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E-LINE KL

Busbar Distribution Systems 160A...1250A



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E-LINE KL

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E-LINE KL

▶▶Introduction

E-Line KL panelized busbar system is used as a horizontal or vertical electricity distribution line between 160-1250A, wherever energy distribution is required.

E-Line KL busbar ensures energy distribution for 3P+N or 3P+N+PE systems.

The system offers modern and practical solutions for constructions with varying tap off needs, such as rapidly developing manufacturing sectors (automotive, textile, furniture), exhibition halls, business centres, hotels, hospitals, warehouses and high-rise buildings.

• Ease of Planning

It is possible to prepare the project with approximate machine location and line, without having to finalize machine layout.

• Quick and Easy Installation

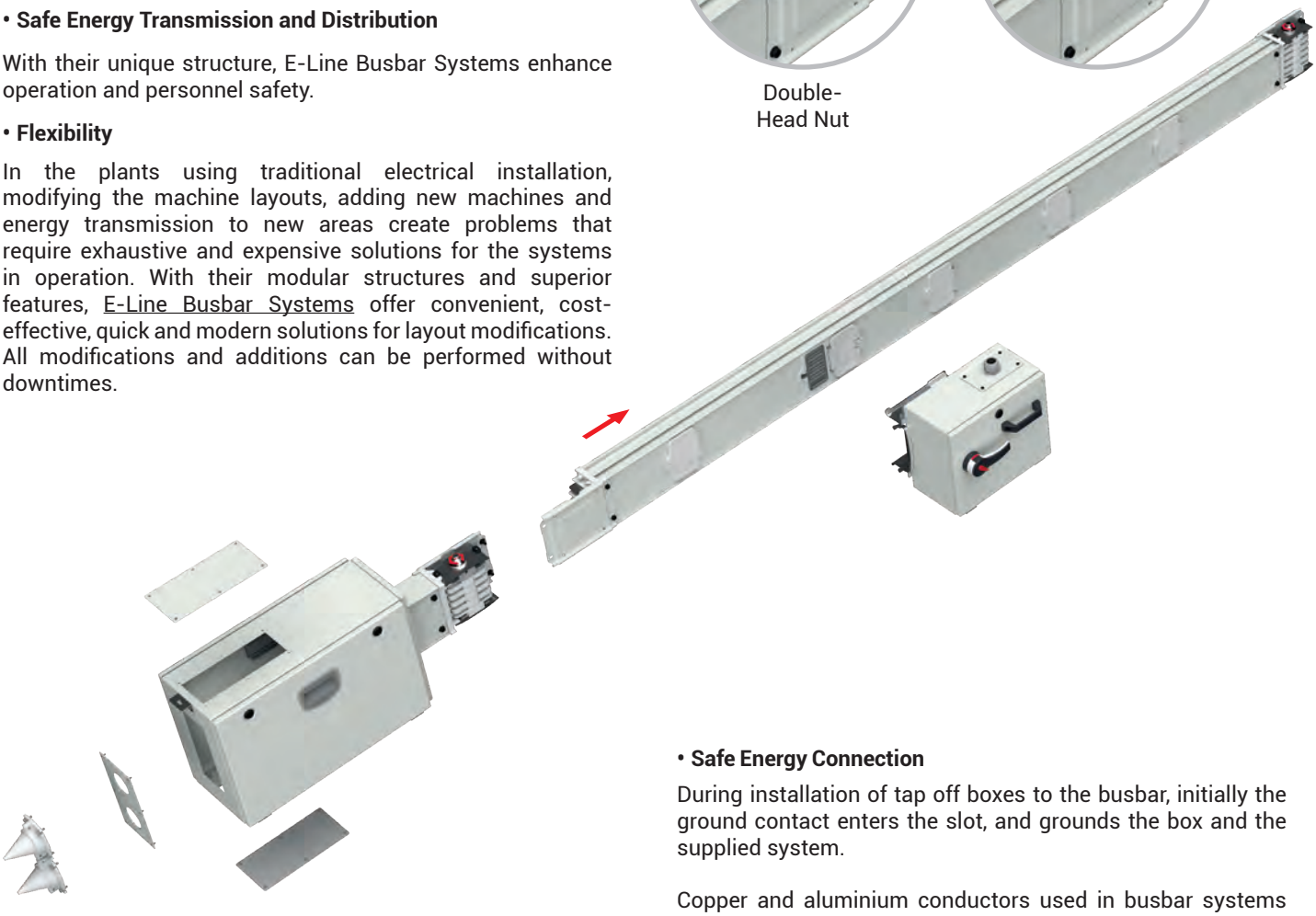
With E-Line Busbar Systems, it is possible to quickly energize the machines. No special expertise is required for installation of products. All accessories required for the structure and shape of the installation site can be conveniently mounted to ceilings and walls. **"Quick and Easy installation"** system allows fast commissioning.

• Safe Energy Transmission and Distribution

With their unique structure, E-Line Busbar Systems enhance operation and personnel safety.

• Flexibility

In the plants using traditional electrical installation, modifying the machine layouts, adding new machines and energy transmission to new areas create problems that require exhaustive and expensive solutions for the systems in operation. With their modular structures and superior features, E-Line Busbar Systems offer convenient, cost-effective, quick and modern solutions for layout modifications. All modifications and additions can be performed without downtimes.



• Long Service Life

E-Line Busbar Systems are maintenance-free. Each part of systems is modular and can be easily removed & installed. If required, the system can be completely moved to another location.

• Modern Appearance

E-Line Busbar Systems not only ensure functional use but also offer a modern appearance.

• Cost-Effective

Eliminates the need for cable ducts and cable installation labour, minimizes the dimensions of main - secondary panels, and drastically reduces total installation costs.

• Tap Off Points

Power can only be provided with E-Line KL tap off boxes. Protection covers of power sockets prevent direct contact and protects the system against foreign material intrusion.



Double-
Head Nut

• Safe Energy Connection

During installation of tap off boxes to the busbar, initially the ground contact enters the slot, and grounds the box and the supplied system.

Copper and aluminium conductors used in busbar systems are fully coated with tin.

In standard practice, the neutral line conductor is produced with the same cross-section as the phase conductors.

If needed, an additional 5th ground conductor can be provided. Ground conductor's cross section is equal to or half of the cross section of phase conductors.

• **Special Block Adjunct**

With its single-bolt adjunct construction, ensures quick and safe installation. With the belleville washers, provides a stable contact pressure in all heat conditions.

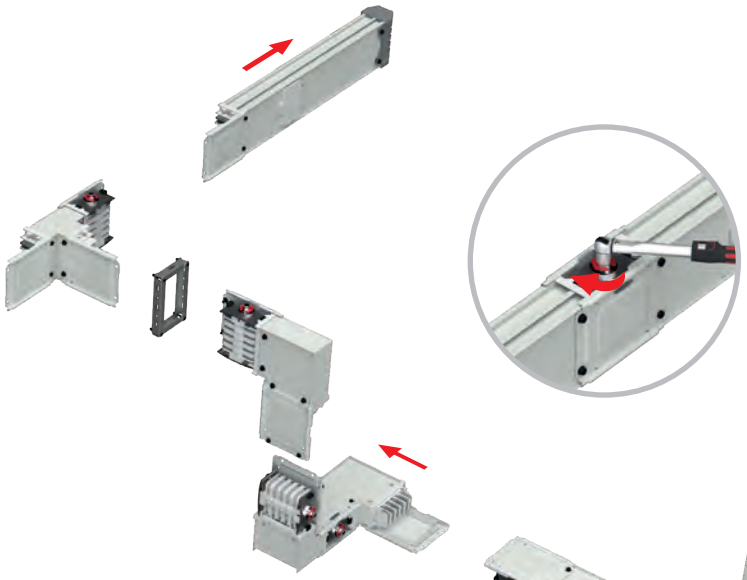
• **Tap Off Boxes**

It is possible to receive current up to 400 A with tap off boxes. Standard tap off boxes have an interlocking mechanism that prevents the cover from being opened without cutting the power off.

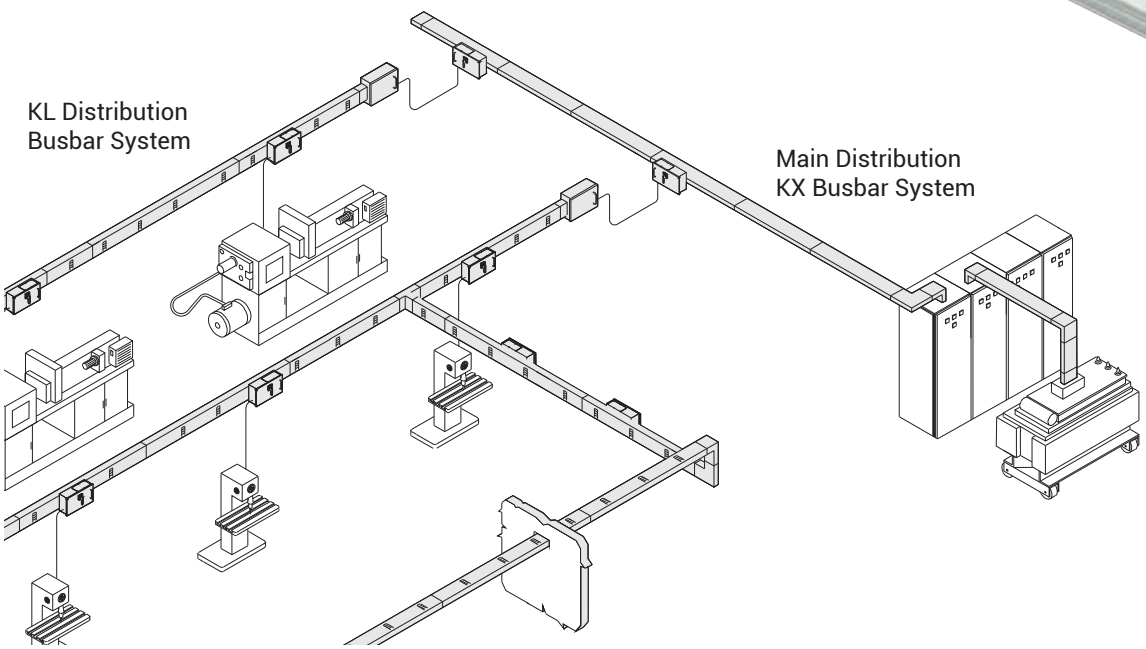
The tap off boxes can be easily and safely mounted without requiring any further components. In tap off boxes with metal body, the special safety screw of box connection system can be tightened by hand, and secured to the busbar easily.

Standard tap off boxes with fuse load breaker are designed to prevent being mechanically removed from the busbar without de-energizing the box.

CONDUCTOR CROSS SECTION GROUP		
Al Current	Cu Current	Torque (Nm)
160	250	**40**
250	315	
315	400	
400	500	
500	630	**55**
-	800	
630	-	
800	1000	**83**
1000	1250	







E-LINE KL

▶▶Design & Project

The criteria to be taken into consideration in designing E-Line KL Electricity Distribution System...

- Forces and approximate locations of loads to be connected on the system,
- Concurrence (Diversity) investigation,
- Forces and short-circuit currents of transformers,
- Coordination with other distribution systems and mechanical installations (heat, steam, water, etc.),
- Creation of routing plan for the system designed on the project,
- Designation of hanger types according to plan,
- Integration of the system with E-Line KX and E-Line MK-KAP busbar, if necessary.

Current Value

The current value of E-Line KL to be used is selected based on the diversity factor, power of loads and voltage drop.

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

I_B = *Busbar current (A)*
P = *Total power of loads (W)*
α = *Concurrence factor (Diversity)*
U = *Supply voltage*

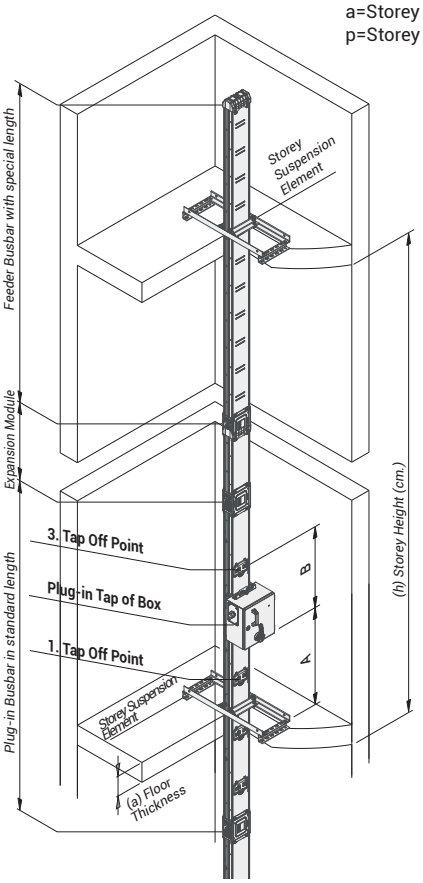
- Firstly, a KL level equal to or higher than the IB in the formula above is chosen.
- Voltage drop is calculated according to the selected **E-Line KL** type. If it is not suitable, the next bigger cross section is selected.

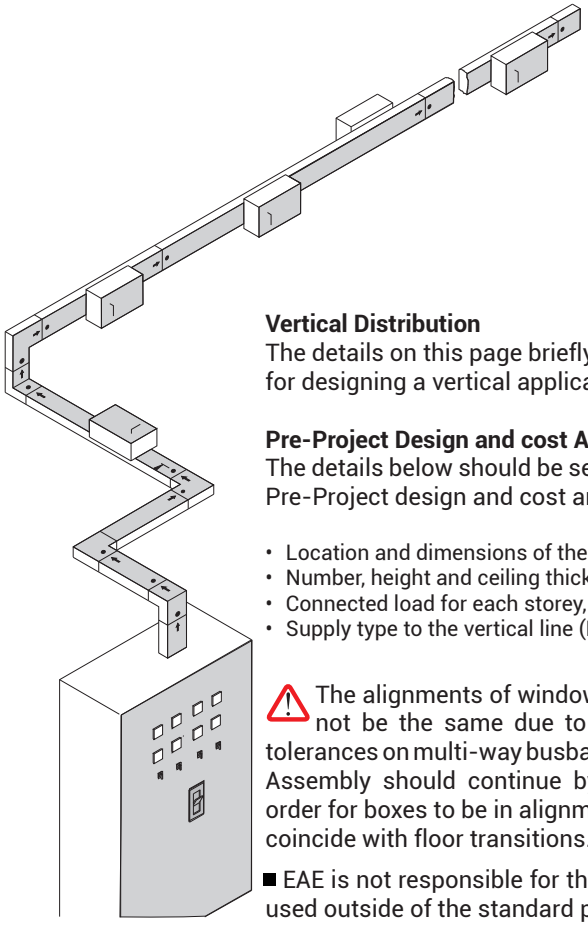
Selection of Concurrence Factor

Concurrence factor (diversity) (a) is dependant on supplied loads' type and quantity. In general it is equal to or lower than "0.7". In lines with heavy lighting and where an engine is supplied, it is quite difficult to go beyond "0.6". It may drop down to "0.05" in welding facilities of automotive factories. In lines where only a single and large loaded is supplied, it may be "1".

Applications

Horizontal and vertical applications of E-Line KL busbar systems require special project preparation due to different architectural structures of buildings.





Vertical Distribution

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

Pre-Project Design and cost Analysis

The details below should be sent to our Project and Design Department for Pre-Project design and cost analysis.

- Location and dimensions of the shaft where busbar will be installed,
- Number, height and ceiling thickness of each storey, (h=)
- Connected load for each storey, (a=)
- Supply type to the vertical line (Busbar or Cable). (p=)

⚠ The alignments of windows or adjunction points on upper floors may not be the same due to floor heights, slab thickness and product tolerances on multi-way busbars in the high-rise vertical shaft applications. Assembly should continue by making measurements on each floor in order for boxes to be in alignment and in order for adjunction points not to coincide with floor transitions.

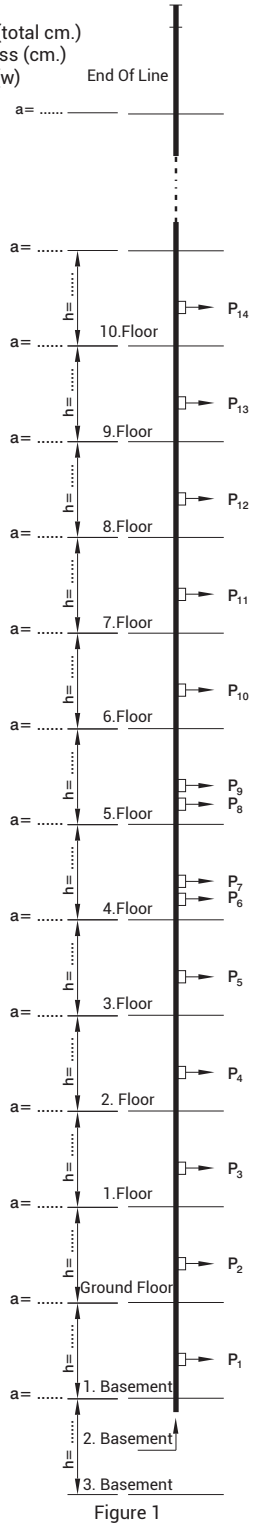
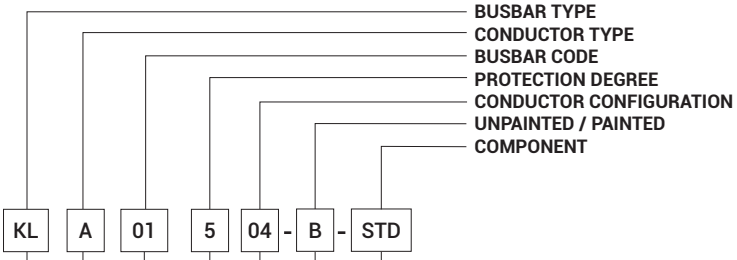


Figure 1

■ EAE is not responsible for the potential risks that may occur in cases where the products in our catalogue are used outside of the standard phase sequences as shown in the catalogue.

