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The low-voltage power distribution board that sets new standards

SIVACON S8 - safe, flexible and cost-efficient

Answers for infrastructure.

Mastering your power needs - we support you with our systems

Energy is the driver of progress, because without energy, everything comes to a standstill. Whether in industrial applications or infrastructure, a safe and reliable power supply is vital for modern buildings. Even at the planning stage, the key focus is therefore on safety, flexibility and efficiency. Our intelligent systems and products for low-voltage power distribution are the perfect match for these requirements. Our high-performance, consistent components are the key to your success: they help to noticeably reduce investment costs and risks and guarantee you maximum convenience and system availability throughout the entire period of use.

Safe and intelligent distribution of power

Cost-efficient system

The SIVACON® S8 low-voltage power distribution board sets new standards as a power distribution board for industrial applications or in infrastructure. The power distribution board system up to 7,000 A for the simple and consistent distribution of power guarantees maximum personal and system safety and, thanks to its optimal design, offers a wide range of possible uses. Thanks to the modular technology, the power distribution board can be optimally adapted to every requirement when designing the complete system. With its combination of maximum safety and a modern design, the system offers a highly cost-efficient solution.

Tested safety

SIVACON S8 stands for the highest level of safety. The low-voltage power distribution board is a design-tested power switchgear and controlgear assembly with a design verification based on testing. Evidence of its physical properties has been provided in the product testing department under both operating and fault conditions. An arcing-resistant locking system also ensures maximum personal safety. Furthermore, even with the standard design, verification of testing under arcing conditions is in accordance with IEC 61641.

Flexible solutions

The SIVACON S8 low-voltage power distribution board is the intelligent solution which can be adapted to match your requirements. The well thought-out design of the system allows it to be integrated perfectly into a modern room concept. The section, either single- or double-fronted, can be installed together with a main busbar system or back-to-back with a separate main busbar system. Different installation designs can be combined in one section with ease. The flexible, modular technology allows for the simple exchange or addition of functional units. The SIVACON S8 modular components undergo a continuous innovation process, thereby ensuring the highest possible level of technical progress for the complete system.

Highlights

- Safety for human beings and plants by design verification by verification tests in accordance with IEC 61439-2
- Maximum personal and system safety in the event of an arcing fault thanks to thorough testing in accordance with IEC 61641 and VDE 0660 Part 500-2
- High level of flexibility thanks to the innovative modular technology

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Safe and extensive power distribution

Whether in industrial applications or infrastructure, our integrated portfolio of products and systems offers safe, flexible and cost-efficient application options for low-voltage power distribution.

SIVACON S8 - system overview

Section design

	Circuit breaker system	Universal installation system	Fixed-mounted system
Installation systems	Fixed-mounted design Withdrawable design	Fixed-mounted design with compartment doors Plug-in design	Fixed-mounted design with front covers
Functions	Supply Feeder Coupling	Cable feeders	Cable feeders
Rated current I_n	up to 6,300 A	up to 630 A	up to 630 A
Connection position	front or rear	front or rear	front
Section width (mm)	400 • 600 • 800 • 1,000 • 1,400	600 • 1,000 • 1,200	1,000 • 1,200
Internal separation	Form 1*, 2b, 3a, 4b, 4 Type 7 (BS)	Form 2b, 3b, 4a, 4b, 4 Type 7 (BS)	Form 1*, 2b, 3b, 4a, 4b
Busbar position	rear/top	rear/top	rear/top

* practical cover add-on possible

	3NJ6 in-line system	3NJ4 in-line system	Reactive power compensation
	Plug-in design	Fixed-mounted design	Fixed-mounted design
	Cable feeders	Cable feeders	Central reactive power compensation
	Up to 630 A	Up to 630 A	unchoked up to 600 kvar choked up to 500 kvar
	front	front	front
	1,000 • 1.200	600 • 800 •1,000	800
	Form 1*, 3b, 4b	Form 1*, 2b	Form 1*, 2b
	rear/top	rear	rear/top/without

Features

Design side panel

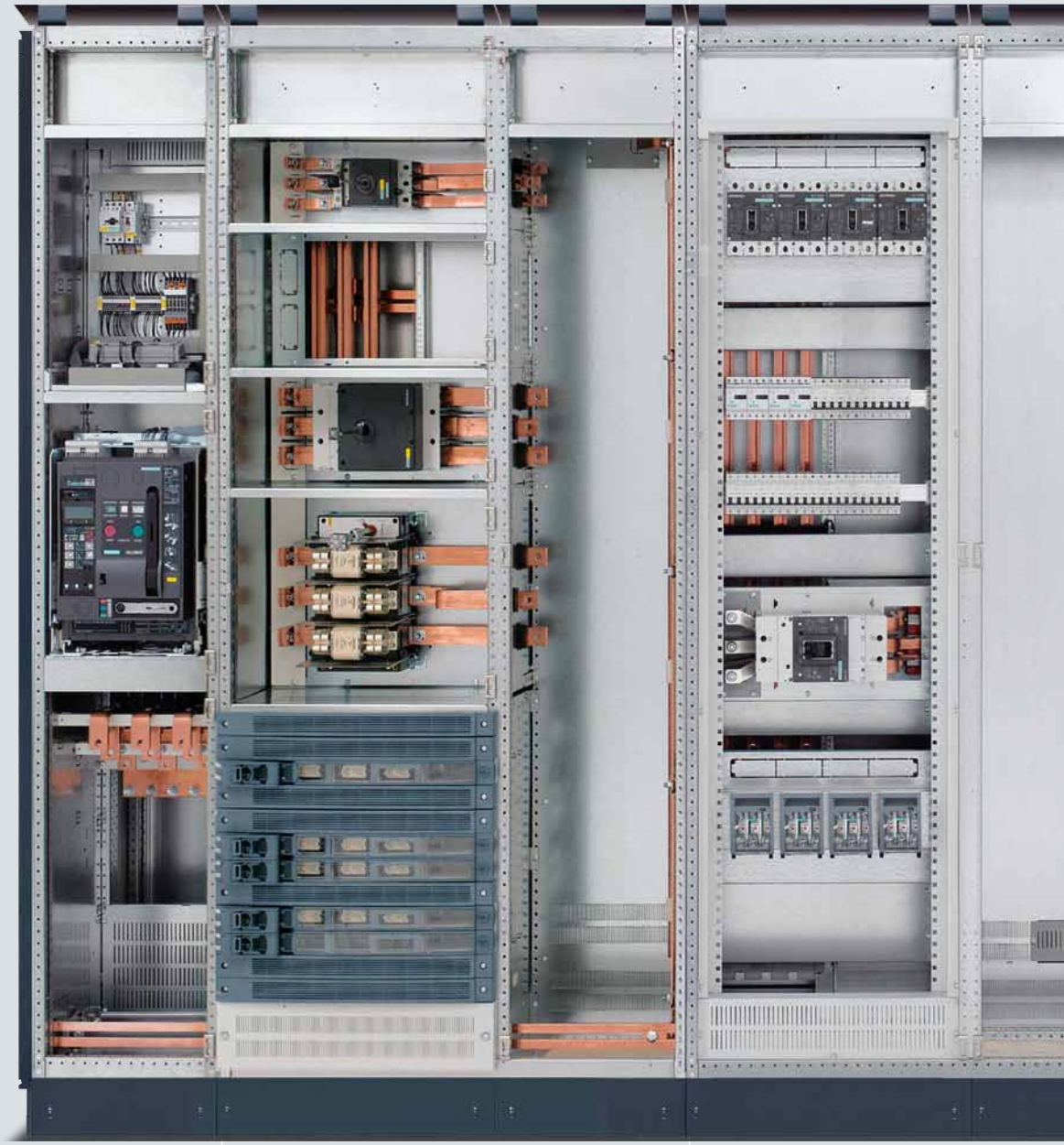
Standardized labelling system for sections and feeders

Variable busbar positions, top up to 6,300 A

Variable busbar positions, rear up to 7,000 A (top and/or bottom)

