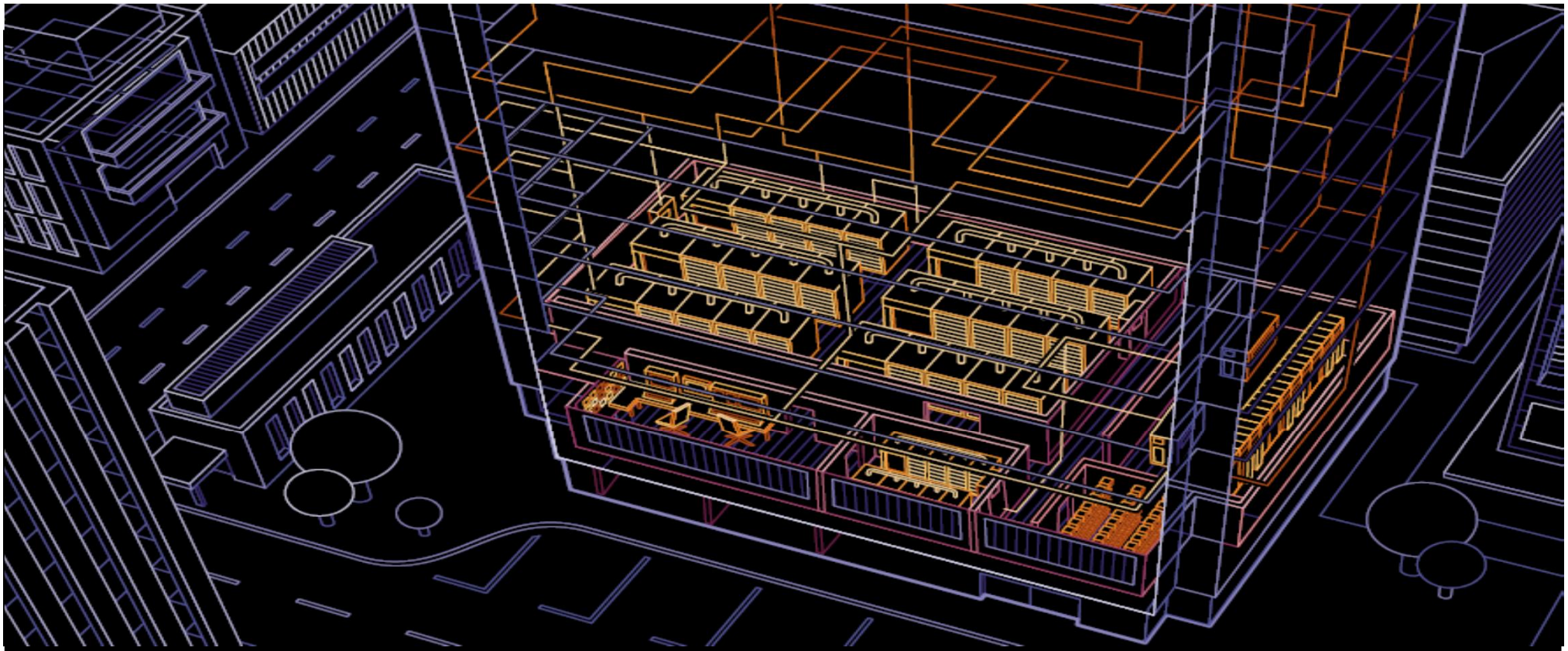


N S Koh SGABB **Electrification Product**

Critical installations
Pluggable final circuits

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Critical installation
Pluggable final circuits

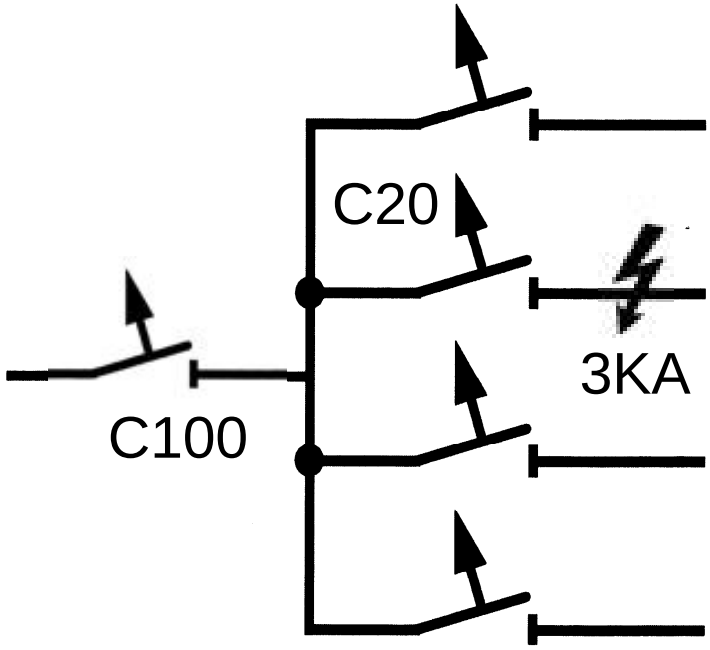
- Coordinated protection
- Fast removable
- Availability
- Safe to use

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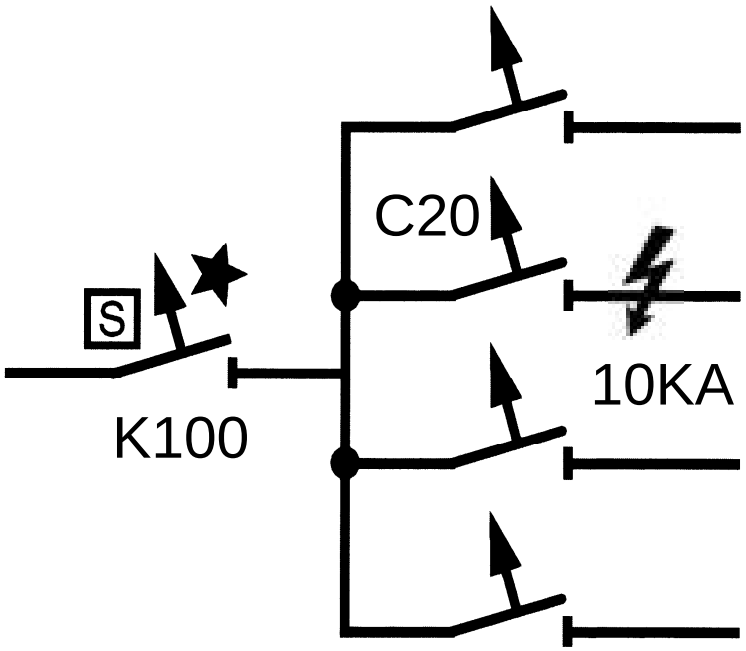
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Pluggable final circuits
Coordinated protection

Cascaded overcurrent protective devices



co-ordination with MCB



co-ordination with main selective circuit-breaker

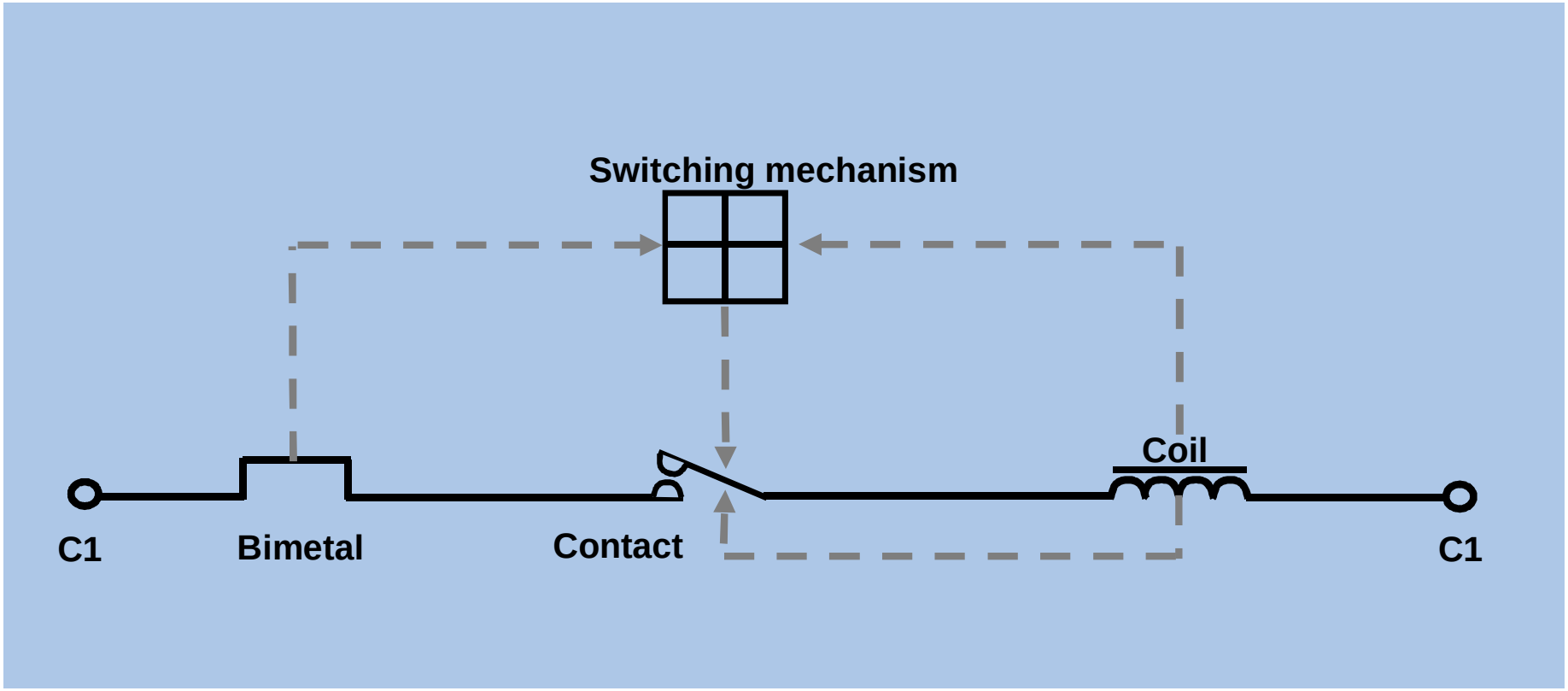
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Pluggable final circuits
Coordinated protection



