



# E-LINE CCR

Busbar Energy Distribution Systems 850A...6300A



# E-LINE CCR

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## ▶▶ E-LINE CCR

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# E-LINE CCR

## ►► Introduction



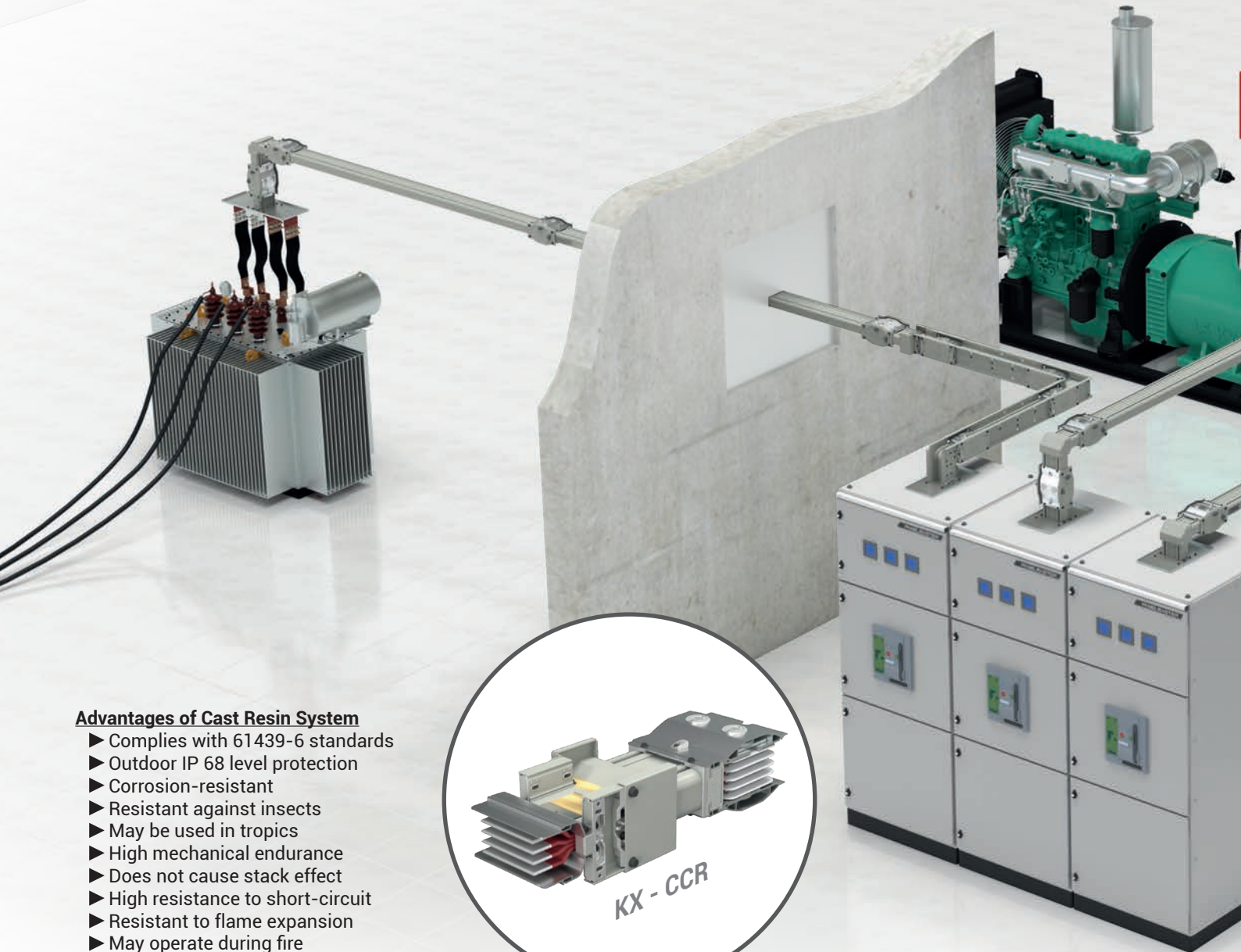
Transportation and distribution of electricity is traditionally done by paralleling several large sized cables together. In order to support these cables within the building a large amount of cable trays, cable ladders & under-floor cable channels are used.

Using Cast Resin bars in outdoor environments, gallery transitions, chemical plants, harbour applications, tunnels instead of cables that are applied as mandatory brings together many advantages.

### **Safe and Easy Installation**

Detachable IP 68 Ext.

Due to alignment piece on the joint point, block joint element and busbar tray are aligned. This makes installation easier and correct on the right axes.



### **Advantages of Cast Resin System**

- Complies with 61439-6 standards
- Outdoor IP 68 level protection
- Corrosion-resistant
- Resistant against insects
- May be used in tropics
- High mechanical endurance
- Does not cause stack effect
- High resistance to short-circuit
- Resistant to flame expansion
- May operate during fire
- Compatible with E-Line KX modules
- Voltage layout advantage thanks to its compact structure

*\* Special components can be manufactured in one week on request.*

# E-LINE CCR



## High IP Isolation

Aluminium body over the "DUROCOMP" composite material that is made by specially selected pure silicium minerals and epoxy resin and has high temperature and mechanical operation features protects E-LINE CCR busbar from external elements.

## Heat Transfer

Heat accumulated in conductors are transferred into the environment through the aluminium body thanks to the additives with high heat transfer rate used in the system. (Figure 1)

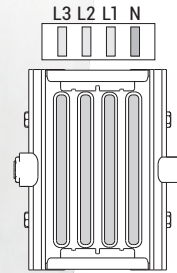
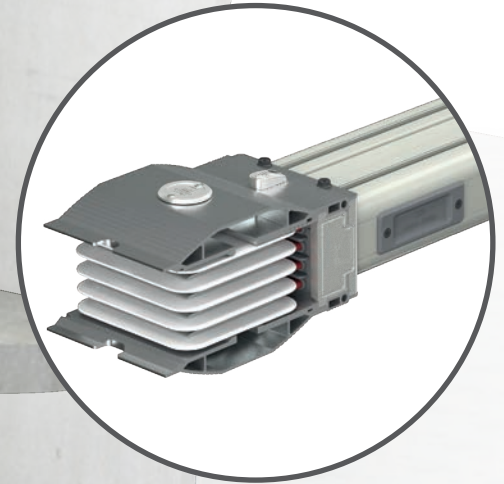


Figure 1



## Short-Circuit Endurance

High mechanical and thermal resistance within aluminium body thanks to DUROCOMP material.

## One Bolt Joint Ensures Safety and Easy Installation

E-Line CRR Busbars are installed by tightening the "one bolt joint". Belleville spring washers on both ends of the bolt retains the original contact pressure, ensuring a more secure, reliable and maintenance - free joint. E-Line KX Busbar Systems are easily installed (Figures 3-4).

**\*The bolt is tightened to 83 Nm (60 lbft) using the torque spanner.**

## Fire and Earthquake Resistance

- ▶ 4 hour fire barrier according to ISO 834 BS EN 1366-3
- ▶ Seismic resistance in compliance with IEC 60068-3-3 / 60068-2-57 and IEEE 693

## EX-Protective

- ▶ ATEX as per EN 60079-0:2009, EN 60079-18:2009, EN60079-31:2009



II 2G Ex mb IIC Gb  
II 2D IIIC Db

# E-LINE CCR

## ►► Distribution & Horizontal Applications



### While designing an electrical distribution system with E-Line CCR a few approximate details will be necessary.

- Location, number, type and approximate ratings of loads,
- Concurrence (diversity) investigation,
- Transformer rates and short-circuit capacities, Utilization factor= $\alpha$ ,
- System coordination with other distribution system (heat, water, etc),
- Determining the route of E-Line KX on layout.
- Deciding on suitable hanger types.
- If necessary, coordination of E-Line KX Busbar with E-Line KX runs.

### Rated Current

The current is calculated using the following equation:

$$I_B = \frac{P \cdot \alpha}{\sqrt{3} \cdot U \cdot \cos \varphi}$$

$I_B$  = Operation current (A)

$P$  = Installed load (W)

$\alpha$  = Utilization factor

$U$  = Supply voltage (V)

- Busbar current rating is chosen as equal to or higher than the calculated  $I_B$  current.
- After the voltage drop calculation if the chosen current rate is not convenient, a higher rating is chosen.

### Utilization Factor ( $\alpha$ )

Utilization factor ( $\alpha$ ) depends on the type and number of loads. It is usually around 0.7 or lower. The utilization factor of a line that supplies electricity to motors and lighting systems is usually lower than 0.6. It is as low as 0.30 in weld shops of car factories, it can be 1 in lines where only one big load is supplied.

### Voltage Drop

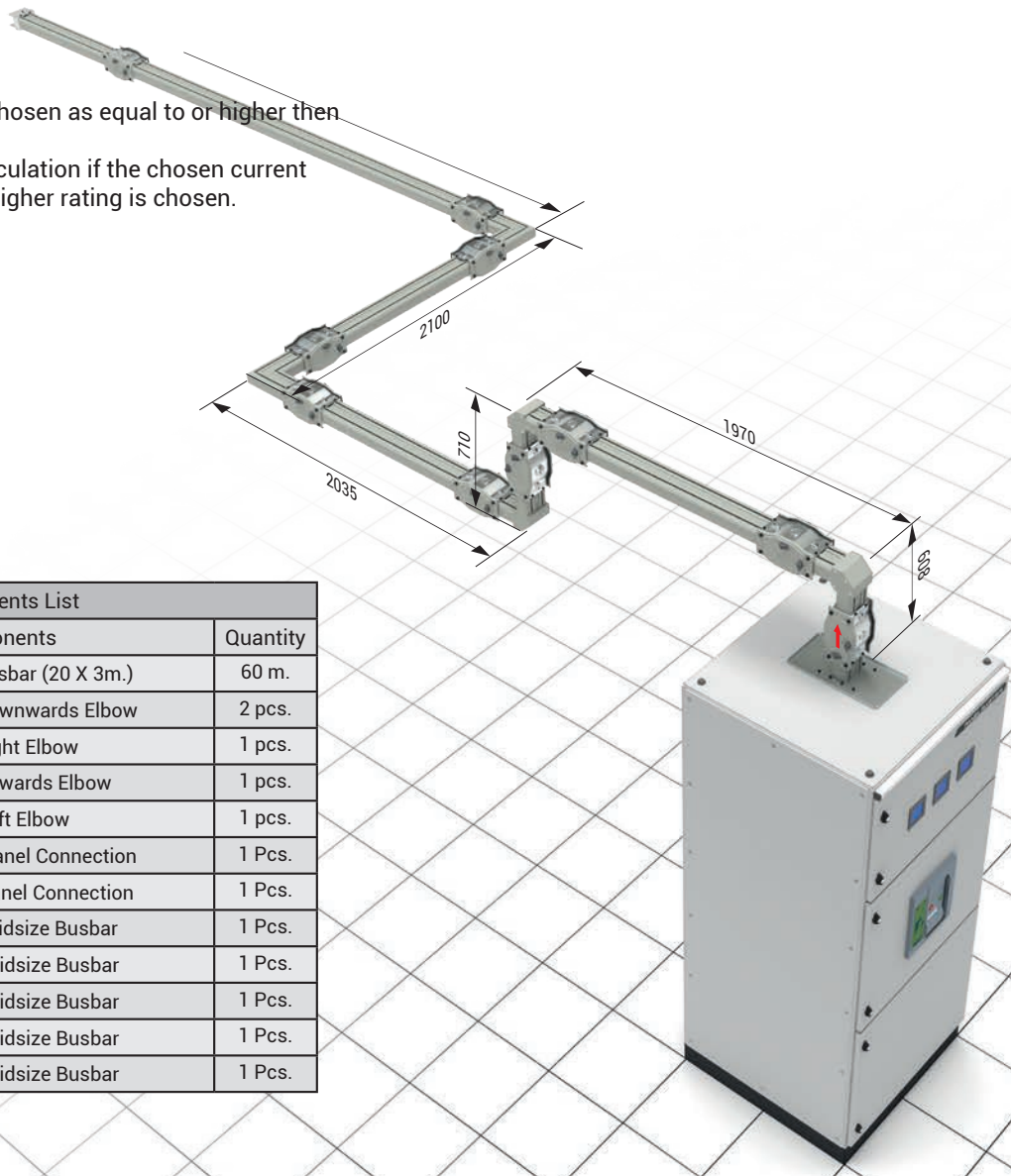
For practical voltage drop calculation, necessary values, formula and easy calculation methods are given on the technical characteristics table on pages.

### Short-Circuit

Tested short-circuit capacities are given on technical characteristics table.

### Busbar Installation Plan

Our distributor's project & design departments will help you for preparing the installation plans on request



Components List			
Item	Components		Quantity
1	CCRC 20504 - STD	Busbar (20 X 3m.)	60 m.
2	CCRC 20504 - D	Downwards Elbow	2 pcs.
3	CCRC 20504 - R	Right Elbow	1 pcs.
4	CCRC 20504 - U	Upwards Elbow	1 pcs.
5	CCRC 20504 - L	Left Elbow	1 pcs.
6	CCRC 20504 - P10	Panel Connection	1 Pcs.
7	CCRC 20504 - S	Panel Connection	1 Pcs.
8	CCRC 20504 - X95	Midsized Busbar	1 Pcs.
9	CCRC 20504 - X120	Midsized Busbar	1 Pcs.
10	CCRC 20504 - X122	Midsized Busbar	1 Pcs.
11	CCRC 20504 - X200	Midsized Busbar	1 Pcs.
12	CCRC 20504 - X174	Midsized Busbar	1 Pcs.