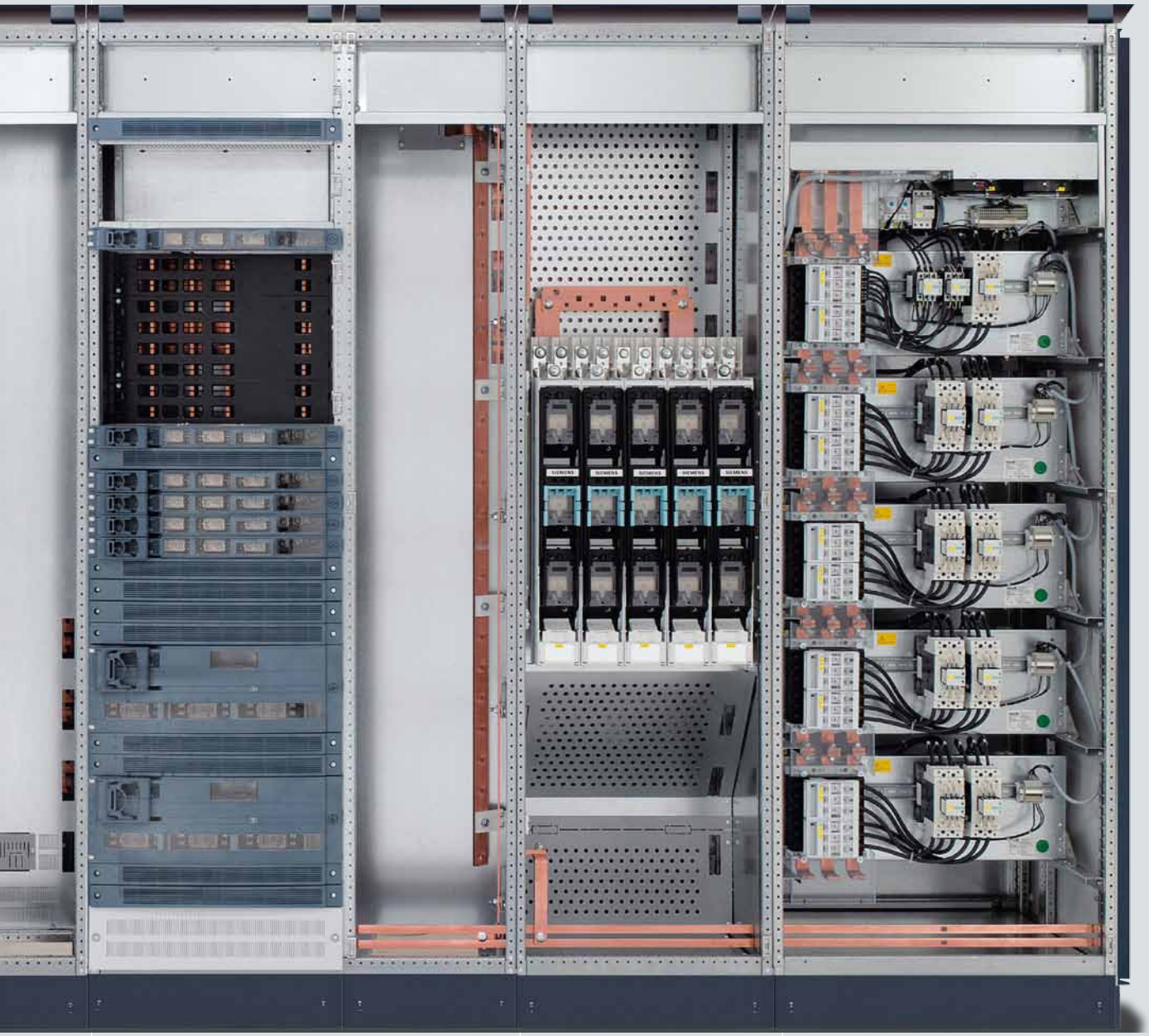
SIVACON S8 – system overview

Section design



	Circuit breaker system	Universal installation system	Fixed-mounted system
Installation systems	Fixed-mounted design Withdrawable design	Fixed-mounted design with compartment doors Plug-in design	Fixed-mounted design with front covers
Functions	Supply Feeder Coupling	Cable feeders	Cable feeders
Rated current I_n	up to 6,300 A	up to 630 A	up to 630 A
Connection position	front or rear	front or rear	front
Section width (mm)	400 • 600 • 800 • 1,000 • 1,400	600 • 1,000 • 1,200	1,000 • 1,200
Internal separation	Form 1*, 2b, 3a, 4b, 4 Type 7 (BS)	Form 2b, 3b, 4a, 4b, 4 Type 7 (BS)	Form 1*, 2b, 3b, 4a, 4b
Busbar position	rear/top	rear/top	rear/top

* practical cover add-on possible



	3NJ6 in-line system	3NJ4 in-line system	Reactive power compensation
	Plug-in design	Fixed-mounted design	Fixed-mounted design
	Cable feeders	Cable feeders	Central reactive power compensation
	Up to 630 A	Up to 630 A	unchoked up to 600 kvar choked up to 500 kvar
	front	front	front
	1,000 • 1.200	600 • 800 •1,000	800
	Form 1*, 3b, 4b	Form 1*, 2b	Form 1*, 2b
	rear/top	rear	rear/top/without

Features

Top plates with pressure relief up to degree of protection IP41

The base can be added optional

Locking system for simple or central locking

Lockable pivoted lever system

Variable busbar positions and stable sheet steel profiles offer maximum safety and flexibility.

Frame, enclosure and busbars

The SIVACON S8 power distribution board combines an cost-efficient design with excellent quality.

Safety and functionality
Safe, user-friendly and appealing: the intelligent design of the SIVACON S8 meets every demand. The frame and all of the bearing components of the section are made from stable, screw-fastened sheet steel profiles. Circumferential rows of holes allow for individual expansion. The patented door-locking system offers maximum safety: the universal door hinge allows for the hinge side to be changed with ease. The doors are available with either simple or central locking and can be fitted with various locking systems such as double bit fastener or pivoted lever lock. The roof plates feature pressure relief for additional safety. Section-to-section separation is provided as standard. The surfaces of frame components, bases, rear panels and floor plates are Sendzimir-galvanized. Doors, covers and base panels are powder-coated or lacquered.

Highlights

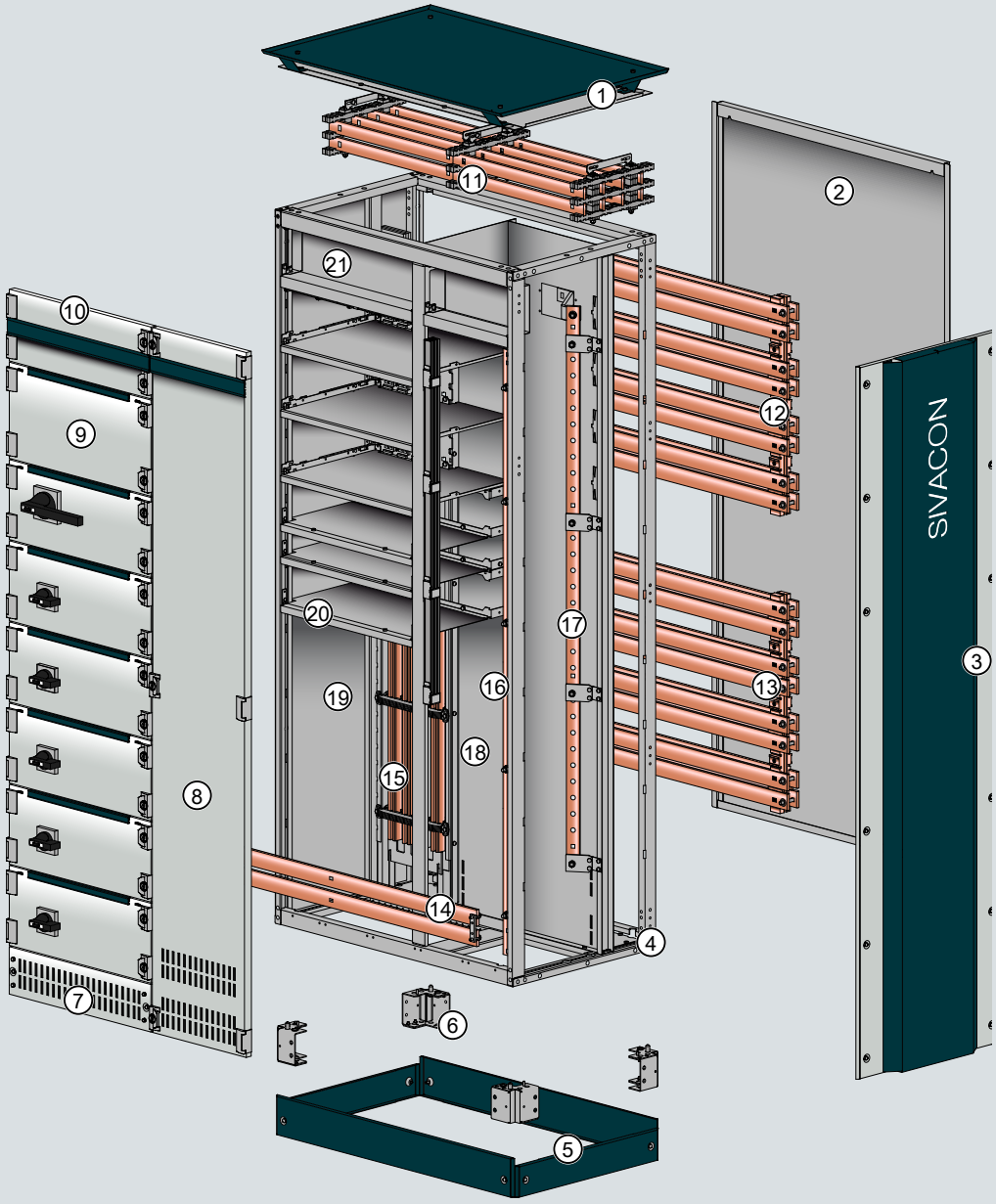
- High level of personal safety thanks to the patented door locking system
- Arrangement of busbar positions suitable for the application
- High level of flexibility thanks to variable busbar systems up to 7,000 A