MCB: Schematic diagram of operation



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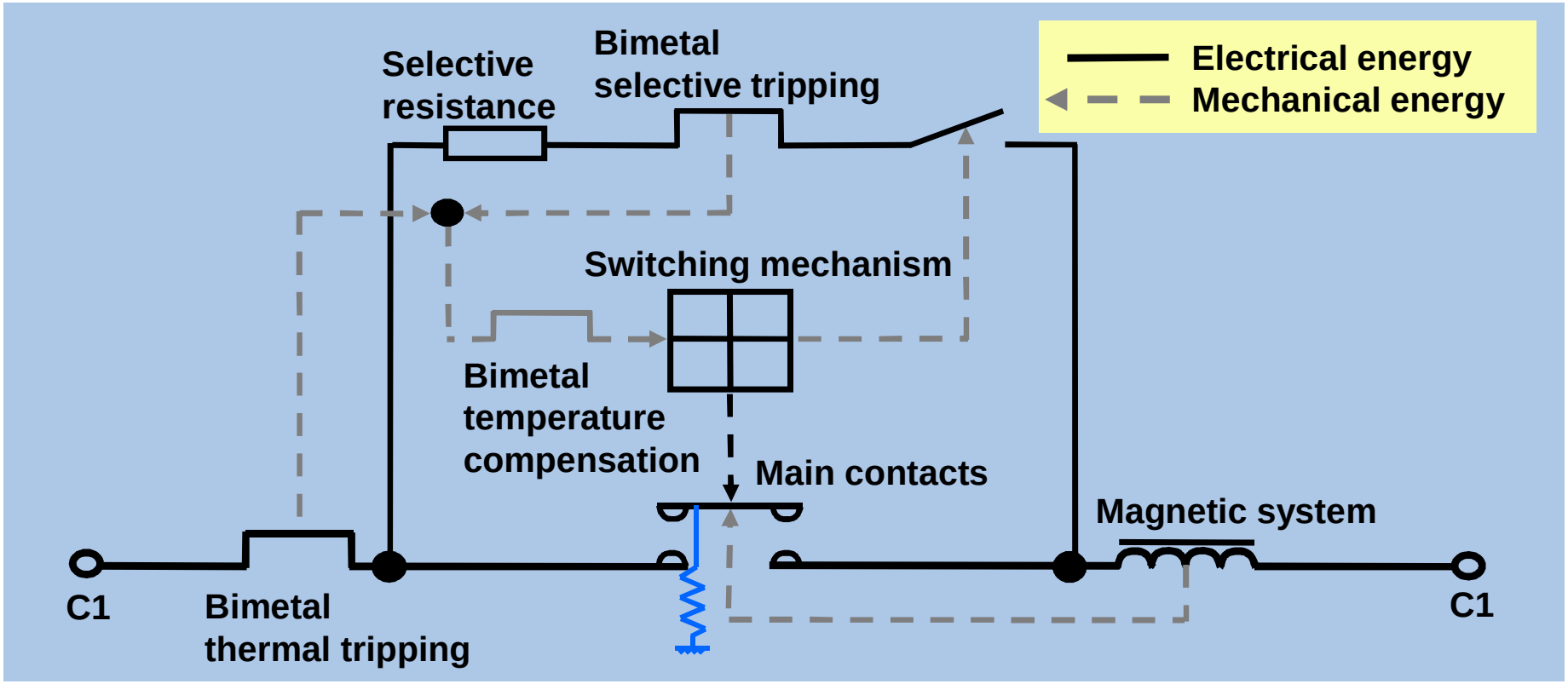
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Pluggable final circuits