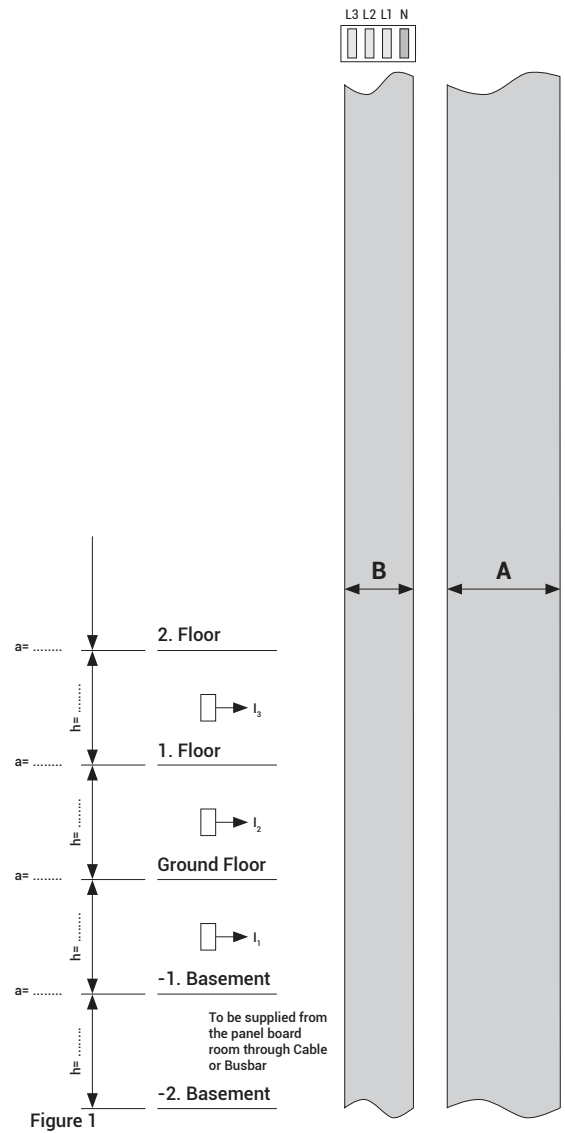
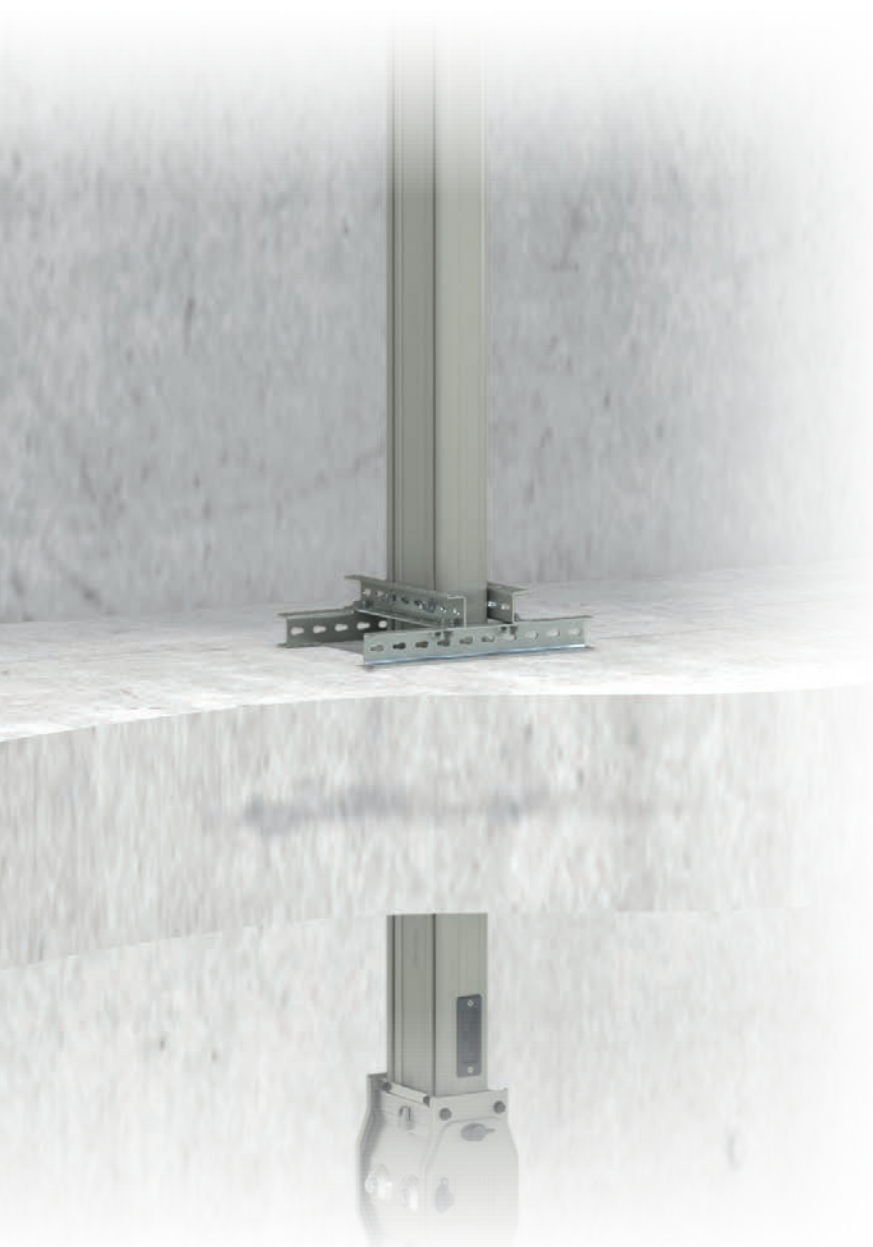
# E-LINE CCR

## ►►Riser & Vertical Applications



As each building's structure is different than the other for vertical applications of E-Line CCR special projects has to be designed.

The details on this page briefly explain the necessary information for drawing a vertical application project.



### Project Design

The details below should be sent to our Project & Design department.

- Location and dimensions of the floor penetration where busbar will be installed.
- Number, height and ceiling thickness of storeys (a=..., h=.....)
- Connected load for each storey.
- Supply type of the vertical line (busbar or cable).

Please send the information to us by fax or e-mail with a sample drawing in Figure.

See the table on page 9 for the "A" dimension.

Number of Conductors	B (mm)
3 Conductor	73
4 Conductor	80
4 ½ Conductor	87
5 Conductor	87

# E-LINE CCR

## ►► Technical Characteristics

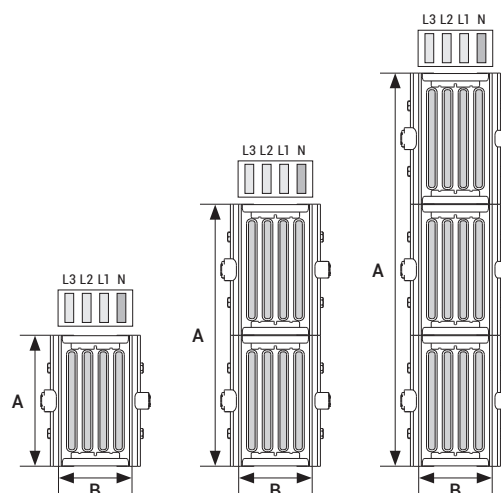
### Copper Conductor (Cu)

Rated Current	$I_n$	A	850	1000	1250	1600	2000
Busbar Code			08	10	12	16	20
Standards	IEC 61439-6:2012 Ed.1 IEC 61439-1 Ed.2:2011, TS EN 61439-1: 2011						
Rated Operational Voltage	$U_e$	V	1000	1000	1000	1000	1000
Rated Isolation Voltage	$U_i$	$V_{ac}$	1000	1000	1000	1000	1000
Rated Impulse Withstand Voltage	$U_{imp}$	kV	12	12	12	12	12
Rated Frequency	f	Hz	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Pollution Degree			III	III	III	III	III
Protection Degree	IP 68		IP 68	IP 68	IP 68	IP 68	IP 68
External Mechanical Impacts (IK Code)*	50J, >IK10		50J, >IK10	50J, >IK10	50J, >IK10	50J, >IK10	50J, >IK10
Rated Short-time Withstand Current (1s) (Three phase)	$I_{cw}$	kA	23	50	80	80	80
Rated Peak Withstand Current	$I_{pk}$	kA	48,3	105	176	176	176
Rated Short-time Withstand Current for Neutral Conductor (1s) (Single phase)	$I_{cw}$	kA	13,8	31,2	49,5	49,5	49,5
Rated Peak Withstand Current for Neutral Conductor (Single phase)	$I_{pk}$	kA	27,6	65,9	106,4	106,4	106,4
Rated Short-time Withstand Current for PE (Housing-Phase) Conductor (1s)	$I_{cw}$	kA	13,8	31,2	49,5	49,5	49,5
Rated Peak Withstand Current for PE (Housing-Phase) Conductor	$I_{pk}$	kA	27,6	65,9	106,4	106,4	106,4
<b>PHASE CONDUCTOR CHARACTERISTICS (<math>I_n</math>)</b>							
Average Ohmic Resistance in $I_n$ Current in 20°C Ambient Temperature	$R_{20}$	mΩ/m	0,0648	0,0534	0,0358	0,0256	0,0198
Average Ohmic Resistance in $I_n$ Current in 35°C Ambient Temperature	R	mΩ/m	0,0890	0,0727	0,0473	0,0345	0,0263
Reactance (Independent from Temperature)	X	mΩ/m	0,0281	0,0246	0,0180	0,0132	0,0097
Average Impedance in $I_n$ Current in 35°C Ambient Temperature	Z	mΩ/m	0,0934	0,0768	0,0506	0,0369	0,0281
Average Impedance in $I_n$ Current in 20°C Ambient Temperature	$Z_{20}$	mΩ/m	0,0706	0,0588	0,0401	0,0288	0,0221
Rated Power Loss at 35 °C		W/m	190,8	212,3	219,5	269,7	304,9
DC Resistance at a conductor temperature of 20 °C for Phases	$R_{ph(dc)}$	mΩ/m	0,460	0,362	0,243	0,177	0,129
DC Resistance at a conductor temperature of 20 °C for Neutral	$R_{N(dc)}$	mΩ/m	0,460	0,362	0,243	0,177	0,129
DC Resistance at a conductor temperature of 20 °C for PE	$R_{PE(dc)}$	mΩ/m	0,362	0,362	0,277	0,213	0,225
<b>SECTIONS</b>							
L1, L2, L3 (Phase Conductors)		mm <sup>2</sup>	270	330	480	660	900
Neutral		mm <sup>2</sup>	270	330	480	660	900
PE (Aluminium Housing)		mm <sup>2</sup>	1261	1261	1784	1984	2379
Conductor Dimensions		mmxmm	6x45	6x55	6x80	6x110	6x150
Busbar Weight (4 conductors)		kg/m	23,5	23,5	31	41	54,75
<b>MEAN FAULT-LOOP CHARACTERISTICS</b>							
<b>Zero-sequence Impedance</b>							
Zero-sequence impedance at a conductor temperature of 20 °C	$Z_{(0)b20phN}$	mΩ/m	0,336	0,280	0,194	0,146	0,108
Zero Impedance of Conductor in 20°C (Phase-Housing)	$Z_{(0)b20phPE}$	mΩ/m	0,279	0,267	0,196	0,155	0,122
Zero-sequence impedance at an ambient temperature of 35 °C (Phase-Neutral)	$Z_{(0)bbphN}$	mΩ/m	0,439	0,360	0,243	0,186	0,136
Zero-sequence impedance at an ambient temperature of 35 °C (Phase-Housing)	$Z_{(0)bbphPE}$	mΩ/m	0,337	0,329	0,232	0,187	0,145
<b>Resistances and Reactances</b>							
Resistance at a conductor temperature of 20 °C	$R_{b20phph}$	mΩ/m	0,136	0,110	0,074	0,055	0,041
Resistance at a conductor temperature of 20 °C	$R_{b20phN}$	mΩ/m	0,141	0,114	0,078	0,059	0,043
Resistance at a conductor temperature of 20 °C	$R_{b20phPE}$	mΩ/m	0,111	0,107	0,072	0,056	0,043
Average Ohmic Resistance in 35°C Ambient Temperature	$R_{bbphph}$	mΩ/m	0,187	0,150	0,098	0,075	0,055
Average Ohmic Resistance in 35°C Ambient Temperature	$R_{bbphN}$	mΩ/m	0,194	0,156	0,103	0,079	0,057
Average Ohmic Resistance in 35°C Ambient Temperature	$R_{bbphPE}$	mΩ/m	0,153	0,145	0,095	0,076	0,057
Mean Resistance at an ambient air temperature of 35 °C	$X_{bbphph}$	mΩ/m	0,053	0,046	0,033	0,025	0,019
Mean Resistance at an ambient air temperature of 35 °C	$X_{bbphN}$	mΩ/m	0,075	0,065	0,048	0,036	0,026
Reactance (Independent from temperature)	$X_{bbphPE}$	mΩ/m	0,083	0,070	0,054	0,043	0,034

**Attention!** Standard installation of cast resin busbar is designed according to the positioning of conductors in 90° (on sides) with the floor level. This positioning is necessary for the easy application of adjunct resin.



2500	3200	3400	4000	5000	5750	6300
25	32	34	40	50	57	63
1000	1000	1000	1000	1000	1000	1000
1000	1000	1000	1000	1000	1000	1000
12	12	12	12	12	12	12
50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
III	III	III	III	III	III	III
IP 68	IP 68	IP 68	IP 68	IP 68	IP 68	IP 68
50J, >IK10	50J, >IK10	50J, >IK10	50J, >IK10	50J, >IK10	50J, >IK10	50J, >IK10
95	95	95	95	95	95	95
210,5	210,5	210,5	210,5	210,5	210,5	210,5
65,2	65,2	65,2	65,2	65,2	65,2	65,2
137,4	137,4	137,4	137,4	137,4	137,4	137,4
65,2	65,2	65,2	65,2	65,2	65,2	65,2
137,4	137,4	137,4	137,4	137,4	137,4	137,4
0,0181	0,0133	0,0120	0,0107	0,0080	0,0063	0,0057
0,0242	0,0180	0,0160	0,0145	0,0106	0,0082	0,0075
0,0084	0,0066	0,0057	0,0053	0,0038	0,0030	0,0028
0,0256	0,0192	0,0169	0,0154	0,0112	0,0088	0,0080
0,0200	0,0148	0,0132	0,0119	0,0088	0,0070	0,0063
447,9	538	543,1	674,3	782,6	776,2	843,9
0,123	0,090	0,080	0,071	0,053	0,042	0,039
0,123	0,090	0,080	0,071	0,053	0,042	0,039
0,156	0,126	0,267	0,119	0,112	0,115	0,091
960	1320	1500	1680	2250	2880	3240
960	1320	1500	1680	2250	2880	3240
3568	3698	4430	4569	6645	7137	7515
2x6x80	2x6x110	2x6x125	2x6x140	3x6x125	3x6x160	3x6x180
61,25	82	92,5	102	138	166,38	211
0,100	0,074	0,067	0,059	0,040	0,035	0,031
0,102	0,081	0,085	0,064	0,044	0,040	0,038
0,127	0,094	0,084	0,075	0,051	0,043	0,040
0,121	0,096	0,103	0,076	0,052	0,047	0,044
0,038	0,027	0,025	0,021	0,017	0,013	0,012
0,041	0,029	0,026	0,023	0,018	0,014	0,012
0,037	0,028	0,029	0,022	0,016	0,014	0,013
0,051	0,037	0,033	0,029	0,022	0,017	0,015
0,054	0,039	0,035	0,031	0,023	0,018	0,016
0,049	0,037	0,039	0,030	0,022	0,018	0,017
0,016	0,012	0,011	0,010	0,007	0,006	0,005
0,024	0,018	0,016	0,015	0,011	0,008	0,008
0,027	0,022	0,021	0,017	0,013	0,011	0,010

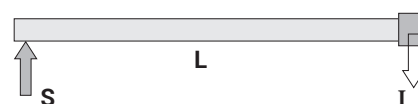


### Voltage Drop Calculation

Generally Voltage drop of a busbar system can be calculated with the following formula.

$$\Delta U = \sqrt{3} \cdot L \cdot I \cdot (R_1 \cdot \cos\phi + X_1 \cdot \sin\phi) \cdot 10^{-3} \text{ [V]}$$

- $\Delta U$  = Voltage Drop (V)
- L = Line Length (m)
- I = Line or Load Current (A)
- $R_1$  = Resistance (m $\Omega$ /m)
- $X_1$  = Resistance (m $\Omega$ /m)
- $\cos\phi$  = Power Factor



S = Supply Point

(1) All phase conductor characteristics had been determined according to Annex BB of IEC/EN 61439-6.

