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The low-voltage power distribution board that sets new standards

SIVACON S8 - safe, flexible and cost-efficient

Answers for infrastructure and cities.

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Safe and flexible power supply

In industrial plants or infrastructure a reliable power supply is essential. Even a small disturbance can cause serious damage to human beings and plants. Therefore, not only are highest requirements for safety in demand, a wide range of possible uses, optimal design and flexible installation technology are also vital for modern buildings.

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 products and systems 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 the infrastructure. The power distribution board system up to 7,000 A for the simple and consistent distribution of power guarantees maximum personal and plant 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 switch- and controlgear assembly with a design verification by verification tests. Evidence of its physical properties has been provided in the product testing department under both operating and fault conditions. An arcing fault-resistant locking system also ensures verification of testing under arcing conditions is in accordance with IEC 61641 and VDE 0660 part 500-2.

Flexible solutions

The SIVACON S8 low-voltage power distribution board is the intelligent solution which can be adapted to match your requirements. 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.

Read the QR code with your QR code reader.

Highlights

- Safety for human beings and plants by design verification by verification tests in accordance with IEC 61439-2
- Maximum personal and plant safety in the event of an arcing fault thanks to continuous testing
- High level of flexibility thanks to the innovative modular technology

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

SIVACON S8 - system overview

Section design

	Circuit breaker design	Universal mounting design	Fixed mounting design
Installation designs	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 3b, 4a, 4b, 4 Type 7 (BS)	Form 1, 2b, 3b, 4a, 4b
Busbar position	rear/top	rear/top	rear/top

	3NJ6 In-line design	3NJ4 In-line design	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 3b, 4b	Form 1, 2b	Form 1, 2b
	rear/top	rear	rear/top/without

Features

Design side panel

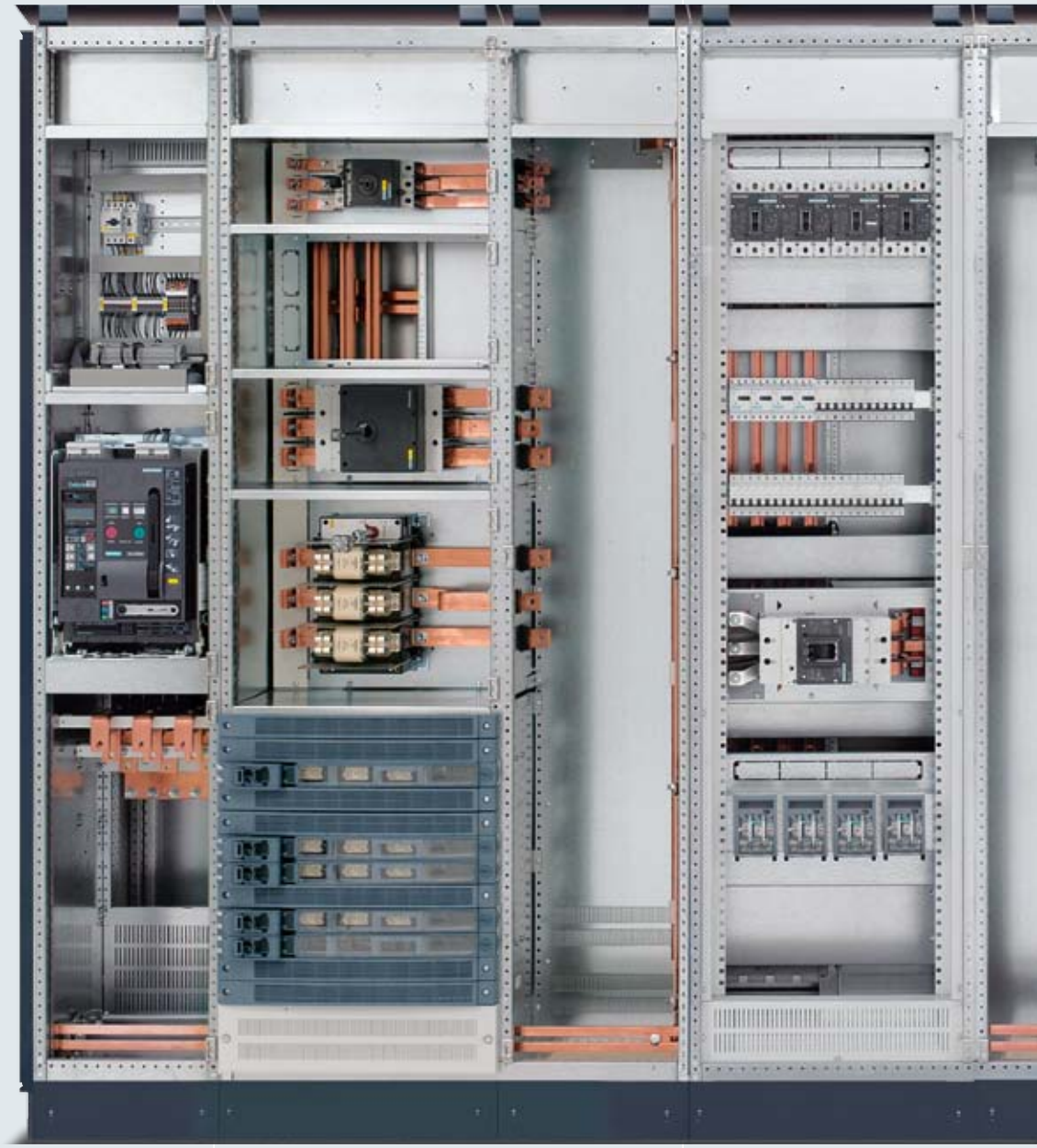
Standardized labelling system for sections and feeders

