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SOJO

KYN28A-12(GZS1)

Withdrawable Metal-clad Switchgear

BEIJING SOJO ELECTRIC CO., LTD.

No. L0223

No. 05525

检验报告

试品型号及名称: KYN28A(GZS1)-12(Z)/T1250-31.5
户内金属铠装移开式开关设备

委托单位: 北京双杰配电自动化设备有限公司

检验类别: 型式试验

国家高压电器质量监督检验中心
西安高压电器研究所 高压电器实验室

西安高压电器研究所
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检验报告

No. 05525

第 3 页 共 32 页

检验结论

委托单位: 北京双杰配电自动化设备有限公司

试品型号: KYN28A(GZS1)-12(Z)/T1250-31.5

试品名称: 户内金属铠装移开式开关设备

制造单位: 北京双杰配电自动化设备有限公司

实施的检验项目:

防护等级检查 [外壳: IP4X; 前门打开及隔室间: IP2X]
回路电阻测量 [＜150μΩ] 温升试验 [1250A]
机械特性、机械操作试验
机械寿命试验 [断路器/断路器手车/接地开关: 10000/500/2000次]
操动机构和辅助回路的绝缘试验 [2000V 1min]
短时工频耐压试验 [相间、对地及真空断口: 42kV 1min]
[隔离断口: 48kV 1min]
雷电冲击耐压试验 [相间、对地及真空断口: 75kV]
[隔离断口: 85kV]
出线端短路试验方式4 [12kV 31.5kA 80kA(峰值)]
额定短路开断电流开断次数试验 [12kV 31.5kA 8次]
异相接地故障开断能力试验 [12kV 27.4kA]
动热稳定试验 [主回路及接地开关: 4s 31.5kA 80kA(峰值)]
[接地连接回路: 2s 12.5kA 31.5kA(峰值)]

检验依据:
GB 3906-1991 3-35kV交流金属封闭开关设备
JB 3855-1996 3.6-40.5kV户内交流高压真空断路器

检验结论:
所检项目的检验结果符合检验依据的相关规定，试品相应性能合格。

编写: 2005-11-14 校核: 2005-11-23 审定: 2005-11-23 批准: 2005-11-23

产品（技术）鉴定验收证书

京电鉴字〔2006〕017号

产品名称: KYN28A-12（Z）/T1250-31.5 型户内铠装移开式金属封闭开关设备

完成单位: 北京双杰配电自动化设备有限公司

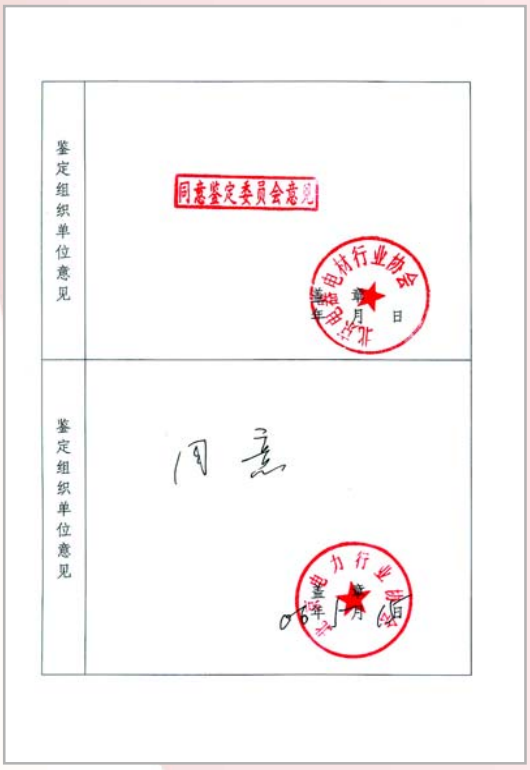
鉴定类别: 新产品

鉴定方式: 会议

组织单位: 北京电力行业协会
北京电器电材行业协会

鉴定日期: 2006 年 4 月 30 日

国家经济贸易委员会
一九九七年制



鉴定组织单位意见

同意鉴定委员会意见

北京电材行业协会

年 月 日

鉴定组织单位意见

同意

北京电力行业协会

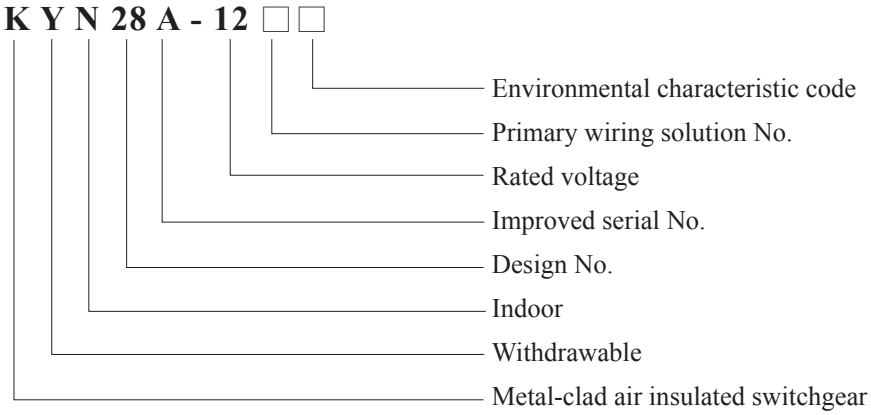
2006 年 4 月 30 日

CONTENTS

1. Product Description

KYN28A-12(GZS1)is metal-clad air insulated switchgear which is for 3 to 12KV AC, 50Hz current redistribution. It is applicable to distribution systems of power plant, substation, industrial and mining enterprises to realize the power acceptance and distribution and control, monitoring and protection of power distribution equipment. KYN28 complies with IEC298、GB3906 standard; and has the interlock functions.This air insulated switchgear is fitted with VD4 circuit breaker from ABB or VS1 circuit breaker from domestic company.