E-LINE KL

▶▶Order Code System



Busbar Type

Aluminium	A
Copper	C

Conductor Type

Busbar Rated Current		Busbar Code	Cross-Section
Aluminium	160	01	4,5x16
	250	02	4,5x23
	315	03	6x30
	400	04	6x40
	500	05	6x55
	630	06	6x80
	800	08	6x110
	1000	10	6x125
Copper	250	02	4,5x16
	315	03	4,5x23
	400	04	6x30
	500	05	6x40
	630	06	6x55
	800	08	6x70
	1000	10	6x110
	1250	12	6x125

Busbar Code

IP 55	5

Protection Degree

Components

Plug-in Standard Length	STD
Plug-in Special Length	X
Feeder Standard Length	FTD
Feeder Special Length	FX
Right Elbow	R
Left Elbow	L
Downwards Elbow	D
Upwards Elbow	U
Right Upwards Combined	KRU
Left Upwards Combined	KLU
Right Downwards Combined	KRD
Left Downwards Combined	KLD
Upwards Right Combined	KUR
Upwards Left Combined	KUL
Downwards Right Combined	KDR
Downwards Left Combined	KDL
Upwards Vertical Offset	UV
Downwards Vertical Offset	DV
Right Horizontal Offset	RH
Left Horizontal Offset	LH
"T" Component	T
Cross	DD
Reductions	RD
End Closer	S
Horizontal Expansion	YDT
Vertical Expansion	DDT
Flexible	FDM
Feeder Box 1	B1
Feeder Box 2	B2
Central Feeder Box 1	BO1
Central Feeder Box 2	BO2
Panel Connections	P10
Panel Connections	P11

Conductor Configuration

Number of Conductors	Code	Configuration								
		L1	L2	L3	N	PE	½ PE	CPE	½ CPE	PE (Housing)
4 Conductors	04	✓	✓	✓	✓					✓
5 conductors	05	✓	✓	✓	✓	✓				✓
5 conductors (CPE)	09	✓	✓	✓	✓			✓		✓

Paint

UNPAINTED	-
PAINTED	B

E-LINE KL

▶▶Technical Characteristics

Rated Current	In	A	Aluminium Conductor (KLA)					
			160	250	315	400	500	630
Busbar Code			01	02	03	04	05	06
Standards			IEC 61439-6, TS EN 61439-6, IEC 61439-1, TS EN 61439-1					
Rated Insulation Voltage	Ui	V	1000					
Max. Rated Operational Voltage	Ue	V	1000					
Rated Frequency	f	Hz	50					
Pollution Degree	3							
Protection Degree	IP	55						
External Mechanical Impacts (IK Code)	Plug-in Busbar IK09							
Protection for Safety	Basic protection (HD 60364-4-41, clause A1)							
Rated Short-time Withstand Current (1s)	I_{pk}	$kA_{(rms)}$	10	10	15	15	25	35
Rated Peak Withstand Current	I_{cw}	kA	17	17	30	30	52,5	73,5
Rated Short-time withstand Current (N) (1s)	I_{pk}	kA	6	6	9	9	15	21
Rated Peak Withstand Current (N)	I_{cw}	kA	10,2	10,2	15,3	15,3	30	44,1
Rated Short-time withstand Current (PE) (1s)	I_{pk}	kA	6	6	9	9	15	21
Rated Peak Withstand Current (PE)	I_{cw}	kA	10,2	10,2	15,3	15,3	30	44,1
MEAN PHASE CONDUCTOR CHARACTERISTICS AT RATED CURRENT I_n								
Resistance at a conductor temperature of 20 °C	R_{20}	mΩ/m	0,389	0,269	0,157	0,119	0,087	0,058
Resistance at an ambient air temperature of 35 °C	R	mΩ/m	0,480	0,364	0,207	0,160	0,117	0,079
Reactance (Independent from Temperature)	X	mΩ/m	0,141	0,127	0,106	0,092	0,077	0,059
Positive and negative sequence impedances at an ambient air temperature of 35 °C	Z	mΩ/m	0,500	0,385	0,233	0,185	0,140	0,098
Positive and negative sequence impedances at a conductor temperature of 20 °C	Z_{20}	mΩ/m	0,413	0,298	0,189	0,150	0,116	0,082
Rated Power Loss at 35 °C		mΩ/m	36,9	68,3	61,6	76,8	87,8	94,1
DC Resistance at a conductor temperature of 20 °C for Phases	R/ort_{Ph}	mΩ/m	0,374	0,260	0,155	0,116	0,083	0,055
DC Resistance at a conductor temperature of 20 °C for Neutral	R_N	mΩ/m	0,374	0,259	0,154	0,116	0,083	0,056
DC Resistance at a conductor temperature of 20 °C for PE	R_{PE}	mΩ/m	0,287	0,277	0,275	0,275	0,257	0,245
SECTIONS								
L1,L2,L3,N		mm²	72	104	180	240	330	480
PE (4 ½ Conductors)		mm²	36	52	90	120	165	240
PE (5 Conductors)		mm²	72	104	180	240	330	480
Housing Section (Sheet Metal)		mm²	249,6	255,2	260,8	268,8	280,8	300,8
Conductor Dimensions		mmxmm	4.5x16	4.5x23	6x30	6x40	6x55	6x80
Busbar Weight (5 Conductors)(1)		kg/m	5,7	6,8	8	8,3	10	12,5
Busbar Weight (5 Conductors)(1)		kg/m	6	7,25	8,7	9	11	13,75
MEAN FAULT-LOOP CHARACTERISTICS								
Zero-sequence Impedance								
Zero-sequence impedance at a conductor temperature of 20°C	$Z_{(0)\ b20phN}$	mΩ/m	1,773	1,321	0,895	0,728	0,565	0,414
Zero-sequence impedance at a conductor temperature of 20°C	$Z_{(0)\ b20phPE}$	mΩ/m	1,727	1,683	1,594	1,568	1,444	1,324
Zero-sequence impedance at an ambient temperature of 35°C	$Z_{(0)\ bphN}$	mΩ/m	2,117	1,674	1,077	0,878	0,671	0,490
Zero-sequence impedance at an ambient temperature of 35°C	$Z_{(0)\ bphPE}$	mΩ/m	2,061	2,146	1,983	1,973	1,814	1,681
Resistances and Reactances								
Resistance at a conductor temperature of 20 °C	$R_{b20phph}$	mΩ/m	0,762	0,528	0,310	0,236	0,171	0,116
Resistance at a conductor temperature of 20 °C	R_{b20phN}	mΩ/m	0,775	0,543	0,323	0,247	0,179	0,122
Resistance at a conductor temperature of 20 °C	$R_{b20phPE}$	mΩ/m	0,777	0,669	0,561	0,518	0,461	0,411
Resistance at an ambient air temperature of 35 °C	R_{bphph}	mΩ/m	0,941	0,713	0,410	0,318	0,230	0,158
Resistance at an ambient air temperature of 35 °C	R_{bphN}	mΩ/m	0,957	0,733	0,426	0,333	0,241	0,167
Resistance at an ambient air temperature of 35 °C	R_{bphPE}	mΩ/m	0,958	0,903	0,740	0,699	0,621	0,561
Reactance (Independent from temperature)	X_{bphph}	mΩ/m	0,276	0,243	0,206	0,177	0,146	0,113
Reactance (Independent from temperature)	X_{bphN}	mΩ/m	0,365	0,325	0,283	0,249	0,208	0,163
Reactance (Independent from temperature)	X_{bphPE}	mΩ/m	0,351	0,358	0,349	0,344	0,309	0,275

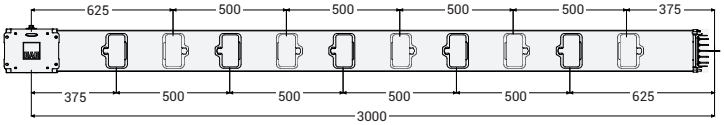
(1) Joint weight is included rated 1/3 of the weight of the joint in the indicated weights per meter.

		Copper Conductor (KLC)							
800	1000	250	315	400	500	630	800	1000	1250
08	10	02	03	04	05	06	08	10	12
35	35	10	15	25	25	35	35	35	35
73,5	73,5	17	30	53	53	74	74	74	74
21	21	6	9	15	15	21	21	21	21
44,1	44,1	10	18	30	30	44	44	44	44
21	21	6	9	15	15	21	21	21	21
44,1	44,1	10	18	30	30	44	44	44	44
0,042	0,038	0,267	0,176	0,097	0,073	0,056	0,042	0,028	0,025
0,057	0,053	0,366	0,238	0,128	0,097	0,076	0,059	0,038	0,035
0,047	0,042	0,149	0,127	0,108	0,094	0,077	0,066	0,046	0,042
0,074	0,068	0,395	0,269	0,167	0,135	0,108	0,088	0,060	0,055
0,063	0,057	0,306	0,217	0,145	0,119	0,095	0,078	0,054	0,049
109,4	159,0	68,6	70,8	61,4	72,8	90,5	113,3	114,0	164,1
0,041	0,036	0,258	0,166	0,094	0,070	0,052	0,040	0,026	0,023
0,042	0,037	0,260	0,165	0..0951	0,069	0,053	0,040	0,026	0,023
0,223	0,215	0,276	0,286	0,274	0,266	0,256	0,258	0,218	0,205
660	750	72	104	180	240	330	420	660	750
330	375	36	52	90	120	165	210	330	375
660	750	72	104	180	240	330	420	660	750
324,8	336,8	249,6	255,2	260,8	268,8	280,8	292,8	324,8	336,8
6x110	6x125	4.5x16	4.5x23	6x30	6x40	6x55	6x70	6x110	6x125
15,2	16,6	8	10,1	12,5	14,3	15	17,5	22	23
17	18,8	9	11,3	14	16	17	19	22,5	24,5
0,318	0,287	1,377	1,014	0,713	0,585	0,457	0,385	0,267	0,243
1,191	1,078	1,910	1,683	1,572	1,514	1,366	1,298	1,044	0,938
0,376	0,334	1,740	1,234	0,816	0,667	0,524	0,443	0,299	0,274
1,529	1,358	2,451	2,133	1,942	1,888	1,727	1,700	1,329	1,207
0,085	0,077	0,526	0,350	0,197	0,150	0,113	0,087	0,056	0,051
0,090	0,081	0,539	0,364	0,210	0,160	0,122	0,095	0,062	0,056
0,368	0,331	0,717	0,598	0,510	0,475	0,416	0,393	0,313	0,282
0,117	0,103	0,721	0,473	0,260	0,200	0,154	0,123	0,077	0,070
0,124	0,109	0,738	0,491	0,276	0,214	0,167	0,134	0,084	0,078
0,505	0,445	0,984	0,807	0,670	0,634	0,567	0,555	0,426	0,389
0,088	0,081	0,286	0,246	0,209	0,179	0,146	0,125	0,088	0,080
0,129	0,118	0,376	0,330	0,287	0,250	0,208	0,180	0,129	0,118
0,235	0,211	0,414	0,374	0,353	0,333	0,295	0,270	0,210	0,189

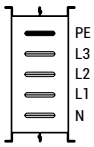
E-LINE KL

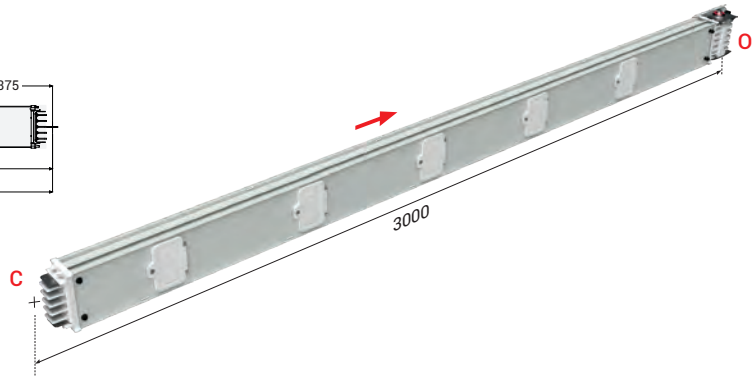
▶▶Standard Components

Plug-in - STD
Standard Length



Sample Order:
250 A, Aluminium, Plug-in,
IP 55, 5 Conductors
KLA 02505 -B- STD

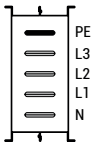


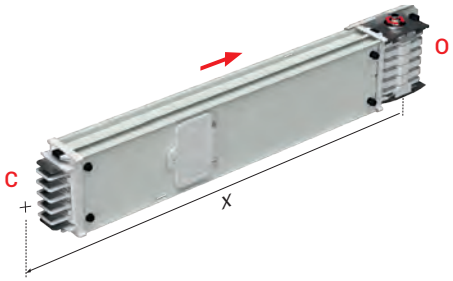


With tap off boxes, it is possible to draw up to 400 A current from E-Line KL busbars. Standard length is 3m, and it is possible to manufacture in custom lengths.

Plug-in - X
Special Straight Length

Sample Order:
400 A, Copper, Plug-in, IP 55,
850mm. 5 Conductors
KLC 04505 -B- X85

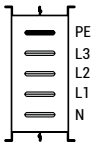


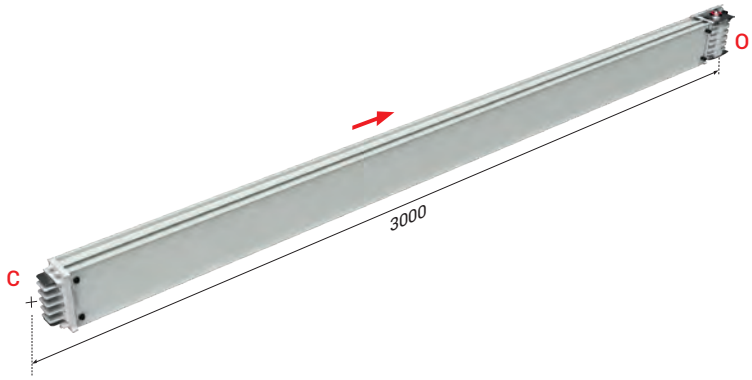


The shortest midsize possible is 700mm.

Feeder - FTD
Standard Length

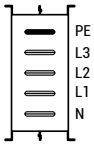
Sample Order:
315 A, Aluminium, Feeder,
IP 55, 5 Conductors
KLA 03505 -B- FTD

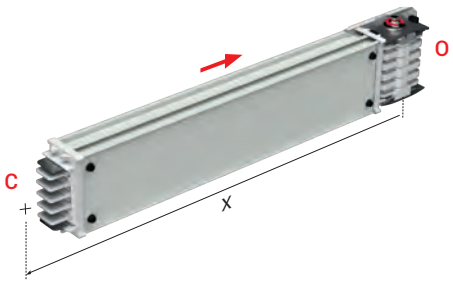




Feeder - FX
Special Straight Length

Sample Order:
160 A, Aluminium, Feeder,
IP 55, 600mm, 5 Conductors
KLA 01505 -B- FX60

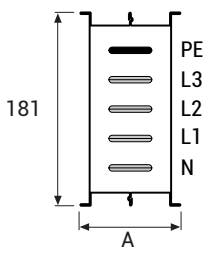




The shortest midsize possible is 350mm.

Busbar Section Size Table

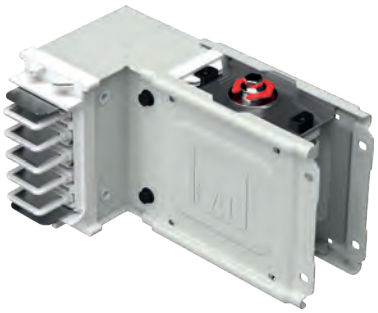
Current	Aluminium	Copper
(A)	A (mm)	A (mm)
160	70	-
250	77	70
315	84	77
400	94	84
500	109	94
630	134	109
800	164	124
1000	179	164
1250	-	179



■ Please call us for non-standard components.

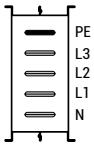
E-LINE KL

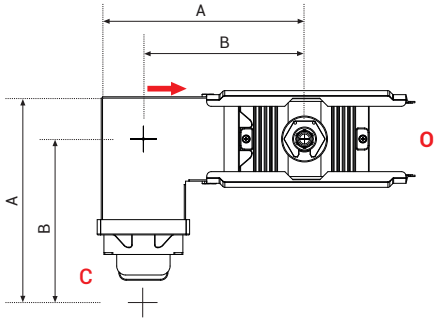
▶▶Elbows



Right Elbow **- R**

Sample Order:
250 A, Aluminium, IP 55, 5 Conductors
KLA 02505- B - R

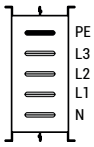


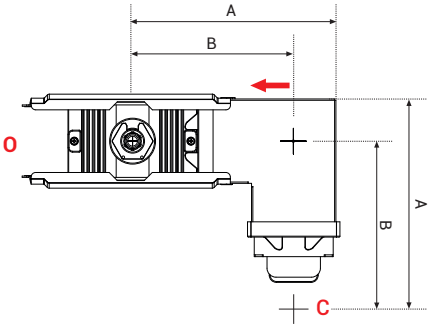




Left Elbow **- L**

Sample Order:
630 A, Copper, IP 55, 5 Conductors
KLC 06505- B - L

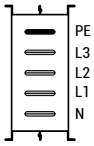


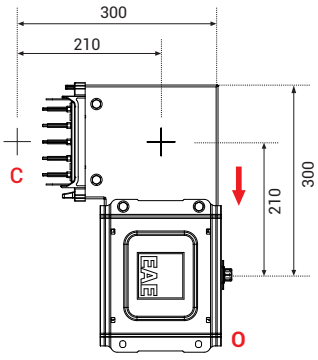




Downwards Elbow **- D**

Sample Order:
400 A, Aluminium, IP 55, 5 Conductors
KLA 04505- B - D



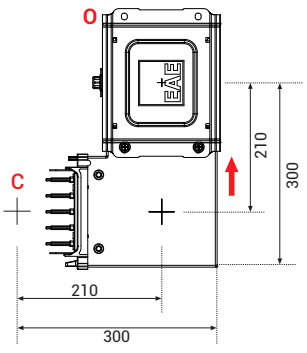




Upwards Elbow **- U**

Sample Order:
630 A, Copper, IP 55, 5 Conductors
KLC 06505- B - U





Conductor	Current	A (mm)	B (mm)
Aluminium	160	203	168
	250	210	171,5
	315	217	175
	400	227	180
	500	242	187,5
	630	267	200
	800	297	215
	1000	312	222,5

Conductor	Current	A (mm)	B (mm)
Copper	250	203	168
	315	210	171,5
	400	217	175
	500	227	180
	630	242	187,5
	800	257	195
	1000	297	215
	1250	312	222,5

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

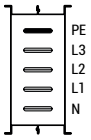
E-LINE KL

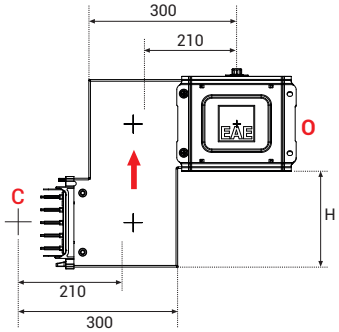
▶▶Elbows



Upwards - UV
Vertical Offset

H= min. 200mm.
Sample Order:
250 A, Aluminium, IP 55,
5 Conductors
KLA 02505- B - UV

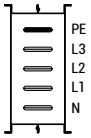


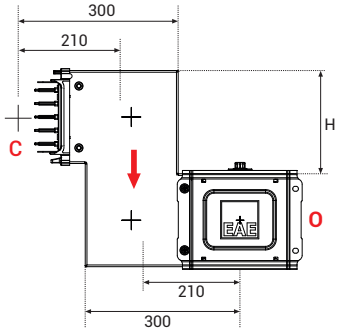




Downwards - DV
Vertical Offset

H= min. 200mm.
Sample Order:
400 A, Copper, IP 55,
5 Conductors
KLC 04505- B - DV

