KYN28-12 Series Armored Movable AC Metal-Enclosed Switchgear

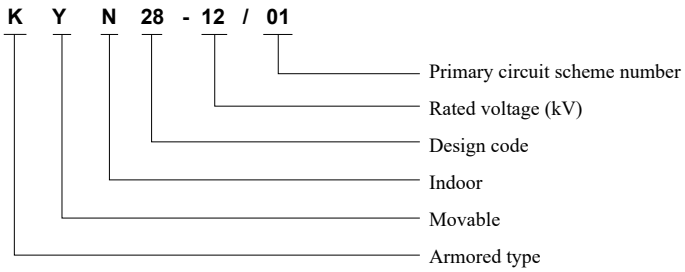
1 Overview

KYN28-12 indoor AC armored removable metal-enclosed switchgear is used in three-phase AC power system with rated voltage of 12kV and rated frequency of 50Hz for receiving and distributing electric energy and for control protection and monitoring of circuits.

This series of products have "Five-Prevents" interlock functions of preventing the push-pull of circuit breaker handcart under load, preventing false ON &OFF of circuit breaker, preventing power-on/off of circuit breaker when the Earthing switch is in the closed position, preventing entering the live compartment, and preventing turning on the Earthing switch when electrified. This product is a power distribution that can be equipped with the ZN63A-12 vacuum circuit breaker developed by our company and the VD4, VB2 and 3AH vacuum circuit breakers from various manufacturers for superior performance.

This product complies with GB3906 "3~35kV Alternating-current metal-enclosed switchgear", GB/T 11022 "Common specifications for high-voltage switchgear and controlgear standard", and DL/T404 "Technical conditions for ordering indoor AC high-voltage switchgear".

2 Type Designation



3 Technical Parameters

3.1 Technical parameters of switchgear equipment

Name	Unit	Parameter
Rated voltage	kV	12
Rated power frequency withstand voltage 1min Ud	kV	Phase-to-phase, to earth 42, open contacts 48
Rated impulse withstand voltage, Up(peak)	kV	Phase-to-phase, to earth 75, open contacts 85
Rated freq.	Hz	50
Rated current	A	630, 1250, 1600, 2000, 2500, 3150, 4000
Rated current of branch busbar	A	630, 1250, 1600, 2000, 2500, 3150, 4000
Rated short-time withstand current(effective value)	kA	20, 25, 31.5, 40
Rated peak withstand current	kA	50, 63, 80, 100
Rated short-circuit duration	s	4
Protection grade		Housing: IP4X; when the compartment door and circuit breaker door are open: IP2X

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3.2 Technical parameters of ZN63A-12 vacuum circuit breaker

Name	Unit	Parameter		
Rated voltage	kV	12		
Rated lighting impulse withstand voltage (peak)		open contacts 85, phase-to-phase and to earth 75		
Rated power frequency withstand voltage (1min)		open contacts 48, phase-to-phase and to earth 42		
Rated freq.	Hz	50		
Rated short-circuit breaking current	kA	20, 25	31.5	40
Rated current	A	630~1,250	630~4,000	1250~4,000
Rated short-time withstand current	kA	20, 25	31.5	40
Rated peak withstand current		50, 63	80	100
Rated short-circuit making current (peak)	kA	50, 63	80	100
Power frequency withstand voltage of secondary circuit (1min)	V	1,000 (2,000 customized)		
Rated operating sequence		O—0.3s—CO—180s—CO	O—180s—CO—180s—CO	
Rated short-circuit duration	s	4		
Rated single/back-to-back capacitor bank breaking current	A	20~31.5kA	40kA	
		630/400	800/400	
Rated capacitor bank making inrush current		12.2 (With frequency not greater than1000Hz)		
Mechanical life	Times	10,000 (20,000 customized)		
Rated short-circuit current breaking times	Times	30		

4 Operating Conditions

4.1 Ambient temperature: Max.: +40°C, Min.: -15°C (down to -45°C under special process conditions);

4.2 Ambient humidity: daily mean < 95%, monthly mean ≤ 90%;

4.3 Altitude: no more than 1,000 meters;

4.4 Earthquake resistance: the earthquake intensity does not exceed magnitude 8;

4.5 There is no obvious pollution such as corrosion or flammable gas, and water vapor in the surrounding air;

4.6 There is no serious dirt and frequent violent vibration; the Category 1 shall be met under severe conditions;

Note: If deviation of normal service conditions occurs, the customer should inform the manufacturer before production.