(2) Fault-loop zero-sequences impedances had been determined according to Annex CC of IEC/EN 61439-6.

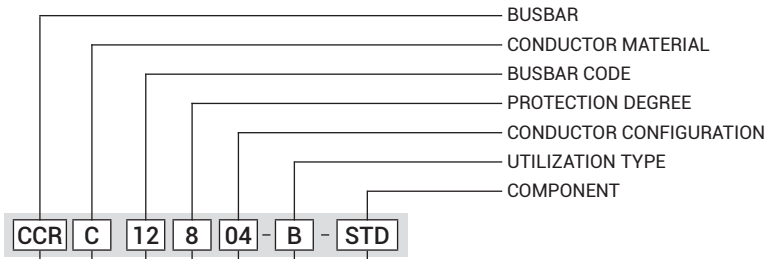
(3) Fault-loop resistances and impedances had been determined according to Annex DD of IEC/EN 61439-6.

\*IK10 corresponds to impact energy of 20J according to IEC 62262.

\*\*CR series busbars are produced as minimum 3 conductors.(3P)

# E-LINE CCR

## ►► Order Code System



STD Standard Length.....	STD
Special Length .....	X
Upwards Elbow.....	U
Downwards Elbow.....	D
Left Elbow .....	L
Right Elbow .....	R
Left Horizontal Offset.....	LH
Right Horizontal Offset.....	RH
Upwards Vertical Offset.....	UV
Downwards Vertical Offset...	DV
Upwards Left Combined.....	KUL
Upwards Right Combined ....	KUR
Downwards Left Combined..	KDL
Downwards Right Combined	KDR
Left Upwards Combined.....	KLU
Right Upwards Combined.....	KRU
Left Downwards Combined..	KLD
Right Downwards Combined	KRD
End Closer.....	S10
End Closer.....	S11
Reduction.....	RD
Crossing Module.....	CCRKX
Right Side Feeder "T".....	TYR
Left Side Feeder "P".....	TYL
Central Feeder "T" .....	TO
Horizontal Expansion.....	YDT
Vertical Expansion.....	DDT
Panel Connection	P10
Panel Connection	TR11
Upwards Panel Connection	PU20
Upwards Panel Connection	TU21
Downwards Panel Connection	PD20
Downwards Panel Connection	TD21
Right Panel Connection	PR30
Right Panel Connection	TR31
Left Panel Connection	PL30
Left Panel Connection	TL31
Horizontal Panel Connection	P40
Panel Connection	TR41
Panel Connection	TR61
Panel Connection	TR71

Busbar Name

BUSBAR

Copper (Cu) C

CONDUCTOR MATERIAL

CCR - Cu Conductor		Conductor Size
Rated Current	Busbar Code	
850	08	6x45
1000	10	6x55
1250	12	6x80
1600	16	6x110
2000	20	6x150
2500	25	2x6x80
3200	32	2x6x110
3400	34	2x6x125
4000	40	2x6x140
5000	50	3x6x125
5750	57	3x6x160
6300	63	3x6x180

BUSBAR CODE

IP68 8

PROTECTION LEVEL

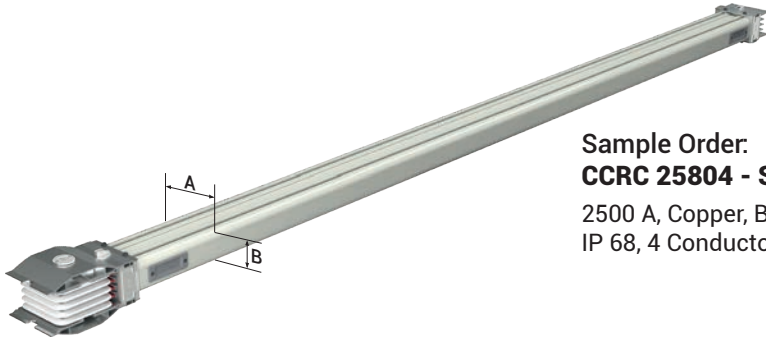
Number of Conductors	Code	Conductor Configuration								
		L1	L2	L3	N	Earth	½ Earth	Clean Earth	½ Clean Earth	Earth
3 conductors	03	✓	✓	✓	✓	✓	✓	✓	✓	✓
4 conductors	04	✓	✓	✓	✓	✓	✓	✓	✓	✓
4 ½ conductors	08	✓	✓	✓	✓	✓	✓	✓	✓	✓
5 conductors	09	✓	✓	✓	✓	✓	✓	✓	✓	✓

* TYPE	Utilization Type.
(B) Bolt-on	Energy is supplied from the joints.

# E-LINE CCR

►► Standard Straight Length

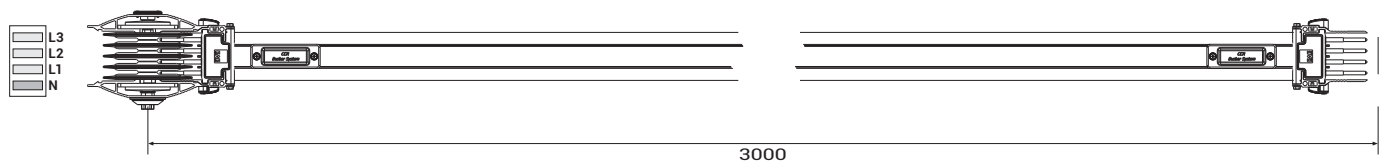
## Straight Busbar - STD



Sample Order:  
**CCRC 25804 - STD**  
2500 A, Copper, Bolt-on,  
IP 68, 4 Conductor

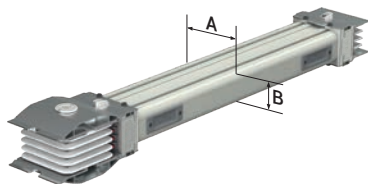
### Applications:

- As feeder or sub-feeder line,
- Where a load has to be supplied



## Special Straight Busbar - X

X Special Straight Length in (mm)



Sample Order:  
**CCRC 25804 - X - 147**  
2500 A, Copper, Bolt-on,  
IP 68, 4 Conductor, 1470 mm Midsize

### Applications:

- As feeder or sub-feeder line,
- Where a load has to be supplied

### information:

Feeder Minimum Midsize = 450 mm

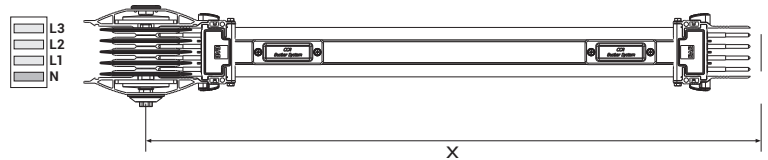


Table For Outer Dimension of Busbars

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar Code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	95	95	120	150	190	240	300	330	360	495	600	660
Number of Conductors	3 Conductors	4 Conductors	4 ½ Conductors		5 Conductors								
	B (mm)	73	80	87		87							



**Attention !** Standard installation of cast resin busbar is designed according to the positioning of conductors in 90° (on sides) with the floor level. This positioning is necessary for the easy application of adjunct resin

■ Dimensions given above are minimum values. ■ Please call us for non-standard components

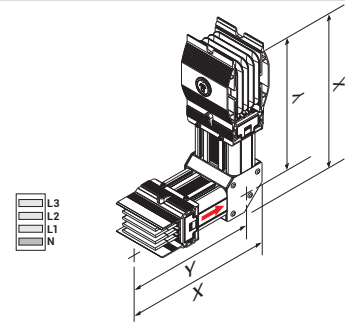
# E-LINE CCR

## ►► Elbows



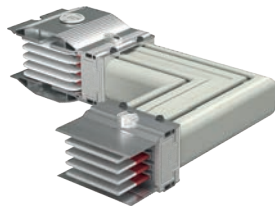
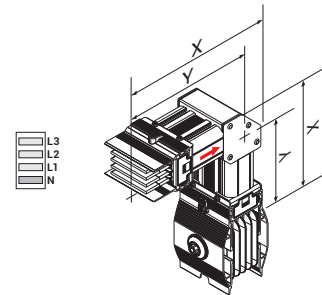
**Upwards Elbow - U**

Sample Order:  
**CCRC 32804 - B - U**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



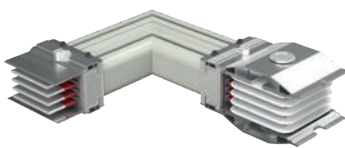
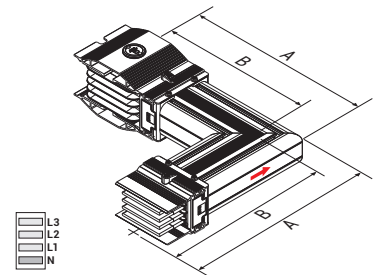
**Downwards Elbow - D**

Sample Order:  
**CCRC 32804 - B - D**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



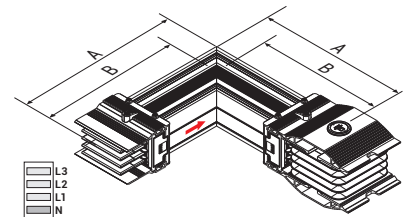
**Left Elbow - L**

Sample Order:  
**CCRC 32804 - B - L**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



**Right Elbow - R**

Sample Order:  
**CCRC 32804 - B - R**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

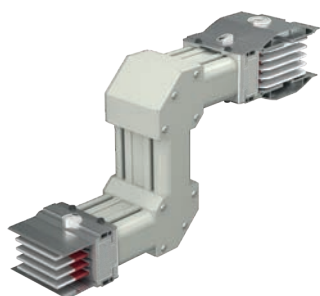
CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307

### Busbar Section Size Table

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

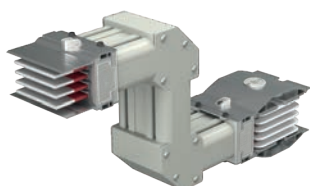
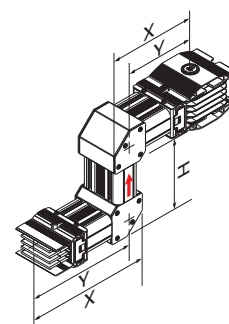
# E-LINE CCR

## ►► Elbows



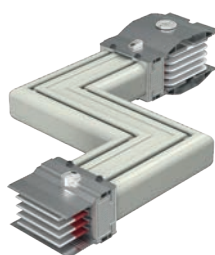
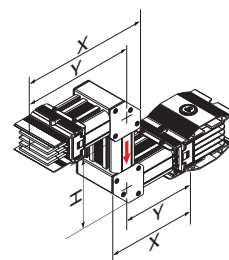
### Upwards Vertical Offset - UV

Sample Order:  
**CCRC 32804 - B - UV**  
 H=60cm, 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



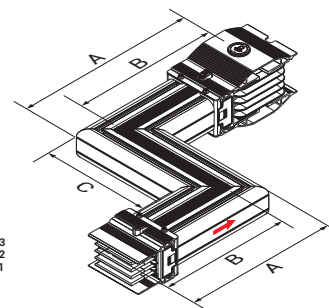
### Downards Vertical Offset - DV

Sample Order:  
**CCRC 32804 - B - DV**  
 H=60cm, 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



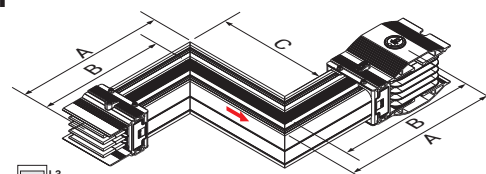
### Left Horizontal Offset - LH

Sample Order:  
**CCRC 32804 - B - LH**  
 C=60cm, 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Right Horizontal Offset - RH

Sample Order:  
**CCRC 32804 - B - RH**  
 C=60cm, 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

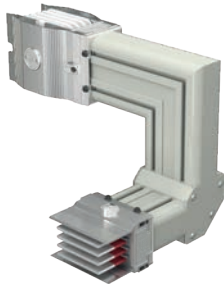
CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565
C	(mm)	375	375	400	430	470	520	580	610	640	675	880	940

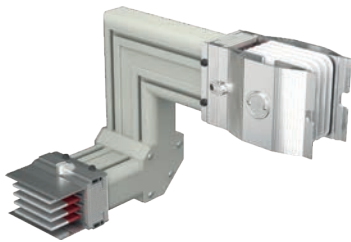
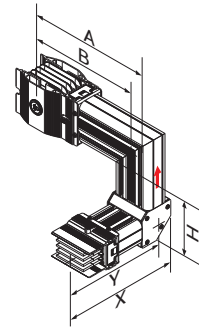
# E-LINE CCR

## ►► Elbows



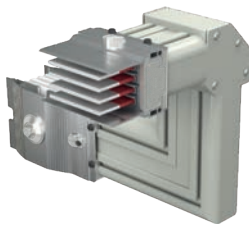
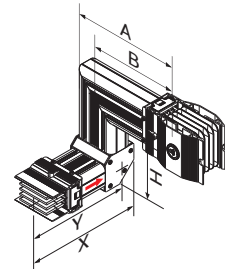
**Upwards Left Combined Offset - KUL**

Sample Order:  
**CCRC 32804 - B - KUL**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



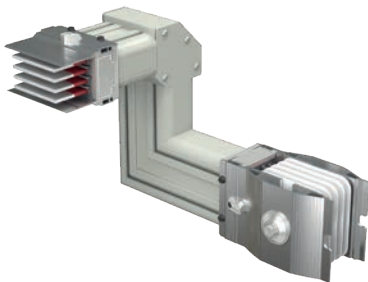
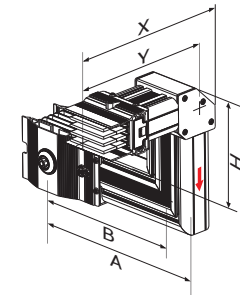
**Upwards Right Combined Offset - KUR**

