SIVACON
The Versatile Low-Voltage Switchboard

Low Voltage
Controls & Distribution
Distribution Boards
& Motor Control Centers
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SIVACON -
Low-Voltage Switchboards - Design Objectives

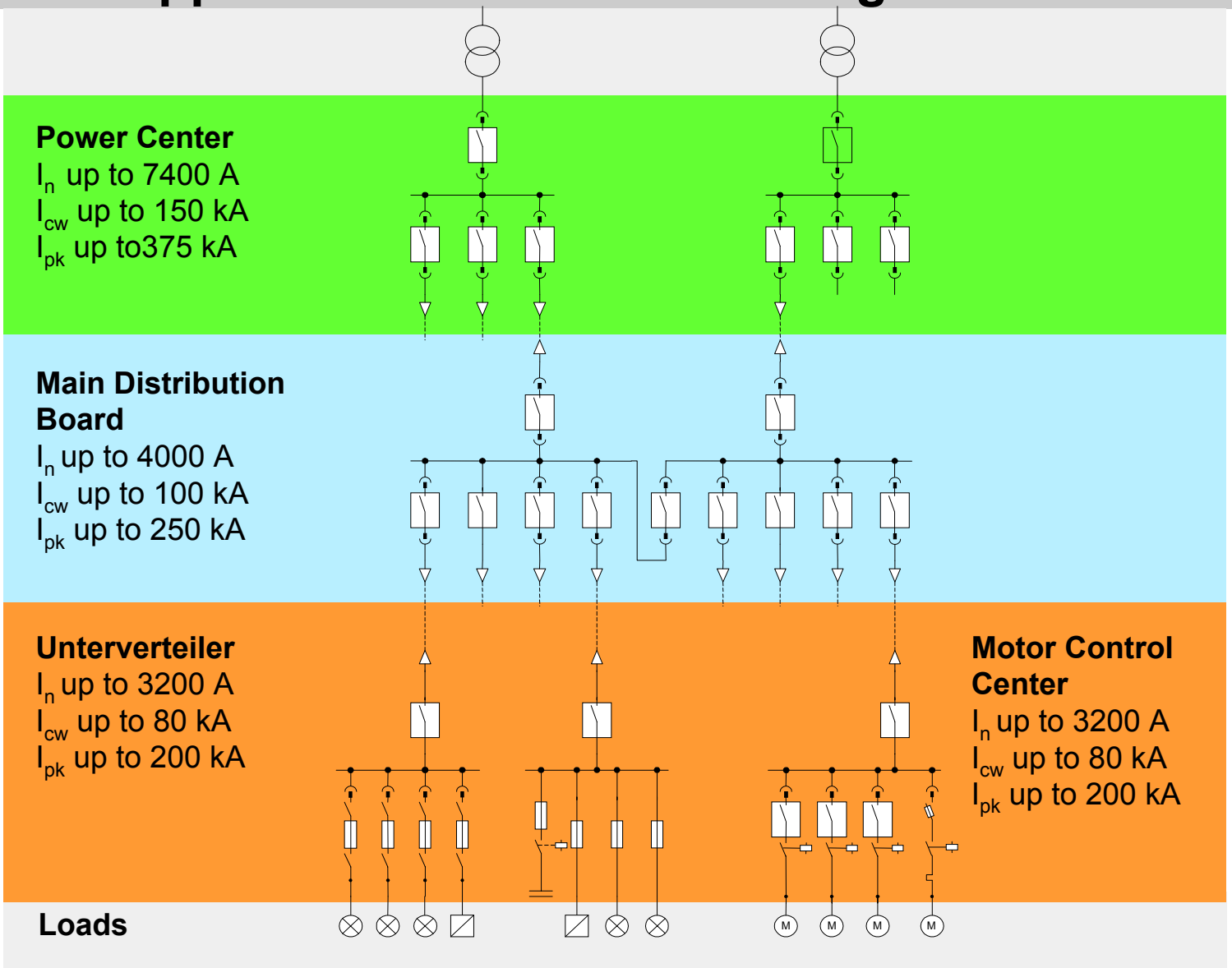
Economy	Life-time cost, Space, Installation, Operation
Operational and personal safety	Security
Availability	Quality, Interchangeability
Operator friendliness	Ergonomics
Flexibility	Meeting requirements, rapid adaptation

SIVACON
The Obvious Solution for Global Challenges

Requirements

- Type-tested standard modules (TTA) for building and industrial systems
- Know-how of technological leader SIEMENS
- Locally manufactured by authorized SIVACON Technology Partners
- Trade name product of high quality
- Globally applicable switchgear of SIEMENS

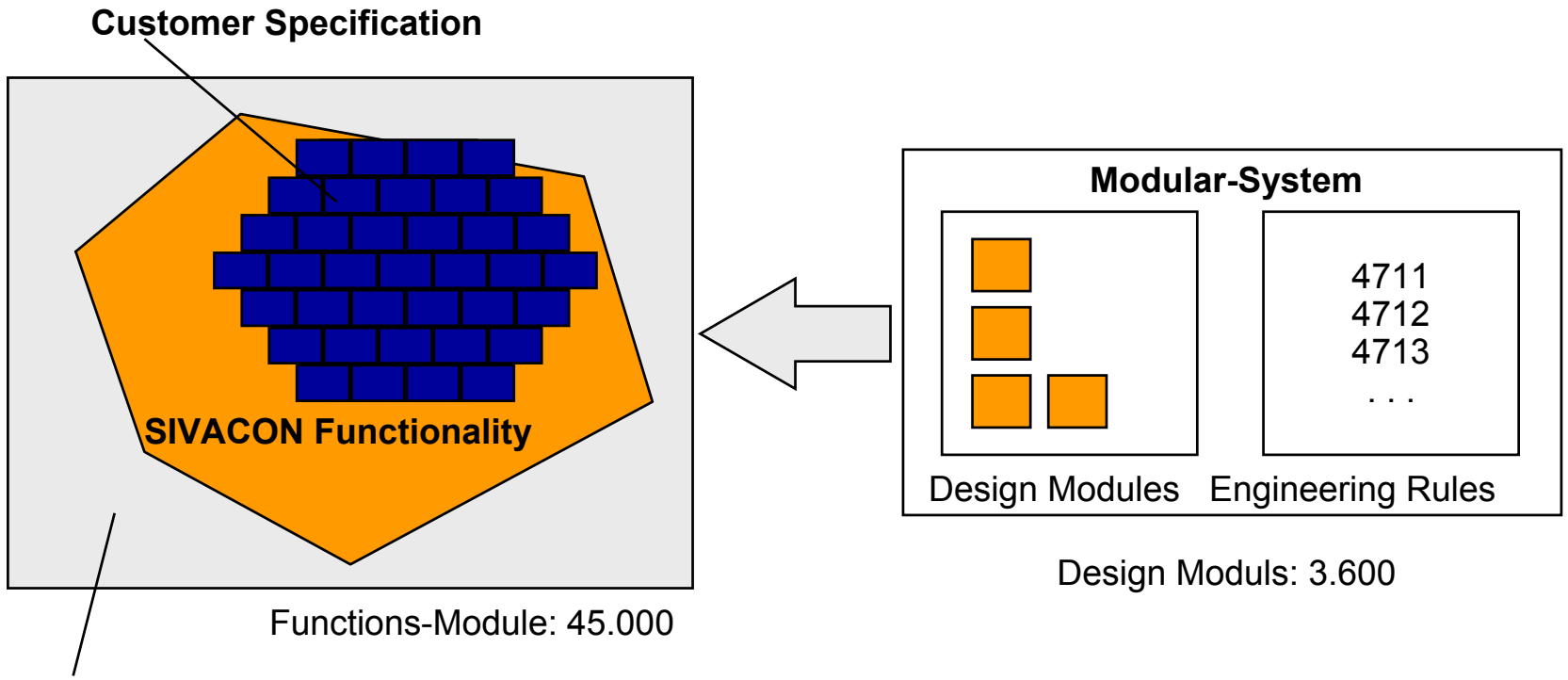
SIVACON
For All Applications in the Low-Voltage Network



