ZBW-12/0.4(F.R)

Outdoor medium voltage prefabricated substation (European)

Overview

ZBW-12/0.4(F.R) Outdoor pre-installed substation (European), is a high-voltage switchgear distribution transformer and low-voltage distribution device, according to a certain wiring scheme arranged into one of the factory prefabricated indoor and outdoor compact distribution equipment, that is, high-voltage power, transformer, low-voltage distribution and other functions organically combined together. Installed in a moisture-proof, rust-proof, dust-proof, rat-proof, fire-proof, anti-theft, spacer, fully enclosed, movable steel structure or non-metal box, mechatronics fully closed operation;

Widely used in urban power grid transformation, residential areas, high-rise buildings, industrial and mining, hotels, shopping malls, airports, railways, oil fields, docks, highways and temporary electricity facilities and other indoor and outdoor places.

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Model meaning

ZBW	□	-	12/0.4	-	□
↓	↓		↓		↓
Pre-installed substation	Design sequence number		Rated voltage (high/low voltage)		Transformer capacity

Environmental conditions of use

● Altitude does not exceed 2000m;

● Ambient temperature: -25℃ ~+40℃ ;

● Relative humidity: at 25℃ , the daily average is not more than 95%, the monthly average is not more than 90%;

● Installation site: no fire, explosion danger, conductive dust, chemical corrosive gas and violent vibration of the place, if beyond the above conditions, users can negotiate with our company.

Function and characteristics

● High-voltage switchgear, distribution transformer, low-voltage switchgear power metering equipment and reactive power compensation device according to a certain scheme combination, complete sets of strong;

● Perfect high and low pressure protection, safe and reliable operation, simple maintenance;

● Small footprint, less investment, short production cycle, easy to move;

● Flexible wiring scheme;

● Unique structure: unique honeycomb structure double layer (composite board) shell is strong, heat insulation and heat dissipation ventilation, beautiful, high protection level, shell materials are stainless steel alloy, aluminum alloy, cold rolled plate, color steel plate optional;

● Various types: universal type, villa type, compact and other styles;

● High voltage ring network cabinet can be equipped with network automation terminal (FTU) to realize the reliable detection of short circuit and single-phase grounding fault, with "four remote" function, easy to upgrade the distribution network automation.

Transformer

Intelligent integrated substation selection of low loss, oil immersed, fully sealed S9, S10, S11 series transformers, can also choose resin insulation or NOMEX paper insulation environmentally friendly dry transformer, the bottom can be equipped with a car, the transformer can be convenient access.

High pressure side

Intelligent integrated substation high voltage generally adopts load switch-fuse combination electrical protection, fuse one phase of the fuse fuse, three-phase linkage trip, load switch has pressure type, vacuum, sulfur hexafluoride and other types of optional, can be equipped with electric operating mechanism, automation upgrade; Fuse is high voltage current limiting fuse, with impactor, reliable operation, large breaking capacity, the main technical parameters are shown in the following table. For transformers above 800kVA, ZN12, ZN28,VS1 and other vacuum circuit breakers can be used for protection.

Low pressure side

Low voltage side main switch adopts universal or intelligent circuit breaker, selective protection; The new type of plastic-case switch is selected as the outlet switch, which has small volume and short fly-arc, and can reach up to 30 circuits. Intelligent automatic tracking reactive power compensation device, there are contactor and contactless two switching modes for users to choose.

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Enforce standards

This product meets the following standards:

GB/T17467-1998 "High voltage/Low voltage pre-installed substation"

DL/T537-93 "6-35kV box-type substation ordering Technical Conditions"

Load switch technical parameters

Item	Units	FKN12-12 load switch	FZN12-12 Vacuum load switch
Rated voltage	kV	10	
Maximum operating voltage	kV	12	
Rated frequency	Hz	50	
Rated current	A	630	
Rated breaking load current	A	630	
Heat stable current	kA/S	20/2	20/4
Dynamic stable current	kA	50	50
Short-circuit closing current (peak)	kA	50	50
Full load breaking times	time	20	10000
Mechanical life	time	2000	10000
1min power frequency withstand voltage (phase to phase and ground)	kV	42	42
Lightning impulse voltage (relative and to ground)	kV	75	75

Technical parameters of high voltage fuse

Model number		Rated voltage (kV)	Breaking current(A)	Breaking current(kA)	Rated current of melt(A)
British model	Domestic model				
SDL※J	XRNT-12	12	40	31.5	6.3, 10,16,20,25,31.5, 40
SFL※J	XRNT-12	12	100	31.5	50,63,71,80,100
SKL※J	XRNT-12	12	125	31.5	125

* Note: Determined by whether an impactor is installed, N means no firing pin and A means there is a firing pin.

