

SOJO



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SOJO

SVP Solid Insulated Metal-clad Switchgear VCB-12 Solid insulated circuit breaker



北京双杰电气股份有限公司
BEIJING SOJO ELECTRIC CO., LTD.

Company Profile

Founded in December 2002, Beijing SOJO Electric Co., Ltd. is a public listed high-tech enterprise. In April, 2015, SOJO was officially listed in Shenzhen Stock Exchange (SZSE) (stock code: 300444; Stock name: SOJO Electric).



SOJO Factory of GIS



SOJO Factory of the Solid Insulated Switchgears



Automation production line
——the robot island



The automatic CNC sheetmetal fabrication center



SOJO Factory of power distribution automation
devices



SOJO Factory of substations & M/L Voltage
switchgears

SVP Solid Insulated Metal-clad Switchgear is suitable for indoor and outdoor installation, which can work in severe environment.

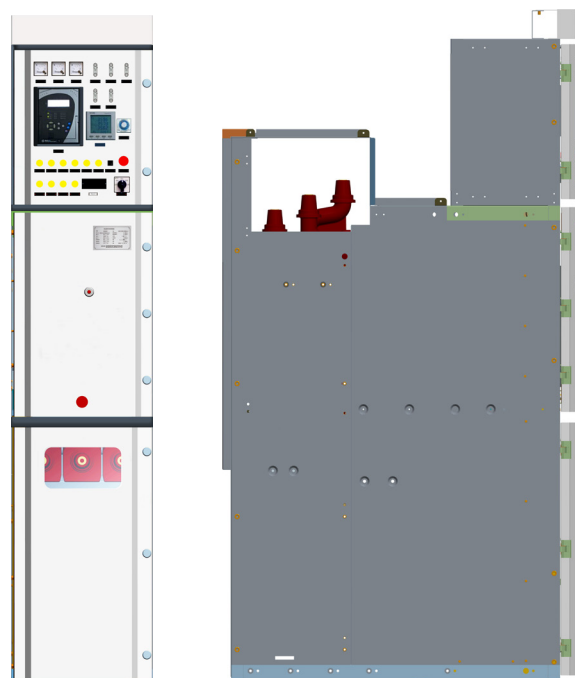
This switchgear adapts “five-compartment structure”, which is isolated from each other through the metal partition. All the live parts are fully sealed or embedded within epoxy resin or silicon rubber.

Standard modular design of different functional module, flexible assembly enabled.

There are functional handcart and auxiliary handcart of SVP. The functional handcart are including circuit breaker, disconnecter, fuse, voltage transformer and surge arrester functions. And earthing handcart for auxiliary handcart.

This switchgear has completed type test in accordance with IEC 62271-201 and GB 3906-2006 standards, including internal arc test. And the multiple interlocking devices ensure safety operation.

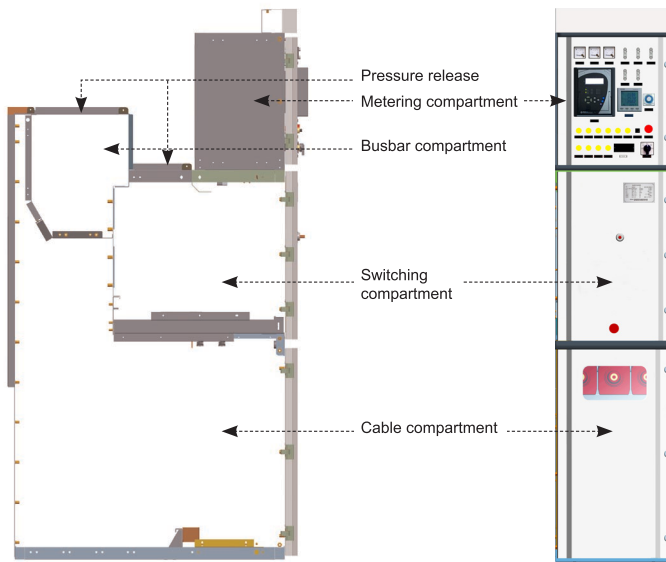
This switchgear can work with protection relay to protect line, transformer and motor.