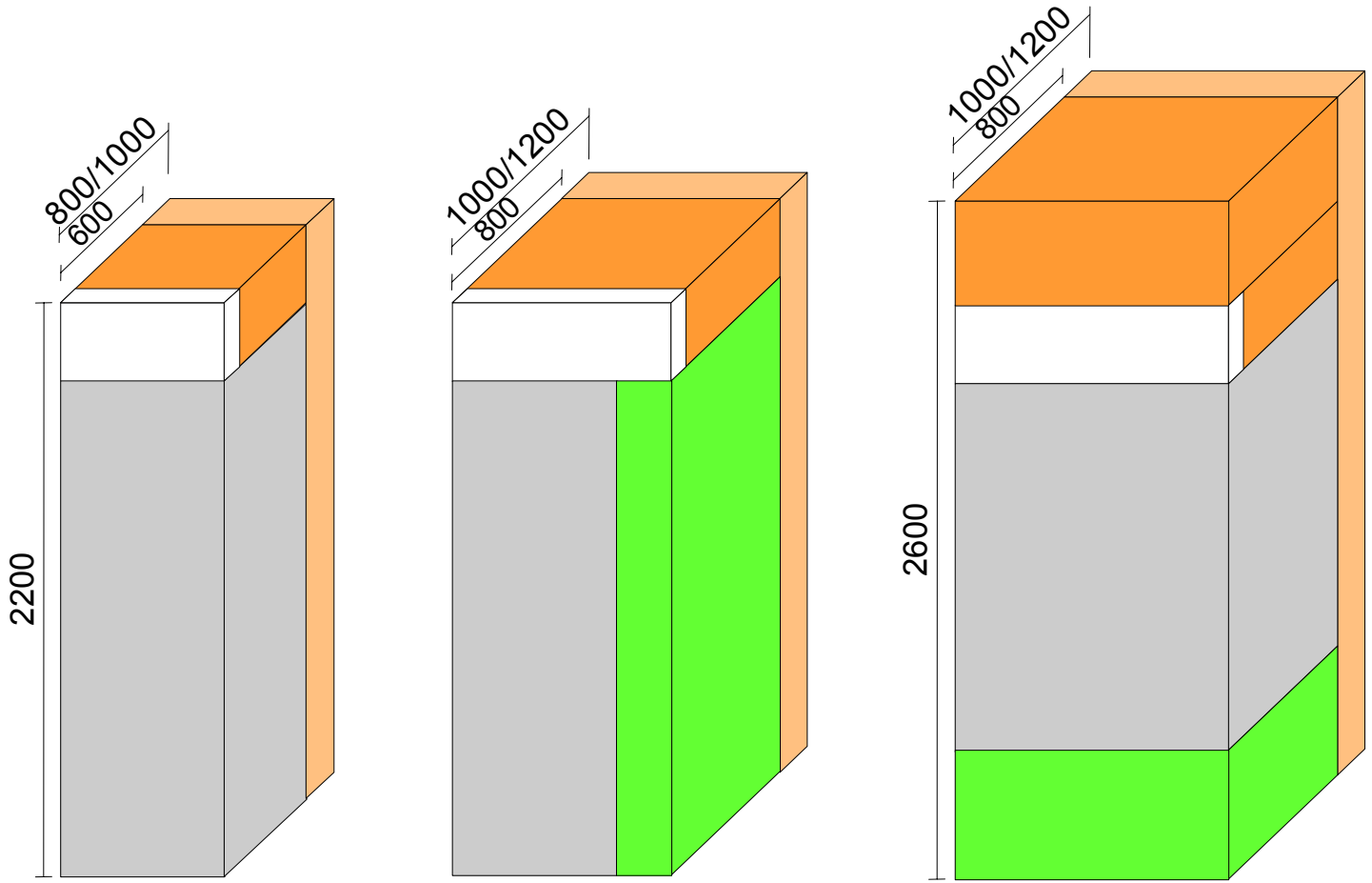
SIVACON
Standards and Specifications

Standards and Specifications	Type-tested low-voltage switchgear assemblies (TTA)	IEC 60439-1 DIN EN 60439-1 (VDE 0660 Part 500) DIN VDE 0106 Part 100
	Testing of response to internal faults (arcing faults)	IEC 61641, VDE 0660 Part 500, Supplement 2
Clearance and creepage distances	Rated impulse withstand voltage 8 kV	DIN EN 60439-1 (VDE 0660 Part 500)
Rated insulation voltage (U_i)	1000 V	
Rated operational voltage class (U_e)	up to 690 V	

SIVACON
Modular Product System



SIVACON - Modular Technology: Optimal Adaptation to All Requirements

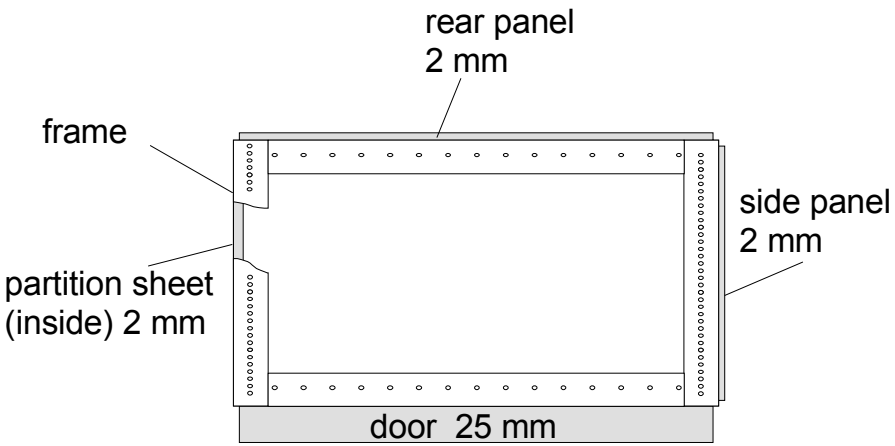


- Device compartment
- Cross-wiring compartment (optional)
- Horizontal busbar compartment
- Cable connection compartment optionally at the side or bottom (depending on the technology used)
- Cable compartment for cable connection rear or cables from above

