CHINT

MV/LV Prefabricated Substation

2015/2016

MV/LV Prefabricated Substation

Brief Introduction

About CHINT Electric

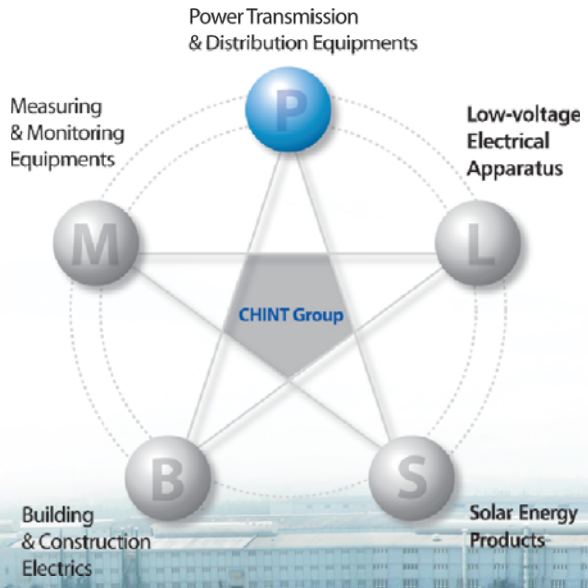
CHINT Electric is a subsidiary of CHINT Group Corporation. With an investment of 450 million USD, CHINT Electric possesses 3800 employees and 5 manufacturing business units with manufactory area of 900,000m^2 located in Shanghai, which is one of the world's largest power transmission & distribution equipments manufactory centers.

New Orders

Around 800 million USD in the year of 2014

Employee

3,800 employees



Product Range

- Power Transformer up to 750kV
- Distribution Transformer up to 35kV
- Dry-type Transformer up to 35kV
- Reactor up to 220kV
- GIS up to 252kV
- HV Circuit Breaker & Disconnector up to 252kV
- VCB 12~40.5kV
- MV & LV Switchgear Panel, Prifabricated Substation up to 40.5kV
- LV Terminal Box, Bus Bar Duct
- Surge Arrester & Insulator up to 550kV, CT & PT up to 220kV
- Power Distribution Automation System
- Cable up to 36kV
- Capacitor
- Turn-key Solution

About CHINT Group

- CHINT is the leading player in the Power Transmission & Distribution industry and Low-voltage electrics industry in China. Founded in 1984 by a few local entrepreneurs and currently hiring 29,000 employees worldwide.
  National Employment Advanced Corporate (China State Council, 2012)
- Ranked in The 2011 BCG 100 New Global Challengers
  (The Boston Consulting Group, 2011)
- CHINT Low-voltage Electrics launched IPO at the Shanghai Stock Exchange of China (2010)
- No.2 in China Electricity Industry's Top 10 Most Competitive Enterprises
  (China Machinery Industry Information Institute, 2009)
- No.3 in China Electricity Industry(China Machinery Industry Information Institute, 2009)
- No.240 in Top 500 Chinese-Companies (China Enterprise Federation, 2009).
- No.1 in Power T&D and the controlling devices (China Machinery Summit, 2009)
- Ranked in Top 100 Best Employers in China (China Entrepreneurs Summit, 2008)
- No.15 in Top 100 Private & Public Companies in China (Forbes, 2006)
- National Quality Management Award(2004) (One of top honours for manufacturing companies in China)
- Worldwide business operation with 2,000 sales offices, agents, distributors, and local partners in domestic Chinese market and distributors & local partners in over 105 countries. International branches or regional offices set up in USA, UAE, Germany, Russia, Brazil, Ukraine, Hong Kong of China, UK and Nigeria.
- CHINT stretches its business to a new frontier of solar energy by setting up a branch company specialized in the solar energy products development.
- The R&D center of CHINT is recognized as the National Level R&D Center run by the companies, which means the R&D level of CHINT Group has reached the leading position in the industry of China.

Sales References

With a worldwide presence in over 129 countries such as, Italy, Germany, Estonia, USA, Russia, Japan, Australia, Saudi Arabia, Poland, Ukraine, Mongolia, Kazakhstan, Pakistan, Indonesia, Thailand, Egypt, Algeria, Morocco, Congo, Tanzania, Mali, Zambia, Kenya, South Africa, Ghana, Nigeria, Colombia, etc, CHINT Electric provides reliable and high-qualified products and solutions to clients engaged in different businesses.






Utility User

Application: *cooperation with National Electricity Companies in over 84 countries for power generation, transmission and distribution.*

Europe

- *EAC-Cyprus*
  Products: Cable.
- *Eesti Energia-Estonia*
  Products: Power transformer.
- *EMS-Serbia*
  Products: Power transformer.
- *ENEL-Italy*
  Products: Distribution transformer, cable.
- *Fingrid-Finland*
  Products: Distribution transformer.
- *HS ORKA HF-Iceland*
  Products: Power transformer.
- *PPC-Greece*
  Products: Power transformer, cable.
- *NEC-Bulgaria*
  Products: VCB.

Latin America

- *BPC-Bhutan*
  Products: Surge arrester.
- *CELEC S.P.-Ecuador*
  Products: Power transformer.
- *CNEL-Ecuador*
  Products: Power transformer.
- *ELCOSA-Honduras*
  Products: Power transformer.
- *Enersis-Chile*
  Products: Power transformer, surge arrester, insulator, SF_6 circuit breaker.
- *ENDESA-Chile*
  Products: Power transformer, surge arrester, insulator, SF_6 circuit breaker.
- *ICE-Costa Rica*
  Products: Power transformer.
- *PREPA-Puerto Rico*
  Products: Surge Arrester.

North America

- *Val Jalbert Mini Hydro Central- Canada*
  Products: Reactor
- *PREPA-Puerto Rico*
  Products : Power transformer; CT&PT
- *APR Energy-America*
  Products: Voltage transformer

Asia-pacific

- *EVN-Vietnam*
  Products: Switch disconnector, power transformer, etc.
- *Kamoki-Pakistan*
  Products: Substation turn-key project.
- *NEA-Nepal*
  Products: Substation turn-key project.
- *NTDC-Pakistan*
  Products: Substation turn-key project.
- *QESCO-Pakistan*
  Products: Surge arrester.
- *TEPCO-Japan*
  Products: Power transformer, circuit breaker, disconnector and CT&PT.
- *NGCP-Philippines*
  Products: Capacitor

More >>>

Africa

- *EEPCO-Ethiopia*
  Products: HV Circuit breaker, disconnector, earthing switch, surge arrester, insulator, CT.
- *KPLC-Kenya*
  Products: Cut-out fuse, surge arrester, insulator.
- *ENE-Angola*
  Products: GIS.
- *JIRAMA-Madagascar*
  Products: Reactor.
- *PHCN-Nigeria*
  Products: Transformer protection & control panel.
- *RECO-Rwanda*
  Products: Distribution transformer, etc.
- *REGIDESO-Burundi*
  Products: Power transformer, distribution transformer.
- *SBEE-Benin*
  Products: Power transformer.
- *SNEL-D.R. Congo*
  Products: Power transformer.
- *SONABEL-Burkina Faso*
  Products: Power transformer, reactor.
- *TANESCO-Tanzania*
  Products: Substation turn-key project.
- *VRA-Ghana*
  Products: MV switchgear, DC panel, disconnector.
- *ZESCO-Zambia*
  Products: CT-VT metering unit.

Middle-east

- *NEPCO-Jordan*
  Products: Power transformer, earthing transformer.
- *ONEC-Oman*
  Products: Power transformer.
- *TEIAS-Turkey*
  Products: Surge arrester, insulator.
- *WARD-Lebanon*
  Products: SF_6 circuit breaker, disconnector, surge arrester, insulator.

CIS

- *ENA-Armenia*
  Products: HV circuit breaker, disconnector, CT, etc.
- *Kiev Boryspil International Airport-Ukraine*
  Products: Power transformer, GIS, etc.
- *TORGOVYIDOM STROJPODSTANZII-Russia*
  Products: Current transformer

More >>>

Global Operation in Over 129 Countries

Industrial End User

Application: *widely applicable for mining, iron-steel, cement, metallurgy, chemical, railway, petroleum, paper, power generation industries, etc.*

Mining Industry

- *BHP Billiton-Australia*
  Products: CT& PT, distribution transformer, etc.
- *Rio Tinto-Australia*
  Products: Distribution transformer, CT.
- *FMG-Australia*
  Products: Power transformer.

Iron-steel Industry

- *JFE Steel-Japan*
  Products: Disconnector.
- *Bao Steel-China*
  Products: Power transformer, MV switchgear panel.

Cement Industry

- *Serebryabskiy Cement Plant-Russia*
  Products: HV capacity compensation device, HV capacitor.
- *Viet Quang Cement Plant-Vietnam*
  Products: Power transformer, HV circuit breaker, disconnector, MV&LV switchgear panel.

Petroleum & Gas Industry

- *Chevron-USA*
  Products: Switchgear panel, distribution transformer.
- *PDVSA-Venezuela*
  Products: Power transformer, distribution transformer.
- *CNPC-China*
  Products: Power transformer, GIS, MV switchgear panel.

Power Rental Industry

- *Aggreko-UK*
  Products: Power transformer.
- *APR Energy-USA*
  Products: Power transformer, HV circuit breaker, disconnector, CT, PT.

Paper Industry

- *VISY-Australia*
  Products: Switchgear panel
- *UPM-Finland*
  Products: MV switchgear panel.

Chemical Industry

- *Saint Gobain-France*
  Products: Power transformer, MV switchgear panel, cable, busduct.
- *INVISTA-USA*
  Products: Distribution transformer, switchgear panel, DC panel.

Power Generation

- *TATA Power-India*
  Products: Power transformer.
- *SIBAYAK Geothermal Power Plant-Indonesia*
  Products: MV&LV switchgear panel, surge arrester, insulator, CT, VCB.

Commercial & Civil Construction

- *Shangri-la Hotel-Philippine*
  Products: Distribution transformer.
- *Kiev Boryspil International Airport-Ukraine*
  Products: GIS.

Shipbuilding Industry

- *Fincantieri-Italy*
  Products: Power transformer.

More >>>

Engineering & Contracting

- *EIFFAGE-France*
  Products: Power transformer, reactor.
- *FLUOR-USA*
  Products: Power transformer.
- *SMS Siemag-Germany*
  Products: Distribution transformer, switchgear panel
- *Bouygues Group-France*
  Products: Disconnector, current transformer
- *Isolux Corsan-Spain*
  Products: Reactor, capacitor, surge arrester

More >>>

Turn-key Project

- *Kamoki-Pakistan*
  Projects: 230kV substation EPC.
- *Saint Gobain-France*
  Projects: 35kV substation EPC.
- *NEA-Nepal*
  Projects: 132kV and 33kV substation EPC.
- *SMCO-D.R. Congo*
  Projects: 220kV substation EPC.
- *TANESCO-Tanzania*
  Projects: 35kV and 66kV substation EPC.
- *NTDC-Pakistan*
  Projects: 220kV substation EPC.
- *Rohri-Pakistan*
  Projects: 220kV substation EPC
- *Mabuki-Tanzania*
  Projects: 220kV,132kV and 33kV substation EPC
- *KPLC-Kenya*
  Projects: 132kV and 33kV substation EPC
- *Dodoma-Tanzania*
  Projects: 220kV substation EPC
- *Mbeya-Tanzania*
  Projects: 220kV substation EPC
- *Shikapur-Pakistan*
  Projects: 220kV substation EPC

More >>>

CATALOGUE

MV/LV Prefabricated Substation

Wood-paneled prefabricated substation

Landscape type prefabricated substation

Pseudo-classic style prefabricated substation

Colored composite steel plate prefabricated substation

Non-metal prefabricated substation

Normal type MV/LV prefabricated substation

YBM(P)29-12/0.4 MV/LV Prefabricated Substation

1 General

YB29-12/0.4 series of medium voltage/low voltage pre-fabricated substation is a product designed by our company to meet the needs of urban network construction, with the advantages of compact structure, strong complete set, safe and reliable operation, easy maintenance and beautiful appearance.

In comparison with conventional civil substation, the prefabricated substation with the same capacity only covers an area of 1/10-1/5 of conventional substation, significantly reducing design workload and construction workload, and reducing construction costs. The product can be used in distribution system, which may be looped network distribution system, or dual power or radiation terminal power distribution system. Therefore, it is a kind of new type complete set equipment which could achieve energy saving and cost reducing in urban and rural substation construction and transformation, and could practice "boost, capacity increase, updating and optimizing channel" development thought.

2 Type Designation

Y B □ □ — 12 / 0.4

- 12 / 0.4 — Rated voltage
- □ — Design number
- □ — Structure characteristics: P-type; M-type
- B — Substation
- Y — Prefabricated

3 Working Condition

3.1 Altitude: ≤1000m
3.2 Ambient temperature: no higher than +40℃ and the average value in 24h is no more than 35℃; no lower than -25℃
3.3 Outdoor wind speed: no more than 35m/s
3.4 Relative humidity : Daily average value is no more than 95% (+25℃)
3.5 Seismic restraint capacity
Horizontal earthquake acceleration: below 0.4 m/s2
Vertical earthquake acceleration: below 0.2 m/s2
3.6 There should be no conductive dust, corrosive, flammable and explosive hazardous articles which are harmful to metal and insulator
3.7 Mounting points without severe movements, and not more than 3 degree inclination

***Notes**: If above conditions could not meet use requirements, the users should negotiate with the manufacturer.*

4 Main Technical Parameters

No.	Item	Unit	MV Apparatus	Transformer	LV Apparatus
1	Rated voltage Ue	kV	7.2/12	6/0.4, 10/0.4	0.4
2	Rated capacity Se	kVA		Type(P3 Figure2-1,Figure2-2): 200~1250 Type(P3 Figure2-3,Figure2-4): 50~80	Max 2×1600
3	Rated current Ie	A	200~630		100~3000
4	Rated breaking current	A	Load switch:400~630A		15~63
		kA	composite apparatus depend on fuse		
5	Rated short time withstand current(S)	kA	20×(2)	200~400kVA	15×1
			12.5×(4)	400kVA	30×1
6	Rated peaking withstand current	kA	31.5, 50	200~400kVA	30
				400kVA	63
7	Rated making current	kA	31.5, 50		
8	1min power frequency withstand current voltage	kV	Phase to phase and earth 30/42	Oil immersed: 35/5min	≤300V: 2kV
			Isolating distance 34/48	Dry: 28/5min	300, 660V: 2.5kV
9	Lightning impulse withstand voltage	kV	Phase to phase and earth 60/75	75	
			Isolating distance 75/85	75	
10	Noise level	dB		Oil :<55	
				immersed:<55	
11	Protection degree			IP23D	
12	overall dimensions	Different dimensions for different schemes			

Prefabricated Substation

High voltage room

Low voltage room

Low voltage room

5 Product Structure Characteristics

5.1 The product is composed of medium voltage power distribution equipment, transformer and low voltage power distribution equipment, divided into three functional compartments, which are medium voltage room, transformer room and low voltage room. The medium and low voltage rooms are fully functioned. Preliminary power distribution system at medium voltage side can be arranged in looped network power supply, terminal power supply, dual power supply and other power supply methods. Medium voltage metering components can be installed to meet medium voltage metering requirements. The transformer room could be S9, S9-M R and other low loss oil immersed transformer and dry transformer. The transformer room is equipped with automatic start forced air cooling system and lighting system. The low voltage room could use panel or cabinet structure according to the user's requirements to constitute the required power supply program, with power distribution, lighting power distribution, reactive power compensation, power metering and power measurement functions, to meet the user's different requirements, to facilitate user's power supply management and improve power supply quality.

5.2 Medium and low voltage rooms are arranged compact and reasonable, convenient to operate and overhaul. Medium voltage circuit breaker has anti-misoperation interlock function. According to the user's requirements, the transformer could access transformer main door from the track. In addition, the transformer door is equipped with labyrinth ventilation. Every room is equipped with automatic lighting device. In addition, the performance of selected elements for medium and low voltage switchgears has features of reliable performance, simple operation and convenient overhaul. The top cover of substation is dual-layer insulation structure, which could reduce solar radiation. The surrounding eaves have ventilation holes, forming convection function with every functional room, to facilitate ventilation and heat dissipation. The bottom base is steel structure, with sufficient strength and rigidity.

5.3 Natural and forced ventilation two cooling methods are adopted to keep good ventilation and cooling performance. Transformer room has temperature controller which could automatically control the transformer temperature, ensuring full capacity operation of the transformer.

