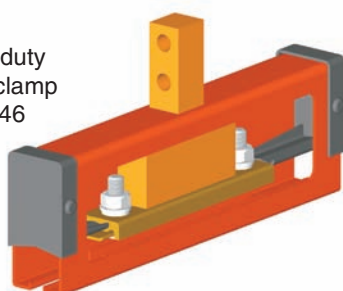


Anchor points are usually situated in the middle of a conductor system.

Additional anchor points are required for systems with expansion sections.

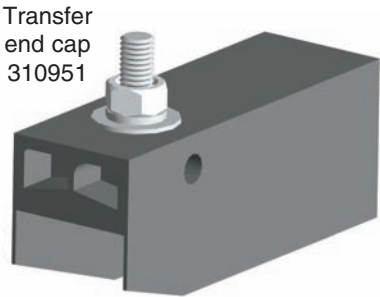
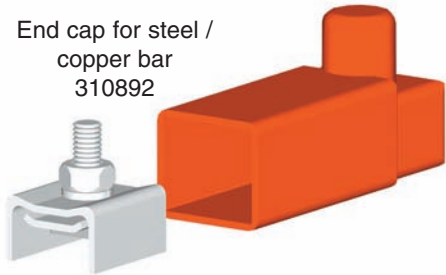
		WEIGHT (Kg)
Heavy duty anchor	399546	0.48

Heavy duty anchor clamp 399546



END CAPS

		WEIGHT (Kg)
Steel / copper bar	310892	0.04
Aluminium bar	310893	0.02
Transfer cap	310951	0.10



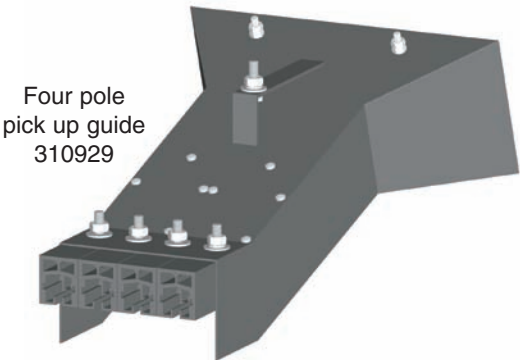
Transfer caps are suitable for air gaps up to 10mm.

Vertical tolerance    ± 5mm

Horizontal tolerance    ± 2mm

PICK UP GUIDES

		WEIGHT (Kg)
Single pole	310920	1.27
Two pole	399532	1.72
Three pole	399502	2.16
Four pole	310929	2.54

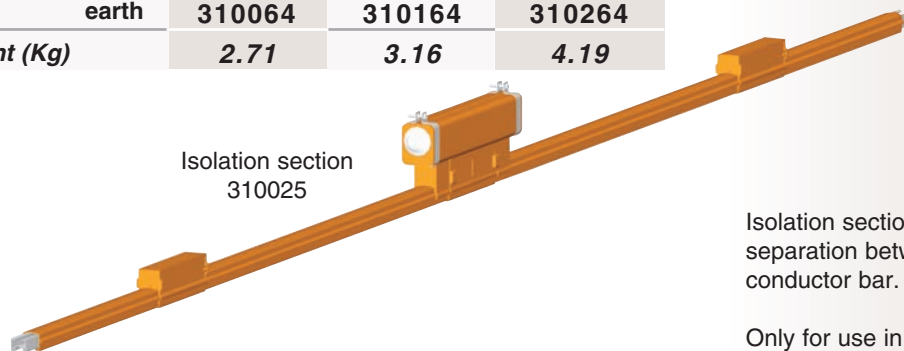


Special collectors are required for systems where pick up guides are fitted.

## ISOLATION SECTIONS

## GALVANISED STEEL BAR

CURRENT RATING	60A	100A	125A
Standard Phase cover (orange)	310025	310125	310225
Standard Earth cover (green)	310026	310126	310226
Medium Heat cover phase (grey) earth	310027 310064	310127 310164	310227 310264
Weight (Kg)	2.71	3.16	4.19



Isolation sections provide electrical separation between adjacent sections of conductor bar.