Model number	Release form	Rated current of the release A	On-off capacity kA (AC380V)
DW15-630	Thermo-electromagnetic or electronic type	315,400,630	40
DW15-1000	Thermo-electromagnetic or electronic type	630,800,1000	50
DW15-1600	Thermo-electromagnetic or electronic type	1600	50
DW15-2500	Thermo-electromagnetic or electronic type	1600,2000,2500	60
CW1-2000	intelligent	630,800,1000,1250,1600,2000	65 (80)
CW1-3200	intelligent	2000,2500,3200	100

Note: (80) polymer fracture type.

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Primary plan drawing

The substation primary scheme is shown in the attached drawing.

Example diagram of a typical scheme

See the attached figure for an example of a typical scheme.

Foundation and floor plan

The basic drawing of substation is referred to the attached drawing. The layout of substation is shown in the attached drawing, and users can choose according to their needs.

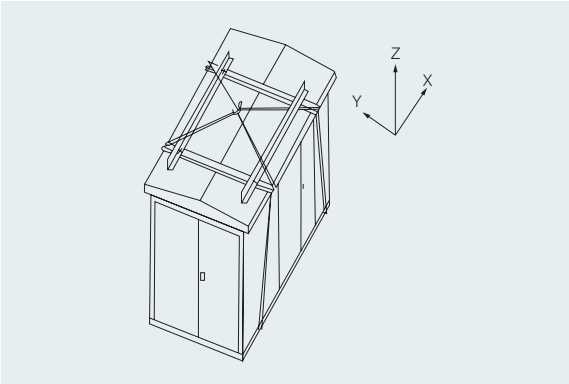

FIG. 3 Product lifting diagram

Installation, use and maintenance

In addition to the requirements of the power department in terms of installation, acceptance, handover test, operation and maintenance, intelligent integrated substation should pay attention to the following matters:

● When the user receives the goods, it should be carefully checked according to the relevant regulations. For the products that are not installed immediately, they should be stored in the appropriate place according to the normal conditions of use.

● The product should be lifted at the bottom of the special spreader, as shown in Figure 3.

● The product is placed horizontally on a pre-made basis, and then the gap between the product base and the foundation is sealed with cement slurry to prevent rain from entering the cable room, and the high and low voltage cables are accessed through the bottom sealing plate of the high and low pressure chambers.

● The product should be reliably grounded after installation; The two main ground terminals on the channel steel of the power station base, the neutral point of the transformer and the shell, and the pile head under the arrester should be grounded respectively by the installation department. All grounding devices should share a set of grounding devices, the grounding resistance should be less than 4 ohms;

● After the installation or maintenance of the product, the following items should be inspected and tested before operation:

○ Whether the substation is clean;

○ Whether the operating mechanism is flexible;

○ Whether the main electrical appliances are flexible and reliable;

○ Whether the electrical auxiliary contact is reliable and accurate;

○ Whether the meter and relay operation are accurate;

○ Whether the ratio and wiring polarity of the instrument and transformer are correct;

○ Whether all electrical installation nuts are tightened, whether the installation is firm and reliable;

○ Whether the bus is well connected, its support insulator, whether the clamp is installed reliably;

○ Whether the setting value of the electrical appliance meets the requirements and whether the melt core specification of the fuse is correct:

○ Whether the contacts of the main circuit and auxiliary circuit meet the requirements of the electrical schematic diagram.

● Maintenance

○ All components in the product are maintained according to their respective technical requirements:

○ If the selected transformer is oil-immersed, the oil sample analysis should be checked at least once a year according to the regulations;

○ High voltage side switchgear in operation, after 20 times with load or 2000 times without load opening and closing operation, should check the contact condition and loss degree of arc extinguishing device, found abnormal should be repaired or replaced in time.

○ Low-voltage switchgear automatic trip, should check and analyze the cause of the trip, after troubleshooting, can be put into operation again;

○ The arrester should be carried out a preventive test every year before the thunderstorm season;

Note: Packing list, certificate of qualification, installation instruction manual, electrical wiring diagram, instructions of the main components and equipment used in this product, key operation tools and spare parts provided in accordance with the agreement are attached.

