EAE

ELEKTRİK

E-LINE KOP

Busbar Systems 160...800 A

ELINEKO-II

▶▶Introduction

E-Line KO-II Busbar System distributes electrical power, both vertically and horizontally at premises where there is a need for electrical power 160 A and 800 A.

It provides a prefabricated and flexible electrical distribution system for all factories engaged in mass production, like automobile plants, textile plants, furniture factories and for buildings where there is a need for a reliable power supply such as business centres, hotels, hospitals, warehouses and all high rise buildings.

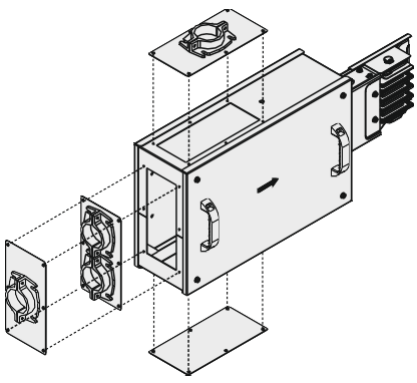
Fast, Flexible Engineering
The large number tap-off points makes it possible to engineer the power supply systems at an early stage, even before the final distribution of loads is known.

Fast and Easy Mounting
Power is easily supplied to machines by **E-Line KO- II** The installation of the system does not require any expertise. Supports and accessories are available for mounting the system either from the ceiling or the wall.

Safe Power Distribution and Transportation
E-Line Busbar Systems increase personnel safety by their special features.

Lower Total Installed Cost
Total Busbar material and installation costs are often equal to or less than cable and conduit .

Flexible Power Supply
Tap-off points at short intervals make electrical power available in all locations, the power supply can be adapted to different production processes simply by relocating the tap-off units.
Being built up of basic elements, it can at any time be extended, modified, dismantled and re-used.