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



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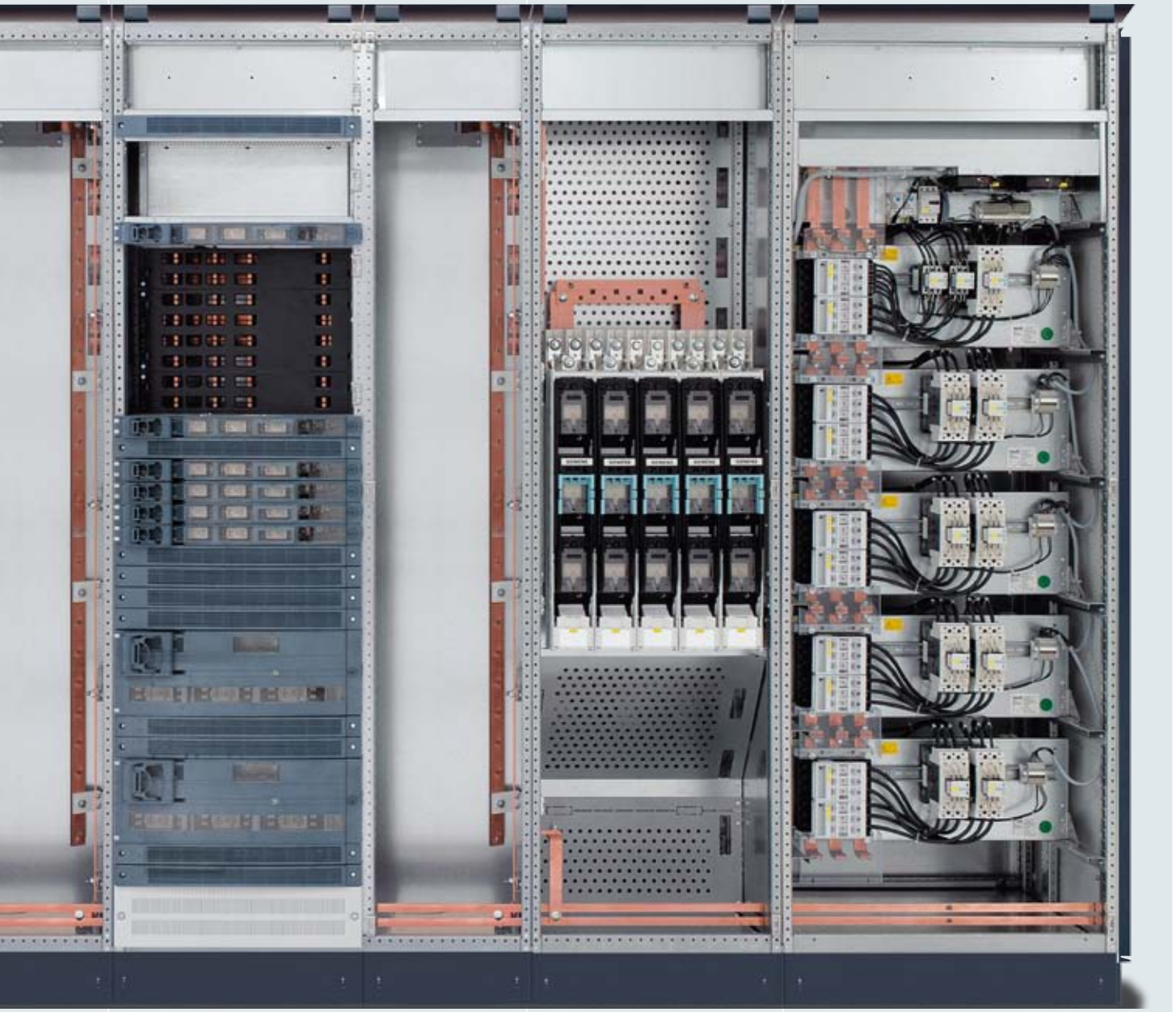
Busbar position	rear/top	rear/top	rear/top