SIVACON - Frame and Enclosure: Dimensionally Accurate and Stable

- All-round perforation rows with a 25 mm hole grid for individual installation
- Flexible door systematic for all requirements
- Door opening angle up to 180°
- Spring-loaded locks reliably prevent doors from opening unintentionally
- Pressure-relief top covers

SIVACON
Frame and Enclosure



Cubicle height (mm)	Cubicle width (mm)	Cubicle depth (mm)
2200	400, 600, 800, 1000, 1200	600, 800, 1000, 1200
2600	400, 600, 800, 1000, 1200	800, 1000, 1200

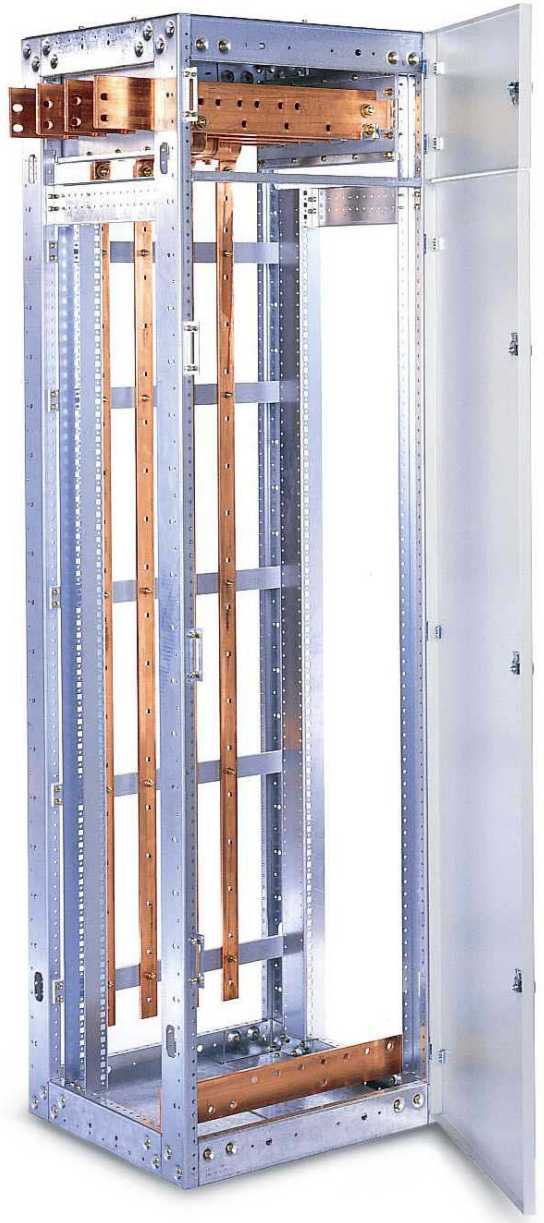
Surface treatment: optionally powder-coated, wet painted or galvanized

Material: sheet steel in the following thicknesses:
Frame: 2.5 mm
Enclosure: 2.0 mm

Degrees of protection to IEC 60529: IP 30, IP 40, IP 42 ventilated
IP 40, IP 54 unventilated

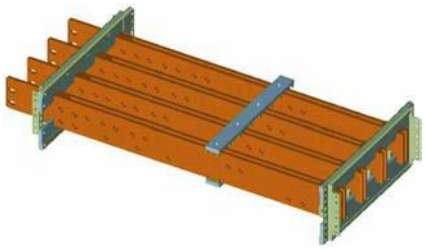
SIVACON - Variable Busbar System: The Answer to Diverse Requirements

- Standardized busbar position at top of the cubicle
- Busbar system for rated currents up to 7400 A
- User-oriented gradation of rated currents
- Rated peak withstand current (I_{pk}) up to 375 kA
- Separation of the busbar compartment from the device compartment
- Transport unit joints easily accessible from above

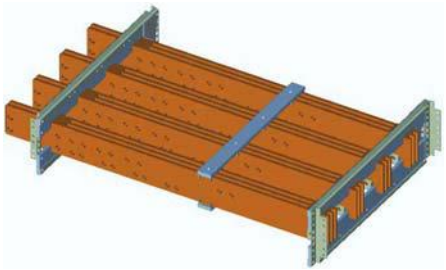


SIVACON
Variable Busbar System

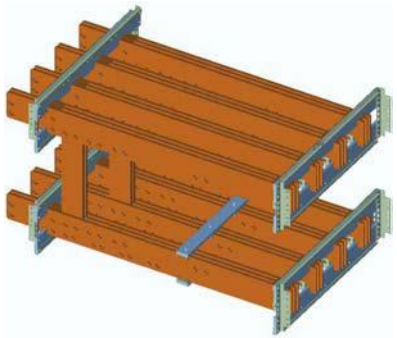
up to 3200 A



up to 4000 A



up to 7400 A



Rated currents at 35 °C ambient temperature

Phase conductors (L1, L2, L3) Quantity, dimensions [mm]	unventi-lated [A]	ventilated [A]	I_{pk} / I_{cw} [kA]	Cubicle height [mm]	Cubicle depth [mm]
2 x 100 x 10 3 x 100 x 10	2400 2950	3200 4000	200/80 250/100	2200 2200	600, 800, 1000 800, 1000, 1200
3 x 100 x 10 + 3 x 100 x 10	5400	7400	375/150	2600	800, 1000, 1200

Supply, Feeder and Coupling Cubicles: Compact, Reliable and User-Friendly

Circuit-Breaker Design:

- For circuit-breaker 3W. from 630 A up to 6300 A
- Up to 3 circuit-breakers per cubicle 3 and 4-pole
- Fixed-mounted and withdrawable design
- Test and disconnected position with door closed
- Rated peak withstand current

I_{pk}	up to 250 kA
I_{cw}	up to 100 kA, 1 s
	up to 80 kA, 3 s

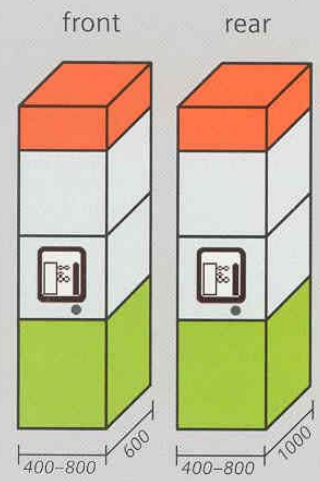
Supply, Feeder and Coupling Cubicles
Circuit-Breaker Design