1.1 Model Explanation



Environmental characteristic code – Used in humid tropics is TH
Used in arid tropics is TA
Used in high altitude is G

1.2 Service Environment Conditions

1.2.1 Normal service conditions

a. Ambient air temperature -10℃ ~+40℃ ;

b. The altitude is less than 1000m;

c. Daily relative humidity is less than 95%, monthly relative humidity is less than 90%.

d. Seismic capacity less than level 8

e. The surrounding air should avoid corrosive or flammable gases, water vapor and other pollution.

f. Without severe pollution and frequent violent vibration, the severe design under severe conditions meets the requirements of class I.

1.2.2 Special service conditions

Contact SOJO for information

2. Main Technical Parameters

2.1 Switchgear Parameters

No.	Item		Unit	Parameters
1		Rated voltage	kV	3.6/7.2/12
2		Rated frequency	Hz	50
3	Rated insulation level	1 min power frequency withstand voltage	kV	42
4		Lightning impulse withstand voltage	kV	75
5		Rated current	A	630/1250/1600/2000/2500/3150/4000
6		Thermal stability current（effective value）（4s）	kA	20/25/31.5/40
7		Rated dynamic current （peak value）	kA	50/63/80/100
8		Switchgear protection level		Enclosure is IP4X；When the doors of disconnector compartment and circuit breaker compartment are open, IP2X.
9	The short circuit capacity of current transformer is considered separately; the thermal stable current time is 4s when use VS1.			

2.2 VS1 Vacuum Circuit Breaker Technical Parameters

No.	Item		Unit	Parameters
1		Rated voltage	kV	12
2		Rated frequency	Hz	50
3		Rated current	A	630/1250/1600/2000/2500/3150/4000
4	Rated insulation level	1 min power frequency withstand voltage	kV	42
5		Lightning impulse withstand voltage	kV	75
6		Rated short circuit breaking current	kA	20/25/31.5/40
7		Rated short circuit current break frequency	Time	30
8		Rated short-time withstand current（3s）	kA	20/25/31.5/40
9		Rated peak withstand current	kA	50/63/80/100
10		Mechanical endurance	time	10000
11		Rated operating sequence		O-0.3s-CO-180s-CO

2.3 VD4 Vacuum Circuit Breaker Technical Parameters

No.	Item		Unit	Parameters
1		Rated voltage	kV	12
2		frequency	Hz	50
3		Rated current	A	630/1250/1600/2000/2500/3150/4000
4	Rated insulation level	1 min power frequency withstand voltage	kV	42
5		Lightning impulse withstand voltage	kV	75
6		Rated short circuit breaking current	kA	20/25/31.5/40
7		Rated short circuit current break frequency	次	100(≤25kA)/50(＞25kA)
8		Rated short-time withstand current（3s）	kA	16/20/25/31.5/40
9		Rated peak withstand current	kA	40/50/63/80/100
10		Mechanical endurance	time	10000
11		Rated operating sequence		O-0.3s-CO-15s-CO

2.4 Schneider EV12 Vacuum Circuit Breaker Technical Parameters

No.	Item		Unit	Parameters
1		Rated voltage	kV	12
2		Rated frequency	Hz	50
3		Rated current	A	630/1250/1600/2000/2500/3150/4000
4	Rated insulation level	1 min power frequency withstand voltage	kV	42
5		Lightning impulse withstand voltage	kV	75
6		Rated short circuit breaking current	kA	20/25/31.5/40
7		Rated short circuit current break frequency	time	100(≤25kA)/50(＞25kA)
8		Rated short-time withstand current（3s）	kA	16/20/25/31.5/40
9		Rated peak withstand current	kA	40/50/63/80/100
10		Mechanical endurance	time	10000
11		Rated operating sequence		O-0.3s-CO-15s-CO

3. Structure

The switchgear designed according to IEC298 and GB 3906-91 standard. It is composed of cabinet and withdrawable circuit breaker. There are four compartments of the cabinet. The protection level of the enclosure is IP4X. When the doors of disconnector compartment and circuit breaker compartment are open, the protection level is IP2X. There are various wiring system solutions such as overhead, cable and other functional solutions. This switchgear can be installed back-to-back or wall mounted, which can improve the flexibility and safety of the switchgear.

3.1 Enclosure

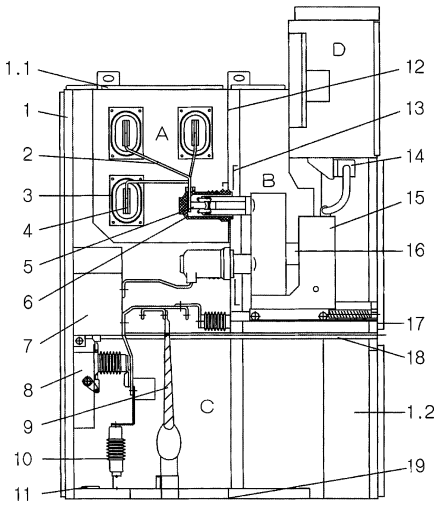
The enclosure is highly accuracy and with high degree of anti-corrosion and anti-oxidation. It adapts aluminum zinc steel sheet, which has been processed by numerical control machine tool. The adopted multiple folding technology allows lighter weight, higher mechanical strength and more beautiful appearance. The cabinet adopts the combination structure, which is connected by the riveting nut and the high-strength bolt, so that the production cycle is short; the parts are versatile and small.