	3NJ6 In-line design	3NJ4 In-line design	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 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

Frame, enclosure and busbars

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

Safety and functionality

The low-voltage switchboard that combines economic design with high quality. 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.

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

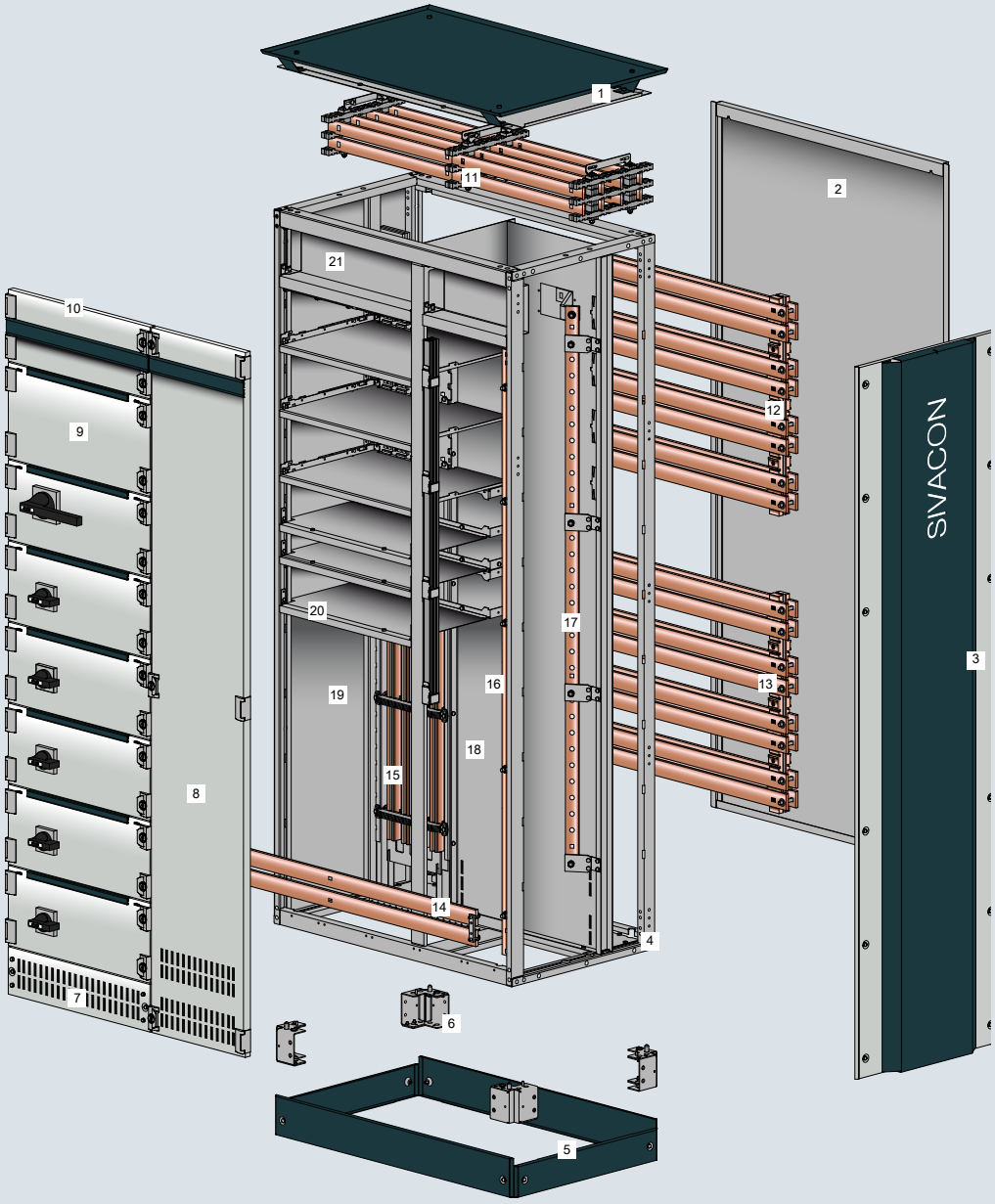
The patented door-locking system offers maximum safety: the universal door hinge allows for the hinge side to be changed with ease. The doors are available with either simple or central locking and can be fitted with various locking systems such as double bit fastener or pivoted lever lock. The roof 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.