Coordinated protection: Selective main circuit breaker



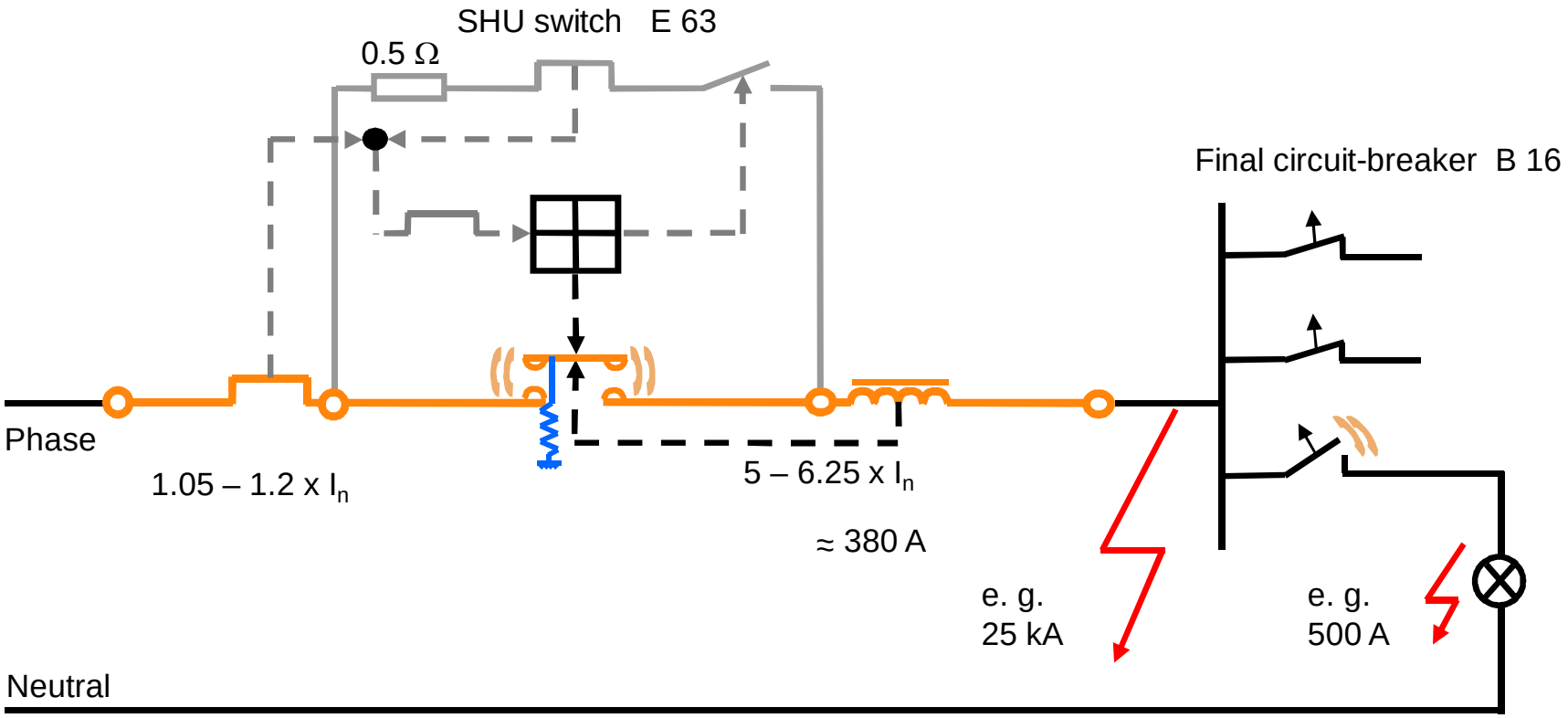
Selective main circuit-breaker S 700



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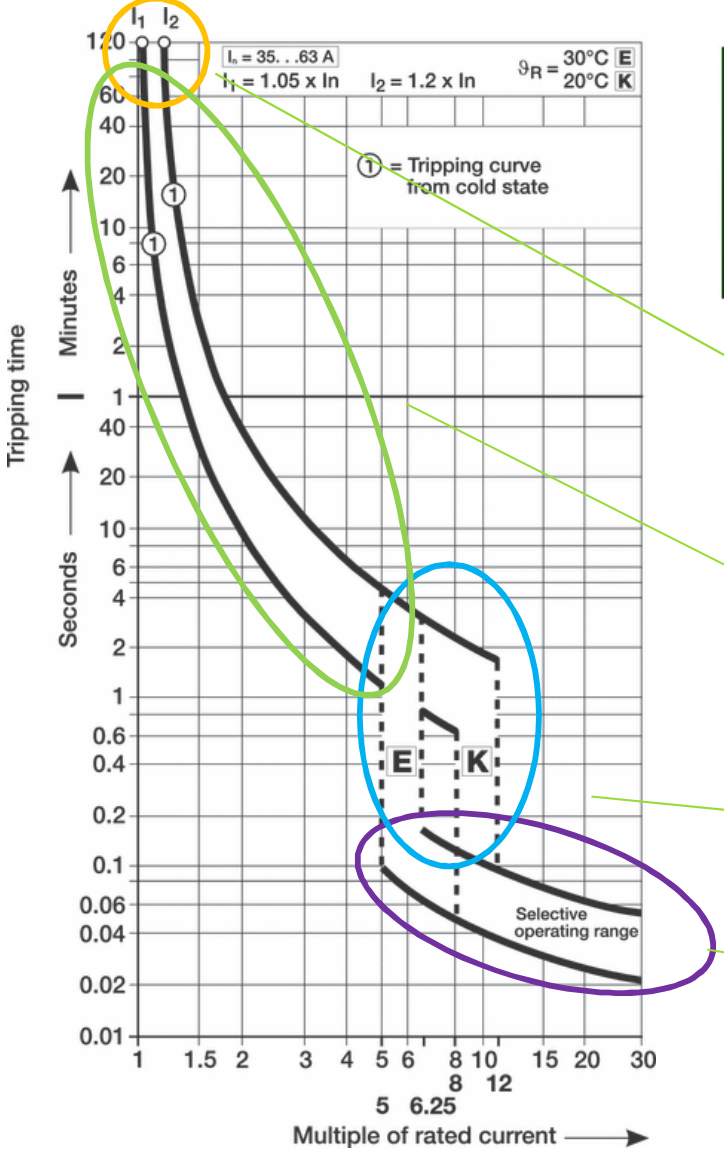
Pluggable final circuits
Coordinated protection: Selective main circuit breaker

Selective main circuit-breaker S 700



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S750DR
Tripping Characteristic



- tripping characteristics:
  - **$E_{selective}$** for all standard applications
  - **$K_{selective}$** for circuits with high inrush currents

- I_1/I_2 close to rated current giving best cable protection and overload coordination with upstream or downstream devices
- accurate overload tripping over the whole range
- 2 activation ranges for electromagnetic system (without mechanical tripping)
- short-time delayed tripping with minimum delay of 10ms for total short-circuit selectivity

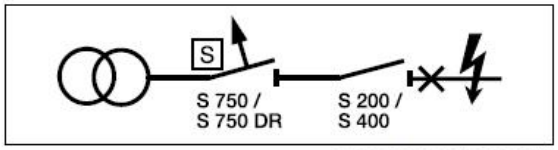
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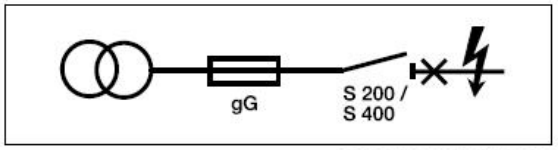
S700
Selectivity Data

S750DR → S200 fuse gG → S200

mcb



2CDC 022 013 F0011



2CDC 022 014 F0011

down-stream ↓	upstream →			S 750 / S 750 DR							fuse					
	Char.			E / K							gG					
		I_{cn} [kA]		25												
			I_n [A]	16	20	25	35	40	50	63	16	20	25	35	50	63
S 200 S 400 E	C	6	≤ 2	10	10	10	10	10	10	10	1	1,2	4	6	6	6
			3	10	10	10	10	10	10	10	0,3	0,7	1,2	4,6	6	6
			4	10	10	10	10	10	10	10	0,3	0,6	0,9	2,8	6	6
	B, C		6	10	10	10	10	10	10	10	0,2	0,4	0,7	1,5	3	5,5
	C		8	10	10	10	10	10	10	10	0,2	0,4	0,7	1,4	2,8	4,5
	B, C		10	10	10	10	10	10	10	10	0,2	0,4	0,6	1,2	2	3,3
			13	10	10	10	10	10	10	10			0,6	1,2	2	3,3
			16		10	10	10	10	10	10			0,6	1,1	1,8	2,8
			20			10	10	10	10	10				1	1,6	2,4
			25				10	10	10	10					1,6	2,4
			32					10	10	10					1,3	2,2
			40						10	10						2,2

