

The Medium-Voltage Switchgear SAM 12

Air-isulated, metal-enclosed
and above all very compact in design



SZM
Schaltanlagen
Zubehör

Bad Muskau
ZUSCHA Boss

Specialist for Electrical Systems

Switchgear | Switchgear Components | Transformers | Substations

The SAM Switchgear

The SAM switchgear from SZM is an environmentally friendly, SF6-free medium-voltage switchgear with reliable vacuum switching technology and our own type C3 switch-disconnector. The air-insulated switchgear for indoor use is sustainable, efficient, safe and, above all, convincing due to its low installation depth.

The SAM switchgear consists of factory-finished switch panels in metal-enclosed design for a rated voltage of 12 kV that can be connected in

series. Fixed switch-disconnectors or circuit-breakers are used as the switching devices.

It is mainly suitable for secondary mains distribution and thus for use in transformer stations and smaller industrial plants. It is particularly popular in power supply containers. Thanks to its low panel depth, the SAM can also be installed in double rows opposite each other. Very few air-insulated switchgears can do this.

Manufacturer

The air-insulated medium-voltage switchgear SAM deserves the attribute "Made in Germany", it is produced at Schaltanlagen Zubehör Bad Muskau (SZM) with German high quality. The system is based on a proven switchgear concept from ABB (formerly Calor Emag). SZM has decades of experience in the development and production of various switchgear concepts.



Technical Data

Rated voltage (kV)	12
Rated busbar current (A)	630/1250
Rated feeder or outgoing current (A)	630/1250*
Rated short-circuit current (kA)	20
Rated short-circuit duration (sec.)	3
Rated impulse current (kA)	50
Rated impulse withstand voltage (kV)	75
Rated impulse withstand voltage (kV)	28
Rated frequency (Hz)	50/60
Auxiliary voltage DC (V)	24/48/60/110/220
Auxiliary voltage AC (V)	110/230
Protection class	IP 3XD

* On request.

Characteristics

| Air-insulated

The SAM uses ambient air as the insulating medium. This saves, among other things, the handling of insulating gases, their pressure monitoring and disposal, as well as the purchase of expensive additional equipment for the use of fluoride gases. Moreover, air is simply available. Whatever is good for humans and animals is also good for the SAM.

| Environmentally friendly

The SAM naturally does not use the insulating gas sulphur hexafluoride (SF6), which is common for medium-voltage switchgear. SF6 is the world's strongest greenhouse gas and is thus considered extremely harmful to the environment: it is 23,500 times more harmful to the climate than CO2 and has a very long residence time in the atmosphere.

| Compact design

Although SAM is an air-insulated switchgear it has a compact design and requires a smaller footprint than air-insulated switchgear. It has an extremely small overall cubicle depth of only 800 mm, it is approx. 20 %, i.e. one fifth, shorter than other air-insulated medium-voltage switchgear and is therefore particularly suitable for use in confined spaces (e.g., in containers). In addition, it only needs a standard levelled foundation and not a completely precise horizontal base as with gas-insulated switchgear.

| Reliable

The SAM is particularly reliable and easy to maintain thanks to the use of tried and tested components that are particularly resilient, such as the C3 shear-load disconnector manufactured by SZM (formerly manufactured by ABB/Calor Emag) and the maintenance-free VD4 vacuum circuit-breaker (ABB).

| Economical

With its compact size, the SAM also requires less building cost. It is particularly reliable and easy to maintain. Its purchase is not only good for the environment, but also for the wallet.



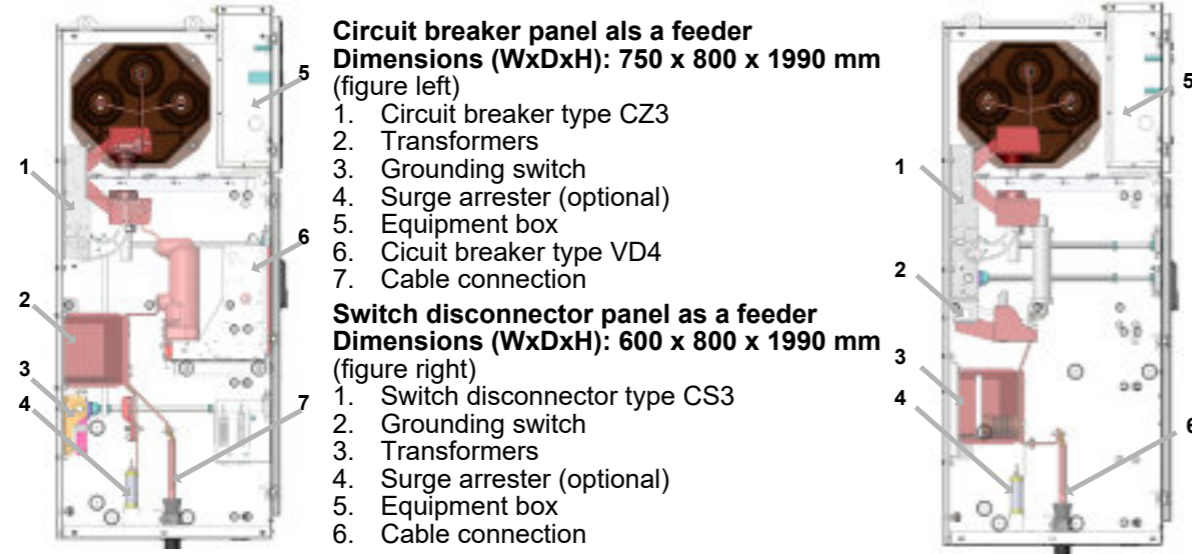
The SAM medium-voltage switchgear is above all one thing: compact. With its extremely low installation depth, it is one fifth shorter than conventional air-insulated switchgear and therefore ideal for use in containers, e.B.