3.2 Truck

The structure of the truck is processed by numerical control machine tool. The truck and cabinet are interlock, which is safe, flexible and reliable. There are circuit breaker truck, potential transformer truck, metering truck and disconnector truck according to the usage. The truck has trip/test position and working position inside of the cabinet; each position is with location device to ensure the reliability of interlock. All the trucks adopt worm gear, worm swing propulsion to work or exit, and the operation is light and flexible.

3.3 Compartment

Each main electrical components has its own compartment, which is circuit breaker truck compartment, bus compartment, cable compartment, relay and meter compartment. The protection level of each compartment can reach to IP2X; all the compartments in addition tothe relay and meter compartment have pressure releasing pathway.



Structure diagram

A. Busbar Compartment
B. Circuit breaker truck compartment
C. Cable compartment
D. Relay meter compartment

1.1 Pressure relief device
1.2 Control trunking
1. Enclosure
2. Branch miniature bus
3. Busbar bushing
4. Main busbar
5. Static contact device
6. Static contact box
7. Current transformer
8. Earthing switch
9. Cabel
10. Surge arrester
11. Earthing main busbar
12. Removable clapboard
13.Clapboard(valve)
14. Secondary plug
15. Circuit breaker truck
16. Heating Device
17.Withdrawable horizontal clapboard
18.Earthing switch operation mechanism
19. Baseboard

● Busbar compartment A

Main bus bar and branch bus bar are rectangular section cooper bar. Bushing is used to connect adjacent cabinets; and the air between the bus bars is used as cushion. Therefore, when fault internal arc occurred, the bushing can effectively limit the accident to isolation without spreading to other cabinets. For special needs, the bus can also be covered with heat-shrinkable bushing and connecting bolt insulator and end cap.

● Circuit breaker compartment B

The track is mounted on both sides of the compartment for the truck to glide between the disconnector/test position and working position. When the truck is moved from the disconnector/test position to the working position, the valve on the upper and lower static contact box is automatically opened linking with the truck; when move to the reverse direction, it will close automatically until the truck is back to a certain position, completely covering the static contact box, forming an effective isolation to ensure that the maintenance personnel do not touch the electrified body.When the door of the circuit breaker compartment is closed, the truck can also be operated. The position of the truck in the compartment, switch position and charging status can be observed through the window.

● Cable compartment C

The current transformer and earthing switch are mounted on the back wall of the compartment and the arrester is installed in the lower part of the cable compartment.After the truck and withdrawable horizontal plate are removed, workers can install and maintain from the front side. Each phase of the cable connection conductor in the cable compartment can connect one or three single core cables; and six single core cables when necessary.

● Relay and meter compartment D

The relay and meter compartment can be installed with protection relays, measuring instruments, metering instruments and voltage indicators, as well as secondary equipment for special requirements.The control line shall be in the slot of sufficient space, with a metal plate cover to ensure that the secondary line is isolated from the high voltage equipment.On the top of the compartment; the small busbar can be mounted through the hole.

3.4 Pressure relief device

There is pressure relief device on the top of circuit breaker compartment, busbar compartment and cable compartment. When there fault internal arc occurs, the internal pressure of switchgear will rise; and the pressure relief metal board will open automatically to release the pressure.

3.5 Earthing device

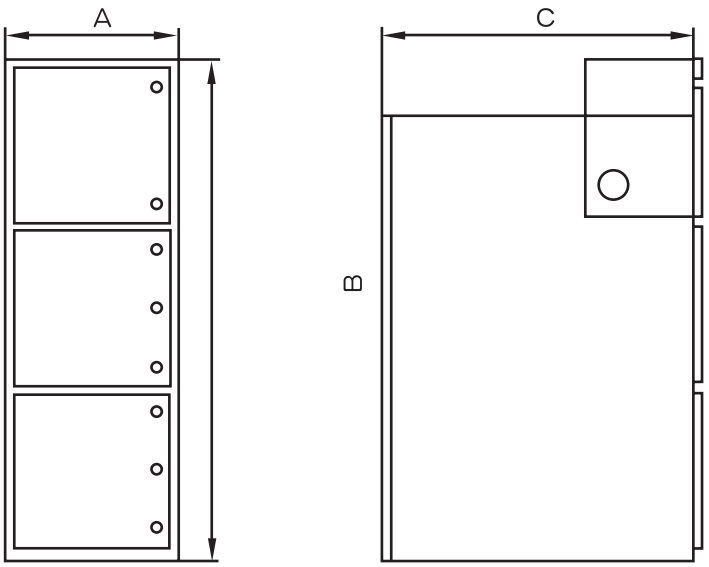
There is 10 x 40 mm earthing bar installed across the adjacent cabinets. And because the entire cabinet structure is used coated aluminium zinc plate, good earthing status can be ensured.

3.6 Prevent condensation and corrosion

In order to prevent the danger of condensate in the high humidity or temperature change, the heater device is installed in the circuit breaker compartment and cable compartment respectively.