Circuit Breaker 3WN / 3WL

Cubicle Dimensions/Cubicle Structure

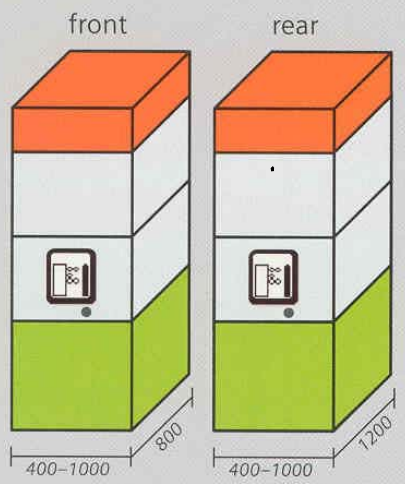
Circuit Breaker 3W.:

630 A–3200 A
cable connection



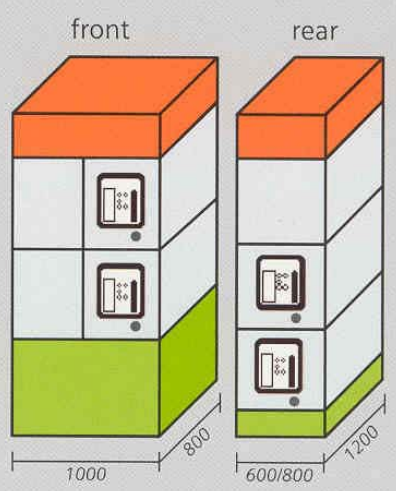
Horizontal busbar system
≤ 3200 A

630 A–6300 A
cable connection

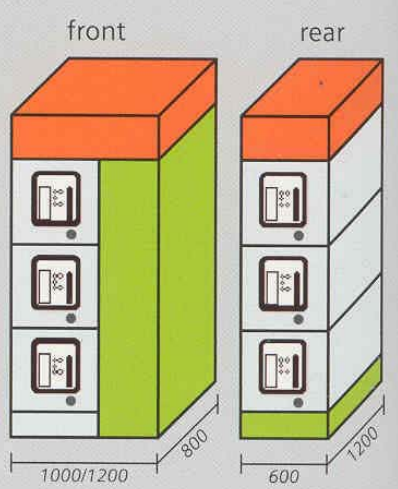


Horizontal busbar system
≤ 4000 A and ≤ 7400 A

2000 A–2500 A
cable connection



630 A–1600 A
cable connection



Supply, Feeder and Coupling Cubicles
Circuit-Breaker Design

User-friendly with 3WN:

- Free choice of supply direction without any restrictions in terms of technical data
- High short-time current-carrying capacity for time-graded short-circuit protection up to 500 ms
- Short-time grading control (ZSS) for very brief delay times (50 ms)
- LCD operating current indication in the control console (without ammeters and current transformers)
- Indication and operation when the door is closed

Supply, Feeder and Coupling Cubicles Circuit-Breaker Design

Optimum connection compartment for high safety

- Cable or busbar connection optionally from above or below
- A rated current-dependent connection compartment offers optimum termination conditions for cables and busbars
- Assembly times are shortened by optimum connection compartments

Outgoing Feeder Cubicles in Fixed-Mounted Design: Economical, Reliable and Variable

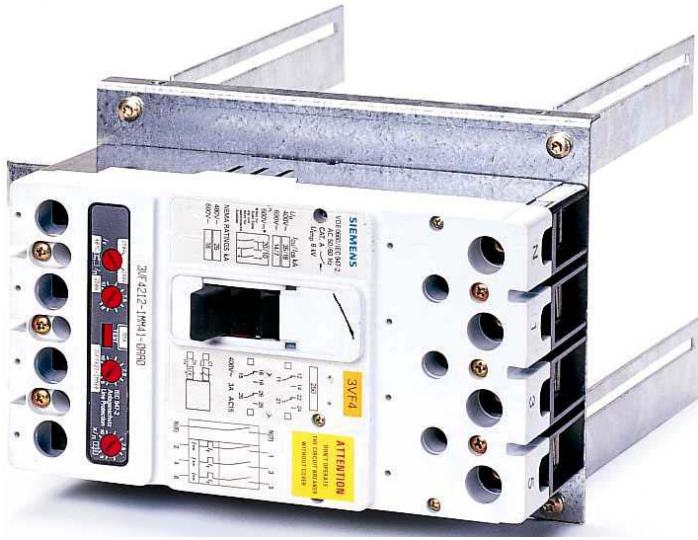
- Any combination of modular cable feeders
- Swift conversion by virtue of the lateral universal cubicle busbar
- Easy replacement of cable feeders after deenergizing the switchboard

Outgoing Feeder Cubicles in Fixed-Mounted Design: Vertical Distribution Busbar

- Rated current up to 1400 A
- Rated peak withstand current
  I_{pk} up to 163 kA
  I_{cw} up to 65 kA, 1 s up to 50 kA, 3 s
- 3 and 4-pole
- Devices are connected without the need for drilling or punching
- Easily accessible connections for quick modification and expansion
- Connections are visible and can be connected from the front

Outgoing Feeder Cubicles in Fixed-Mounted Design: Modular Cable Feeders

- Moulded case circuit-breakers or fuse-switch-disconnectors can be fitted as required
- Continuously adjustable mounting plates for a standard front plane
- Cable feeders with and without current measurement



Cable Feeders in Fixed-Mounted Design: Compartment Technology

- Individual sub-sections with doors with doors for each circuit breaker
- Breaker 3KL, 3RV and 3VL up to 630 A
- With or without plug-in socket
- High form of internal separation up to Form 4 Type 7 acc. to BS EN 60439 (gland box per functional unit)
- Optimum connection conditions in the front and rear cable connection compart-ment

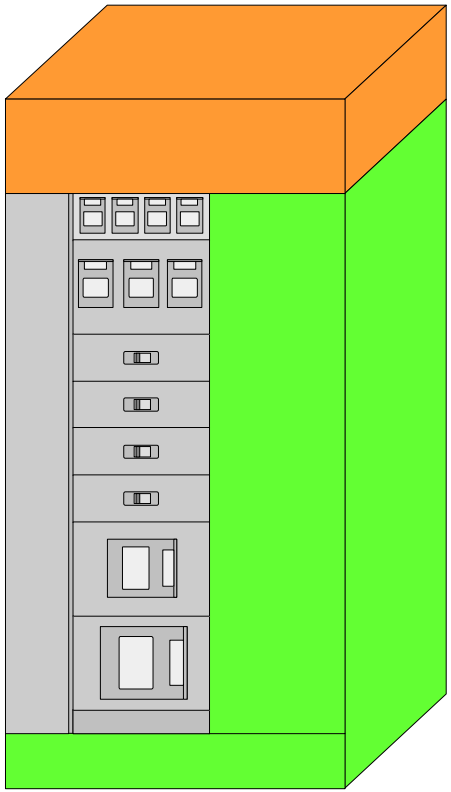
Cable Feeders in Fixed-Mounted Design: Compartment Technology