| Made in Germany

The SAM is manufactured at SchaltgeräteZubehör Bad Muskau (SZM) and is thus "Made in Germany". Production takes place in modern production halls and quality assurance is carried out in accordance with DIN ISO 9001:2015. SZM is a partner of major electrical companies and renowned energy suppliers around the world.

Variants/Dimensions

SAM 12 / Variant - Fixed installation



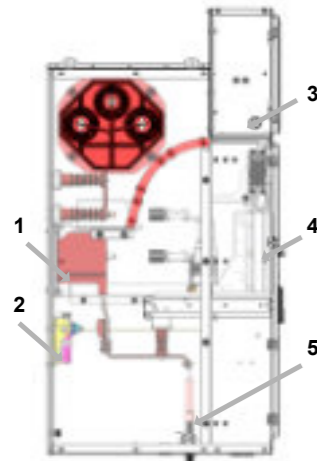
Circuit breaker panel als a feeder
Dimensions (WxDxH): 750 x 800 x 1990 mm
 (figure left)

1. Circuit breaker type CZ3
2. Transformers
3. Grounding switch
4. Surge arrester (optional)
5. Equipment box
6. Circuit breaker type VD4
7. Cable connection

Switch disconnecter panel as a feeder
Dimensions (WxDxH): 600 x 800 x 1990 mm
 (figure right)

1. Switch disconnecter type CS3
2. Grounding switch
3. Transformers
4. Surge arrester (optional)
5. Equipment box
6. Cable connection

SAM 12 / Variant - Slide in panel



Circuit breaker panel as a branch
Dimensions (WxDxH): 750 x 1100 x 2200 mm
 (figure left)

1. Current transformer
2. Grounding switch
3. Equipment box
4. Circuit breaker type VD4 on slot
5. Cable connection

Switch disconnecter panel as branch
Dimensions (WxDxH): 600 x 1100 x 2200 mm
 (without illustration)

Technical data as in fixed installation.

Dimensions

		Pitch (mm) / Depth (mm) / Height (mm)
Switch-disconnectors panels (Fixed installation):	Feeder panel / transformer feeder	600 / 830 / 1990*
	Coupling panel / longitudinal coupling	
	Busbar connection panel	
Circuit-breaker panels:	Feeder panel as withdrawable unit	750 / 1130 / 2200*
	Feeder panel with disconnecter as fixed installation	750 / 830 / 1990*
Further panels:	Raised guide	600 / 830 / 1990*
	Raised guide for measurement	750 / 830 / 1990*

*plus arc deflectors

Plant description



Mostly vacuum circuit-breakers type VD4, make ABB/Calor Emag (other types on request) are installed behind the front doors.

■ Busbars:

The busbars consist of bare or insulated copper tubes and are bolted together bay by bay. Between the compartments, the busbar spaces are partitioned arc-resistently by bushing plates made of cast resin. Busbars and the upper contacts of the main switchgear are covered in a non-touchable manner by a slide-in plate in an open or expanded state. This plate can be inserted through a slot in the door pillar when the compartment door is closed.

■ Switch panels:

The switch panels are made of 2.5 mm galvanized sheet metal and are closed on all sides. The compartments are assembled from individual segments by means of screw fastenings to form a stable, pressure-resistant construction. The pressure relief is in the roof plate, which opens in the event of an internal fault due to the resulting overpressure. An expanded metal reinforcement reduces the pressure and temperature of the escaping gases (at 20 kA). At the bottom, the bays can be closed by split bottom plates with recesses for the cables. The cable compartment is equipped with an adjustable cable holder for the connection of up to 2 parallel cables.

■ Doors:

The front doors are completely weld-free. They have pressure-resistant shear locks and are fastened with screw-on hinges. The fork parts for holding the locking bolts are riveted to the door panel with additional door stiffeners. The door has a 170° opening angle. The door is operated by double-bit keys or by a swiveling lever lock. Each door is provided with a pressure-resistant inspection window. The low-voltage equipment box is equipped with a separate door. Switch-disconnector panels without a device box have a removable, flameproof panel to cover the busbar compartment.