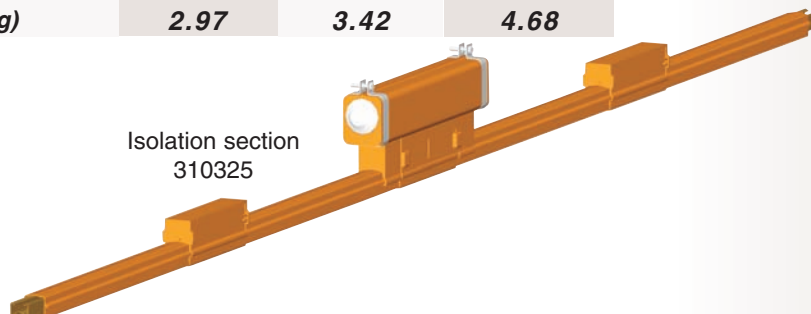
Only for use in dry, clean conditions.

The Isolation section is 4.5m long and is installed in place of one length of conductor bar.

It is recommended that Isolation sections are not fitted in earth conductors.

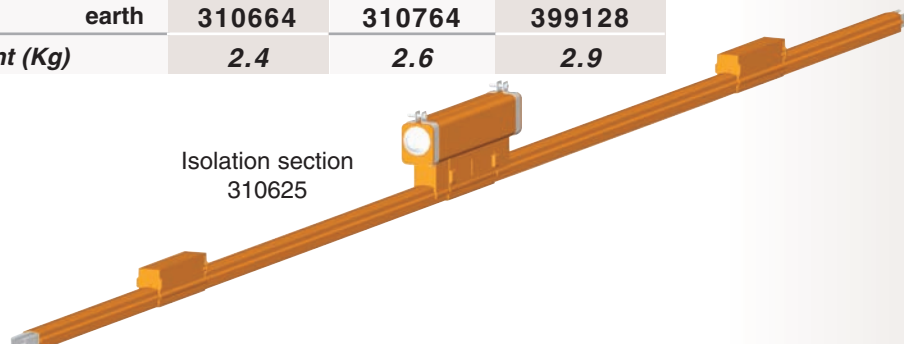
## COPPER BAR

CURRENT RATING	160A	250A	400A
Standard Phase cover (orange)	310325	310425	310525
Standard Earth cover (green)	310326	310426	310526
Medium Heat cover phase (grey) earth	310327 310364	310427 310464	310527 310564
Weight (Kg)	2.97	3.42	4.68



## ALUMINIUM / STAINLESS STEEL

CURRENT RATING	200A	315A	400A
Standard Phase cover (orange)	310625	310725	399125
Standard Earth cover (green)	310626	310726	399126
Medium Heat cover phase (grey) earth	310627 310664	310727 310764	399127 399128
Weight (Kg)	2.4	2.6	2.9