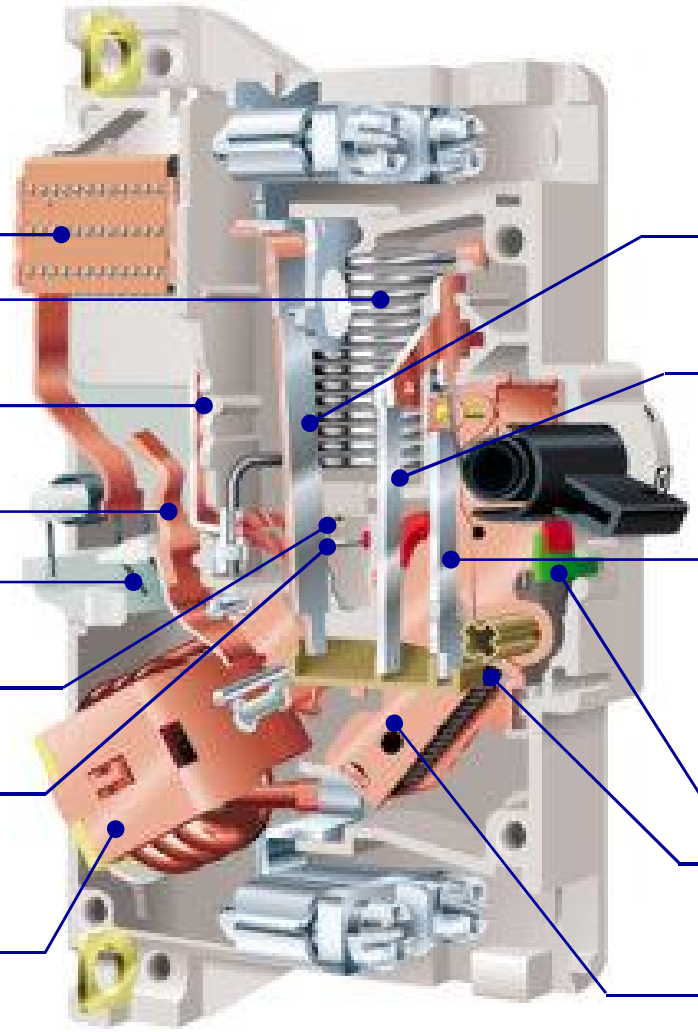
example for a selectivity table

selectivity limits in kA

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Underlying principle

Construction of the S 700®



arc chamber

resistor auxiliary-circuit

fixed contact in the main circuit

movable contact in the main circuit

main-contact spring

fixed contact in the auxiliary-circuit

movable contact in the auxiliary-circuit

electromagnetic system as hammer trip

main bimetal

bimetal in the auxiliary-circuit

bimetal for temperature compensation

contact position indicator red = I, green = 0

tripping lever

switching mechanism

Pluggable final circuits
Coordinated protection: Selective main circuit breaker

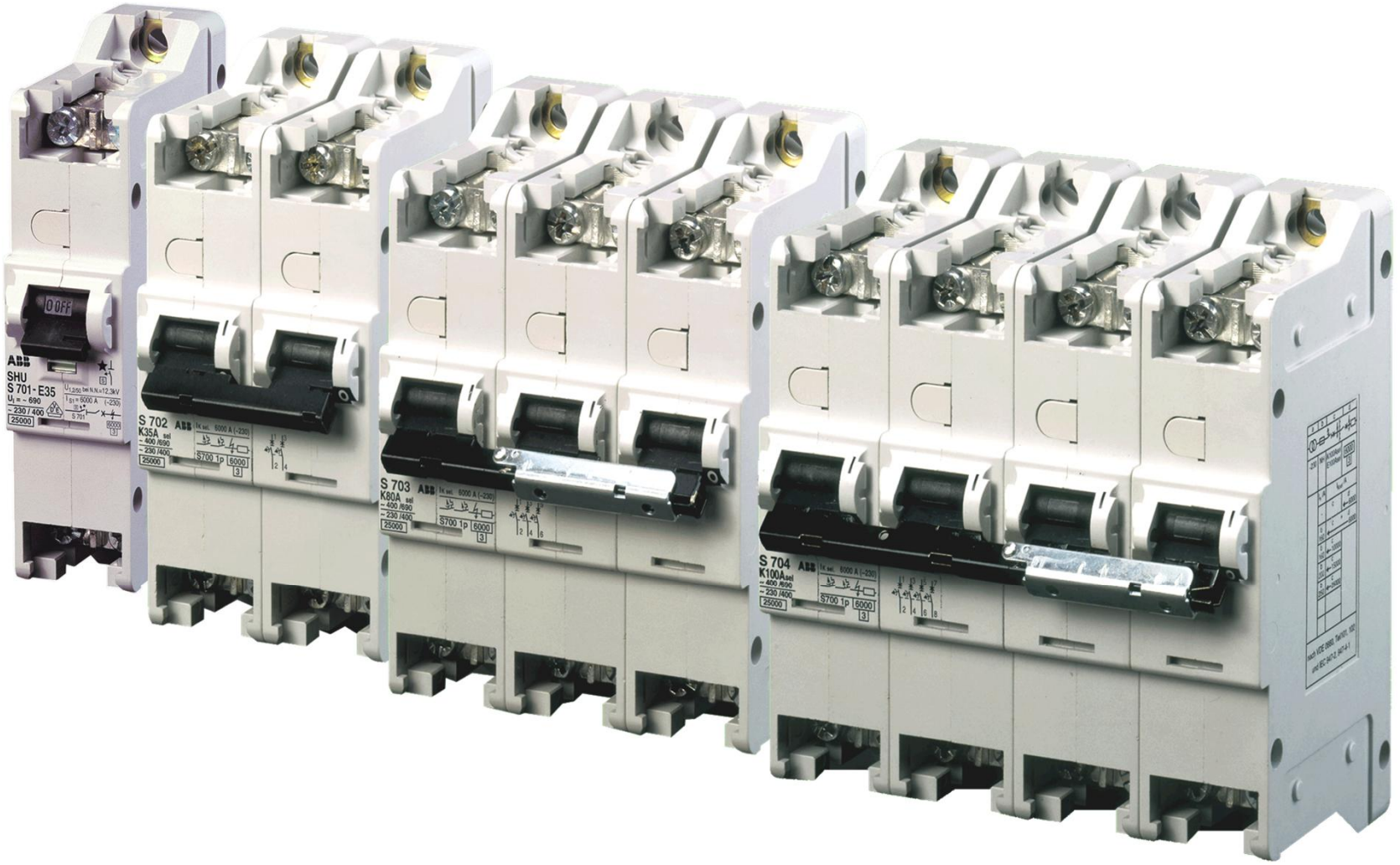
Technical data

Rated current I_n:	E: 10 A ... 100 A (125 A) K: 16 A ... 100 A (125 A)
No. of poles:	1, 2, 3, 4
Tripping characteristic:	E = exact characteristic K = Kraft (power) characteristic
Standards:	E DIN VDE 0645, DIN VDE 0660 Part 101/ EN 60947-2
Rated voltage U_n / U_e:	single-pole 230/400 V AC, multipole 400 V AC
Rated rupturing capacity I_{cn}:	25 kA at 230/400 V~

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Pluggable final circuits
Coordinated protection: Selective main circuit breaker



SK 029 B 98, SK 160 B 00, SK 161 B 00, SK 162 B 00

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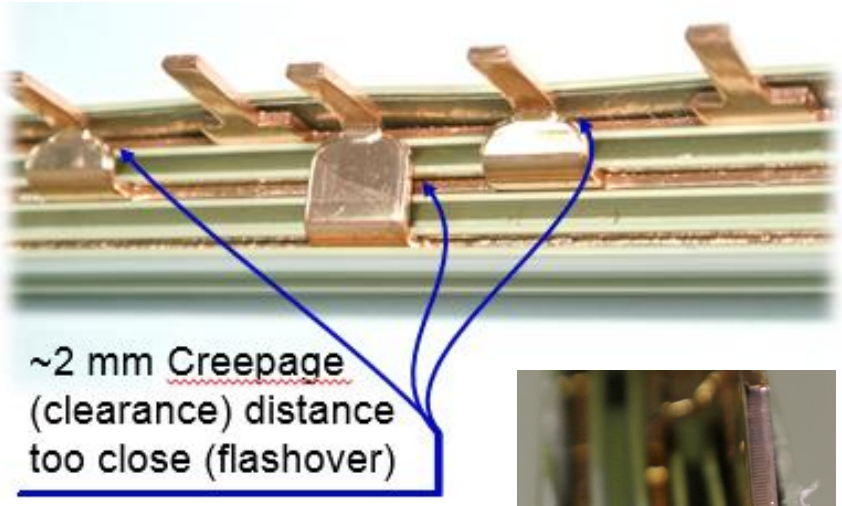
Critical installation
Pluggable final circuits

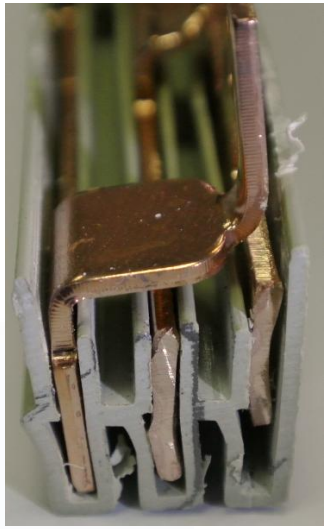
- Coordinated protection
- Fast removable
- Availability
- Safe to use

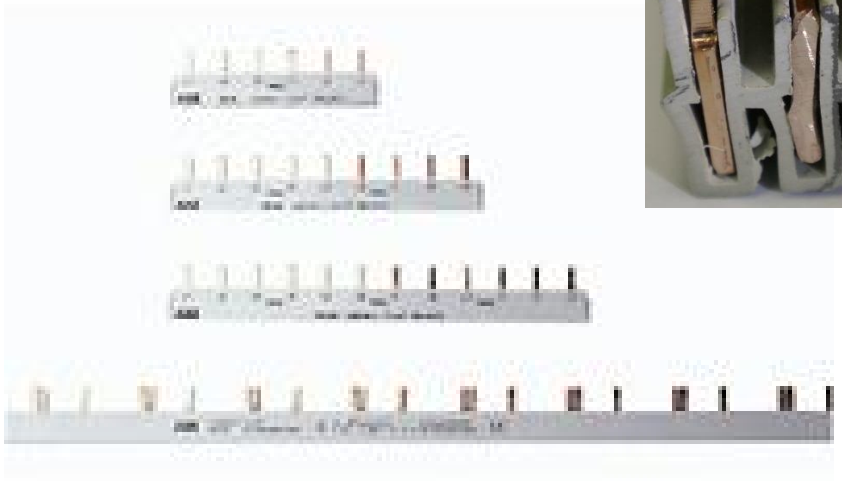
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Pluggable final circuits
Fast removal and availability



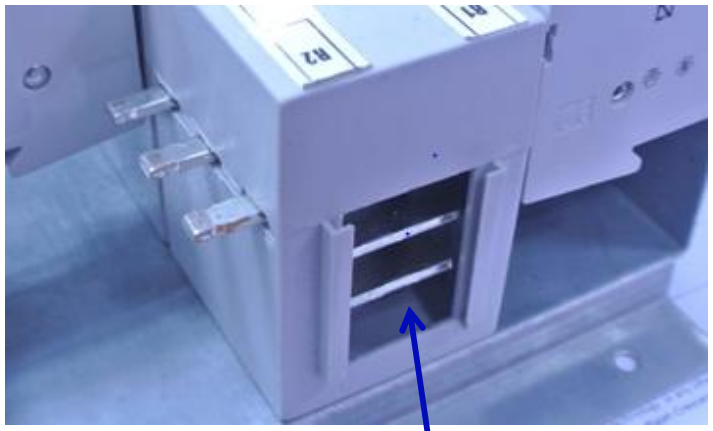




Comb Busbar

- 1P, 1P+N, 2P, 3P or 3P+N at 1 meter
- Current rating up to 100A
- Very Low cost
- Normally not type tested
- Not for mix phase with auxiliary/signal contact or accessories installation
- Air insulated 2 mm clearance between busbars.
- Performance very much depend on the skill of the installer.
- Very low surge withstanding < 4KV

Pluggable final circuits
Fast removal and availability



5 to 8 mm clearance

Load centre or fishbone busbar

- 1P+N, 3P and 3P+N, up to 250A
- May have type tested
- Vertical mounting with limited connection ways
- Single feed/incoming only
- Not for mix phase installation with auxiliary/signal contact or accessories
- Air insulated range from 5 to 8 mm clearance between busbars.
- Better surge withstanding performance than comb busbar, ~4KV to 6KV

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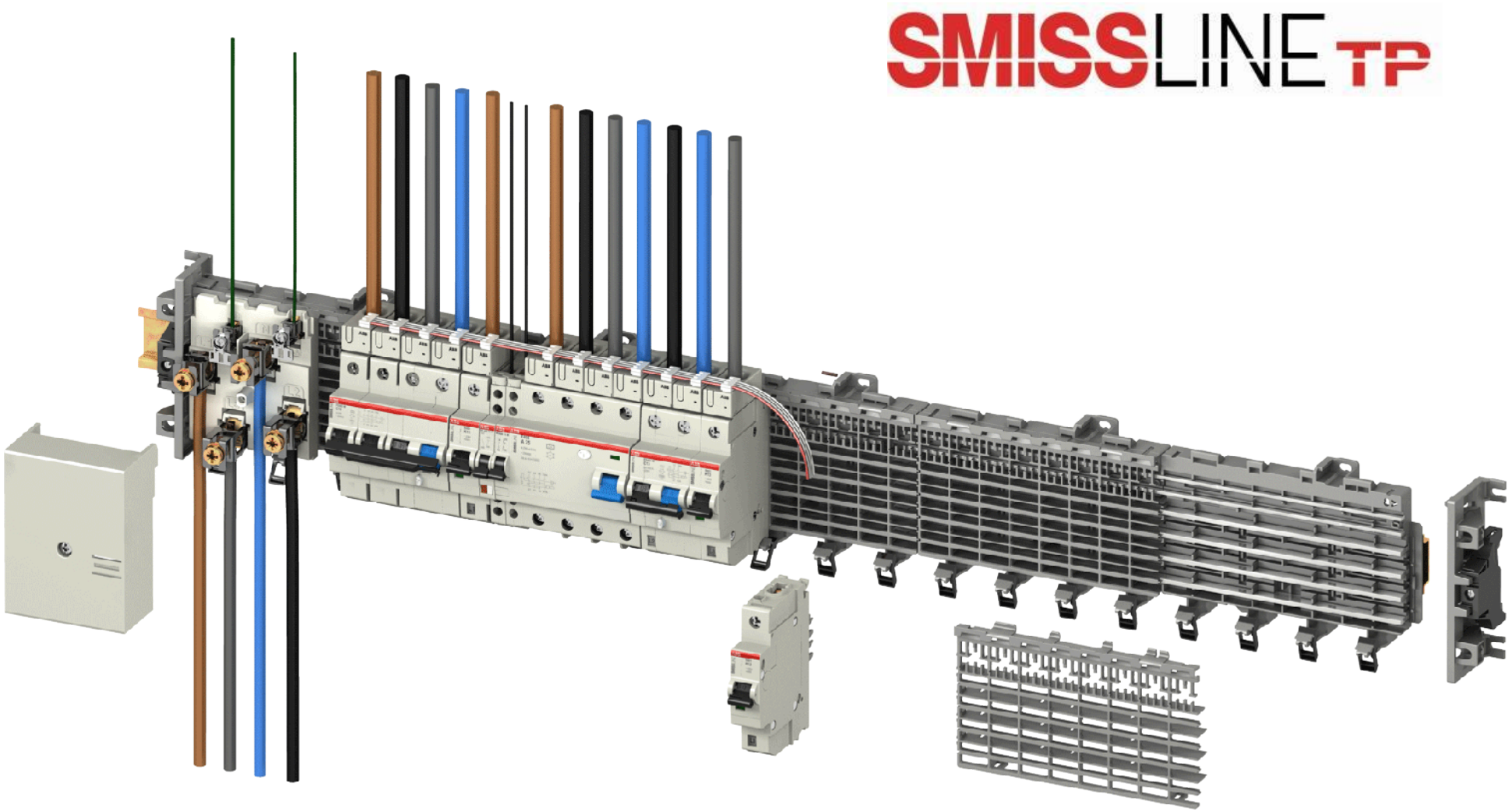
Pluggable final circuits
Fast removal and availability