Technical specifications

Frame	Door opening angle	125 ° • 180 ° with stand-alone design
	Frame height	2,000 • 2,200 mm
	Base height	100 • 200 mm
	Degree of protection	in accordance with IEC 60529: IP30 • IP31 • IP40 • IP41 • IP42 • IP54
Main busbars	Rated currents	up to 7,000 A
	Rated impulse withstand current (I_{pk})	up to 330 kA
	Rated short-time withstand current (I_{cw})	up to 150 kA

Systematic flexibility
Whether your need is for simple systems or extensive networks with transversal and longitudinal couplings, SIVACON offers you all the flexibility you need. The busbars can be positioned at either the top or the rear and, if required, two busbar systems can also be integrated in a power distribution board. The shipping splits are easily accessible from the front or the top. The busbar connections require zero maintenance.

Section design



Enclosure

① Roof plate (IPX1)
② Rear panel
③ Design side panel
④ Frame
⑤ Base panel
⑥ Base
⑦ Ventilated base compartment panel
⑧ Ventilated section door
⑨ Compartment door
⑩ Head room door

Busbars

⑪ Main busbar (L1… L3, N) – top
⑫ Main busbar (L1… L3, N) – rear top
⑬ Main busbar (L1… L3, N) – rear bottom
⑭ Main busbar (PE) – bottom
⑮ Section busbar system (L1… L3, N) device compartment
⑯ Section busbar (PE) cable connection compartment
⑰ Section busbar (N) cable connection compartment

Internal separation

⑱ Device compartment/busbar compartment
⑲ Section to section
⑳ Compartment to compartment
㉑ Cross-wiring compartment

Maximum system safety and an uninterrupted power supply in functional buildings.

As a compact design with a section width of just 400 mm, the section with air circuit breaker 3WL is ideally suited to a rated current of up to 1,600 A.

Circuit breaker system

The sections for circuit breakers 3WL/3VL ensure long-term operational and personal safety.

Safe and user-friendly

The incoming, outgoing and coupling sections of the circuit breaker system are fitted with air circuit breakers 3WL in the withdrawable or fixed-mounted system, or, alternatively, with molded-case circuit breakers 3VL. Since there are generally many loads downstream from these sections, the long-term personal and operational safety of these is of particular importance. SIVACON S8, with its components of the circuit breaker system, meets all these requirements, compact and safe. Movement to the connected, test or disconnected position with the air circuit breaker 3WL take place with the door closed. Design verification by verification test in accordance with IEC 61439-2 also guarantees maximum safety for all sizes.

Flexibility for individual requirements

The section dimensions are tailored to the size of the circuit breakers and can be selected to meet individual needs. The circuit breaker system offers optimal connection conditions for every rated current range. In addition to cable connections, the system also has design verification to SIVACON 8PS busbar trunking systems.

Technical specifications	
Installation system	Fixed-mounted design, withdrawable unit design
Functions	Feeding, tap-off units, transversal or longitudinal coupling
Rated current I_n	up to 6,300 A
Connection position	front or rear
Section width (mm)	400 • 600 • 800 • 1,000 • 1,400
Internal separation	Form 1, 2b, 3a, 4b, 4 Type 7 (BS)
Busbar position	top, rear top and/or rear bottom

The busbar connection compartment offers optimal connection conditions.

In the circuit breaker system, the equipment compartment offers sufficient space for control and monitoring switching devices.

For an cost-efficient installation, the circuit breaker section offers enough room for up to three circuit breakers.

The busbar trunking system connection pieces, specially developed for the SIVACON S8, are an integral component of the sections in the circuit breaker system. These sections consist of three functional compartments. The auxiliary equipment compartment provides the ideal space for control or monitoring switching devices. They are arranged on an auxiliary equipment support which can be separated from the power section.

Depending on the position of the cable connection or busbar connection compartment, this can be arranged at the top and/or bottom.

Efficient solutions
With a width of 600 mm and a depth of 800 mm, the section with three air circuit breakers takes up very little space. In this design, the cable connection compartment is located at the back.

Highlights

- Maximum safety in the connected, test and disconnected position with the door closed
- Ideal space conditions for connecting any range of rated current
- Design verification connection to SIVACON 8PS busbar trunking systems

Inspection possible without removing the air circuit breaker 3WL.

Safe operation and space-saving installation are important aspects of power distribution in infrastructure.

The fixed-mounted feeders in combination with the 3NJ6 in-line system; plug-in can be individually combined at all times.

Universal installation system

Thanks to the universal installation system section, the fixed-mounted design and the plug-in design can be combined for the power distribution.

The successful combination of modules

The SIVACON universal installation system combines tap-off units in the fixed-mounted system and plug-in tap-off units in the in-line design. The system is suitable for cable feeders up to 630 A. The modular technology allows functional subassemblies to be put together in any combination, thereby allowing for the space-saving installation of the power distribution board. Add-on modules enable functional compartments to be divided as required. The front control panel is available with either a section-height door or with compartment doors. The cables are routed at the right side of the section in a cable connection compartment with a choice of width of either 400 mm or 600 mm. Cable brackets are provided here for fastening the cables. Alternatively, the cables can be connected at the back of the section. In this case, the cable connection compartment on the right is no longer required and the section width is reduced to 600 mm.

Safe and flexible power distribution

The vertical section busbars are arranged at the rear left of the section. The profile bar or flat copper design allows for tap-offs in the smallest of grids. Connections to the section busbars by means of

Compartment formation – add-on modules enable functional compartments to be divided as required.

Technical specifications

Installation system	Fixed-mounted design with compartment doors, plug-in design
Functions	Cable feeders
Rated current I_n	up to 630 A
Connection position	front and rear
Section width (mm)	600 • 1,000 • 1,200
Internal separation	Form 2b, 3b, 4a, 4b
Busbar position	top, rear top and/or rear bottom

Internal separation of the compartments as required ensures a high level of flexibility.

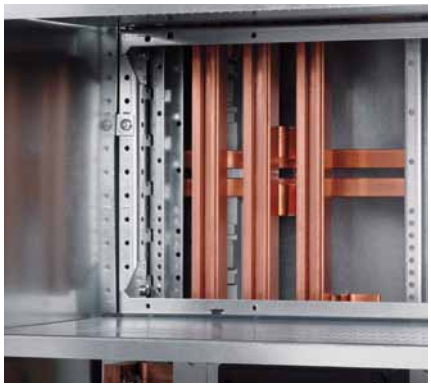
The patented connection terminals are safe, flexible and easy to connect.

cables, wires or busbars are also possible without any need for drilling or punching. This guarantees maximum flexibility, both at the outset and for later expansions.