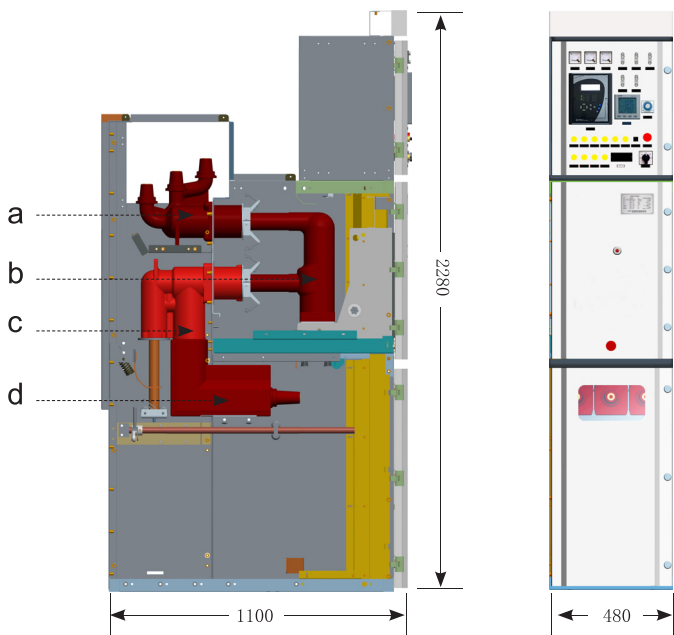
Item		Unit	Technical specification
Rated voltage		kV	12
Rated insulation level	Lightning impulse withstand voltage		phase to phase, phase to earth 75/across open contacts 85
	1 min power frequency withstand voltage		phase to phase, phase to earth 42/across open contacts 48
Rated current		A	630/1250
Rated short-circuit breaking circuit		kA	25/31.5
Rated short-circuit making current (peak value)			80
Rated peak withstand current (peak value)			80
Rated short-time withstand current /4s			31.5
Rated operating sequence:O-0.3s-CO-180s-CO			
Rated short-circuit breaking frequency		time	30
Mechanical duration of disconnecter and earthing switch		time	3000
Protection level of enclosure/ primary live parts of cable compartment and busbar compartment			IP4X/IP67
Busbar system			Insulated bus conductor diameter ϕ 30
Dimension (W \times L \times H) mm		mm	480 \times 1100 \times 2280
Weight		kg	About 700
Normal working conditions			
Working environment		The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.	
Temperature		-15℃—+40℃	
Altitude		<3000	
Seismic intensity		less than Level 8	
Humidity Level	Daily average	\geq 95%	
	Monthly average	\geq 90%	

Introduction

Overview



SVP metal-clad solid insulated switchgear consists of fixed parts (Enclosure) and withdrawable (handcart) parts. There are four compartments, which are switching compartment, metering compartment, busbar compartment and cable compartment. The pressure release channel is on top. Front accessible compartments enable easier maintenance. Busbar is placed at the back.



- a. Main busbar bushing: fully insulated busbar bushing, the branch bus is enclosed in epoxy resin, and the main busbar adapts silicon rubber for insulation.
- b. Main switch: Withdrawable type.
- c. Earthing switch: fully insulated earthing switch; the earthing contacts are fully sealed.
- d. CT cable bushing built into same epoxy resin block provides IP67 degree of protection.

Technical Features



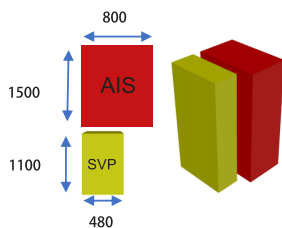
Solid Insulated Metal-clad switchgear

SVP is the first solid insulated metal-clad switchgear designed and manufactured in China. Compared with traditional solid insulated metal-enclosed switchgear, this kind of withdrawable-type design can enable quickly troubleshooting and shorten interruption duration.

Fully insulated leaves no exposed live parts

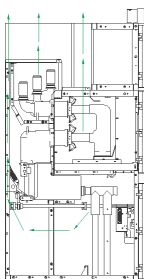


Compared with traditional air insulated switchgear, SVP adopts the integrated design of current transformer and bushing; and the busbar is fully sealed and insulated by silicon rubber. At the same time, with the cooperation of special dynamic and static contact mechanism, the complete insulation of the switchgear under various operation conditions is guaranteed.



Width is only 480mm

Compared with the traditional air insulated switchgear, the SVP only occupies 44% of air insulated switchgear.



Ability to serve in severe environment

All the live parts are fully sealed and insulated by epoxy resin or silicon rubber, which enables the switchgear working in high salt mist, high altitude, and high humidity environment.

Application and related certificate report



Drilling platform of CNOOC (China National Offshore Oil Corporation) in Hainan province.



DNV(Det Norske Veritas) Certificate

Product Features

Flexible Performance

- Units can be assembled on site.
- Units can be altered on site.
- Unit can be exchanged on site.
- Units can connect to the power supply on site, it is convenient to upgrade the monitoring and metering system.

