framatome

Customized for maximum demands

SIVACON S8 low-voltage power distribution board:
A safe, flexible and efficient system



Safe and flexible
Power distribution

In nuclear utilities, industrial plants, buildings, and infrastructure, even a small disturbance in the power supply can cause serious damage – not only to industrial and building operations but also to people. That is why the standards for safe power distribution are so high.

In addition, today's increasingly automated and digitized production processes and buildings require increasingly adaptable power distribution. They need a flexible layout, high availability, and personal and plant safety.

Conforming to standards:
Systematic power distribution

The SIVACON S8 system supports the safe, flexible, and efficient implementation of power distribution and motor control center planning, design, and operation. The SIVACON S8 low-voltage switchgear and the used components are proven and perfectly compatible.

This not only helps to significantly reduce investment costs and risks:
It also increases plant safety and availability throughout the entire period of use.

To standards: IEC 61439

As of 2014, all low-voltage switchgear and control gear assemblies in the European Economic Area must conform to the IEC 61439 standard. This standard describes distinct areas of responsibility. Specifically, it divides the tasks between an "original manufacturer" and a "manufacturer of a switchgear and control gear assembly".

The original manufacturer (such as Siemens) is the company responsible for the original design and the associated verification of the switchgear and control gear assembly in accordance with the relevant standard.

With a SIVACON S8 low-voltage switchgear, customers are always on the safe side: It is design-verified according to the IEC 61439-1/-2 standard.

SIVACON S8
For maximum demands

Benefits

- Emphasis on maximum personal and plant safety
- Flexible layout thanks to a modular concept and wide variety of parts
- Efficient implementation of technologically sophisticated solutions



Safe down to the last detail

The SIVACON S8 low-voltage switchgear ensures a high level of personal and plant safety. Continuous testing to IEC 61641 and VDE 0660 Part 500-2 guarantees safety in the event of an arcing fault. Many well thought-out details, including a reduced use of plastic parts and insulated main busbars, guarantee maximum safety and plant availability, resulting in low liability risk.

Flexible and adaptable

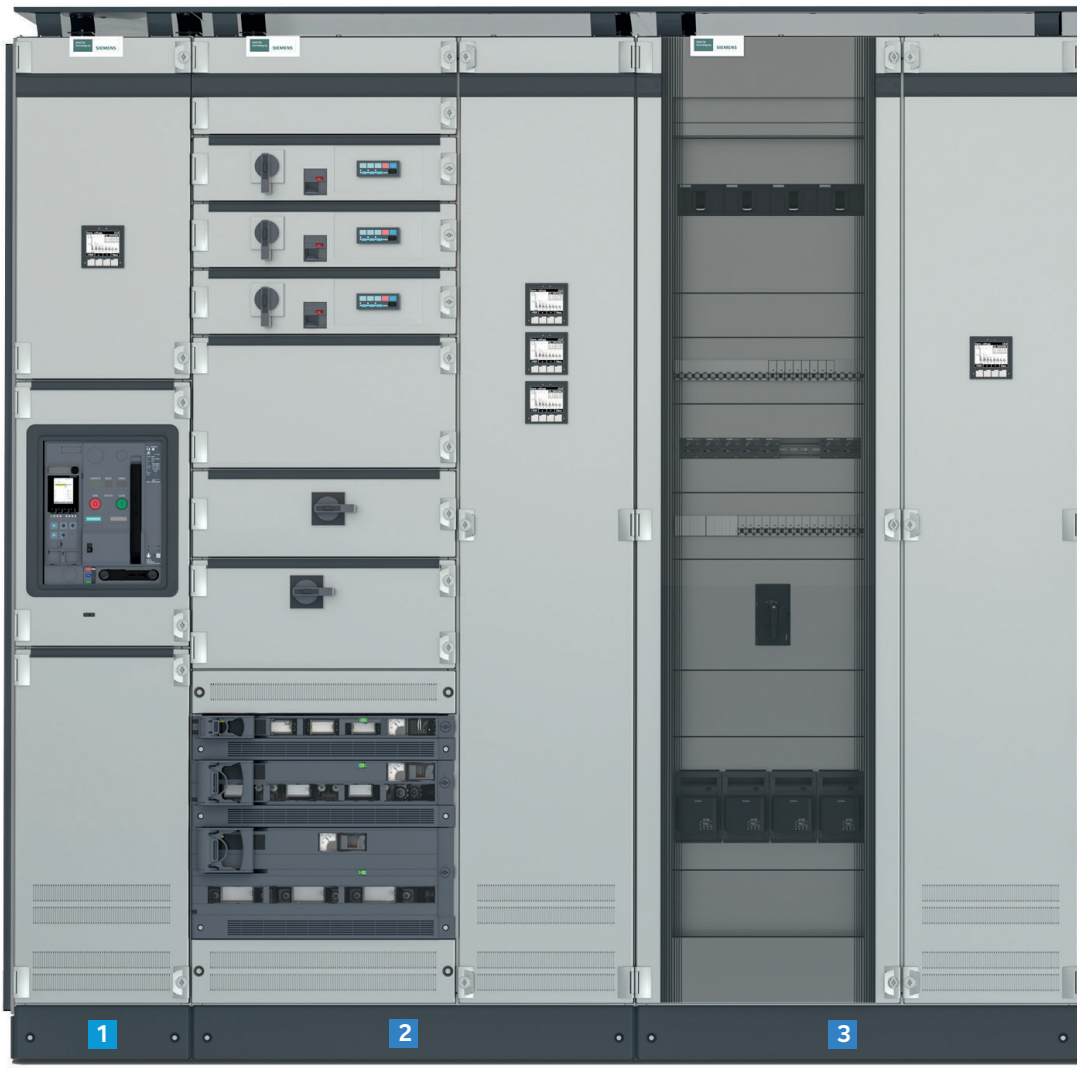
Thanks to its modular concept and wide variety of components, the SIVACON S8 low-voltage switchgear can meet all individual requirements. For instance, the profile bar or flat copper design of the vertical section busbars allows for tap-offs in the smallest of grids.