Sample Order:  
**CCRC 32804 - B - KUR**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



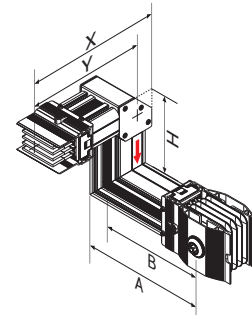
**Downwards Left Combined Offset - KDL**

Sample Order:  
**CCRC 32804 - B - KDL**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



**Upwards Right Downwards Combined Offset - KDR**

Sample Order:  
**CCRC 32804 - B - KDR**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

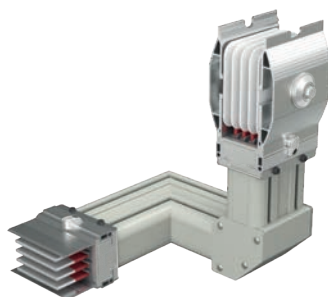
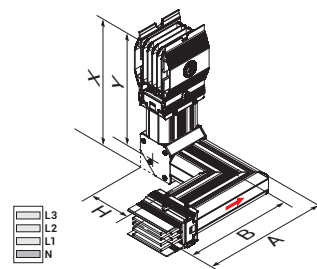
# E-LINE CCR

## ►► Elbows



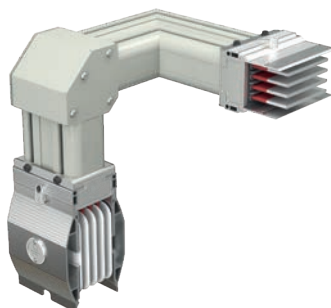
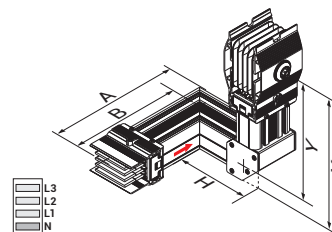
**Left Upwards  
Combined Offset - KLU**

Sample Order:  
**CCRC 32804 - B - KLU**  
3200 A, Copper, Bolt-on, IP  
68, 4 Conductor



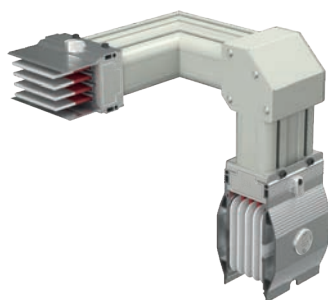
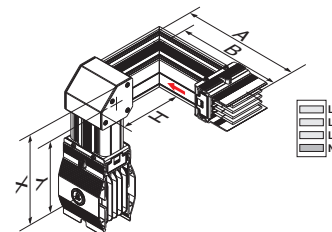
**Right Upwards  
Combined Offset - KRU**

Sample Order:  
**CCRC 32804 - B - KRU**  
3200 A, Copper, Bolt-on, IP  
68, 4 Conductor



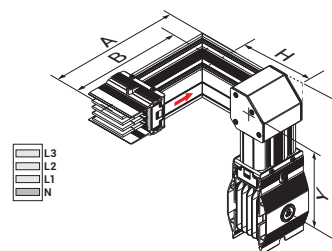
**Left Downwards  
Combined Offset - KLD**

Sample Order:  
**CCRC 32804 - B - KLD**  
3200 A, Copper, Bolt-on,  
IP 68, 4 Conductor



**Right Downwards  
Combined Offset - KRD**

Sample Order:  
**CCRC 32804 - B - KRD**  
3200 A, Copper, Bolt-on,  
IP 68, 4 Conductor



### Conductor Dimension Table

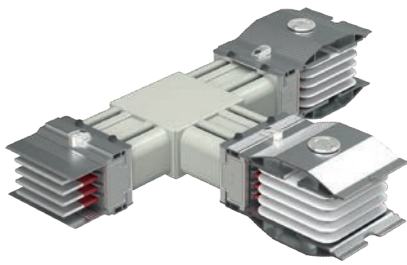
CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

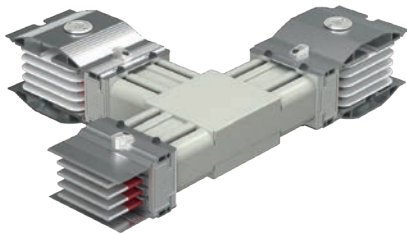
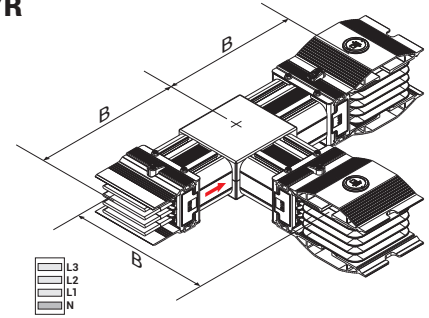
# E-LINE CCR

►► Elbows



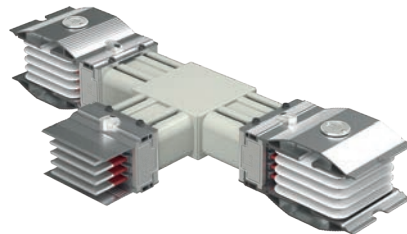
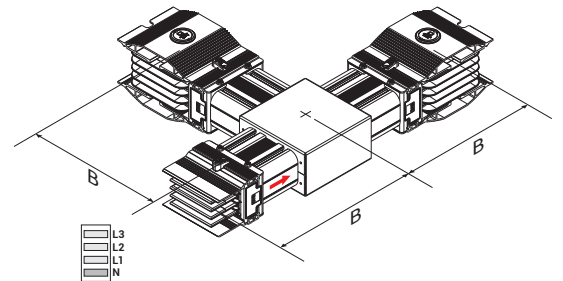
**Right Side Feeder "T" - TYR**

Sample Order:  
**CCRC 32804 - B - TYR**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



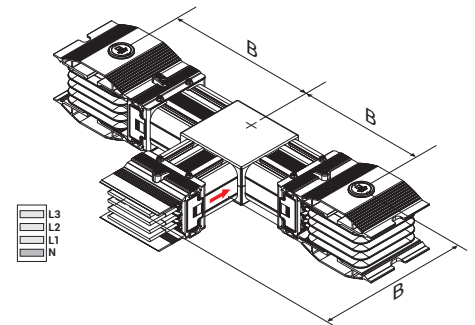
**Left Side Feeder "P" - TYL**

Sample Order:  
**CCRC 32804 - B - TYL**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



**Central Feeder "T" - TO**

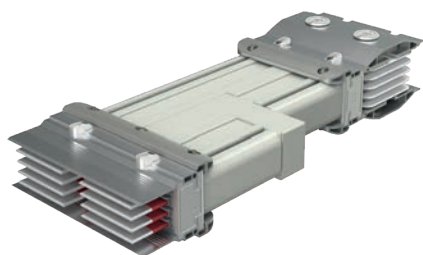
Sample Order:  
**CCRC 32804 - B - TO**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



## Busbar Section Size Table

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

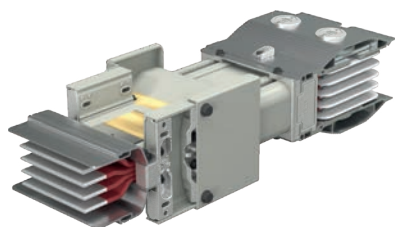
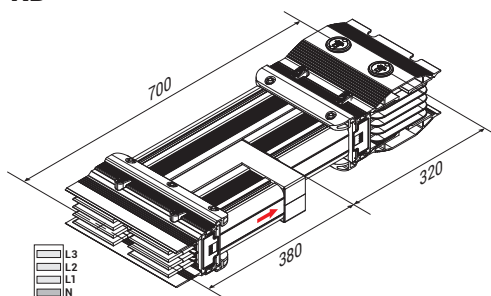




Reduction

- RD

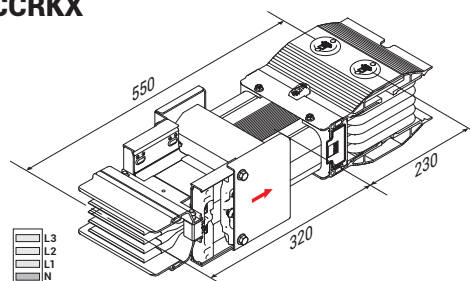
Sample Order:  
**CCRC 32804 - B - RD**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



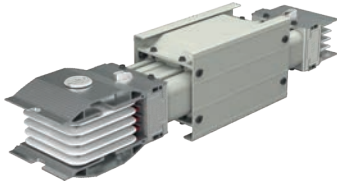
KX - CCR  
 Crossing Module

- CCRKX

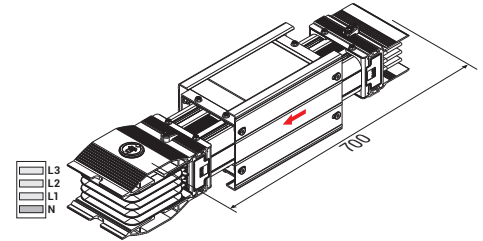
Sample Order:  
**CCRC 32804 - B - CCRKX**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



## Vertical Expansion Module - DDT



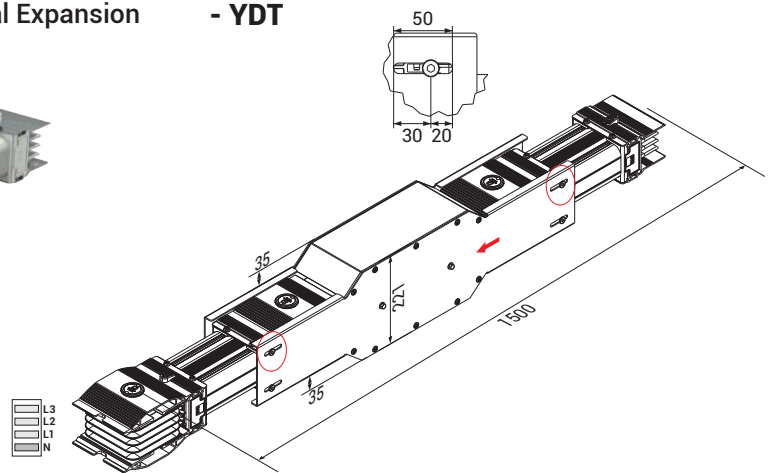
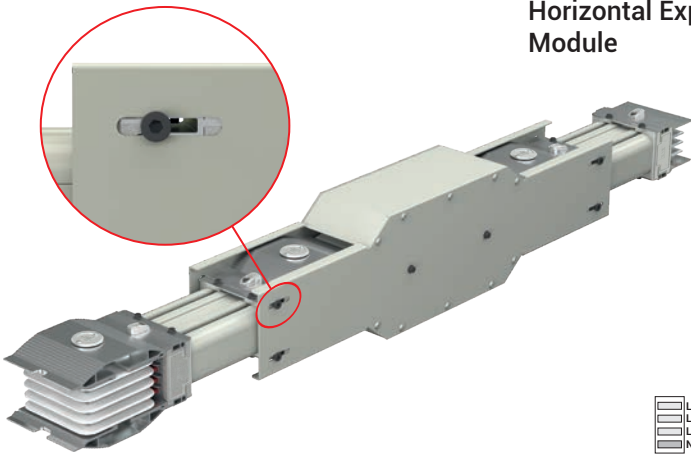
Sample Order:  
**CCRC 32804 - B - DDT**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### DDT Expansion

- Used for vertical applications in multi storey buildings. One vertical expansion unit is advised to be used at every floor between fixed support points.

## Horizontal Expansion Module - YDT



### Horizontal Expansion Module

- It is used as a horizontal expansion element every 40m on a long straight run.

#### Note:

- If the busbar run passes through a horizontal expansion of building, a Dilation Module has to be used.
- Dilation Modules must be used for very long free lines (>75m) that are closed with an end closer and not fixed on the hanger.
- The movement span of Dilation Module is 50mm

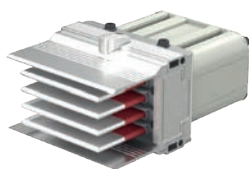
We recommend consulting our company during the project phase.

# E-LINE CCR

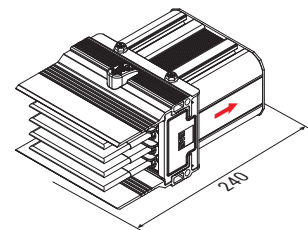
►► End Closers

End Closers

- S 10



Sample Order:  
**CCRC 32804 - B - S10**  
3200 A, Copper, Bolt-on,  
IP 68, 4 Conductor

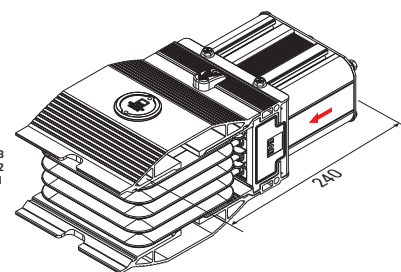


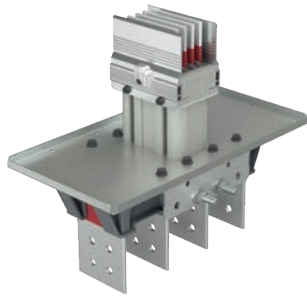
End Closers

- S 11



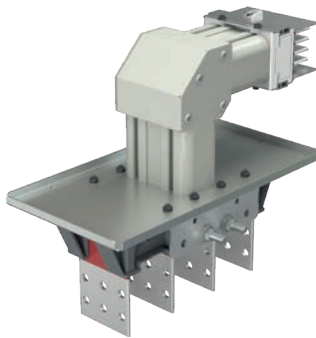
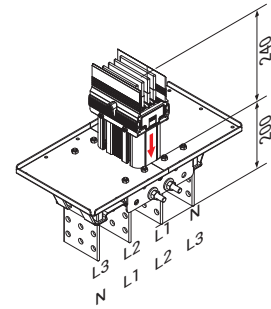
Sample Order:  
**CCRC 32804 - B - S11**  
3200 A, Copper, Bolt-on,  
IP 68, 4 Conductor





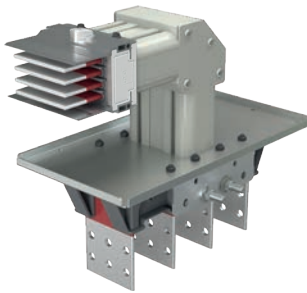
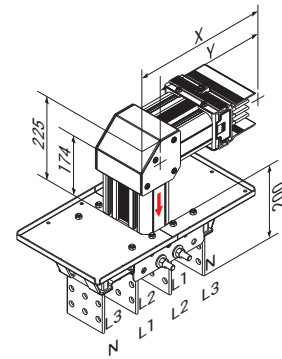
**Panel Connection - P 10**