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. 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.

Technical specifications		
Frame	Door opening angle	125 ° • 180 ° with stand-alone design
	Frame height	2,000 • 2,200 mm
	Base height add-on	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

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

Circuit breaker design

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

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

Safe and user-friendly

The sections for 3WL/3VL circuit breakers cater for personal safety and plant safety in the long run. The incoming, outgoing and coupling sections of the circuit breaker design are fitted with 3WL air circuit breakers in the withdrawable or fixed-mounted design or, alternatively, with 3VL molded-case circuit breakers. 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 design, 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 design offers optimal connection conditions for every rated current range. In addition to cable connections, the design also has design verification to be connected to SIVACON 8PS busbar trunking systems. The busbar trunking system connection pieces, specially developed for the SIVACON S8, are an integral component of the sections in the circuit breaker design. The sections con-

The busbar connection compartment offers optimal connection conditions.

Inspection is possible anytime, without removing the 3WL air circuit breaker.

SIVACON S8 offers maximum system safety and an uninterrupted power supply for all requirements in functional buildings.

sist 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 or bottom.

Economic 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 verified connection to SIVACON 8PS busbar trunking systems

Technical specifications	
Installation design	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

Universal installation design – Power distribution board

Fixed-mounted design with compartment doors and 3NJ6 In-line design, plug-in are individually combinable at any time

Combining modules sucessfully

The SIVACON universal installation design combines tap-off units in the fixed-mounted design 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 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 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 patented connection terminals are safe, flexible and easy to connect.

Vertical section busbars offer a range of connection options.

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

Modular and variable installation

The installation of switching devices in the fixed-mounted design 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 connector terminals in the cable connection compartment. For individual expansion, the design offers freely assignable device holders.

Flexible retrofitting of feeders

3NJ6 In-line switch disconnectors with LV HRC fuses 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.