3.7 Dimensions and Weight

There is 10 x 40 mm earthing bar installed across the adjacent cabinets. And because of the entire cabinet structure is used coated aluminium zinc plate, good earthing status can be ensured.

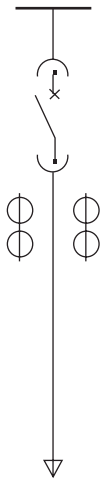
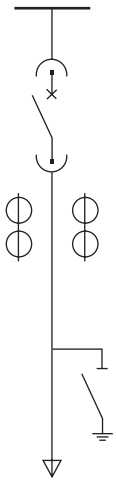
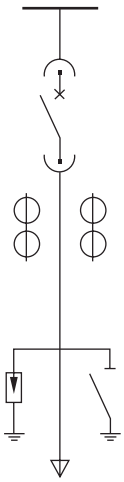
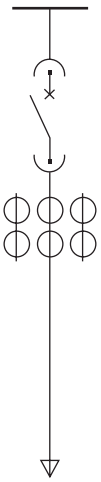
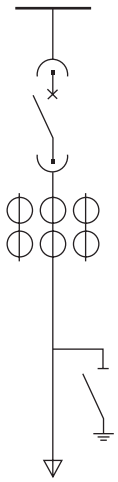


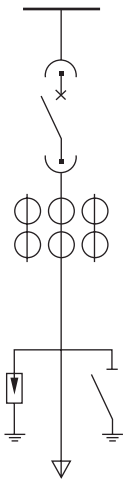
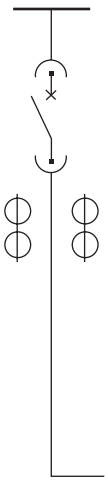
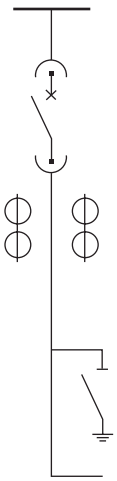
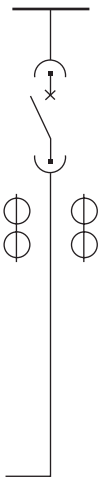
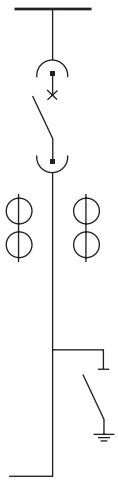
Switchgear dimensions and weight

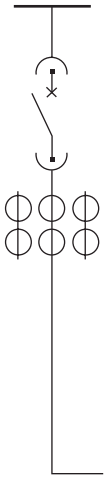
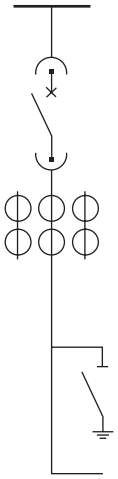
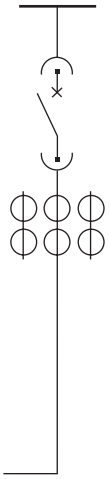
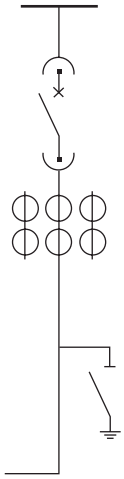
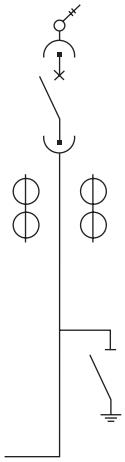
Height		2300（2200）
Width	Rated current≤1250A	800
	Rated current1600A	800（31.5KA）1000（40KA）
	Rated current≥1600A	1000
Depth	Incomer and Feeder Line	1500
	Overhead incomer and feeder line	1660
Weight		7000-1200

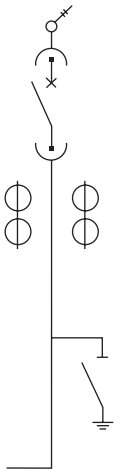
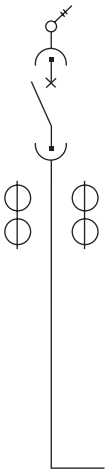
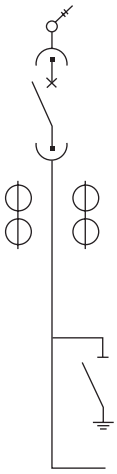
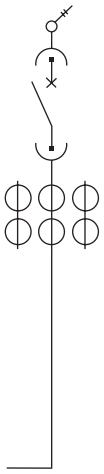
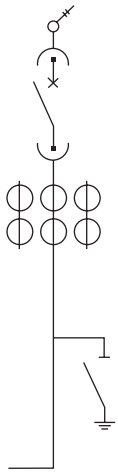
4. Primary wiring solution