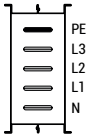


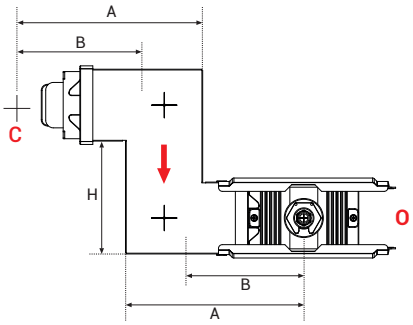


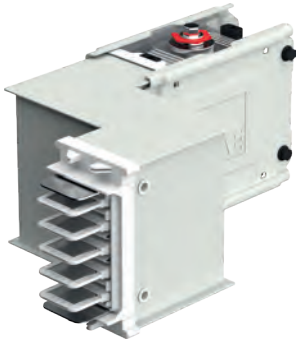


Right - RH
Horizontal Offset

H= min. 150mm.
Sample Order:
315 A, Aluminium, IP 55,
5 Conductors
KLA 03505- B - RH

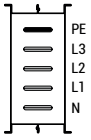


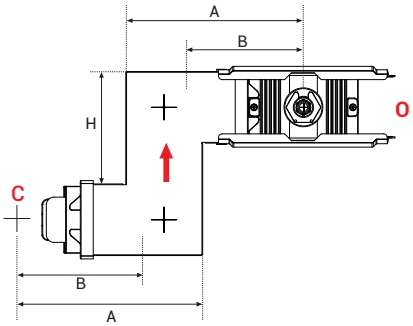




Left - LH
Horizontal Offset

H= min. 150mm.
Sample Order:
160 A, Aluminium, IP 55,
5 Conductors
KLA 01505- B - LH





Conductor	Current	A (mm)	B (mm)
Aluminium	160	203	168
	250	210	171,5
	315	217	175
	400	227	180
	500	242	187,5
	630	267	200
	800	297	215
	1000	312	222,5

Conductor	Current	A (mm)	B (mm)
Copper	250	203	168
	315	210	171,5
	400	217	175
	500	227	180
	630	242	187,5
	800	257	195
	1000	297	215
	1250	312	222,5

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

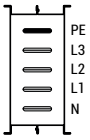
E-LINE KL

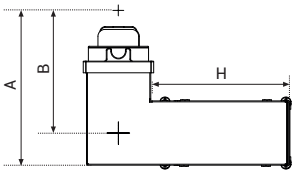
▶▶Elbows

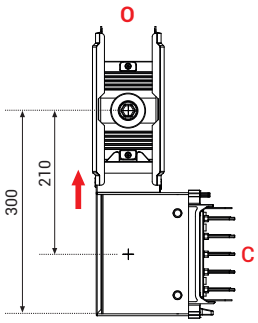


Right Upwards Combined Offset **- KRU**

H= min. 200mm.
Sample Order:
250 A, Aluminium, IP 55,
KLA 02505- B - KRU





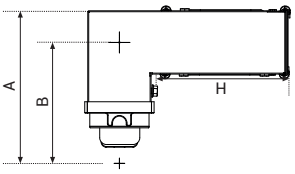


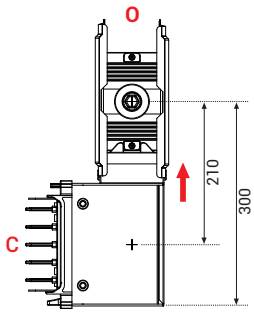


Left Upwards Combined Offset **- KLU**

H= min. 200mm.
Sample Order:
400 A, Copper, IP 55,
5 Conductors
KLC 04505- B - KLU



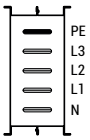


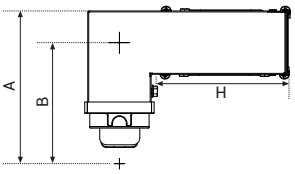


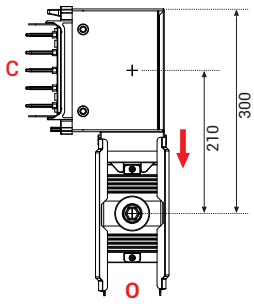


Right Downwards Combined Offset **- KRD**

H= min. 200mm.
Sample Order:
315 A, Aluminium, IP 55,
5 Conductors
KLA 03505- B - KRD



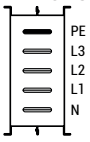


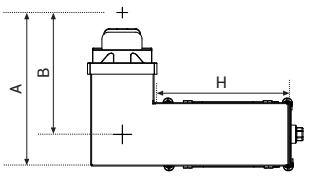


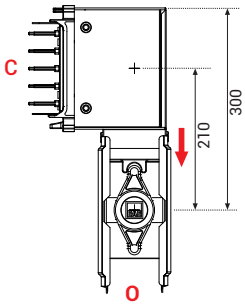


Left Downwards Combined Offset **- KLD**

H= min. 200mm.
Sample Order:
160 A, Aluminium, IP 55,
5 Conductors
KLA 01505- B - KLD







Conductor	Current	A (mm)	B (mm)
Aluminium	160	203	168
	250	210	171,5
	315	217	175
	400	227	180
	500	242	187,5
	630	267	200
	800	297	215
	1000	312	222,5

Conductor	Current	A (mm)	B (mm)
Copper	250	203	168
	315	210	171,5
	400	217	175
	500	227	180
	630	242	187,5
	800	257	195
	1000	297	215
	1250	312	222,5

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

E-LINE KL

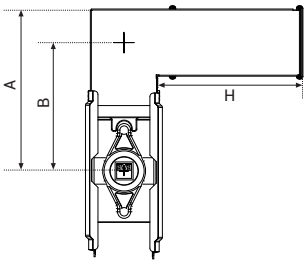
▶▶Elbows

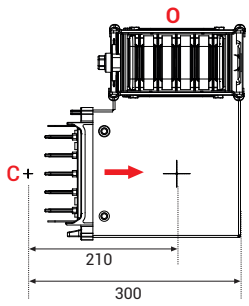


Upwards Right Combined Offset **- KUR**

H= min. 200mm.
Sample Order:
250 A, Aluminium, IP 55,
5 Conductors
KLA 02505- B - KUR





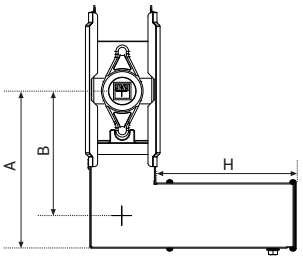


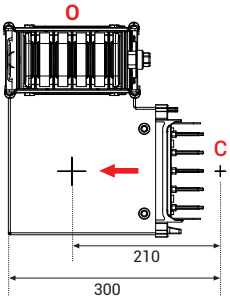


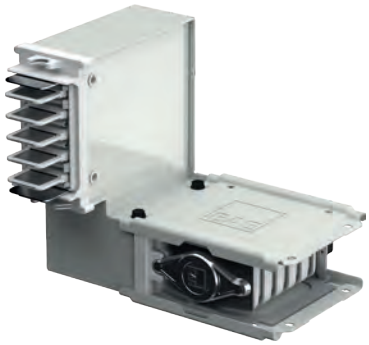
Upwards Left Combined Offset **- KUL**

H= min. 200mm.
Sample Order:
400 A, Copper, IP 55,
5 Conductors
KLC 04505- B - KUL





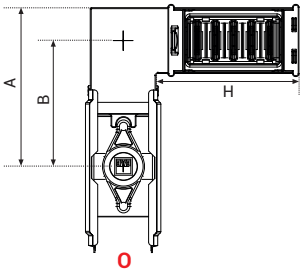


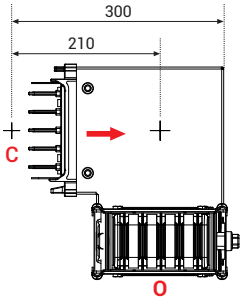


Downwards Right Combined Offset **- KDR**

H= min. 200mm.
Sample Order:
315 A, Aluminium, IP 55,
5 Conductors
KLA 03505- B - KDR





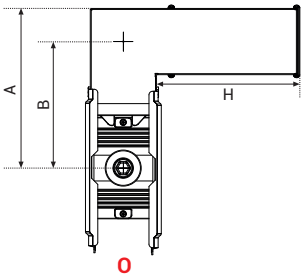


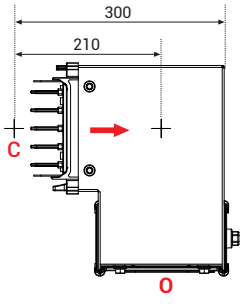


Downwards Left Combined Offset **- KDL**

H= min. 200mm.
Sample Order:
160 A, Aluminium, IP 55,
5 Conductors
KLA 01505- B - KDL







Conductor	Current	A (mm)	B (mm)
Aluminium	160	204	169
	250	211	172,5
	315	218	176
	400	228	181
	500	243	188,5
	630	268	201
	800	298	216
	1000	313	223,5

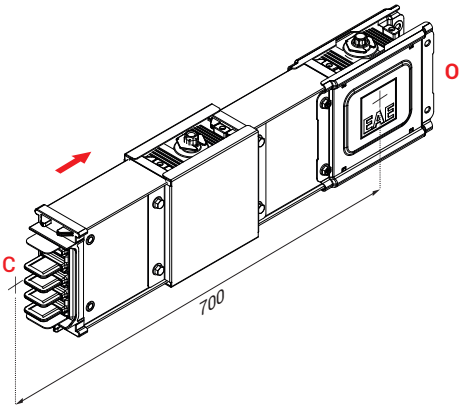
Conductor	Current	A (mm)	B (mm)
Copper	250	204	169
	315	211	172,5
	400	218	176
	500	228	181
	630	243	188,5
	800	258	196
	1000	298	216
	1250	313	223,5

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



Reduction - RD

Sample Order:
400-250 A, Aluminium,
IP 55, 5 Conductors
KLA 04505- B - RD



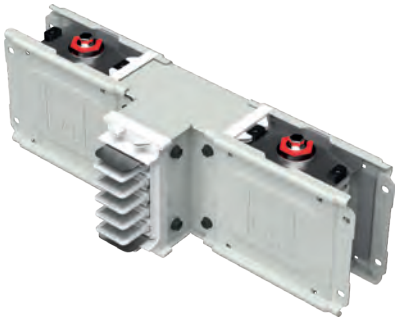
Reduction Module Reduction Table

KLA - Al Conductors							
Rated Current	Reduced Busbar Current						
	160	250	315	400	500	630	800
250	✓	-	-	-	-	-	-
315	✓	✓	-	-	-	-	-
400	-	✓	✓	-	-	-	-
500	-	-	✓	✓	-	-	-
630	-	-	-	✓	✓	-	-
800	-	-	-	-	✓	✓	-
1000	-	-	-	-	-	✓	✓

KLC - Cu Conductors							
Rated Current	Reduced Busbar Current						
	250	315	400	500	630	800	1000
315	✓	-	-	-	-	-	-
400	-	✓	-	-	-	-	-
500	-	✓	✓	-	-	-	-
630	-	-	✓	✓	-	-	-
800	-	-	-	✓	✓	-	-
1000	-	-	-	-	✓	✓	-
1250	-	-	-	-	-	✓	✓

Reduction Module
Used to change the busbar cross section.

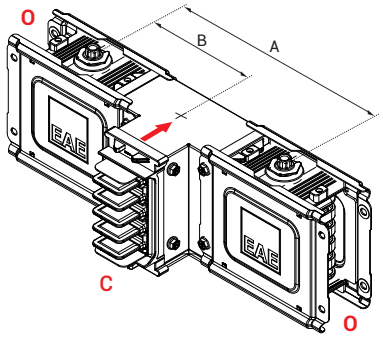
NOTE:
The selection of the reduction unit and the lower side protection is the responsibility of the customer.

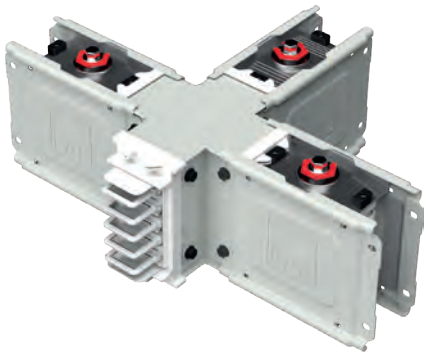


"T" Component - T

Sample Order:
250 A, Aluminium,
IP 55, 5 Conductors
KLA 02505- B - T

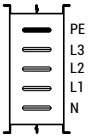


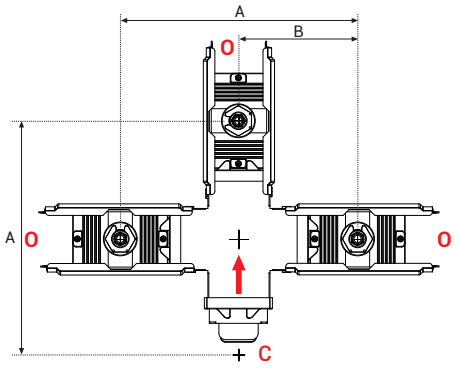




Cross - DD

Sample Order:
630 A, Aluminium,
IP 55, 5 Conductors
KLA 06505- B - DD





Conductor	Current	A (mm)	B (mm)
Aluminium	160	336	168
	250	343	171,5
	315	350	175
	400	360	180
	500	375	187,5
	630	400	200
	800	430	215
	1000	445	222,5

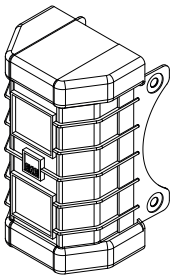
Conductor	Current	A (mm)	B (mm)
Copper	250	336	168
	315	343	171,5
	400	350	175
	500	360	180
	630	375	187,5
	800	390	195
	1000	430	215
	1250	445	222,5

■ Please call us for non-standard components.



End Closer **- S**

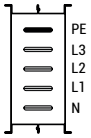
Sample Order:
250 A, Copper, IP 55,
5 Conductors
KLC 02505- B - S

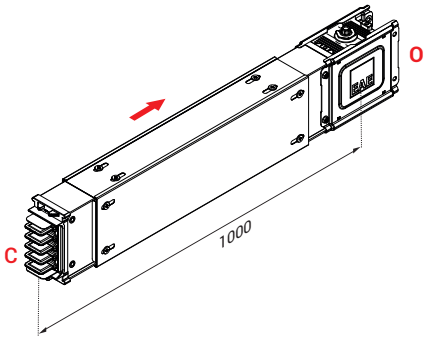




Horizontal Expansion **- YDT**

Sample Order:
250 A, Aluminium, IP 55,
5 Conductors
KLA 02505- B - YDT



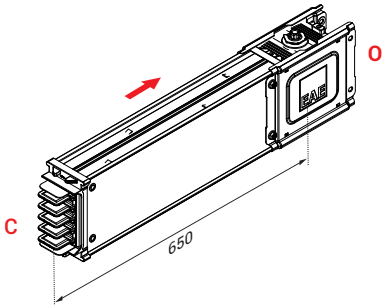




Vertical Expansion **- DDT**

Sample Order:
250 A, Copper, IP 55,
5 Conductors
KLC 02505- B - DDT



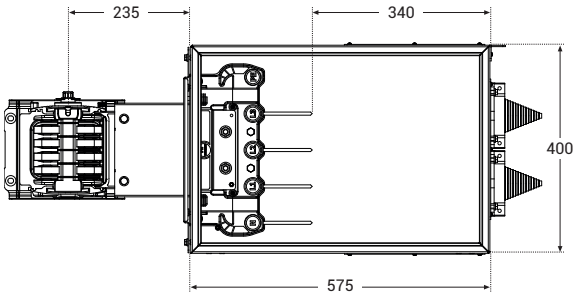


■Dimensions given are minimum values. ■Please call us for non-standard components.

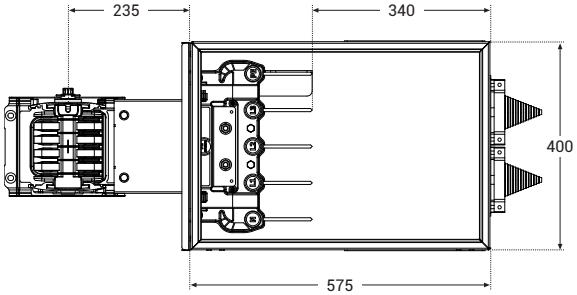
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▶▶Feeder Boxes
(Beginning / End of Line)

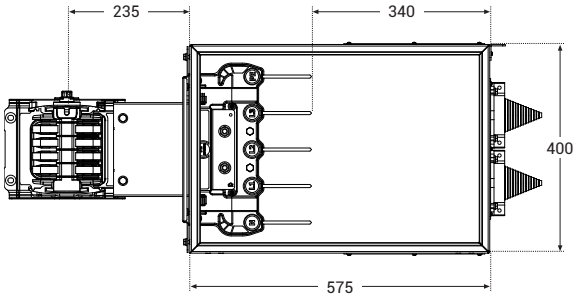
4 Conductors



5 conductors (PE)

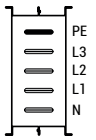


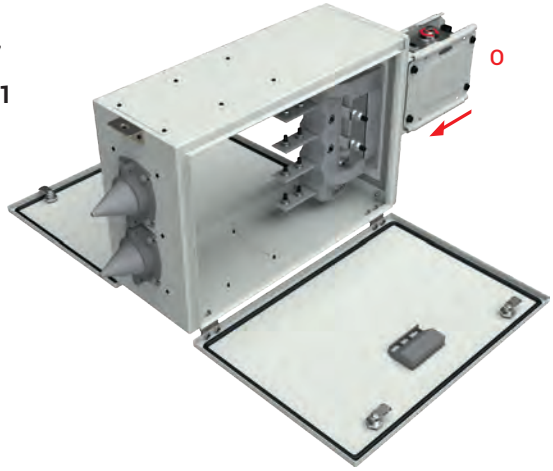
5 conductors (CPE)