5.4 Depending on application conditions, different structural forms and materials could be used to meet different use requirements and ensure normal operation of the substation. The enclosure of substation could be made of ordinary steel, stainless steel, aluminum alloy plate, colored composite plate, partially or completely going through surface treatment, so that the shell could have long-term outdoor use conditions, ensuring waterproof, dustproof performance, with long service life and beautiful appearance. The basic structure can be roughly divided into:

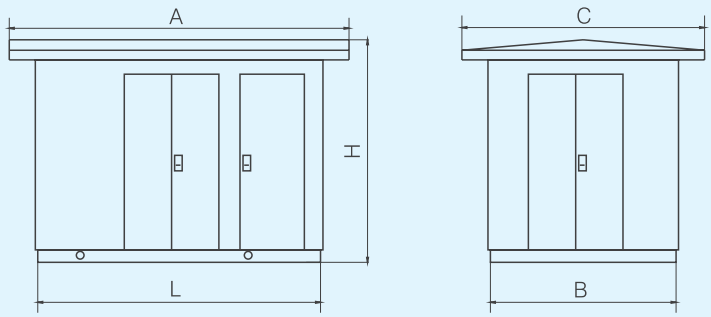
- General substation which is made of ordinary steel plate
- High anti-corrosion type substation which is made of stainless steel or aluminum alloy plate
- Heat preservation and insulation type substation which is made of colored composite plate
- Other kinds of substations

5.5 Incoming and outgoing line are cables, and we also can use other types according to customer's special requirements.

6 Overall dimension and layout forms

6.1 Overall dimension (Figure 1, Figure 2)

Figure1 layout forms drawings of YBM, YBP series pre-fabricated substations ("目"type arrangement)



(mm)Table 2

Type	Transformer capacity(kVA)	L	B	H	A	C
YBM29	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
YBP29	100~250	Confirmed by LV outgoing wire	2000	2520	Confirmed by LV outgoing wire	2320
	315~630		2600	2560		2920
	800~1000		2600	2560		2920
	1250		3000	2980		3320

6.1 YBM、YBP series prefabricated substations, divided into the following types according to the arrangement:

Type structure (Figure 2-1, Figure 2-2);

Type structure (Figure 2-3, Figure 2-4);

Figure2 layout forms drawings of YBM、YBP series pre-fabricated substations(H-HV room, T-transformer room, L-LV room)

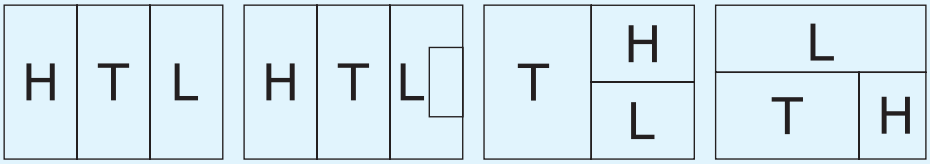
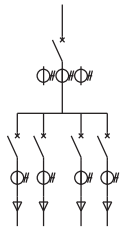
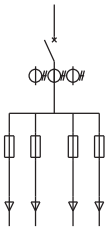
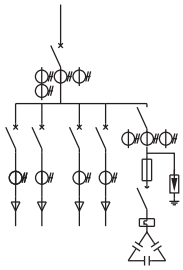
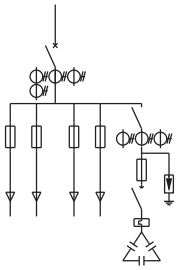


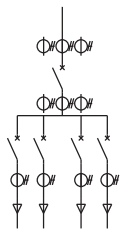
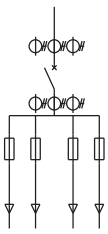
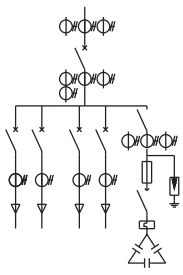
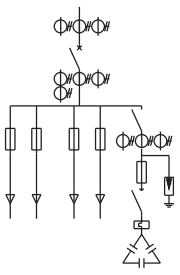
Figure 2-1 Figure 2-2 Figure 2-3 Figure 2-4

7 Main circuit scheme

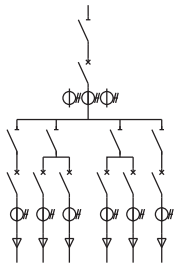
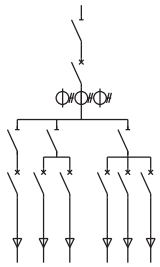
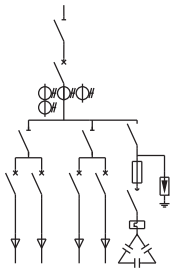
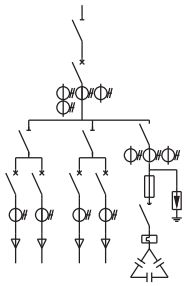
7.1 Low voltage main circuit scheme(Table 3)

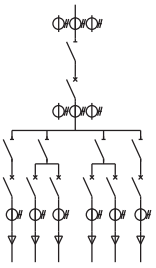
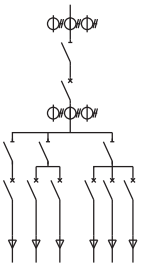
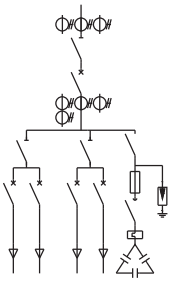
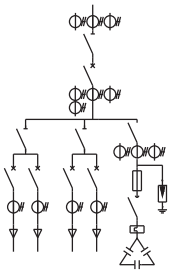
Table 3

No.	01	02	03	04
Main circuit single line drawings				
	Explanation: With main CB, no measuring and no compensation, outgoing with metering			

No.	05	06	07	08
Main circuit single line drawings				
	Explanation: With main CB, no measuring and no compensation, outgoing with metering			

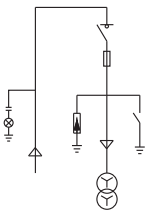
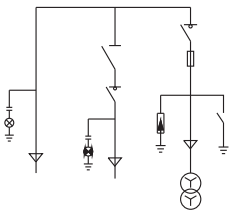
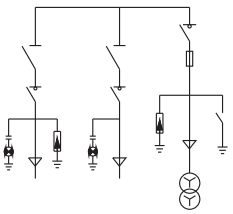
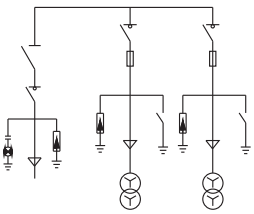
Continued Table 3

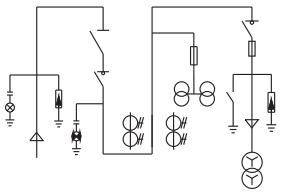
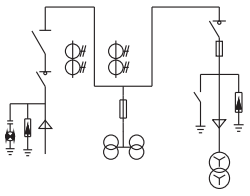
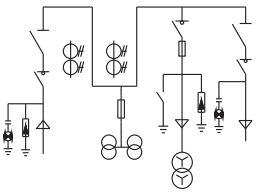
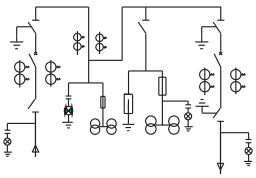
No.	09	10	11	12
Main circuit single line drawings				

No.	09	10	11	12
Main circuit single line drawings				
	Explanation: With main CB, no measuring and no compensation, outgoing with metering			

7.2 HV main circuit scheme

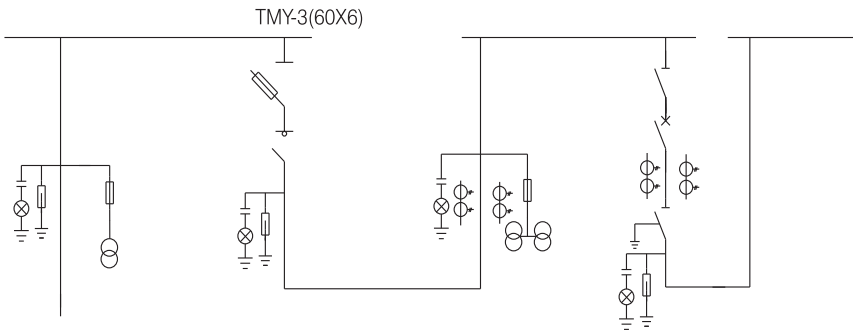
Table 4

No.	01	02	03	04
Main circuit single line drawings				

No.	05	06	07	08
Main circuit single line drawings				

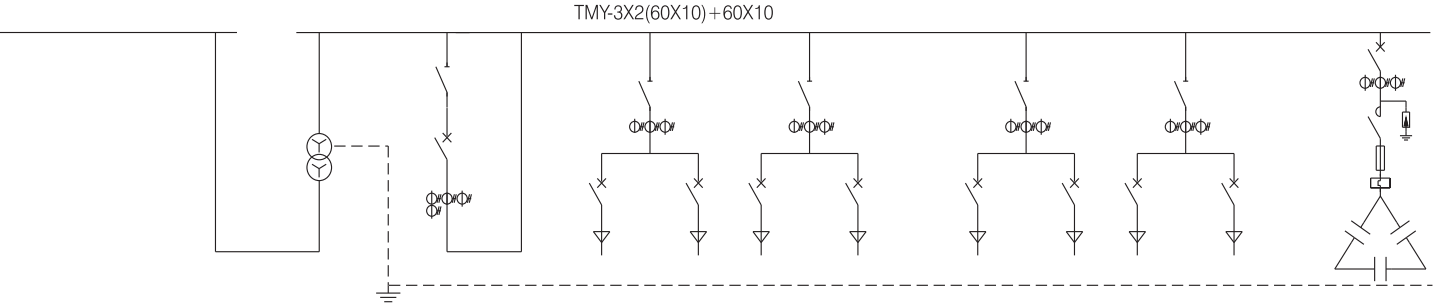
8 Connection Scheme Plans

8.1 Cable incoming, high supplying and high metering scheme

No.		H1	H2	H3	H4
Type		HXGN15-12	HXGN15-12	HXGN15-12	XGN36-12
Cubicle dimension (Width*Depth*Height)		800×2270×1000	800×2270×1000	800×2270×1000	800×2270×1000
Main circuit single line drawings					
Application		Incoming	outgoing	metering and connection	outgoing
Main electrical components	Vacuum load switch FZRN21-12 630/20		1		
	Current transformer LZZBJ9-10 □ /5			(50/5 0.2/10P10×2)	75/5 0.5/10P10×2
	Current transformer LZJC-10 □ /5			(JDZ-10 10/0.1 0.2 class ×2)	
	Arrester HY5WS-17/50	3	3		3
	HV fuse RN2-10 0.5A	2		3	
	Voltage transformer	DC1.2-10 10/0.22 1200VA			
	Voltage indicator DXN6-10/T	1	1		1
	Fuse SFLAJ-12 80A		3		
	Disconnector DGN-12/630				1
	Transformer				1
	Vacuum switch ZN63A-12/630-25				1
	Disconnector DGN-12/630				
	Disconnector HD13BX-□				
	Circuit breaker DW17-2000/3P				
	Current transformer LMK-0.66 □ /5A				
	Outgoing switch DZ20Y-□ /3300				
	Circuit name				
Notes					

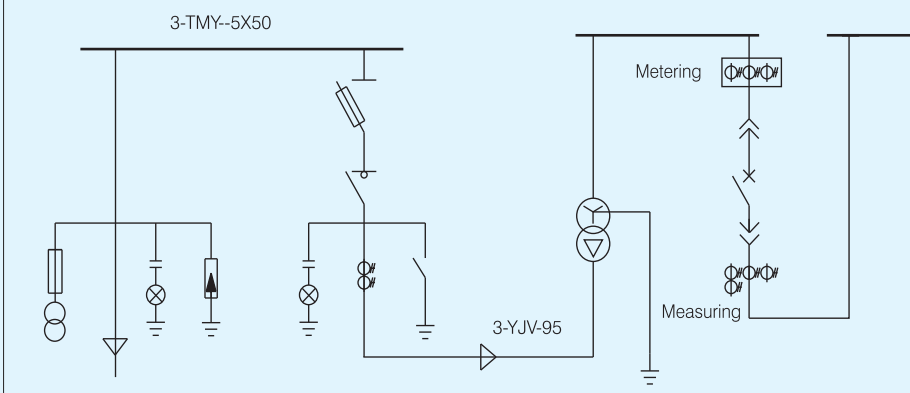
Prefabricated Substation

	D1	D2	D3	D4
	GGD	GGD	GGD	GGD
	1000×2000×800	1000×2000×800	1000×2000×800	1000×2000×800



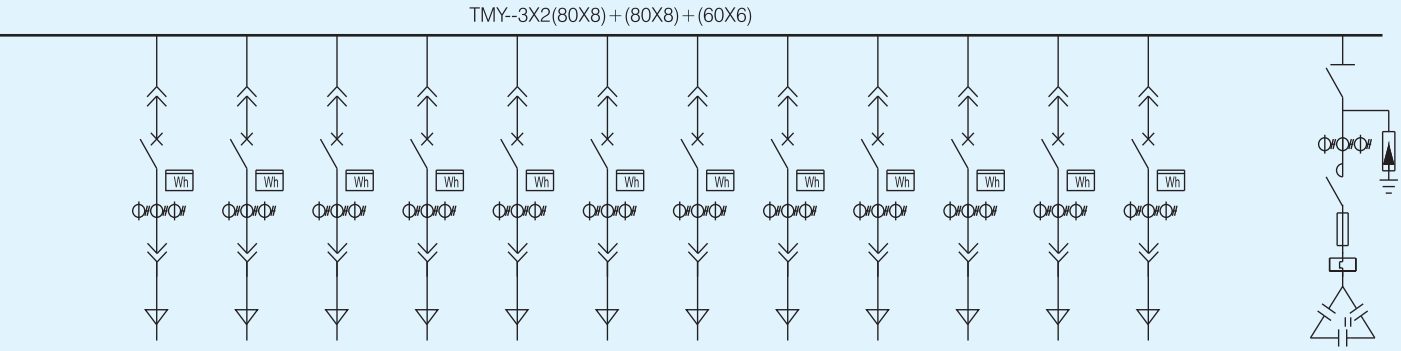
SCB9-1000kVA 10/0.4						
Y.yn0-10000±2×2.5%						
	HD13BX-2500/30	HD13BX-1500/30	HD13BX-400/31	HD13BX-1500/30	HD13BX-1000/31	
	1					
	2000 ×4	1500 ×3	2000 ×3	1200 ×3	400 ×3	
		DZ20Y-630/3300 In=630A ×2	DZ20Y-100/3300 In=100A ×2	DZ20Y-400/3300 In=400A ×3	DZ20Y-225/3300 In=200A ×2	
						300kvar

8.2 Cable incoming, high supplying and low metering scheme

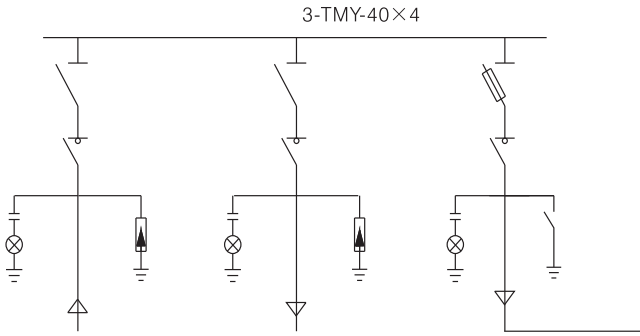
No.	H1	H2		D1
Cubicle dimension (Width*Depth*Height)	600×1900×900	800×1900×900		1200×2000×800
Primary single line drawings				
Application	Incoming	Outgoing and Connection		
Vacuum load switch		FZRN21-12D/125-31.5		
Fuse SFLAJ-12		100A×3		
Current transformer LZZBJ9-10 100/5		1		
Arrester HY5WS-17/50	3	1		
HV fuse RN2-10 0.5A	2			
Voltage transformer JDZ11-10B 10/0.22 500VA	1			
Voltage indicator DXN6-10/T	1	1	SCB9-1250kVA 10/0.4 D.yn11 10000±2X5%	
Transformer				
Circuit breaker NA1-2000M/3 In=2000A motoring, with undervoltage and shunt trip				1
Energy meter DT864-4K				
Disconnector				
Current transformer				3
Current transformer BH-0.66 2000/5A				4
Current transformer BH-0.66 □ /5A 0.2级				
CB with plastic casing NM1-630H/3320 In=630A				
CB with plastic casing NM1-400H/3320 In=400A				
CB with plastic casing NM1-400H/3320 In=315A				
Application				
Notes				

Main electrical components

Prefabricated Substation

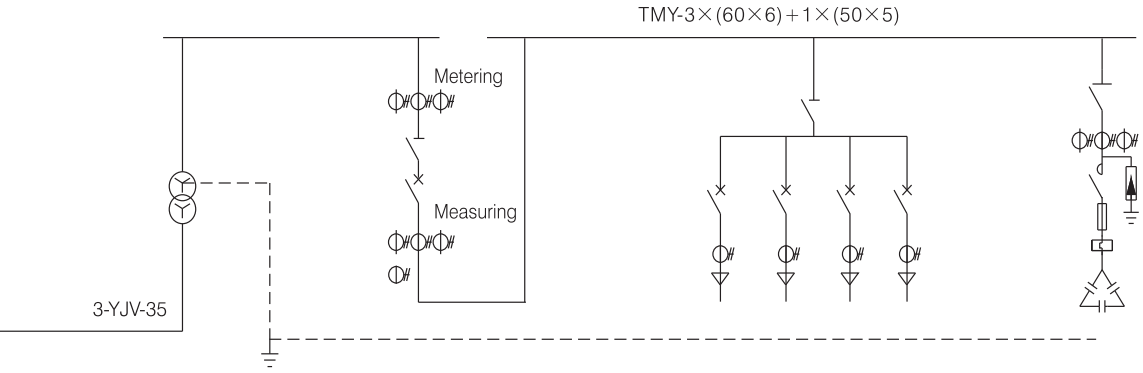
D2	D3	D4	D5
800×2000×800	800×2000×800	800×2000×800	1200×2000×800
			
4	4	4	
600×3、400×6、300×3	600×3、300×9	400×12	
1	1		
2		4	
1	1		
			10×30=300kvar

8.3 Cable incoming, Ring network power supply, high supply and low metering scheme

No.		H1	H2	H3
Type		HXGN15-12	HXGN15-12	HXGN15-12
Cubicle dimension (Width*Depth*Height)		600×800×1900	800×800×1900	800×800×1900
Primary single line drawings				
Application		Incoming	Outgoing	Outgoing
Main electrical components	Load switch	FZN21-12/630-20	FZN21-12/630-20	FZRN21-12D/125-31.5
	Fuse SDLAJ-12			31.5×3
	Voltage indicator DXN6-10/T	1	1	1
	Arrester HY5WS-17/50	3		
	Transformer			
	Circuit breaker DW15-1000/3 In=800A			
	Disconnector HD13BX-1000/3 1			
	Circuit breaker NM1-400H/3300 In=400A			
	Circuit breaker NM1-400H/3300 In=315A			
	Circuit breaker NM1-225H/3300 In=200A			
	Current transformer LMZ1-0.66 500/5A 0.2 class			
	Current transformer LMZ1-0.66 500/5A			
	Current transformer LMZ1-0.66 400/5A			
	Current transformer LMZ1-0.66 300/5A			
	Current transformer LMZ1-0.66 200/5A			
Notes				

Prefabricated Substation

	D1	D2	D3
	GGD	GGD	GGD
	800×2000×800	800×2000×800	800×2000×800



	1		
	1		
S11-M · R-315kVA 10/0.4 Y,y0-10000 □ 5%		1	
		1	
		2	
	3		
	4		
		1	
		1	100kvar
		2	

Bending Steel Plate
Prefabricated Substation

Glass Tile
Prefabricated Substation

Colored composite plate
Prefabricated Substation

Steel Plate
Prefabricated Substation

YBM(P)29-24/0.4 24kV MV/LV Prefabricated Substation

1 General

YB29-24/0.4 series of medium/low voltage pre-fabricated substation features compact structure, strong complete set, safe and reliable operation, easy maintenance and beautiful appearance.