Modular and variable installation
The installation of switching devices in the fixed-mounted system takes place using modular device holders. It can be fitted with circuit breakers or in-line switch disconnectors with LV HRC fuses. The cable connection is made directly at the device or, in cases of higher requirements, at special patented cable connection terminals. For individual expansion, the system offers freely assignable device holders.

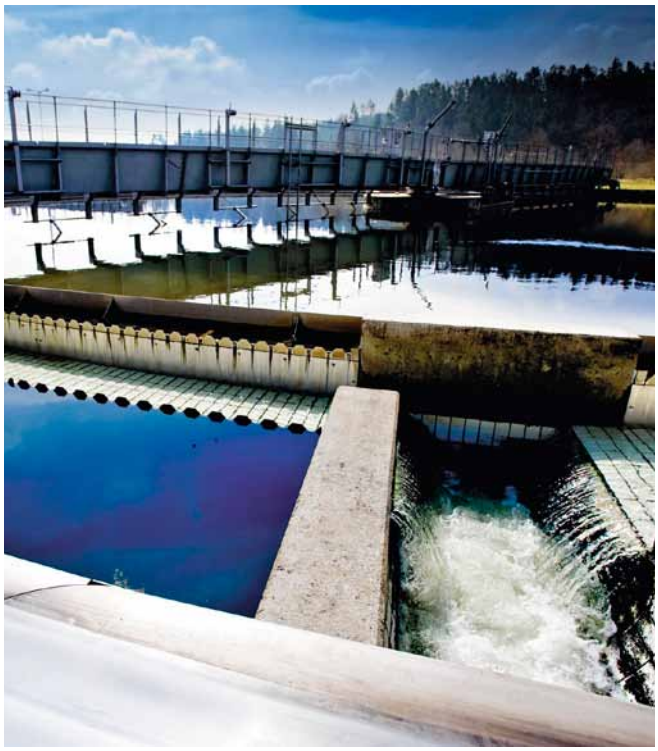
Flexible retrofitting of feeders
In-line switch disconnectors with LV HRC fuses 3NJ6 can be installed in the bottom 600 mm of the equipment compartment. They are equipped with a plug-in contact on the supply line side. This means that the switch disconnectors can be exchanged or retrofitted without disconnecting the section. The plug-in in-line disconnectors are operated directly at the device.

Vertical section busbars offer a range of connection options.



Highlights

- High level of flexibility thanks to the modular technology subassemblies which can be combined as required
- Range of connection options to the section busbar system
- Cost-efficient design of the internal separation by means of add-on modules



With many industrial applications, the exchange of components under operating conditions is not required.

The front panels in the fixed-mounted design section are easy to fit and provide a uniform front surface.

Fixed-mounted design with front covers

Fixed-mounted design with front covers allows for the cost-efficient installation of high-rating tap-off units and the assembly of modular installation devices.

Safe and cost-efficient

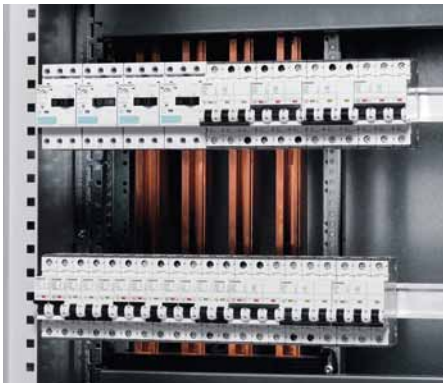
If the exchange of components under operating conditions is not required, or if short downtimes are acceptable, then the SIVACON fixed-mounted system offers a safe and cost-efficient solution. The system is designed for cable feeders up to 630 A. Individual functional subassemblies can be combined in the modular technology as desired, therefore offering you all the flexibility that you need.

Add-on modules enable functional compartments to be subdivided as required (up to form 4b). The hinged masking frame also guarantees simple commissioning and maintenance. The cables are routed at the right side of the section in a cable connection compartment with a choice of width of either 400 mm or 600 mm. Cable brackets are provided here for fastening the cables.

Flexible and space-saving

The vertical section busbars are arranged at the rear left of the section. The profile bar or flat copper design allows for tap-offs in the smallest of grids. Connections to the section busbars by means of cables, wires or busbars are also possible without any need for drilling or punching. This guarantees maximum flexibility, both at the outset and for later expansions.

The aluminium multi-profile bar allows for the simple assembly of modular installation devices.



Technical specifications

Installation system	Fixed-mounted design with front panels
Functions	Cable feeders
Rated current I_n	up to 630 A
Connection position	front
Section width (mm)	1,000 • 1,200
Internal separation	Form 1*, 2b, 4a, 4b
Busbar position	top, rear top and/or rear bottom

* practical cover add-on possible

Add-on modules enable functional compartments to be divided as required.

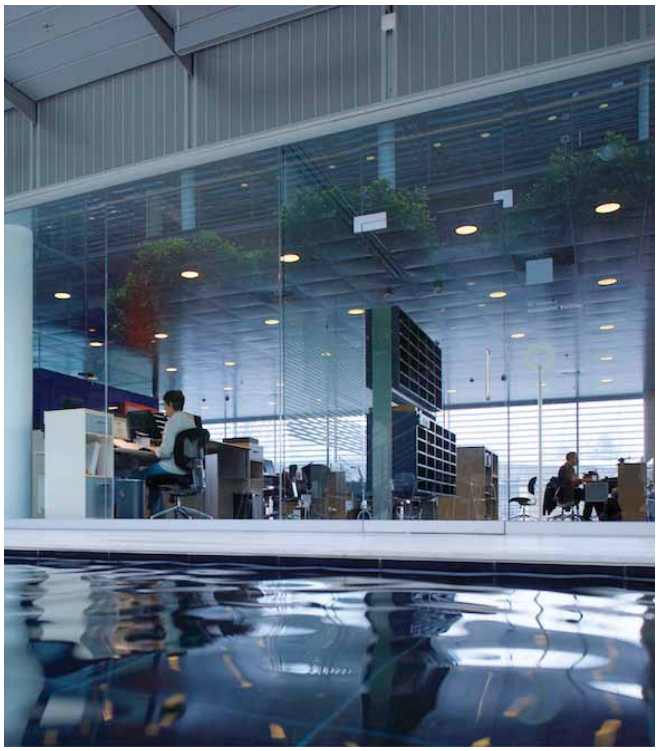
Arrangement of devices as single or multiple feeders possible.

Multifunctional modules

The switching devices are installed on modular device holders of graduated depth. It can be equipped with circuit breakers, switch disconnectors with fuses or modular installation devices. Different switching devices groupings into one module are also possible. They are attached onto the device holders and directly connected to the section busbar. The cable connection is made at the device or, in cases of higher requirements, at special cable connection terminals. Thanks to the panel, simple operation is possible directly at the device. For individual expansion, the system offers freely assignable device holders.

Highlights

- Efficient arrangement of devices as single or multiple feeders
- More safety thanks to design verified standard modules
- High level of flexibility through the combination of high-rating tap-off units and modular installation devices



In office complexes, a space-saving and cost-effective power distribution board installation is generally required.

With the fixed-mounted 3NJ4 in-line system, it is possible to install up to 18 tap-off units per section.

3NJ4 In-line system

The compact design of the in-line system ensures optimal and cost-efficient applications in infrastructure.

Compact and safe

The sections for cable feeders in the fixed-mounted system up to 630 A are equipped with vertically installed LV HRC fuse switch disconnectors 3NJ4. Thanks to their compact design and modular installation, they allow for optimal and cost-efficient applications in infrastructure. Design-tested standard modules guarantee maximum safety.

Depending on the section width, up to nine switch disconnectors of size 1 to 3, or 18 switch disconnectors of size 00 can be installed. A device support plate can be provided in the section for the installation of additional auxiliary devices, standard rails, wiring ducts, terminal blocks, etc. Alternatively, an ALPHA small distribution board can be installed. Measurement devices and control elements are built into the door.

Cost-efficient and adaptable

As a horizontal section busbar system (phase conductors L1, L2, L3), various cross-sections are available which are arranged horizontally at the back of the section. The section busbar cross-sections can be freely selected, so the section type can be optimally adapted to the requirements. The protective conductor and PEN or neutral conductor busbars are installed separately from the phase conductors in the cable connection compartment, either at the top or the bottom of the section, depending on the connection.