Sample Order:  
**CCRC 32804 - B - P10**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



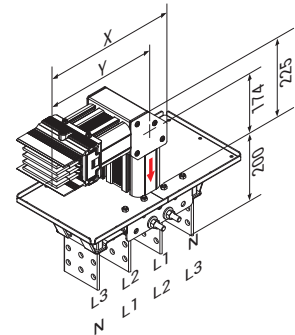
**Upwards Panel Connection - PU 20**

Sample Order:  
**CCRC 32804 - B - PU20**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



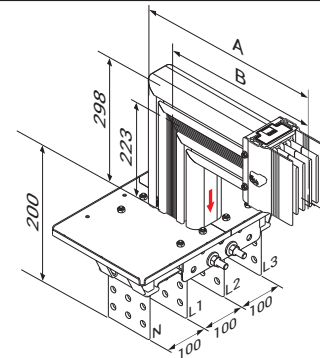
**Downwards Panel Connection - PD 20**

Sample Order:  
**CCRC 32804 - B - PD20**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



**Right Panel Connection - PR 30**

Sample Order:  
**CCRC 32504 - B - PR30**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

■ Dimensions given above are minimum values. ■ Please call us for non-standard components

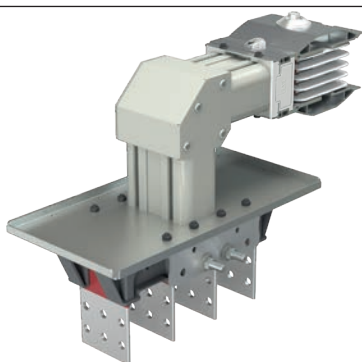
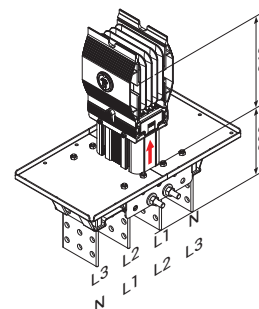
# E-LINE CCR

## ►► Panel Connection



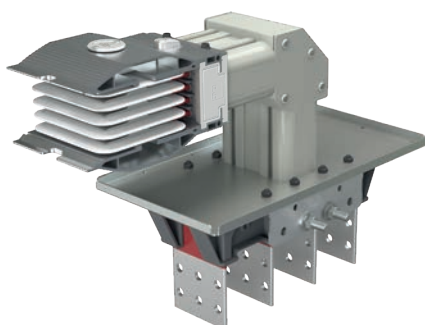
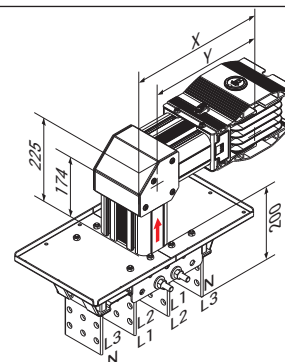
Panel Connection - TR 11

Sample Order:  
**CCRC 32804 - B - TR11**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



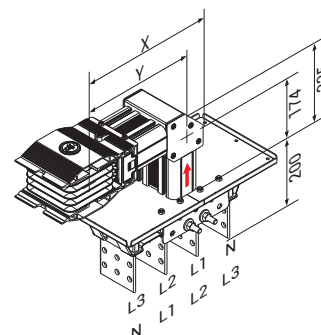
Upwards Panel Connection - TU 21

Sample Order:  
**CCRC 32804 - B - TU21**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



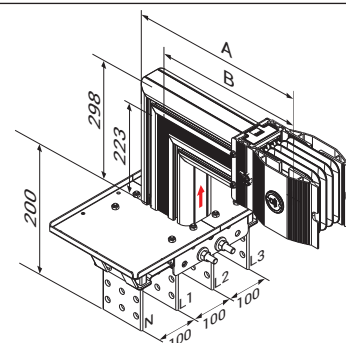
Downwards Panel Connection - TD 21

Sample Order:  
**CCRC 32804 - B - TD21**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



Right Panel Connection - TR 31

Sample Order:  
**CCRC 32504 - B - TR31**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

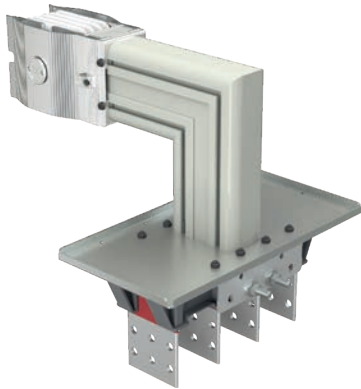
CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

■ Dimensions given above are minimum values. ■ Please call us for non-standard components



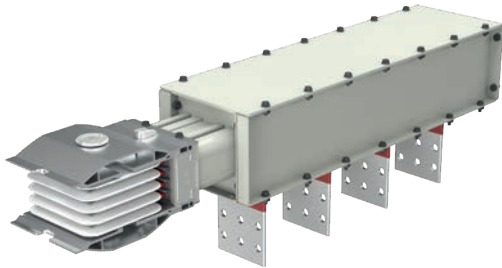
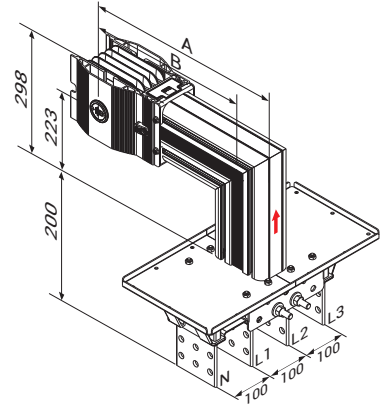
# E-LINE CCR

## ►► Panel Connection



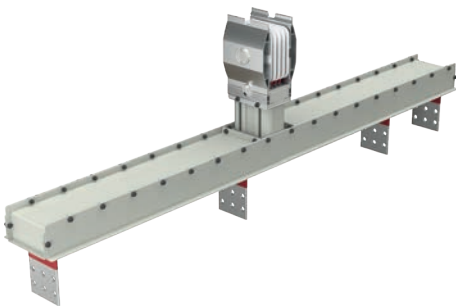
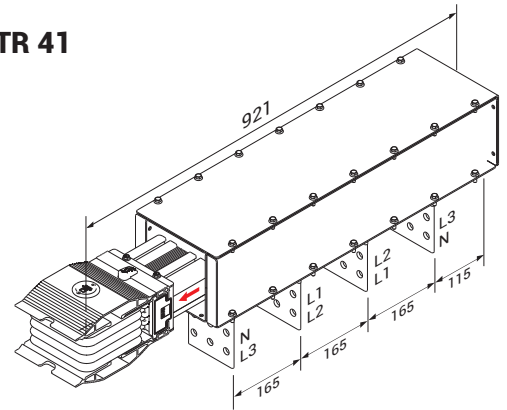
**Left Panel Connection - TL 31**

Sample Order:  
**CCRC 32504 - B - TL31**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



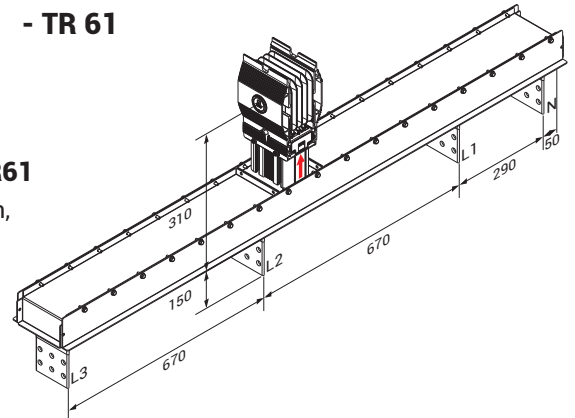
**Panel Connection - TR 41**

Sample Order:  
**CCRC 32504 - B - TR41**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



**Panel Connection - TR 61**

Sample Order:  
**CCRC 32504 - B - TR61**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

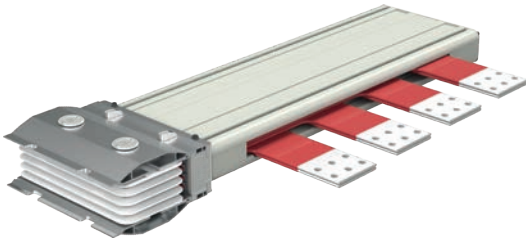
CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

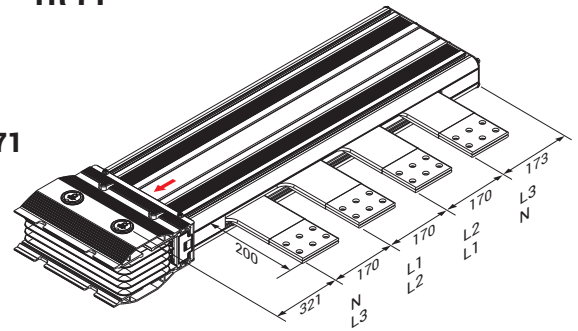
CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

■ Dimensions given above are minimum values. ■ Please call us for non-standard components

### Panel Connection - TR 71



Sample Order:  
**CCRC 32504 - B - TR71**  
 3200 A, Copper, Bolt-on,  
 IP 68, 4 Conductor



### Conductor Dimension Table

CCRC - Cu Conductor	Conductor Number	3	4	4½	5
X	(mm)	342	355	368	368
Y	(mm)	300	304	307	307
H	(mm)	208	220	233	233

### Busbar Section Size Table

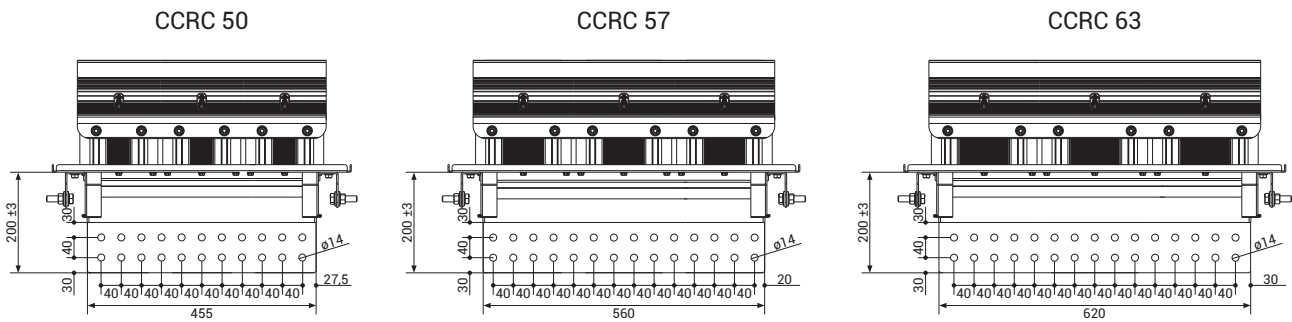
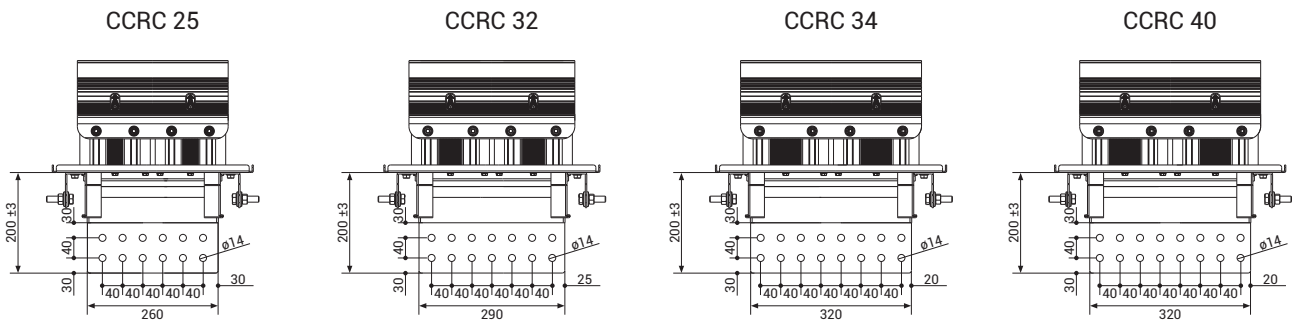
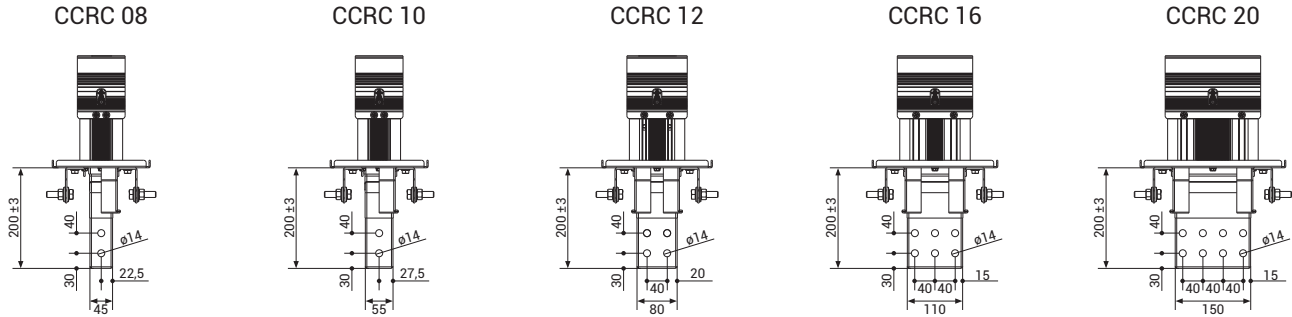
CCRC - Cu Conductor	Rated Current	850	1000	1250	1600	2000	2500	3200	3400	4000	5000	5750	6300
	Busbar code	08	10	12	16	20	25	32	34	40	50	57	63
A	(mm)	330	330	355	385	425	475	535	565	595	730	835	895
B	(mm)	283	283	295	310	330	355	385	400	415	483	535	565

■ Dimensions given above are minimum values. ■ Please call us for non-standard components

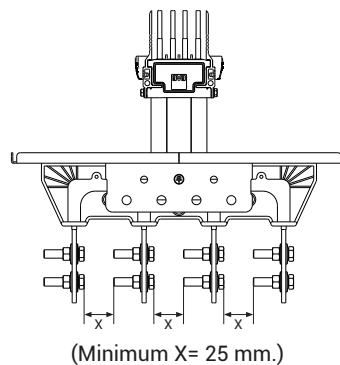


## Board Modules Two-Dimensional Technical Drawings

Board-top modules (P10, TR11, PU20, TU21, PD20, TD21, PR30, TR31, PL30, TL31, P40, TR41, TR61, TR71)