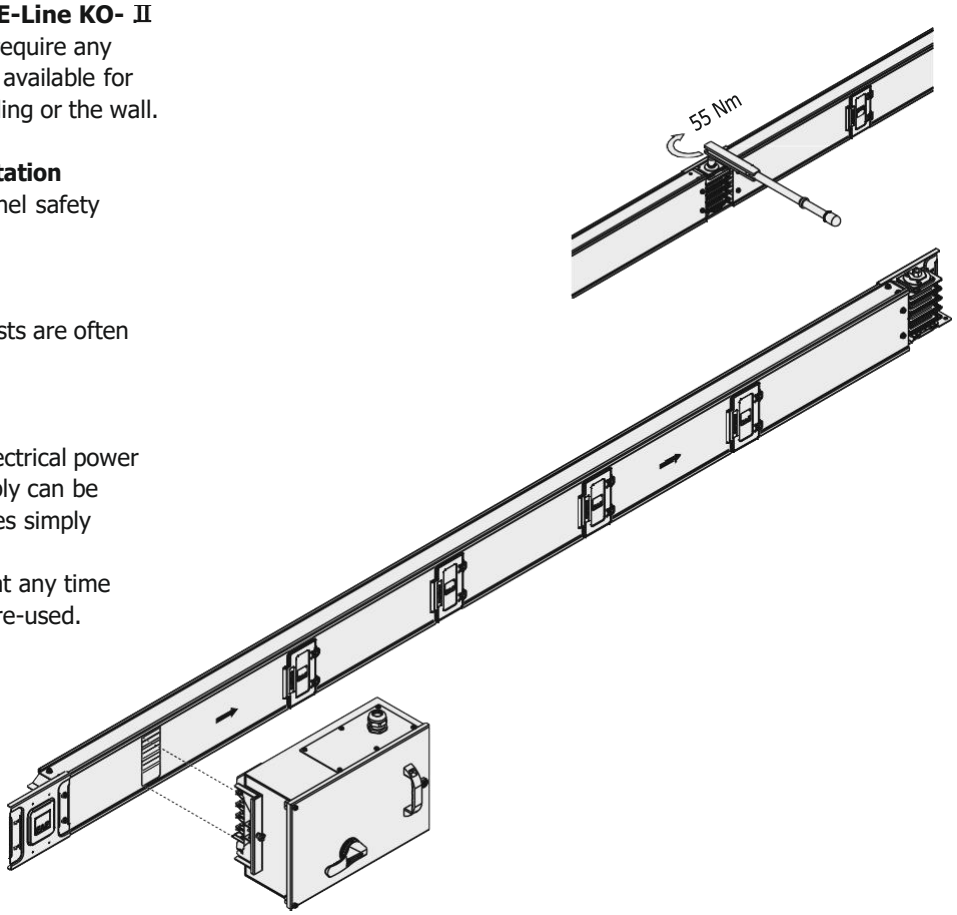


Safe Power Take Off
The earth of the tap-off box makes contact with the busbar first and ensures the safety, of the box andthe system that's been fed.

Modern Appearance
Other than its functional advantages **E-Line KO-II** busbar system also creates a modern appearance in buildings where it is used.

Lower Life Cycle Cost
Busbar components can be added, removed or relocated after the initial installation, saving time and money.

Tap-off Points
Power can only be supplied by **E-Line KO- II** tap-off boxes. Where necessary the unused tap-off points can be restricted by sealing. Dust covers protect the system from any accidental contact and also prevents the ingress of pollutants from the environment.



Conductors

- Copper and Aluminium conductors are tin plated along their length.

- Cross-section of neutral conductor is the same as the phase conductors.

- Upon request the **KO-II** range can also be manufactured with 5 conductors.

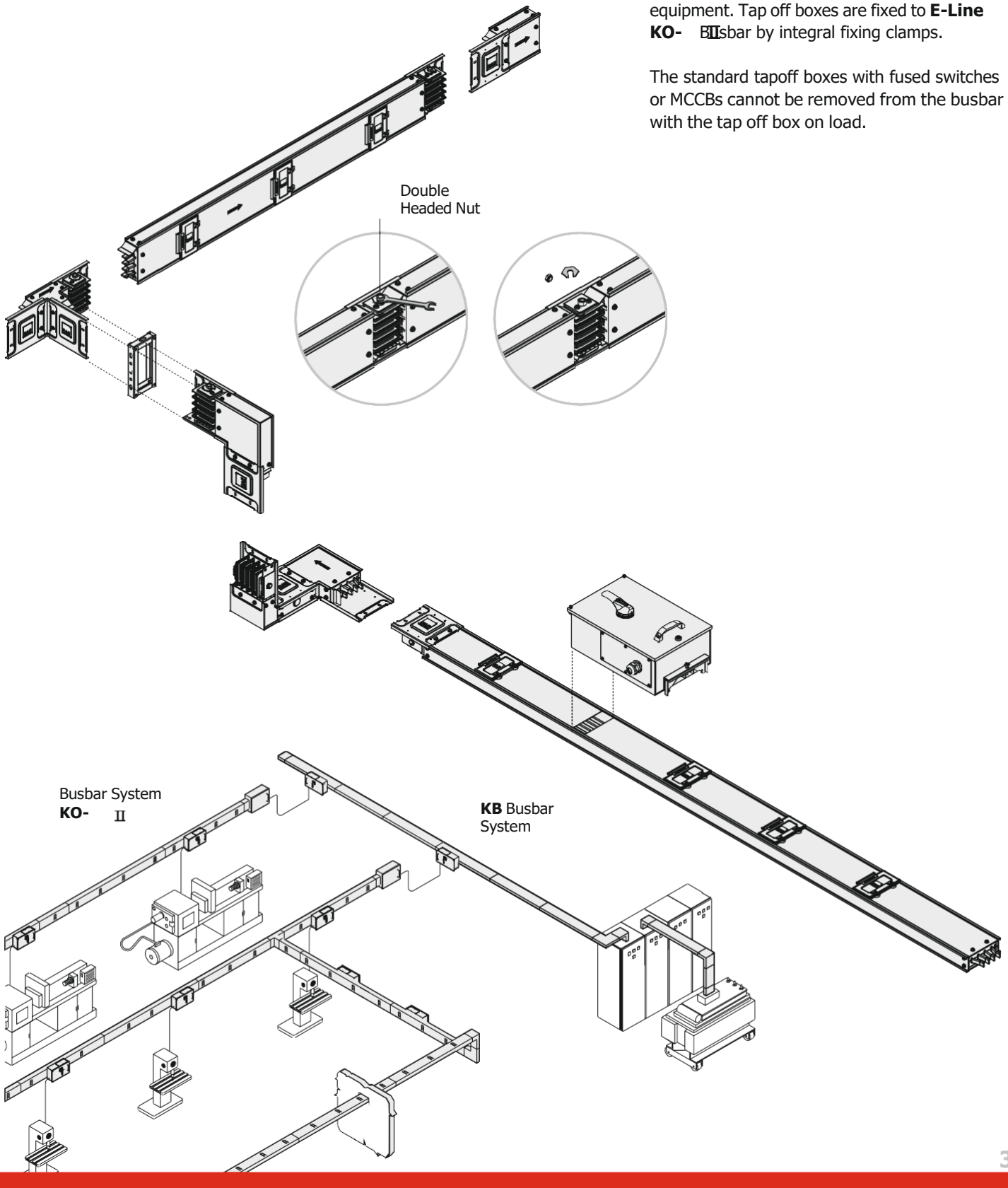
"One Bolt Joint"