Feeder Box 1 - B1

Sample Order:
250 A, Copper IP 55,
5 Conductors
KLC 02504- B - B1

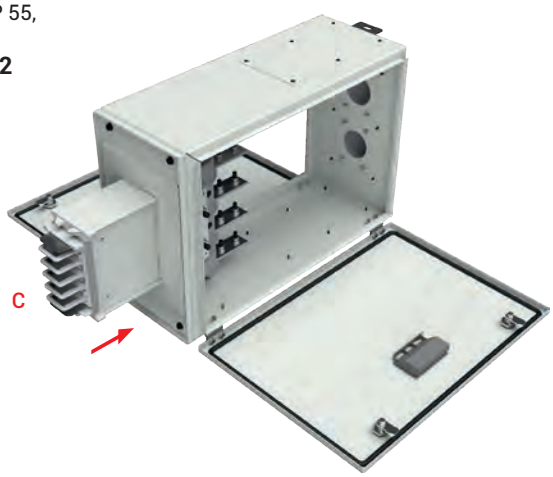




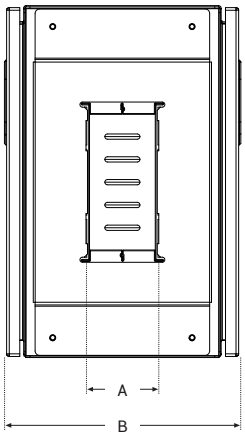
Feeder Box 2 - B2

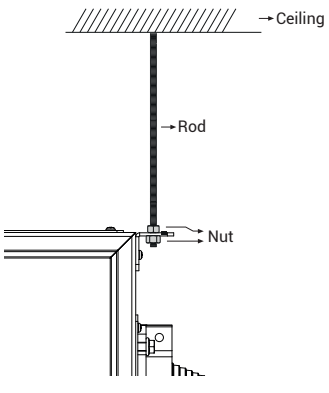
Sample Order:
250 A, Aluminium IP 55,
5 Conductors
KLA 02505- B - B2





Cond.	Current	A	B	C
ALUMINIUM	160	70	221	380
	250	77	221	380
	315	84	271	575
	400	94	271	575
	500	109	271	575
	630	134	341	575
	800	164	341	575
	1000	179	341	575
COPPER	250	70	221	380
	315	77	221	380
	400	84	271	575
	500	94	271	575
	630	109	271	575
	800	124	341	575
	1000	164	341	575
	1250	179	341	575





Supply Box Ceiling
Mounting Part

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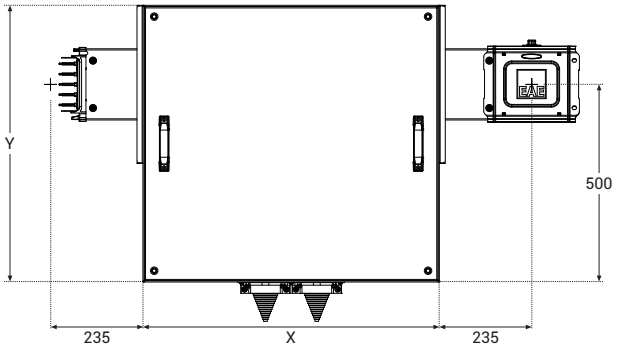
▶▶Feeder Boxes (Central Feeder Box)

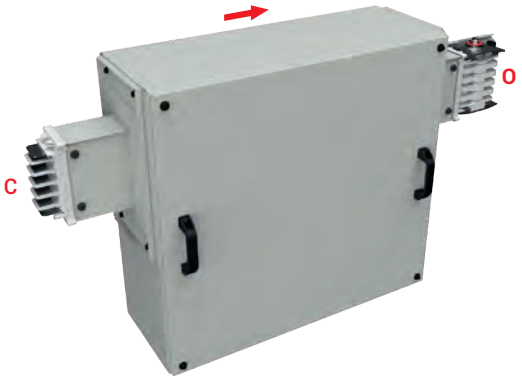
5 conductors / (CPE)

Central Feeder Box 1

Sample Order:
630 A, Aluminium IP 55,
5 Conductors
KLA 06505- B - BO1

- BO1



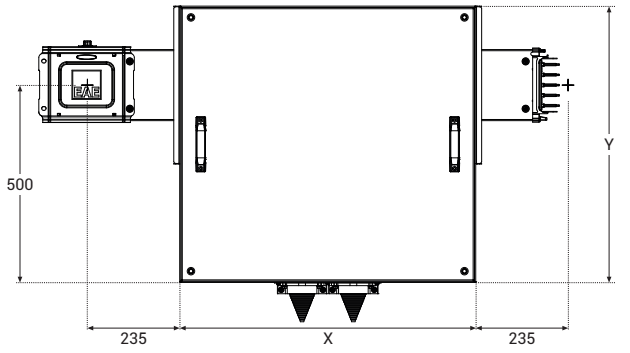


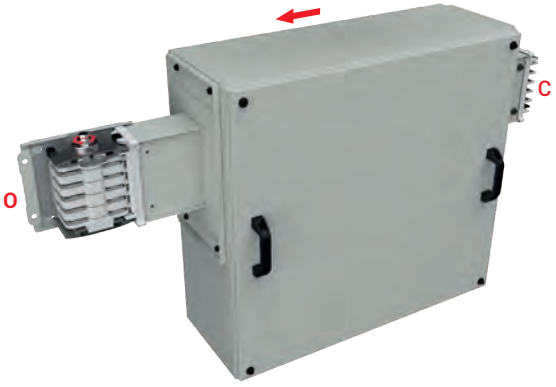
5 conductors / (CPE)

Central Feeder Box 2

Sample Order:
630 A, Aluminium IP 55,
5 Conductors
KLA 06505- B - BO2

- BO2

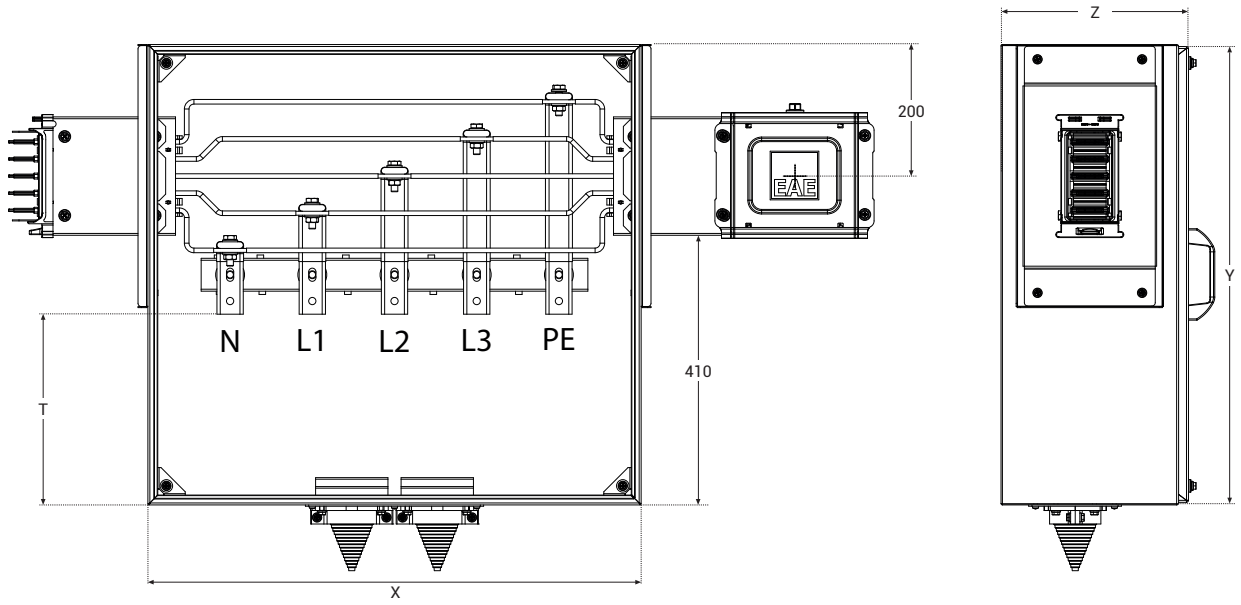


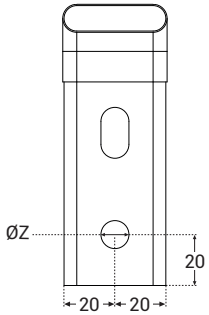
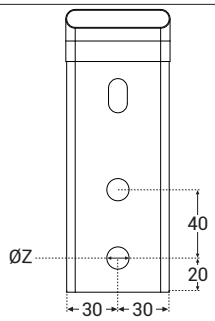
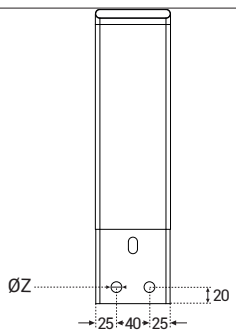


■ Please call us for non-standard components.

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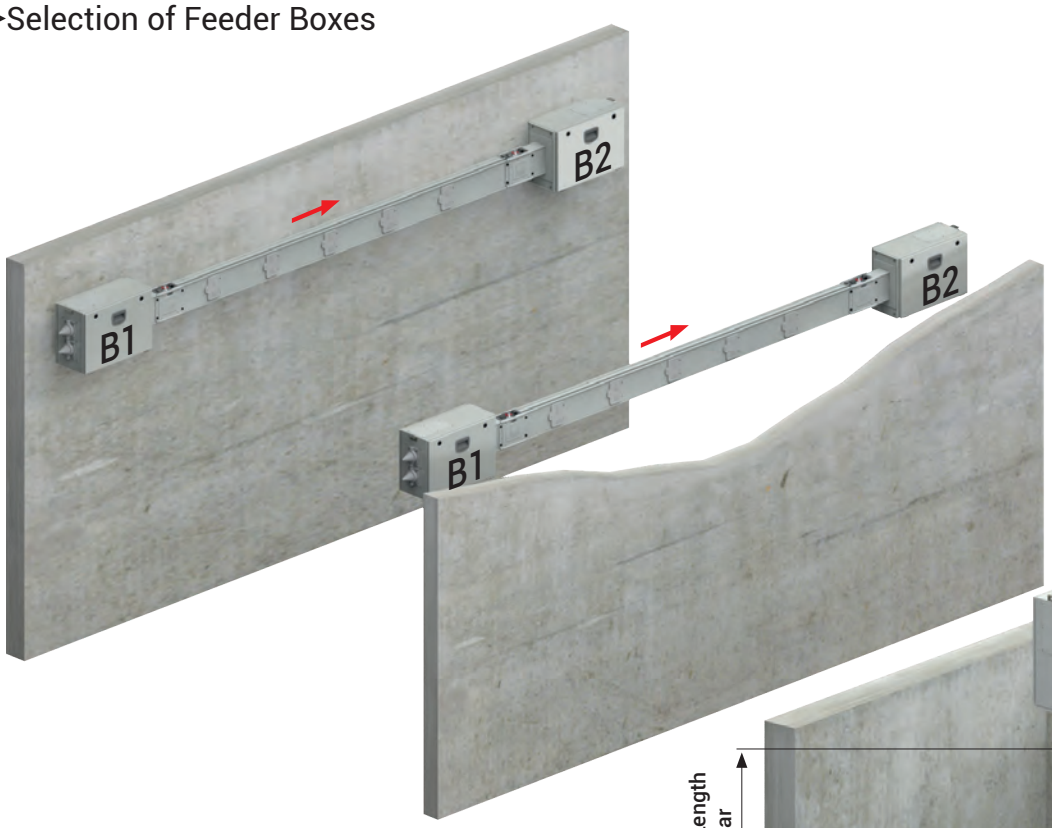
▶▶Feeder Boxes (Central Feeder Box)

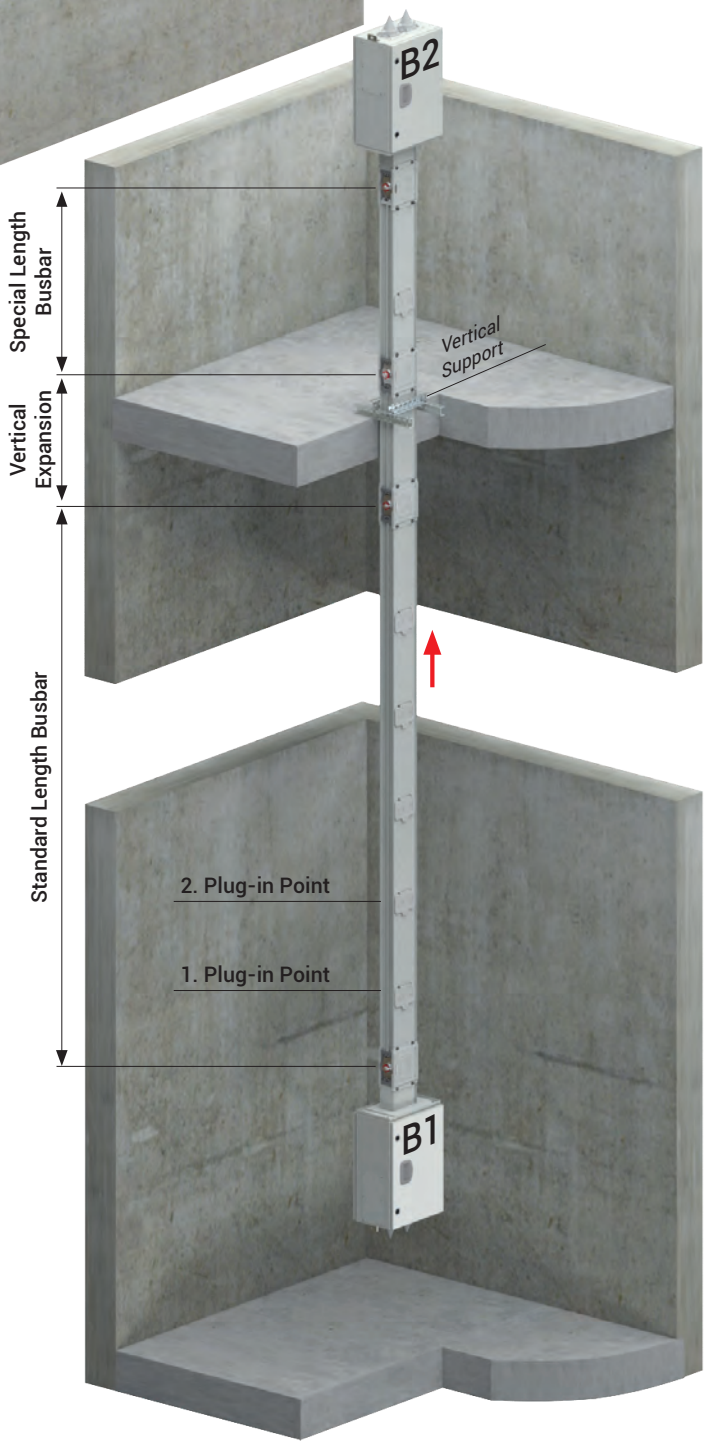


	ALUMINIUM								COPPER							
Rated Current	160	250	315	400	500	630	800	1000	250	315	400	500	630	800	1000	1250
X	600	600	750	750	750	750	750	750	600	600	750	750	750	750	750	750
Y	700	700	700	700	700	720	720	720	700	700	700	700	700	720	720	720
Z	240	240	285	285	285	325	325	325	240	240	285	285	285	325	325	325
T	290	290	290	290	235	245	290	290	290	290	290	290	235	290	290	290
ØZ	11	11	11	11	13	13	13	13	11	11	11	11	13	13	13	13
	✓	✓	✓	✓	-	-	-	-	✓	✓	✓	✓	-	-	-	-
	-	-	-	-	✓	✓	-	-	-	-	-	-	✓	-	-	-
	-	-	-	-	-	-	✓	✓	-	-	-	-	-	✓	✓	✓

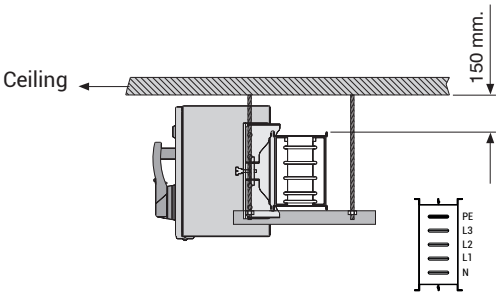
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▶▶Selection of Feeder Boxes

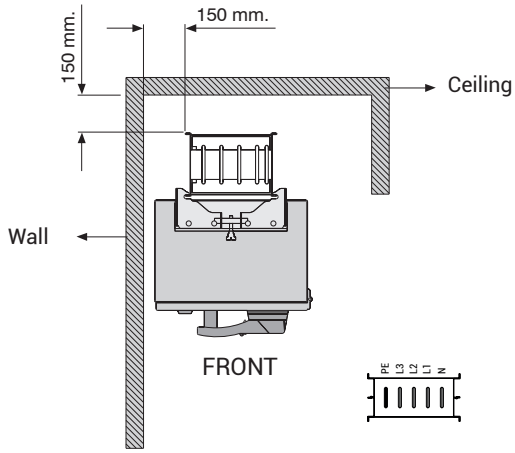




Application of Tap-off Boxes for Horizontal Lines



In horizontal installation the neutral conductor is situated as shown above.



Application of Tap-off Boxes for Vertical Lines

In vertical installation the neutral conductor should be on the right side. It is important for tap-off box connections.

E-LINE KL

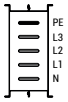
▶▶Panel Connections

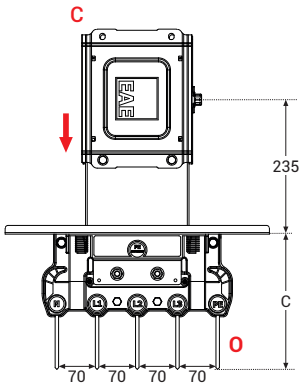


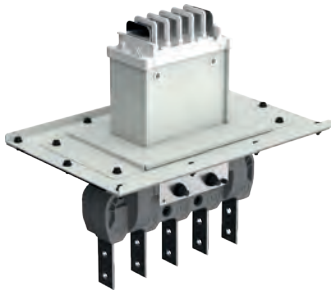
Busbar Feeder - P10

Sample Order:
630 A, Aluminium, IP 55, 5 Conductors

KLA 06505- B - P10

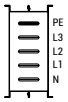






Panel Feeder - P11

Sample Order:
630 A, Aluminium, IP 55, 5 Conductors
KLA 06505- B - P11



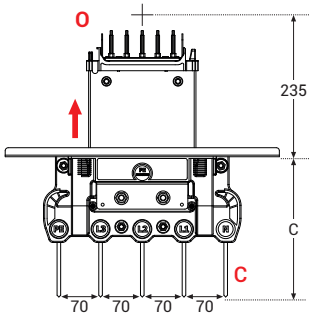


Figure 1

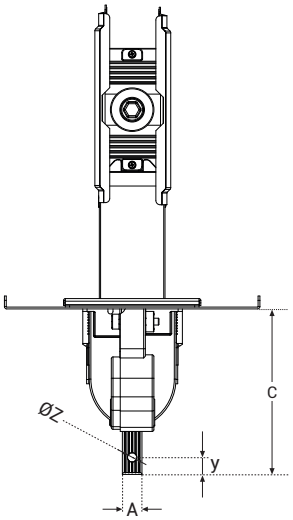


Figure 2

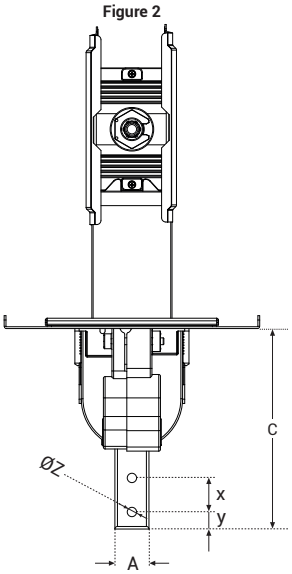


Figure 3

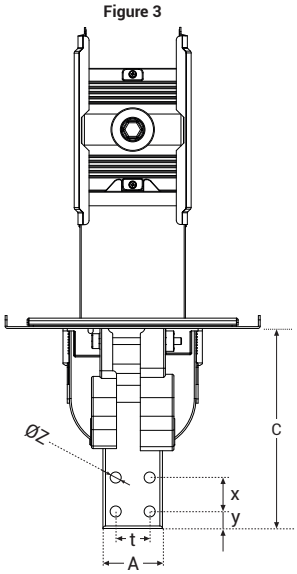
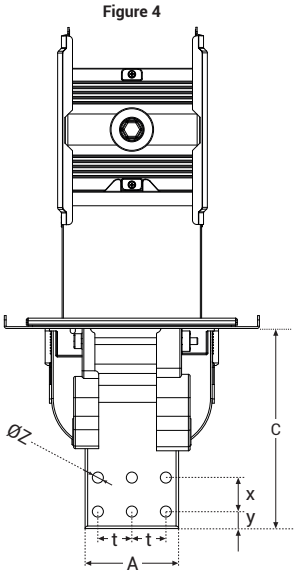
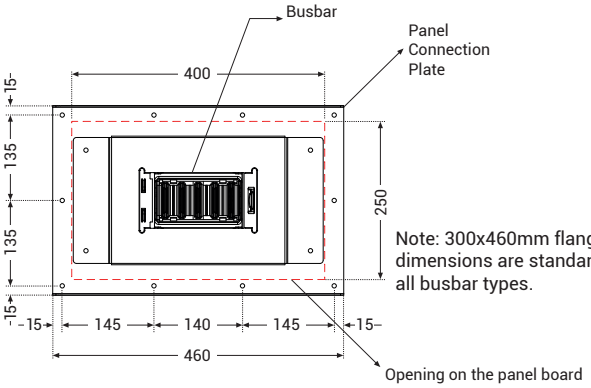


Figure 4





Note: 300x460mm flange plate dimensions are standard for all busbar types.