In comparison with conventional civil substation, the pre-fabricated substation with the same capacity only covers an area of 1/10-1/5 of conventional substation, significant space-saving has been realized.

The product can be used in distribution system, which may be looped network distribution system, or dual power or radiation terminal power distribution system. Therefore, it is a kind of new type complete set equipment which could achieve energy saving and cost reducing in urban and rural substation construction and transformation, and could practice "boost, capacity increase, updating and optimizing channel" development thought.

The product conforms to GB/T17467 IEC1330-1995 <High Voltage/Low Voltage Pre-fabricated Substation> Standard and SD320 <Box-type Substation Technical Conditions>.

2 Type Designation

Y B □ □—24 / 0.4 — □

- Transformer rated capacity (kVA)
- Rated Voltage
- Design number
- Structure characteristics: P–type; M–type
- Substation
- Prefabricate

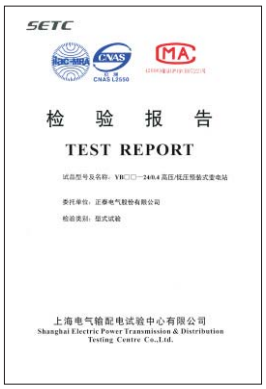
3 Working Condition

3.1 Normal service conditions

- Ambient temperature: no higher than +40℃ and the average value in 24h is no more than 35℃; no lower than -30℃
- Relative humidity: Daily average value is no more than 95%; monthly average value is no more than 90%
- Altitude: ≤Q1000m
- Seismic restraint capacity:
  Horizontal earthquake acceleration: below 0.4 m/s2
  Vertical earthquake acceleration: below 0.2 m/s2
  Safety factor: 1.67
- Mounting points without severe movements, and not more than 30℃
- Outdoor wind speed: no more than 35m/s
- There should be no conductive dust, corrosive, flammable and explosive hazardous articles which are harmful to metal and insulator

3.2 Special service conditions

Customized design is available.



Type Test Report

ZL 2008 2 0155883.3
Inner plate in Double layer of the steel plate of pre-fabricated substation

ZL 2008 2 0155882.9
waterproof cover of pre-fabricated substation

4 Main Technical Parameters

4.1 Main technical parameters of pre-fabricated substation

No.	Item		Unit	HV Side	LV Side
1	Rated voltage Ue		kV	24	0.4
2	Rated frequency		Hz	50	50
3	Rated current Ie		A	630	2000
4	Rated short circuit breaking current		kA	25	50
5	Rated insulation	1min Power frequency withstand voltage	kV	65/79	
		Lightning impulse withstand voltage short-circuit		125/145	
6	Rated short-time withstand current/rated		kA/s	25/4	
7	Rated peak withstand current		kA	63	
8	Transformer rated capacity		kVA	1000	
9	Protection degree of Enclosure			IP33D	
10	Noise level		dB	Oil ≤55, dry ≤65	
11	Type of transformer			Oil or dry	
12	Enclosure class		K	20	

4.2 Main Technical Parameters of switchgear

No.	Item	Unit	Parameters
			With circuit breaker
			NV1-24
1	Rated voltage Ue	kV	24
2	1min power frequency withstand voltage	kV	(50)65
3	Rated lightning impulse withstand voltage(Peak)	kV	125
4	Rated frequency	Hz	50(60)
5	Rated current	A	630 1250 1600 2000 2500 3150
6	Rated current of branch busbar	A	630 1250 1600 2000 2500
7	Rated short-time withstand current	kA	16 20 25 31.5
8	Rated peak withstand current	kA	40 50 63 80
9	Rated short-circuit duration	s	4
10	Protection degree		Enclosure: IP4X; Indoor: IP2X
11	Weight	kg	800, 1000(Rated current above 1600A)

4.3 Main Technical Parameters of circuit breaker

No.	Item		Unit	Parameters
1	Rated voltage Ue		kV	24
2	Rated insulation	1min Power frequency withstand voltage	kV	65(79)
		Lightning impulse withstand voltage	kV	125(145)
3	Rated frequency		Hz	50
4	Rated current Ie		A	630、1250、1600 2000、2500、3150
5	Rated short-time withstand current		kA	20、25、31.5
6	Rated peak withstand current		kA	50、63、80
7	Rated short circuit breaking current		kA	20、25、31.5
8	Rated short circuit making current		kA	50、63、80
9	Rated short-circuit duration		s	4
10	Rated operation sequence			O-0.3s-CO-180s-CO
11	Mechanical life			M2 class (20000 times
12	Rated operation voltage		V	AC 220/DC 220
13	Total breaking time		ms	≤70
14	Electrical life			E2 Class

5 Product Structure Characteristics

5.1 The product is composed of medium voltage power distribution equipment, transformer and low voltage power distribution equipment, divided into three functional compartments, which are medium voltage room, transformer room and low voltage room. The medium and low voltage rooms are fully functioned. Primary power distribution system at medium voltage side can be arranged in looped network power supply, terminal power supply, dual power supply and other power supply methods. Medium voltage metering components can be installed to meet high voltage metering requirements. S9, S9-M R and other low loss oil immersed transformer and dry transformer can be installed in the transformer room. The transformer room is equipped with automatic start forced air cooling system and lighting system. The low voltage room could use panel or cabinet structure according to the user's requirements to constitute the required power supply program, with power distribution, lighting power distribution, reactive power compensation, power metering and power measurement functions, to meet the user's different requirements, to facilitate user's power supply management and improve power supply quality.

5.2 Medium and low voltage rooms are arranged compactly and reasonably, convenient to operate and overhaul. Medium voltage circuit breaker has anti-misoperation interlock function. According to the user's requirements, the transformer could access transformer main door from the track. In addition, the transformer door is equipped with labyrinth ventilation. Every room is equipped with automatic lighting device. In addition, the performance of selected elements for medium and low voltage switchgears has features of reliable performance, simple operation and convenient overhaul. The top cover of substation is dual-layer insulation structure, which could reduce solar radiation. The surrounding eaves have ventilation holes, forming convection function with every functional room, to facilitate ventilation and heat dissipation. The bottom base is steel structure, with sufficient strength and rigidity.

5.3 Natural and forced cooling methods are adopted to keep good ventilation and cooling performance. Transformer room has temperature controller which could automatically control the transformer temperature, ensuring full capacity operation of the transformer.

5.4 Depending on application conditions, different structural forms and materials could be used to meet different use requirements and ensure normal operation of the substation. The enclosure of substation could be made of ordinary steel, stainless steel, aluminum alloy plate, colored composite plate, partially or completely going through surface treatment, so that the shell could have long-term outdoor use conditions, ensuring waterproof, dustproof performance, with long service life and beautiful appearance. The basic structure can be roughly divided into:

- General substation which is made of ordinary steel plate
- High anti-corrosion type substation which is made of stainless steel or aluminum alloy plate
- Heat preservation and insulation type substation which is made of colored composite plate
- Other kinds of substations

5.5 Incoming and outgoing line are cables, and we also can use other types according to customer's special requirements.

6 Layout Forms

6.1 YBM/YBP series pre-fabricated substations, divided into the following types according to the arrangement:

- Type structure (Figure 2-1, Figure 2-2);
- Type structure (Figure 2-3, Figure 2-4);

Picture 2 layout forms drawings of YBM/YBP series pre-fabricated substations(H-HV room, T-transformer room, L-LV room)

Figure 2-1

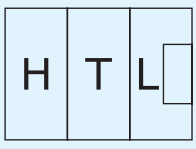


Figure 2-2

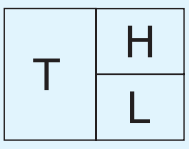


Figure 2-3

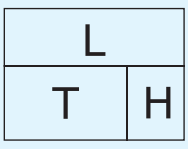
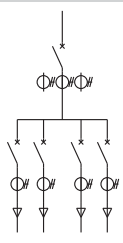
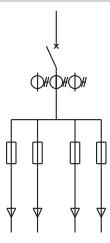
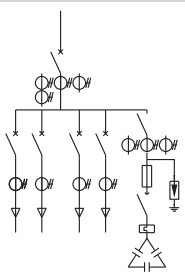
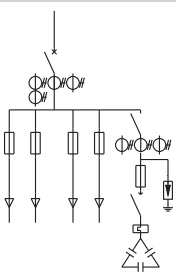
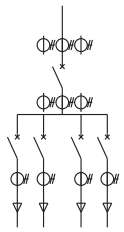
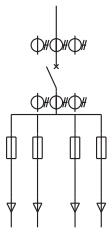
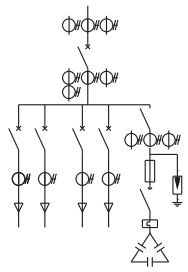
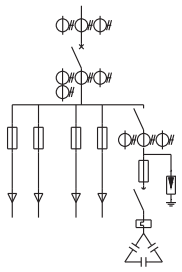


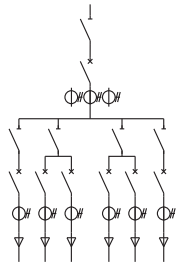
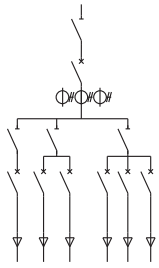
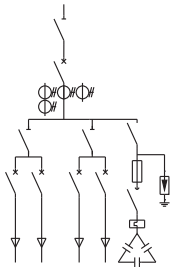
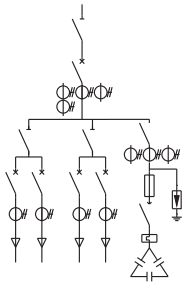
Figure 2-4

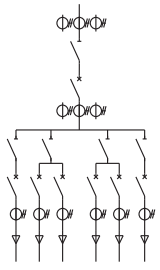
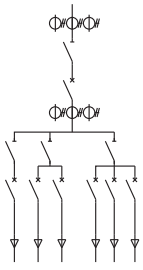
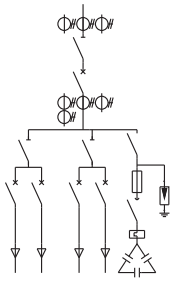
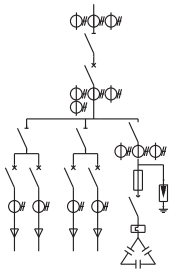
7 Main Circuit Scheme

7.1 Low voltage main circuit scheme

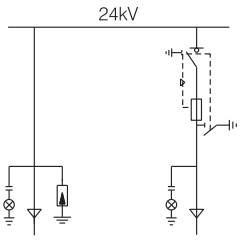
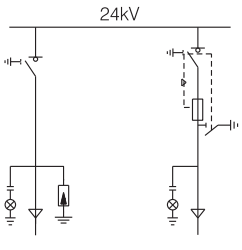
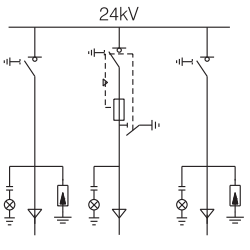
No.	01	02	03	04
Main circuit single line drawings				
	Explanation: with main CB, no measuring and no compensation, outgoing with metering			

No.	05	06	07	08
Main circuit single line drawings				
	Explanation: with main CB, no measuring and no compensation, outgoing with metering			

No.	09	10	11	12
Main circuit single line drawings				
	Explanation: with main CB and disconnector, no measuring and no compensation, outgoing with metering			

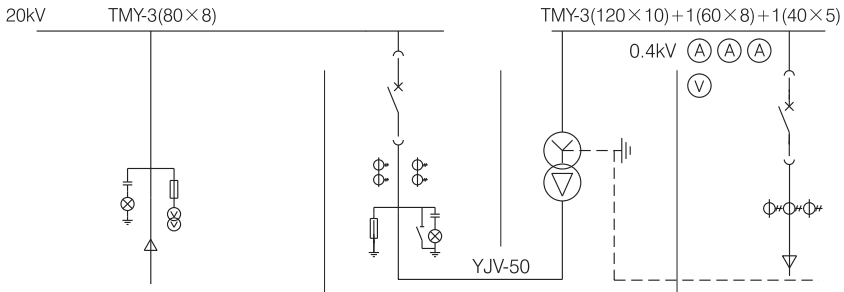
No.	09	10	11	12
Main circuit single line drawings				
	Explanation: with main CB, no measuring and no compensation, outgoing with metering			

7.2 HV main circuit scheme

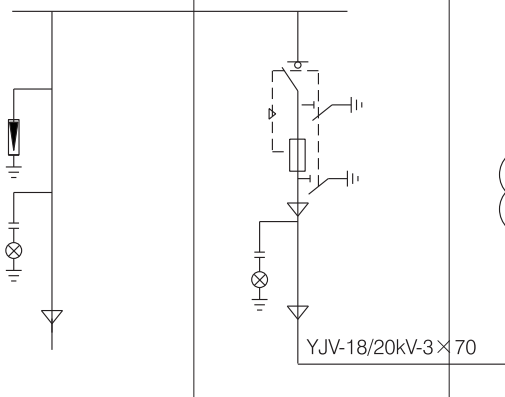
No.	01	02	03
Main circuit single line drawings			

8 Connection Scheme Plans

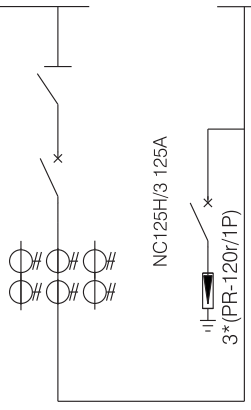
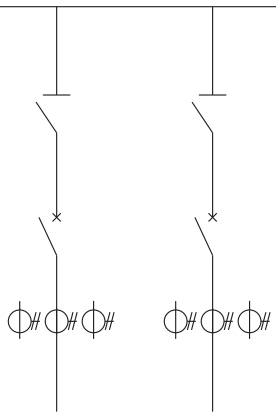
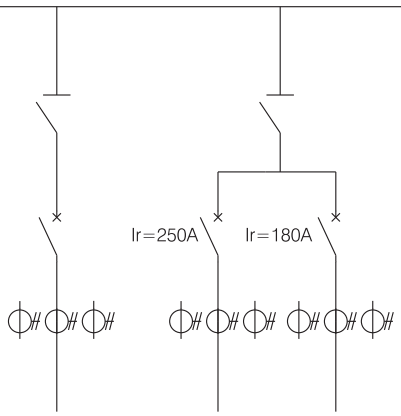
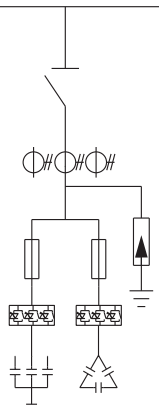
8.1 HV side with circuit breaker scheme

No.		H1	H2	TM	D1
Type		KYN28A-24	KYN28A-24		NGG1(GGD)
Cubicle dimension (width*depth*height)		1000×1820×2300	1000×1820×2300		800×800×2200
Primary single line drawings					
Application		incoming	transformer outgoing		LV incoming and outgoing
Main Components	Vacuum CB Porcelain vacuum interrupter		NV1-24/630-25AC220V	S11-M-1000kVA 20±2×2.5//0.4 D,yn11 Uk=4.5 with gas, oil temperature protection comply with IEC standard	
	Current transformer LZZBJ9-24/220b/2		75/5 0.5/10P10		
	HV fuse XRNP-24/0.5A with foundation	3 pieces for spare parts			
	Earthing switch JN15-24/275-31.5	630A	JN15-24/275 with sensor		
	Arrester MT-FGB-24Z		1 unit		
	Voltage indicator DXN6-20	Q	T		
	Voltage transformer JDZ11-20 20/0.1/0.22	0.22kVlimit capacity500VA，0.1kV 0.5 class×2			NA1-2000M/3P In=2000A withdrawable,motor-drive, C, O, stored energyusing AC 220V, no
	ACB NA1-2000M/3P In=2000A				
	Current transformer				
	Current transformer BH-0.66				2000/5A 0.5 class ×3
	Notes		UVT		

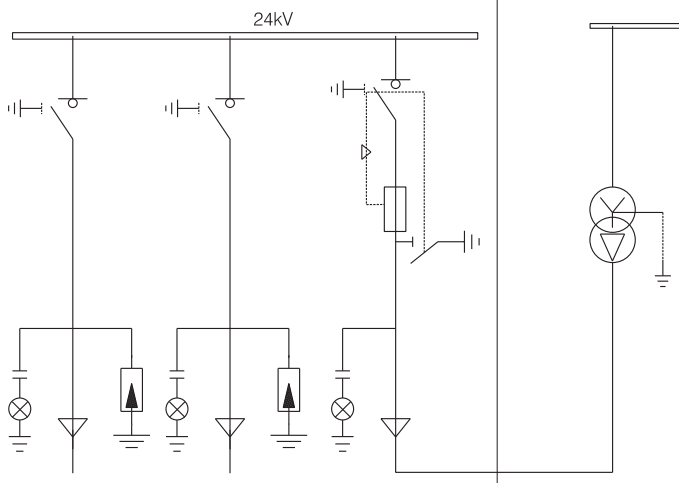
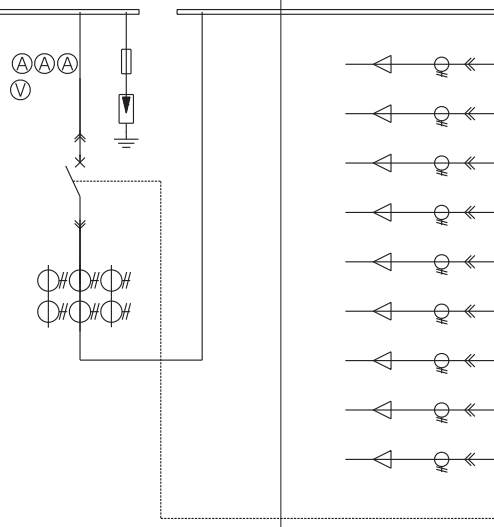
8.2 Ring main unit scheme