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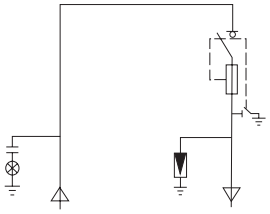
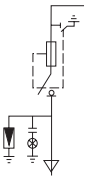
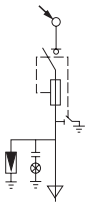
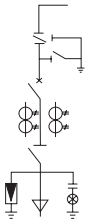
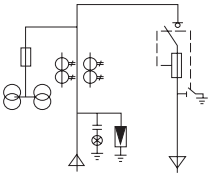
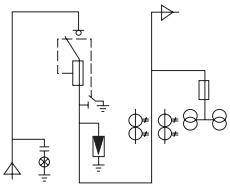
Technical solution legend

Scheme number		01	02	03
Main circuit scheme diagram				
Use		Terminal type cable inlet/primary outlet	Terminal type (backward) incoming line	Terminal type overhead line
Cabinet type		HXGN-12	HXGN-12	HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28			
	Load switch FN, FZN, FLN	1	1	1
	Disconnecting switch GN			
	Fuse XRNT	3	3	3
	Fuse RN2			
	Lightning arrester HY5W	3	3	3
	Live display GSN	1	1	1
	The current transformer			
	Voltage transformer JDZ			

Scheme number		04	04	06
Main circuit scheme diagram				
Use		Terminal type vacuum circuit breaker incoming line	Terminal type inlet metering \ primary outlet	Terminal type cable inlet line \ primary outlet line \ metering
Cabinet type		XGN66-12	HXGN-12	HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28	1		
	Load switch FN, FZN, FLN		1	1
	Disconnecting switch GN	2		
	Fuse XRNT		3	3
	Fuse RN2		3	3
	Lightning arrester HY5W	3	3	3
	Live display GSN	1	1	1
	The current transformer	2	2	2
	Voltage transformer JDZ		2	2

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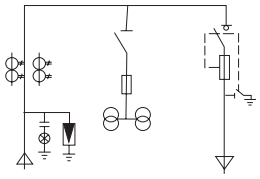
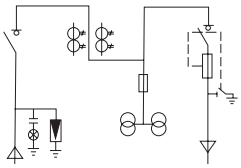
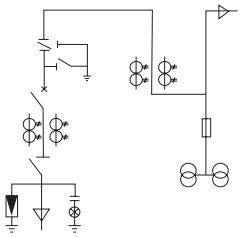
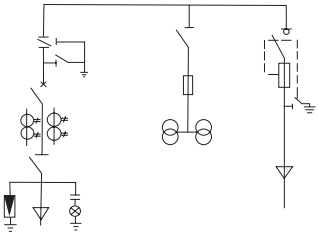
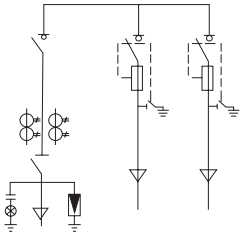
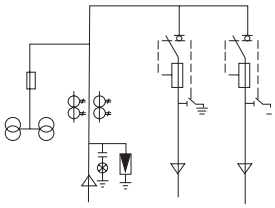
Technical solution legend

Scheme number		07	08	09
Main circuit scheme diagram				
Use		Terminal type inlet metering \ PT \ primary outlet	Terminal type primary line \ metering \ primary line	Terminal type circuit breaker inlet/ metering
Cabinet type		HXGN-12	HXGN-12	XGN66-12
Major electrical component	Vacuum circuit breaker VS1, ZN28			1
	Load switch FN, FZN, FLN	1	2	
	Disconnecting switch GN	1		2
	Fuse XRNT	3	3	3
	Fuse RN2	3	3	3
	Lightning arrester HY5W	3	3	3
	Live display GSN	1	1	1
	The current transformer	2	2	4
	Voltage transformer JDZ	2	2	2

Scheme number		10	11	12
Main circuit scheme diagram				
Use		Terminal type circuit breaker inlet line \ PT \ primary outlet line	Terminal type primary entry line \ double exit line	Terminal type inlet metering \ double outlet line
Cabinet type		XGN66-12 HXGN-12	HXGN-12	HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28	1		
	Load switch FN, FZN, FLN	1	3	2
	Disconnecting switch GN	3	1	
	Fuse XRNT	3	6	6
	Fuse RN2	3		3
	Lightning arrester HY5W	3	3	3
	Live display GSN	1	1	1
	The current transformer	2	2	2
	Voltage transformer JDZ	2		2