Efficient throughout the entire process

Over 500.000 switchgears have already been launched on the market proof that technologically sophisticated solutions can be efficiently implemented with the SIVACON S8 low-voltage switchgear. Power distribution as well as Motor Control Center are easy to plan, and the switchboard can be quickly configured using the SIMARIS software tools.

SIVACON S8
System overview

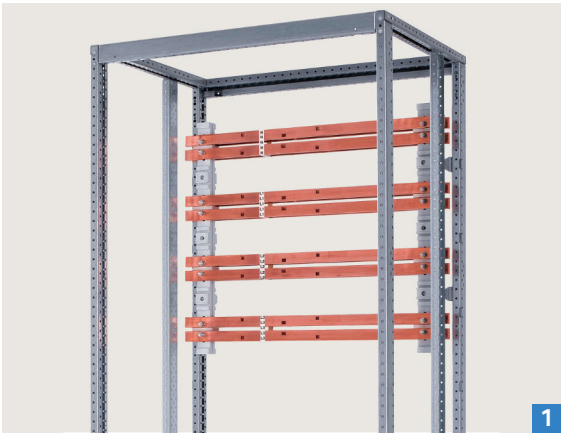
	1 Circuit breaker	2 Universal mounting	3 Fixed-mounted
Mounting design	Fixed-mounted design, withdrawable	Fixed-mounted design with front covers	Fixed-mounted design with compartment doors, plug-in
Functions	Supply, outgoing feeder, coupling	Cable feeders	Cable feeders
Rated values	Up to 6,300 A	Up to 630 A	Up to 630 A
Connection position	Front or rear	Front or rear	Front or rear
Cubicle width (mm)	400, 600, 800, 1,000, 1,400	1,000, 1,200	600, 1,000, 1,200
Internal separation	Form 1, 2b, 3a, 4b, 4 type 7 (BS)	Form 1, 2b, 3b, 4a, 4b	Form 3b, 4a, 4b, 4 type 7 (BS)
Busbar position	Top/rear	Top/rear	Top/rear