Highlights

- High level of flexibility thanks to the modular technology sub-assemblies 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

Technical specifications	
Installation design	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

Fixed-mounted design with front covers

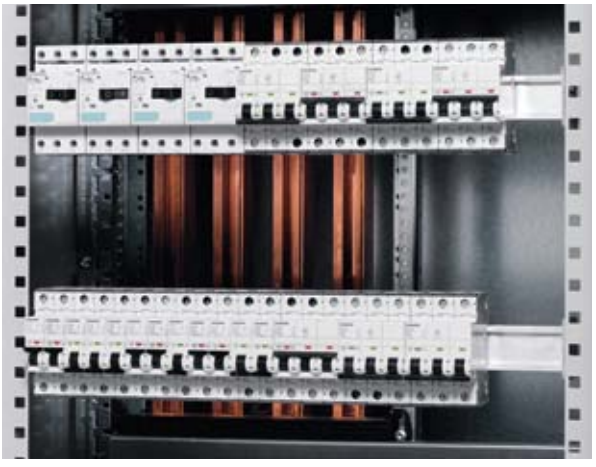
The front covers in the fixed-mounted design are easy to install and guarantee uniform front levels.

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 design 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 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.

With many industrial applications, the exchange of components under operating conditions is not required. Therefore the safe and cost-efficient construction in fixed-mounted design with front covers would be suitable.

Multifunctional modules

The switching devices are installed on modular device holders of graduated depth. These can be equipped with circuit breakers, switch disconnectors with fuses or modular installation devices. Different switching device 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 connection terminals. Thanks to the panel, simple operation is possible directly in the cable connection compartment. 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

Technical specifications	
Installation design	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

3NJ4 In-line design

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

Compact and safe

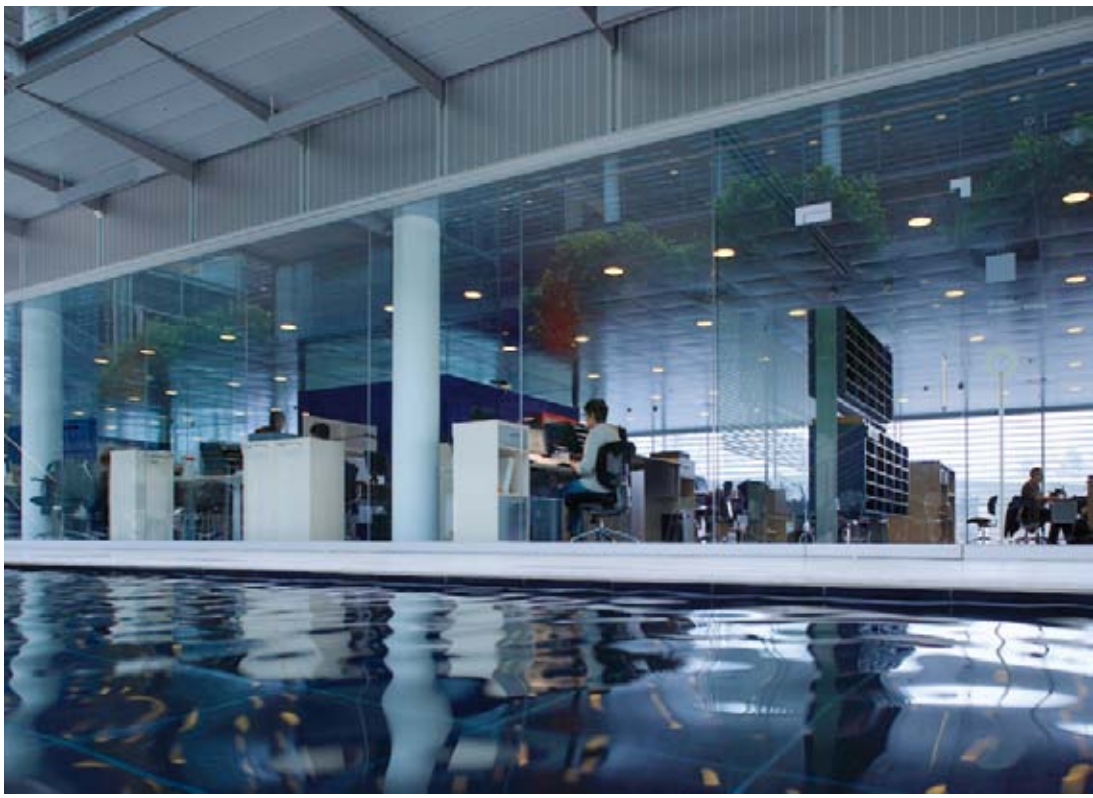
The sections for cable feeders in the fixed-mounted design up to 630 A are equipped with vertically installed 3NJ4 LV HRC fuse switch disconnectors. Thanks to their compact design and modular installation, they allow for optimal and cost-efficient applications in infrastructure. Design-tested standard modules guarantee maximum safety. Depending on the section width, up to several switch disconnectors of size 00 to 3 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. Measuring 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.