### Sample Connection

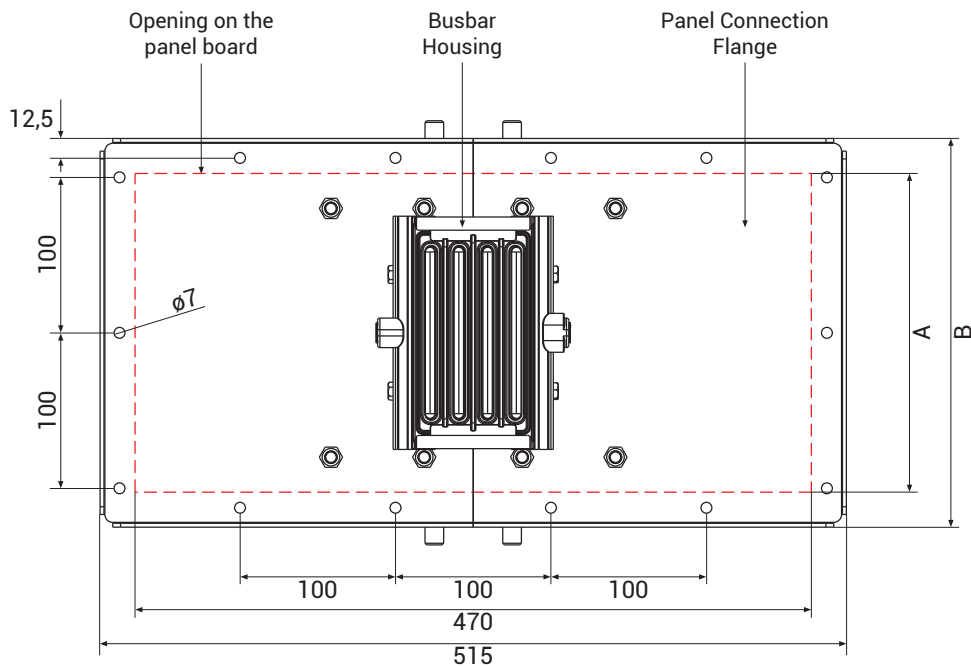
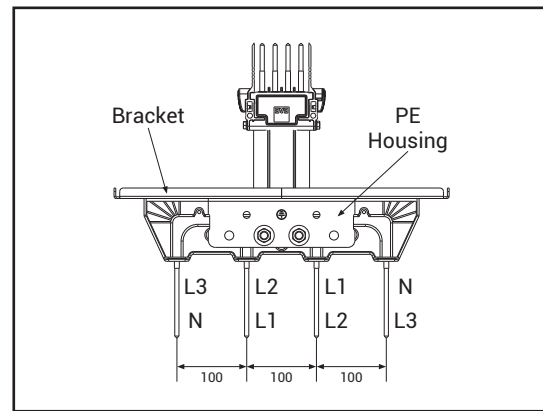
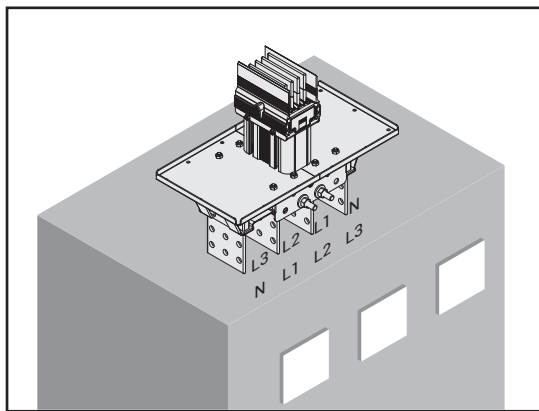


# E-LINE CCR

## ►► Panel Connection

### Flange Dimensions

Panel Connection Units are supplied with suitable flange as standard.



Panel Connection Flange Dimensions Table

Copper (Cu)			*Bolt and nut sets are supplied together with related product as per the quantities below.			
Rated Current	Busbar Code	Conductor	A (mm)	B (mm)	Number of the holes along "B"	* M6 Bolt / Nut Set
850	08	6x45	150	195	2	12
1000	10	6x55	150	195	2	12
1250	12	6x80	175	220	2	12
1600	16	6x110	205	250	3	14
2000	20	6x150	245	290	3	14
2500	25	2(6x80)	295	340	4	16
3200	32	2(6x110)	355	400	4	16
3400	34	2(6x125)	385	430	4	16
4000	40	2(6x140)	415	460	5	18
5000	50	3(6x125)	550	595	6	20
5750	57	3(6x160)	655	700	6	20
6300	63	3(6x180)	715	760	8	20

# E-LINE CCR

## ►► Vertical and Horizontal CCR Applications

Figure 1 - Edgewise Position

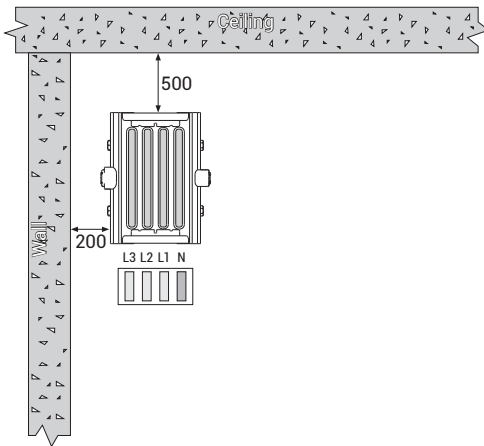
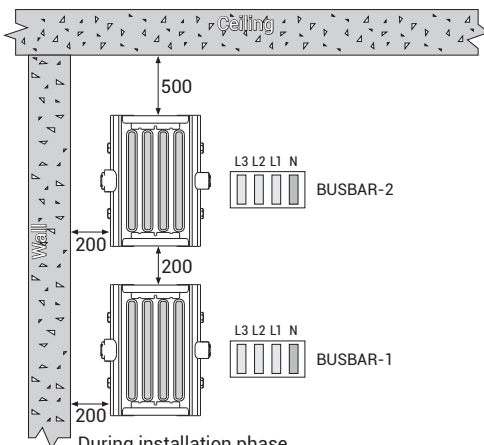
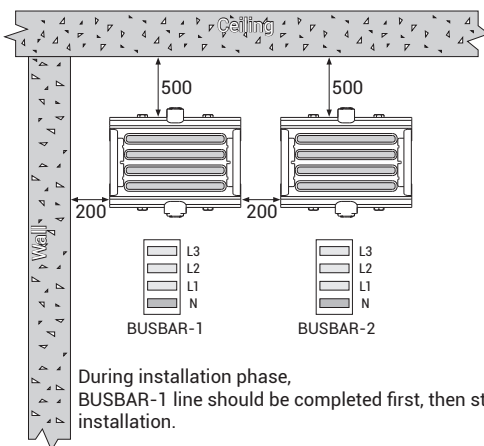


Figure 2 - Edgewise Position



During installation phase, BUSBAR-1 line should be completed first, then start BUSBAR-2 line installation.

Figure 3 - Flatwise Position



During installation phase, BUSBAR-1 line should be completed first, then start BUSBAR-2 line installation.

Figure 4 - Crossing Under A Beam Vertical Position

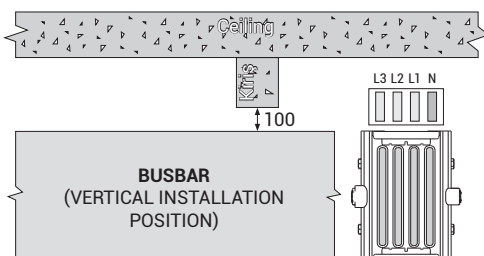


Figure 5 - Crossing Under A Beam Horizontal Position

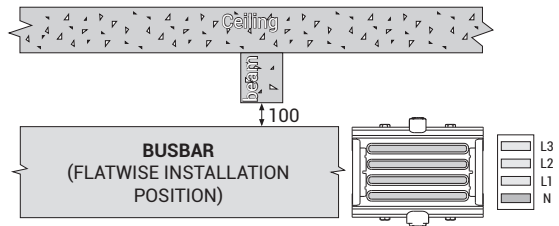


Figure 6 - Sample Wall Crossing With Fire Barrier

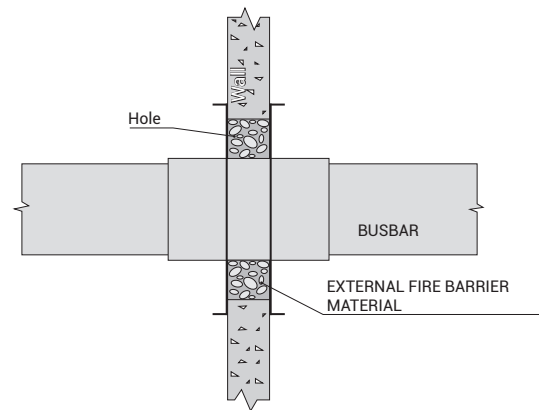
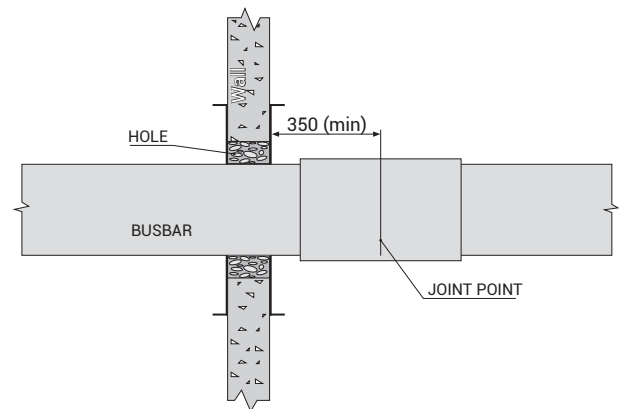


Figure 7 - Standard Wall Crossing



### Attention!

- In order to perform installation, busbar's distance to the ceiling should be at least 500mm.
- Make sure there are no adjunct points between beams.
- Dimensions given above are minimum values.
- All dimensions are stated in "mm".

# E-LINE CCR

## ▶▶ Measuring Gap Distance

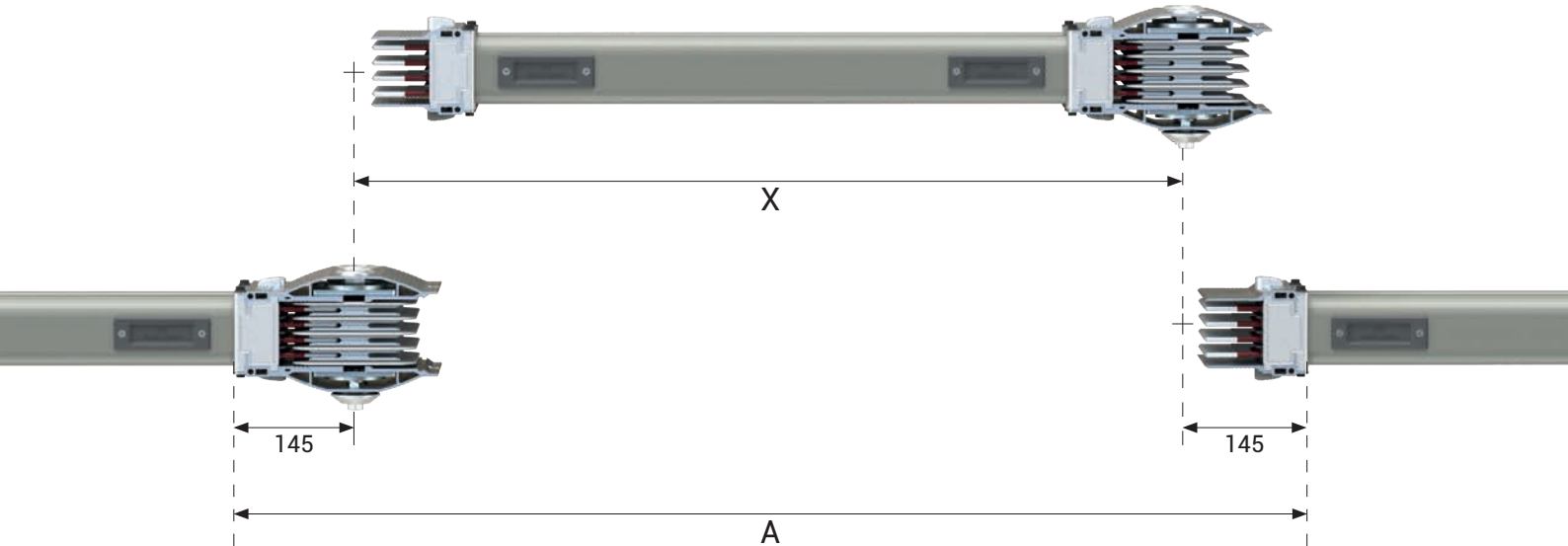


After installation of standard busbar 3m lengths, you will be in need of special lengths which are smaller than 3m. The minimum length for these special elements can be 450 mm. Please measure the lengths of these modules as shown below.

Length A is measured between housing of 2 busbars in cm. A. The special length is calculated by deducting 25 cm from this measured length. (The busbar module will be manufactured as per X value.)

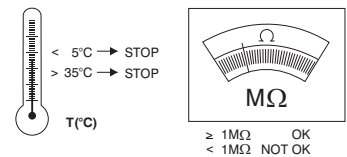
$$X = A - 290\text{mm}$$

X = Length of Special Busbar



## ▶▶ Preparation of Joint Resin 4

The meger test must be carried out before casting. If Resin 4 (A) and Resin 4 (B) are stored in a cold environment, they should be kept in a warm environment one day before casting ( $> 20^{\circ}\text{C}$ ). Ambient temperature during casting should be  $5^{\circ}\text{C} < T_{\text{casting}} < 40^{\circ}\text{C}$ .



### Preparation of Resin 4



### Amount of Resin to be Used

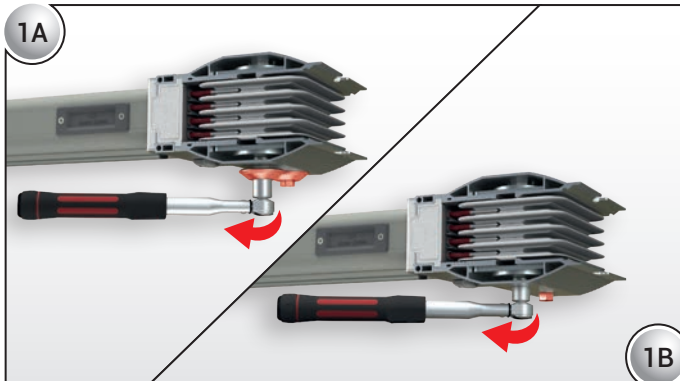
Copper (Cu)			
Rated Current	Busbar Code	Conductor Sections	4 Conductors (kg)
850	08	6x45	1,4
1000	10	6x55	1,4
1250	12	6x80	1,6
1600	16	6x110	1,8
2000	20	6x150	2,0
2500	25	2(6x80)	2,7
3200	32	2(6x110)	3,2
3400	34	2(6x125)	3,5
4000	40	2(6x140)	3,7
5000	50	3(6x125)	4,8
5750	57	3(6x160)	5,5
6300	63	3(6x180)	6,8

Based on the joint, find the total mixture from the table values on the side.