■ Please call us for non-standard components.

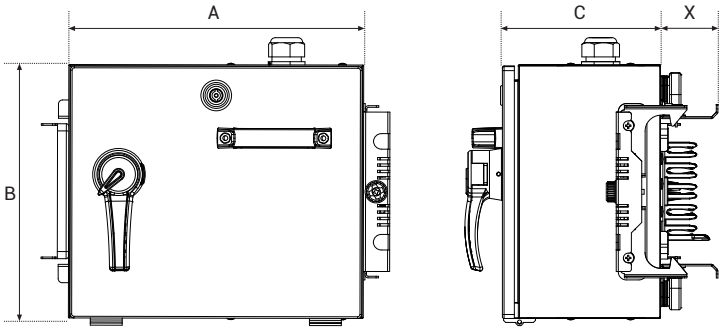
Busbar Section Size Table

Cond.	Current	A	x	y	z	t	C	Figure
ALUMINIUM	160	16	-	20	9	-	195	1
	250	23	-	20	11	-	195	1
	315	30	40	20	11	-	235	2
	400	40	40	20	11	-	235	2
	500	55	40	20	13	-	235	2
	630	80	40	20	13	40	235	3
	800	110	40	20	13	40	235	4
	1000	125	40	20	13	40	235	4
COPPER	250	16	-	20	9	-	195	1
	315	23	-	20	11	-	195	1
	400	30	40	20	11	-	235	2
	500	40	40	20	11	-	235	2
	630	55	40	20	13	40	235	3
	800	70	40	20	13	40	235	3
	1000	110	40	20	13	40	235	4
	1250	125	40	20	13	40	235	4

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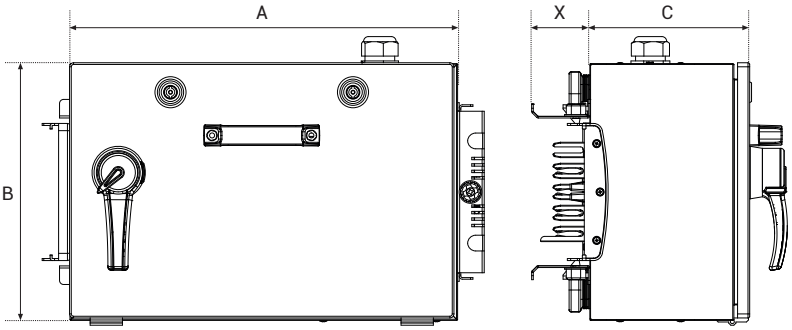
▶▶Tap-Off Boxes with Fused Switches

KLP 160A



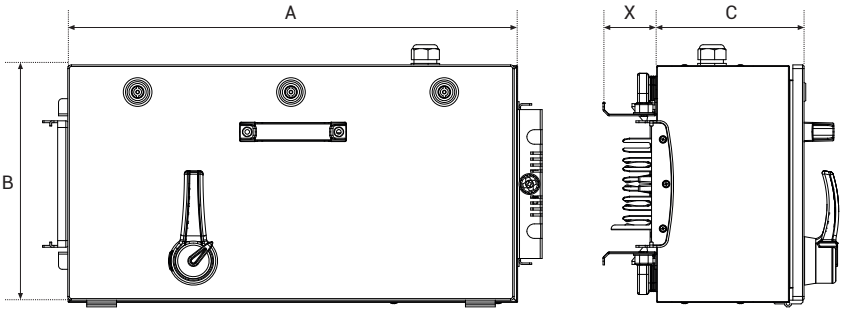


KLP 250A



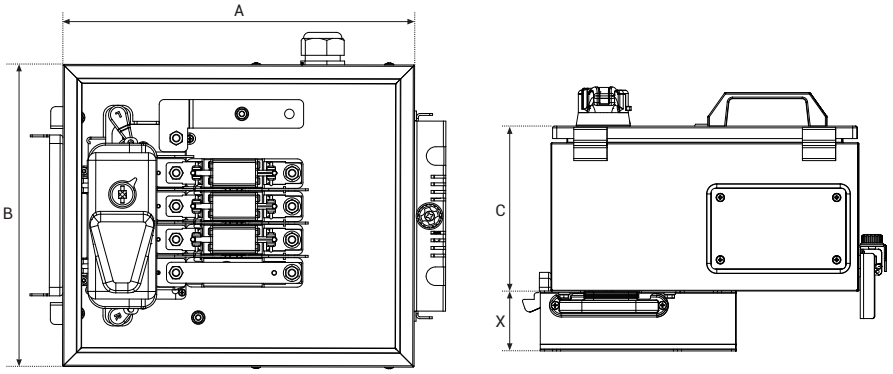


SYK 400A





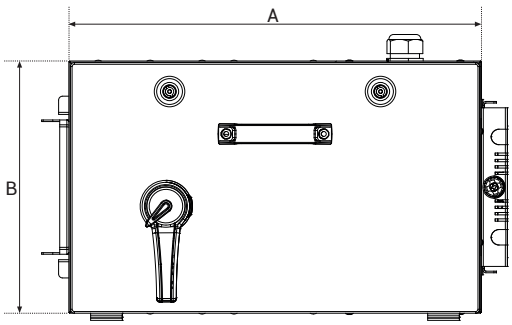
Product	A (mm)	B (mm)	C (mm)	X (mm)	Cable Gland Type	Order Code
KLP 1652 - KYA 4P	370	318	198	72	RPK2	3338882
KLP 2552 - KYA 4P	480	318	198	72	PP3	3338885
KLP 4052 - SYK 4P	750	420	305	72	RP4	3338891

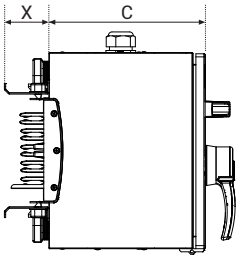


E-LINE KL

▶▶Tap-Off Boxes for MCCB's

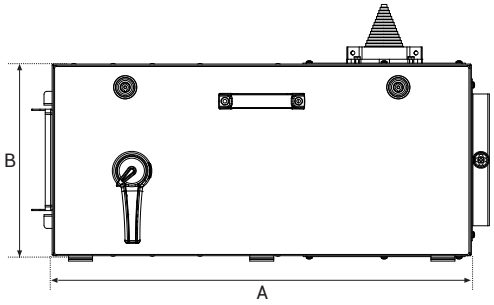
KLP 160-250A

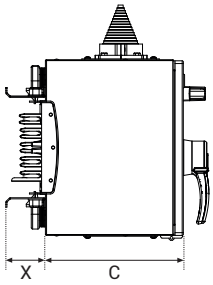






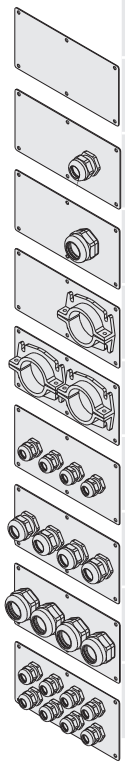
KLP 400A







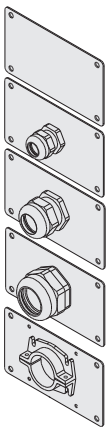
Cable Gland Plates



Mat.	Cable Gland Type	Order Code	Inner Diameter (mm)
Sheet Metal	---	RP0	---
Sheet Metal	M32	RP1	25
Sheet Metal	M40	RP2	32
Sheet Metal	Special	RP3	63
AL	2x Special	RP4	63
AL	4xM25	RP5	18
AL	4xM32	RP6	25
AL	4xM40	RP7	32
AL	8xM32	RP8	25

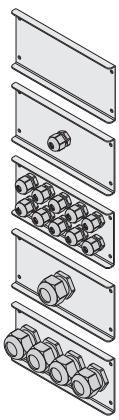
Product	A (mm)	B (mm)	C (mm)	X (mm)	Fitting Type	Order Code
KLP 1652 - MCCB 4P	520	318	250	72	RPK2	3338869
KLP 2552 - MCCB 4P	520	318	250	72	PP3	3338872
KLP 4052 - MCCB 4P	700	320	250	72	RPK2	3338875

Special Cable Gland Plates



Mat.	Cable Gland Type	Order Code	Inner Diameter (mm)
Sheet Metal	---	RPK0	---
Sheet Metal	M25	RPK1	25
Sheet Metal	M32	RPK2	32
Sheet Metal	M40	RPK3	63
Sheet Metal	1x Special	RPK4	63

Cable Gland Plates

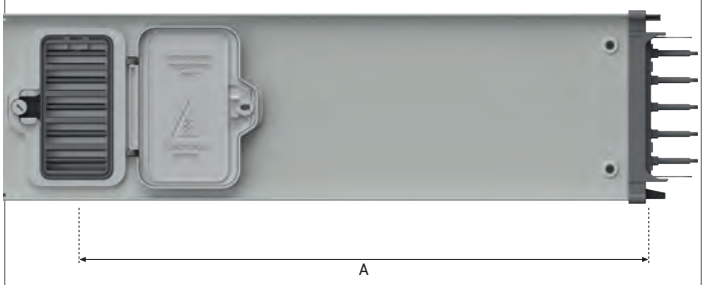


Mat.	Cable Gland Type	Order Code	Inner Diameter (mm)
Al	---	DPK0	---
Al	M16	DPK1	10
Al	10xM16	DPK2	10
Al	M25	DPK3	18
Al	4xM25	DPK4	18

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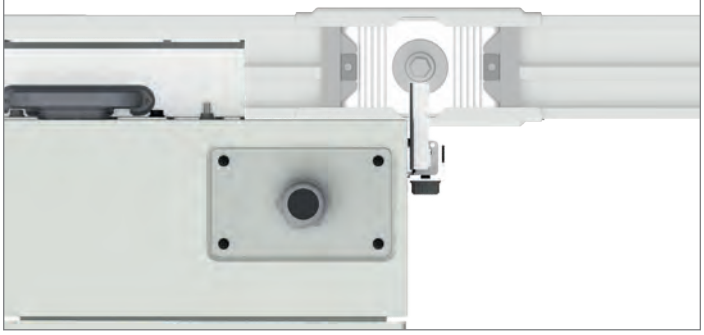
▶▶Window Dimensions

Figure 1



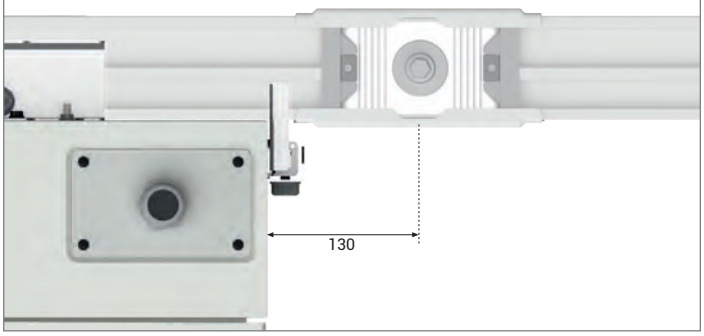
NOTE: A Min. in the Sheet Metal Boxes is the dimension of the position of Sheet Metal Boxes that is aligned with the groove on the full axis of Adjunct, as shown in Figure-2. If A Min. cannot be aligned with the groove on the Duct Adjunct, it should be 130 mm. less than (A Min) as shown in Figure-3.

Figure 2



	Description	Box Type	A (min)
1	Simple Box (32A)	Plastic	235
2	KLP 40-80A	Plastic - w/KYA	315
3	KLP 100-125A	Plastic - w/KYA	330
4	KLP 160A	Sheet metal - w/KYA	235
5	KLP 250A	Sheet metal - w/KYA	380
6	KLP 160-250A	Sheet metal - w/MCCB	375
7	KLP 400A	Sheet metal - w/MCCB	545

Figure 3



■ Please call us for non-standard components.

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▶▶Tap-Off Boxes

BUSBAR
BOX TYPE
BOX RATING
32 A - 03
40 A - 04
80 A - 08
125 A - 12
PROTECTION DEGREE
IP 55 5
EARTHING TYPE
1- PE
2- CPE
FUSED SWITCHES TYPE
B1 -Transparent hinged lid / Empty tap off box
M -MCB

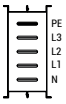
KL P □ □ 5 □ - □

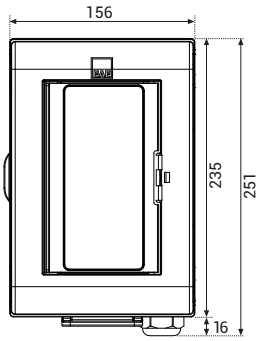
3x6 A
3x10 A
3x16 A
3x20 A
3x25 A
3x32 A
3x40 A
3x50 A
3x63 A
3x80 A

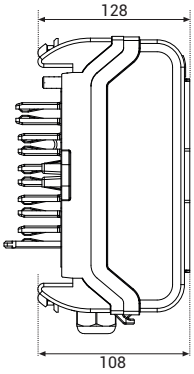


KLP - 32A

Sample Order:
32 A, IP 55, 5 Conductors,
Hinged lid,
suitable for 8 pcs MCB,
Empty tap off box





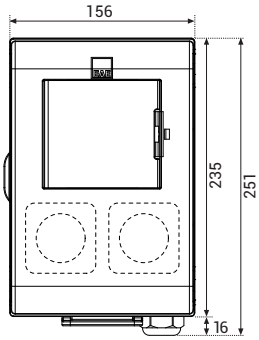


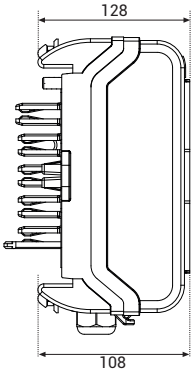


KLP -32A

Sample Order:
32 A, IP 55, 5 Conductors,
Hinged lid,
suitable for 4 pcs MCB,
Empty tap off box





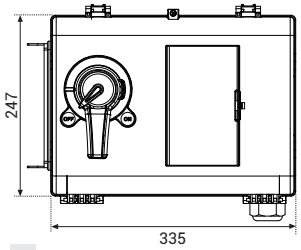


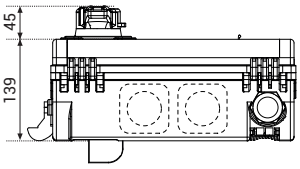


KLP - 40A-80A - 5CPE

Sample Order:
40 A, IP 55, 5 Conductors,
Hinged lid,
suitable for 8 pcs MCB,
Empty tap off box



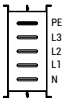


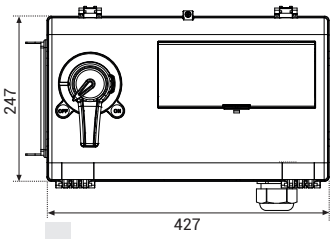


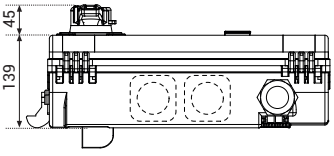


KLP -125A - 5CPE

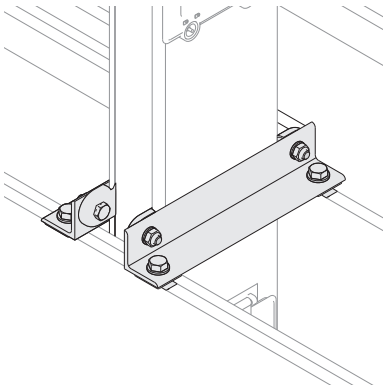
Sample Order:
125 A, IP 55, 5 Conductors,
Hinged lid,
suitable for 12 pcs MCB,
Empty tap off box

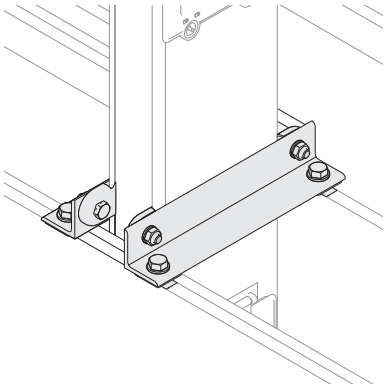


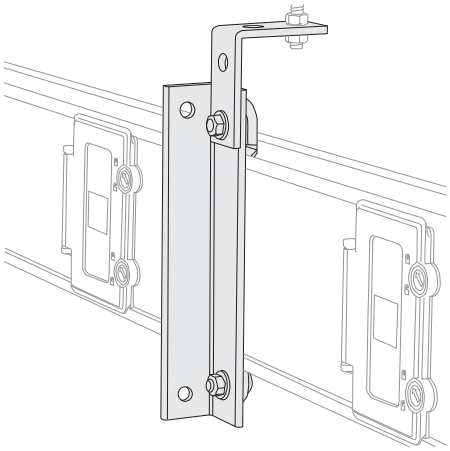




■ Please call us for non-standard components.