E-Line KO-II Busbars are easily 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 and reliable joint.

Tap-off Boxes

Power upto 400A can be supplied by tap-off boxes. Standard tap-off boxes are equipped with an interlock mechanism which prevents the cover of tap-off boxes from being opened before the power is turned off. Tap-off boxes are easily mounted on the busbar without any additional mounting equipment. Tap off boxes are fixed to **E-Line KO-** BIIsbar by integral fixing clamps.

The standard tapoff boxes with fused switches or MCCBs cannot be removed from the busbar with the tap off box on load.



▶▶ Design

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

- Location, number, type and approximate ratings of loads,
- Transformer rates and short-circuit capacities,
- Utilization factor = α
- System co-ordination with other distribution systems (heat, water, etc.)
- Determining the route of **E-Line KO-II** on layouts, Deciding on suitable supports,
- If necessary, co-ordination of **E-Line KB** and **E-Line MK-KAP** with **E-Line KO-II** runs.

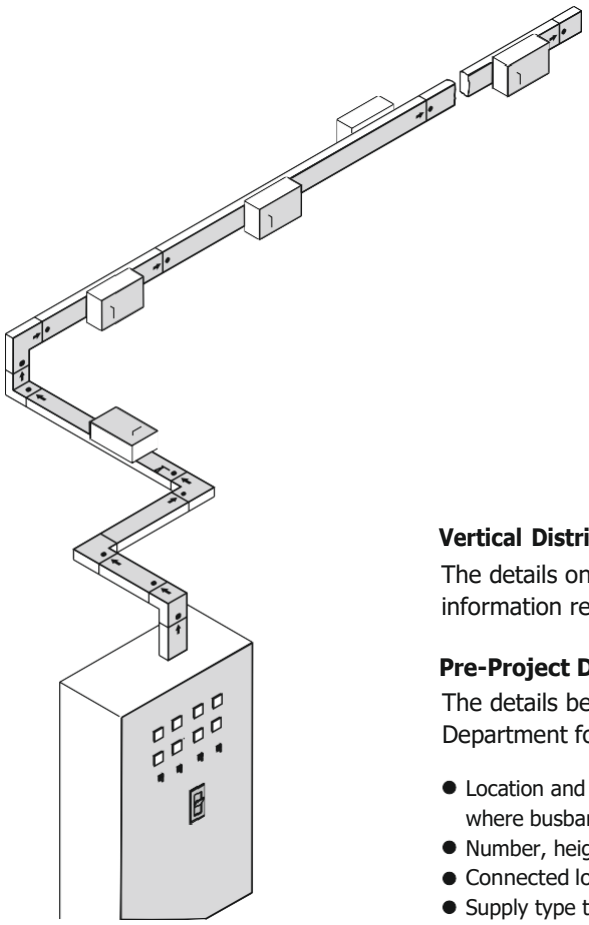
Rated Current

The current is calculated using the following equation.