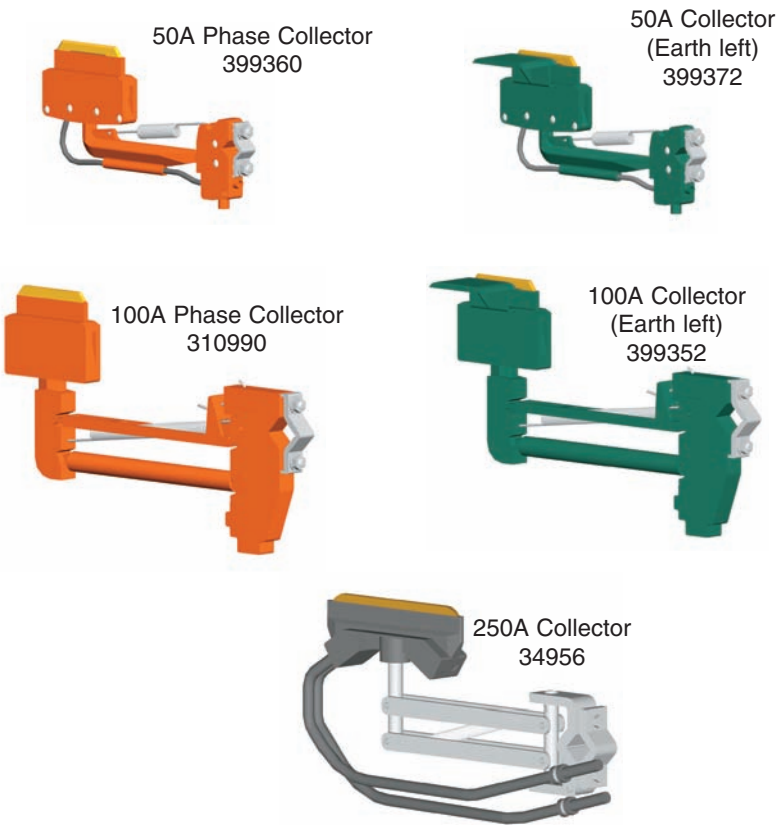
COLLECTORS

CURRENT RATING	50A	100A	250A
Phase	399360	310990	34956
Earth - without deflector	399380	399355	
Earth - right hand	399373	399340	
Earth - left hand	399372	399352	
Weight (Kg)	0.38	0.8	2.00

50A and 100A collectors are supplied without cable.

Stranded cable terminal clamps are included.

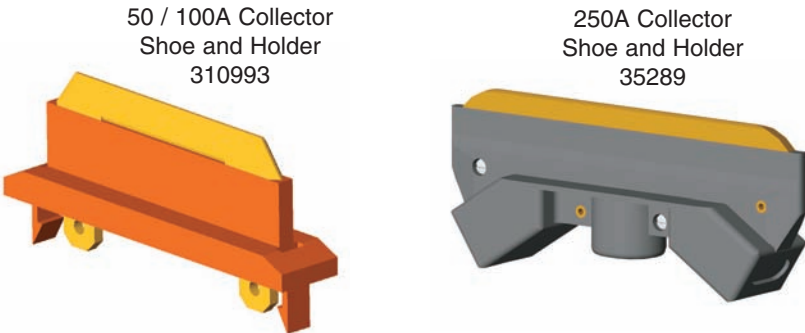
250A collectors are supplied with 2 x 1m 35mm² cable.



COLLECTOR SHOE + HOLDER

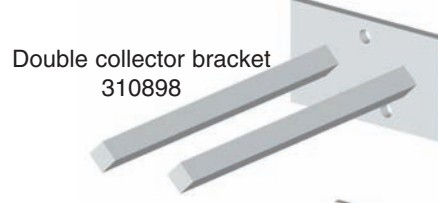
CURRENT RATING	50A + 100A Phase - red	50A + 100A Earth - green	250A
Code	310993	399357	35289
Weight (Kg)	0.06	0.06	0.28

The copper graphite shoe ensures electrical continuity, a smooth contact with the conductor bar and a good resistance to wear.



## COLLECTOR BRACKET

	13mm SQUARE	Weight (Kg)	25mm SQUARE	Weight (Kg)
Single	310994	0.36	310991	0.88
Double	310898	0.74	310992	1.84



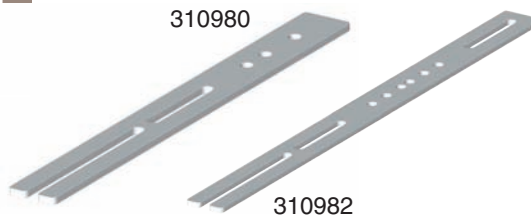
13mm square, 200mm long for use with 50A collector.



25mm square, 400mm long for use with 100A and 250A collectors.

## BRACKETS: SINGLE SIDED BRACKET

	WEIGHT (Kg)
310980	0.66
310982	0.86

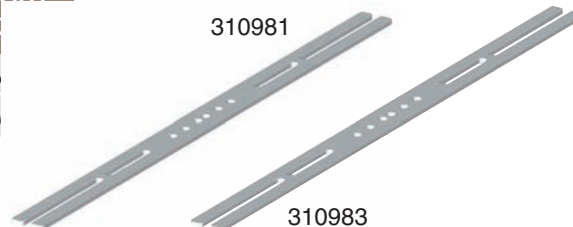


310980 - to suit beam flange 80-155mm.

310982 - to suit beam flange 155-305mm.