Cubicle No.					Cubicle No.
Panel hole					
Main busbar position Primary system drawings					
cubicle type	RM6-0Q				cubicle width mm
cubicle width (mm)					cubicle type
HV load switch				1	disconnector
Current transformer					circuit breaker
Voltage transformer					
HV fuse			XRNT1-10/50A	3	current transformer BH-0.66
Arrester	YH5WS-17/50	3			power meter
Voltage indicator		1		1	Comprehensive instrument/ ampere me
Application	This project firstly used in 10kV, using 10kV Fusible Core and arrester, then change them after 20kV power source is available				Application
Notes					

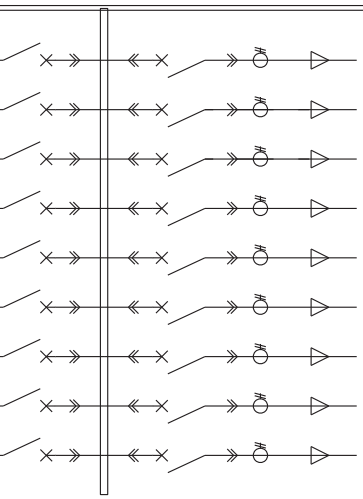
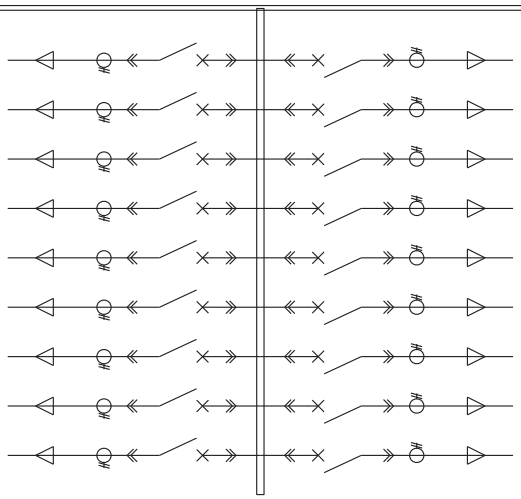
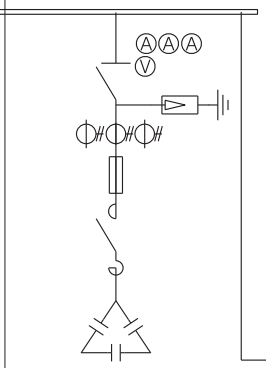
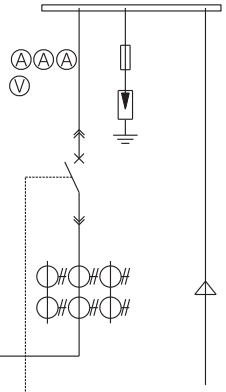
Prefabricated Substation

	D1	D2		D3		D4
				TMY-3X(80X8)+1X（80X8）+1X(40X4)		
						
	NGG1(GGD)	NGG1(GGD)		NGG1(GGD)		NGG1(GGD)
	800X600X2000	800X600X2000		800X600X2000		800X600X2000
	QP-1000/31	QP-400/31	QP-400/31	QP-400/31	QP-400/31	
	E2S1000 R1000 PR122/PD-LSI 3P	T5H400 PR221DS/P-LI	T5H400 PR221DS/P-LI	T5H400 PR221DS/P-LI	T4H250 PR221DS/P-LI	QP+BH-0.66+PDM803A+
	Ir=800A motor-driven, Shunt trip, no-voltage delay3S	R400/3P Ir=400A	R400/3P Ir=300A	R400/3P Ir=400A	R250/3P *2Pieces	FYS+RPCF3-16D+NT00+
	1000/5*3 800/5*3	400/5A	400/5A	400/5A	250/5A 200/5	HXFK-Y-220V-45A(2Pieces)+
	DTSD22-SS1					BSMJ0.25-10x3-1Y(2Pieces)+
ter	YTZJ-1A	PDM803A	PDM803A	PDM803A	PDM803A*2 Pieces	HXFK-△-380V-45A(6Pieces)+
		3WP1:Building No.5 288KW	3WP2:Building No.7 192KW	3WP3:Building No.8 288KW	3WP4:Building 08	BSMJ0.4-30-3(5Pieces)+
					Dual Power 132KW	3WP5:Building 08 Dual Power 88KW
						BSMJ0.4-15-3(1Piece)

8.3 Ring main unit at MV side, ARTUK cubicle in LV side scheme.

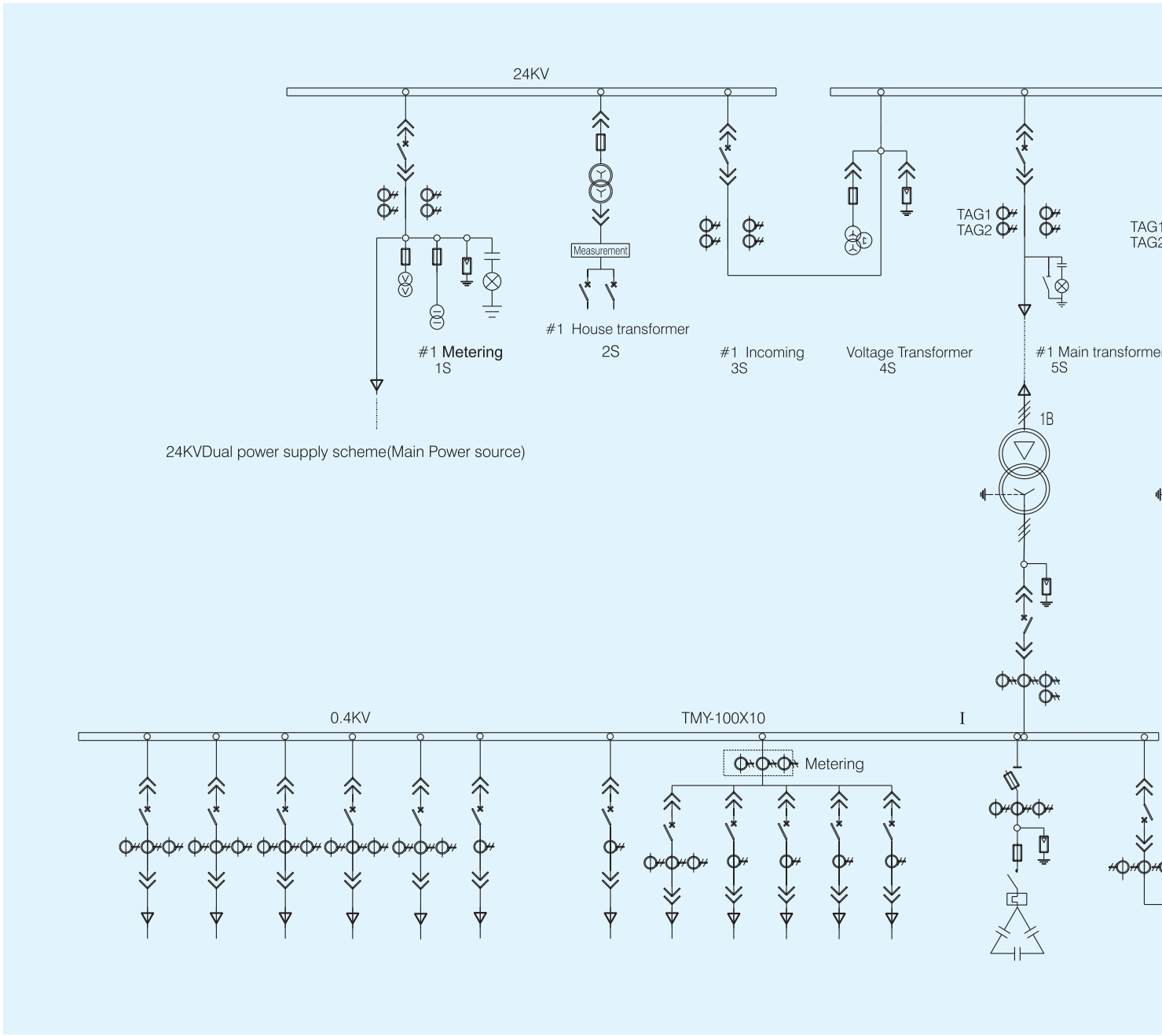
Cubicle No.	H		D1	
Main circuit single line drawings				
Cubicle type	SafeRing-CCF		ARTUK	
Cubicle Width*Depth*Height (mm)			920X1030X2231	
Circuit No				
Application		transformer	LV incoming	
Main Components: Load switch				
Main Components: HV fuse				
Main Components: Voltage indicator				
Main Components: Main transformer		SCB10-1250KVA 20/0.4		
Main Components: Main circuit breaker		Dyn11 20±2X2.5	E3N2500 R2500 PR121/P-LSI	
Main Components: Circuit breaker			3Pwith drawable type with under voltage delay	
Main Components: Current transformer			BH-0.66 2500/5 6只	
Notes			NZL308L-51 NZT3-231-0	

Prefabricated Substation

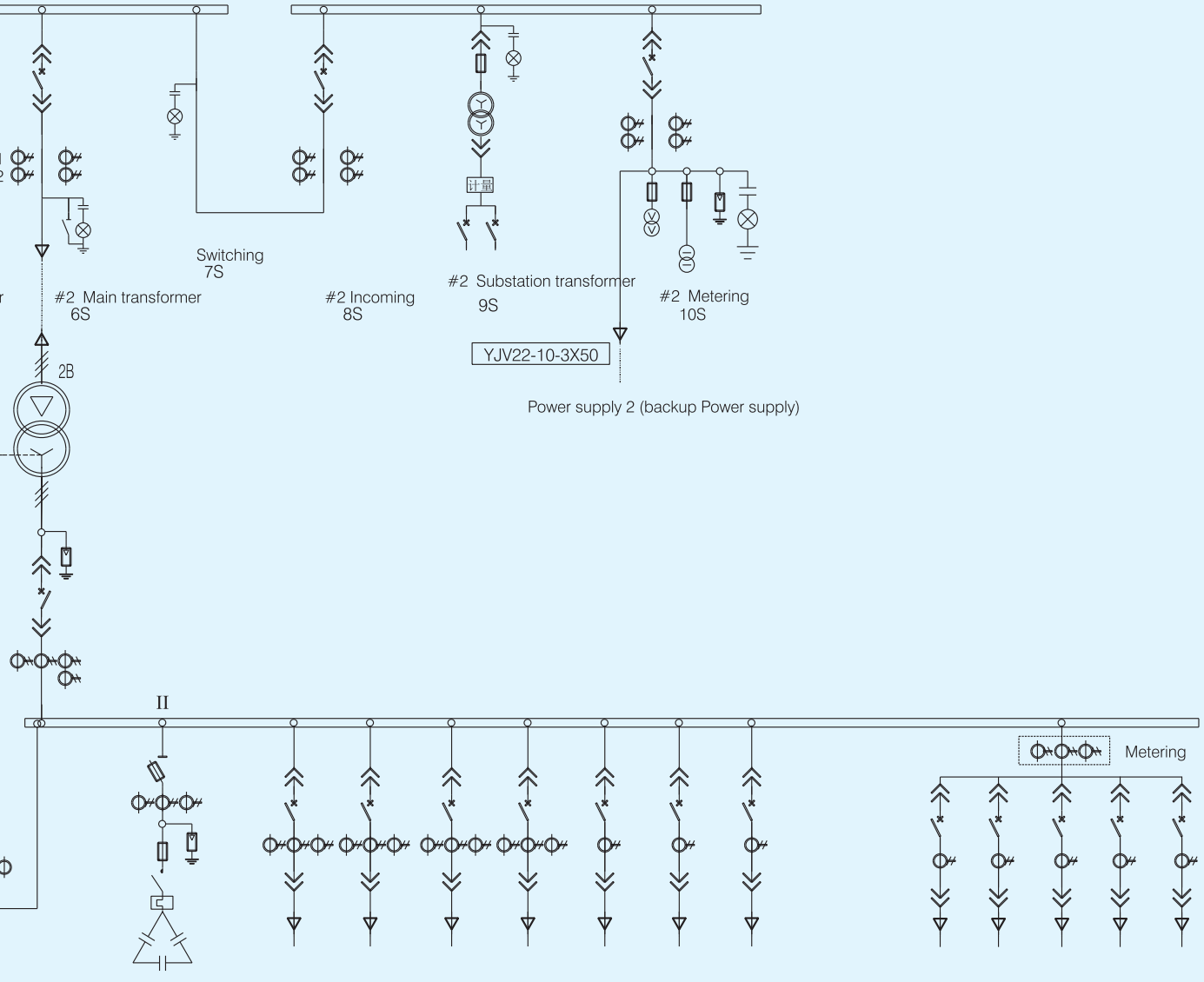
D2	D3	D4	D5
TMY-3X2X（80X8）+2（80X8）+80X8			
			
ARTUK	ARTUK	ARTUK	ARTUK
920X1030X2231	920X1030X2231	1120X1030X2231	920X1030X2231
LV feeder	LV feeder	capacitance compensation	LV Incoming 2
		QSA+NT00+CJ19+	E1B800 R800 PR121/P-LSI
Outgoing switchgear with auxiliary contacts AUX-2Q, pening /closing contacts	Outgoing switchgear with auxiliary contacts AUX-2Q, pening /closing contacts	EVC50-P7/400+NZK329L-11	3P withdrawable type with undervoltage delay
BH-0.66I 100/1 48pieces BH-0.66I 250/1 6pieces	BH-0.66I 100/1 48pieces BH-0.66I 250/1 6pieces	400Kvar	BH-0.66 1500/5 6 pieces
NZL308S-1112000 18pieces	NZL308S-1112000 18pieces		NZL308L-51

Prefabricated Substation

8.4 Dual power supply scheme



Prefabricated Substation



YB29-40.5/12 MV/LV pre-fabricated substation

1 General

YB29-40.5/12 series of medium voltage/low voltage pre-fabricated substation is a three-phase AC 50Hz outdoor equipment with medium voltage of 40.5kV and low voltage of 12kV (7.2), which is widely used in cities, towns, factories, oil fields and other places. It is also applicable for some large-scale construction sites, to accept, transform and distribute electrical energy. It has the features of strong complete set, small coverage area, convenient installation and use, low cost, high comprehensive automation degree, safe and reliable operation.

2 Type Designation

Y B □ — 40.5/12(7.2)

- 40.5/12(7.2) — Rated voltage
- □ — Design number
- B — Substation
- Y — Prefabricated

3 Working Condition

3.1 Normal service Ambient Conditions

- Altitude: no more than 1000m
- Ambient temperature: no higher than +40℃ and no lower than -25℃
- Outdoor wind speed: no more than 34m/s
- Relative humidity: daily average value is no more than 95%; monthly average value is no more than 90%
- There should be no regular violent vibration and impact
- There should be no conductive dust, corrosive, flammable and explosive hazardous articles which are harmful to metal and insulator

3.2 Special service Ambient Conditions

If above conditions could not meet use requirements, the users should negotiate with the manufacturer

4 Main Technical Parameters

4.1 Main technical parameters of transformer

Type	Rated voltage(kV)	Rated capacity (kVA)	Ratio(kV/kV)
SZ7	40.5	1000～20000	35/10、35/6.3
SZ9	40.5	1000～20000	35/10、35/6.3

4.2 Technical parameters of current transformer

Type	Rated primary current(A)	Rated secondary curren(A)	Accurate class	10%times no more than	secondary load
LCZ-35Q	40～500	5	0.5/10P10	10	50
LZJC-10	100～1000	5	0.5/10P10		

4.3 Main technical parameters of KYN61-40.5 or XGN-40.5 switchgear with ZN85-40.5 type vacuum circuit breaker

No.	Item		Unit	Parameters	
1	Rated voltage Ue		kV	40.5	
2	Rated insulation	1min Power frequency withstand voltage	kV	95	
		Lightning impulse withstand voltage	kV	185	
3	Rated current Ie		A	1250	1600
4	Reted Frequency		Hz	50	
5	Rated short-time withstand current		kA	25	31.5
6	Rated peak withstand current		kA	63	80
7	Rated short circuit breaking current		kA	25	31.5
8	Rated short circuit making current(peak)		kA	63	80
9	Rated short-circuit duration		s	4	
10	Rated operation sequence			O-0.3s CO-180s- CO	
11	Breaking time		ms	<80	
12	Rated short-circuit breaking current breaking times		times	20	
13	Rated Capacitor Banks breaking current		A	630	
14	Mechanical life		times	10000	
15	Rated operation voltage		V	-110/～110，-220/～220	

4.4 Main technical parameters of XGN36-12、KYN28A-12 with ZN63A-12(VS1) vacuum circuit breaker

No.	Item		Unit	Parameters				
1	Rated voltage Ue		kV	12	12	12	12	12
2	Rated current Ie		A	630、1250	630、1250	630、1250、1600	1250、1600、2000	2000、2500、3150
3	Rated insulation	1min Power frequency withstand voltage	kV	42	42	42	42	42
		Lightning impulse withstand voltage	kV	75	75	75	75	75
4	Rated short circuit breaking current		kA	16	20	25	31.5	40
5	Rated short circuit making current(peak)		kA	40	50	63	80	100
6	Rated peak withstand current		kA	40	50	63	80	100
7	Rated short-time withstand current		kA	16	20	25	31.5	40
8	Rated short-circuit breaking current breaking times		times	50	50	50	50	30
9	Rated short circuit duration		s	4	4	4	4	4
10	Rated operation sequence			O-t-CO-180s-CO*				
11	Mechanical life		times	20000	20000	20000	20000	10000
12	Rated single-capacitor breaking current		A	630	630	630	630	630
13	Rated Capacitor Banks breaking current			400	400	400	400	400