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

I_B = Operating Current (A)
P = Installed Load (W)
α = Utilization Factor
U = Supply Voltage

- Busbar Current rating is chosen as equal to or higher then the calculated I_B current.
- After the voltage drop calculation if the chosen current rating is too low, a higher rating should be selected.

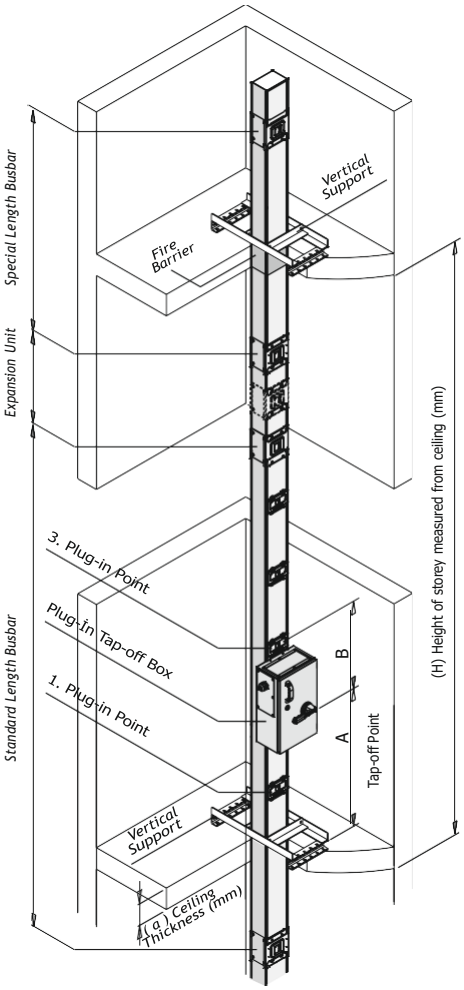


Diversity Factor (α)

The diversity factor(α) depends on the type and number of loads. It is usually around 0.7 or lower. The diversity factor of a line supplying electric motors and lighting systems is usually 0.6 It is as low as 0.5 in welding shops of car factories,
(α) can be 1 in lines where only one big load is supplied.

Applications

As each building's structure is different from another for vertical and horizontal applications special projects have to be designed.



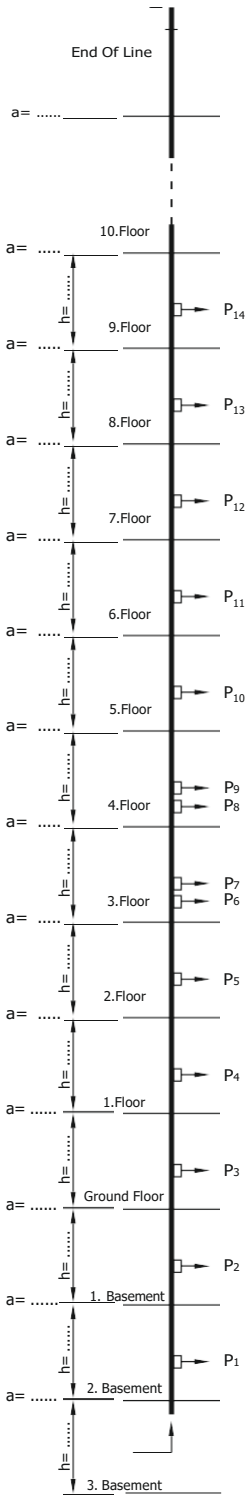


Figure 1

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, (h=)
- Number, height and ceiling thickness of each storey, (a=)
- Connected load for each storey, (p=)
- Supply type to the vertical line (Busbar or Cable).