## BRACKETS: DOUBLE SIDED BRACKET

	WEIGHT (Kg)
310981	0.66
310983	1.86



310981 - to suit beam flange 80-185mm.

310983 - to suit beam flange 185-305mm.

## BRACKETS: WEB BRACKET

	WEIGHT (Kg)
310984	0.62



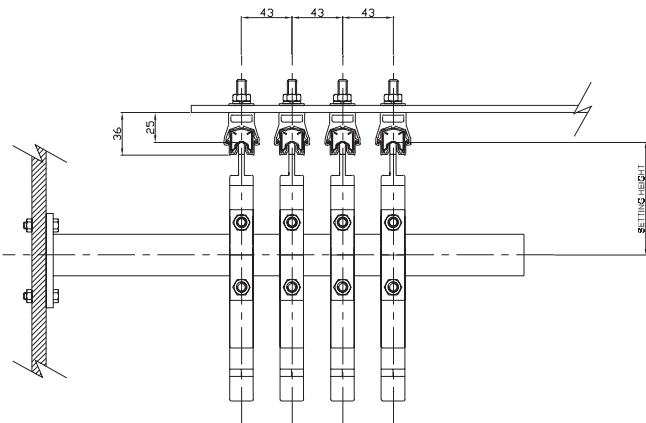
## BRACKETS: GIRDER CLAMP

	WEIGHT (Kg)
310985	0.08



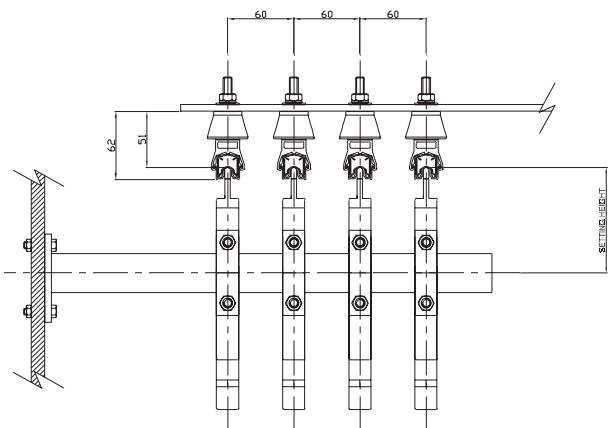
SYSTEM DIMENSIONS

STANDARD HANGER CLAMPS

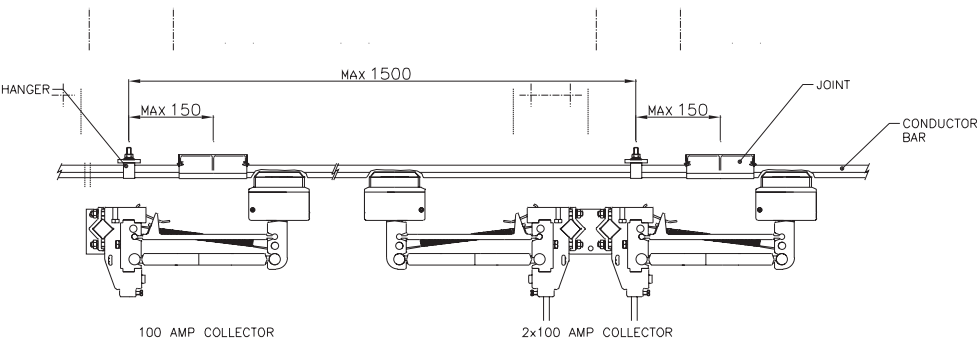


SETTING HEIGHT - SEE RELEVANT COLLECTOR  
DRAWING FOR DIMENSION

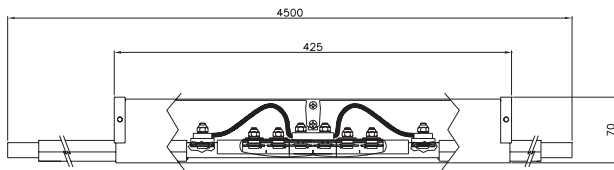
HANGER CLAMPS WITH INSULATOR



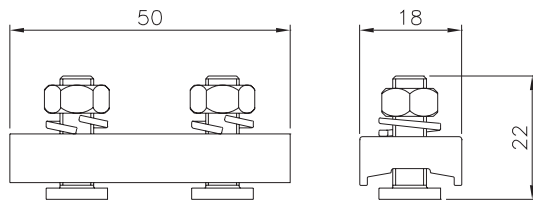
SETTING HEIGHT - SEE RELEVANT COLLECTOR  
DRAWING FOR DIMENSION



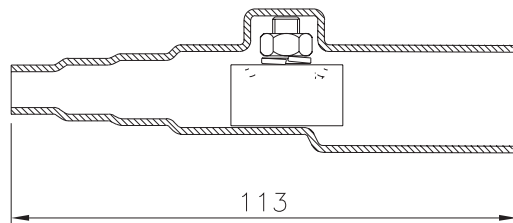
## COMPONENT DIMENSIONS



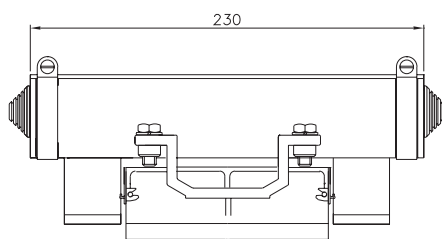