Optimum cable connection compartment for high safety

- Cable connection compartment at the rear with cable gland box
- High form of internal separation up to Form 4 Type 7 acc. to BS EN 60439 (gland box per functional unit)

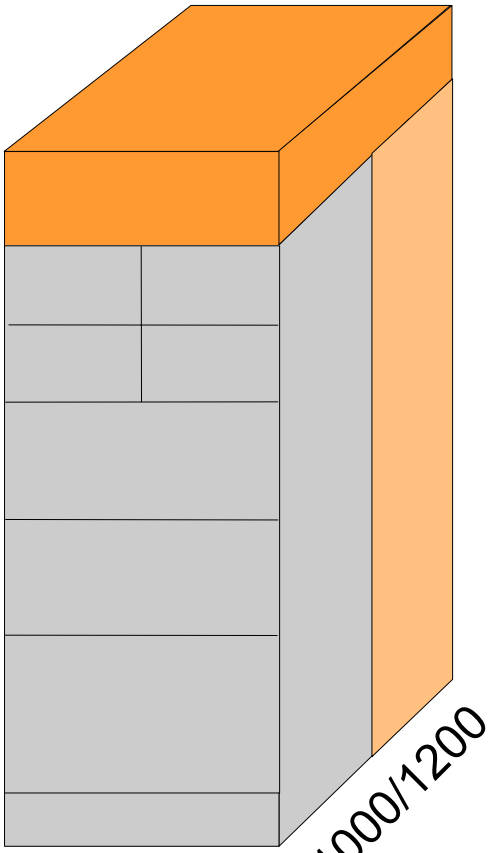
Cable Feeders in Fixed-Mounted Design: Cubicle Dimensions / Cubicle Structure

Modular cable feeders
Cable connection
front, right-hand side



600/800/1000

Compartment technology
Cable connection rear



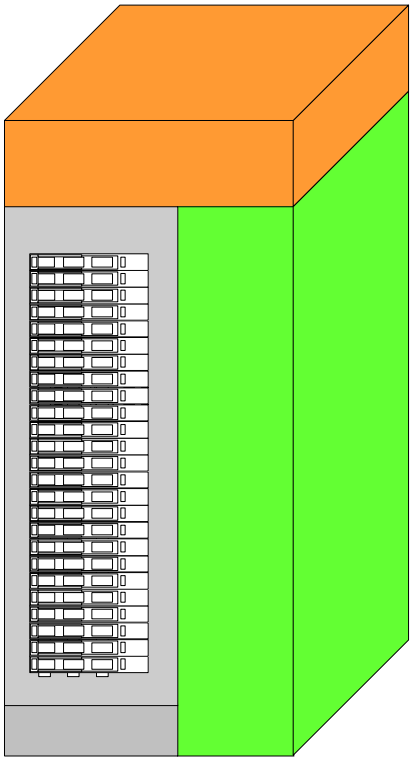
800

Outgoing Feeder Cubicles in Fixed-Mounted Design Switchable Fuse-Switch-Disconnectors 3NJ4

- Cable feeders up to 630 A with/without current metering
- 25 feeders can be installed in each cubicle
- Dead-state fuse replacement

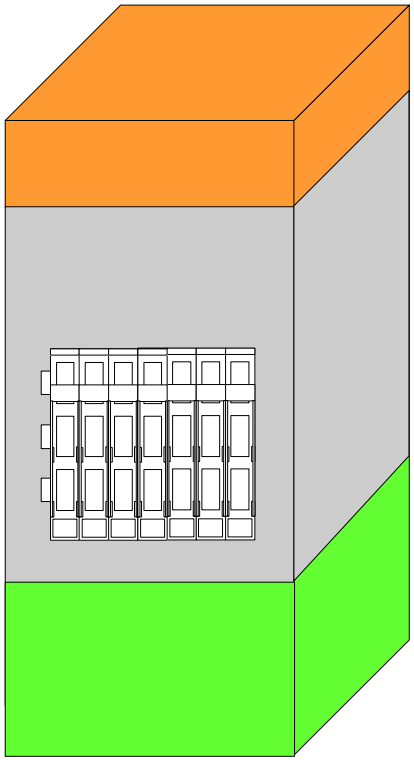
Outgoing Feeder Cubicles in Fixed-Mounted Design Switchable Fuse-Switch-Disconnectors 3NJ4

Cable connection lateral



up to 160 A / feeder

Cable connection below



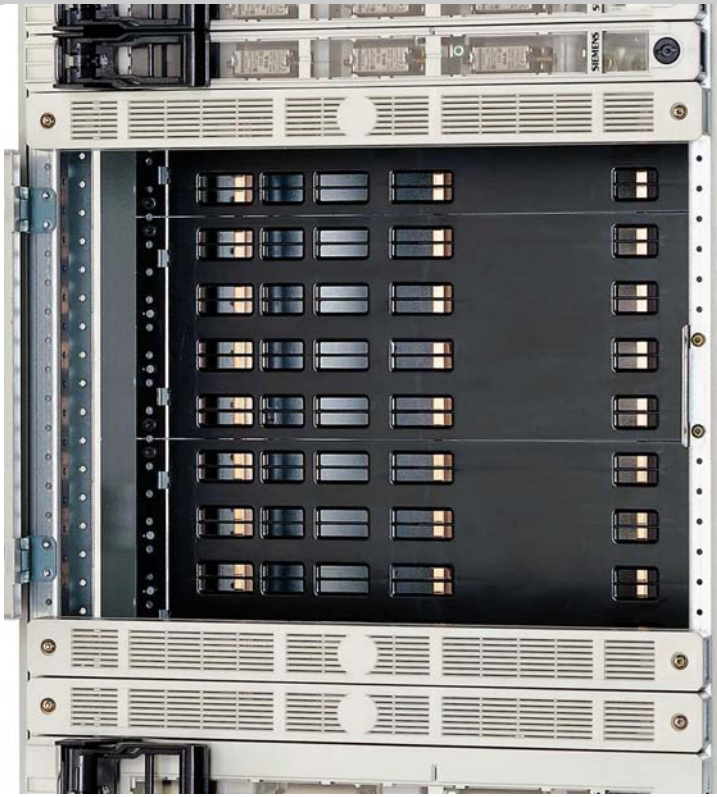
up to 630 A / feeder

Outgoing Feeder Cubicles in In-line Plug-in Design: 3NJ6 Plugged in Swiftly, Always Safe