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

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



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

Technical specifications	
Installation design	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

3NJ6 In-line design

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

Variable with the plug-in design

In-line switching devices with a plug-in contact on the supply-line side offer a cost-efficient alternative to the with-drawable unit design and, thanks to its modular design, allow for quick and easy modification or exchange under operat-ing 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 brack-ets are provided here for fastening the cables.

Safe and flexible

The section busbar system is arranged at the rear of the In-line design 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.

Plug-in busbar system, with test finger safety cover (IP20B).

3NJ6 In-line switch dis-connectors with LV HRC fuses have single or dou-ble-breaking as standard.

The In-line design is particularly well-suited for applications with numerous cable branches in a very confined space.

Compact with high functionality

The cable is connected at the front, directly at the device. The device forms the front closure. The plug-in in-line disconnectors are operated directly at the device. Up to three 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 feeders per section

Technical specifications	
Installation design	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 3b, 4b
Busbar position	top, rear top and/or rear bottom

Reactive power compensation

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

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 and 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.

The capacitor subassemblies can be used choked or unchoked.

Safe and integrated power distribution for flexible application in the industry.

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 measures 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

Technische Daten	
Installation design	Fixed mounting
Functions	Central reactive power compensation
Capacitor load	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

Arc resistance

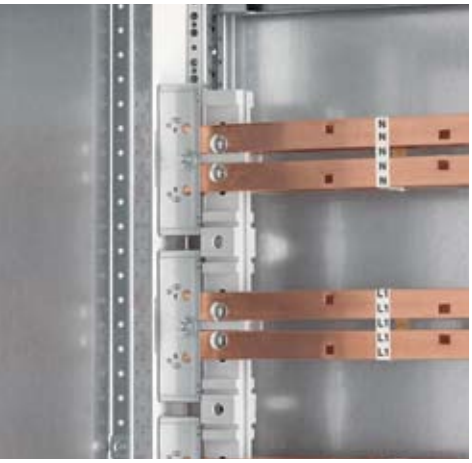
Arc resistance measures are an integral component of the SIVACON S8 system.

Personal and plant protection

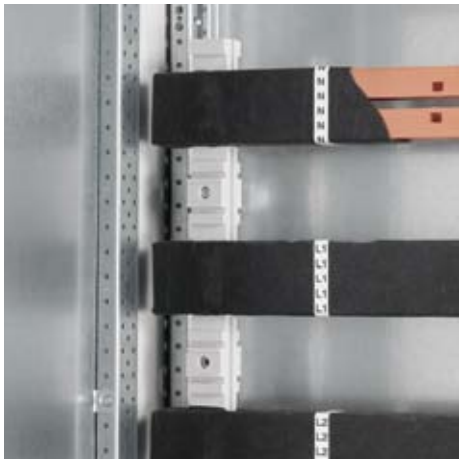
The efficiency of production plants depends very much on the reliability of the power supply. Low-voltage power distribution boards play a key role in this regard. An arcing fault is one of the most dangerous faults, associated with the most serious consequences, which can occur in a power distribution 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. 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, prevent arcing faults and the associated personal injuries. Passive protections increase personal and system safety many times over. These include: hinge and locking systems with arc resistance, the safe operation of withdrawable units or circuit breakers behind a closed door and patented swing check valves behind ventilation openings on the front, arcing fault barriers or arcing fault detection system combined with the rapid disconnection of arcing faults. 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.