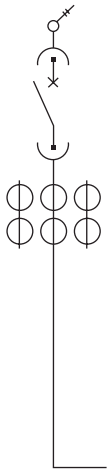
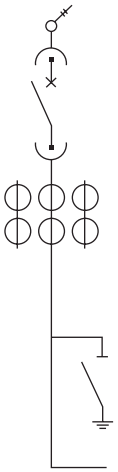
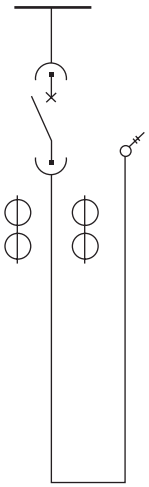
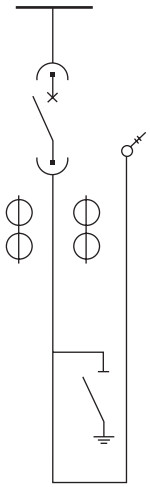
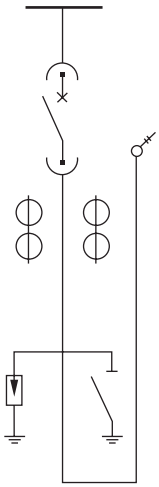
Switchgear primary wiring solution

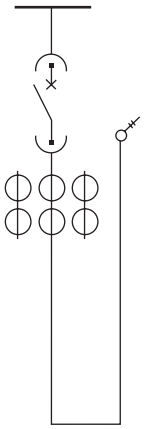
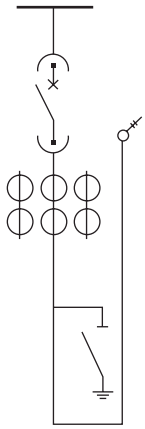
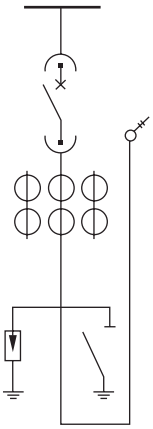
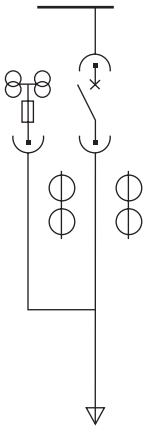
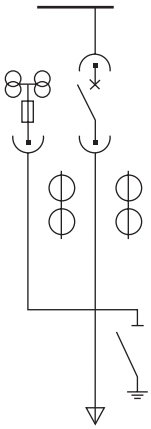
Solution No		01	02	03	04	05
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	1
	Current transformer AS12 or LZZBJ9	2	2	2	3	3
	Potential transformer RAL.REL or JDZ					
	High voltage fuse RN2-10					
	Earthing switch JN15		1	1		1
	Surge arrester HY5WS2-17/50			3		
Circuit Name		Incomer and feeder	Incomer and feeder	Incomer and feeder	Incomer and feeder	Incomer and feeder
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

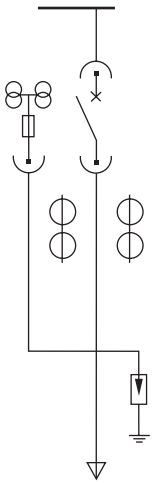
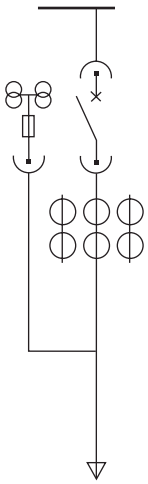
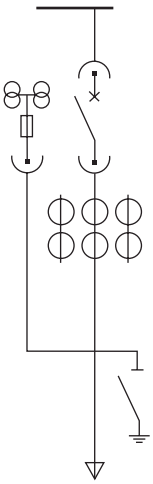
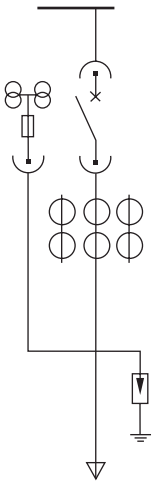
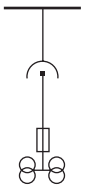
Solution No		06	07	08	09	10
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	1
	Current transformer AS12 or LZZBJ9	3	2	2	2	2
	Potential transformer RAL.REL or JDZ					
	High voltage fuse RN2-10					
	Earthing switch JN15	1		1		1
	Surge arrester HY5WS2-17/50	3				
Circuit Name		Incomer and feeder	Connection (Right)	Connection (Right)	Connection (Left)	Connection (Left)
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

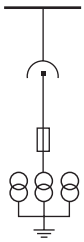
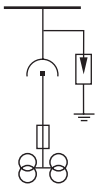
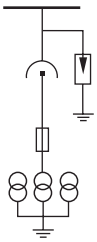
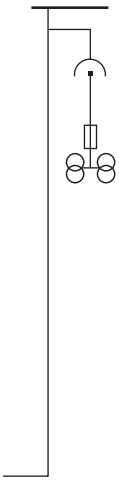
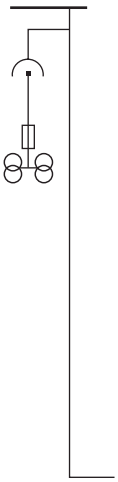
Solution No		11	12	13	14	15
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	1
	Current transformer AS12 or LZZBJ9	3	3	3	3	2
	Potential transformer RAL.REL or JDZ					
	High voltage fuse RN2-10					
	Earthing switch JN15		1		1	1
	Surge arrester HY5WS2-17/50					
Circuit Name		Connection (Right)	Connection (Right)	Connection (Left)	Connection (Left)	Overhead incomer(left connection)
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