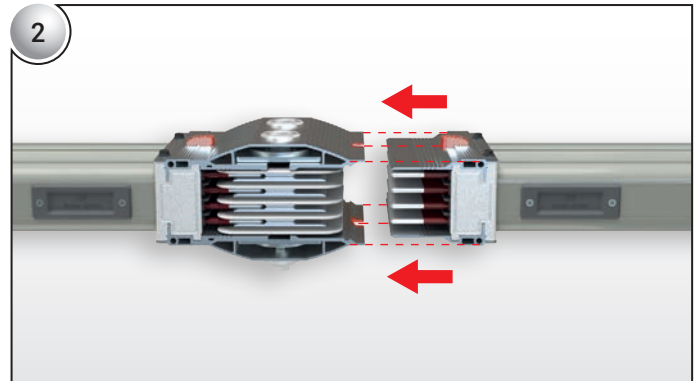
Mix the mixture with a beater at low speed for at least 5 minutes until it is homogeneous.

# E-LINE CCR

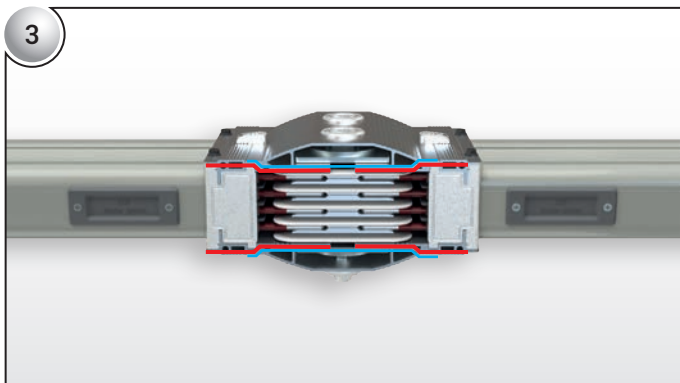
## ►► Installation / Horizontal



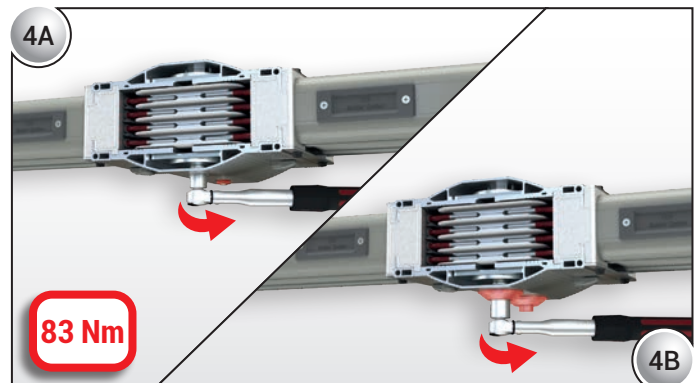
1A  
1B  
First busbar hanging is performed and conformity is controlled from each direction. Adjunct bolts are lightly loosened.



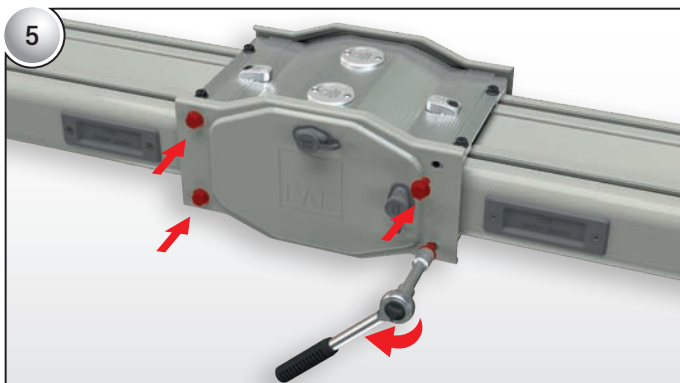
2  
Direction of adjunct busbar and conformity of alignment parts are controlled. Busbar is assembled in a way to overlap small alignment parts.  
**Attention! Make sure that the conductors are dry and clean!**



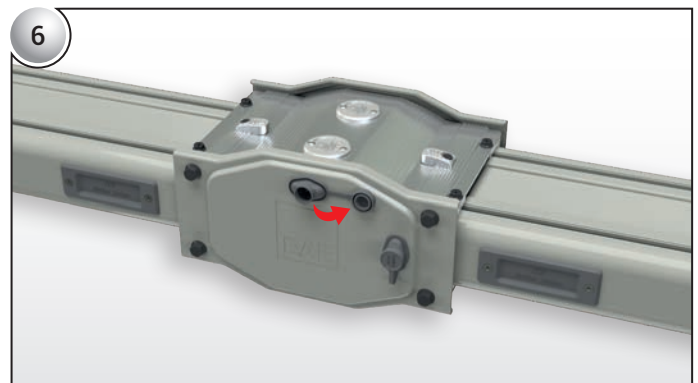
3  
Busbar is approached to alignment slots until it is perfectly seated. Adjunct bolts are tightened after checking alignments.



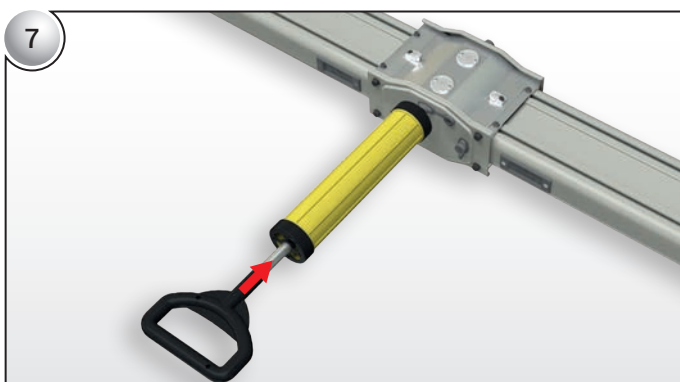
4A  
4B  
83 Nm  
Joint bolts are tightened after checking alignments. Joint covers are placed.



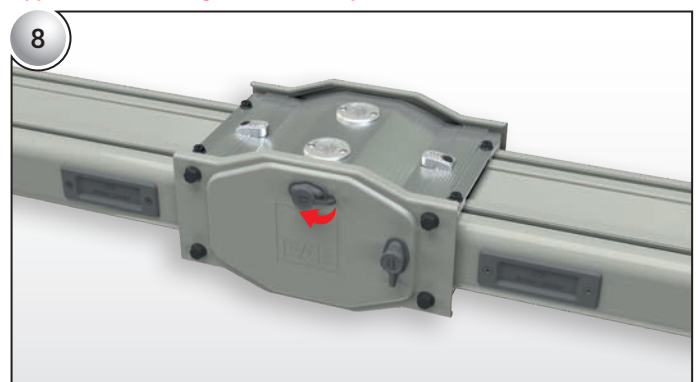
5  
Adjunct lids are placed.



6  
Plastic lid of the pouring area is removed.  
**Attention! Pouring is done through the lid that is positioned on the upper side according to the busbar position direction.**



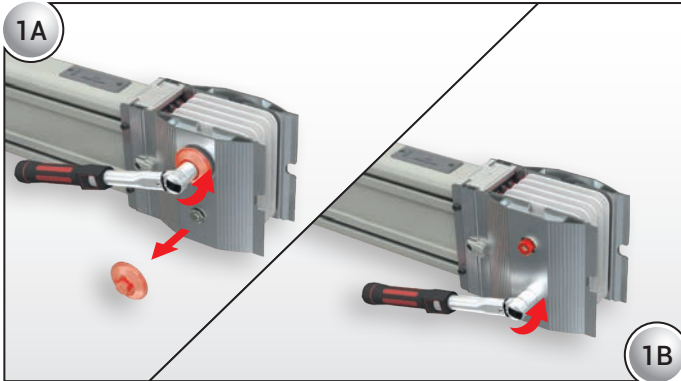
7  
Injection piston is attached to the pouring nozzle in a way to prevent leakage, and "Resin 4" material injected inside the adjunct with the help of the handle.



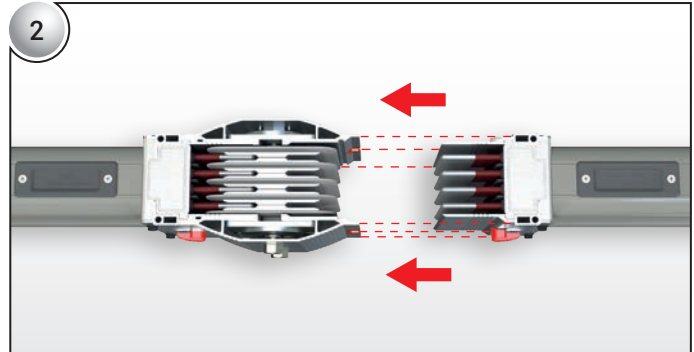
8  
Once the injection is done, plastic lid is placed and installation is completed.

# E-LINE CCR

## ►► Installation / Edgewise

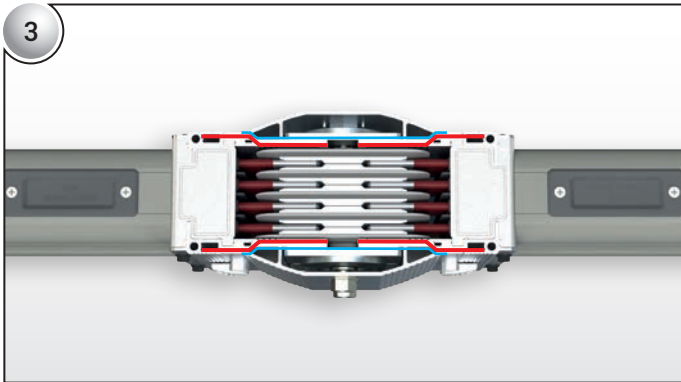


First busbar hanging is performed and conformity is controlled from each direction. Adjunct bolts are lightly loosened after removing the bolt protection lids.

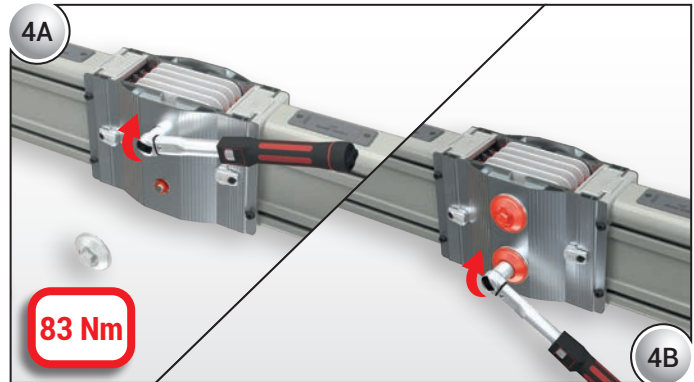


Direction of adjunct busbar and conformity of alignment parts are controlled. Busbar is assembled, aligning big alignment part to big, small part to small.

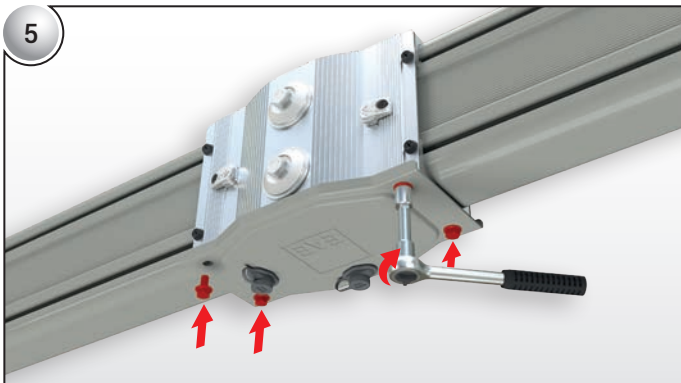
**Attention! Make sure that the conductors are dry and clean!**



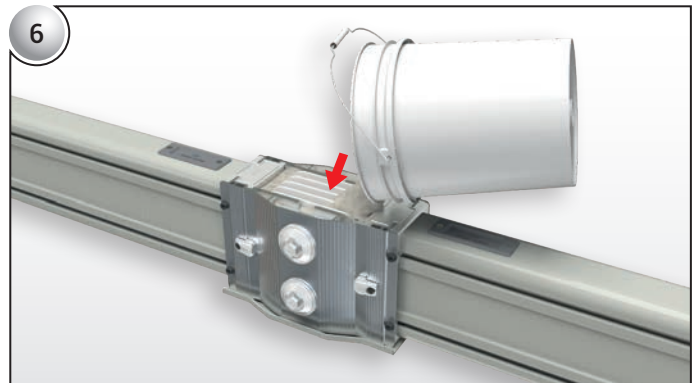
Busbar is approached to alignment sockets until it is perfectly seated.



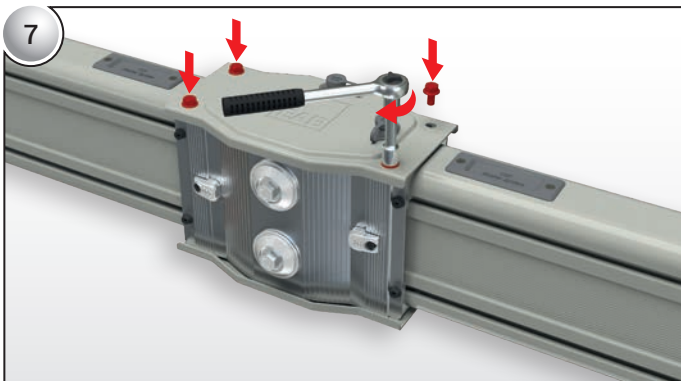
Adjunct bolts are tightened with a moment of 83Nm after checking alignments. Bolt protection lids are attached.



