

YB □ -12/0.4 Series High Voltage/Low Voltage Prefabricated Substations

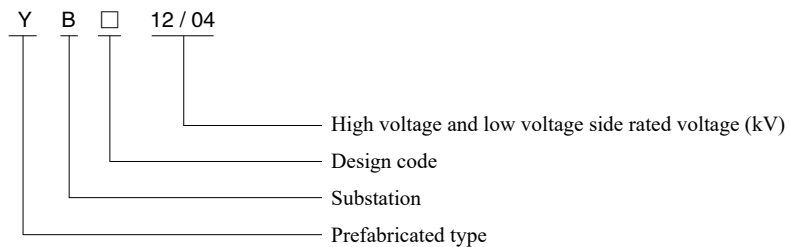
1 Overview



YB □ -12/0.4 high voltage / low voltage prefabricated substation is used to combine the high voltage electrical equipment, transformers, and low voltage electrical equipment into a compact complete set of power distribution device, and is widely used in many places such as urban high-rise buildings, urban and rural buildings, luxury villas, square parks, residential areas, high-tech development zones, small and medium-sized factories, mines and oil fields, and temporary construction electricity to receive and distribute the electric energy in the power distribution system, integrating the substation and the surrounding environment naturally.

Standard : GB/T17467 "High-voltage / low-voltage prefabricated substation", DL/T537 "6-35kV Box type substation order technical conditions".

2 Type Designation



3 Product Parameters



3.1 Technical parameters of switchgear equipment

Device	Name		Unit	Parameter			
High voltage unit	Rated voltage		kV	12			
	Rated lightning impulse withstand voltage	To earth and between the phases	kV	75			
		Isolating gap		85			
	1min rated power frequency withstand voltage	To earth and between the phases	kV	42			
		Isolating gap		48			
	Rated current			A	400、630		
	3s rated short circuit withstand current			kA	20		
	Rated peak withstand current			kA	50		
Low voltage unit	Rated voltage		V	400			
	Main circuit rated current		A	100~2500			
	Rated short time withstand current	kA	250~315kVA	400~800kVA	1000kVA		
			30	50	80		
	Rated peak withstand current		kA	63	105	176	
Compensation capacity			kvar	15%~30% transformer capacity			

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Table, continued

Device	Name	Unit	Parameter
Transformer unit	Rated capacity	kVA	100~1600
	Rated voltage	kV	12
	Rated lightning impulse withstand voltage	kV	75
	Rated power frequency withstand voltage	kV	Oil immersed type 35, dry type 28
	Noise level	dB	Oil immersed type ≤55, dry type ≤65
Box body	Protection grade	IP23D	
	Outline dimensions	Select the corresponding outline dimensions according to the plan and the selected high voltage and low voltage switchgear and transformer	

3.2 Technical parameters of load switch



Name	Unit	FN12-12 load switch	FZN25-12 vacuum load switch
Rated voltage	kV	12	
Rated frequency	Hz	50	
Rated current	A	630	
Rated breaking load current	A	630	
Thermal stable current (effective value)	kA/s	20/2	20/4
Dynamic stable current	kA	50	50
Short circuit making current (peak)	kA	50	50
Mechanical life	Times	2000	10000
1min power frequency withstand voltage (between the phases and to earth)	Times	42	42
Lightning impulse voltage (between the phases and to earth)	kA	75	75



3.3 Technical parameters of high voltage fuse

Model	Rated voltage	Breaking current (A)	Rated short circuit breaking current (kA)	Rated current of fuse element (A)
XRNT□-12 (SDLAJ-12)	kV	40	31.5	10、16、20、25、31.5、40
	kV	100	31.5	50、63、71、80、100
	kV	125	31.5	125

The principle of selecting the rated current of the current limiting fuse in the composite apparatus configuration is generally selected according to the rated current capacity on the high voltage side of the transformer $I_N = S_N / U_N / \sqrt{3} * (1.5 \sim 2)$

4 Working Environment Conditions

- The altitude does not exceed 2000m;
- Ambient temperature: -25°C ~ +40°C;
- Relative humidity: The daily mean value is not greater than 95% at 25°C, and the monthly mean value is not greater than 90%;
- Installation site: There is no fire, explosion hazard, conductive dust, chemical corrosion gas and violent vibration;
- There is no severe vibration at the installation site, and the vertical slope is not less than 3°;

Note: When the use environment conditions are different from the above application environment, please contact the manufacturer.