How to overcome these difficult?

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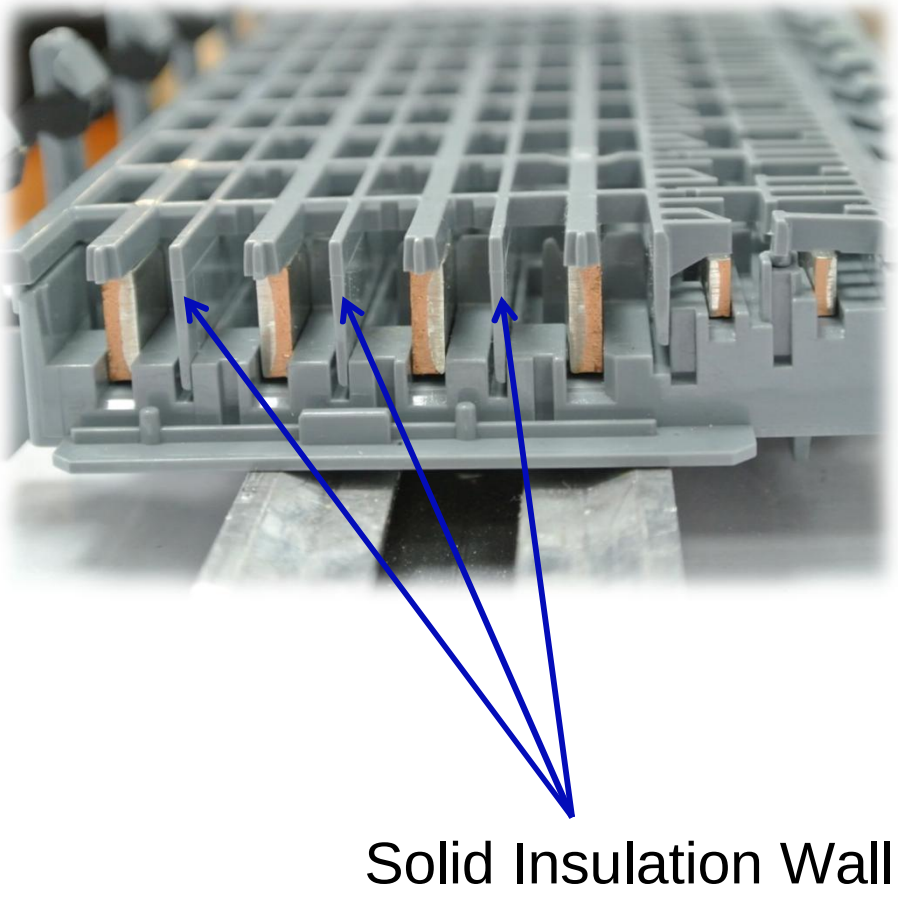
Pluggable final circuits
World’s safest pluggable busbar system



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Pluggable final circuits
Fast removal and availability



- Multi-phase 8 busbar system for any phase & accessories combination.
- IP20 Touch Proof
- Up to 250A current rating
- 2-signal busbar for control signal
- 4 meter long busbar
- 13mm clearance b/t Line busbar with Individual compartment to prevent busbar flashover.
- Surge withstanding more than 8KV

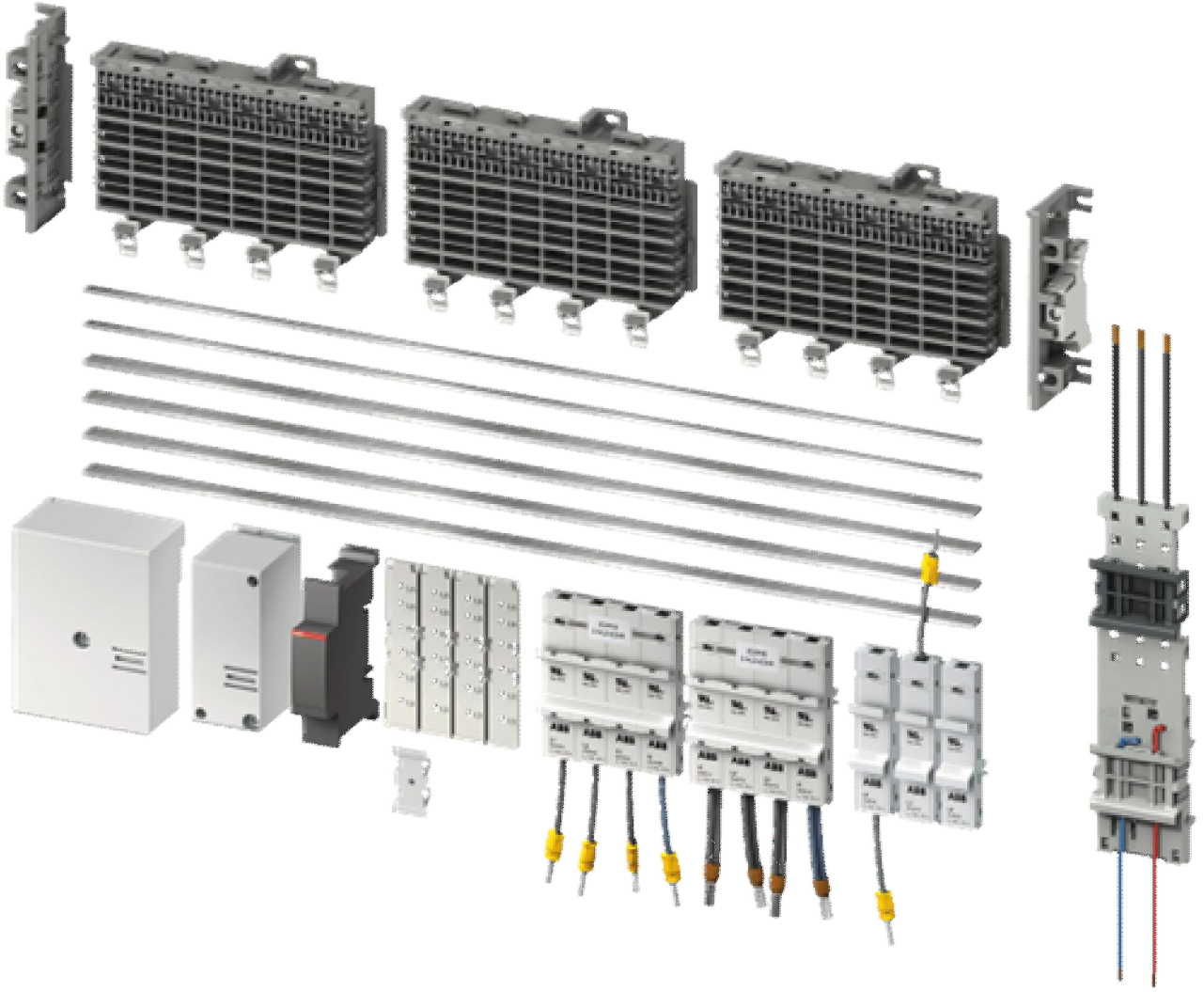
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Fast removal and availability