ELINEKO-II

▶▶Order Code System

BUSBAR TYPE
CONDUCTOR TYPE
BUSBAR CODE
PROTECTION DEGREE
CONDUCTOR CONFIGURATION
UNPAINTED / PAINTED
COMPONENT

KO | A | 06 | 5 | 5 | - | II | - | B | - | DDT

Busbar Type

Conductor Type

Aluminium	A
Copper	C

Busbar Code

Busbar Rated Current		Busbar Code	
Aluminium	160	01	6x20
	250	02	6x25
	315	03	6x30
	400	04	6x50
	500	05	6x62,5
	600	06	6x75
Copper	250	02	6x20
	315	03	6x25
	400	04	6x30
	600	06	6x50
	800	08	6x75

Protection Degree

IP 55	5

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	A
Upwards Elbow	Y
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	D
Reductions	RD
End Closer	S
Horizontal Expansion	YDT
Vertical Expansion	DDT
Flexible	F
Feeder Box 1	B1
Feeder Box 2	B2
Central Feeder Box 1	BO1
Central Feeder Box 2	BO2
Panel Connections	P10
Panel Connections	P11

Paint

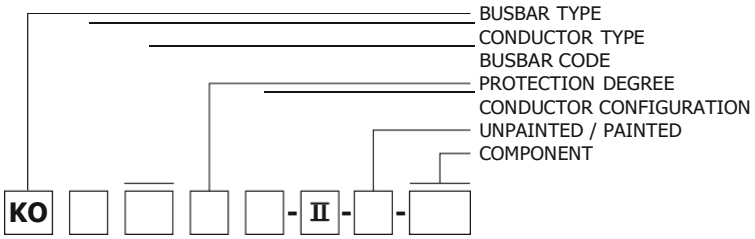
UNPAINTED	-
PAINTED	B

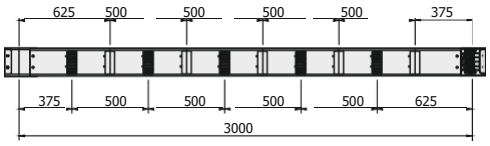
Conductor Configuration

Number of Conductors	Code	Configuration								
		L1	L2	L3	N	PE	½ PE	CPE	½ CPE	PE (Housing)
4 conductors	4									✓
5 conductors	5									✓
4 ½ conductors	6									✓
5 conductors (CPE)	7							✓		✓
4 ½ conductors (CPE)	9								✓	✓

ELINEKO-II

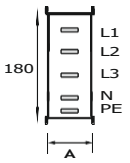
▶▶Standard Components





Electrical Power up to 400A can be supplied from the busbar by Tap-off boxes.

E-Line KOII Busbar is manufactured in 3m lengths as standard, special lengths can be manufactured on request.



Current	Aluminium	Copper
(A)	(A) mm	(A) mm
160	70	-
250	75	70
315	80	75
400	100	80
500	112	-
600	125	100
800	-	125

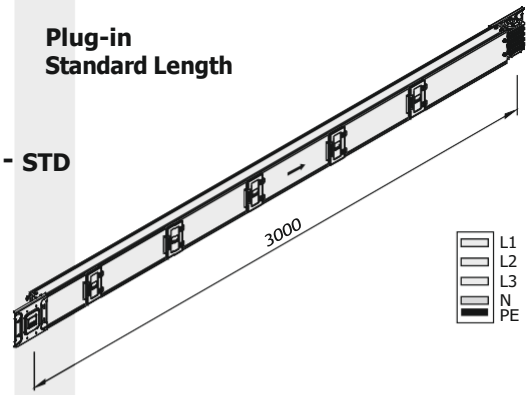
Busbar cross-section dimensions

Please call us for non-standard components.