Technical specifications

Installation system	Fixed-mounted design
Functions	Cable feeders
Rated current I_n	up to 630 A
Connection position	front
Section width (mm)	600 • 800 • 1,000
Internal separation	Form 1*, 2b
Busbar position	rear top and/or rear bottom

* practical cover add-on possible

In-line section with LV HRC fuse switch disconnectors 3NJ4 and quick-assembly kits for modular installation devices.

With a wide range of connection options, the compact devices can be optimally fitted, even where space is limited.

Flexible design

The switch disconnectors of sizes 1 to 3 are fixed-mounted on the horizontal section busbar system. For switch strips of size 00, mounting takes place on an adapter. The cable is connected at the front, directly at the device. The cables can be routed into the section from the top or the bottom. A section-height door provides the front closure. With degrees of protection up to IP31, this door can be optionally fitted with a cutout area, which allows for control of the switching devices when the door is closed. It is operated directly at the device. The switch disconnectors can be fitted with up to three current transformers to allow for feeder-related measurements. In order for a section-related summation current measurement to be performed, the system offers the option of installing a current transformer in the section busbar system.

Highlights

- Space-saving, thanks to the compact design with up to 18 tap-off units per section
- Cost-efficient system thanks to maximum possible main busbar loading with arrangement on separate section busbar system
- Optional installation of quick-assembly kits or freely assignable device holders

The in-line system is particularly well-suited to applications with numerous cable branches in a very confined space.

The section for switch disconnectors with 3NJ6 LV HRC fuses is suitable for up to 35 tap-off units in a fused system.

3NJ6 In-line system

Thanks to its modular design, the plug-in system allows for quick and easy modification or exchange under operating conditions.

Variable with the plug-in design
In-line switching devices with a plug-in contact on the supply-line side offer an cost-efficient alternative to the withdrawable unit design and, thanks to its modular design, allow for quick and easy modification or exchange under operating conditions. The switch disconnectors with double-breaking are suitable for cable feeders up to 630 A.

With up to 35 feeders per section, the switching devices achieve a high packing density. The cables are routed vertically at the right side of the section in a cable connection compartment with a choice of width of either 400 mm or 600 mm. Cable brackets are provided here for fastening the cables.

Safe and flexible
The section busbar system is arranged at the rear of the in-line system section. It offers test finger safety (IP20B) to live parts. The tap openings are arranged in a 50 mm modular grid. This guarantees maximum flexibility, both at the outset and for later expansions.

Technical specifications

Installation system	Plug-in design
Functions	Cable feeders
Rated current I_n	up to 630 A
Connection position	front
Section width (mm)	1,000 • 1,200
Internal separation	Form 1*, 3b, 4b
Busbar position	top, rear top and/or rear bottom

* practical cover add-on possible

The combination of the plug-in in-line disconnectors and device compartments makes space available for recording performance data.

In-line switch disconnectors with LV HRC fuses 3NJ6 have single or double-breaking as standard.

Compact with high functionality
The cable is connected at the front, directly at the device. The in-line system door forms the front closure. The plug-in in-line disconnectors are operated directly at the device. Up to four required current transformers can be installed in the in-line disconnector inside the device contours. Alarm and signalling devices can be integrated in the in-line disconnector. Device compartments are available for individual expansion. A compartment door provides the front closure, and signalling or measurement devices can be built into the door.

Highlights

- High level of system availability thanks to modification or exchange under operating conditions
- Simple and cost-efficient assembly through plug-in contact on the supply-line side
- High packing density with up to 35 branches per section

Whether for industrial applications or infrastructure, energy costs can be lowered thanks to the reactive power compensation.

Sections for the central reactive power compensation relieve transformers and cables and reduce transmission losses.

Reactive power compensation

Save costs with the intelligent SIVACON technology.

Cost-efficient system

In a network, reactive power is caused by inductive linear loads, such as motors, transformers or reactors, and inductive, non-linear loads, such as converters, welding apparatus, arc furnaces or UPS systems. The sections for central reactive power compensation relieve transformers and cables, reduce transmission losses and therefore save energy.

Depending on the load structure, the reactive power compensation is equipped with choked or unchoked capacitor subassemblies. The controller subassembly has an electronic reactive power controller for door installation. The C/k value setting takes place automatically. The multifunction display is also used to set and display various parameters. The desired target cos phi can be set from 0.8 ind to 0.8 cap. Network parameters such as U, I, f, cos phi, P, S, Q, harmonics are displayed. The capacitor subassembly (up to 200 kvar) with MKK capacitors has a fuse switch disconnector, capacitor contactors, discharge devices and filter reactors. The switch disconnector subassembly can optionally be used for the central safety isolation of the integrated capacitor subassemblies.

Technical specifications

Installation system	Fixed mounting
Functions	Central reactive power compensation
Rated current I_n	unchoked up to 600 kvar, choked up to 500 kvar
Capacitive reactive power Q	Degree of choking: without • 5.67 % • 7 % • 14 %
Connection position	front
Section width (mm)	800
Internal separation	Form 1*, 2b
Busbar position	without, top, rear top and/or rear bottom

* practical cover add-on possible

Thanks to the modular design, the section for reactive power compensation can be adapted to changing reactive power.

The capacitor subassemblies can be used choked or unchoked.

Integrated savings potential
The reactive power compensation section is available either with or without a main busbar system. The section can therefore be directly integrated into the power distribution board with design-test approval. In this case, additional protection and cable connections between the power distribution board and the reactive power compensation are not required.

The entire height of the device compartment is available for the installation of the controller, capacitor or group switch subassemblies. The device compartment is closed by means of a section-height door with ventilation openings.

Highlights

- Convincing efficiency thanks to lower energy costs
- Cost-efficient, network dimensioning thanks to low reactive power
- Simple handling by means of the switch disconnector subassembly for the central safety isolation of the capacitor subassemblies

The most serious accidents which occur during work with low-voltage power distribution boards are those caused by arcing faults.

Arc resistance measures are an integral component of the SIVACON S8 system.

Arc resistance

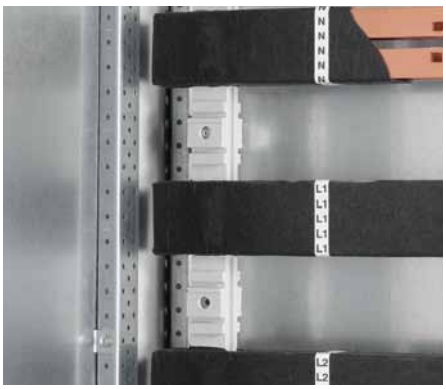
The SIVACON S8 power distribution board offers evidence of personal and system safety, thanks to testing under arc conditions.

Personal and system protection
The efficiency of production plants depends very much on the reliability of the power supply. Low-voltage power distribution boards play a key role in this regard. An arcing fault is one of the most dangerous faults, associated with the most serious consequences, which can occur in a power distribution board, and it can also damage adjacent tap-off units, sections or the entire system. Arcing faults can be caused by incorrect dimensioning and reductions in insulation due to contamination etc., but they can also be the result of handling errors. The effects, resulting from high pressure and extremely high temperatures, can have fatal consequences for the operator, the system and even the building. However, you can rely on the safety offered by SIVACON. Testing of low-voltage power distribution boards under arcing fault conditions is a special test in accordance with IEC 61641 or VDE 0660 Part 500-2. Even in its standard design, SIVACON offers evidence of personal safety through testing under arcing fault conditions.