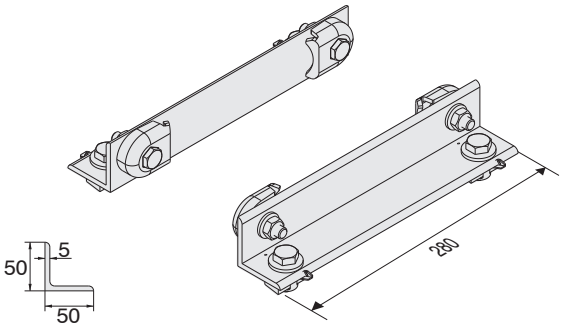




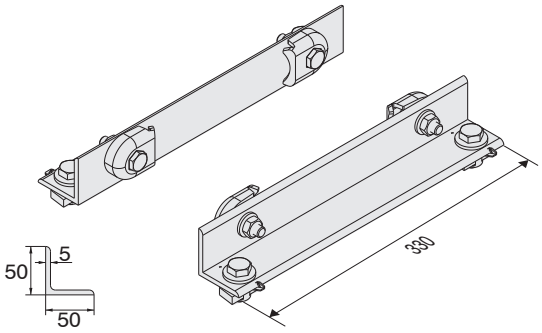


Supports

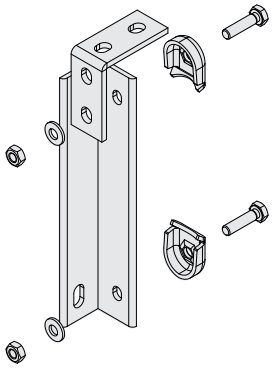
Description	Order Code
KL Vertical Riser Fixing Unit	3336991



Description	Order Code
KL Vertical Riser Fixing Unit (Fire Barrier)	3337530

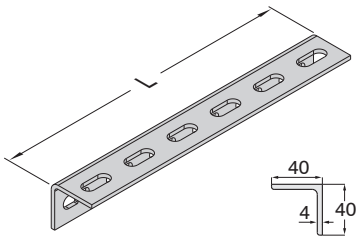


Description	Order Code
KL Horizontal Busbar Support Set	3337702

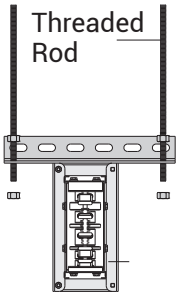


Tray Supports

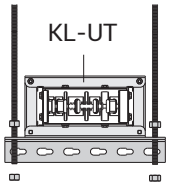
Description	L (mm)	Code
UAS-K4 SUPPORT (1)	200	3005333
UAS-K4 SUPPORT (2)	250	3005332
UAS-K4 SUPPORT (3)	300	3005331
UAS-K4 SUPPORT (4)	350	3005330
UAS-K4 SUPPORT (5)	400	3005329
UAS-K4 SUPPORT (6)	500	3005328
UAS-K4 SUPPORT (7)	600	3005327
UAS-K4 SUPPORT (8)	700	3005326
UAS-K4 SUPPORT (9)	1100	3005325



UAS-K4
L Support



Flatwise
application sample



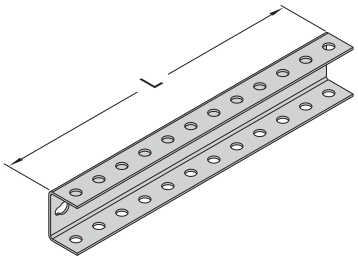
Edgewise
application
sample

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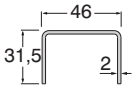
▶▶Fixing Elements

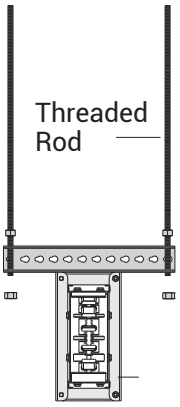
Tray Supports

Description	L (mm)	Code
ASU2A-1	135	3008589
ASU2A-2	250	3008587
ASU2A-3	500	3008585
ASU2A-4	1000	3008583
ASU2A-5	2000	3008168

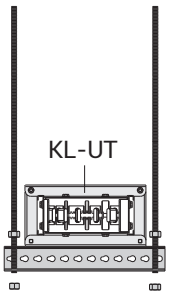


ASU2A





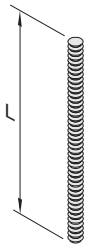
Flatwise
application sample



Edgewise
application
sample

Connection Parts

Description	L (mm)	Code
BRA 11-05 Threaded Rod (M8)	500	5000039
BRA 11-10 Threaded Rod (M8)	1000	5000038
BRA 12-05 Threaded Rod (M10)	500	5000037
BRA 12-10 Threaded Rod (M10)	1000	5000032
BRA 10 Extension Part (M8)	2000	1004313
BRA 13 Extension Part (M10)	-	1004312
BRA 9 EAE Pull-off Dowel (M8)	-	5000033
BRA 9 EAE Pull-off Dowel (M10)	-	5000023
M8 Steel Nut	-	1000521
M10 Steel Nut	-	1000522
M8 Washer	-	1000502
M10 Washer	-	1000504



Threaded
Rod



Extension
Part



EAE
Pull-off
Dowel



Steel Nut



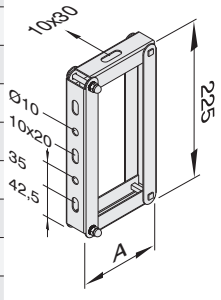
Washer

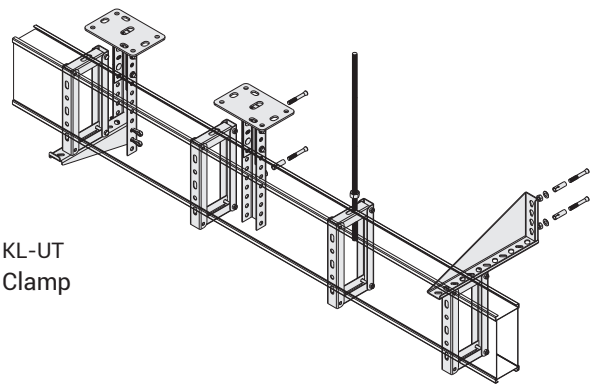
Current	Aluminium	Copper
(A)	(A) mm	(A) mm
160	70	-
250	75	70
315	80	75
400	100	80
500	112	-
630	125	100
800	160	125

Busbar cross-section dimensions

Diameter of the
hole to be drilled
M8.....Ø12
M10.....Ø14

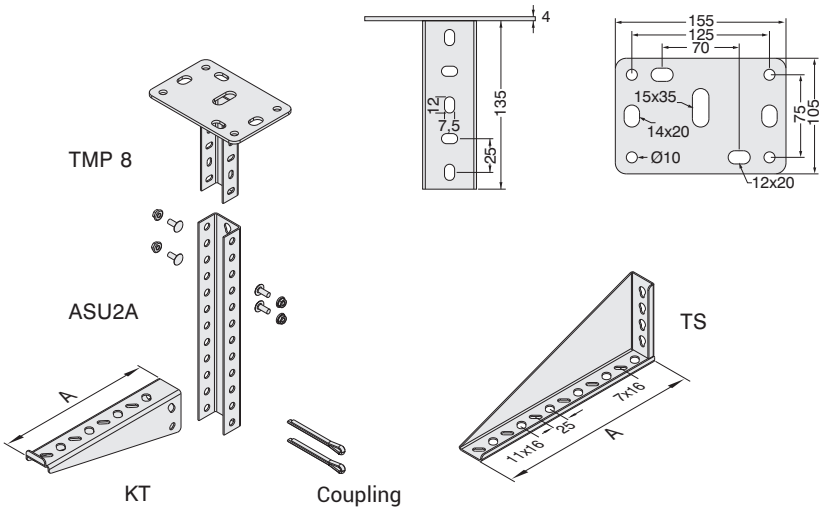
Description	Current	A (mm)	Code
KLA - 1 UT Clamp	160	120	1027224
KLA - 2 UT Clamp	250	127	1027226
KLA - 3 UT Clamp	315	134	1027227
KLA - 4 UT Clamp	400	144	1027228
KLA - 5 UT Clamp	500	159	1027229
KLA - 6 UT Clamp	630	184	1027231
KLA - 8 UT Clamp	800	214	1027232
KLA - 10 UT Clamp	1000	229	1027233
KLC - 2 UT Clamp	250	120	1027224
KLC - 3 UT Clamp	315	127	1027226
KLC - 4 UT Clamp	400	134	1027227
KLC - 5 UT Clamp	500	144	1027228
KLC - 6 UT Clamp	630	159	1027229
KLC - 8 UT Clamp	800	174	1027230
KLC - 10 UT Clamp	1000	214	1027232
KLC - 12 UT Clamp	1250	229	1027233



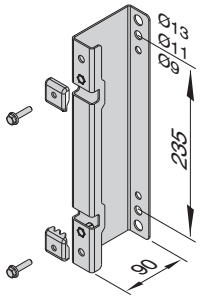


KL-UT
Clamp

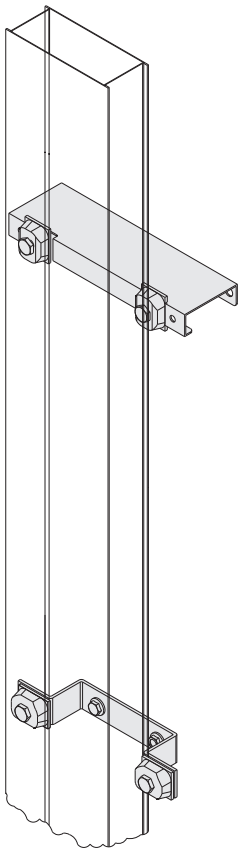
Description	A (mm)	Code
KT 200 Tray Support	235	3008567
KT 250 Tray Support	285	3008565
KT 300 Tray Support	335	3008563
KT 400 Tray Support	435	3008561
KT 500 Tray Support	535	3008559
KT 600 Tray Support	635	3008264
TS 200 Tray Support	205	3008551
TS 250 Tray Support	255	3008549
TS 300 Tray Support	305	3008547
TS 400 Tray Support	405	3008545
TS 500 Tray Support	505	3008543
TS 600 Tray Support	605	3005828
TMP 8 Ceiling Support Unit	-	3008382
Coupling	-	1004310



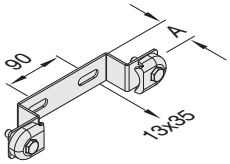
Description	Code
Vertical Support Set Wall Type	3292233



Vertical Support Set Wall Type



Description	A	Code
Vertical Support Set (VS)-40	40	3337694
Vertical Support Set (VS)-60	60	3337695



Vertical Support Set (VS) Type

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▶▶Vertical and Horizontal Busbar Applications

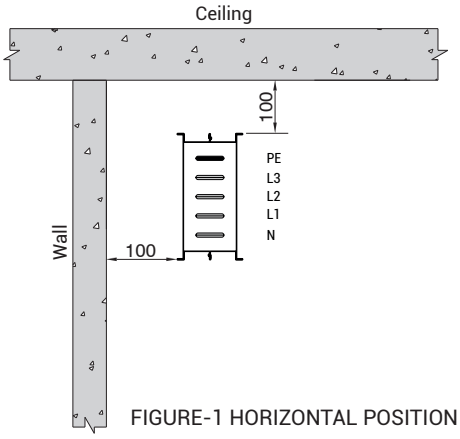


FIGURE-1 HORIZONTAL POSITION

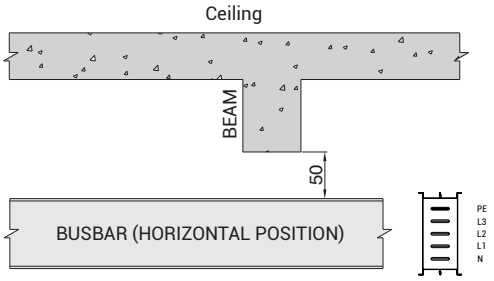


FIGURE-4 BEAM PASSAGE HORIZONTAL POSITION

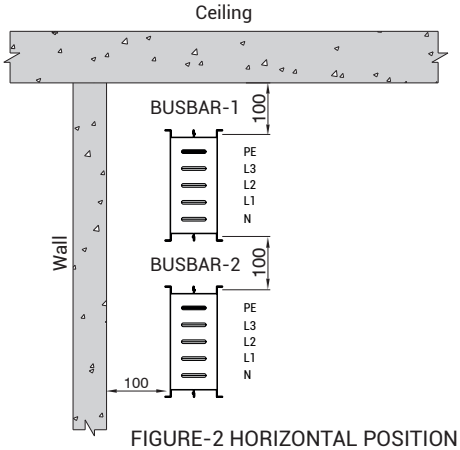


FIGURE-2 HORIZONTAL POSITION

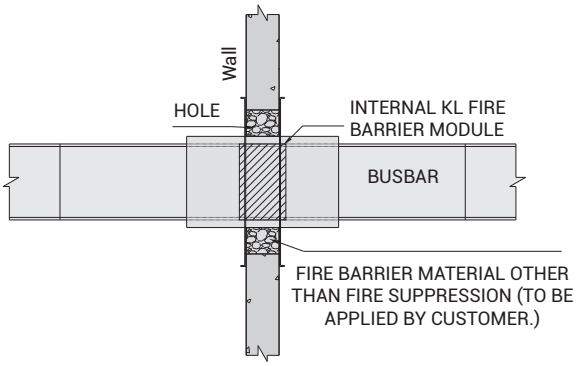


FIGURE-5 EXAMPLE WALL PASSAGE WITH FIRE BARRIER

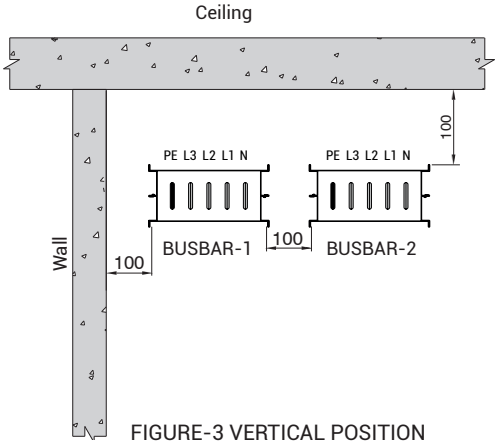


FIGURE-3 VERTICAL POSITION

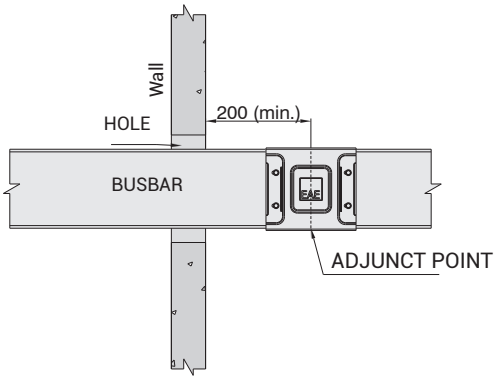


FIGURE-6 STANDARD WALL PASSAGE

■ The dimensions given above are minumum values. ■ All dimensions are given in mm.

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▶▶Vertical and Horizontal Busbar Applications

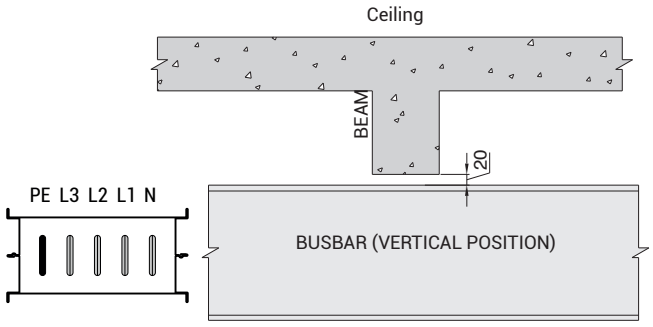


FIGURE-7 BEAM PASSAGE VERTICAL POSITION

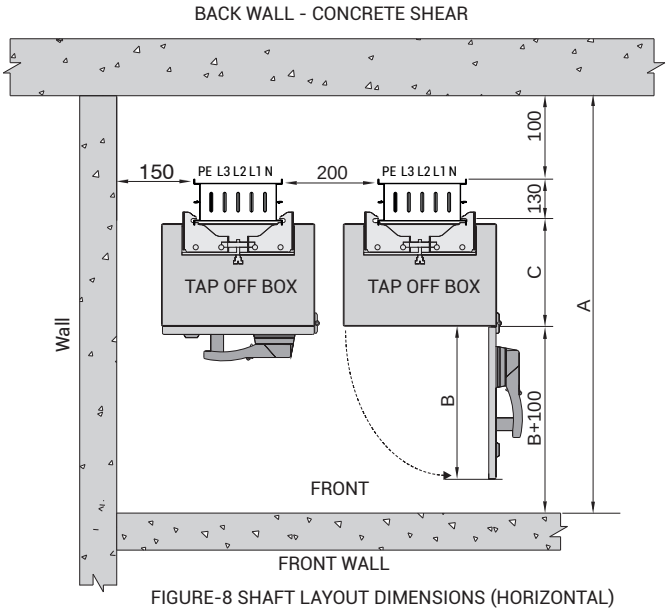


FIGURE-8 SHAFT LAYOUT DIMENSIONS (HORIZONTAL)

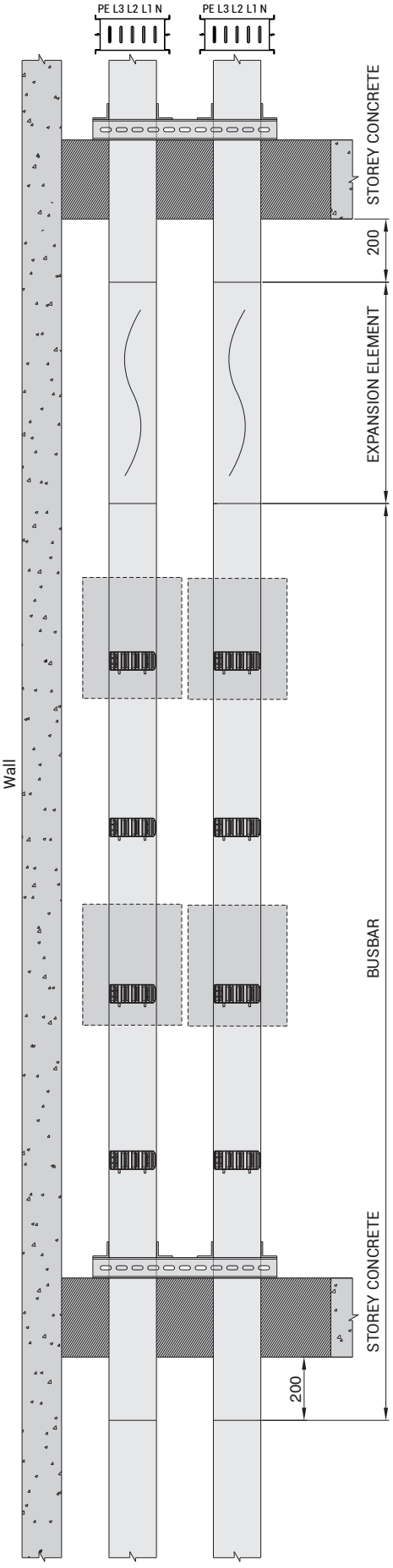


FIGURE-9 SHAFT LAYOUT DIMENSIONS (VERTICAL)

NOTE: For obtaining the correct shaft layout value;
A= B+C+330

A = Minimum Front Wall Distance
B = Cover Opening Distance
C = Tap Off Box Depth,
(Tap Off Boxes page, see page 18-19 or the custom C dimension of your tap-off box)

Tap Off Box Application In Vertical Lines

In vertical lines, the neutral conductor is considered as the conductor on the right side when viewed from the front.