Plug-in
Standard Length

Sample Order:
250 A, Aluminium, Plug-in,
IP 55, 4 Conductors
KOA 0254-II-STD

- STD

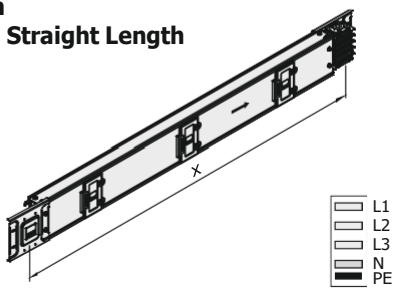


Plug-in
Special Straight Length

Sample Order:
400 A, Copper, Plug-in,
IP 55, 850 mm. 5 Conductors
KOC 0455-II-85

- X

Minimum special length that can be manufactured is 350 mm.

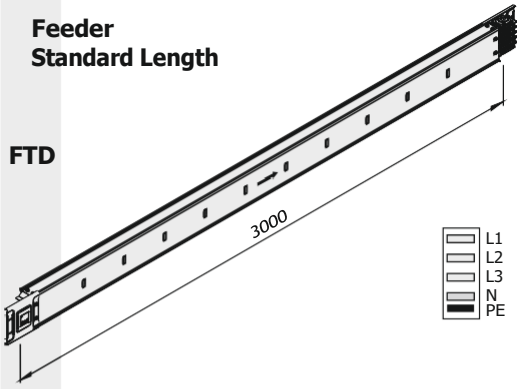


X Special
Straight Length
(mm)

Feeder
Standard Length

Sample Order:
315 A, Aluminium, Feeder,
IP 55, 5 Conductors
KOA 0355-II-FTD

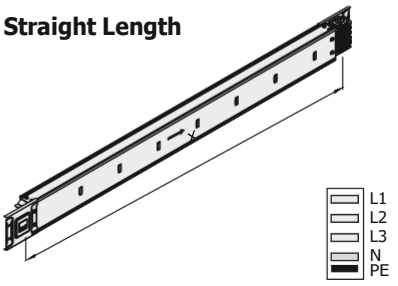
- FTD



Feeder
Special Straight Length

Sample Order:
160 A, Aluminium, Feeder,
IP 55, 600 mm, 4 Conductors
KOA 0154-II-60

- FX



X Special
Straight Length
(mm)

CE DECLARATION OF CONFORMITY

Product Group E-Line KO-II Busbar Energy Distribution System

Manufacturer EAE Elektrik Asansor End. Insaat San. ve Tic. A.S.
Akcaburgaz Mahallesi, 119. Sokak,
No:10 34510 Esenyurt-Istanbul

This is to attest, under our sole responsibility, that the aforementioned products conforms with the determined regulations,guidelines and the below standards.

Standard :

EN 60439-2
Low-voltage switchgear and controlgear assemblies –Part 2:Particular requirements for busbar trunking systems (busways)

IEC 60439-2
Low-voltage switchgear and controlgear assemblies –Part 2:Particular requirements for busbar trunking systems (busways)

CE - Directive

(2006/95/EC) Electrical equipment designed for use within certain voltage limits

Date

21.01.2014

EAE Elektrik A.Ş.

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160A 800A BUSBAR SYSTEM
PRODUCT OVERVIEW (E-LINE KO-II)

1- Standards & Certification:

- Busbar system shall be designed and manufactured as per IEC 60439-2 standard. Each individual rated busbar shall have separate type test certificate from an independent internationally accredited laboratory.
- Manufacturing facility of busbar systems shall have ISO 9001 and ISO 14001 certification.
- Busbar system shall have CE marking.
- Each product shall have a "Type Label", which indicates the brand, type of the unit, conductor number and electrical details.

2- General Structure of Products:

- Busbar system shall be Air-Insulated and Plug-in type. Aluminium or Copper conductors shall be tin plated along the entire length. Housing shall be galvanized steel or if required RAL7038-Electrostatic painted.

2.1- Electrical Characteristics:

- Busbar systems nominal insulation voltage shall be 1000V.
- As per ampere rates, minimum short circuit values shall be like below;
- Temperature rise shall be maximum 55K over 40°C ambient temperature for both tin plated Aluminium and Copper conductor busbars.