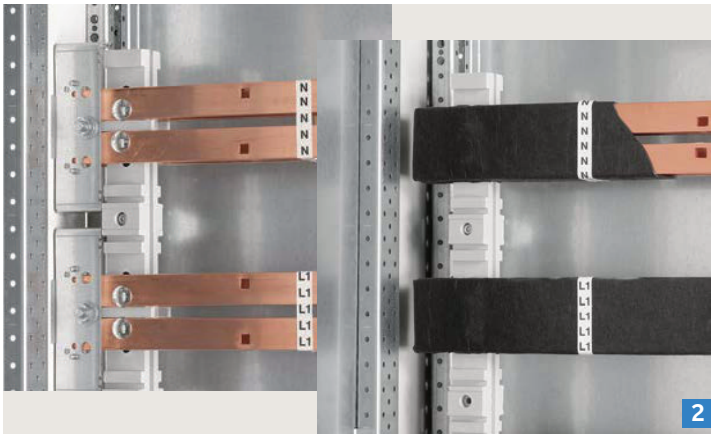


4 In-line design, plug-in	5 In-line, fixed-mounted	6 Reactive power compensation
Plug-in	Fixed-mounted design	Fixed-mounted design
Cable feeders	Cable feeders	Central reactive power compensation
Up to 630 A	Up to 630 A	Unchoked up to 600 kvar, choked up to 500 kvar
Front	Front	Front
1,000, 1,200	600, 800, 1,000	800
Form 3b, 4b	Form 1, 2b	Form 1, 2b
Top/rear	Rear	Without/top/rear



SIVACON S8
features



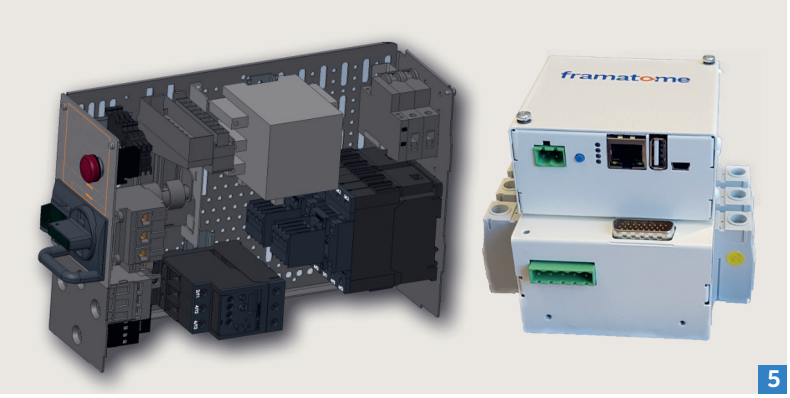




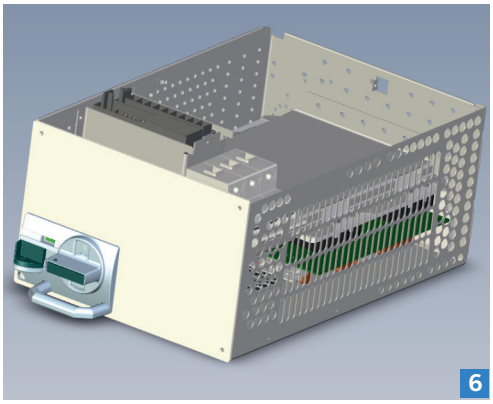


1. Variable busbar position rear up to 7,000 A (top and/or bottom)
2. Arc-fault protection with Arc-barrier or with insulated live parts
3. Vertical busbar system with test finger safety, cover (IP 20B) or with shutter
4. Optimal connection conditions in busbar connection compartment

SIVACON S8
features



5



6

EQDB Equipment Qualification Data Base (EQDB)

7



8

5 Integration of a Framatome SIPLUG module in a ¼ Module drawer.
SIPLUG is designed for permanent installation at the switch gear. Data are transmitted via Ethernet 100 Mbit/s, and stored the internal memory of 4GB for measurements when the network is not available. The SIPLUG is available with sensor modules for motor operated valves ("MOV", AC motor actuators), solenoid valves ("SOV", DC magnets) and air operated valves ("AOV", pneumatic actuators). They are qualified for installation at safety related nuclear components based on KTA and IEC/IEEE standards.