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5 Features

5.1 With a perfect and complete switchgear scheme and with mature structure, various power supply system schemes can be flexibly formed according to the needs of different users to fully satisfy the field and operation requirements.

5.2 Complete "Five-prevent" interlock provided: the reverse interlock of the rear door, the valve interlock, the interlock of middle door, and the emergency switch-off mechanism can be match as needs for high safety performance.

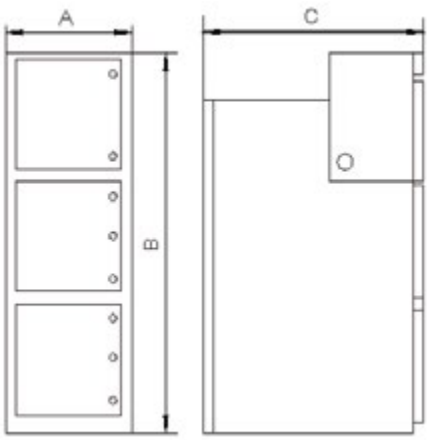
5.3 The 2.0 aluminum-zinc-coated steel plate is made by inward folding and double bending process. The entire frame is riveted with high-strength cup-shaped blind rivets. The riveted cabinet features with high stability; the cabinet door is sprayed with plastics providing strong impact resistance and corrosion resistance.

5.4 The standardized product design and modularized, assembled, and systematic design development are adopted for convenient organization of production; the product has high safety and interchangeability and features with easy installation, operation, and maintenance.

5.5 The different brand of vacuum circuit breaker can be selected; that is, our brand of circuit breaker can be used, and other brand is also available.

6 Product Structure Design and Dimensions

6.1 Standard high and low cabinets



Height B (mm)		2300
Width A (mm)	Rated current of branch busbar: ≤1250; Thermal stability current: ≤31.5kA	650
	Rated current of branch busbar: ≤1250; Thermal stability current: ≤40kA	800
	Rated current of branch busbar: ≥1600	1000
Depth C (mm)	Cable outlet	1500
	Overhead incoming and outgoing lines	1660

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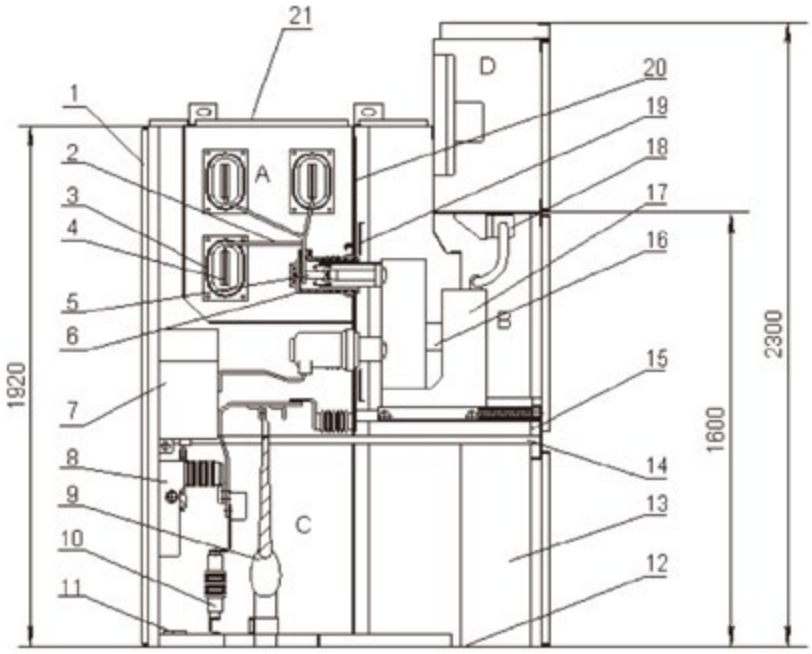
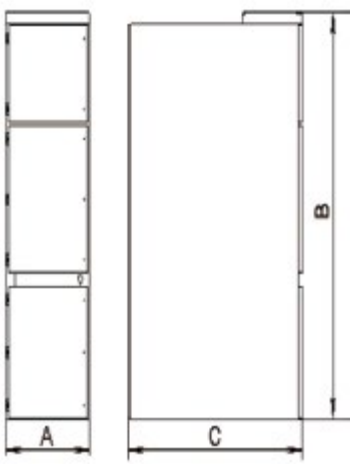