**60A STANDARD PHASE COVER - Expansion Section**  
(310007)



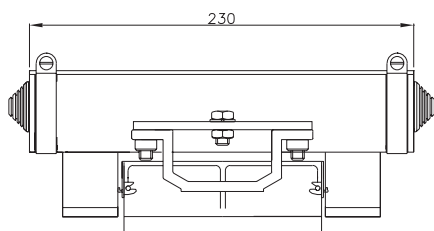
**ALUMINIUM JOINT**  
(310874)



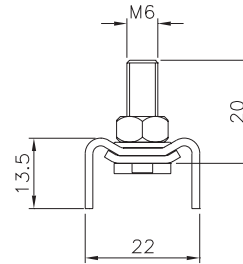
**END POWERFEED**  
(310911)



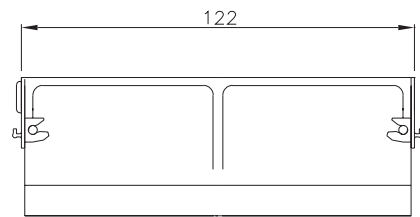
**250A JOINT POWERFEED**  
(310910)



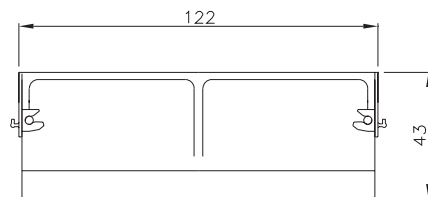
**400A JOINT POWERFEED**  
(310912)



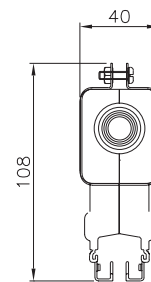
**STEEL JOINT**  
(310872)



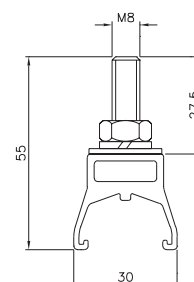
**STANDARD PHASE COVER**  
(310850)



**60A JOINT POWERFEED**  
(310034)

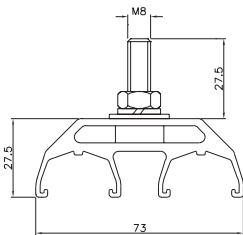


**250A JOINT POWERFEED**  
(310910)

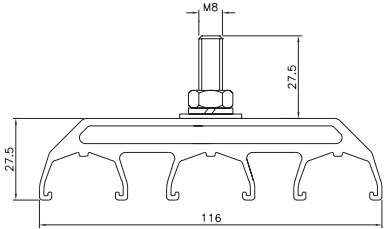


**SINGLE POLE HANGER CLAMP**  
Standard Mount  
(310824)

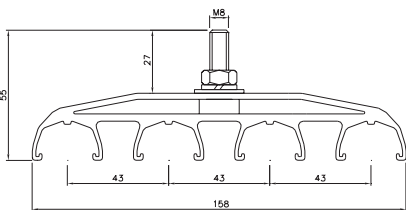
COMPONENT DIMENSIONS (Continued)