6 The in a ½ Module drawer integrated Framatome Thorc module is a software-free nuclear-qualified semiconductor motor controller for directional switching and reversing of asynchronous motors for controlled actuators.

7 The Equipment Qualification Data Base (EQDB) ensures an overview of the qualification done.

8 Framatome software-free monitoring devices (Voltage Relay and Time Relay) offer a nuclear qualified and long-term available solution.

SIVACON S8
6 good arguments for safety

The SIVACON S8 low-voltage power distribution board ensures a high level of personal and plant safety at all times and everywhere.



1

- Design verification by verification test in accordance with IEC 61439-1/-2
- Design-verified connection to the SIVACON 8PS busbar trunking system

2

Comprehensive certifications

- High degree of test coverage
- Certifications for use on ships and offshore platforms
- Earthquake upgrade

3

Safety in the event of an arcing fault, thanks to testing in accordance with IEC 61641 and VDE 0660 Part 500-2: restriction of the effects of the arcing fault

4

The patented locking system or simple or central locking keeps doors closed even in the event of an arcing fault

5

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

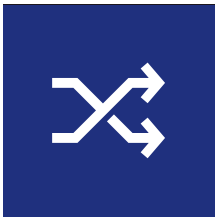
The insulated main busbars prevents the occurrence of arcing

6

High level of personal safety thanks to roof plate with pressure relief

SIVACON S8
6 good arguments for flexibility

Thanks to its modular concept and wide variety of parts, SIVACON S8 can meet the most demanding requirements and satisfy all individual needs



1

High level of flexibility thanks to innovative modular technology:

- Different installation designs can be combined in one section
- Functional units are easy to exchange or add

2

Supply unit and feeder

- Via cable or SIVACON 8PS busbar trunking system
- Entry from the top or bottom

3

The section can be installed – either single- or doublefronted – together with a main busbar system or back-to-back with a separate main busbar system

4

Depending on requirements, different degrees of protection can be implemented with the roof plate– ventilated or non-ventilated

5

The functional compartments can be divided as required with add-on modules

6

The universal door hinge allows the hinge side to be easily changed.

SIVACON S8
6 good arguments for efficiency

The SIVACON S8 low-voltage switchgear permits the efficient implementation of technologically sophisticated solutions. The proof:

Over 1.000.000 switching boards have already been installed in a wide variety of applications by SIVACON Technology Partners worldwide.



1

Economical design

- Flexible installation design: fixed-mounted or withdrawable design for easy maintenance

2

Efficient, flexible operation

- High packing density with up to 48 outgoing feeders per section
- Fast exchange under operating conditions

3

Reduced service time thanks to maintenance-free section connections

4

The patented ventilation slots reduce maintenance effort

- Cleaning is possible with the door closed and from the outside
- Low repair costs

5

The patented connection terminals are safe, flexible, and easy to connect during installation and in the event of subsequent changes

6

- Maximum technological progress through constant innovation guarantees the highest quality
- Brand strength combined with expertise gained over many years and the availability of a well known partner on-site

Connection to energy management, control and automation systems

Analyze data, reduce energy costs, increase plant availability

For industrial plants to operate efficiently, their load must be constantly optimized and downtime reduced. The 7KM/7KT PAC measuring devices and communication- capable 3WA/3VA circuit breakers integrated in the power distribution board can help you achieve this.

They precisely and reliably record energy values for electric feeders or individual loads and display the values on-site. The communication-capable devices supply important measured values via standardized bus systems for the purpose of assessing the system status and power quality.



Benefits

- System status and fault prevention are made transparent
- Increase plant availability
- Identify potential savings with transparent energy flows
- Reduce energy costs

Data can be visualise and managed via measuring devices with an integrated web server and the powermanager power monitoring software. The measured data of the devices can easily be processed in higher-level automation and energy management systems as well as cloud applications. Because only by knowing your energy consumption you can reduce energy costs and ensure optimal system operation.