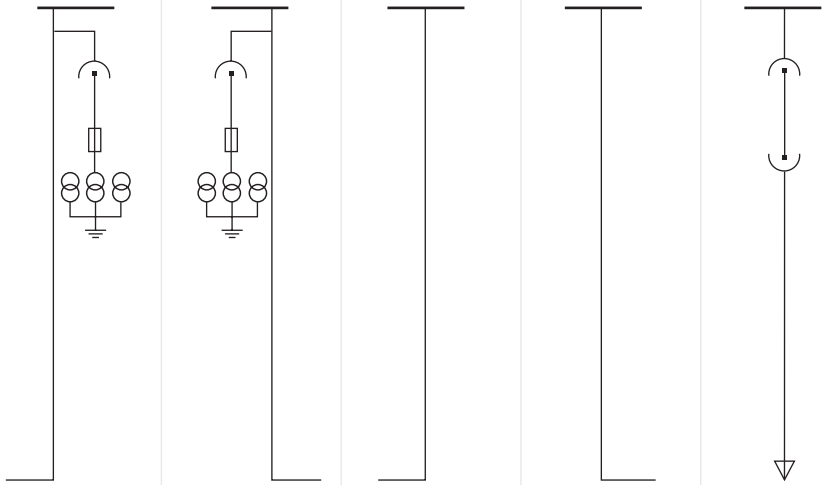
Solution No		16	17	18	19	20
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	1
	Current transformer AS12 or LZZBJ9	2	2	2	3	3
	Potential transformer RAL.REL or JDZ					
	High voltage fuse RN2-10					
	Earthing switch JN15	1		1		1
	Surge arrester HY5WS2-17/50					
Circuit Name		Overhead incomer(left connection)	Overhead incomer(right connection)	Overhead incomer(right connection)	Overhead incomer(left connection)	Overhead incomer(left connection)
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

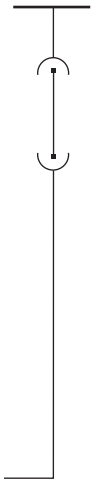
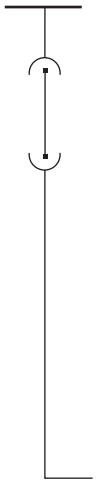
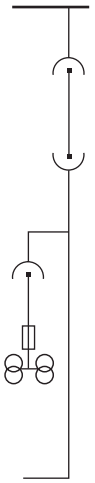
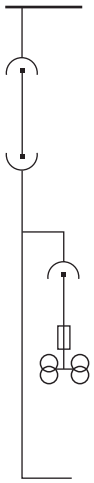
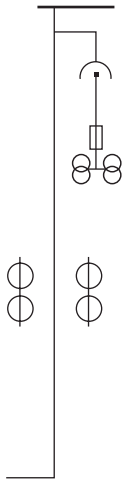
Solution No		21	22	23	24	25
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1660	1660	1660
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	1
	Current transformer AS12 or LZZBJ9	3	3	2	2	2
	Potential transformer RAL.REL or JDZ					
	High voltage fuse RN2-10					
	Earthing switch JN15		1		1	1
	Surge arrester HY5WS2-17/50					3
Circuit Name		Overhead incomer(right connection)	Overhead incomer(right connection)	Overhead incomer and feeder	Overhead incomer and feeder	Overhead incomer and feeder
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

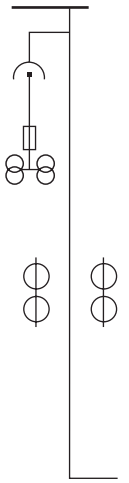
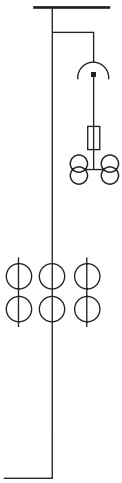
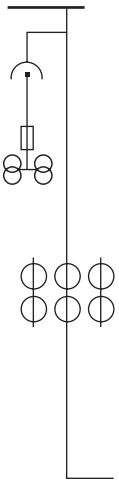
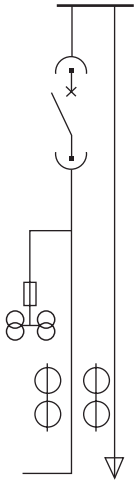
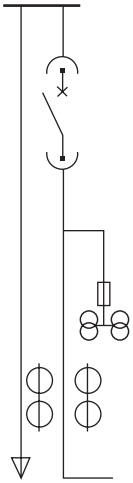
Solution No		26	27	28	29	30
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1660	1660	1660	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	1
	Current transformer AS12 or LZZBJ9	3	3	3	2	2
	Potential transformer RAL.REL or JDZ				2	2
	High voltage fuse RN2-10				3	3
	Earthing switch JN15		1	1		1
	Surge arrester HY5WS2-17/50			3		
Circuit Name		Overhead incomer and feeder	Overhead incomer and feeder	Overhead incomer and feeder	Cable feeder +PT	Cable feeder +PT
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