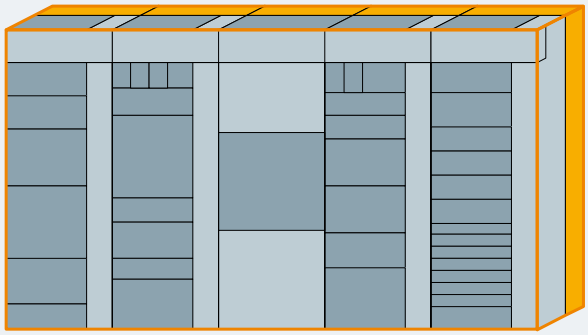
The arcing fault barrier restricts the effects to one section when an arcing fault occurs.



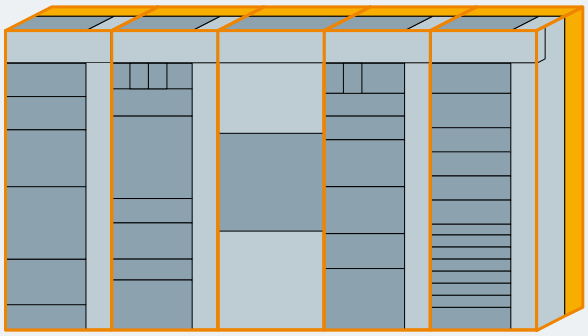
Insulated main busbars prevent the occurrence of arcing.

Arcing fault levels

The arcing fault levels describe the classification in accordance with the characteristics under arcing fault conditions and the restriction of the effects of the arcing fault to the system or system section.



Level 1
Personal safety without major restriction of the effects of arcing within the power distribution board



Level 2
Personal safety with restriction of the effects of arcing on a single section or double fronted section.

Earthquake boosting

The SIVACON S8 low-voltage power distribution board is also available in earthquake-proofed version for seismic requirements. In accordance with the testing the evidence of functionality and stability after and during the earthquake has to be checked.

The results of the the earthquake testings are divided into 3 categories:

1: Functionality during the earthquake

2: Functionality after the earthquake

3: Stability

Highlights

- 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 pressure relief flaps on the roof plates

Special test under arcing fault conditions according to IEC 61641. Various criteria for the protection of human beings and plants will be tested.

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

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

Requirement of standard IEC 61439

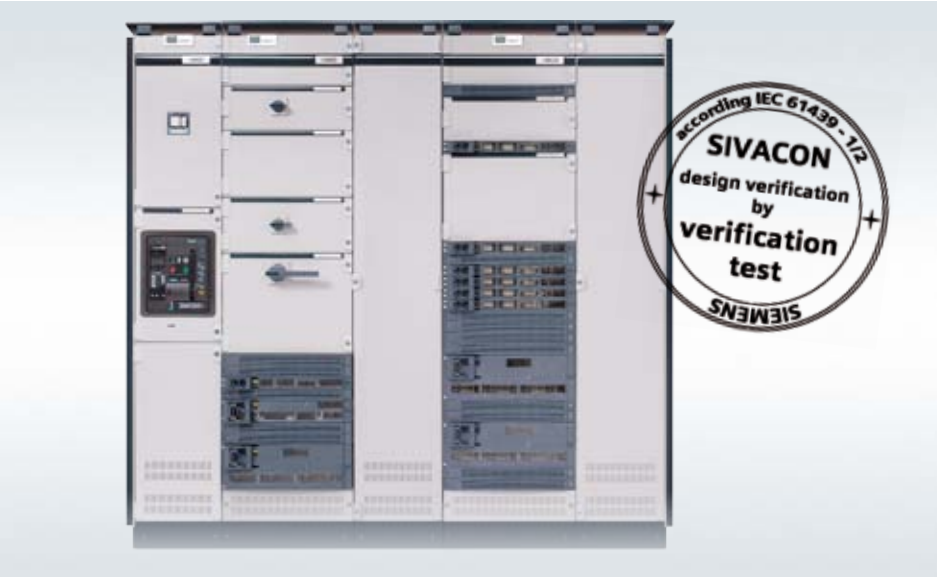
Low-voltage power distribution boards or standard-compliant power switchgear and controlgear assemblies are developed, manufactured and approved in accordance with the specifications of IEC 61439-1/-2 (VDE0660 Part 600-1/-2). In order to provide evidence that the power distribution board is fit for purpose, 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 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.