A. Busbar chamber	B. Circuit breaker handcart chamber	C. Cable chamber	D. Relay instrument chamber
1. Housing	2. Branch small busbar	3. Busbar bushing	4. Main busbar
5. Fixed contact device	6. Contact box	7. Current transformer	8. Earthing switch
9. Cable	10. Lighting arrester	11. Earthing main busbar	12. Baseplate
13. Control small busbar	14. Earthing switch operating mechanism	15. Withdrawable horizontal partition	16. Heating device
17. Circuit breaker handcart	18. Secondary plug	19. Partition(valve)	20. Removable partition
21. Pressure release channel			

6.2 Standard flat-top cabinet



Height B (mm)		2200
	Rated current: 4000~5000A	2300
Width A (mm)	Rated current of branch busbar: ≤1250; Thermal stability current: ≤31.5kA	650
	Rated current of branch busbar: ≤1250; Thermal stability current: ≤40kA	800
	Rated current of branch busbar: ≥1600	1000
Depth C (mm)	Cable outlet and overhead incoming and outgoing line	1350
	Rated current: 4000~5000A	1550 (1660)

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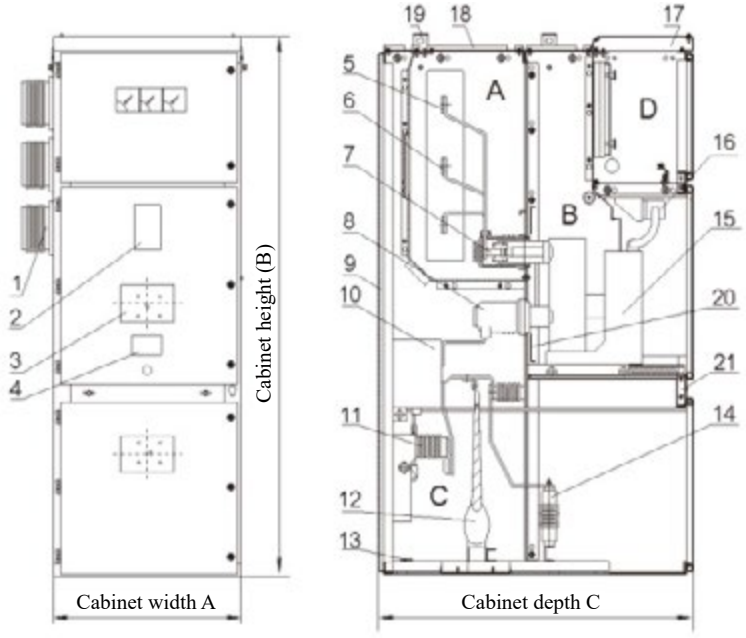
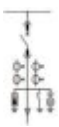


A. Busbar chamber	B. Circuit breaker handcart chamber	C. Cable chamber	D. Relay instrument chamber
1. Busbar bushing	2. Dummy busbar coil	3. Handcart sight glass	4. Nameplate
5. Main busbar	6. Branch busbar	7. Fixed contact	8. Contact box
9. Rear seal plate	10. Current transformer	11. Earthing switch	12. Cable
13. Main earthing busbar	14. Lightning arrester	15. Circuit breaker handcart	16. Aerial linker
17. Secondary small busbar chamber	18. Pressure release cover	19. Lifting ring	20. Partition(valve mechanism)
21. Withdrawable horizontal partition			

7 Primary Main Circuit Schematic Diagram

Scheme No.		01	02	03	04	05	06
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650 800 1000 x 1500x2300 1350x2200	650 800 1000 x 1500x2300 1350x2200	650 800 1000 x 1500x2300 1350x2200	650 800 1000 x 1500x2300 1350x2200	650 800 1000 x 1500x2300 1350x2200	650 800 1000 x 1500x2300 1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1	1	1	1	1
	Current transformer	2	2	2	3	3	3
	Earthing switch		1	1		1	1
	Lightning arrester			3			3
Circuit name		Receiving, feed	Receiving, feed	Receiving, feed	Receiving, feed	Receiving, feed	Receiving, feed
Remarks							