- In-line type switching devices for cable feeders up to 630 A
- High packing density up to 34 feeders per cubicle
- Dead-state fuse replacement
- 400 mm or 600 mm wide cable connection compartment
- Degree of protection up to IP 40
- Supply-side plug-in contacts enable quick replacement
- Possible to replace a feeder without having to shut down the system

Outgoing Feeder Cubicles in In-line Plug-in Design Vertical Distribution Busbar

- Rated current up to 2100 A
- Rated peak withstand current
  I_{pk} up to 125 kA
  I_{cw} up to 50 kA, 1 s
- Protection against electric shock from plug-on bus system



Reactive Power Compensation
Lower Costs with Increased Safety

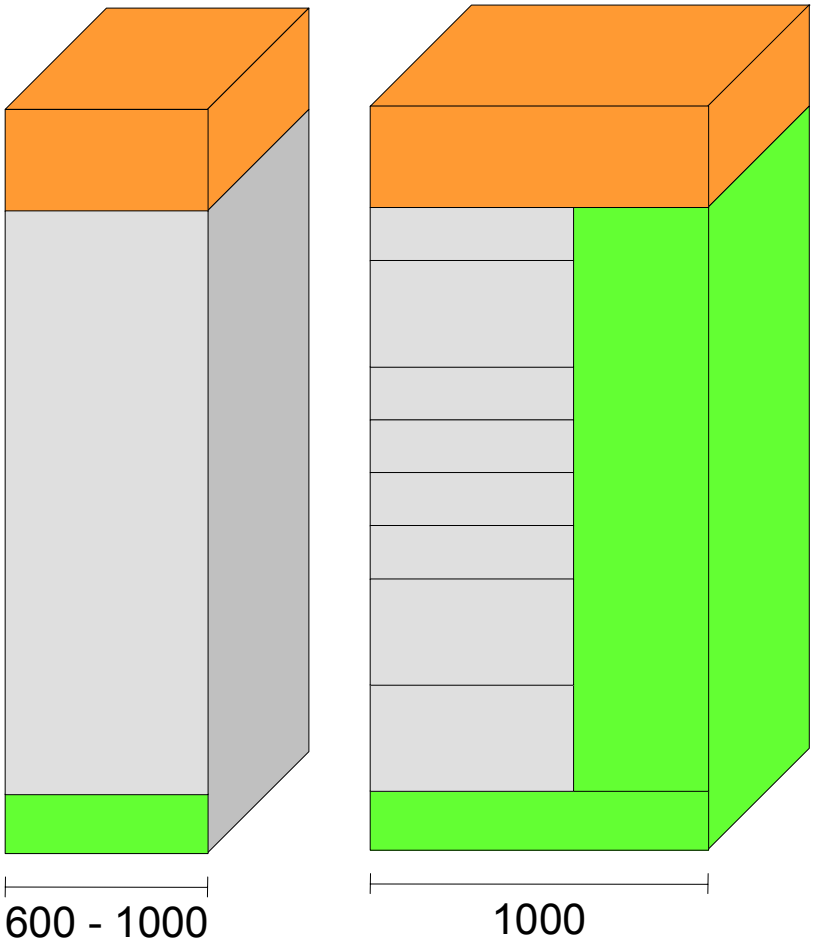
- Non-choked up to 500 kvar
- Choked up to 350 kvar
- Capacitor module up to 100 kvar
- Controller module with electronic power factor controller for flush door mounting
- Cubicle width 800 mm

Cubicle for Customised Solutions
Plenty of Space for Flexibility

- Various installation components
- Cubicle-high doors or compartment doors
- Compartmentalization
- Vertical distribution busbar 3 and 4 pole
- Rated current up to 1200 A
- Rated peak withstand current
  - I_{pk} up to 163 kA
  - I_{cw} up to 65 kA

Cubicle for Customised Solutions
Cubicle Dimensions / Cubicle Structure

Cable connection
front, right-hand side



SIVACON-
Motor-Control-Center in Withdrawable Unit Design

Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Highly available, Always Safe

SIVACON 8PT

- Motor and cable feeder up to 630 A (fused and non-fused)
- Space-saving sizes of withdrawable units from 100 mm module height (up to 17 feeders per cubicle)
- Clearly visible withdrawable unit positions
- Standard operator interface for all withdrawable units
- Isolating gaps on the supply and feeder sides
- Cable connection compartment at front or rear
- Alteration of compartment size possible without having to shutdown the switchboard

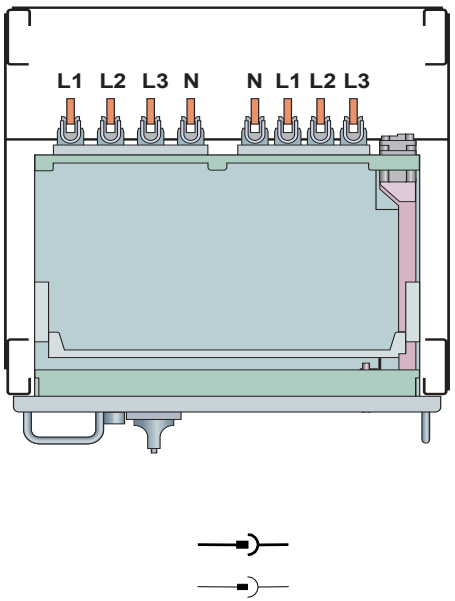
Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Highly available, Always safe

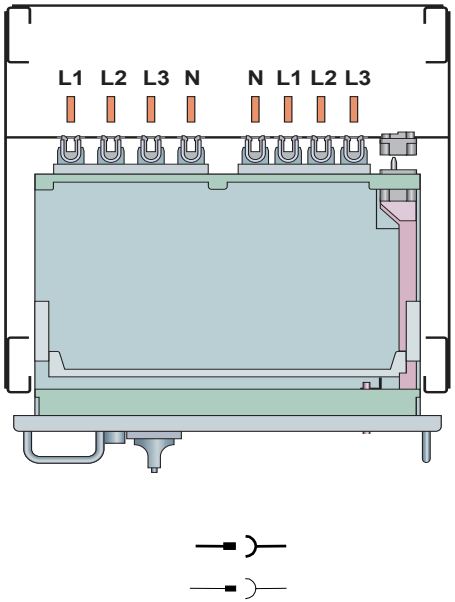
- Cable connection front
  Cubicle width 1000 mm
  Cubicle depth 600 - 1200 mm