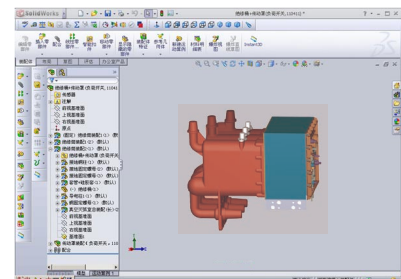
Smart Performance

- Real-time temperature monitoring of cable joint
- In order to ensure the reliability of power distribution, we developed the SJDA2000 as power distribution automation solution.

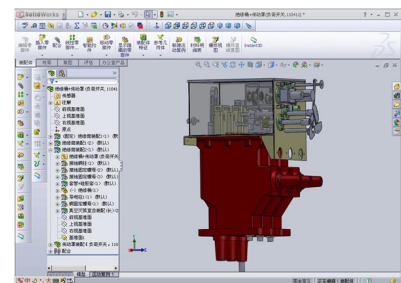


Product Design Feature

- ProE、Solidworks computer simulation
Solid modeling, Virtual assembly
ANSYS Finite element analysis and optimization design
ADAMS analysis of electromagnetic field
3D motion simulation of mechanism
Interference detection
- Optional configuration available for SOJO' s DTU SJDA 2000 or client can select other DTU brands.
- Flexible structure, integrate the advantages of easy maintenance and fully enclosed insulation
- Solid dielectric insulated medium-voltage switchgear is the future trend of development which has been commonly acknowledged by the industry. The continuous technology development from oil insulation to SF₆ insulation, now solid insulated is in accordance with international requirement for environment protection.




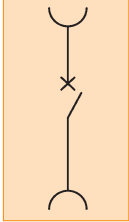
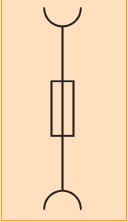
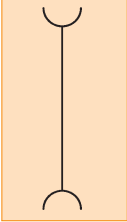
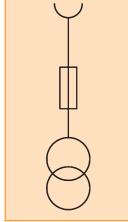
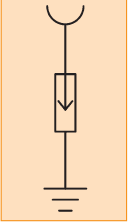
SVI II Series



SVI I Series

Functional Handcards

- SVP Solid insulated metal-clad switchgear can fit circuit breaker handcard, disconnecter hand card, fuse handcard, voltage transformer handcard and surge arrester handcard etc.
- All the core components of functional handcards are fully sealed, no live parts exposed, which also realize the complete insulation of the entire switchgear.
- The embedded poles can work safely SF₆ -25℃ — +40℃.
- The handcard panel is equipped with human-computer interaction interface to realize the operation of the switch, so that the user can understand the running state of the switch in real time.
- The handcard is installed on chassis truck which is directly contacted to the grounded metal enclosure. Therefore, the handcard is completely grounded to ensure the safety of operation staff.

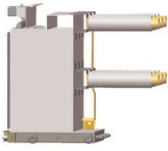
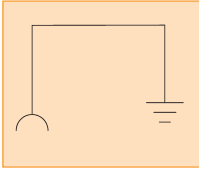
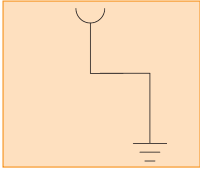
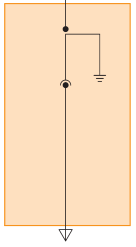
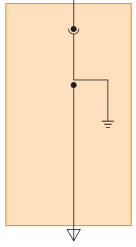
Handcard Type	V-Circuit Breaker Handcard	F-Fuse Handcard	G-Disconnector Handcard	Pt-Voltage transformer Handcard	B-Surge Arrester Handcard
					
HMI	<ul style="list-style-type: none"> ● Open Button ● Close Button ● Charging Button ● Counter ● Open Indicator ● Close Indicator 	● Fuse Status Indicator			● Counter

Earthing Handcart

The earthing handcart is used to provide additional reliable earthing to ensure personal safety, which is required by some operation and maintenance process. There are two kinds of earthing handcards.

- Busbar earthing handcart
- Cable earthing handcart

When busbar earthing handcart is in the moving-in phase, open the up valve mechanism and connect the up contact to the earth. In the same way, when the cable earthing handcart is in the moving-in phase, open the lower valve mechanism and connect the contact connecting to feeder cable to the earth.