For Aluminium Conductor;	For Copper Conductor;
160A: 1sec/rms-10kA, Peak-17kA	250A - 315A: 1sec/rms-18kA, Peak-36kA
250 and 315A: 1sec/rms-15kA, Peak-30kA	400A: 1sec/rms-25kA, Peak-52,5kA
400 and 500A: 1sec/rms-30kA, Peak-63,5kA	600A and above: 1sec/rms-35kA, Peak-73,5kA
600A and above: 1sec/rms-35kA, Peak-73,5kA	

2.2- Housing and Structure:

- Busbar system shall be of air insulated type. The bars shall be supported by insulators installed into the housing at every 25 cm.
- On a three meter standard length busbar the distance between the plug-in points on one side shall be 50cms. The points shall be on both sides of the busbar making the average distance of plug-in points 25cm.
- To prevent wrong alignment of the phase sequence during installation there shall be mechanical barriers on the joint that shall ensure correct mounting.
- IP Plug-in covers of the busbar system should be hinged.Plug-in windows shall have automatic shutter system. This shutter shall open automatically when the earth contact of tap-off box is inserted.
- Busbar system shall have all necessary accessories (elbows, offsets, panel-transformer connections, reductions, etc). Manufacturer shall supply special dimensioned units in short time, if the project conditions requires.
- For horizontal runs, a horizontal expansion unit shall be used at every 40m and expansion points of the building.
- For vertical applications, a vertical expansion unit shall be used at every floor. Busbar system shall be rigidly fixed by supports at every floor.

2.3- Conductors:

- Busbar system shall have Nickel and Tin-plated 6101 class aluminium conductors (160-600A). / Busbar system shall have Tin-plated Electrolytic copper conductors (250-800A).
- Busbar system shall have below number of conductors and phase configuration;

a) 4 Conductors:(4 full size conductors + Housing (earthing)
b) *4 ½ Conductors* :(4 full size conductors + ½ earth conductor + Housing)
c) *5 Conductors* :(5 full size conductors + Housing (earthing))
d) *5 Conductors* :(5 full size conductors, 5th bar shall be used as clean earth + Housing).

- Neutral conductor shall have the same cross-section (100%) of phase conductors.

2.4- Insulation:

- Busbars shall have air-insulation system.
- Rated insulation voltage of the system shall be 1000 V.

2.5- Joint Structure:

- Electrical and mechanical connection shall be made at joints by "single bolt" joint construction and each joint shall have two "Belleville" washers.
- Insulators of the joint shall be manufactured of glass-reinforced polyester.
- Joints shall be realized by a torque spanner (wrench) set at 55 Nm.
- To prevent the joints from transportation damages, they shall be protected by metal caps, which shall be removed before installation.
- Joint bolt shall be locked from both sides (Bolt head and nut).

2.6- Protection:

- Protection degree of the busbar system shall be minimum IP55.

3- Tap Off Boxes:

- Rating of plug-in tap off boxes shall be up to and including 400A. Plug-in tap off boxes shall be installed, when the busbar line is energized.
- Tap off boxes shall have an electrical interlock mechanism, which ensures that plug-in tap off box cannot be removed mechanically from the busbar, when the switch is at "ON" position. Mechanical interlock mechanism shall prevent the cover of the box from opening, when the switch is at "ON" position.
- When the switch is at "OFF" position and the cover is open, tap off box shall provide IP2X protection level. (There shall not be any accessible live part in the box).
- Tap Off boxes shall be suitable for any brand of MCB.
- Contacts of plug-in tap off box shall be silver-plated copper.
- While inserting the contacts of Plug-in tap off boxes, earth contact shall make first contact.
- Tap off boxes up to 80A shall be manufactured of (850 GLW) type plastic material. Tap off boxes from 160A up to 400A shall be manufactured of sheet steel and epoxy painted RAL 3020.

4- 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 manufacturer's test procedures. The results of the test shall be reported to the manufacturer. Minimum insulation value shall be 1Mohm.