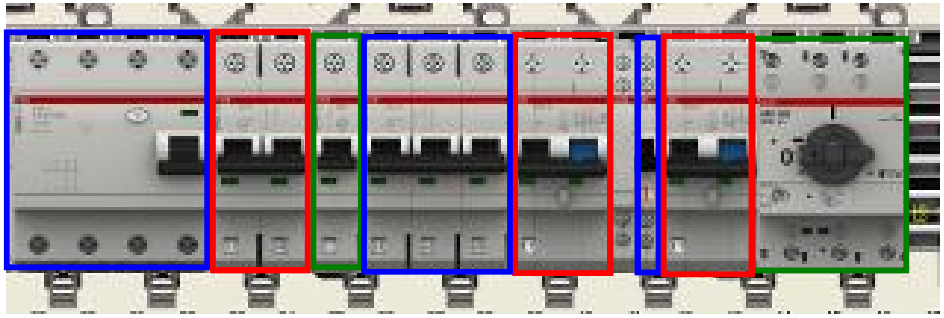
SMISSLINE TP



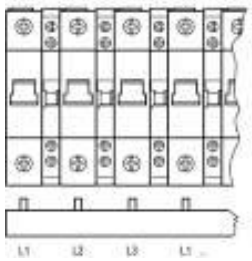


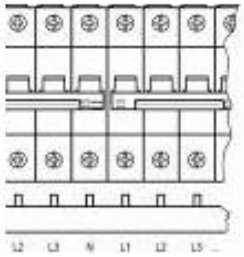
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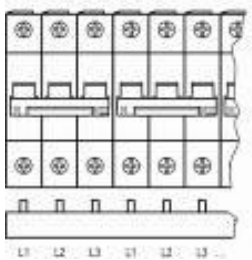
Pluggable final circuits
Fast removal and availability

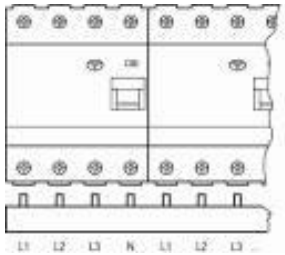


- SMISSLINE, everything is possible: 1, 2, 3 and 4-pole devices with or without auxiliary/signal contacts can be arranged in any sequence.







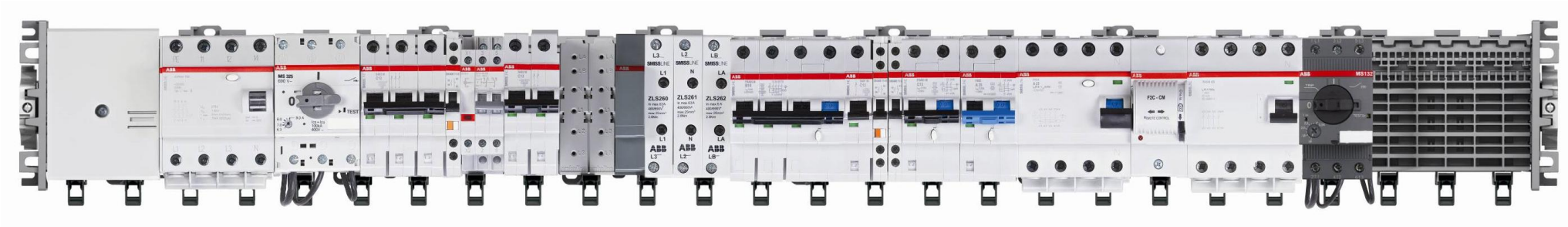


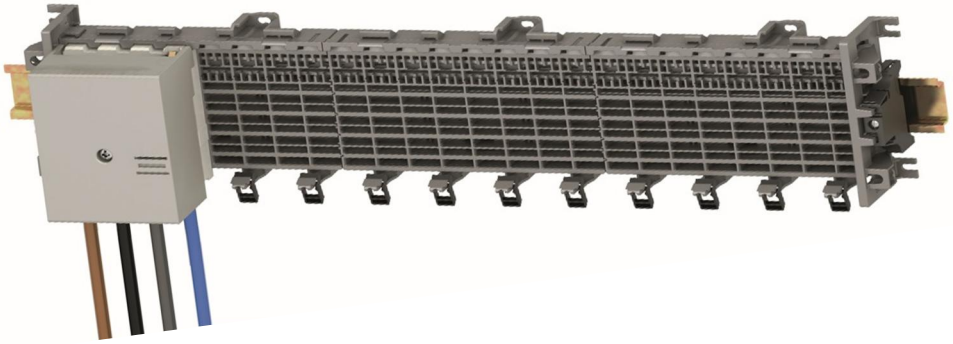
In Comparison to DIN rail mounting

- DIN rail: It is important to know which device is being fitted on which busbar
- The order of the devices is determined by the busbar
- The length of the busbar is limited

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Pluggable final circuits
Fast removal and availability



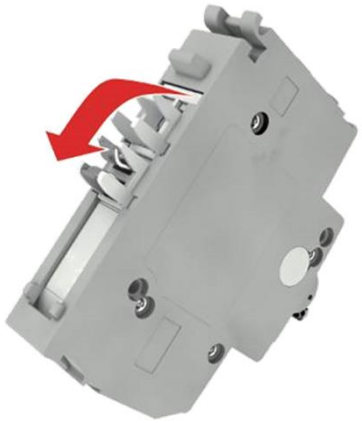


- Can install 210 pcs. of single pole MCB or 52 pcs. of 4-pole MCB in one busbar.
- Flexible installation length with or without starter kits possible from 6PLE to 110PLE (1979 mm)

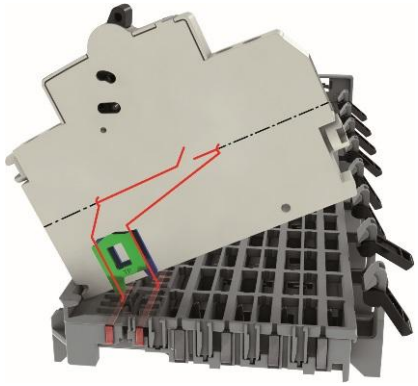
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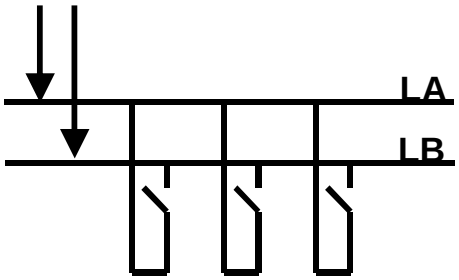
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Pluggable final circuits
Fast removal and availability









- Plug contacts can be moved easily between L1, L2 and L3 for load balancing
- Facilitate mix pole installation
- Allow zone protection devices to install at designated location.
- Time & cost-efficient with signal busbar
- Only busbar system with integrated plug-in signal socket

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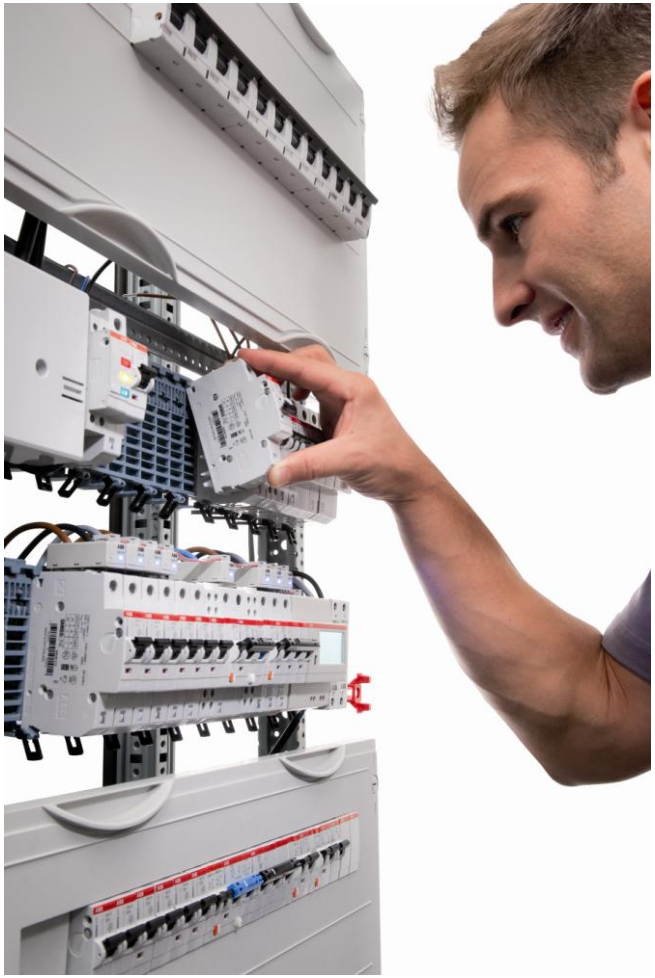
Pluggable final circuits
Safe to use: Work on live



Conventional



SMISSLINE TP



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Pluggable final circuits
Safe to use: Work on live

SMISSLINE TP

Translation

BG ETEM
Energie Textil Elektro Medienerzeugnisse

Department of prevention

BG ETEM • Postfach 510580 • 50941 Köln

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E-Mail: pechoc.wolfgang@bgetem.de
mehlem.martin@bgetem.de
Datum: 14. November 2011

Use of the SMISSLINE TP Plug-in Socket System

Dear Sir or Madam,

The SMISSLINE TP Plug-In Socket System presented to us for evaluation was examined by the Test and Certification Center of BG ETEM as well as the BG ETEM Department of Electrical Engineering in regard to the behavior of load-free components snapped on and off under voltage. Any reasonably foreseeable misuse was also taken into account in the evaluation.

The final evaluation of the system was done on rapid prototyping models during a visit on 20.04.2011 and the test report P3053 of 7.10.2011.