■Dimensions given are minimum values. ■ All dimensions are in mm.

▶▶Horizontal and Vertical Expansion Module Applications

Horizontal Expansion Module (YDT) Applications

Used as shown below with the figures in long horizontal lines. (Figure-1)

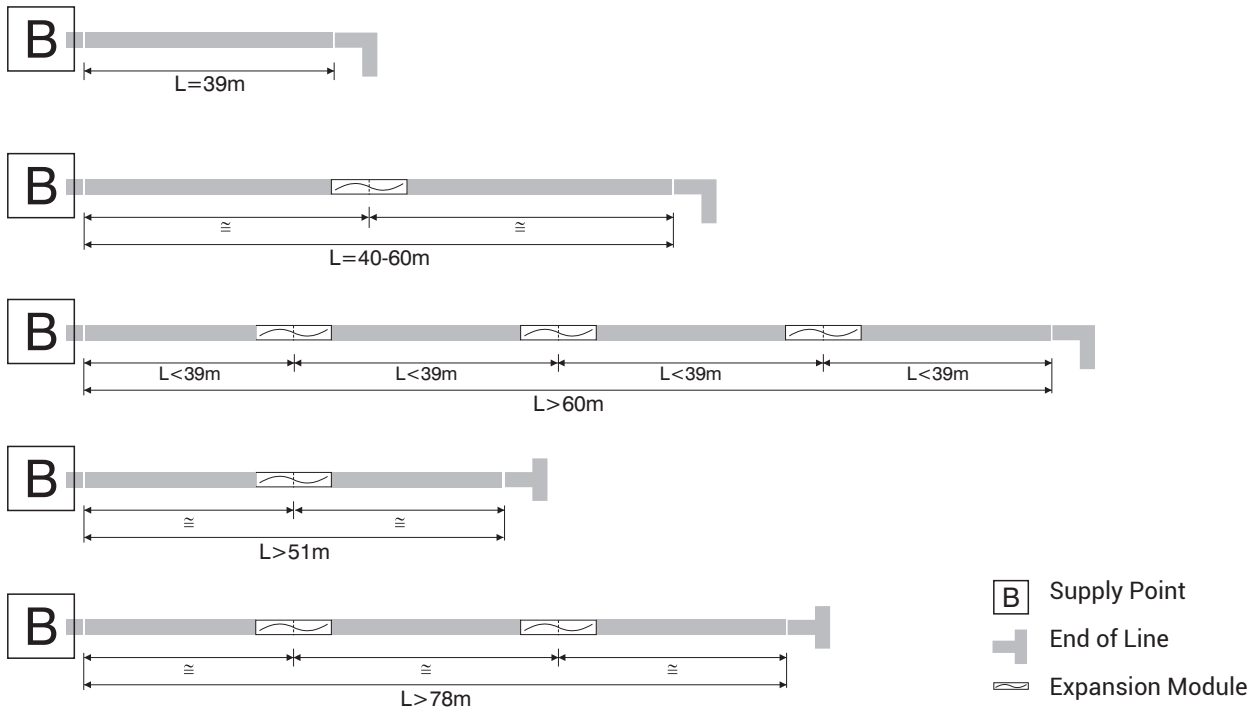


FIGURE-1 YDT APPLICATION

It is essential that a YDT is used if busbar runs cross a building expansion joint. (Figure-2)

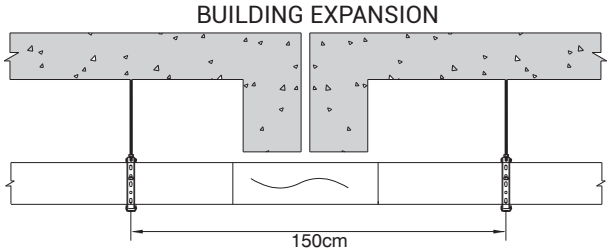


FIGURE-2 YDT BUILDING EXPANSION APPLICATION

Vertical Expansion Module (DDT) Applications

1-) Used in vertical lines of multi-storey buildings.
2-) One piece used in between two fixed hangers in each storey passage.(Figure-3)

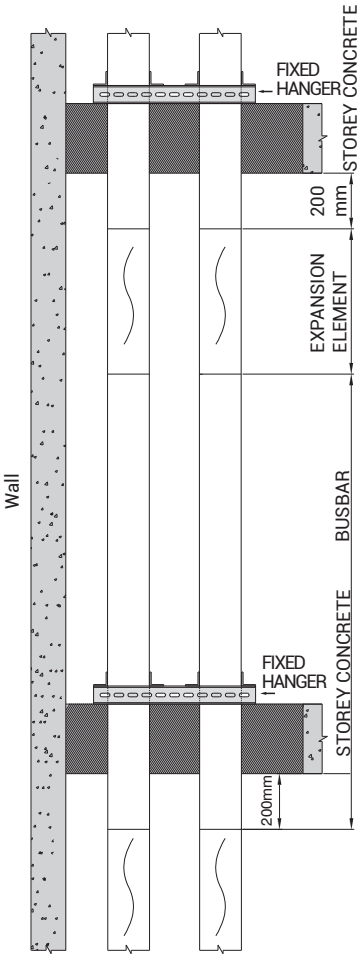
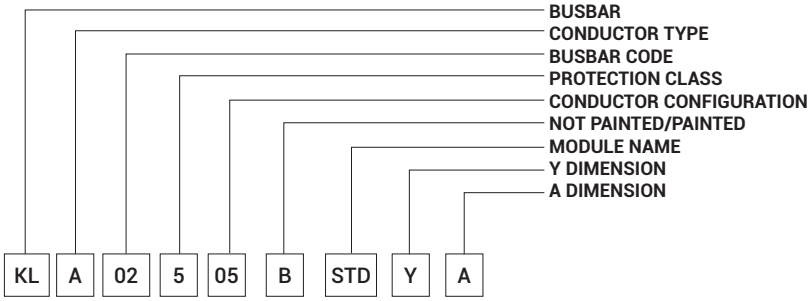
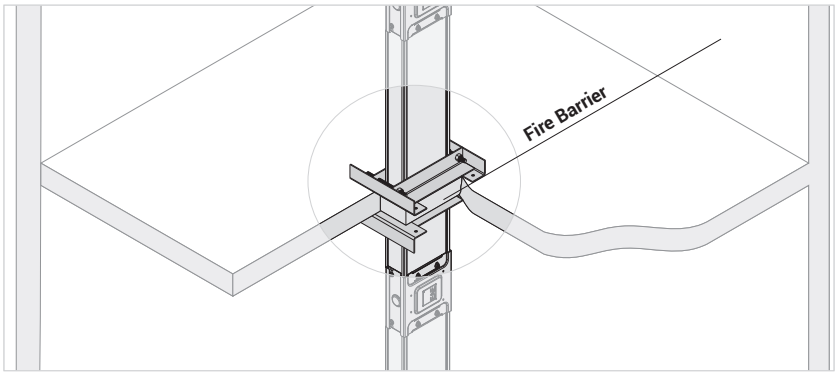


FIGURE-3 DDT APPLICATION

E-LINE KL

▶▶Fire Barrier

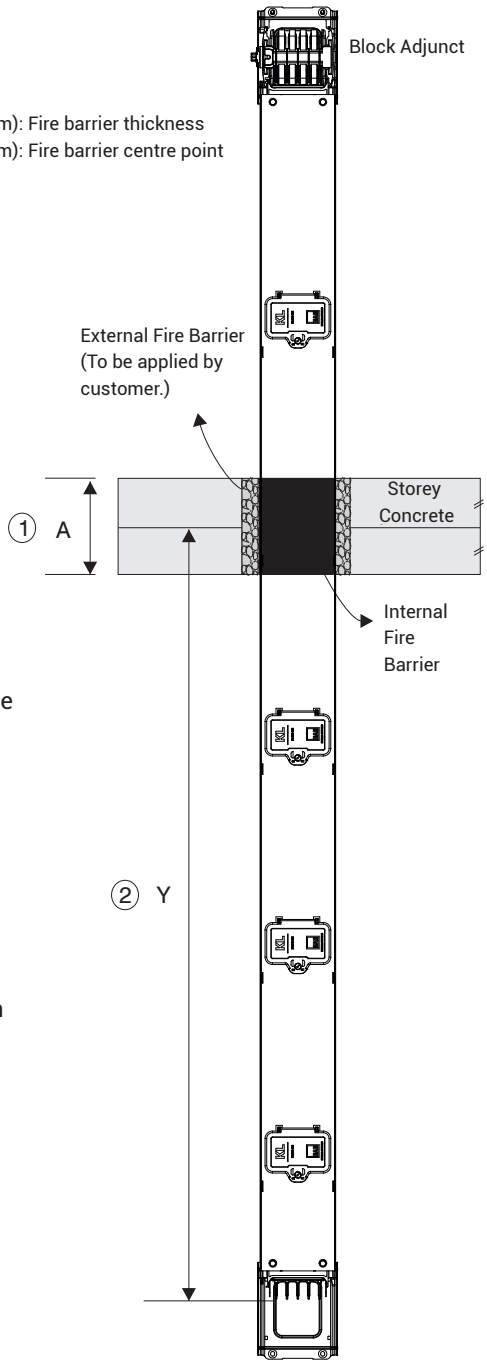




Sample Order:
For 250 A, Copper, IP 55, 5 Conductors Busbar Fire Barrier

KLC 02505 - B - STD -150 - 40

A (mm): Fire barrier thickness
Y (mm): Fire barrier centre point



Fire Barriers

Used to prevent flame and smoke from passing through one area to another using the busbar with separate structure as a funnel in storey passages in vertical lines, or in wall passages in horizontal lines.

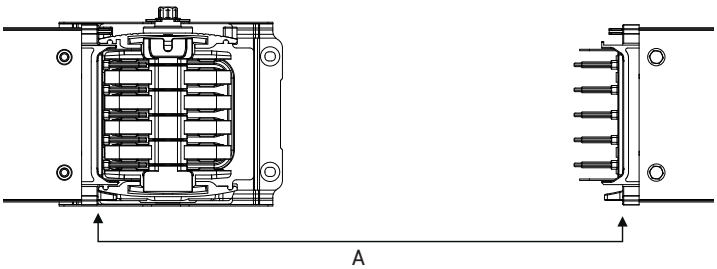
Fire Barrier Dimensions

Below pointers should be taken into consideration when ordering and giving the dimensions of fire barriers that will be used in KL Busbar.

1. Thickness of storey concrete or wall should be given in mm. (A mm)
2. The centre dimension where fire barrier will be placed on the busbar should be measured from the side of KL busbar without block adjunct, and should be given in cm.(Y mm)
3. No window is placed to the area with fire barrier.
4. In cases where no storey and wall thickness is specified, standard 300mm fire barriers are used.
5. Minimum midsize dimension with fire barrier is 700mm.

▶▶Determination of Special Lengths

During busbar installation, midsize (custom sized) busbars are used where standard sizes do not fit or in other locations. In such cases, determine the midsize dimensions as stated below. Minimum midsize dimension is 350mm.

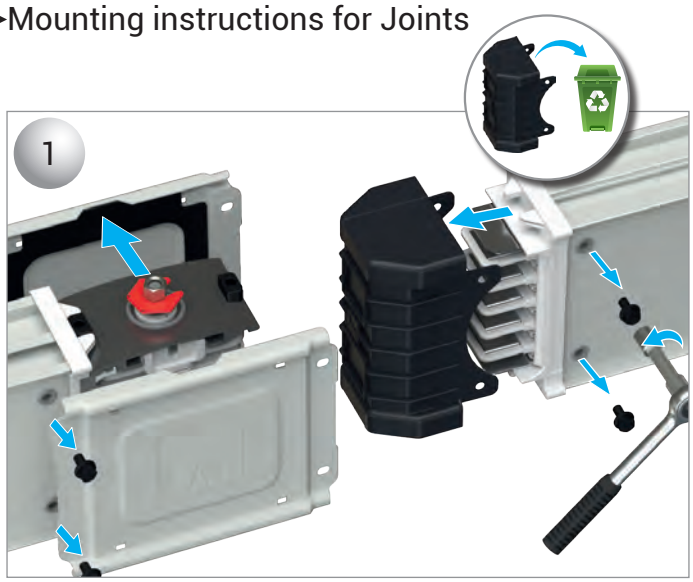


The dimension X is the measurement in cm from the corner of the body plate of a busbar to the other busbar's corner of body plate. Then, by subtracting 120mm from this dimension, midsize dimension is calculated.
X=A-120mm X=Midsize Dimension

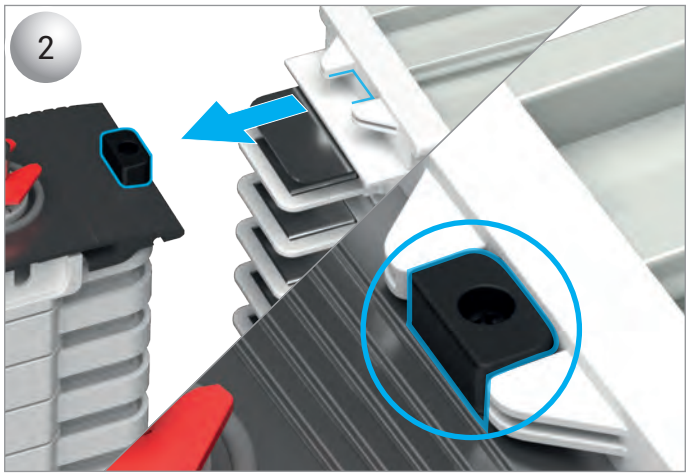
■ Please call our company for more information.

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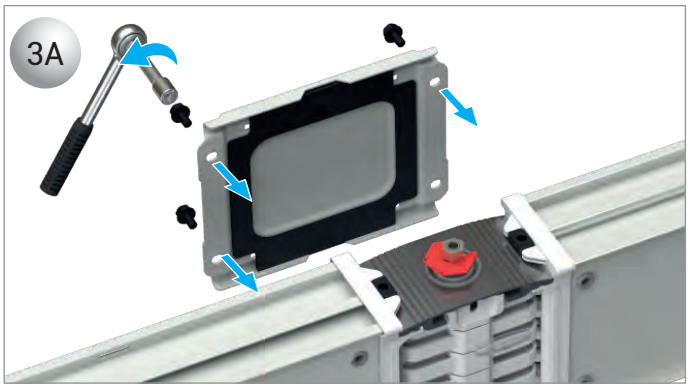
▶▶Mounting instructions for Joints



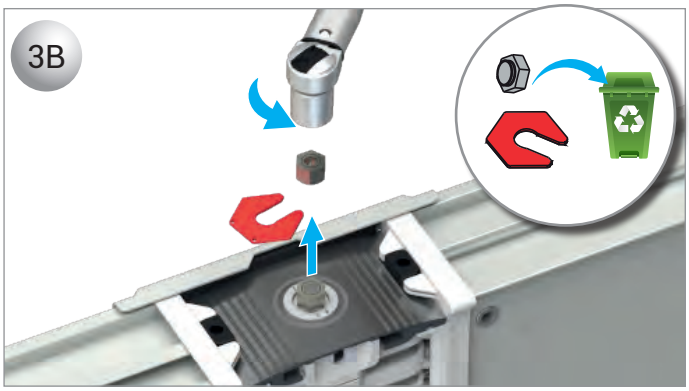
1- Align the body with and without block adjunct. Remove the adjunct cover and protection plastic.



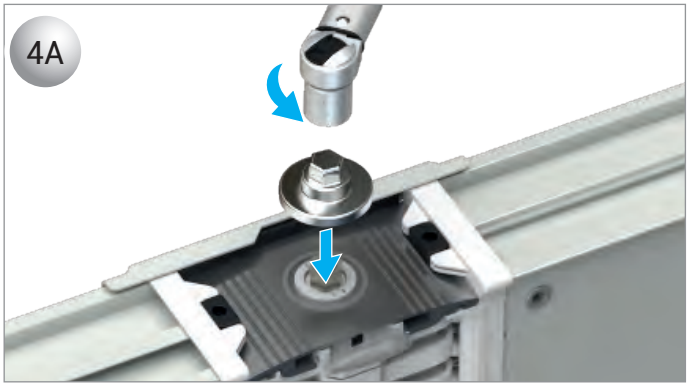
2- Combine the body with block adjunct, with the without block adjunct. Make sure that you align them properly.



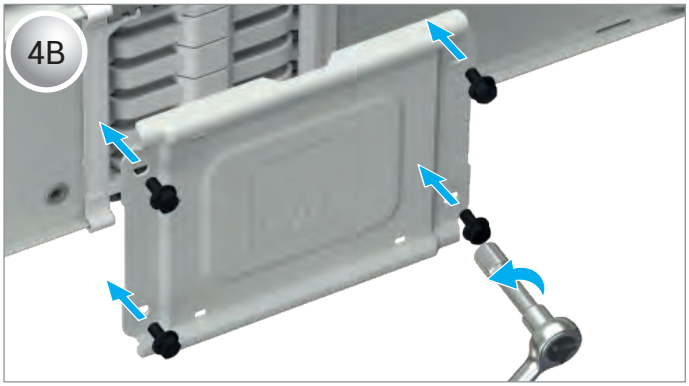
3A- Attach to the back side of the adjunct cover.



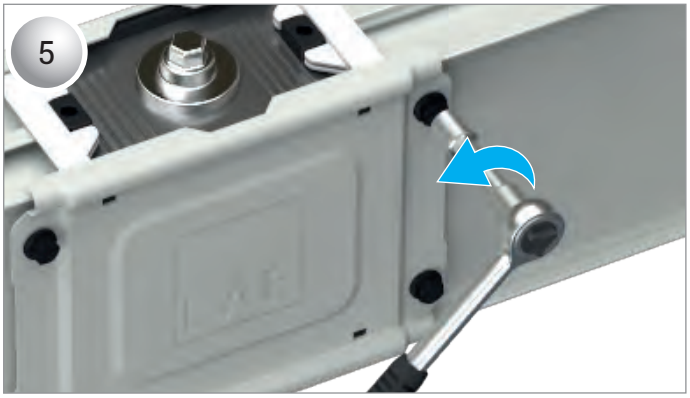
3B- Tighten the double-head breaking type nut until the first head breaks.