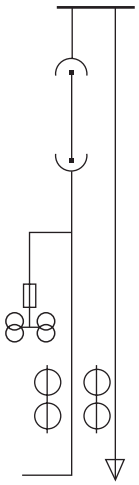
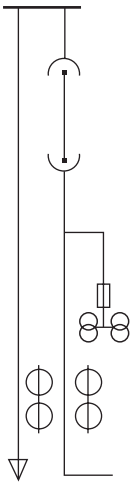
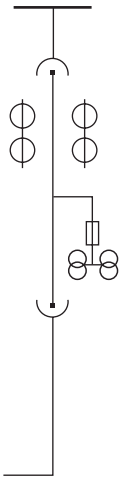
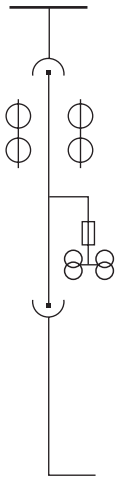
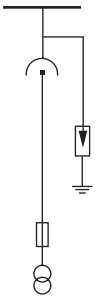
Solution No		31	32	33	34	35
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1	1	1	1	1	
	Current transformer AS12 or LZZBJ9	2	3	3	3	
	Potential transformer RAL.REL or JDZ	2	2	2	2	2
	High voltage fuse RN2-10	3	3	3	3	3
	Earthing switch JN15			1		
	Surge arrester HY5WS2-17/50	3			3	
Circuit Name		Cable feeder +PT	Cable feeder +PT	Cable feeder +PT	Cable feeder +PT	Voltage measurement (PT cabinet)
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

Solution No		36	37	38	39	40
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1					
	Current transformer AS12 or LZZBJ9					
	Potential transformer RAL.REL or JDZ	3	2	2	2	2
	High voltage fuse RN2-10	3	3	3	3	3
	Earthing switch JN15					
	Surge arrester HY5WS2-17/50		3	3		
Circuit Name		Voltage measurement (PT cabinet)	Voltage measurement+ surge arrester	Voltage measurement+ surge arrester	Voltage measurement+ bus coupler	Voltage measurement+ bus coupler
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

Solution No		41	42	43	44	45
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1					
	Current transformer AS12 or LZZBJ9					
	Potential transformer RAL.REL or JDZ	3	3			
	High voltage fuse RN2-10	3	3			
	Earthing switch JN15					
	Surge arrester HY5WS2-17/50					
Circuit Name		Voltage measurement+ bus coupler	Voltage measurement+ bus coupler	Bus coupler	Bus coupler	Disconnector
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

Solution No		46	47	48	49	50
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1					
	Current transformer AS12 or LZZBJ9					2
	Potential transformer RAL.REL or JDZ			2	2	2
	High voltage fuse RN2-10			3	3	3
	Earthing switch JN15					
	Surge arrester HY5WS2-17/50					
Circuit Name		Disconnector+ connection	Disconnector+ connection	Disconnector+ connector+ voltage measurement	Disconnector+ connector+ voltage measurement	Meter+ left connection
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

Solution No		51	52	53	54	55
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1500	1500	1500	1660	1660
Main primary components	Vacuum circuit breaker AD4 or VS1				1	1
	Current transformer AS12 or LZZBJ9	2	3	3	2	2
	Potential transformer RAL.REL or JDZ	2	2	2	2	2
	High voltage fuse RN2-10	3	3	3	3	3
	Earthing switch JN15					
	Surge arrester HY5WS2-17/50					
Circuit Name		Meter+ right connection	Meter+ left connection	Meter+ right connection	Incomer+ meter	Incomer+ meter
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

Solution No		56	57	58	59	60
Primary wiring solution						
Rated Current(A)		630-3150				
Depth(mm)		1660	1660	1500	1500	1500
Main primary components	Vacuum circuit breaker AD4 or VS1					
	Current transformer AS12 or LZZBJ9	2	2	2	2	
	Potential transformer RAL.REL or JDZ	2	2	2	2	3
	High voltage fuse RN2-10	3	3	3	3	3
	Earthing switch JN15					
	Surge arrester HY5WS2-17/50					.3
Circuit Name		Incomer disconnector+ meter	Incomer disconnector+ meter	Meter+ left connection	Meter+ right connection	Transformer
Note1		If rated current is higher 1600A, the depth of cabinet is 1000mm				
Note2		Special requirements, please contact SOJO for information				

5. Transporting and Storage

Pay attention to the following points:

a. Specified transportation means(e.g. crane or forklift) are valid, cylinder and crowbar prohibited.

b. Keep the CB truck in another place separated from cubicle.

c. The cabinet shall not be overturned, inverted or subjected to severe vibration, and the cabinet shall not be close to the fire.

d. Prevent getting wet from the rain.

e. Do not disassemble components.

6. Installation and Adjustion

6.1Base Type

The installation process should comply with the technical specifications for construction. Pouring concrete to build the base of the switchgear is generally divided into two steps. First, to pour the base frame of the switchgear, which is to pour the foundation of Angle steel, square steel or channel steel. Second, pouring surface replenishment layer, the general thickness is 60mm, and the concrete height should be 1-3mm lower than component plate.

6.2 Installation

6.2.1Switchgear installation

The installation steps of the switchgear are as follows:

a. Loosen the top cover bolts of the busbar compartment and remove the top cover

b. Loosen the fixing bolt in front of the busbar compartment and remove the removable clapboard.

c. Release the fixed bolts of the withdrawable horizontal clapboard below the circuit breaker compartment and remove the horizontal clapboard.

d. Loosen and remove the cable cover.

e. Remove the cover plate from the control slot located on the left side of switchgear; remove the right front control line tank cover at the same time.

f. Remove the hoisting board and fasteners

g. Install the cubicle one by one on the foundation including both vertical and horizontal sides. The maximum gap shall not exceed 2mm through adjustment.According to the requirements and drawings, the cubicles shall be carried to the specified site. Arrangement shall be started from the middle if the arrangement is long (over 10 sets).