Handcart type	Cable earthing handcart	Busbar earthing handcart
		
Solutions		

Solutions

No	01	02	03	04	05	06	07
Solution							
Rated Current	630-1250	630-1250	630-1250	630-1250	630-1250	630-1250	630-1250
Main Switch	SVP-V	SVP-V	SVP-V	SVP-G	SVP-G	SVP-G	SVP-G
Main configuration	Current transformer	(_/5)3	(_/5)3	(_/5)3	(_/5)3	(_/5)3	(_/5)3
	Voltage transformer	--	--	--	--	--	--
	High-voltage fuse	--	--	--	--	--	--
	VPI	1	1	1	1	1	1
	Surge arrester	3	--	3	3	--	3
	Earthing switch	1	1	--	1	1	--
Note							

No	08	09	10	11	12	13	14
Solution							
Rated Current	630-1250	630-1250	630-1250	630-1250	630-1250	630-1250	630-1250
Main Switch	SVP-Pt/SVP-B	SVP-Pt	SVP-F	SVP-F	SVP-F	SVP-V	SVP-V
Main configuration	Current transformer	--	--	(_/5)3	(_/5)3	(_/5)3	(_/5)3
	Voltage transformer	1	1	--	--	--	1
	High-voltage fuse	3	3	3	3	3	3
	VPI	1	1	1	1	1	1
	Surge arrester	3	--	3	--	3	--
	Earthing switch	--	--	1	1	--	1
Note							

Special epoxy resin insulation material

Anti-cracking ability

Passed severe thermal-shock test, components will not be cracked during long-term operation.

Pyrocondensation

The shrinkage of Epoxy Resin near to copper enables tight contact with copper made components, internal cracks avoided.

High glass state temperature

It has a glass state temperature of 135°C to 150°C which enables the dielectric ability of Epoxy Resin remains reliable under high ambient temperature.

Thermal conductivity

The coefficient of thermal conductivity is 80 to 100 (10⁻² W/m.k) which enables easy heat emitting.

Environment Protection

The Epoxy Resin is able to be recycled in line with the concept of Green Switch

Anti-aging ability

The Epoxy Resin has no potential risks of temperature and radiation aging effect.

The anti-aging test and service life of Epoxy Resin of the solid insulated switchgear

Typical aging temperature of insulation structure	Aging period	Service life
Low temperature point, 180°C	35 Days	30 Years
Medium temperature point, 200°C	7 Days	30 Years
High temperature point, 220°C	2 Days	30 Years

Patent Technologies

SOJO Solid insulated switchgear has been awarded 69 patents including 1 international invention patent, 20 domestic invention patents, 46 utility model patents and 3 design patents.

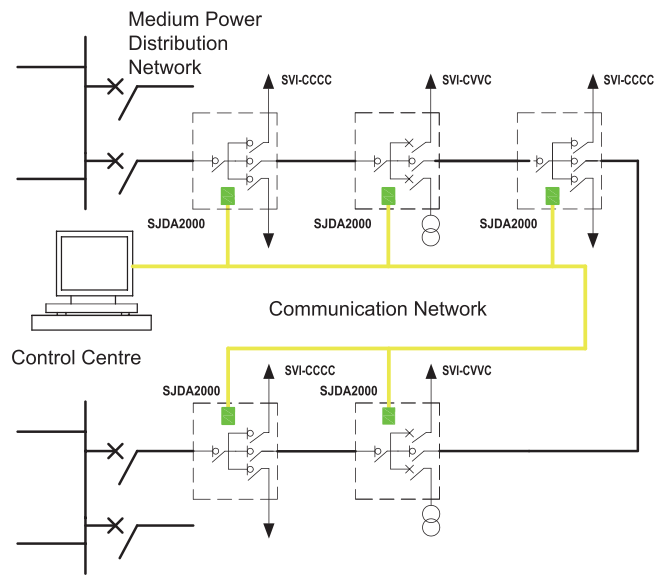
Power Distribution Automation



Power Distribution Automation

SJDA2000

In order to ensure the reliability of power distribution, we developed the SJDA2000 as power distribution automation solution.



Basic Configuration

- 6 Circuits Capacity
- Visible Control panel and operation
- Modular hardware design, mutiple CPU control system
- 24 circuits switching quantity input
- 3×5 numbers of current, 3×3 numbers of voltage, Accuracy class 0.2
- 24VDC/220VAC Input
- Incorporate between every two current and voltage can achieve class 1.0 for power quantity calculation.
- 2 RS485, 1 GPS, 1 Ethernet interface for remote communication
- 1 Local RS232
- 24 Local SOE
- Ambient temperature scope: -25°C to $+70^{\circ}\text{C}$
- DAS system
- Standard Industrial Computer
- Windows XP operating system
- Software and Hardware watchdog function
- Real-time multi-task process
- Communication protocol DNP 3.0, IEC60870-5-101
- Single cycle data recall function



SVP Solid Insulated Metal-clad Switchgear

Optional Configuration

- Switching input interlock;
- Analog quantity threshold-crossing protection;
- Switching output configuration;