Result:

- Snapping load-free devices into or off of the SMISSLINE TP poses no risk of electrical shock.
- The SMISSLINE TP plug-in socket system is completely finger-safe (IP2XB). The system remains entirely touch-protected even when snapping the devices on or off.
- SMISSLINE TP ensures that persons are not endangered by switching arcs or fault arcs.

Evaluation:

The design of the plug-in socket system SMISSLINE TP ensures that load-free devices and components can be snapped on and off under voltage without the need for additional personal protective equipment to guard against electrical hazards.

With kind regards

Wolfgang Pechoc
Head Department of Electrical Engineering

Martin Mehlem
Head Test and Certification Center

Seite 1 von 1

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Gesetzliche Unfallversicherung Körperschaft des öffentlichen Rechts

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SEV Verband für Elektro-, Energie- und Informationstechnik

electrosuisse

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CMC Low Voltage Products
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Unsere Zeichen KJ
Direktwahl 044 956 12 60
079 276 35 04
E - Mail jost.keller@electrosuisse.ch
Datum 30. November 2011

Arbeitsverfahren – Bewertung
Einsatz des Stecksystems SMISSLINE TP

Sehr geehrte Damen und Herren

Das zur Bewertung vorgestellte Stecksystem SMISSLINE TP wurde in Zusammenarbeit mit der Prüf- und Zertifizierungsstelle der BG ETEM sowie dem Fachbereich Elektrotechnik der BG ETEM hinsichtlich des Verhaltens beim lastfreien Auf- und Entstecken von Komponenten unter Spannung begutachtet.
Dabei wurde die vernünftigerweise anzunehmende Fehlanwendung mit berücksichtigt.

Die abschließende Begutachtung des Systems erfolgte an Rapid Prototyping Modellen beim Besuch am 20.04.2011 und dem Prüfbericht P3053 vom 7.10.2011.

Ergebnis:

- Beim lastfreien Auf- und Entstecken der Geräte auf SMISSLINE TP kann keine Gefährdung durch Körperdurchströmung entstehen.
- Das Stecksockelsystem SMISSLINE TP ist vollumfänglich fingersicher (IP2XB). Auch beim Auf- und Entstecken der Geräte bleibt das System vollumfänglich berührungsgeschützt.
- SMISSLINE TP verhindert eine Gefährdung von Personen durch Schaltlichtbögen oder Störlichtbögen.

Bewertung:

Es ist konstruktiv gewährleistet, dass das Stecksystem SMISSLINE TP das lastfreie Auf- und Entstecken von Geräten und Komponenten unter Spannung erlaubt, ohne zusätzliche persönliche Schutzausrüstung gegen elektrische Gefährdung benutzen zu müssen.

Freundliche Grüsse

Electrosuisse
Jost Keller

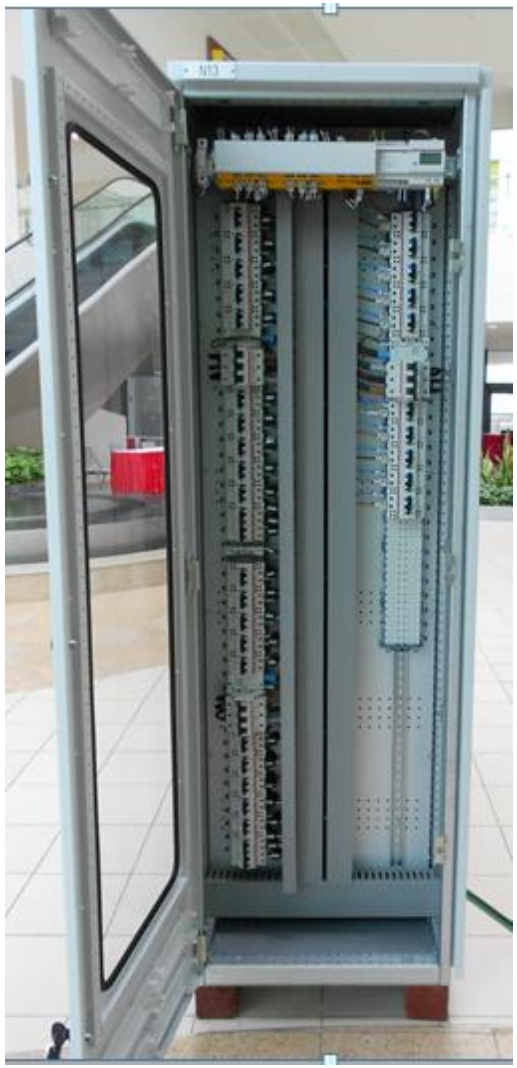
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info@electrosuisse.ch
www.electrosuisse.ch

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16 August 201

Pluggable final circuits
Area of installation: Airport





Mounting of the Smissline TP bus bar can be in vertical or horizontal construction:

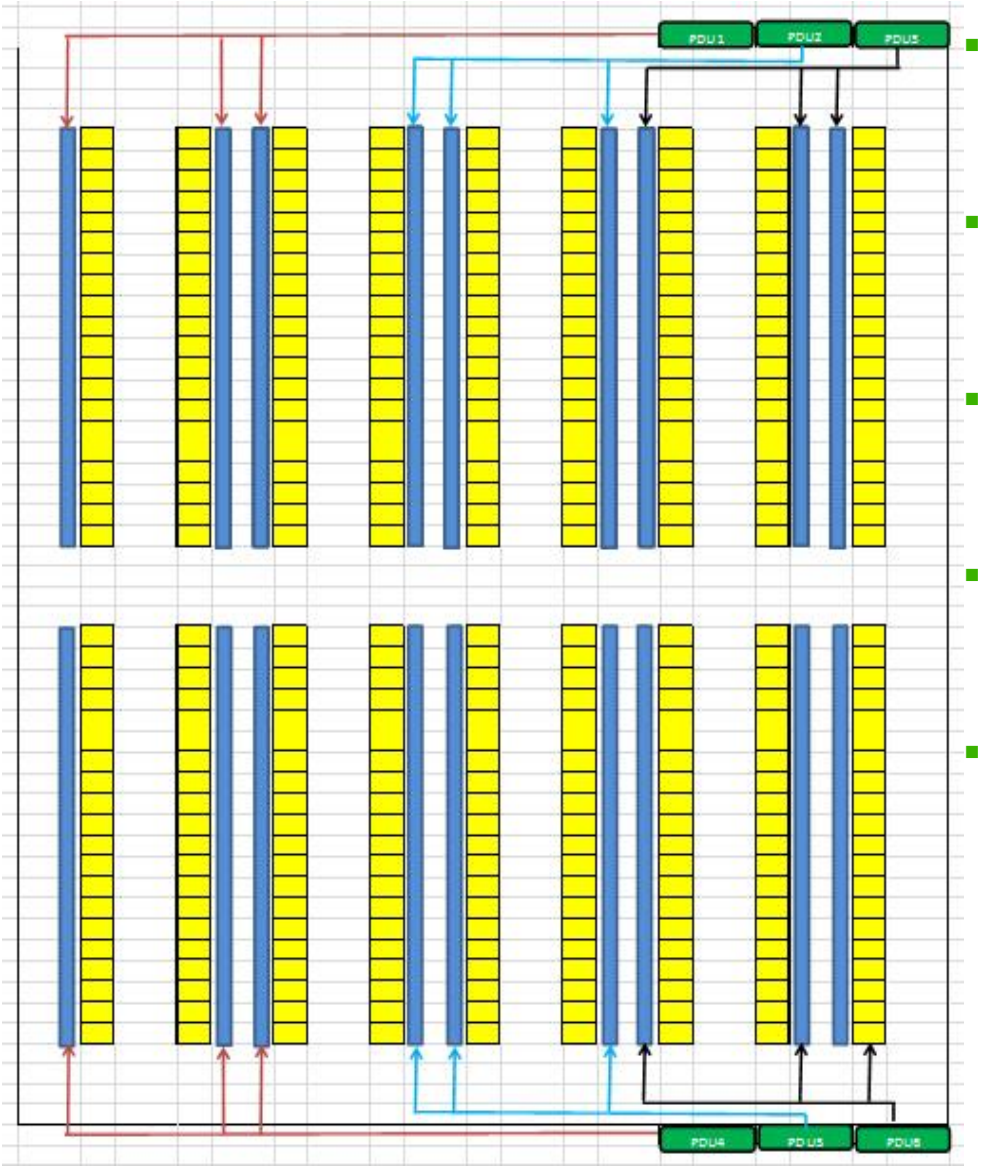
- In conventional horizontal construction, the device wiring is routed individually to the output terminals.

- The connection terminals are arranged either at the top or at the bottom of the cabinet.

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Pluggable final circuits
Data Center – Facts Related to Power Distribution



- PDU is a centralize concepts for power distribution to data rack
- Massive cabling work b/t PDU & data rack.
- Two source are required for redundancy with integrated BCM
- New cabling work is required for data rack expansion
- Uncertainty & great challenge to perform shutdown at rack level & it is time consuming for maintenance & upgrading.