C3 shear load-break switches are usually integrated into the SAM. The switch-disconnectors formerly manufactured by ABB/Calor Emag are now produced by SZM.

Plant description



The rear right bevel gear drive ensures smooth operation of the switchgear when the door is closed. Like other manual and motor-driven actuators, it is manufactured by SZM.

■ Switchgear:

Shear load disconnectors Type C3 (make ABB/Calor Emag, now manufactured by SZM) or other types on request are integrated in the load switch panels. Each switch-disconnector can be equipped with a built-in earthing switch and fuse holders for HRC fuses. The switchgear is operated by rotating bevel gear drives at the front of the compartment when the compartment door is closed.

The circuit-breakers used are vacuum circuit-breakers type VD4, make ABB/Calor Emag or other types on request. In the switchgear versions as withdrawable compartments, the circuit-breakers are mounted on a withdrawable unit and can be moved with a hand crank when the compartment door is closed. In this version there are three positions: Operating position, Isolated position and Withdrawn position for maintenance purposes.

The switch is operated with the cubicle door closed using mechanical push-buttons in the compartment door and/or electrically using push-buttons in the low-voltage compartment door. The withdrawable unit can also be equipped with a motor drive as an option.

In the most compact switchgear version, the circuit breaker is permanently installed. In this case, an additional disconnector is required as a visible isolating distance.

An earthing switch type EK 6, make ABB/Calor Emag, can be installed below the circuit-breaker in the cable connection area. It is actuated by a rotary bevel gear drive when the panel door is closed. The earthing switch is interlocked with the circuit-breaker drawer unit or the disconnector and can only be switched on in the disconnected position.

■ Voltage indication:

All switch panels can be equipped with a three-pole, high-impedance capacitive voltage indication system type HR according to VDE 0682 or IEC 61243-5. The reading is carried out by capacitive voltage dividers.

■ Low-voltage instrument panels:

All switch panels are equipped with a metal-enclosed low-voltage instrument panel on the upper front part of the compartment. They have their own lockable door.



Customized secondary wiring according to customer specifications.

Other SZM's portfolio

Retrofit and Service for low- and medium-voltage switchgear

When the old switchgear is worn out and the search for spare parts becomes more and more difficult, often the only thing that comes to mind is to purchase a new switchgear. Of course, this is also available from SZM. But if the budget is not sufficient or there is no time for lengthy shut-downs, SZM has another option: the modernization (retrofit) of the old switchgear. In fact, a retrofit is a good, more economical alternative to a new acquisition!

Retrofit means renewal/modernization, the old switchgear is preserved. We "only" replace the critical components, usually the circuit breaker with its drive. We use modern circuit breakers from renowned manufacturers for this. The switchgear is adapted in such a way that it can be moved into the place of the old circuit-breaker by plug-and-play and works

The advantages are obvious: a retrofit is a quick and reliable upgrade of the system. Switching to current products with state-of-the-art technology means operational continuity - with minimal interruption! A retrofit extends the operating life of the system (depending on use) by another 25 to 30 years! In addition: The operating personnel do not have to get used to a new system and

the new circuit-breaker requires significantly less maintenance than the old device.

In addition to our 250+ retrofit solutions, we also offer maintenance and repair of low- and medium-voltage switchgear. As a business partner of ABB, Siemens and Schneider Electric, we are also familiar with their switchgear and can procure and install original spare parts.



SZM not only manufactures new switchgear, but offers a variety of modernisation solutions (Retrofit solutions) for aging switchgear.

Project planning, installation, service for transformer stations / Transformer maintenance

We advise and undertake the planning and project management of walk-in and compact transformer stations, low and medium voltage switchgear and transformers up to 36 kV. Moreover, this includes the design of these electrical installations and cable dimensioning as well as the coordination and approval procedure with grid operators and the preparation of complete documentation after completion of such projects.

In addition to new installations, we also undertake expansions and retrofitting projects as well as the maintenance, cleaning, inspection and servicing of transformer stations. At the same time, we take care of all testing, fault analysis and troubleshooting in protection and control technology systems.

With a transformer service, we take care of the cleaning, inspection, maintenance, servicing and evaluation of the condition of cast resin transformers and oil transformers throughout Germany (incl. oil samples, gas-in-oil analyses). In the case of hermetic transformers, we can restore the hermetic condition correctly and on site after an intervention. That is possible at any oil temperature!

In the case of oil transformers, our focus, in addition to the condition assessment, is on oil treatment and a gentle oil regeneration instead of an oil change. We also undertake the delivery and installation of new or used transformers as well as the upgrading, downgrading and conversion.

Contact

**Would you want to know more about our medium-voltage switchgear SAM?
Then simply give us a call or send us an e-mail:**



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We are proud of:

our Quality Management certification by TÜV Rheinland according to DIN EN 9001:2005

our occupational health and safety seal "Safe with system" from the "Holz und Metall" employers' liability insurance association

our partnership with Siemens for the SIMO-PRIME switchgear

our cooperation with Schneider Electric as an independent EcoXpert Master Partner