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. According to standard for rated currents up to 1,600 A, this verification can be carried out by means of calculation. For the SIVACON S8 a verification by means of testing is always mendatory. 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.



Design verifications

The table offers all in the standard required verifications. These can be provided in three alternative options	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

Design verified power distribution boards for a hospital

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.

The Duisburg Casualty Hospital with design verified power distribution.

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

Saving potentials can be easily identified through transparent energy flows. The highest system safety for an uninterruptible power supply in hospitals.

Power monitoring with SIVACON S8

Highlights

- Simple integration of the measuring 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

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

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 7KT/7KM PAC measuring devices and communication-capable 3WL/3VL circuit breakers 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 7KM PAC measuring devices provide you with important measured 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 measuring devices and communication-capable circuit breakers therefore provide the ideal basis for cost-efficient power monitoring with the SIVACON S8 power distribution board.

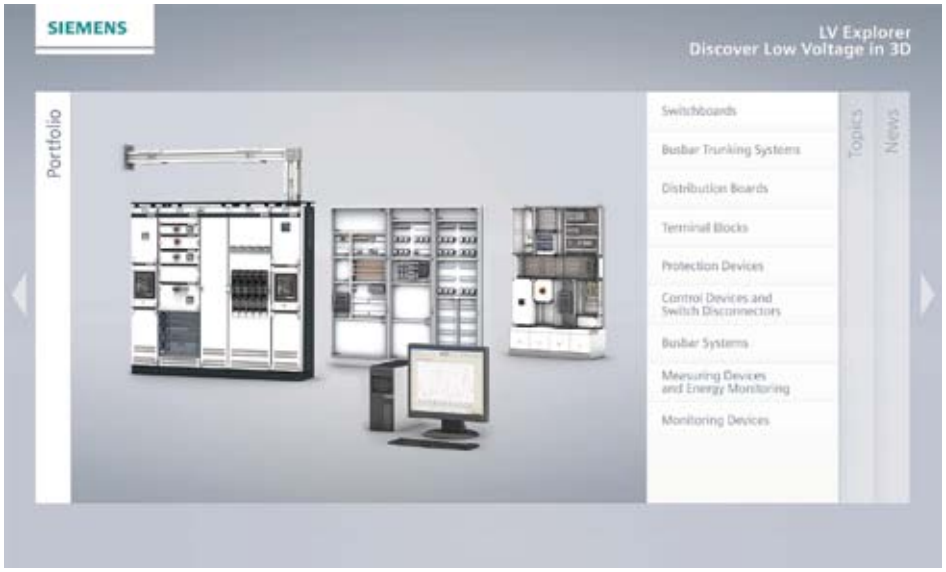
Reliable through communication

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

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

Any questions?
One click – well-informed

LV Explorer – Discover Low Voltage in 3D



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SIVACON Technology Partner

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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 2 Restriction to one section ☐ insulated main busbar ☐ arcing fault barrier ☐ arcing fault detection system						
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	☐ bare		☐ 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	☐ bare	☐ 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							
Incoming sections	☐ from below		☐ from above		☐ from the rear		
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 design	☐ Form 1	☐ Form 2b	☐ Form 3a			☐ Form 4b	☐ Form 4 Type 7
Universal installation design				☐ 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 3b		☐ Form 4b	
Reactive power compensation	☐ Form 1	☐ Form 2b					

Technical data

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 U_{imp}	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 design	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 design (fixed-mounted)	Rated current	Up to 1,600 A
		Conditional rated short-circuit current (I_{cc})	Up to 100 kA
	Vertical busbars for 3NJ6 In-line design (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

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