PRODUCT TYPES


E-LINE KX

Compact Busbar Distribution System
630...6300 A


E-LINE CR

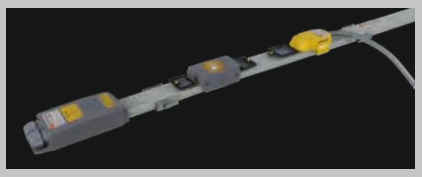
Compact Busbar Distribution System
630...6300 A


E-LINE KB

Compact Busbar Distribution System
800...6300 A


E-LINE MK

Small Power Plug-in Busbar Distribution System
100-160-225 A




E-LINE DABLINE

Underfloor Busbar Systems
63-80 A


E-LINE KAP

Plug-in Busbar Distribution System
40-63A

E-LINE DL

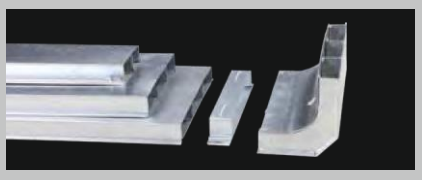
Multi-Conductor Lighting Busbar System
25-32-40 A


E-LINE KAM

Lighting Busbar System
25-32 A


E-LINE TB

Multi Conductor Trolley Busbar System
35...250 A




E-LINE DK

Underfloor Ducting Systems


E-LINE UK

Cable Tray Systems, Cable Ladder Systems,
Binrak (Unistrut) and Tray Support Systems

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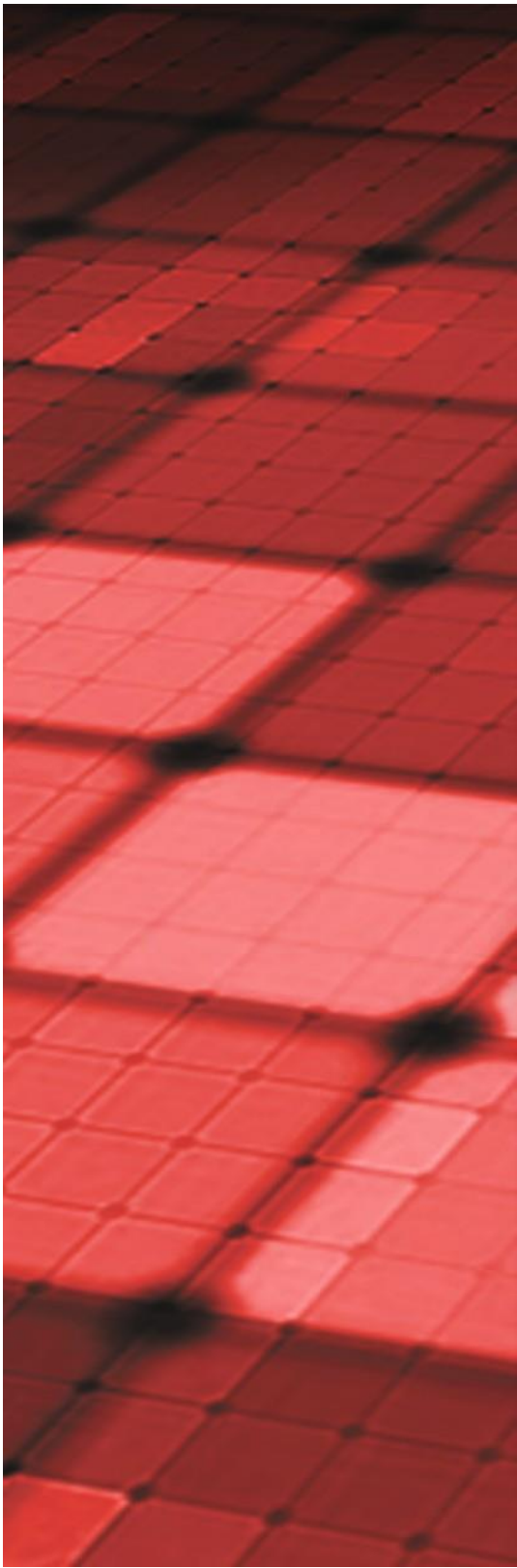

IEC 60439-2

ME 04

ISO 9001 14001

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