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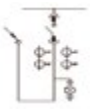
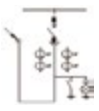
Scheme No.		07	08	09	10	11	12
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1	1	1	1	1
	Current transformer	2	2	2	3	3	3
	Earthing switch		1		1		1
Circuit name		Contact (right)	Contact (right)	Contact (left)	Contact (left)	Contact (right)	Contact (right)
Remarks							

Scheme No.		13	14	15	16	17	18
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1	1	1	1	1
	Current transformer	3	3	2	2	2	2
	Earthing switch	1		1	1		1
Circuit name		Contact (left)	Contact (left)	Overhead incoming line (left contact)	Overhead incoming line (left contact)	Overhead incoming line (right contact)	Overhead incoming line (right contact)
Remarks							

Scheme No.		19	20	21	22	23	24
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1	1	1	1	1
	Current transformer	3	3	3	3	2	2
	Earthing switch		1		1		1
Circuit name		Overhead incoming line (left contact)	Overhead incoming line (left contact)	Overhead incoming line (right contact)	Overhead incoming line (right contact)	Overhead incoming and outgoing line	Overhead incoming and outgoing line
Remarks							

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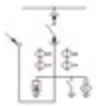
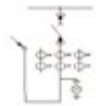
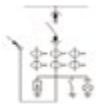
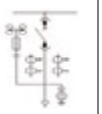
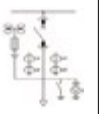
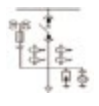
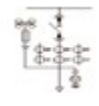
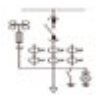
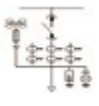
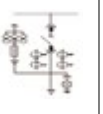
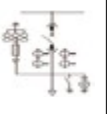
Scheme No.		25	26	27	28	29	30
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1	1	1	1	1
	Current transformer	2	3	3	3	2	2
	Voltage transformer					2	2
	High-voltage fuse					3	3
	Earthing switch	1		1	1		1
	Lightning arrester	3			3		
Circuit name		Overhead incoming and outgoing line	Overhead incoming and outgoing line	Overhead incoming and outgoing line	Overhead incoming and outgoing line	Incoming cable + PT	Incoming cable + PT
Remarks							

Scheme No.		31	32	33	34	35	36
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1	1	1	1	1
	Current transformer	2	3	3	3	2	2
	Voltage transformer	2	2	2	2	3	3
	High-voltage fuse	3	3	3	3	3	3
	Earthing switch			1			1
	Lightning arrester	3			3		
Circuit name		Incoming cable + PT	Incoming cable + PT	Incoming cable + PT	Incoming cable + PT	Incoming cable + PT	Incoming cable + PT
Remarks							

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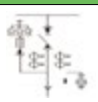
Scheme No.		37	38	39	40	41	42
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1					
	Current transformer	2					
	Voltage transformer	3	2	2	2	3	2
	High-voltage fuse	3	3	3	3	3	3
	Lighting arrester	3			3	3	3
Circuit name		Incoming cable + PT	Voltage measurement	Voltage measurement	Voltage measurement + Lighting arrester	Voltage measurement + Lighting arrester	Voltage measurement + Lighting arrester
Remarks							

Scheme No.		43	44	45	46	47	48
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Voltage transformer	3	2	2	3	3	2
	High-voltage fuse	3	3	3	3	3	3
	Lighting arrester	3					3
Circuit name		Voltage measurement + Lighting arrester	Voltage measurement + Buscouple	Voltage measurement + Buscouple	Voltage measurement + Buscouple	Voltage measurement + Buscouple	Voltage measurement + Lighting arrester + Buscouple
Remarks							

Scheme No.		49	50	51	52	53	54
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Voltage transformer	2	3	3			
	High-voltage fuse	3	3	3			
	Lighting arrester	3	3	3			
Circuit name		Voltage measurement + Buscouple	Voltage measurement + Buscouple	Voltage measurement + Buscouple	Buscouple	Buscouple	Buscouple
Remarks							

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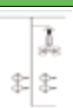
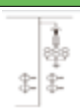
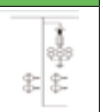
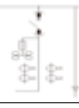
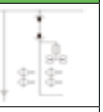
Scheme No.		55	56	57	58	59	60
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Voltage transformer			2	2		
	High-voltage fuse			3	3		
	Earthing switch						1
Circuit name		Isolation + Contact (left)	Isolation + Contact (right)	Isolation + Contact (left) + Voltage measurement	Isolation + Contact (right) + Voltage measurement	Outgoing phasing	Isolation outgoing phasing
Remarks							