- Cable connection rear
  Cubicle width 600 mm
  Cubicle depth 1000 / 1200 mm

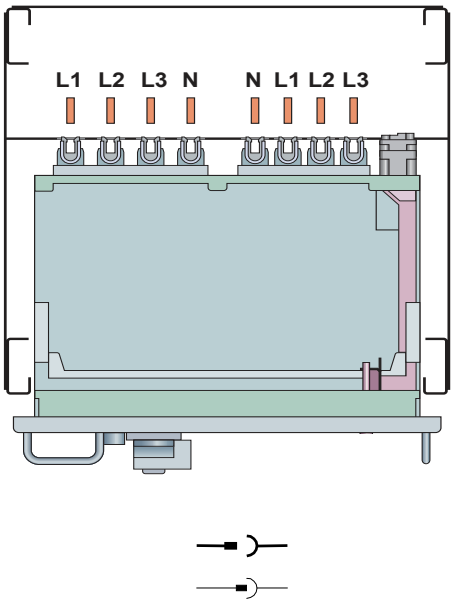
Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Withdrawable Principle

Connecting position
I



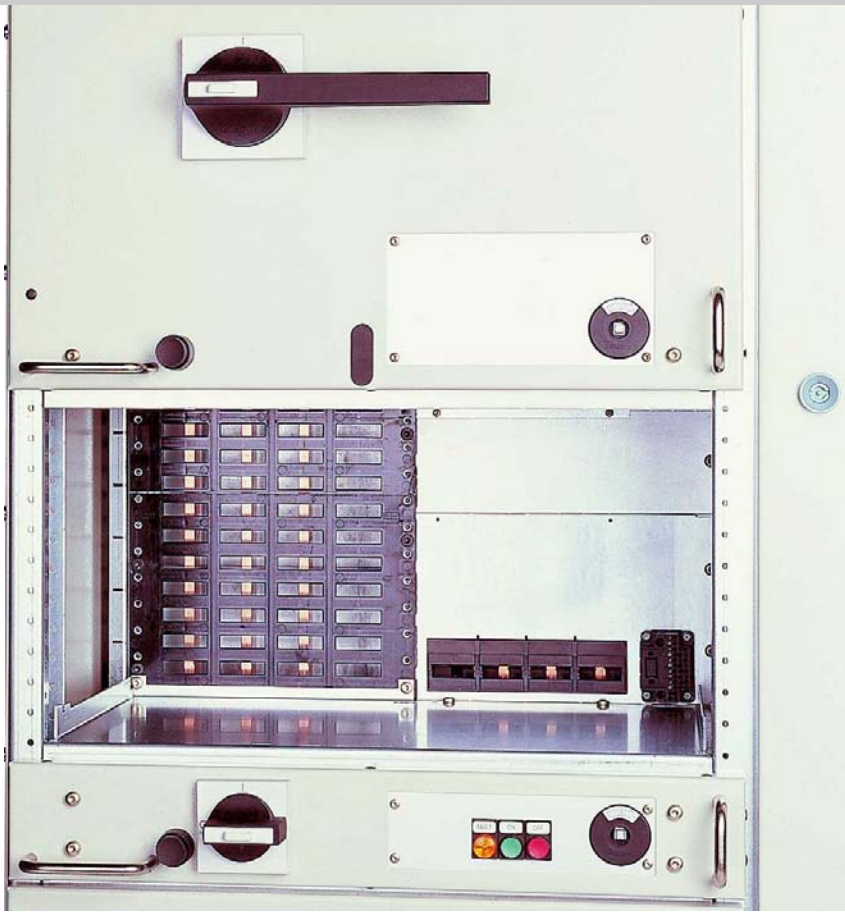


Test position
TEST



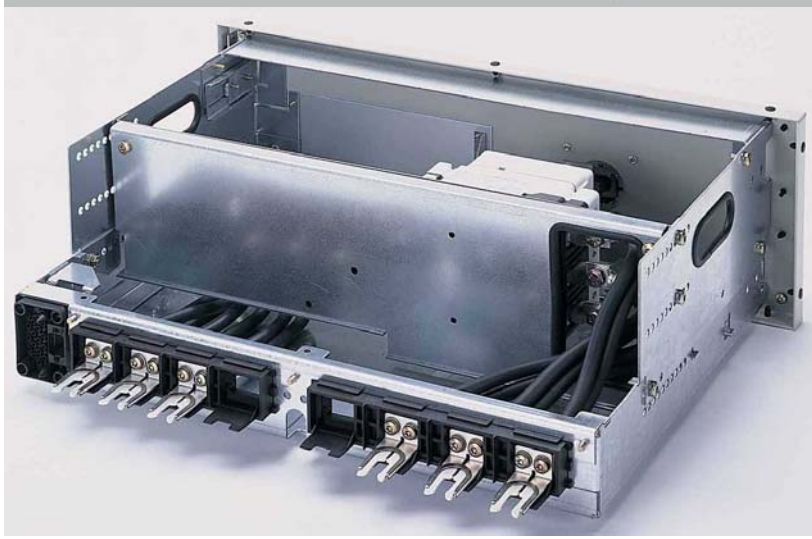
Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Plug-on bus system

- Integrated protection against electric shock, safe-to-touch (IP20B)
- 3- and 4-pole versions
- Tap openings in a modular grid of 25 mm
- Rated current up to 1200 A
- Short-circuit strength
  I_{pk} up to 163 kA
  I_{cw} up to 65 kA, 1 s
  up to 50 kA, 3 s



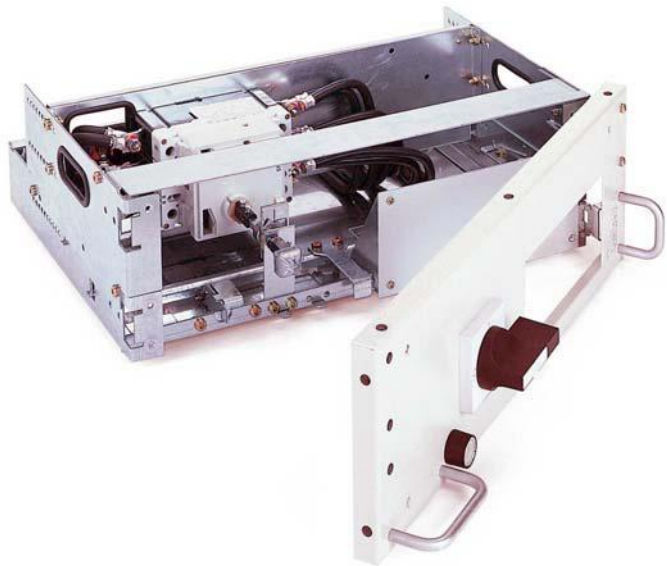
Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Withdrawable Units

- Standardised design in 8 module heights (100, 150, 200, 300, 400, 500, 600, 700 mm)
- Motor feeders fuse-less up to 11 kW in 100 mm module height only
- Integrated maloperation protection in all withdrawable units (main switch locking device)
- Control plugs up to 40-pole with bus contact optionally (PROFIBUS-DP)
- Plenty of space for auxiliary equipment by possibility of fitting components at the rear



Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Withdrawable Units

- Insertion support for easy moving of the withdrawable units > 250 A
- Test and disconnected position with protection degree IP 30 (outside of the contours of cubicle, therefore clearly visible)
- Hinged covers of withdrawable units for adjustments (≥ module height 200 mm)
- Control panel for measuring instruments and actuating devices directly on the withdrawable unit



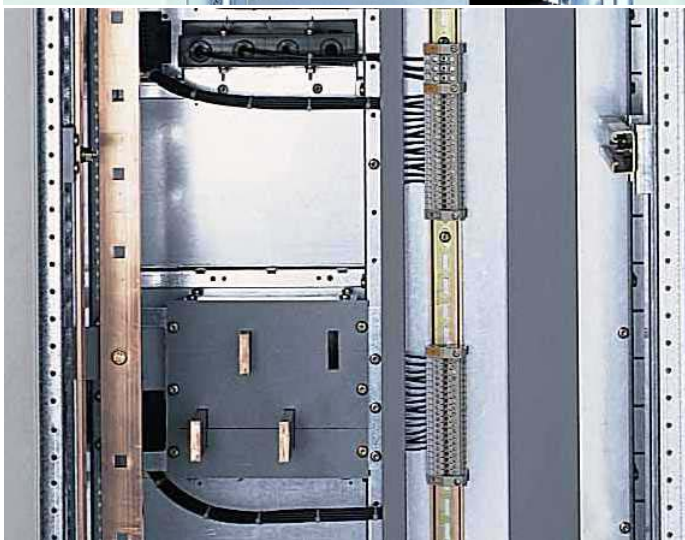
Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Withdrawable Units

- Simple conversion of with-drawable compartments without shutdown of switchboar
- Lockable disconnected position for safe operating at the load

Motor and Cable Feeder Cubicle in Withdrawable Unit Design: Cable Connection

- Connections for power and control cable in the separate cable connection compartment
- No connection work necessary in the withdrawable unit compartment
- Cable connection compartment optionally

  - front = 400 mm wide
  - rear = 600 mm wide



SIVACON – Low-voltage switchboards
Busway connection

Type-tested and standardised connection to the busbar trunking systems SIVACON 8PS

- Type-tested and standardised
- Rated-current from 1600 A up to 6300 A
- Degree of protection IP20 up to IP54
- Busway connection to circuit-breaker 3WL
- For busbar trunking system LD (up to 5000 A) and LX (up to 6300 A)

Always on the Safe Side: Type-Test Included

- Every SIVACON switchgear assembly is verifiably type-tested
- SIVACON Technology Partner uses innovative IT tools for project planning and manufactures safely and conform to the type-tests
- SIVACON Technology Partner maintains a quality management system
- SIVACON Technology Partner is audited periodically and certified by Siemens


SIEMENS

Certificate

Siemens Aktiengesellschaft,
Automation and Drives Group,
Low-Voltage Switchboards Subdivision
hereby certifies that

abc Switchgears
Sample Street 1
23456 Sampletown

is a SIVACON Technology Partner.

SIVACON

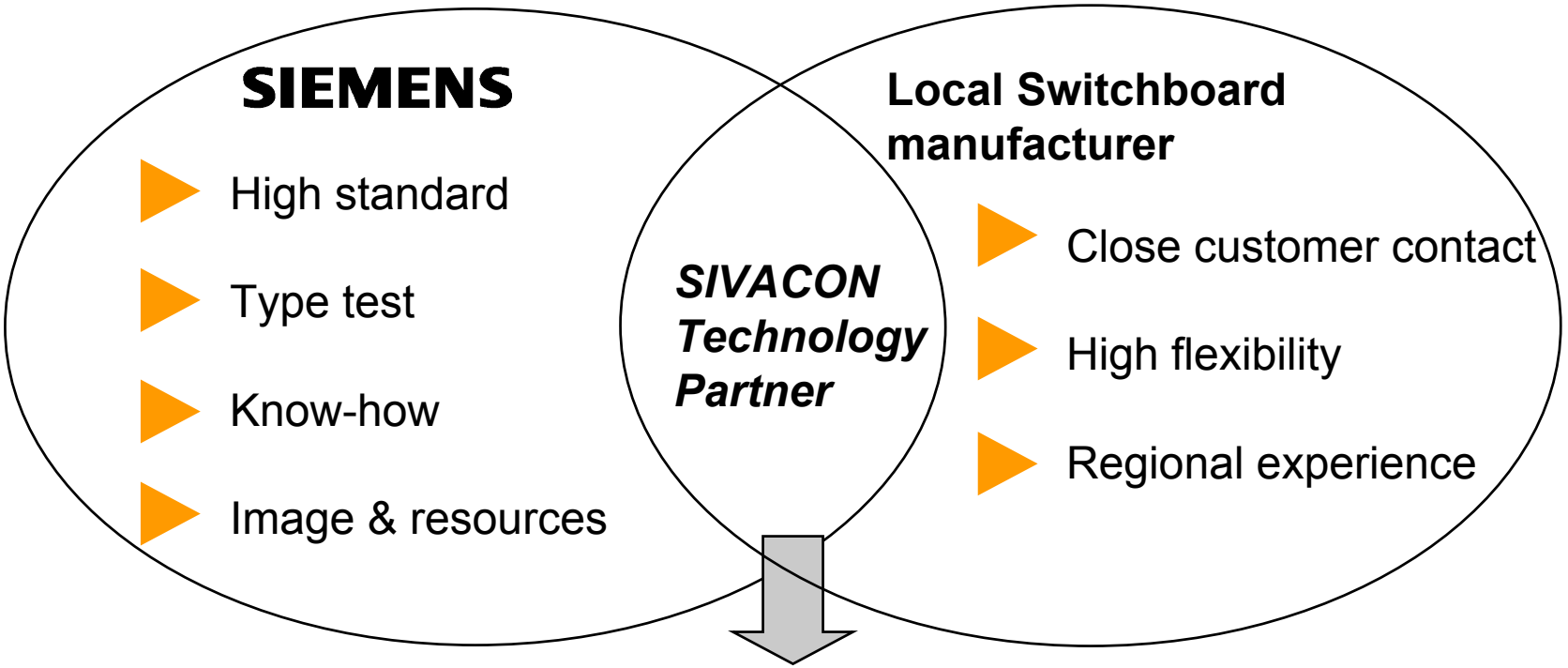

TEST CONFIRMATION

on the given range of performed tests

SIVACON
Highlights

- Type-tested standard modules (TTA)
- Standardized busbar position at the top of the cubicle
- 3 and 4-pole busbar system up to 7400 A
- Rated peak withstand current I_{pk} up to 375 kA
- Deep switchgear compartment for universal installation
- Modular structure of device compartments
- Single-front and back-to-back installation
- Cable lead-in from above or below
- Cable connection from the front or rear

SIVACON-Technology-Partner
The Unique Combination



Proximity to the customer

+

World trade name