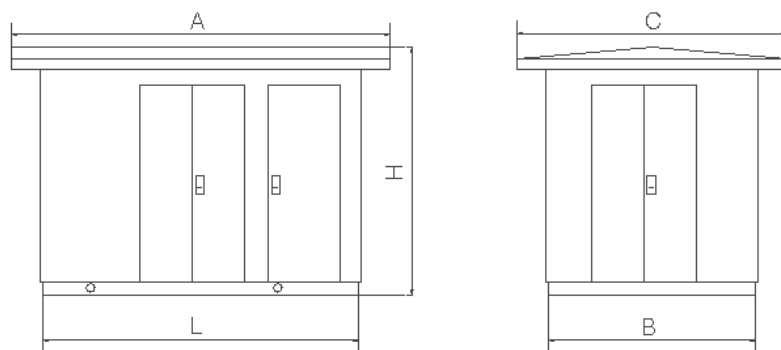
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5 Product Functions and Features

- 5.1 High-voltage switchgear, power distribution transformers, low-voltage switchgear, energy metering equipment, and reactive power compensation devices are combined according to a certain plan, providing a strong complete set.
- 5.2 Structural characteristics: The unique honeycomb structure features with double-layer (composite panel) and firm shell, heat insulation, heat dissipation and ventilation, exquisite appearance, high protection grade; the shell is made of stainless steel titanium alloy, aluminum alloy, cold-rolled plate, or color steel plate.
- 5.3 The high-voltage ring main unit can be equipped with a distribution network automation terminal (FTU) to realize reliable detection of short circuit and single-phase earthing fault; with "four remote" function, the distribution network can be updated automatically.
- 5.4 Transformer: The intelligent integrated substation adopts low-loss, oil-immersed, fully sealed S9, S10, S11 series transformers, and can also adopt resin insulated or NOMEX paper-insulated environmentally friendly dry-type transformers; a cart is equipped on the bottom to ensure that the transformer can enter and leave the site.
- 5.5 High voltage side: The intelligent integrated substations generally adopt load switch-fuse combination electrical protection; after the fuse-phase blows, the three-phase linkage trips; the fuse is a high-voltage current limiting fuse with impactor featuring with reliable action and high breaking capacity.
- 5.6 Low voltage side: the main switch adopts universal circuit breaker or intelligent circuit breaker for selective protection; the outlet switch adopts a new moulded case circuit breaker featuring with small size and zero arcing.
- 5.7 Box: The box body is divided into metal shell and non-metal shell, and it can be customized according to different requirements of customers; the product shape and color can be integrated with the surrounding environment; the non-metallic shell is made of reinforced glass fiber and special cement prefabricated synthesis featuring with high mechanical strength, good impact resistance, not easily heat conduction, fire and flame retardant, anti-corrosion, artistic appearance, and long service life; the metal shell is made of color steel composite plate featuring with small size, light weight, convenient maintenance, and simple processing technology.

6 Outline Dimensions and Layout Plan

6.1 Outline dimensions



(“Mesh” shaped layout)

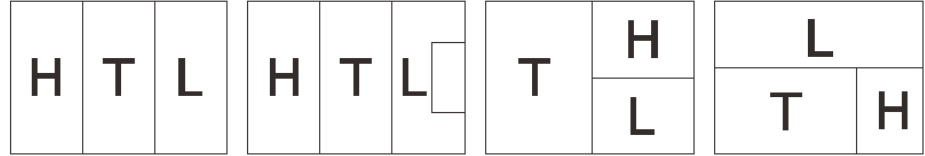
(mm)