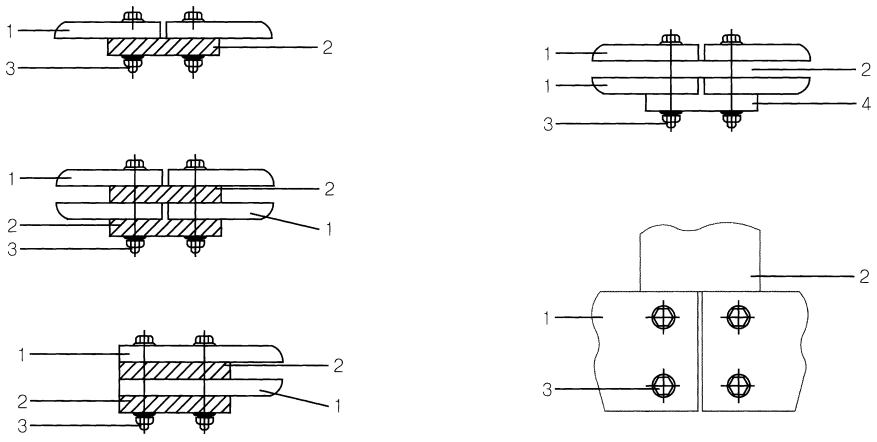
h. When finish cabinets combination, M12 foundation bolts should be used to weld base frame.

6.2.2 Bus bar installation

The installation steps of the bus bar are as follows:

a. Clean the busbar with a clean and dry soft cloth, and check if the insulation bushing is damaged, paint conductive greaseplaster or neutral vaseline to the joints.

b. Install busbar one by one, and connect main busbar with corresponding branch busbar according to the figure below.



1.Main bus bar 2. Brach bus bar 3.Bolt 4. Supporting insulator

Connection mode of busbar

6.2.3 Installation of earthing device

Installation steps of earthing device are as follows:

a. Connect all the main earthing busbar together by the connection plate.

b. Connect all the earthing leads inside the cubicle.

c. Connect the earthing wire of earthing switch with main earthing bus of the cubicle.

d. The base frame is connected to the earthing busbar, and if there are more than 10 cabinets combination, two connection points are necessary.

6.3 Check after Installation

After the switchgear is installed, remove the dust on the equipment; then check whether all the bolts are fastened, and the secondary wiring is good.Roll the circuit breaker in and out of the cabinet, and then close the CB to observe whether it could work normally. Adjust the instrument pointer to zero and check whether the secondary wiring is correct according to the wiring diagram; adjust the relay according to the requirement of power supply; check whether the interlocking functions are valid.

7. Operation and maintenance

7.1Operation cautions

Although there is protection interlock in the switchgear, operating staff should follow the operation procedures and technical documents strictly.

7.2 Install the circuit breaker truck into cabinet

Before the circuit breaker is put into the cabinet, the working status should be carefully checked.Check whether the CB compartment is clean; whether the truck rail is smooth; and whether the metal valve of static contact box is flexible. Then lift withdrawable CB onto the service truck by suitable crane and lock it tightly.Adjust the height of service truck to make it reliably connect with the cubicle. Insert the positioning locking plate of the front part of the service truck into the cabinet to lock the truck and the cabinet; open the circuit breaker locking hock, and push the circuit breaker smoothly into the cabinet and lock it simultaneously. After confirming that the truck is locked , remove the lock between service truck and cabinet.

7.3 Truck operation inside the cabinet

After entering cabinet, the CB is in break position. The CB truck needs to reach test position first before working. When CB is in opening state, pull locking plate by hands to make lock tongueretract into bottom board machine till going into testing position of guide rail. And both left and right lock tongues are inserted into the lock hole. Insert aerial plug into secondary circuit socket of the cubicle, and close CB door, then begin the test.To continue working operations, close and lock all the cabinets and confirm that the CB is in opening state, insert the special handle into the forward machine of bottom board machine, and rotate the handle in counter-clockwise to make CB reach working position, then put down the handle and start the ON/OFF operation.To quit working position: When CB is in opening state, insert the special handle into the rocking in mechanism of bottom board machine, and rotate the handle anticlockwise to make CB reach testing position.

7.4 Quit the circuit breaker truck out of the cabinet

To quit the CB truck out of the cabinet, first, to check whether the CB truck is in testing position, then pull secondary plug and lock the service truck with cubicle body tightly, pull the bottom locking plate by hands to make lock tongue retract into bottom board machine, then quit CB out of cubicle and carry it to the service handcart.

7.5 Operation of earthing switch

In order to close the earthing switch, withdrawable truck should be quit to testing/open position. And remove the crank, press the earthing switch operation interlocking plate hole, insert the earthing switch operating handle, turn the 90 degrees clockwise, eathing switch closed;if turn 90 degrees counterclockwise, earthing switch open.

7.6 Interlock functions

This switchgear interlocking function is based on the mechanical interlock and electric interlock torealize "five prevention" functions. The operation staff should comply with operation procedures to prevent misoperation accident.

If the operation is obstructed (or the operation resistance increases), the misoperation should be firstly checked instead of forced operation.

7.7 Maintenance

It is recommended that users pay attention to the following points:

a. Check the status of CB according to instruction manual.

b. Check the truck mechanism and interlock status to ensure working reliably.

c. Check the status of the contact of the main circuit.

d. Check the status of the contact of the auxiliary circuit.

e. Check the components of earthing circuit such as earthing contacts, main earthing bus and the conductive continuity of each component.

f. Check all parts fasteners, if any of those loose, tighten it timely.