4A- Fit the adjunct cup to the nut and tighten with the specified torque. 20 Nm.



4B- Install the adjunct cover and the bolts.



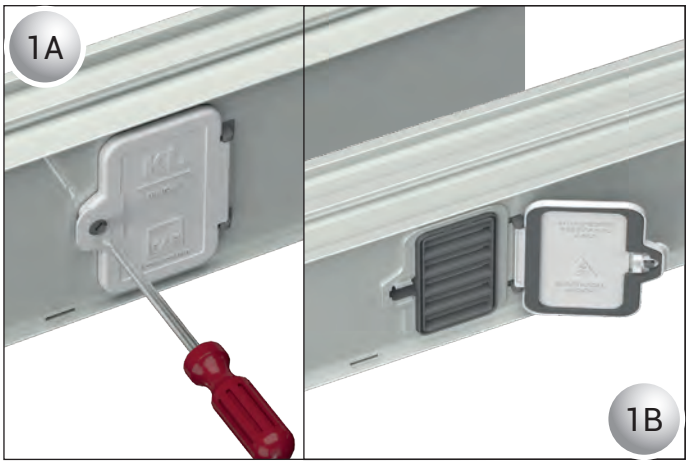
5- Tighten the bolts.



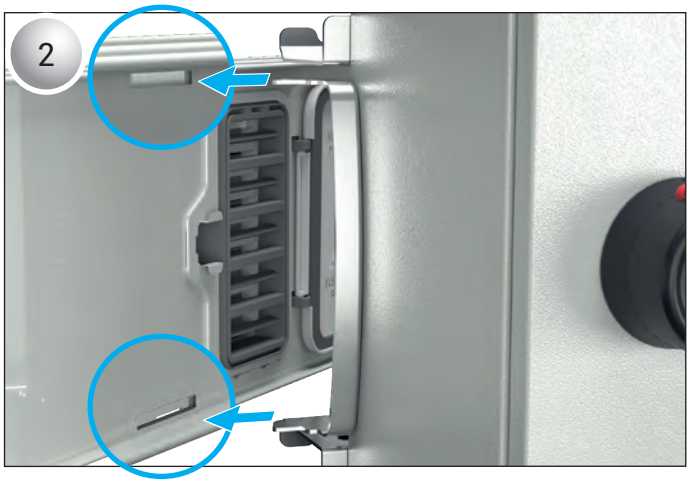
6- You have completed the additional assembly.

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▶▶Lever Type Box Installation Manual



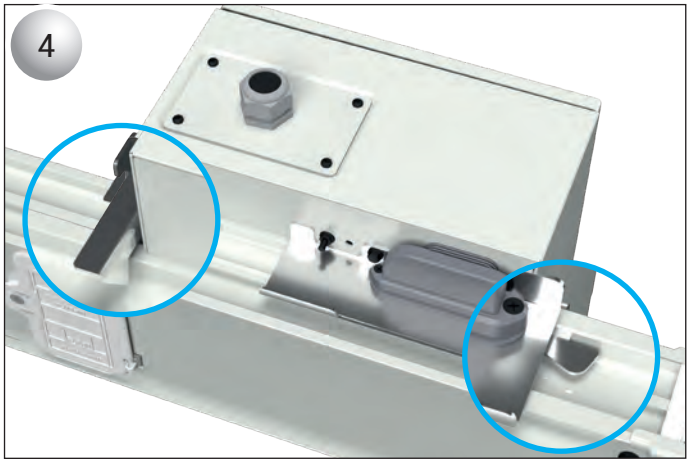
1A- Loosen the window securing screw with a flat-head screwdriver.
1B- Open the window through the body. At this stage, the window cover should not be removed.



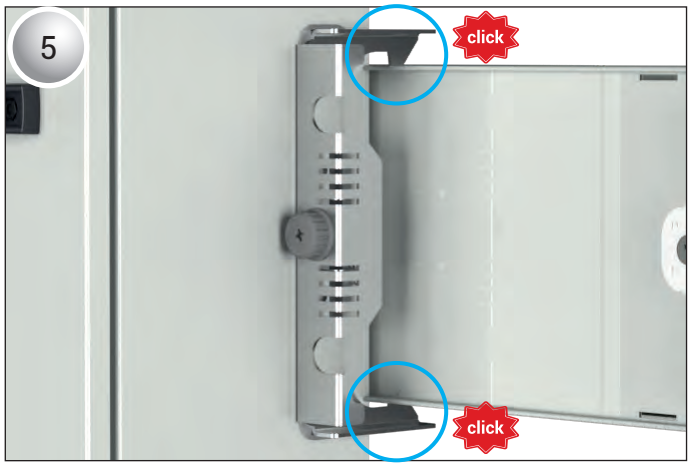
2- Insert the box lever plate to the handle hole on the body.



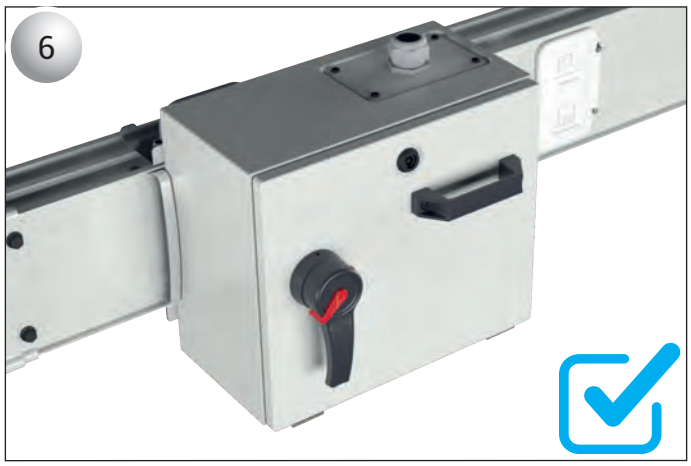
3- After placing the lever plate, move the hanging part of the box towards the body with an angle, and fit it into the place.



4- Make sure that the box securing plate and handle plate fit into the body.



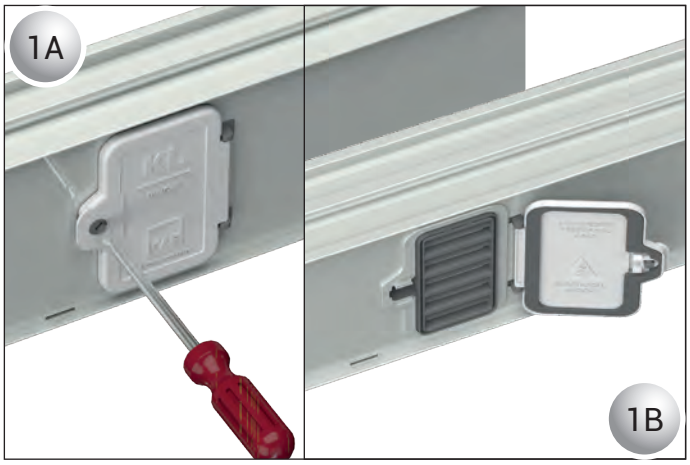
5- Tighten the screw on the securing plate of the box, and make sure that the part with the gap has fit into the body.



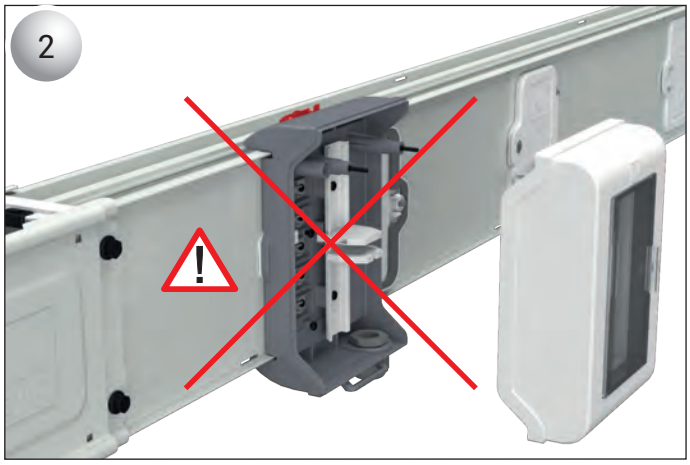
6- Now, your box is ready to use!

E-LINE KL

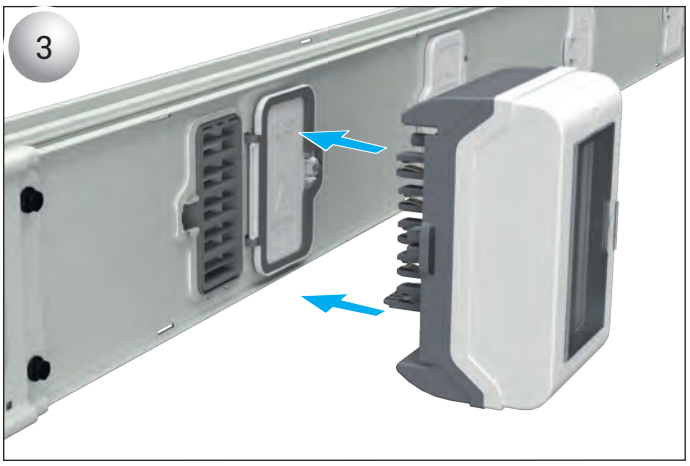
▶▶Plastic Box Installation Manual



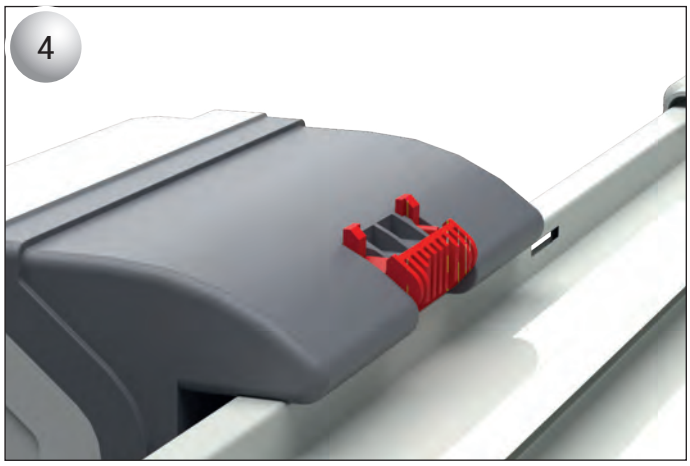
1A- Loosen the window securing screw with a flat-head screwdriver.
1B- Open the window through the body. At this stage, the window cover should not be removed.



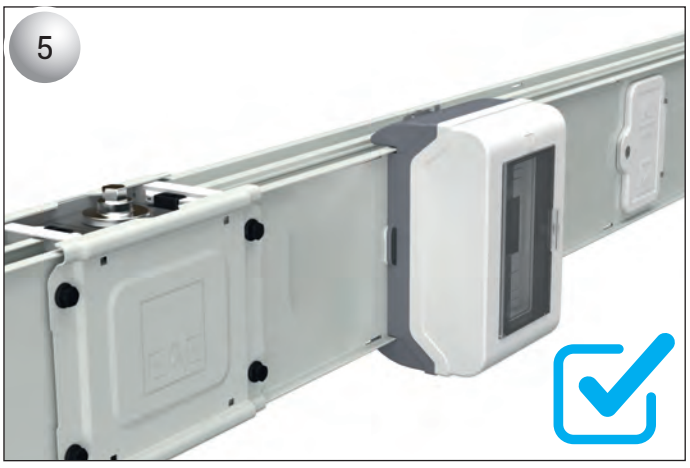
2- Placing the lower body of the box to the open window slot as shown in the figure, and performing the cable installation work this way will cause danger. Cable installation work should be performed securely, separate from the body.



3- Place the box, with internal connections performed in accordance with the instructions, vertical to the body, as shown in the figure.



4- While attaching the tap off box to the busbar body, make sure that the red locking part is fully in contact with the body.



5- Now, your box is ready to use!

CE DECLARATION OF CONFORMITY

Product Group E-Line KL Busbar Energy Distribution System

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

The subject of the below identified declaration conforms with the European Legislations. This declaration of conformity is made under the responsibility of the manufacturer.

Standard:

TS EN 61439-6
Low-voltage switchgear and controlgear assemblies - Part 6: Busbar trunking systems

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. Inşaat San. ve Tic. A.S.
Akcaburgaz Mahallesi, 3114. Sokak, No:10 34522 Esenyurt-Istanbul

Mustafa AKÇELİK

Date

04.03.2024

Document Authorized Signatory

Elif Gamze KAYA OK
Deputy General Manager



E-LINE KL

▶▶Certificates



160A 1250A PLUG-IN BUSBAR SYSTEM PRODUCT OVERVIEW (E-LINE KL)

1-Standards & Certification:

-Busbar system should be in accordance with international IEC 61439-6 standard, type-approval test should be performed for each current rating of busbar system, and a standard conformance certificate should be obtained from internationally recognized test laboratories. Short-circuit type-approval tests should also be performed in accordance with the same standard, and a type-approval test certificate should be obtained. Busbar system should be manufactured in accordance with the standard and test certificate.

-Busbar system should have a CE mark.

-There should be type-approval labels, in accordance with the standards, on busbar system modules, specifying the brand, type, number of conductors and electrical ratings of the system.

-Busbar system should be manufactured in a plant that has ISO 9001 quality system and ISO 14001 environment system.

2- General Structure of the System

Busbar system should be in accordance with the below given phase configuration and number of conductors, should have a structure with Aluminium [or Copper] conductor fully coated with tin, and should be of air-isolated PLUG-IN type. The outer body should be galvanized sheet, and if specified below, the galvanized sheet body should be painted with RAL 7038 colour electrostatic oven dye. System's protection class should be IP 55.

2.1- Electrical Values

-Nominal isolation voltage of the busbar system should be 1000V.

-Minimum short-circuit values of the busbar ducts should be as given on the right:

For Aluminium conductors;	For Copper conductors;
160A and 250A: 1s value 10kA, peak value 17kA	250A : 1s value 10kA, peak value 17kA
315A and 400A: 1s value 15kA, peak value 30kA	315A : 1s value 15kA, peak value 30kA
500A: 1s value 25kA, peak value 52,5kA	400A : 1s value 25kA, peak value 53kA
630A and above: 1s value 35kA peak value 73,5kA	630A and above : 1s value 35kA, peak value 74kA

2.2- Body and General Structure

-Busbar system should be manufactured in current ratings between 160A - 1250A, with separate busbars.

-The body of the system should be in non-perforated galvanized sheet, and on one side of the body, there should be plug-in windows that are placed to provide outlets every 50 cm. These windows should be placed randomly on each side of the busbar body, and to provide outlets every 25 cm in average from both sides. To prevent wrong phase sequence connections during addition of busbar lengths, there should be stops securing the correct installation on the busbar.

-IP covers of the Plug-in points on the busbar should have hinges. Under the IP cover of the plug-in windows, there should be a grille system that is opened by sliding the box ground contact towards the plug-in window. It should be possible to open the grille mechanism while installing the tap off box, and the mechanism should automatically close when the tap off box is removed. Window structure should not allow intrusion of fingers, and hand contact to conductors.

-The body of the busbar ducts should be manufactured with zinc coated (galvanized) sheet with a minimum thickness of 0.9mm. [The body of the busbar ducts should be manufactured with galvanized sheet with a minimum thickness of 0.9mm, and coated with RAL 7038 colour epoxy polyester class paint.]

-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 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 expansion point, horizontal expansion parts definitely must be used in crossing points. Additionally, in horizontal lines, expansion parts should be used in every 40m.

-In the vertical shaft busbar applications, expansion elements with a physical structure equivalent to that of the busbar, that will bear the expansions of each storey should be used.

2.3- Conductors

-Busbar system should be with aluminium conductor between 160A-1000A. [Busbar system should be with copper conductor between 250A-1250A.]

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

-4 Conductors : L3 / L2 / L1 / N / + Body

-5 Conductors : PE / L3 / L2 / L1 / N / + Body

-5 Conductors : CPE / L3 / L2 / L1 / N / + Body

-Neutral conductors should be isolated, and within the same section as phase conductors.

-Aluminium conductors should be should be fully and continuously coated with nickel, and then tin, and of 6101 grade.

-[Copper conductors should be fully and continuously coated with tin, and should be of electrolytic copper type.]

2.4- Isolation Structure

- Busbar system conductors should be installed on flame-proof (850 GLW) isolators, and should have air ventilation with the formed separate busbar structure.

2.5- Modular Adjunct Structure

-Addition of busbar modules should be performed with a safe block adjunct and "single bolt construction" consisting of a single central bolt on all current ratings, isolators, square washer ensuring a proper adjunct structure and belleville washer mechanism. After tightening, the bolt head should be fixed.

3- Tap-Off Boxes

-It should be possible to draw up to 400A current from each plug-in tap off point of the plug-in type busbar system with plug-in tap off boxes. It should be possible to remove and install these boxes without de-energizing the busbar. There should be at least 5 plug-in windows on the standard length of 3 meters. In cases where the system is IP 55 and these windows are not used, they should be closed with a IP-55 protected cover.

-The contacts of the plug-in tap-off boxes should be silver coated.

-Busbar tap off boxes should be manufactured with flame-proof (up to 80 A) (850 GLW) material. For currents higher than 125 A, tap off boxes should be manufactured with sheet metal, and should be coated with RAL 7035 colour epoxy polyester class electrostatic powder paint.

-Plug-in tap-off boxes should meet the below mechanical and electrical safety requirements.

-There should be a safety mechanism that mechanically locks the box to the busbar housing in order to prevent the box to be inserted into the busbar or removed from the busbar when its protection device inside is set on the "on" position. The cover of the box should only be opened when it is set on the "off" position. When the box is connected to the busbar, and its cover is open in "off" position, there should be no exposed live conductors, and in this form, the box should be of protection class IP 2x. When the box is installed to the system, its grounding contact should be the first part to contact; and it should be the last to separate from the system when the box is removed from the system.

-Busbar tap-off boxes should be equipped with SYK fused load breaker [or with compact breakers] with lock mechanism that restricts the opening of the cover without de-energizing the load.

4- Installation and Commissioning Testing

-Installation of the busbar system should be done according to electrical project, electrical single line diagrams and layout plans, in line with the type and current values shown in these plans, and the installation instructions should be carefully observed. Central adjunct bolts should be tightened with the appropriately set torque wrench and the nut part of the bolt should be fixed using a locking lid.

-After the busbar system installation is completed and conformity to project and installation instructions are checked, isolation test must be performed with a megger isolation test device and a commissioning test report should be regulated. Isolation value between each conductor and the body should be over 1 megaohm.

PRODUCT TYPES



BUSBAR ENERGY DISTRIBUTION SYSTEMS



CABLE TRAYS



TROLLEY BUSBAR ENERGY DISTRIBUTION SYSTEMS



INDOOR SOLUTIONS



SUPPORT SYSTEMS



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