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Pluggable final circuits
Data Center – New Trend



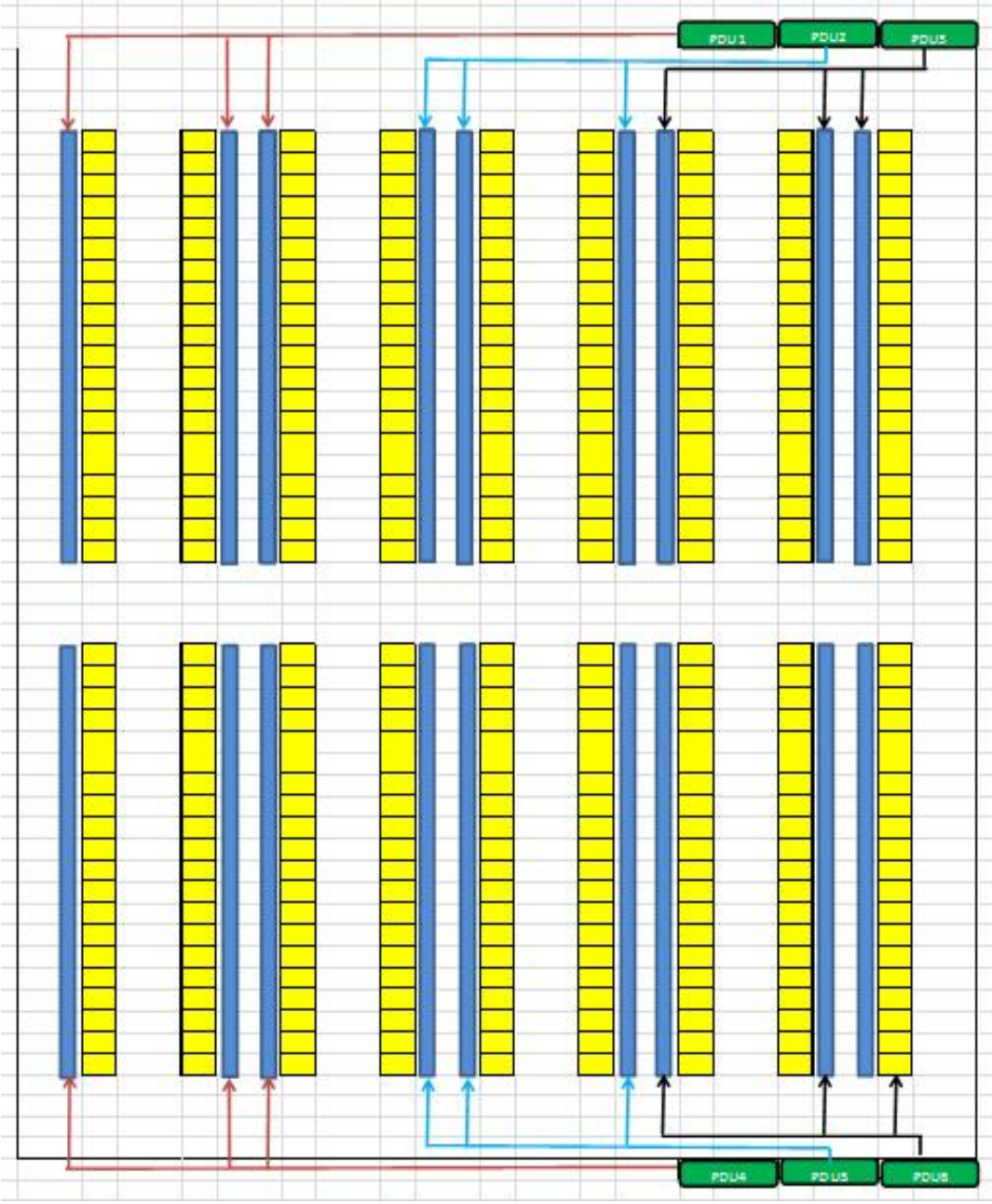
- Distributed PDU concept with more than 2 source to each data rack for resilience & redundancy
- No cabling work or shut down required for additional data racks at any location inside the data hall.
- Free choice of MCBs or RCBOs with trip signal contact and integrated open core CT for energy monitoring.
- The solution is : Smissline TP busbar truncking system.

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Pluggable final circuits

Smissline TP busbar truncking



Conventional Design for 6 PDU

- No. of Rack: 360
- No. of Circuit: 720
- No. of Cable: 720 (4mm^2 3-core L,N,E cable)
- PDU Size : 3.0m

Busbar Truncking System for 6 PDU

- No. of Rack: 360
- No. of Circuit: 36
- No. of Cable: 18 (35mm^2 5-core 3-phase cable.)
- PDU Size : 0.8m
- Busbar Truncking : 210m

Total saving: Upto 25% installation cost

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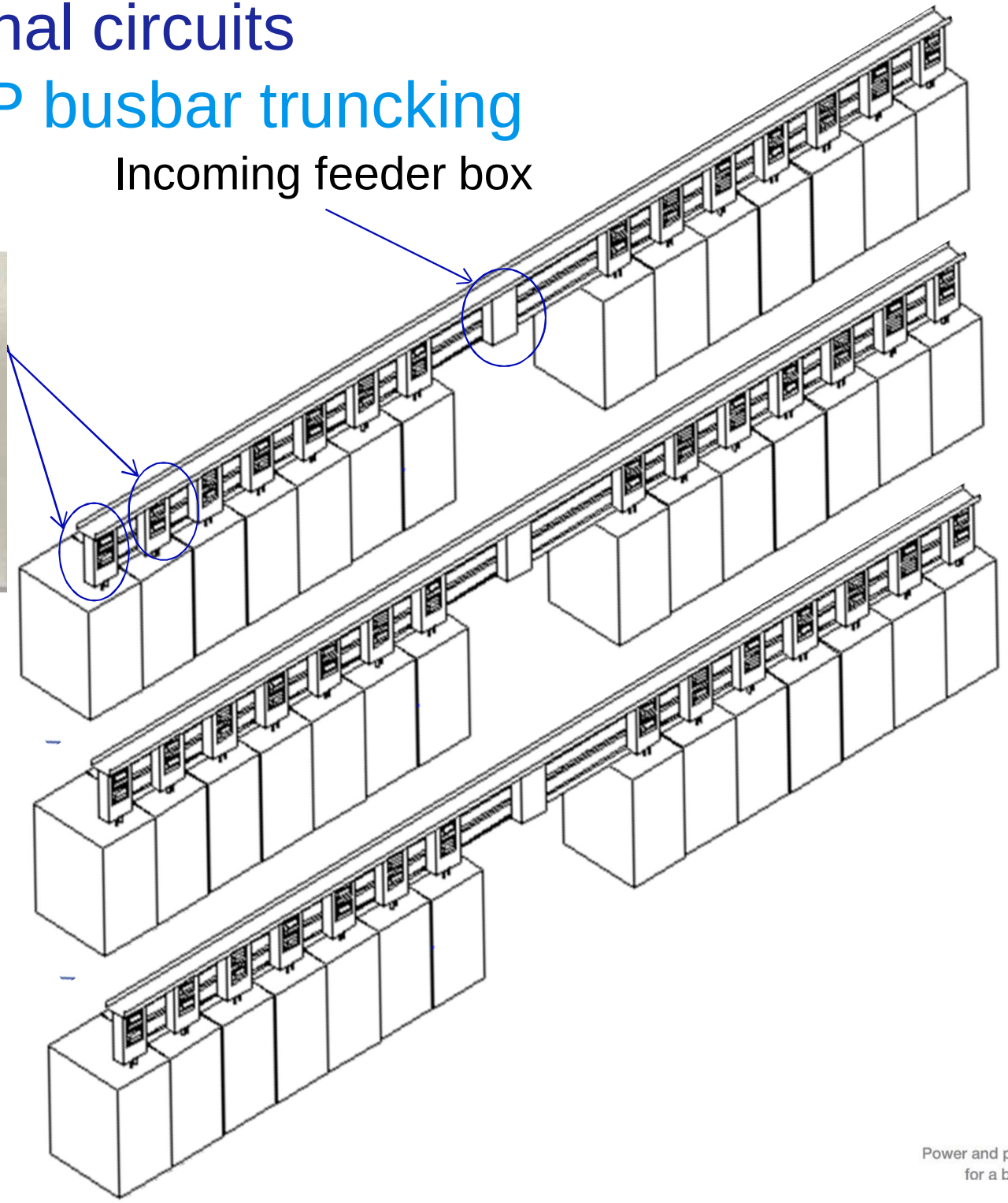
Pluggable final circuits

Smissline TP busbar truncking

Incoming feeder box

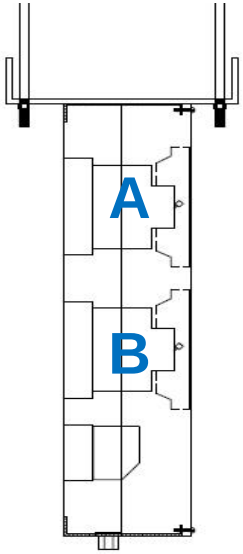
Individual tap-off





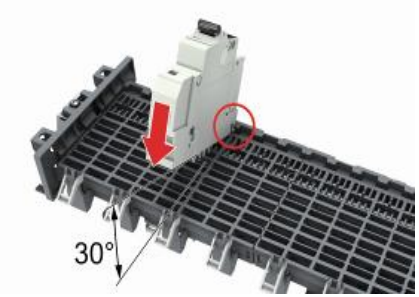
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Pluggable final circuits
Smissline TP busbar truncking









Pluggable final circuits
Smissline TP busbar truncking







- Single & Multi Source Busbar system
- Integrated Branch Circuit Monitoring
- Hot swap & pluggable
- Superior in availability & agility
- Cost saving in cable work
- 1.2 meter (standard) to 4 meter long
- 18mm tap-off space, 7 to 20 modules
- Up to 250A, 230/400V

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