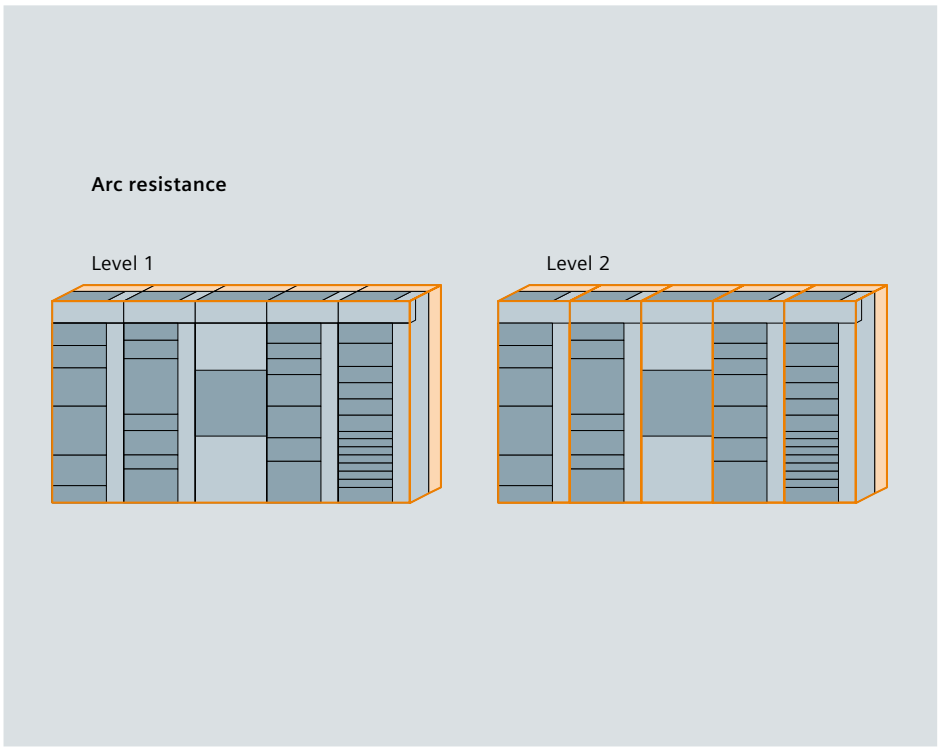
Safety – the primary objective
Active protection measures such as the high-quality insulation of live parts (e.g. busbars), standardized and simple operation, integrated operating fault protec-

The arcing fault barrier restricts the effects to one section when an arcing fault occurs.

Insulated main busbars prevent the occurrence of arcing.



The SIVACON S8 restricts or prevents the occurrence of arcing faults.



For situations which require a higher degree of arc resistance, Siemens has developed a system of levels for the SIVACON system. It is based on a very high level of personal safety without major restriction of the effects of arcing within the power distribution board (Level 1) for enhanced operating conditions.
Subsequent levels are also based on personal safety, and these also include additional measures for system protection.
With Level 2, damage is restricted to one section of the system.

Measures to restrict the parts of the power distribution board ensure enhanced system safety in the event of an arcing fault.

tion and reliable system dimensioning prevent arcing faults and the associated personal injuries. Passive protection measures such as hinge and locking systems with arc resistance, the safe operation of circuit breakers behind a closed door and patented swing check valves behind ventilation openings on the front, combined with the rapid disconnection of arcing faults increase personal and system safety many times over. Evidence of the functionality of the measures described is provided by numerous, comprehensive arcing fault tests under "worst case" conditions, performed on a wide variety of section types and functional units. These tests are used to assess the danger that people and systems can be exposed to in the event of an arcing fault.

Highlights

- High level of personal safety thanks to the testing of the power distribution board under arc conditions
- Reliability thanks to comprehensive and thorough test evidence
- System safety by restricting the effects of arcing faults within the system
- Personal safety in all configurations, e.g. through patented swing check valves behind ventilation openings

SIVACON S8 – low-voltage power distribution board with maximum personal and system safety.

SIVACON S8 – standard-compliant, design verified low-voltage power distribution board

Essential fit for purpose verifications in accordance with IEC 61439.

Requirement of standard IEC 61439
Low-voltage power distribution boards or standard-compliant power switchgear and controlgear assemblies are developed, manufactured and approved in accordance with the specifications of IEC 61439-1/-2 (VDE0660 Part 600-1/-2). In order to provide evidence that the power distribution board is fit for purpose, this standard requires two main forms of verification – the design verification and the routine verification. The design verification involves tests carried out during the development process and this is the responsibility of the original manufacturer (developer). A routine verification must be performed on every manufactured power distribution board prior to delivery by the manufacturer of the power switchgear and control gear assembly.

Design verification through testing
The SIVACON S8 power distribution board offers safety for human beings and plants by design verification by verification tests in accordance with IEC 61439-2. The physical properties are designed in the product testing department for operational and fault conditions and guarantee maximum system and personal safety. The design verification and the routine verification are a vital component of quality assurance and are the prerequisite for CE marking in accordance with EC directives and legislation.

Highlights

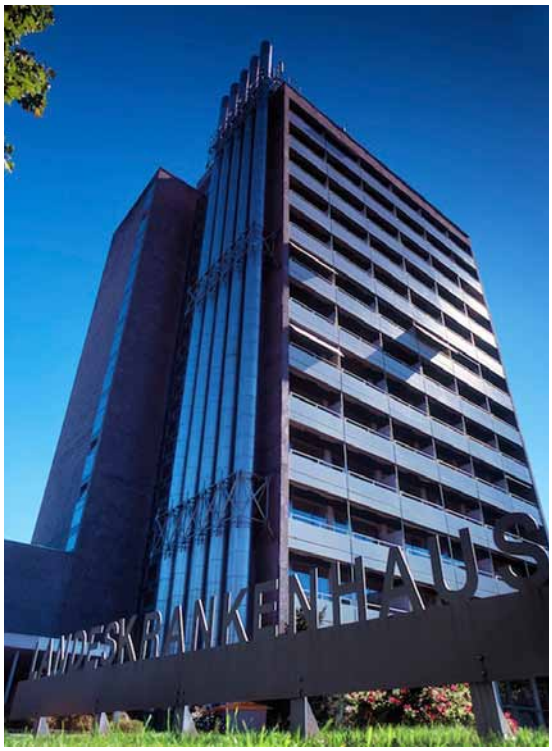
- Safety for human beings and plants by design verification by verification tests in accordance with IEC 61439-2
- Maximum quality assurance through design verification and routine verification
- Testing always carried out on the complete system with all devices

Design verifications

	Verification through testing	Verification through calculation	Verification through engineering rules
1. Strength of materials and parts	✓	–	-
2. Degree of protection of enclosures	✓	–	✓
3. Clearances in air and creepage distances	✓	✓	✓
4. Protection against electric shock and integrity of protective circuits	✓	✓[1]	✓[1]
5. Incorporation of switching devices and components	–	–	✓
6. Internal electric circuits and connection	–	–	✓
7. Terminal for external conductors	–	–	✓
8. Dielectric properties	✓	–	✓[2]
9. Temperature-rise limits	✓	up to 1,600 A	up to 630 A[3]
10. Short-circuit withstand strength	✓	conditional[3]	conditional[3]
11. Electromagnetic compatibility (EMC)	✓	–	✓
12. Mechanical operation	✓	–	–

[1] Effectiveness of the switchgear and controlgear assembly when external faults occur
[2] Impulse voltage withstand only
[3] Compared with a construction already tested

Verification of temperature rise
One of the most important verifications is the "Verification of temperature rise". This verifies that the power distribution board is fit for purpose when the temperature rises due to power loss. In view of the ever increasing rated currents, together with higher requirements relating to degree of protection and internal separation, this is one of the greatest challenges in the power distribution board industry. This verification can be carried out by means of calculation for rated currents up to 1,600 A; for rated currents from 1,600 A, this verification must be performed by means of testing. Rules governing the selection of the test items (worst-case test) and the testing of complete switchgear and control gear assemblies ensure that there is systematic coverage of the entire product range and that the verification always includes the devices. Testing items selected at random is therefore inadequate, as is the replacement of a device without repeating testing.



Saving potentials can be easily identified through transparent energy flows.

The highest system safety for an uninterruptible power supply in hospitals.

Design verified power distribution boards for a hospital

The Duisburg Casualty Hospital with design verified power distribution.