*16kA、20kA、25kA、31.5kA: t=03.s 40kA: t=180s

4.5 Technical parameters of substation transformer

Type	Rated voltage(kV)	Rated capacity(kVA)	Ratio(kV/kV)
SC9	35	30、50	35/0.4
SC9	10	30、50	10/0.4

4.6 Technical parameters of voltage transformer

Type	Rated voltage(V)			Rated capacity(VA)				limit
	Primary	Secondary	auxiliary secondary	0.2 class	0.5 class	1 class	3 class	capacity(VA)
JDZ-35	35000	1000	—	60	180	360	1000	1800
JDZX8-35	35000/ $\sqrt{3}$	100/ $\sqrt{3}$	100/$\sqrt{3}$	60	180	360	1000	1800
JDZJ-10	10000/ $\sqrt{3}$	100/ $\sqrt{3}$	100/$\sqrt{3}$		50	80	20	400

4.7 Main technical parameters of XGN36-12 with ZN28-12 vacuum circuit breaker

No.	Item	Unit	Parameters
1	Rated voltage Ue	kV	12
2	Rated current Ie	A	630、1000、1250、1600、2000
3	Rated short circuit breaking current	kA	20、25、31.5
4	Rated short circuit making current(peak)	kA	50、63、80
5	Rated peak withstand current	kA	50、63、80
6	Rated short-time withstand current	kA	20、25、31.5
7	Rated short-circuit duration	s	4
8	Rated short-circuit breaking current breaking times	times	30
9	breaking times		O-0.3sCO-180s-CO
10	1min Power frequency withstand voltage (effective value)	kV	42
11	Lightning impulse withstand voltage(peak)	kV	75
12	Mechanical life	times	10000
13	Rated operation voltage	V	-110/~110，-220/~220
14	Inter-phase distance	Mm	210±2.5、230±2.5(＜1600A)、250±2.5(2000A)

4.8 technical parameters of arrester

Type	Rated voltage(kV)	Peak value of residual voltage(kV)
HY5WZ-42/134	42	134

5 Product Structure Characteristics

5.1 General structure

The overall substation is laid in "H" shape, which is composed of 35kV switchgear room, 10kV switchgear room, automatic control room and the transformer. According to detailed situations, the control room is integrated with 35kV or 10kV switch room as a cabinet; the other switch room constitutes a cabinet and the transformer is placed outdoor, forming transformer installation region through some protection and isolation. The space between the transformer and two switches should be connected by erected busbar or cable.

The cabinet is generally made of high quality steel plate after surface anticorrosion and spraying treatment, with insulation material in the middle, which could effectively the normal work of thermostat system in the cabinet.

In addition, the cabinet material could be made of colored steel composite board or other materials.

5.2 40.5kV switchgear room

According to practical usage requirements of the substation, XGN77-40.5 fixed switchgear or ABB GIS-ZX1 40.5kV switchgear and KYN61-40.5kV switchgear.

- XGN-40.5(Z) 1600-31.5 (Patent No.: 01119316.6) has independent intellectual property rights, with the advantages of new and compact structure, small size, convenient maintenance and inspection, which is very applicable for 35kV grade substation.
- Equipped with ABB GIS-ZX1 40.5kV switchgear picture 1), having the following advantages:
  a. GIS-ZX1 40.5kV switchgear sealed the CB cabinet、busbar cabinet and cable connector in the SF_6 gas chamber.
  b. MV-part is maintenance-free in their whole service life.
  c. Not influenced by ambient conditions such as corrosive and salt gas.
  d. Operation in the high altitude areas.
- Easy maintenance for KYN61-40.5 withdrawable switchgear.

5.3 12kV switchgear room

Equipped with different switchgears according to customers' requirements.

- XGN35-12 fixed type switchgear with ZN63A-12(VS1) or ZN28-12 type vacuum CB.
- KYN28A-12 metal-clad withdrawable switchgear with ZN63-12(VS1) or ABB VD4.
- HXGN15A-12 RMU with FZN21-12/T630-20 or FZRN21-12/T125-31.5 type vacuum load switch or load switch and fuse combination.
- XGN15-12 SF_6 RMU with FLN36-12D or FLRN36-12D type SF_6 load switch or load switch and fuse combination.

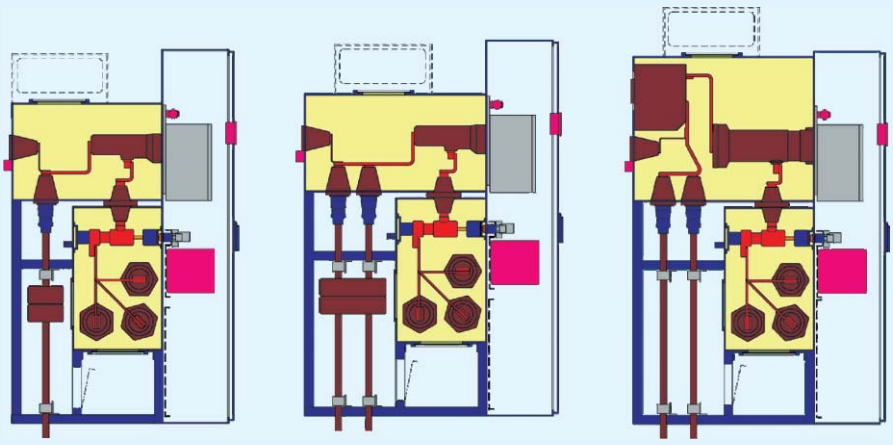
5.4 Relay protection room

The relay protection room is equipped with AC screen, DC screen, signal screen, movement control screen(RTU) carrier screen of fiber terminal.

***Note**: according to user's requirement, this substation could be protected by routine relay or use substation computer integrated automation system.*

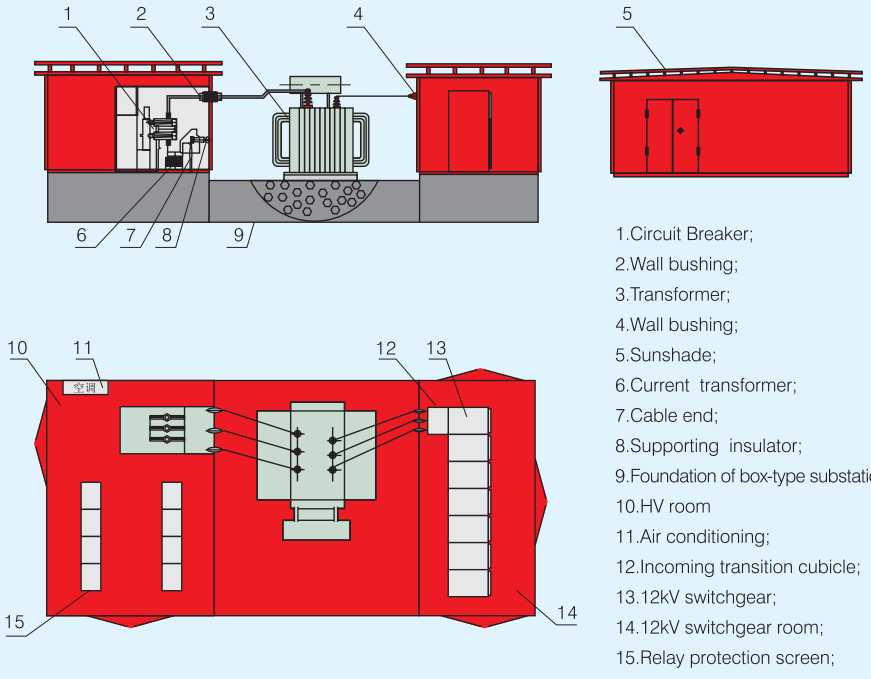
5.5 Horizontal plan and elevation of 40.5kV substation (See figure 2～4)

Figure 1



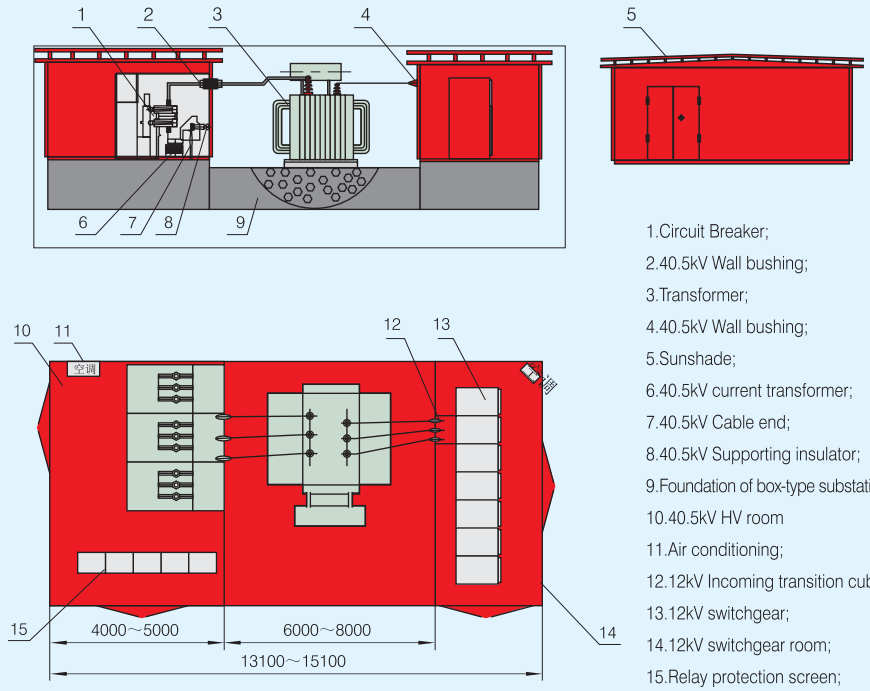
Prefabricated Substation

Figure 2



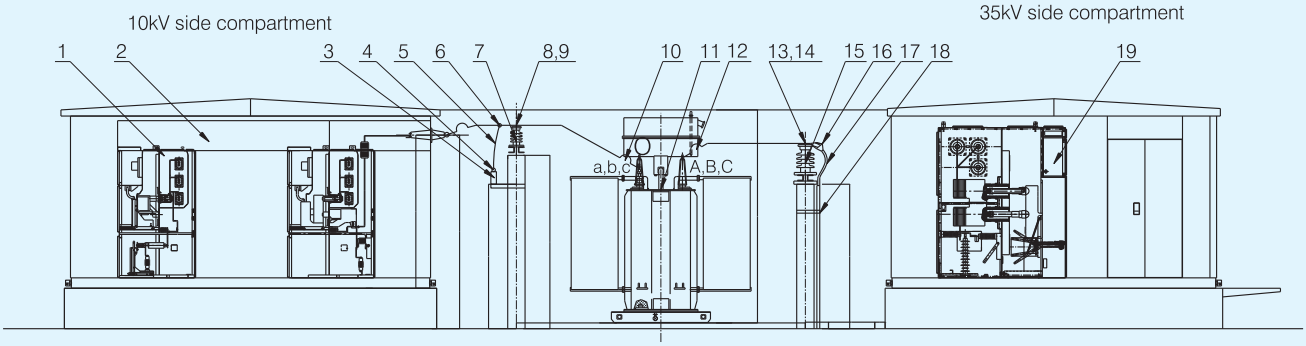
1.Circuit Breaker;
2.Wall bushing;
3.Transformer;
4.Wall bushing;
5.Sunshade;
6.Current transformer;
7.Cable end;
8.Supporting insulator;
9.Foundation of box-type substation;
10.HV room
11.Air conditioning;
12.Incoming transition cubicle;
13.12kV switchgear;
14.12kV switchgear room;
15.Relay protection screen;

Figure 3

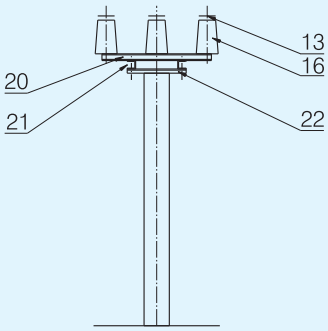


1.Circuit Breaker;
2.40.5kV Wall bushing;
3.Transformer;
4.40.5kV Wall bushing;
5.Sunshade;
6.40.5kV current transformer;
7.40.5kV Cable end;
8.40.5kV Supporting insulator;
9.Foundation of box-type substation;
10.40.5kV HV room
11.Air conditioning;
12.12kV Incoming transition cubicle;
13.12kV switchgear;
14.12kV switchgear room;
15.Relay protection screen;

Figure 4



On-site installation drawings

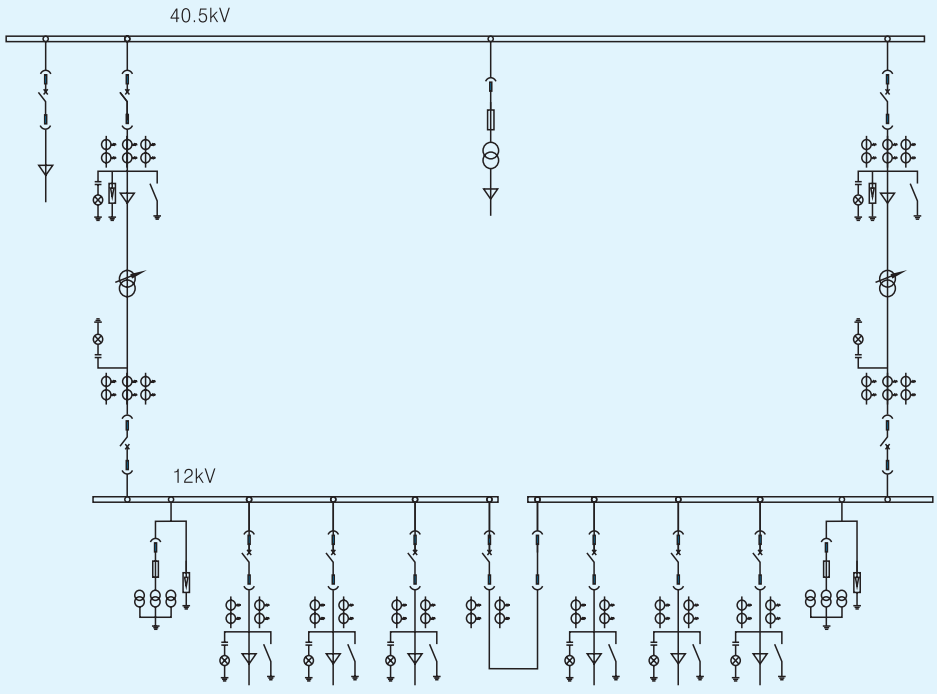


Fixed installation drawings of conductor

1. 10kV switchgear
2. 10kV bus-bar bridge
3. Zinc oxide arrester
4. Copper and aluminum transition equipment clip
5. wire
6. Alive dismounting clip
7. Supporting insulator
8. Rectangular aluminum conductor
9. Rectangular bus-bar fixed fittings
10. Copper and aluminum expansion joint
11. Main transformer
12. Copper and aluminum expansion joint
13. Rectangular aluminum conductor
14. bus-bar fixed fittings
15. Supporting insulator
16. cable end
17. power cable
18. cable protection pipe
19. 35kV switchgear
20. U-steel
21. U-steel
22. U-steel