Model	Transformer capacity (kVA)	L	B	H	A	C
M: Mesh shaped	100~ 250	3000	2000	2520	3320	2320
	315-630	4000	2600	2560	4320	2920
	800~ 1000	4600	2600	2560	4920	2920
	1250	5000	3000	2980	5320	3320
P: Pyramid shaped	100~ 250	Determined according to the low voltage wire outlet	2000	2520	Determined according to the low voltage wire outlet	2320
	315~ 630		2600	2560		2920
	800~1000		2600	2560		2920
	1250		3000	2980		3320

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6.2 Mesh type and pyramid type series prefabricated type substation layout plan



“Mesh” shaped layout (Fig. 2-1, Fig. 2-2)

“Pyramid” shaped layout (Fig. 2-3, Fig. 2-4)

7 Primary Main Circuit Plan Diagram

7.1 High voltage main circuit plan



Plan No.	01	02	03	04
Main circuit plan diagram				
Plan No.	05	06	07	08
Main circuit plan diagram				



7.2 Low voltage main circuit plan

Plan No.	01	02	03	04
Main circuit plan diagram				
Remark	With main circuit breaker, without metering, without compensation, and with outlet measurement			

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Plan No.	05	06	07	08
Main circuit plan diagram				
Remark	With main circuit breaker, without metering, without compensation, and with outlet measurement			

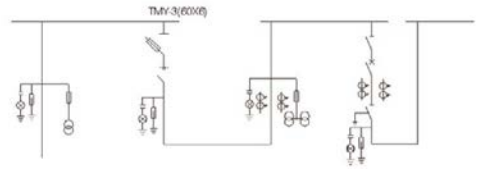
Plan No.	09	10	11	12
Main circuit plan diagram				
Remark	With isolation, with main circuit breaker, without metering, without compensation, and with outlet measurement			

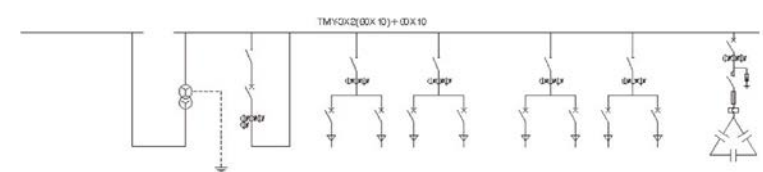
Plan No.	13	14	15	16
Main circuit plan diagram				
Remark	With isolation, with main circuit breaker, without metering, without compensation, and with outlet measurement			

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8 Main Circuit Typical Plan Example

8.1 Cable inlet and high voltage power supply and metering plan

Cabinet No.	H1	H2	H3	H4
Model	HXGN □ -12	HXGN □ 12	HXGN □ -12	XGN □ -12
Cabinet dimensions (W x H x D)	800x2270x1000	800x2270x1000	800x2270x1000	800x2270x1000
Main circuit plan diagram				
Purpose	Inlet	Outlet	Metering contact	Feeder line
Vacuum load switch FZRN25-12 630/20		1		
Current transformer			(50/5 0.2/10P10 x 2)	75/5 0.5/10P10 x 2
Current transformer			(10/0.1 0.2 class x 2)	
Lightning rod YH5WS-17/50	3	3		3
High voltage fuse 0.5A	2		3	
Voltage transformer	DC1.2-10 10/0.22 1200VA			
Live display device	1	1		1
Fuse 80A		3		
Switch disconnector				1
Transformer				
Vacuum switch ZN63A- 12/630-25				1
Switch disconnector				1
Switch disconnector				
Fuse				
Current transformer				
Outlet switch				
Circuit name				
Remarks				

	D1	D2		D3		D4
	TGG1	TGG1		TGG1		TGG1
	1000 x 2000 x 800	1000 x 2000 x 800		1000 x 2000 x 800		1000 x 2000 x 800
						
Transformer						
	2500/30	1500/30	400/31	1500/30	HD13BX-1000/31	
	1					
	2000 x 4	1500 x 3	2000 x 3	1200 x 3	400 x 3	
		Outlet switch 630/3300 In=630Ax 2	Outlet switch 100/3300 In=100Ax 2	Outlet switch 400/3300 In=400Ax 3	Outlet switch 225/3300 In=200Ax 2	
						300Kvar