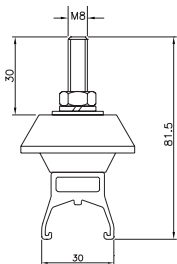
TWO POLE  
HANGER CLAMP  
Standard Mount  
(310882)



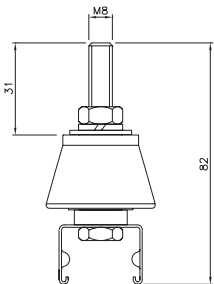
THREE POLE  
HANGER CLAMP  
Standard Mount  
(310861)



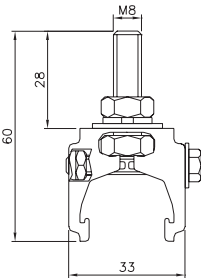
FOUR POLE  
HANGER CLAMP  
Standard Mount  
(310821)



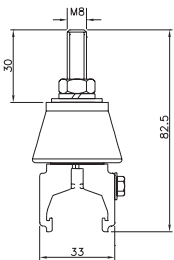
SINGLE POLE  
HANGER CLAMP  
with Insulator  
(310918)



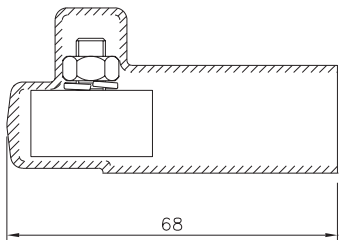
STAINLESS STEEL  
HANGER CLAMP  
with Insulator  
(310827)



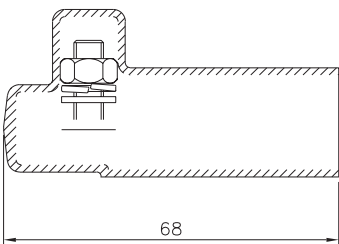
ANCHOR CLAMP  
(310832)



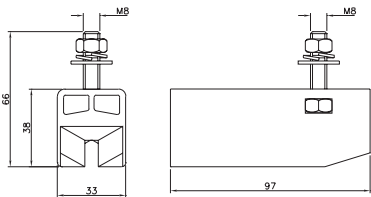
ANCHOR CLAMP  
With Insulator  
(310969)



END CAP  
for Steel / Copper Bar  
(310892)



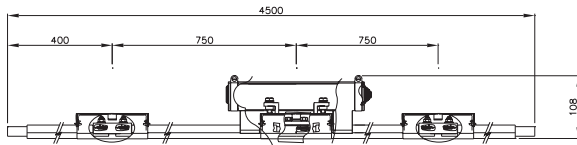
END CAP  
for Aluminium Bar  
(310893)



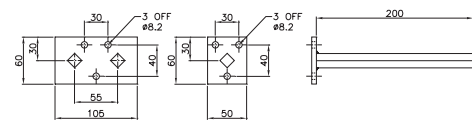
TRANSFER END CAP  
(310951)



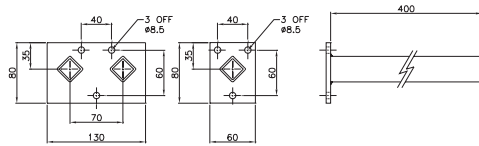
### COMPONENT DIMENSIONS (Continued)



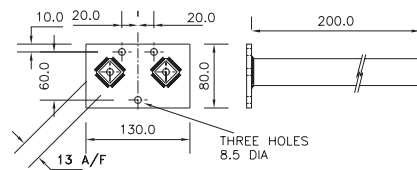
**STANDARD PHASE COVER**  
**Isolation Section**  
**(310025)**



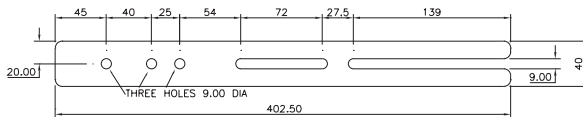
**SINGLE COLLECTOR BRACKET**  
13mm square  
(310994)