9 Typical primary system diagram(Figure 5~Figure 7)

Figure 5



Prefabricated Substation

Figure 6

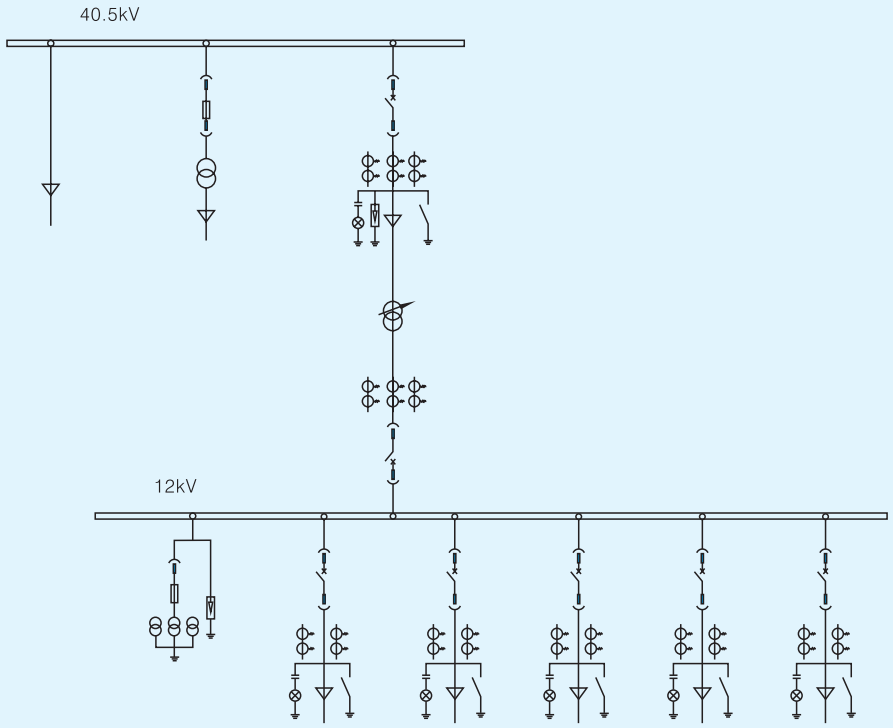
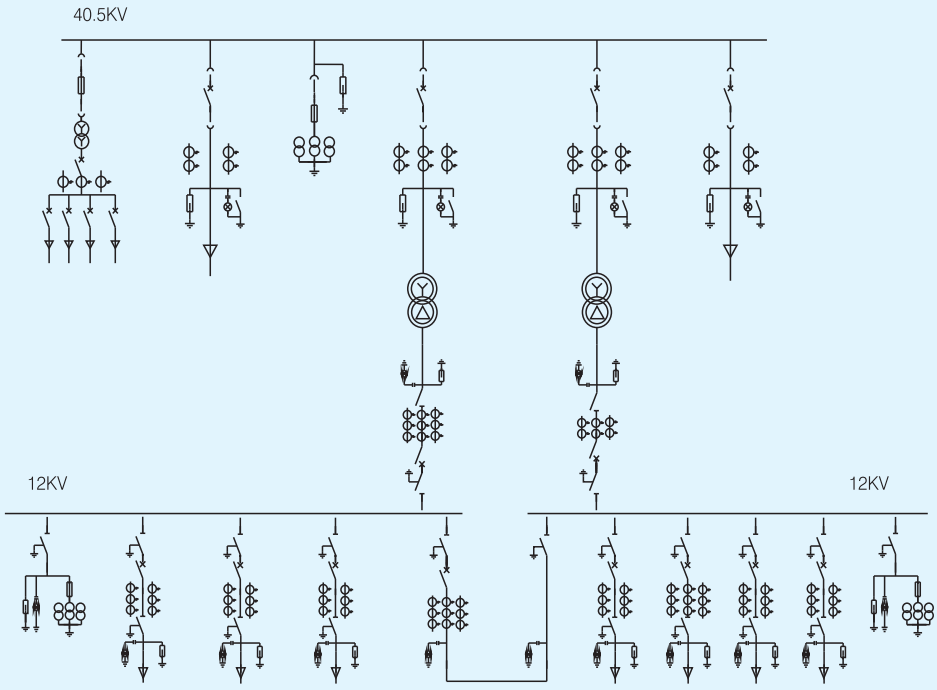
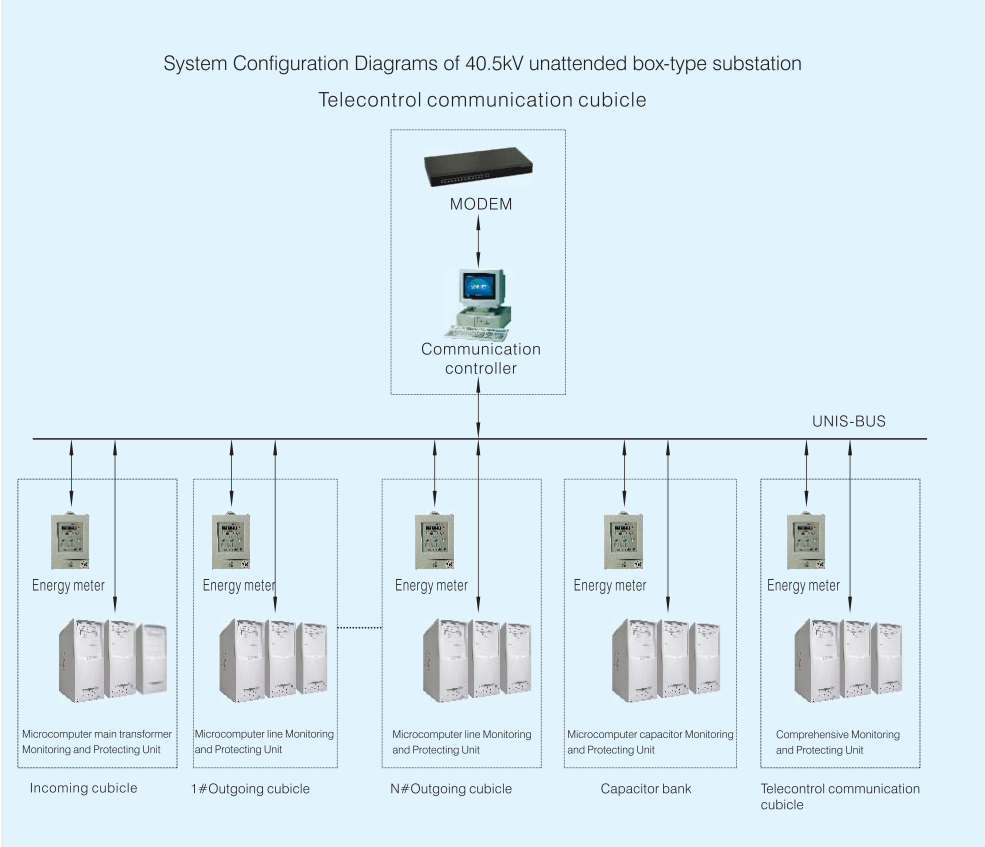


Figure 7



7 Box-type Substation System Diagram



***Notes**: This system diagram is a typical design drawing of 40.5kV box-type substation, in actual use, we can make different system configuration according to customers' different requirements.*

8 Installation

8.1 Foundation

The prefabricated substation only need the steel and concrete foundation which is poured in the outdoor ground.

8.2 Transformer、40.5kV switchgear room、12kV switchgear room all are individual transportation unit, and can be assembled and connected on site.

8.3 Incoming and outgoing line of power source can use cable or overhead line, customer can chose freely, please mark out when order the goods.

9 Inspection, Adjustment and Test

After pre-fabricated substation is installed, carry out inspection, commissioning and test before putting into operation. Before the test, the inlet and outlet wires must be disconnected.

9.1 Adjustment

The pre-fabricated substation has been adjusted before they leave the factory, normally the user doesn't have to reset. If users found the parameters were changed or didn't comply with the relevant requirements, please adjust them in time.

9.2 Test

- Operating test

  Launch opening and closing operating test to main switch, the test should be carried on smoothly.

- Power frequency withstand voltage test

  40.5kV Main circuit of complete equipment 76kV 1min auxiliary circuit 2kV 1min
  12kV Main circuit of complete equipment 34kV 1min auxiliary circuit 2kV 1min
  6kV main circuit of complete equipment 28kV 1min auxiliary circuit 2kV 1min

- Other tests

  For other electrical components and auxiliary circuit, bus bar, grounding and the relay protection, the tests should accord to relevant standards and regulations.

9.3 Inspection before the operation: the inspection items and requirements are shown in the table below:

Item	Requirements
General inspection	a. Elements and parts should be intact;
	b. All connection parts should be fastened;
	c. Elements and insulators is free from moisture and rust corrosion.
	d. Door open and close should be flexible.
	e. No rust and rust articles.
Wiring inspection	a. The bus is reliably connected and well grounded, with correct phase sequence.
	b. Reliable grounding
	c. Control switch, meter and breaker models conform to relevant drawings, wiring is correct and reliable.
	d.Small bus has been installed.
	e. Relay is set and setting value conforms to requirements.
Action inspection	a. Main switch can be open/close operated, no clamping stagnation, good contact.
	b. Interlock device is flexible and reliable.
	c. Main switch mechanical properties conform to requirements.

10 Maintenance, Inspection and Precautions

10.1 Regular inspection item

a) Check the relay action is normal;
b) Check signal and indication are normal;
c) Check open/close and energy storage power are normal;

10.2 Annual inspection and maintenance items:

a) Check whether the connection points of primary and secondary circuits are loosening and overheating;
b) Check inter-phase and grounding insulation with megger; observe whether there is damage and aging;
c) Clean the dust and foreign object;
d) Make all inspection records.

10.3 Carry out complete inspection and test in case of re-installation after every movement.

10.4 Inspection and precautions

If there are abnormal phenomenons or some parts are abnormal, inspection or replacement must be carried out. The higher level disconnectors must be disconnected and earthing switch must be closed in case of inspection. The inspection can only be conducted after confirming the power is off.

11 Transportation and Storage

If pre-fabricated substation product is transferred out of the factory, it should be divided into several transportation units, covered with plastic cloth, and it should be well bind to keep product clean. If SF_6 breaker is installed, it should be discharged to keep zero gauge pressure.

12 Attached Technical Documents

Attached technical documents include:

12.1 Product certificate

12.2 Installation instructions

12.3 Secondary circuit diagram

12.4 Packing list

13 Ordering Information

The user should notice the followings to order product:

13.1 The type and quantity of pre-fabricated substation

13.2 The type and capacity of transformer

13.3 Provide electric primary circuit diagram and secondary circuit diagram

YBM(P)29-40.5/0.69kV(Ordinary)

NYBM(P)77-40.5/0.69kV(Compact)

YBM(P)29-40.5/0.69kV (Ordinary Type)
NYBM(P)77-40.5/0.69kV (Compact Type)
40.5kVMV/LV Prefabricated Substation for Wind Power Generation

1 General

YBM(P) 29-40.5/0.69kV and NYBM(P)77-40.5/0.69 kV MV/LV prefabricated substation series products are designed for wind power generation, wind generator output voltage is 0.69 kV, via 0.69/35 kV transformer step-up to 35kV, after 35 kV line side via multiple circuits to form a combined unit, by 35 kV cable line to 35/110kV booster stations.

The prefabricated substation is composed of step-up transformer, medium voltage switchgear Panel, LV switchgear Panel and auxiliary equipment such as power transformer, and combined with reasonable case for a complete set of substation.

The performance is fully met GB/T17467-1998 " MV/LV Prefabricated Substation", it is in view of the special requirements of the wind power generation and developed a new type of prefabricated substation, with the advantages of strong completion, easy installation, short construction period, low cost operation, high structural strength, strong anticorrosion performance etc, fully applicable to the poor natural condition for running, such as the beach, grassland, desert etc. The type testing is inspected by Shanghai power transmission & distribution testing center, the performance is fully met the requirements of wind farms use.

The main difference between YBM(P) 29 - 40.5/0.69kV and NYBM(P)77-40.5/0.69 kV are as following, the main transformer are installed outside of the enclosure for YBM(P) 29 -40.5/0.69 kV, it is more advantageous to the heat dissipation and transformer maintenance, and for NYBM(P)77-40.5/0.69kV, the main transformer is installed within the case, it is better for protective effect.

2 Working Condition

2.1 Normal service conditions

- Running environment temperature: ambient air temperature is less than 45 ℃, and the average value shall not more than 35 ℃within 24 hours. The Minimum ambient air temperature is- 30 ℃
- Relative humidity: Relative humidity of daily mean shall no more than 95%. Water vapor pressure of daily mean shall no more than 2.2 kPa. Relative humidity of monthly mean shall no more than 90%. Water vapor pressure of monthly mean shall no more than 1.8kPa
- Altitude:≤1000m
- Seismic restraint capacity:
  Horizontal earthquake acceleration: below 0.4m/s2
  Vertical earthquake acceleration: below 0. 2m/s2
  Safety factor: 1.67
- Mounting points without severe movements, and no more than 3° inclination
- Outdoor wind speed: not more than 35m/s
- There should be no conductive dust, corrosive, flammable and explosive hazardous articles which are harmful to metal and insulator

2.2 Special service conditions

Customized design is available.

3 Main Technical Parameters

3. 1 Rated Parameter for Prefabricated Substation

- Voltage
  High voltage side：40.5kV
  Low voltage side：0.69kV
- Rated frequency：50Hz
- Rated insulation level
  The rated insulation level of switch gear panel can meet requirements of DL404-91" indoor AC high voltage switchgear panel".

HV Side	To Earth and between poles	Between open contacts
Power frequency withstand voltage	95kV	110kV
Impulse peak Withstand voltage	185kV	215kV
LV Side:		
Power frequency withstand voltage	2500V	

- Phase Number: Three Phase
- Protection Level: IP44D

NFZ77-40.5D/T1250-20

NFZR77-40.5D/T63-31.5

3.2 Main Technical Parameter for Transformer

- Technical Standard

  Transformer can meet the standard of GB1094.1～1094.5 "Power Transformer" and GB6451.1" Three Phase Oil immersed Power transformer technical Parameter and requirement".

- Technical Parameter

  1) Type：S11-M、S9-M
  2) Rated Capacity: 500～2500kVA
  3) Rated Voltage：HV 40.5kV　　LV 0.69kV
  4) Ratio： 0.69/40.5（kV）
  5) No-load Loss：≤1.7 kW
  6) Load Loss：≤15 kW

3. 3 Technical Parameter for HV Switchgear

- Vacuum load switch and Fuse-combination Unit

  Type: NFZ77-40.5D/T1250-20 Indoor HV AC Vacuum load switch for wind power use.
  NFZR77-40.5D/T63-31.5Indoor HV AC Vacuum load switch & combination Unit for wind power use.

Use the vacuum load switch and Fuse-combination unit, the element choice are according to the requirements of GB16926"HV AC load switch-fuse combination unit"

Main Technical Parameter for Vacuum load switch and Fuse-combination Unit

SN	Item		Unit	Parameters	
					NFZR77-40.5D/T63-31.5
1	Rated Voltage			NFZ77-40.5D/T1250-20	40.5
2	Rated Frequency		kV	40.5	50
3	Rated Current		Hz	50	63
4	Rated Insulation	1min Power Frequency withstand Voltage	A kV	1250	Vacuum contacts, between poles, and to earth 95; Open contacts 110
		Lightning impulse withstand voltage(peak)	kV		Vacuum contacts, between poles, and to earth 185; Open contacts 215
5	Rated peak withstand current		kA	50	/
6	4s rated short time withstand current		kA	20	/
7	Rated active load breaking current		A	1250	/
8	Rated closed circuit breaking current		A	1250	/
9	rated cable-charging breaking current		A	21	/
10	Rated short-circuit breaking current		kA	/	31.5
11	Rated handover current		A	/	1200
12	Fuse Type			/	XRNT3A-40.5/□ -31.5
13	Impactor energy output		J	/	2～5
14	Rated short-circuit making current		kA	50	80(peak)
15	Rated peak withstand current for earthing switch		kA	50	50
16	4s rated short time withstand current for earthing switch		kA	20	20
17	Rated voltage for auxiliary circuit(DC&AC)		V	220；110	220；110
18	Mechanical Life		times	10000	10000

- Fuse

  1) Type： XRNT-40.5
  2) Rated Voltage：40.5kV

- Surge Arrestor

  1) Style：Silicone rubber coat non-clearance metal zinc oxide surge arrestor
  Type：YH5WZ-51/134
  2) Rated voltage： 51kV
  3) Continuous-running voltage： 40.8kV

***Notes**: 40.5kV side, according to the requirement of the user, the C - GIS gas insulated switchgear or other types of switchgear could be used.*

3.4 LV switchgear is produced strictly according to GB725.1、IEC60439 and wind farm conditions.

- LV main circuit breaker

  1) Type
  2) Rated voltage

3) Rated current
4) Rated limitary short-circuit breaking capacity
5) Controller: Intelligent release

4 Product Structure Characteristics

4.1 YBM(P)29-40.5/0.69kV series of normal MV/LV pre-fabricated substations.

- Wind farms normally are built in the beach, shallow sea, grassland, desert where sparsely populated and natural condition is poor. Using different anticorrosive processing according to the different operating environment, the service life of pre-fabricated substation is guaranteed.
- The entire layout of box transformer is “P3 Figure 2-3, Figure 2-4” type with the advantages of compact and reasonable structure, small volume size. Main elements could be connected easily, significantly reducing cooper bar; there is larger wiring space for wire in/out cable and overhaul space, to facilitate assembly and overhaul.

  Box structure: re-develop colored steel plate box structure, replace original purchased aluminum extrusions with colored steel plate made of steel plate, improving overall strength and reduce manufacture costs.

  Develop complete set of 40.5kV vacuum combinations, skeleton installation method is used in the box transformer for the first time. The structural layout is more suitable for special requirements of the box transformer: reduced costs, convenient operation, more reasonable overhaul and cable wiring space. The more important is, the developed isolation interlock device adopts two connecting rods with slider mechanism, and the operation method is lever principle: effort saving and flexible. The device is at folded position in case of energized operation and forms overhaul space in case of overhaul, eliminating generally used method to operate insulation plate manually. Its marks are reasonable and clear. The use of electromagnetic and mechanism double interlock is a striking technical innovation of this pre-fabricated substation.

  If YB29-40.5/0.69 kV series of medium voltage/low voltage pre-fabricated substation is used in shoals or shallow water, all metal structural component should be treated by sandblasting, hot zinc spray and paint. Such corrosion resistance process is widely used in shipbuilding and container manufacturing industry, as chemical and physical double protection, ensuring the use of equipment in wet environment with heavy salt spray, with strong corrosion resistance ability.

  If YB29-40.5/0.69 kV series of medium voltage/low voltage pre-fabricated substation is used in the cold environment with huge temperature difference and strong wind sand, such as deserts and grasslands, the shell should be composite colored steel plate or stainless steel plate with strong film adhesion, preventing shell rust due to film peeling in wind sand environment for a long period. The middle is filled with polyurethane and silicate composite insulation materials which have good thermal insulation properties, so that the equipment could be safely and rapidly put into operation in cold environment.