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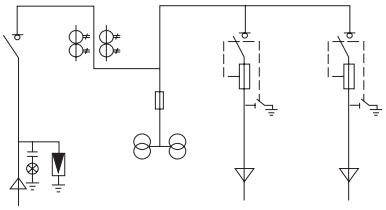
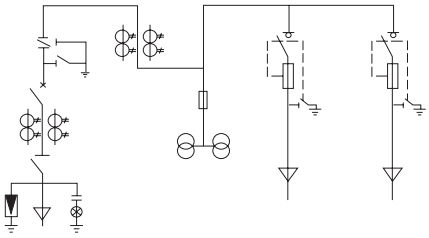
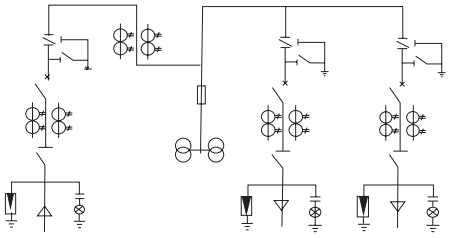
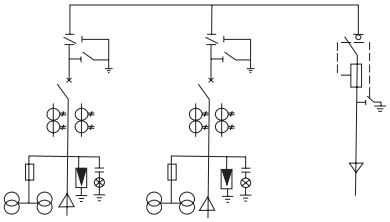
Technical solution legend

Scheme number		13	14
Main circuit scheme diagram			
Use		Terminal type primary entry line \ metering \ double exit line	Terminal type circuit breaker inlet line \ metering \ primary outlet line
Cabinet type		HXGN-12	XGN66-12 HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28		1
	Load switch FN, FZN, FLN	3	2
	Disconnecting switch GN		2
	Fuse XRNT	6	6
	Fuse RN2	3	3
	Lightning arrester HY5W	3	3
	Live display GSN	1	1
	The current transformer	2	4
	Voltage transformer JDZ	2	2

Scheme number		15	16
Main circuit scheme diagram			
Use		Terminal type circuit breaker incoming line \ metering \ two circuit breaker outgoing line	Terminal type two circuit breaker inlet line \ primary outlet line
Cabinet type		XGN66-12	XGN66-12 HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28	3	2
	Load switch FN, FZN, FLN		1
	Disconnecting switch GN	6	2
	Fuse XRNT		3
	Fuse RN2	3	6
	Lightning arrester HY5W	9	6
	Live display GSN	3	2
	The current transformer	8	4
	Voltage transformer JDZ	2	4

Note: Optional measurement and control protection unit can be installed to realize distribution network automation.

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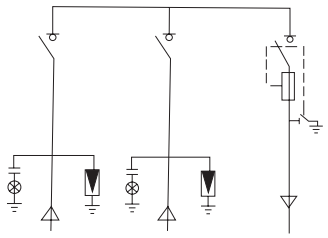
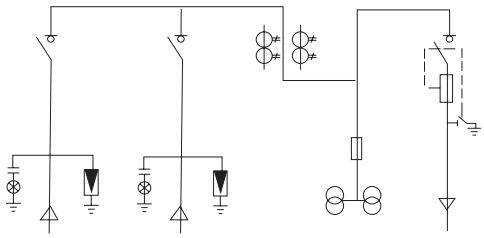
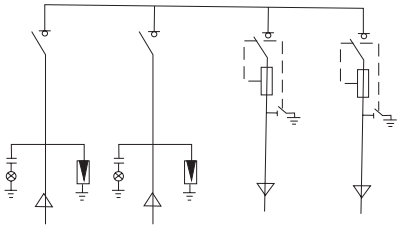
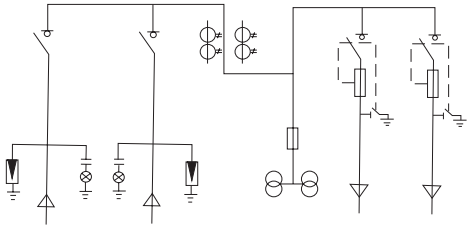
Technical solution legend

Scheme number		17	18
Main circuit scheme diagram			
Use		Loop type double entry line \ primary exit line	Ring mesh type double entry line \ metering \ primary exit line
Cabinet type		HXGN-12	HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28		
	Load switch FN, FZN, FLN	3	3
	Disconnecting switch GN		
	Fuse XRNT	3	3
	Fuse RN2		3
	Lightning arrester HY5W	6	6
	Live display GSN	2	2
	The current transformer		2
	Voltage transformer JDZ		2