Reference

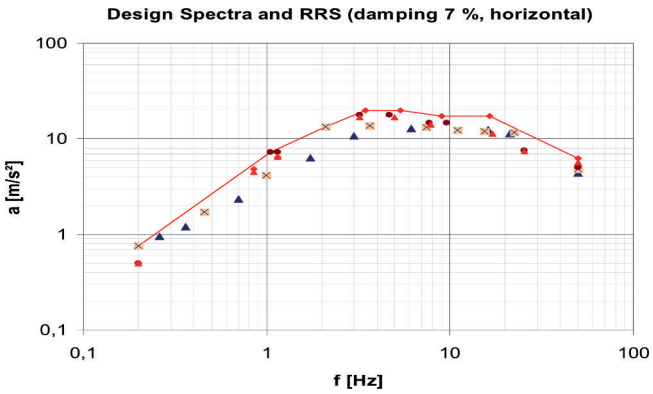


Taishan nuclear power station

The Taishan nuclear power plant with two EPR reactors is located near Yaogu in the Chinese province of Guangdong on the coast of the South China Sea, around 42 km south-east of the city of Taishan.

The switchgears are located in the Safeguard, Diesel, Waste and Auxiliary buildings. They are classified with SC1 (verification of the operability and functional ability during or after the seismic test).

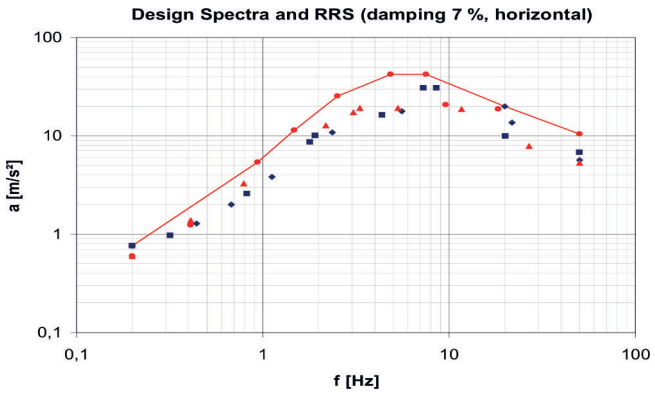
According to the shown spectra the max acceleration is app. 2g. in horizontal direction.





Only in the Waste and Auxiliary buildings they are classified with SC2 (without verification of the operability and functional ability during or after the seismic test), but in conjunction with much higher seismic requirements.

According to the shown spectra the max acceleration is app. 4g. in horizontal direction.



The LV switchboard SIVACON S8 and busway SIVACON 8PS LD fulfils the requirements of the RCC-E (2005), the general technical specification CST, the project specific equipment specification as well as the relevant requirements of the IEC standards and project specific specifications.

In Unit 1 and 2 in total 141 switchgears with 1054 cabinets SIVACON S8 are installed in the nuclear island.

Reference



Angra nuclear power station

The Angra nuclear power plants are located on the Itaorna Beach in Angra dos Reis, in the province Rio de Janeiro. The location is between the metropolises of Rio de Janeiro and São Paulo in a bay on the Atlantic coast.

Angra 3 will be a replica of Angra 2, incorporating certain improvements, like up to date electrical equirement, e.g. the LV switchgears type SIVACON S8.

The qualification of the LV switchboard SIVACON S8 for the nuclear power station Angra unit3 based on the requirements of KTA, the project specific equipment specification as well as the relevant requirements of the IEC standards and project specific specifications.



The switchgears are located in the Safeguard, Diesel, Waste and Auxiliary buildings. They are classified with SC1 (verification of the operability and functional ability during or after the seismic test).



In total 58 switchgears with 541 cabinets SIVACON S8 are installed.

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Framatome is an international leader in nuclear energy recognized for its innovative, digital and value added solutions for the global nuclear fleet. With worldwide expertise and a proven track record for reliability and performance, the company designs, services and installs components, fuel, and instrumentation and control systems for nuclear power plants. Its more than 22,000 employees work every day to help Framatome's customers supply ever cleaner, safer and more economical low-carbon energy.

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SIVACON

Technology Partner

SIEMENS

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