  In addition, according to special environment requirements of wind power plant, the developed ventilation device is reasonable and beautiful, which could enhance heat dissipation effects and increase box strength. Hinge special for wind power box transformer door panel, and the door panel can be opened with 180 degrees. New type of door panel positioning device is sued to meet the special requirements of wind power plant on door panel open method and positioning.
- The transformer is mainly three-phase double-winding oil-immersed no load regulating S11 type low loss power transformer. Other types of power transformer could be equipped according to requirements. S11 type of power transformer adopts a series of reforms in materials, processes and structure; so that the product's electrical performance could meet the advance level of equivalent international products in 1990s. Its no-load loss and load loss are both lower than national standard requirements, with the features of high efficiency and low loss, saving a large amount of power consumption and operation costs, achieving obvious social benefits. The iron core is high quality cold rolled grain oriented silicon steel miter lamination, and the oil is injected by vacuum.
- Low voltage side adopts NA1 series of intelligent circuit breaker or other series of low voltage breaker, as power distribution and circuit protection equipment, protecting against overload, under voltage, short circuit and single-phase ground fault hazards. At the same time, low voltage side has small-scale overhaul transformer to provide power for the users in case of site overhaul. Electrical beams of low voltage cabinet frame use hot dip galvanized anti-corrosion treatment.
- Medium voltage side adopts indoor medium voltage AC vacuum load switch and combination NFZR77-40.5D/T63-31.5 vacuum load switch and fuse combinations special for the wind power users. 40.5kV vacuum combination complete set device is developed so that the structural layout is more suitable for the special use requirements of pre-fabricated substation, with the features of convenient operation, more reasonable overhaul room and cable wiring room. The developed isolation interlock device adopts two connecting rods with slider mechanism, and the operation method is lever principle: effort saving and flexible. The device is at folded position in case of energized operation and forms overhaul space in case of overhaul, eliminating generally used method to operate insulation plate manually. Its marks are reasonable and clear. The use of electromagnetic and mechanism double interlock is a striking technical innovation of this box transformer.

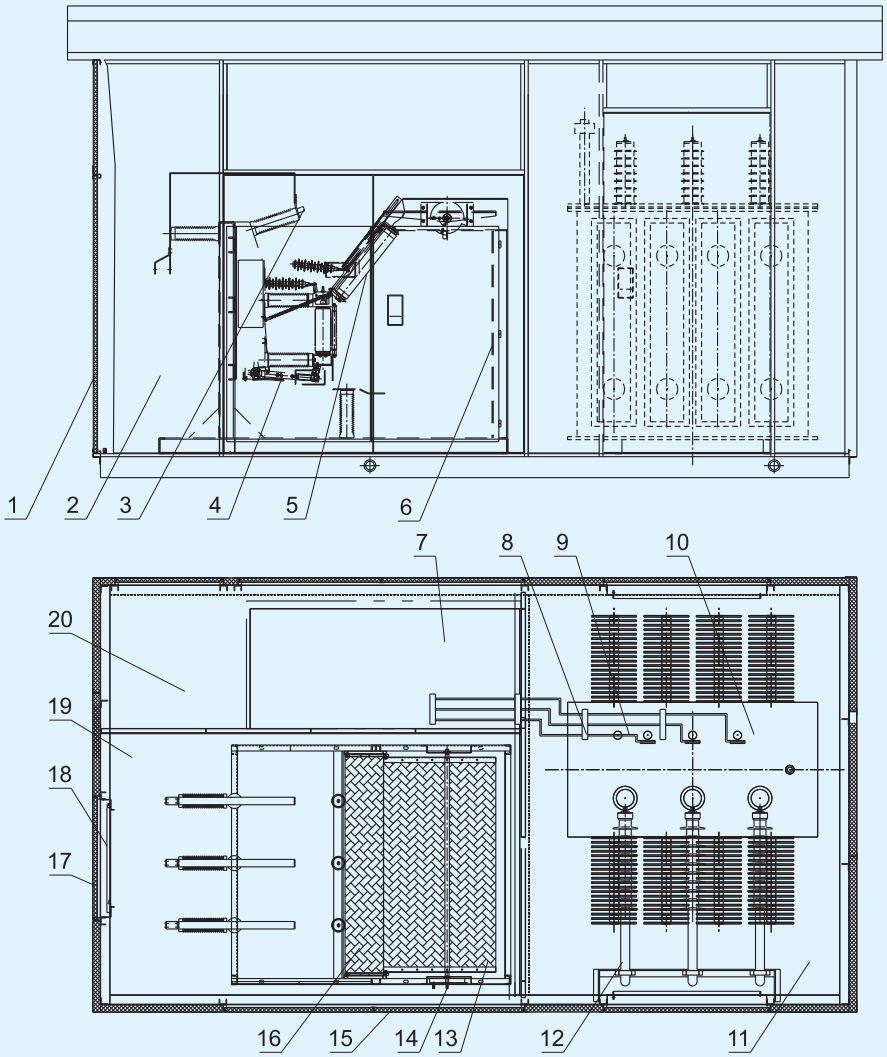
We have applied for a patent from National Patent Bureau.

Patented invention: Isolation interlock equipment for 40.5KV vacuum composite apparatus equipment set (Patent application No: 200810203333.9, Publication No: CN101409174A)

Utility Design Patent: 40.5kv Compact type wind power generation prefabricated substation (Patent application No: 200820155884.8)

Prefabricated Substation

Figure 1: YBM(P)77-40.5/0.69kV Common type MV/LV Prefabricated Substation Structure Illustration



1. Enclosure case of Prefabricate substation
2. 40.5kV Outgoing cable bay
3. Stationary contact of vacuum composite apparatus
4. Complete equipment with 40.5kV vacuum composite apparatus
5. Fuse
6. Maintenance door for 40.5kV side
7. LV switchgear
8. LV busbar fix racket
9. Busbar connect from LV main incoming switchgear to transformer room
10. Transformer
11. Transformer room
12. Connect cable for 40.5kV side
13. Insulation board for isolating equipment (upper)
14. Insulation board mechanism for isolating equipment
15. HV room door
16. Insulation board for isolating equipment (lower)
17. HV cable room door
18. Protection door for 40.5kV maintenance room
19. HV room
20. LV room

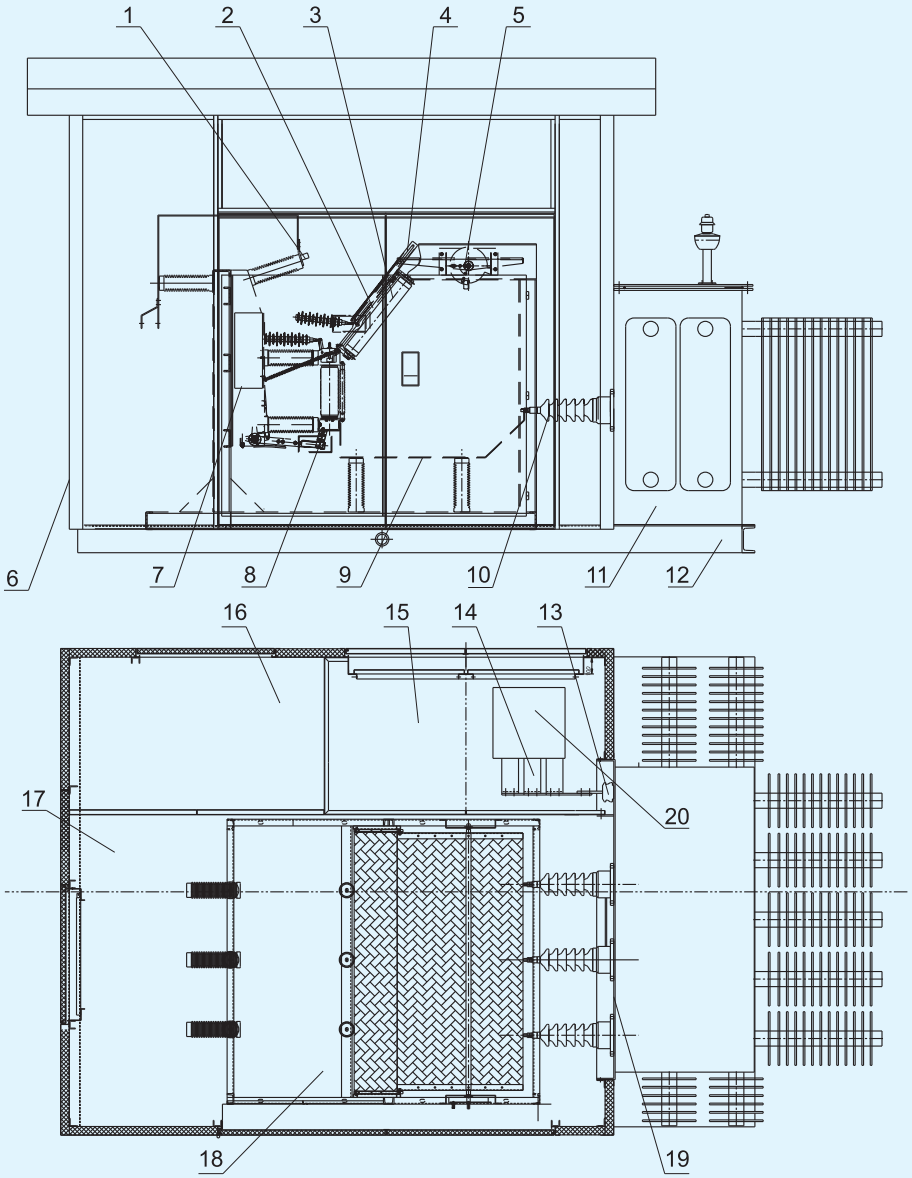
4.2 NYBM(P)77-40.5/0.69kV compact type MV/LV Prefabricated Substation

NYBM(P)77-40.5/0.69kV compact type MV/LV Prefabricated Substation is a model designed based on common type prefabricated substation model: YBM(P)77-40.5/0.69kV. It mainly arranges the radiator of transformer into the enclosure case of substation. And extend MV/LV incoming and outgoing bushing into related functional room through one side face. This design not only better solved heat radiating but also compact the whole structure.
We have applied for a patent from National Patent Bureau.
Patented invention: Isolation interlock equipment for 40.5kV vacuum composite apparatus equipment set (Patent application No: 200810203333.9, Publication No: CN101409174A)

Utility Design Patent: 40.5kV Compact type wind power generation prefabricated substation (Patent application No: 200920072002.6), Design patent: compact composed prefabricated substation (Patent application No: 200930098120.X).

Prefabricated Substation

Figure 2 MV/LV prefabricated substation structure drawing



1. Static contact of vacuum composite apparatus
2. Insulation plate
3. Moving contact of vacuum composite apparatus
4. Fuse
5. Insulated interlocking device
6. Enclosure
7. 40.5kV Vacuum composite apparatus complete equipments
8. 40.5kV Vacuum composite apparatus
9. HV connecting busbar
10. Transformer HV outgoing terminal
11. Transformer
12. Base
13. Transformer LV outgoing terminal
14. LV connecting busbar
15. LV room
16. Mantainance room
17. HV cable outgoing room
18. HV room
19. Transformer outgoing terminal mounting panel
20. LV circuit breaker

5 Auto monitoring system (option)

Regarding to the using of wind power box changes will be placed in harsh environments, while long-term absences of state run. The device can be equipped with LV intelligent monitoring unit to connect with background monitoring system monitoring unit and connections to realize the telemetry, remote viewing, remote communication and other "remote" function. Specific configuration is as follows:

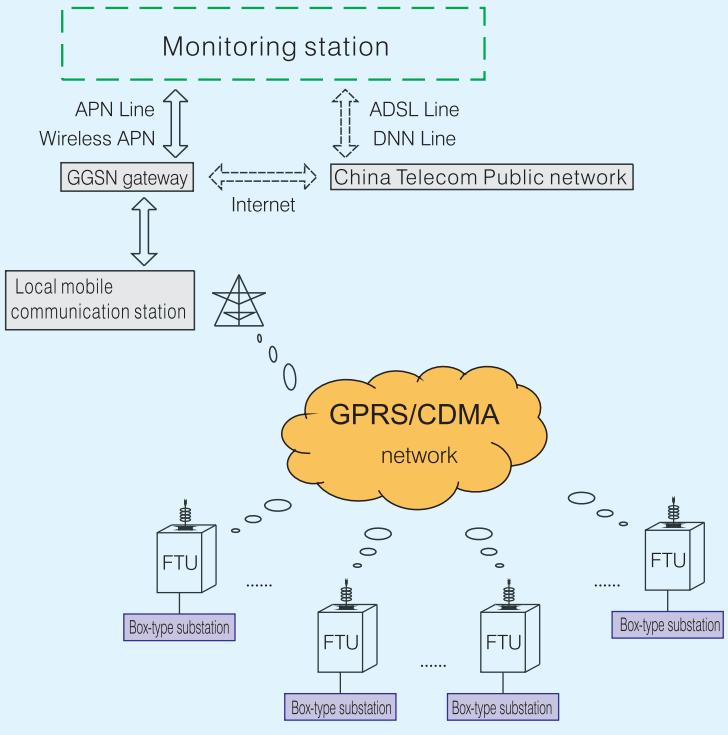
		Standard Fitting	Optional Fitting
Remote Communication	35kV load switch position	√	
	35kV earthing blade position	√	
	LV CB operation status	√	
	LV outlet unit position	√	
	Transformer pressure relief	√	
	Transformer gas alarm and trip	√	
	Transformer temperature high alarm and over temperature trip	√	
	Transformer oil level high-low signal	√	
	Station smoke-explosion alarm		√
	Station flooding alarm		√
	Device door-open alarm		√
Remote Control	Remote control 35kV load switch and LV main CB	√	
Remote Measurement	Full power factor (voltage \ current \ power \ frequency \ power energy)	√	√
RTD	RTD transformer oil temperature	√	
Communication	GPRS network	Alternative	
	Optical fiber network		

5.1 Two recommend communication network plan

1) GPRS network

If it is inconvenient to construct or is not laying fiber-optic network for the current system, We recommend using the GPRS network program, which leased the China Mobile's GPRS network, and the device should be installed to a GPRS module, as long as the device-side was covered by China Mobile network, you can easily Networking. And it is easy to install the whole system, which is low cost and high reliability. The following figure shows a schematic diagram of the system network.

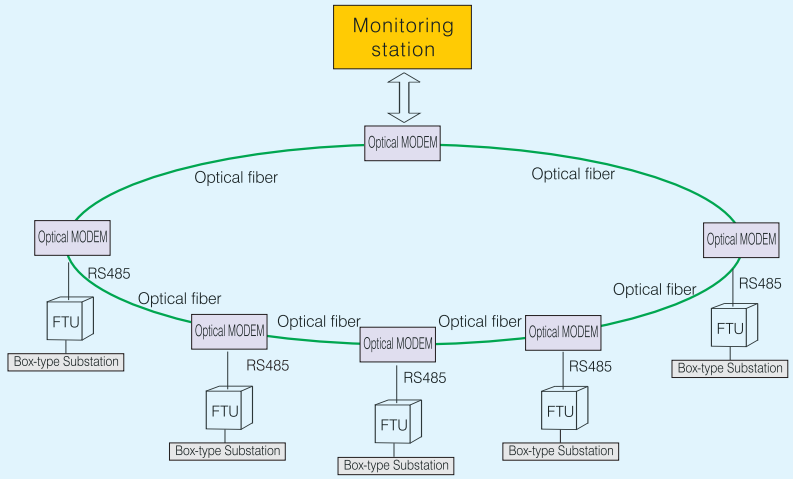
Figure 3 GPRS schematic diagram drawing



2) GPRS network/Optical fiber network

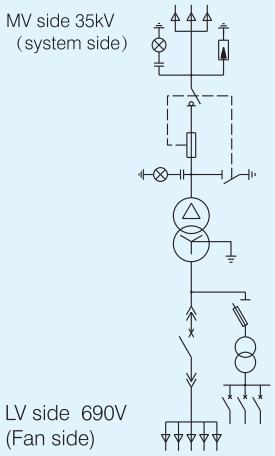
If the current system has been laying fiber-optic network, and easy access to the internal box changes, we recommend the use of fiber-optic network, the master side, the device ends the installation of a photovoltaic module optical MODEM. The following figure shows a schematic diagram of the system network.

Figure 4 Optical fiber network diagram drawing



6 Typical single line drawing

MV side (system side)



7 Installation

7.1 Foundation

This type of prefabricated substation level placed in well in advance, based on the product and then the gap between the base and the foundation with cement Mortar touch seal to prevent rainwater from entering the cable compartment. MV and LV chamber through the bottom seal plate access high low-voltage cables.

7.2 LV side of the fan to the box changes to cable connections, MV side of the supremacy of a power station for the cable connection, if so please specify when ordering.

8 Inspection Adjustment and testing before putting into construction

After prefabricated substation installation, it should be checked before operation, adjustment and testing, must be introduced before the test, cut off the leads.

8.1 Adjustment

Prefabricated substation has been adjusted before leaving the factory, the clients do not need to re-adjust under normal circumstances. If the prefabricated substation occurs some data changed and don't meet the requirements, it should be adjusted timely.

8.2 Test

- Operating test

  Launch opening and closing operating test to main switch, the test should be carried on smoothly.

- Power frequency withstand voltage test

  40.5kV Main circuit of complete equipment 76kV 1min

  Auxiliary circuit 2kV 1min

- Other tests

  For other electrical components, auxiliary circuit, bus bar, grounding and the relay protection, the tests should be according to relevant standards and regulations.

8.3 Inspection before the operation: The inspection items and requirements are shown in the table below:

Item	Requirements
General inspection	a Elements and parts should be intact;
	b All connection parts should be fastened;
	c Elements and insulators are free from moisture and rust corrosion.
	d Door open and close should be flexible.
	e No rust and rust articles.
Wiring inspection	a The bus is reliably connected and well grounded, with correct phase sequence.
	b Reliable grounding.
	c Control switch, meter and breaker models conform to relevant drawings, wiring is correct and reliable.
Action inspection	a Main switch can be open/close operated, no clamping stagnation, good contact.
	b Interlock device is flexible and reliable.
	c Main switch mechanical properties conform to requirements.

9 Maintenance, Inspection and Precautions

9.1 Maintenance

- Regular inspection items

  a. Check signal and indication are normal

- Annual inspection and maintenance items:

  a) Check whether the connection points of primary and secondary circuits are loosening and overheating

  b) Check inter-phase and grounding insulation with megger; observe whether there is damage and aging

  c) If transformer is oil immersed type, analysis of oil sample should be carried out at least once a year

  d) Clean the dust and foreign object

  e) Make all inspection records

- Inspection and precautions

If there are abnormal phenomenous or some parts are abnormal, inspection or replacement must be carried out. The higher level disconnectors must be disconnected and earthing switch must be closed in case of inspection. The inspection can only be conducted after confirming the power is off.