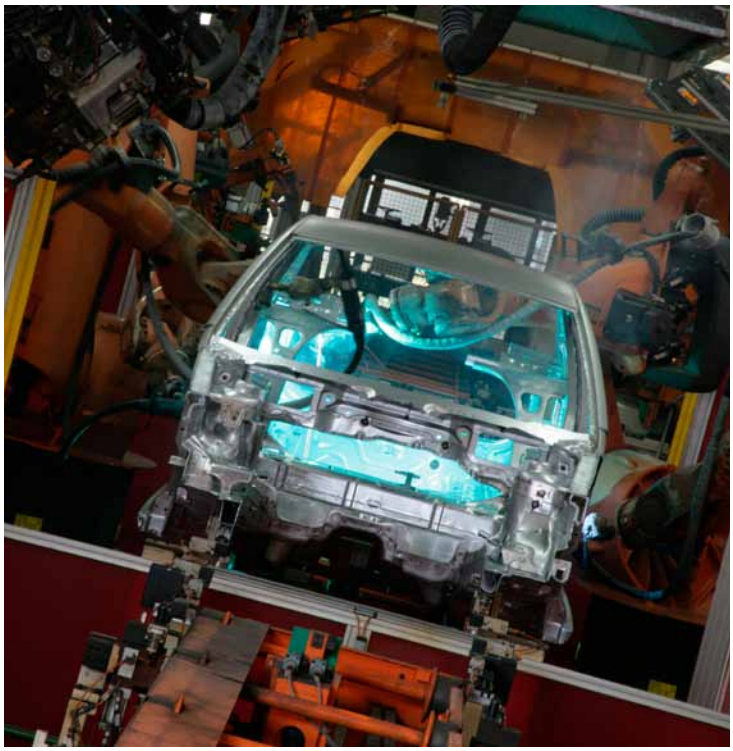
Requirement
The buildings for a new hospital were equipped with a modern power distribution system. An uninterruptible power supply is required to ensure, that patient treatment can be guaranteed in full at all times. Electromagnetic compatibility also plays an important role. A switchboard with communications capability is needed in order to perform monitoring and control functions via a central building management system.

Solution
The new SIVACON S8 power distribution board is a design verified system which offers the highest system safety as well as an uninterruptible power supply and electromagnetic compatibility. To make optimum use of the available space, the main busbars were arranged in the rear part of the power distribution board in order to configure as compact as possible even for very high operational currents. LV HRC switch disconnectors 3JN6 for plugging directly onto the finger-safe field bars by means of contacts on the supply-line side were installed to protect the individual power lines. With this technology system expansions can be easily realized. Transformer connection and disconnection operations are performed by communication-capable air circuit breakers 3WL which enable settings, diagnostics information and status data to be read out via Profibus DP.

Result
By using design verified power distribution boards with communication-capable circuit breakers it was easy to integrate a reliable power supply in the existing building management system. The configuration of the power distribution board enables all functions to be adapted to the desired requirements with optimum effect. Furthermore, it enables easier servicing and provides a reliable and clear-cut overview of the power distribution in the hospital.

Highlights

- High reliability of supply, also during retrofitting and maintenance, thanks to plug-in feeders
- Compact design even for high operational currents through intelligent arrangement of the main busbars
- High electromagnetic compatibility through joint routing of the supply and return conductors



Maximum system availability, even with production lines with a high power requirement.

The compact design ensures a flexible, cost-efficient assembly of the SIVACON S8.

Design verified power distribution boards for the automobile industry

Safe power supply for welding tongs in vehicle body serial manufacture.

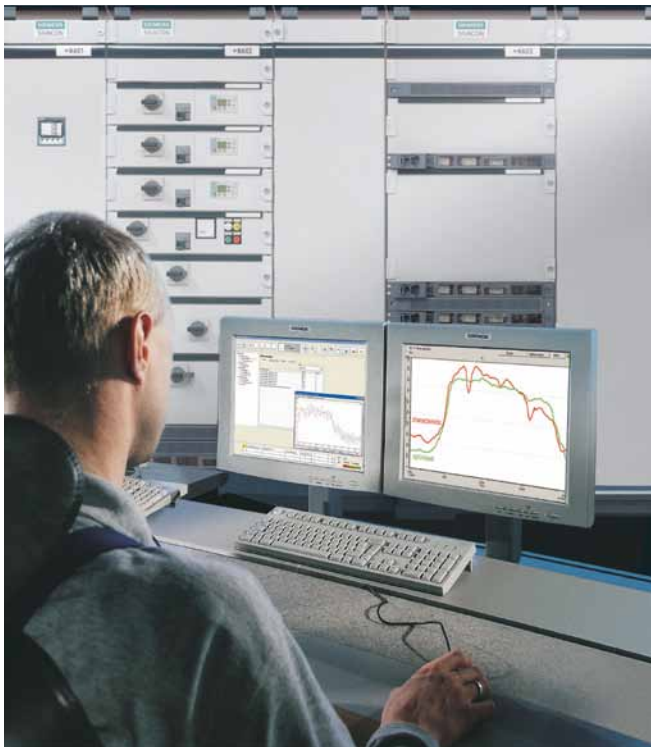
Requirement
In car body production, the manual welding tongs require a power supply of up to 130 kVA. Since short-circuit currents of up to 100 kA are possible, a safe and interruption-free low-voltage power distribution board is required.

Solution
In order to design the power supply allocation to a welding station with several sets of tongs with maximum transparency, there is a decentrally positioned power distribution board, in each case, set on a supply gangway directly above the station. By supplying the power over the main busbars from above or below, a high level of flexibility is achieved, together with the associated reduced installation effort. The molded-case circuit breaker 3VL acts as a switch disconnector between the power supply via busbar trunking systems and the low-voltage power distribution board. The in-line switch disconnectors with LV HRC fuses 3NJ62 themselves provide a high level of flexibility, since they can be plugged into and removed from the live system. Due to the interruption contacts in front of and behind the fuse links up to 630 A, no additional measures are required when changing the fuses. All relevant electronic values can be recorded by the integrated measuring devices 7KM PAC3200.

Result
It was possible to achieve a high level of personal and system safety through the use of the SIVACON S8 power distribution board, which has the required design verification and which was also supplied in a design offering arc resistance.
A standardized installation was a crucial factor in terms of efficiency for planning, execution and service. Other production plants in various countries were fitted out on the basis of the model provided by the welding equipment power supply in this case.

Highlights

- More flexibility thanks to free choice of the main busbar position
- High level of system availability thanks to the exchange of plug-in disconnectors under operating conditions
- Cost-efficient planning thanks to standardized assembly



Due to the transparency of power flows, savings potential can be easily identified.

Measuring devices of the SENTRON family for recording and supplying consumption data and electrical parameters.

Energy management with the SIVACON S8 power distribution board

Knowing when, where and how much energy is being consumed – costs are lowered thanks to optimized energy use.

Consistently well informed
Anybody who wants to reduce energy costs on a long-term basis, firstly requires a clear overview of current energy consumption and power flows. The measuring devices 7KT/7KM PAC and communication-capable circuit breakers 3WL/3VL integrated in the power distribution board can help you to achieve this. They record precise and reliable measurements of the energy values for electric feeders or individual loads. In addition to this, the measuring devices 7KM PAC provide you with important measurement values, via standardized bus systems, for the assessment of system status and network quality.

Simple evaluation of data
For the further processing of measured data, additional devices, which are perfectly matched to the power distribution board, can be integrated into higher-level automation and power management systems with the greatest of ease, thanks to the wide variety of communication options they offer. The measurement devices and communication-capable circuit breakers therefore provide the ideal basis for cost-efficient energy management with the SIVACON S8 power distribution board.

Reliable through communication
Power distribution boards must operate efficiently. Consequently, the load must be constantly optimized and downtimes must be avoided. The software for energy management powermanager analyses and documents the data from measurement devices and communication-capable circuit breakers and produces load profile curves and trend analyses, extending to the visualisation of switching states.

Costs under control
Maximum monitors in conjunction with GAMMA building management systems enable cost-efficient and low-cost load management in buildings.

Highlights

- Simple integration of the measurement devices and communication-capable circuit breakers
- Identification of savings potential thanks to transparency of power flows
- Reliable recording and presentation of consumption data
- Improvement of system availability through continuous monitoring

Everything from a single source – from initial information, planning, configuration and ordering through to commissioning, operation and technical support.

Comprehensive support from A to Z

For more efficiency on all counts – comprehensive support and quick and easy access to service-proven tools at any time via the Internet.