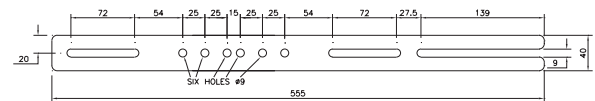
**SINGLE COLLECTOR BRACKET**  
25mm square  
(310991)



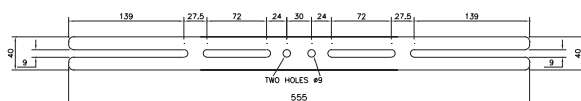
**DOUBLE COLLECTOR BRACKET**  
13mm square  
(310898)



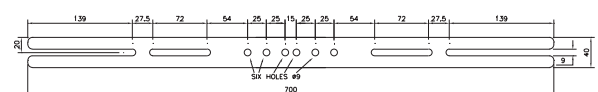
**SINGLE SIDED BRACKET  
(310980)**



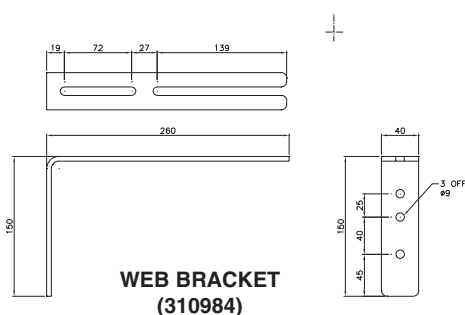
**SINGLE SIDED BRACKET  
(310982)**



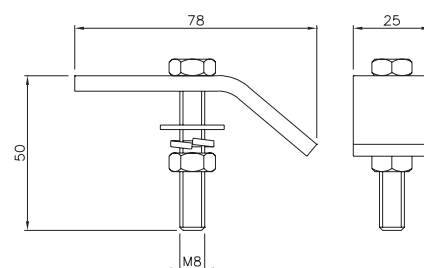
**DOUBLE SIDED BRACKET  
(310981)**



**DOUBLE SIDED BRACKET**  
**(310983)**



**WEB BRACKET  
(310984)**



**GIRDER CLAMP**  
**(310985)**

## SAFELEC 3 TECHNICAL DATA

CONDUCTOR BAR COVER	STANDARD	MEDIUM HEAT
Material	PVC	BAYBLEND
Dielectric strength	180 KV/cm	240 KV/cm
Surface resistivity	$10^{11}\Omega$	$>10^{14}\Omega$
Volume resistivity	$>10^{15}\Omega/\text{cm}$	$>10^{16}\Omega/\text{cm}$
Vicat softening temperature (never expose PVC cover to temperatures in excess of 80°C)	84°C	120°C
Flame-test	Self extinguishing	Self extinguishing
Oxygen index	54%	24%
Specific density	1.5 g/cm <sup>3</sup>	1.15 g/cm <sup>3</sup>

CONDUCTOR BAR	COPPER			ALUMINIUM / STAINLESS STEEL
Nominal current	500A	800A	1150A	630A
Cross sectional area	115mm <sup>2</sup>	171mm <sup>2</sup>	339mm <sup>2</sup>	277mm <sup>2</sup>
Maximum system voltage (AC) (contact Insul-8 for other voltages) (DC) (contact Insul-8 for other voltages)	1000V 1000V	1000V 1000V	1000V 1000V	1000V 1000V
Resistance R (for DC) at 20°C (ž/m)	0.000149	0.000100	0.000051	0.000113
Impedance Z (for AC) at 20°C (ž/m)	0.000189	0.000154	0.000127	0.000162
Maximum allowable ambient temperature for 100% duty cycle	25°C	25°C	25°C	25°C
Bar length	4.5m	4.5m	4.5m	4.5m
Support pitch Standard	1500mm	1500mm	1500mm	1500mm
Lateral	1125mm	1125mm	1125mm	1125mm
Minimum pitch centres Standard	60mm	60mm	60mm	60mm
Lateral	60mm	60mm	60mm	60mm
Expansion sections: not required for runs less than	150m	150m	150m	150m
Minimum bending radius: (horizontal only)	1.5m	1.5m	1.5m	1.5m

Railway  
Shore  
Supply



Electric Mining Vehicles