10 Storage

After box transformer arrives at the destination, it should be installed in use position as soon as possible. The transformer door of the box transformer which is not put into operation immediately should be locked.

11 Attached technical documents

Attached technical documents include:

11.1 Product certificate

11.2 Installation instructions

11.3 Secondary circuit diagram

11.4 Packing list

12 Ordering Information

The user should notice the followings to order product:

12.1 The type and quantity of pre-fabricated substation

12.2 The type and capacity of transformer

12.3 Provide electric primary circuit diagram and secondary circuit diagram

YB6-12/0. 4 MV/LV Prefabricated Substation

1 General

With international advance technology, the YB6-12/0.4 type prefabricated substation possess many strengths, like convenient maintenance, low noise, low loss, prevention of burglary, capability of overload. It is mainly used to the tall building of the urban, Resident sub district, greenbelts, park, public placeto accept and distribute electric power.

The YB6 type prefabricated substation in accordance with IEC1330. It is used as transmission distribution, metering, compensation, control, and protection of device in 10kV ring network power supply system, duplicate supply system and terminal power supply system.

Besides the transformer which is installed in the YB6 type prefabricated substation, there are some other component, four position load switch, two position load switch, backup fuse and plug-in fuse at the MV side. At the LV side, the electric control component, compensating device, metering instrument and distributing component can be designed under client's requirement. The insulating medium is oil.

The scheme to cancel cable head of MV side has got the patent (No. ZL2006200450038).

2 Type Designation

YB 6 — 12/0.4 (F.R) / T — □

- Rated capacity (kVA)
- Spring operating mechanism
- Fuse +load switch
- Rated voltage
- Design number
- Prefabricated substation

3 Working Condition

1) Altitude: ≤1000m
2) Ambient temperature: no higher than +40℃ and the average value in 24h is no more than 35℃; no lower than -30℃
3) Outdoor wind speed: no more than 35m/s
4) Pollution level: not exceed III
5) There should be no fire, exploding danger, severe nasty, chemical corrosion and strong vibration.
6) The equipment should be installed on a flat and firm platform
7) Air self cooling(AN)

4 Main Technical Parameters

4.1 Technical Parameters of Pre-fabricated Substation

Figure 1

No.	Item		Unit	Data
1	Rated Voltage	HV side	kV	12
		LV side	kV	0.4
2	Rated capacity of transformer		kVA	100, 125, 160, 200, 250 315, 400, 500, 630, 800, 1000
3	No-load voltage tap changers			±2×2.5%
4	Connection method			△/Yn11
5	Rated insulating	Lightning impulse withstand voltage(peak , full wave	kV	75
		Power frequency withstand voltage 1min	kV	35
6	Power frequency withstand voltage at LV side, phase-phase, phase-earth(1min)	Main circuit	kV	2.5
		Control and Metering circuit	kV	2.0
7	Noise level		dB	50
8	Preventing class			IP34
9	Cooling method			

4.2 Technical Parameters of Load Switch (Table 2)

Table 2

No.	Item		Unit	Data	
				Four Position Load Switch	Two Position Load Switch
1	Lighting impulse withstand voltage(Peak, Full wave)	To phase, phase to phase	kV	75	75
		Isolating distance	kV	85	85
2	1min power frequency withstand voltage	To phase, phase to phase	kV	42	42
		Isolating distance	kV	48	48
3	Rated current		A	630	315
4	Rated short-Circuit making current (Peak)		kA	31.5	16
5	Rated short time withstand current		kA	12.5	6.3
6	Rated short-Circuit time duration		s	2	2
7	Rated peak withstand current		kA	31.5	16
8	Mechanical life		times	2000	2000
9	Conversion time between open and close		ms	16~22/15~20	11~15

4.3 Technical Parameters of Fuse (Table 3)

Table 3

No.	Capacity (kVA)	Rated current of backup protection fuse(A)/breaking k(A))	Rated current of plug-type fuse (A)
1	100	40/40	10
2	125	50/40	15
3	160	63/40	25
4	200	80/40	25
5	250	80/40	25
6	315	80/40	25
7	400	100/40	40
8	500	100/40	40
9	630	125/40	65
10	800	175/40	65
11	1000	200/40	100

5 Product Structure Characteristics

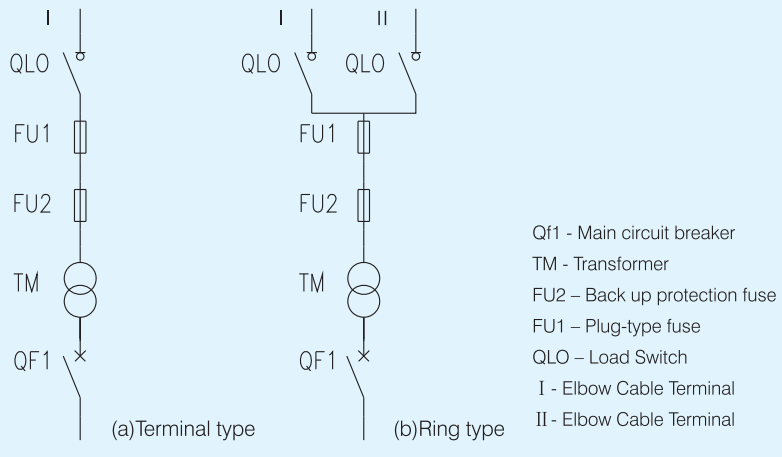
5.1 Transformer body and HV switchgear are assembled separately, there are only electrical connection between transformer and HV switchgear. The arc caused by live operation on load switch will only make the oil in the switch become black or even carbonize without influence the quality of the oil.

5.2 Low losses, and strong overload capability.

5.3 Can be used in ring power supply network, double source power supply system and terminal power supply system. Convenient power supply conversion, and working reliable.

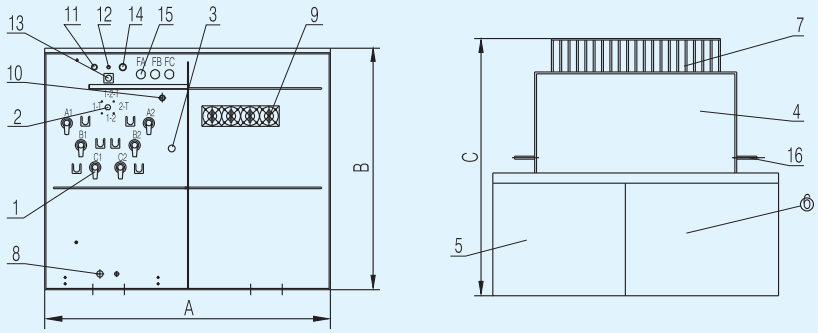
5.4 This product can be equipped with lacking phase protection devices. When lacking phase happens, the LV circuit break will open automatically.

Figure 1 Schematic Drawing of Product



6 Overall dimension and structure (Table 4, Figure 2)

Figure 2 Prefabricated substation structure sketch



1.HV insulating bushing
2.Four-function load switch
3.Tap changer
4.Transformer
5.HV room
6.LV room
7.Radiator
8.Oil drain valve
9.LV outgoing wire
10.Oil temperature indicator
11.Oil filler point
12.Pressure relief valve
13.Oil level gauge
14.Pressure gauge
15.Plug-in fuse
16.Hook

(mm) Table 4

Capacity (KVA)	A(Terminal/Ring net)	B	C	Weight(kg)
100	1850/2050	1900	1470(1670)	1560
125	1850/2050	1900	1470(1670)	1640
160	1850/2050	1900	1470(1670)	1720
200	1850/2050	1900	1470(1670)	1830
250	1850/2050	1900	1470(1670)	2000
315	1850/2050	1900	1470(1670)	2200
400	1850/2050	1900	1470(1670)	2480
500	1850/2050	1900	1470(1670)	2970
630	1850/2050	1900	1470(1670)	3490
800	1850/2050	1900	1470(1670)	3620
1000	1850/2050	1900	1470(1670)	4650

7 LV device

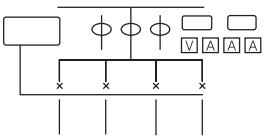
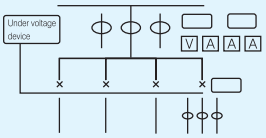
Low voltage side of prefabricated Substation can equip with no-voltage, under-voltage protection function. When MV side occurs default phase, the LV side can be automatically tripped.

According to user's requirements, the LV side can also be installed with distributing apparatus, control apparatus, compensation apparatus.

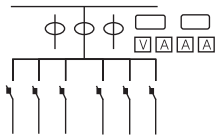
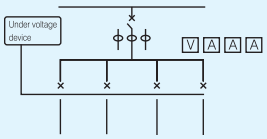
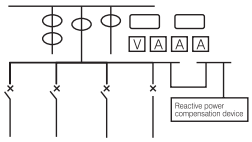
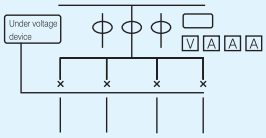
Alternatively, you can install comprehensive distribution tester which has with telemetering and remote telecommunications function.

Table 5 is a typical LV side scheme, which can probably meet with your requirements. If not, please contact us.

Table 5

No.	LV outgoing wire scheme		Sketch
1	Function	Main metering (watt-hour meter, vat-hour meter voltmeter, three-phase current meter) equipped with Four-way outgoing circuit breaker	
	Loop current	100A~630A	
2	Function	Main metering (watt-hour meter, vat-hour meter voltmeter, three-phase current meter) has one branch for active measurement and equipped with Four-way outgoing circuit breaker	
	Loop current	100A~630A	

Continue Figure 5

No.	LV outgoing wire scheme		Sketch
3	Function	Main metering (watt-hour meter, vat-hour meter voltmeter, three-phase current meter) equipped with Six-way incoming fuse switch	
	Loop current	160A、200A、400A、630A	
4	Function	Main switch, Main metering (voltmeter, three-phase current meter) equipped with Four-way outgoing circuit breaker	
	Loop current	Main switch 225A~2500A Outgoing switch 100A~630A	
5	Function	Main metering (watt-hour meter, vat-hour meter, voltmeter, three-phase current meter) equipped with Four-way outgoing circuit breaker and plug-in reactive compensation panel	
	Loop current	100A~630A reactive compensation 100kvar~200kvar	
6	Function	Main metering (comprehensive distribution tester, voltmeter, three-phase current meter) equipped with Four-way outgoing circuit breaker	
	Loop current	100A~630A	

8 Installation Platform

Prefabricated substation should be installed in a horizontal concrete countertop

Countertops should be guaranteed to withstand the weight of prefabricated substation

Recommended countertops size (Figure 3, Figure 4)

Recommended countertops size Figure 3

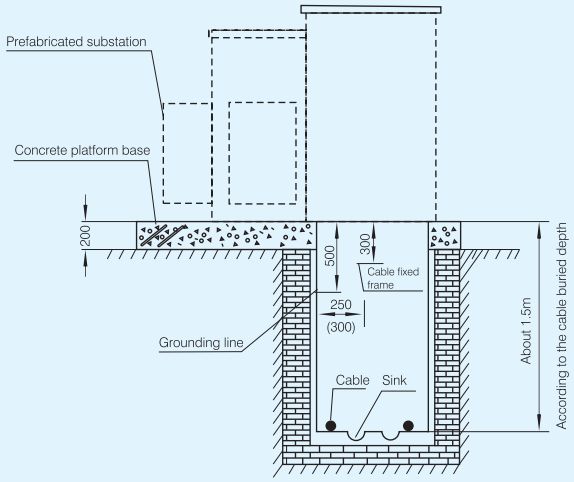
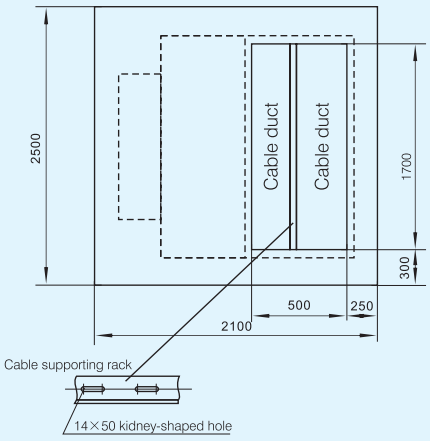


Figure4 Prefabricated substation proposal installation base dimension drawing



Note: 1. The relative dimension refer to the substation installation base dimension drawing

2. The concrete base ensure horizontal, the plate smooth， let's pre-fabricated substation uniform it's withstanding weight, the Prefabricated substations plate fixed firmly on the platform using clamp plate.
3. The form and size of about the ground busbar and cable connection holder supporting can make appropriate changes to the actual situation
4. Cable chamber wall and base platform using 1:25 matching cement mortar to seal, the thickness up to 20mm, and surface ensure smooth
5. The bottom surface of the cable compartment shall gutters slightly tilted to avoid stagnant water
6. The Ground Grid using 30×4mm plate steel or ¢12mm round flat steel respectively through from both sides's top of the basement, and firmly weld to the pre-embedded steel, ground resistance in accordance with local power bureau's requirements

9 Ordering Information

The user should notice the followings to order product:
Product type, size, quantity, weakness parts and color appearance etc

Available Product Range from CHINT Electric:

≥500kV


500kV Power Transformer


500kV Rod Composite Insulator


468kV Porcelain Metal Oxide Surge Arrester used for Substation


750kV Power Transformer

252kV


GW7-252 HV Switch Disconnector


GW22-252kV Switch Disconnector


GW23-252kV Switch Disconnector


252kV GIS


LW43-252 Circuit Breaker


220kV Power Transformer


220kV SF₆ tank metal oxide surge arrester (without gap)(GIS)


220kV Rod Composite Insulator


220kV Outdoor SF₆ HV Current Transformer


220kV Outdoor Oil-Immersed HV Current Transformer

110kV


LW36-126 Outdoor SF₆ Circuit Breaker


GW4-126 AC HV Switch Disconnector


126kV Compact GIS


126kV Compact GIS


ZF21-126kV GIS


110kV SF₆ tank metal oxide surge arrester (without gap) (GIS)


110kV Power Transformer

40.5kV


KYN61-40.5(Z) Metalclad Enclosed Withdrawable Switchgear


ZN85 Indoor Solid Sealed Polar Pole Vacuum Circuit Breaker


XGN77-40.5(Z) Cubicle Fixed AC Metal-enclosed switchgear


NYBM(P)77-40. 5-0. 69 HV/LV Prefabricated Substation


NFZR77-40. 5D HV AC Vacuum Load Switch-Fuse Combined Equipment Specialised for Wind Power


ZGS11 American Type Transformer Specialised for Wind Power


Outdoor SF₆ Circuit Breaker


ZW7-40.5 Outdoor HV AC Vacuum Circuit Breaker


GW4-40.5 Outdoor AC Switch Disconnector


YB29-40.5/12 Prefabricated Substation


Skid-type Box Transformer


TBBS (6-35kV) Substation Type Auto-switched HV Shunt Capacitor Equipment


MSVC Magnetic Control Reactor Type HV Static Reactive Compensator


35kV Oil-immersed Transformer with OLTC in SZ9 series


27. 5kV Surge Arrester & Insulator Used for Electric Railway 35kV Porcelain Metal Oxide Surge Arrester Used for Substation

12kV


KYN28A-12(Z) Metalclad Enclosed Withdrawable Switchgear


KYN28A-24(Z) Metalclad Enclosed Withdrawable Switchgear


XGN15-12 (SF₆) Fixed Type Metalclad Enclosed Loop Switchgear


HXGN15A-12 Fixed Type Metalclad Enclosed Loop Switchgear

XGN2-12 Box-type Fixed AC Metal-enclosed switchgear

XGN36-12 Box-type Fixed AC Metal-enclosed switchgear

NG7 Cubicle Gas Insulated Switchgear (C-GIS)

TBBF(6-10kV) HV Shunt Capacitor Complete Equipment

12kV Indoor Embedded Pole Vacuum Circuit Breaker

12kV Indoor HV AC Vacuum Circuit Breaker

12kV Indoor HV AC SF₆ Switch-fuse Combined Equipment

12kV Indoor HV AC Vacuum Load Switch-fuse Combined Equipment

12kV Outdoor HV AC Vacuum Circuit Breaker

12kV Outdoor Shunt Type HV AC Vacuum Load Breaker Switch (Electric Dog)

12kV Outdoor Shunt Type HV AC Vacuum Circuit Breaker (Electric Dog)

Outdoor HV Permanent Magnet Vacuum Circuit Breaker

12kV Outdoor HV AC Droping Fuse

HV Shunt Capacitor Compensation Equipment

TBBF(X) HV Shunt Capacitor Complete Equipment

S9-S11 Series Three-phase Oil-immersed Regulating Distribution Transformer without Excitation

S9-S11 Series Three-phase Oil-immersed Full-sealed Distribution Transformer withput Excitation

SC(B) series Epoxy Resin Dry-type Transformer

SCBH15 Amorphous Transformer

SBH15 Amorphous Oil-immersed Transformer

YB6 series Prefabricated Substation

YBM(P)29 HV/LV Prefabricated Substation

10kV Indoor Casting Current Transformer 10kV Indoor Casting Voltage Transformer

Outdoor Oil-immersed Energy Metering Box

12kV AC Three-phase Combined Over-voltage Protector With Composite Jacket and Gap

0.38-0.6kV

NGC8 LV Withdrawable Switchgear

NGC1~3 LV Withdrawable Switchgear

NGG1 LV Fixed Switchgear

NGZ2 series Power Supply Switchgear

NGZ3 DC Power Supply Switchgear

PZ series Lighting and Control Box

NTSC(0.4-1kV) Dynamic Filtering Compensator

BAM /BFM Full-film HV Shunt Capacitor

BAMH Assembled HV Shunt Capacitor

XKGKL Dry Type Air-core Current-limiting Reactor CKGKL Dry Type Air-core Reactor

BKS, BKD HV Oil-immersed Shunt Reactor

NCM1 Coarctation Insulated Control Bus-bar

XQJ series Cable Bracket

Cable

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