Scheme number		19	20
Main circuit scheme diagram			
Use		Loop type two return line \ two return line	Loop type two return line \ metering \ two return line
Cabinet type		HXGN-12	HXGN-12
Major electrical component	Vacuum circuit breaker VS1, ZN28		
	Load switch FN, FZN, FLN	4	4
	Disconnecting switch GN		
	Fuse XRNT	6	6
	Fuse RN2		3
	Lightning arrester HY5W	6	6
	Live display GSN	2	2
	The current transformer		2
	Voltage transformer JDZ		2

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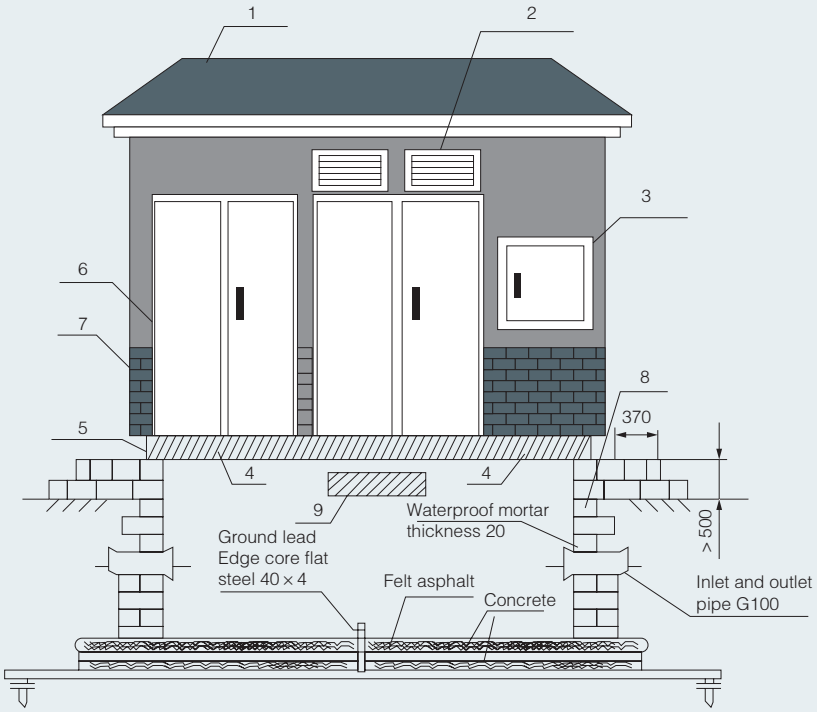
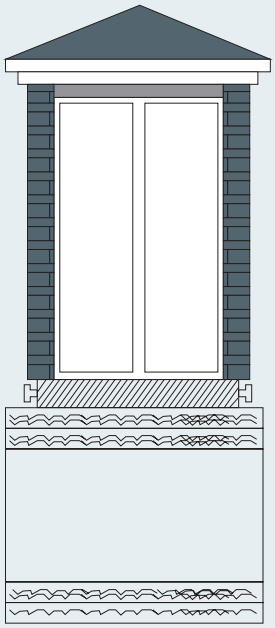
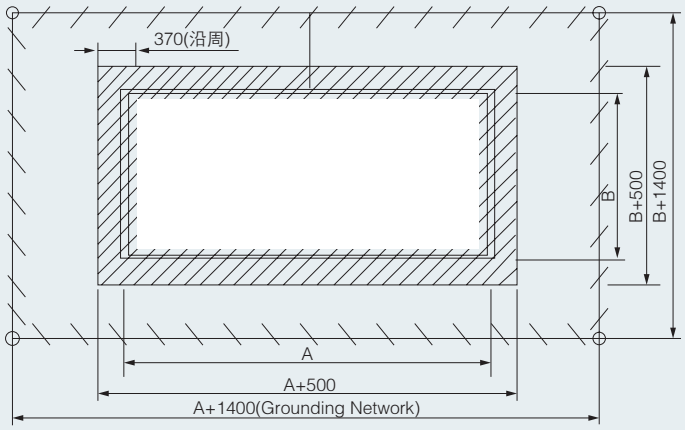
Installation dimension drawing







Note: A and B are the outline dimensions of the substation base

1. Roof
2. Blinds
3, external metering box
4. Lift the ring
5, steel groove bottom frame
6. Doors
7, brick, brick wall surface
8. Concrete foundation
9. Base vent

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Substation structure drawing

Substation high voltage chamber

Substation transformer room

Substation low voltage chamber

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Some product outline examples

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Some product outline examples