Scheme No.		61	62	63	64	65	66
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Current transformer	2	2	3	3	2	2
	Voltage transformer	2	2	2	2	3	3
	High-voltage fuse	3	3	3	3	3	3
Circuit name		Metering + Left contac	Metering + Right contact	Metering + Left contac	Metering + Right contact	Metering + Left contac	Metering + Right contact
Remarks							

Scheme No.		67	68	69	70	71	72
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200	650/800/1000 x 1500x2300/1350x2200
Main electrical components	Rated current (A)	630-5000					
	Current transformer			1	1		
	Voltage transformer	2	2	3	3	2	2
	High-voltage fuse	3	3	3	3	3	3
Circuit name		Metering + Left contac	Metering + Right contact	Incoming line + Metering	Incoming line + Metering	Incoming line + Metering	Incoming line + Metering
Remarks							

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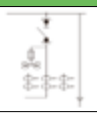
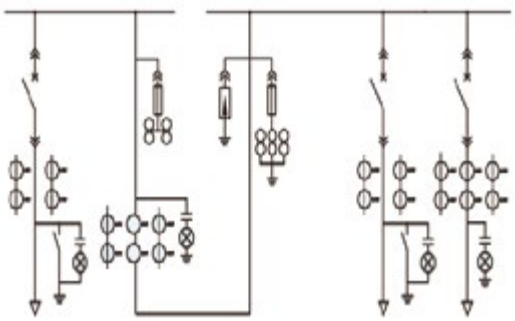
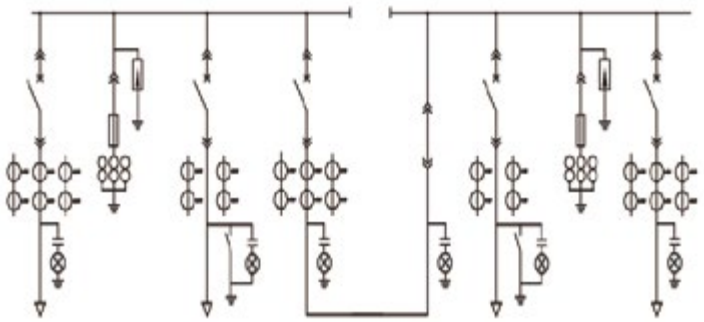
Scheme No.		73	74	75	76	77	78
Main circuit schematic diagram							
Cabinet dimensions (WxDxH)(high and low cabinet) Dxh (flat-top cabinet) (mm)		650 / 800 / 1000 x 1500x2300 / 1350x2200	650 / 800 / 1000 x 1500x2300 / 1350x2200	650 / 800 / 1000 x 1500x2300 / 1350x2200	650 / 800 / 1000 x 1500x2300 / 1350x2200	650 / 800 / 1000 x 1500x2300 / 1350x2200	650 / 800 / 1000 x 1500x2300 / 1350x2200
Main electrical components	Rated current (A)	630-5000					
	Vacuum circuit breaker (ZN63A)	1	1				
	Current transformer	3	3	3	3		
	Voltage transformer	2	2	2	2		
	High-voltage fuse	3	3	3	3	3	3
	Lightning arrester					3	3
	Transformer					3	
	Capacitor						3
Circuit name		Incoming line + Metering	Incoming line + Metering	Incoming line + Metering	Incoming line + Metering	Substation	Capacitor cabinet
Remarks							

8 Example of A Typical Scheme of Main Circuit





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9 Ordering Notice

9.1 Main wiring scheme number and single-line system diagram, arrangement diagram and layout plan;

9.2 Secondary wiring diagram, terminal arrangement diagram; please refer to the manufacturer's terminal arrangement diagram if there is no terminal arrangement provided;

9.3 Model, specification, and quantity of electrical components of switchgear;

9.4 Electrical equipment summary list;

9.5 The span and height dimensions shall be provided when a busbar bridge (busbar bridge across two columns of cabinets and busbar bridge across wall cabinets) is required;

9.6 When the switchgear works in special environmental conditions, this shall be specified when ordering;

9.7 Type and quantity shall be given when other equipment is required or the equipment is out of the accessory supply scope;

9.8 Customized through the negotiation with our company for any special requirements.