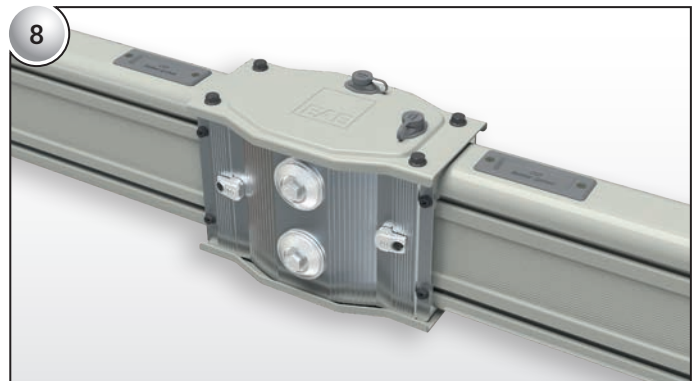
Only the lower lid of the adjunct is attached. Bolts are tightened.



Mixture is poured in a single point over the conductors in the aligned adjunct with the lower-lid capped. It is poured until the maximum level.



Upper adjunct lid is attached. Bolts are tightened.

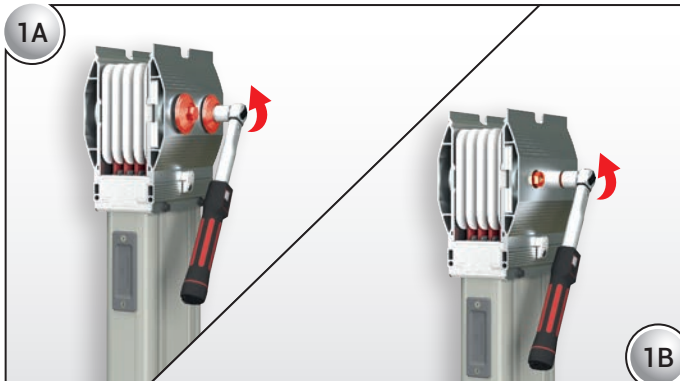


Assembly is completed and left to dry.

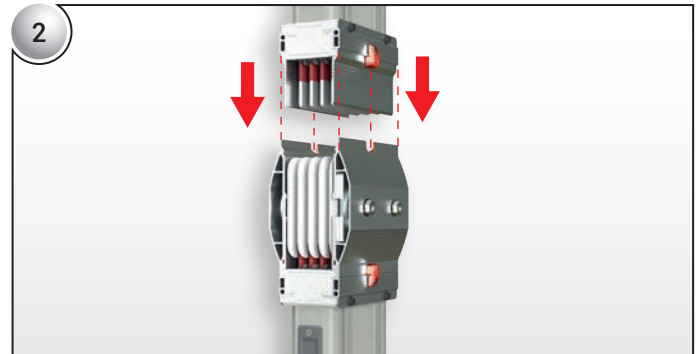
**Note : Megger test may not be performed for 24 hours.**

# E-LINE CCR

## ►► Installation / Vertical

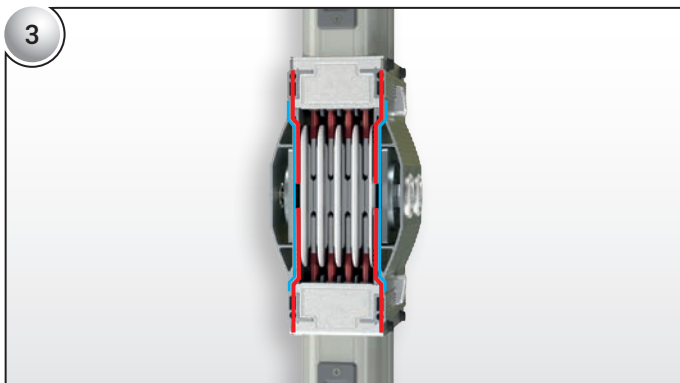


First busbar hanging is performed and conformity is controlled from each direction. Adjunct bolts are lightly loosened after removing the bolt protection lids.

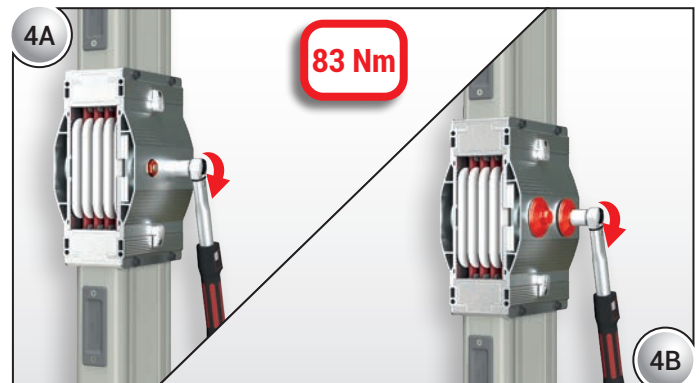


Direction of adjunct busbar and conformity of alignment parts are controlled. Busbar is assembled, aligning big alignment part to big, small part to small.

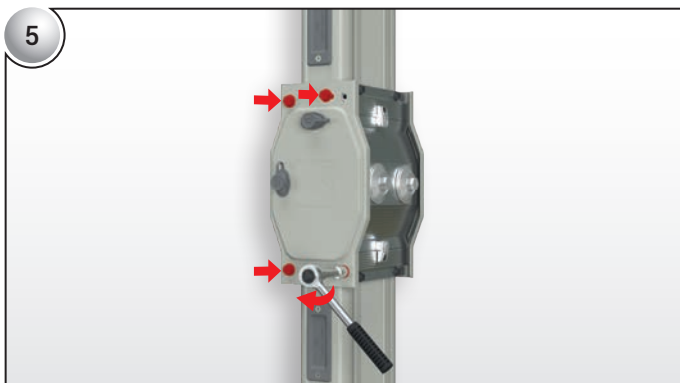
**Attention! Make sure that the conductors are dry and clean!**



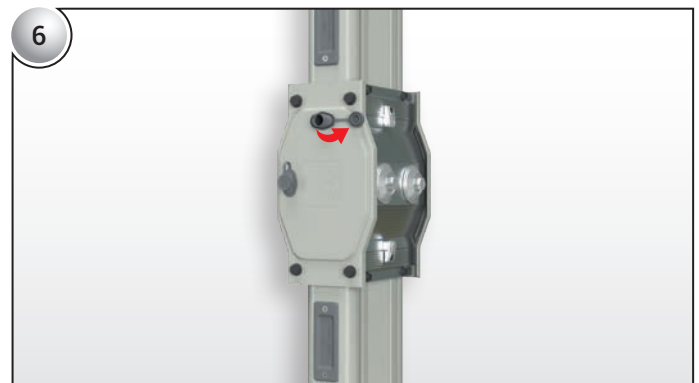
Busbar is approached to alignment sockets until it is perfectly seated.



Adjunct bolts are tightened with a moment of 83Nm after checking alignments. Bolt protection lids are attached.

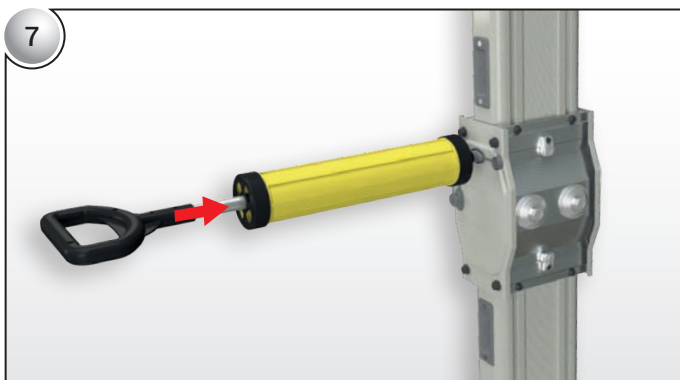


Adjunct lids are placed. Bolts are tightened.



Plastic lid of the pouring area is removed.

**Attention! Pouring is done through the lid that is positioned on the upper side according to the busbar position direction.**



Injection piston is attached to the pouring nozzle in a way to prevent leakage, and "Resin 4" material injected inside the adjunct with the help of the handle.



Once the injection is done, plastic lid is placed and installation is completed.

## CE DECLARATION OF CONFORMITY

**Product Group** E-Line CCR Busbar Energy Distribution System

**Manufacturer** EAE Elektrik Asansor End. Insaat San. ve Tic. A.S.  
Akcaburgaz Mahallesi, 3114. Sokak,  
No:10 34522 Esenyurt-Istanbul

The objects of the declaration described below is in conformity with the relevant Union harmonisation legislation. This declaration of conformity is issued under the sole responsibility of the manufacturer.

**Standard:**

**EN 61439-6**

Low-voltage switchgear and controlgear assemblies - Part 6: Busbar trunking systems (busways)

**CE - Directive:**

2014/35/EU "The Low Voltage Directive"

2014/30/EU "Electromagnetic Compatibility (EMC) Directive"

2011/65/EU "Restriction of the use of certain hazardous substances (RoHS)"

**Technical Document Preparation Official::**

EAE Elektrik Asansor End. Insaat San. ve Tic. A.S.  
Akcaburgaz Mahallesi, 3114. Sokak, No:10 34522 Esenyurt-Istanbul

Emre GÜRLEYEN

**Date**

20.04.2016

**Document Authorized Signatory**

Elif Gamze KAYA OK  
Deputy General Manager





# E-LINE CCR

## Certificate



### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

### EX ENERGY PETROLIUM INSTITUTE

EX Energy Petroleum Institute  
F.C. Type Examination Certificate

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

For the product: Low-voltage busbar trunking system

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

Requirements: IEC 61439-6: 2012; Clauses: 10.2.3, 10.2.6, 10.2.7, 10.2.101, 10.3, 10.4, 10.5, 10.9, 10.10, 10.11 and Annex BB, CC, and DD

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

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DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

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F.S. Strikwerda  
Certification Manager

### TEST CERTIFICATE

DEKRA Certification B.V.  
F.S. Strikwerda  
Certification Manager

**ПромМаш Тест**  
PROMMASH TEST LIMITED COMPANY  
Test Center  
Address: Plot of territory of village 22222, Moscow, Otkrytiy Road, Apt 34, Office 202  
(125040, Moscow, Russia, registration 50:0500000000)

Low Voltage Equipment Test Laboratory  
Address: where the accreditation is granted: 14200 Moscow, Otkrytiy Road, Office 202, Otkrytiy Road, Apt 3  
(142000, Moscow, Russia, registration 50:0500000000)

28/HLVOK issue number and dated 28.11.2019  
TEST REPORT

DEKRA Certification B.V.

F.S. Strikwerda  
Certification Manager

this certificate and adjoining reports is allowed



DEKRA Certification B.V. Utrechtseweg 310, 6812 AR Arnhem P.O. Box 5185, 6802 ED Arnhem, The Netherlands  
T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com Company registration 09085396

### 850A...6300A COMPACT BUSBAR PRODUCT OVERVIEW (E-LINE CCR)

#### 1- Standards & Certification:

-Standards & Documentation:

-Busbar system shall be designed and manufactured as per IEC 61439-6 standard, which requires below listed tests. Each busbar rating shall have a separate type test certificate from an independent internationally accredited laboratory including below tests:

#### 2- General Structure of the System

-Busbar system should be in low impedance in line with the features below. Should be attained by placement of tin-covered conductors inside the material in a way that there is no air gap.

#### 2.1- Electrical Characteristics

-Busbars nominal insulation voltage shall be 1000 V.

-As per ampere rates, minimum short circuit values shall be as given below;

##### *For Copper conductors;*

850A : 1 sec/rms 23kA, peak 48.3kA

1000A : 1 sec/rms 50kA, peak 105kA

1250-1600-2000A: 1 sec/rms 80kA, peak 176kA

2500A and more : 1 sec/rms 90kA, peak 210.5kA

#### 2.2- Housing

-Body of busbar ducts should be produced with a specially-developed cast material.

-Busbar duct structure should be in a way that the entire surface contains tin-covered conductors with specific intervals within the body.

-Multi-channel busbars should be combined as a single body that cannot be separated.

-Down-up, right-left rotation parts, "T" and offset parts, board, transformer and cable connection parts, ending, horizontal and vertical expansion parts should be included in the busbar duct system as standard. Special modules and midsize busbar ducts that may be required during project application should be available to be produced in short notice in line with standard specifications and technique

-If busbar lines are crossing over a building dilation point, horizontal dilation parts definitely must be used in crossing points. Additionally, in horizontal lines, dilation parts should be used in every 40m.

#### 2.3- Conductors and Phase Configuration

-Busbar duct system should be with copper conductor between 850-6300A.]

-Busbar duct system should be in conductor number and phase configuration as given below.

- a) With 3 Conductors
- b) With 4 Conductors
- c) With 4 ½ Conductors
- d) With 5 Conductors

-Phase conductors and neutral conductor shall have the same cross-section and they shall be insulated.

-Copper conductors shall be minimum 99,95% electrolytic copper. Minimum conductivity shall be 56m/mm<sup>2</sup>. Entire surface of electrolyte copper conductors must be covered with tin.

#### 2.4- Isolation Structure

-Bars with high conductivity should be isolated with a mixture of specially selected sand, calcite, and epoxy resin. This material should be appropriate for temperature changes and thermal expansions. High protection against external impacts should be provided.

#### 2.5- Modular Adjunct Structure

-Busbar duct adjunct point should be assembled by placing drawer type modular block adjunct system and bar conductors on the conductor sockets within the block adjunct set. Block adjunct structure isolators should be high resistant CTP. Adjunct point center bolt should be tightened after installation using a torque wrench with a moment of 83 Nm (60lbft).

#### 2.6- Protection Grade

-Busbar ducts should be in IP68 protection grade.

#### 3- Installation and Commissioning

-Busbar systems shall be installed as per Single-Line drawings respect to required ampere rates and manufacturer installation guide (torque values, lockers, etc.). Electrical installer shall run an insulation test after installation according to manufacturers test procedures. The results of the test shall be reported to the manufacturer. Minimum insulation value shall be 1 Mohm.

# E-LINE CCR

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Component List		Quantity
Item	Component	
Company :		Prepared by
Project :		
Project No :		
Name :		Date :
		Signature :

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# E-LINE CCR

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# PRODUCT TYPES

## BUSBAR ENERGY DISTRIBUTION SYSTEMS



## CABLE TRAYS



## TROLLEY BUSWAY ENERGY DISTRIBUTION SYSTEMS



## INDOOR SOLUTIONS



## SUPPORT SYSTEMS



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**EAE Elektrik A.S.**  
**Head Office**

Akcaburgaz Mahallesi,  
3114. Sokak, No:10 34522  
Esenyurt - Istanbul - TURKEY  
Tel: +90 (212) 866 20 00  
Fax: +90 (212) 886 24 20

**EAE DL 3 Factory**  
**Busbar**

Makine Ihtisas Organize Sanayi  
Bolgesi Mahallesi, 6. Cadde,  
8. Sokak, No:6 41455  
Dilovası - Kocaeli - TURKEY  
Tel: +90 (262) 502 05 65  
Fax: +90 (262) 502 05 70

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