Product information	
Website	Fast and selective information on the subject of low-voltage power distribution: **www.siemens.com/lowvoltage**
Newsletter	Keep up to date with our future-oriented products and systems: **www.siemens.com/lowvoltage/newsletter**
Product information/product & system selection	
Information and download center	Latest catalogs, customer magazines, brochures, demo software and campaign packages: **www.siemens.com/lowvoltage/infomaterial**
Industry mall	Comprehensive information and ordering platform for the Siemens industry shopping basket: **www.siemens.com/lowvoltage/mall**
Product & system engineering	
SIMARIS software tools	Support with the planning and configuration of electrical power distribution: **www.siemens.com/simaris**
Configuration software ALPHA SELECT	Quick and easy configuration of distribution boards with products from the Siemens Industry shopping basket: **www.siemens.com/alpha-select**

Product documentation	
Service & Support portal	Comprehensive technical information - from planning to configuration through to operation: **www.siemens.com/lowvoltage/support**
CAx data	Compilation of the commercial and technical master product data: DVD Order No.: E86060-D1000-A207-A6-6300 (via Industry Mall) **www.siemens.com/lowvoltage/support**
Image database	Collection of product photos and graphics such as dimensional drawings and internal circuit diagrams: **www.siemens.com/lowvoltage/picturedb**
Product training	
SITRAIN portal	Comprehensive training program on our products, systems and engineering tools: **www.siemens.com/lowvoltage/training**
Product hotline	
Technical support	Support for all technical queries concerning our products: E-mail: support.automation@siemens.com **www.siemens.com/lowvoltage/technicalsupport**

SIVACON

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Project checklist

Customer			Processor			
Project			Telephone			
Order No.			Fax			
Date of delivery			Date			
Standards and specifications						
☐ IEC 61439-1/2 / EN 61439-1/2 VDE 0660 Part 600-1/2	IEC 61641/VDE 0660 Part 500-2 arc resistance ☐ Level 1 Personal safety ☐ Level 3 Restriction to functional compartment ☐ Insulated main busbar		☐ Level 2 Restriction to one section ☐ Level 4 Restriction to site of origin			
Environmental conditions						
Operating conditions	☐ standard (interior climate 3K4)		☐ special		☐ corrosive gases (e.g. H_2S)	
Ambient temperature (24-hour average)	☐ 20 °C	☐ 25 °C	☐ 30 °C	☐ 35 °C	☐ 40 °C	☐ 45 °C / ☐ 50 °C
Installation altitude above sea level	☐ ≤ 2,000 m		☐ other			
IP degree of protection						
Against the interior Section ventilated	☐ IP30	☐ IP31	☐ IP40	☐ IP41	☐ IP42	
Section non-ventilated						☐ IP54
Against cable base	☐ IP00	☐ IP30	☐ IP40	☐ IP54		
	☐ manufacturer-provided		☐ customer-provided			
Aggravated operating conditions	☐ none		☐ earthquake-proof		☐ other	
Control cabinet heating	☐ no	☐ yes				
Mains data/Infeed data						
Mains type	☐ TN-C	☐ TN-S	☐ TN-C-S	☐ IT	☐ TT	
Design External connection	☐ L1, L2, L3, PEN		☐ L1, L2, L3, PE + N ☐ ZEP (PEN + PE)		☐ other:	
	☐ 3-pole switchable		☐ 4-pole switchable			
Transformer rated power S_r	kVA		Rated short-circuit voltage U_z		%	
Rated operational voltage U_e	V		Frequency f		Hz	
Rated short-time withstand current I_{cw}	kA		Short-circuit withstand current I_k with DC		kA	
Horizontal busbar system						
Position	☐ top		☐ rear (top)		☐ rear (bottom)	
Rated current I_n	A		A		A	
CU treatment	☐ blank		☐ silver-plated		☐ tin-plated	
AC design L1, L2, L3 + ...	☐ PEN	☐ PE	☐ N	☐ PEN, N = 50 %	☐ PEN, N = 100 %	
DC design	☐ 220 V, L+, L-, PE		☐ 24 V, L+, M(L-)			
Vertical busbar system						
CU treatment	☐ blank	☐ silver-plated	☐ tin-plated			
AC design L1, L2, L3 + ...	☐ PEN	☐ PE	☐ N	☐ PEN, N = 50 %	☐ PEN, N = 100 %	
DC design	☐ 220 V, L+, L-, PE		☐ 24 V, L+, M(L-)		Other conditions	
Layout and installation						
Installation type	☐ Single-fronted		☐ Back to back		☐ Double-fronted	
Restriction of total length	☐ none		☐ yes	mm		
Max. net length per transport unit	☐ 2,400 mm		☐	mm		
Cable/busbar connection						
With incoming sections	☐ from below		☐ from above		☐ from the rear	
With outgoing sections	☐ from below		☐ from above		☐ from the rear	
Sections						
Internal separation in accordance with IEC 61439-2, DIN EN 61439-2, VDE 0660 Part 600-2, BS EN 61439-2						
Circuit breaker system	☐ Form 1	☐ Form 2b	☐ Form 3a		☐ Form 4b	☐ Form 4 Type 7
Universal installation system		☐ Form 2b		☐ Form 3b	☐ Form 4a / ☐ Form 4b	☐ Form 4 Type 7
Fixed-mounted design	☐ Form 1	☐ Form 2b		☐ Form 3b	☐ Form 4a / ☐ Form 4b	
Fixed-mounted 3NJ4 in-line design	☐ Form 1	☐ Form 2b				
Plug-in 3NJ6 in-line design	☐ Form 1			☐ Form 3b	☐ Form 4b	
Reactive power compensation	☐ Form 1	☐ Form 2b				

Technical specifications

SIVACON S8 low-voltage power distribution board

Standards and specifications	Power switchgear and controlgear assembly Design verifications	IEC 61439-2 DIN EN 61439-2 (VDE 0660 Part 600-2)	
	Inspection of behaviour with internal errors (arcing faults)	IEC 61641, VDE 0660 Part 500-2	
	Protection against electric shock	DIN EN 50274, VDE 0660 Part 514	
Rated insulation voltage (U_i)	Main circuit	Up to 1,000 V	
Rated operational voltage (U_e)	Main circuit	Up to 690 V	
Clearances in air and creepage distances	Rated impulse withstand voltage Uimp	8 kV	
	Overvoltage category	III	
	Pollution degree	3	
Busbars (3-pole and 4-pole)	Horizontal main busbars	Rated current	Up to 7,000 A
		Rated impulse withstand current (I_{pk})	Up to 330 kA
		Rated short-time withstand current (I_{cw})	Up to 150 kA, 1s
	Vertical busbars for circuit breaker system	Rated current	Up to 6,300 A
		Rated impulse withstand current (I_{pk})	Up to 220 kA
		Rated short-time withstand current (I_{cw})	Up to 100 kA, 1s
	Vertical busbars for universal and fixed-mounted design	Rated current	Up to 1,600 A
		Rated impulse withstand current (I_{pk})	Up to 143 kA
		Rated short-time withstand current (I_{cw})	Up to 65 kA*, 1s
	Vertical busbars for 3NJ4 in-line system (fixed-mounted)	Rated current	Up to 1,600 A
		Conditional rated short-circuit current (I_{cc})	Up to 50 kA
	Vertical busbars for 3NJ6 in-line system (plug-in)	Rated current	Up to 2,100 A
		Rated impulse withstand current (I_{pk})	Up to 110 kA
		Rated short-time withstand current (I_{cw})	Up to 50 kA*, 1s
Device rated currents		Circuit breaker 3WL/3VL	Up to 6,300 A
		Cable feeders	Up to 630 A
		Motor outgoing feeders	Up to 250 kW
Internal separation	IEC 61439-2, Section 8.101, VDE 0660 Part 600-2, 8.101	Form 1 to Form 4	
	BS EN 61439-2	To Form 4 Type 7	
Surface treatment	(Coating in accordance with DIN 43656)		
	Frame parts, bases	Sendzimir-galvanized	
	Doors	Powder-coated	
	Side panels	Powder-coated	
	Back panels, roof plates	Sendzimir-galvanized	
	Ventilation roof (IPX1, IPX2)	Powder-coated	
	Standard colour of the powder-coated parts (Coating thickness 100 ± 25 µm)	RAL 7035, light grey Design parts: Blue Green Basic	
IP degree of protection	In accordance with IEC/EN 60529	IP30 • IP31 • IP40 • IP41 • IP42 • IP54	
Dimensions	Preferred dimensions in accordance with DIN 41488	Height (without base):	2,000 • 2,200 mm
		Width:	200 • 350 • 400 • 600 800 • 850 • 1,000 • 1,200 mm
		Depth (single-fronted):	500 • 600 • 800 mm
		Depth (double-fronted):	1,000 • 1,200 mm

* Conditional rated short-circuit current (I_{cc}) = 100 kA

The information provided in this brochure contains descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

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