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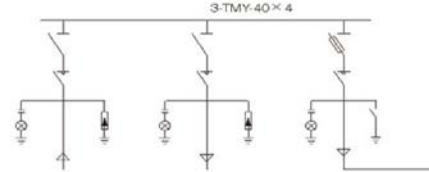
8.2 Cable inlet and high voltage power supply and low voltage metering plan

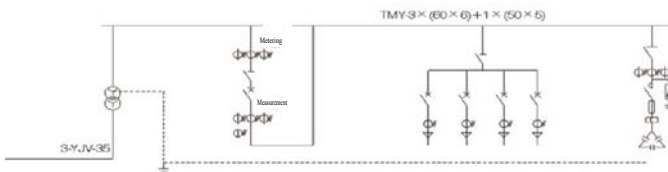
Cabinet No.	H1	H2	D1		
Cabinet dimensions (W x H x D)	600 x 1900 x 900	800 x 1900 x 900	1200 x 2000 x 800		
Main circuit plan diagram					
Purpose					
Main electrical components	Vacuum load switch		FZRN25-12D/125-31.5		
	Fuse		100A x 3		
	Current transformer		1		
	Lightning rod YH5WS-17/50	3	1		
	High voltage fuse	2			
	Voltage transformer 10/0.22 500VA	1		Transformerr -1250kVA 10/0.4 D,yn11 10000±2X5%	
	Live display device	1	1		
	Transformer				
	Circuit breaker 2000M/3 In -2000A Electric, with undervoltage, shunt				1
	Watt-hour meter DT864-4K				
	Switch disconnector				3
	Current transformer (installed by power supply bureau)				4
	Current transformer 2000/5A				
	Current transformer □/5A Grade 0.2				
Moulded case circuit breaker 630H/3320 In 630A					
Moulded case circuit breaker 400H/3320 In 400A					
Moulded case circuit breaker NM1 400H/3320 In=315A					
Purpose					
Remarks					

D2	D3	D4	D5	
800 x 2000 x 800	800 x 2000 x 800	800 x 2000 x 800	1200 x 2000 x 800	
4	4	4		
600 x 3, 400 x 6, 300 x 3	600 x 3, 300 x 9	400 x 12		
1	1			
2		4		
1	1			
				10 x 30 = 300 Kvar

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8.3 Cable inlet, power supply by ring main unit, high voltage power supply and low voltage design plan

Cabinet No.	H1	H2	H3
Model	HXGN □ -12	HXGN □ -12	HXGN □ -12
Cabinet dimensions (W x H x D)	600 x 800 x 1900	800 x 800 x 1900	800 x 800 x 1900
Main circuit plan diagram			
Purpose	Inlet	Outlet	Feeder line
Vacuum load switch	FZN25-12/630-20	FZN25-12/630-20	FZRN25-12D/125-31.5
Fuse			31.5 x 3
Live display	1	1	1
Lightning rod YH5WS- 17/50	3		
Transformer			
Circuit breaker 1000/3 In= 800A			
Knife switch 1000/31			
Circuit breaker 400H/3300 In= 400A			
Circuit breaker 400H/3300 In= 315A			
Circuit breaker 225H/3300 In- 200A			
Current transformer Grade 0.2			
Current transformer 500/5A			
Current transformer 400/5A			
Current transformer 300/5A			
Current transformer 200/5A			
Remarks			

	D1	D2	D3
	TGG1	TGG1	TGG1
	800 x 2000 x 800	800 x 2000 x 800	800 x 2000 x 800
			
Transformer -315KVA 10/0.4 Y,y0-10000 □ 5%	1	1	
		1	
		2	
	3		
	4		
		1	
		1	
		2	
			100 Kvar

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9 Ordering Notice

- 9.1 Model, specification, quantity and delivery time of the box transformer;
- 9.2 Type and capacity of transformers;
- 9.3 High-voltage chamber, low-voltage chamber main wiring plan, and the model and rated parameters of main component;
- 9.4 Selection of material, shape and color of the shell of box transformer;
- 9.5 Specification, method and number of circuits of inlet and outlet cables of box transformer;
- 9.6 For special requirements, please contact our company for customization.