

## YB□-40.5(12)/0.69 Wind Power Special Compact Substation

### Summary

Nowadays, the wind energy source becomes one of the most important energy sources, and it is one of 'Green energy sources' which has great potential exploiting and applied perspective.

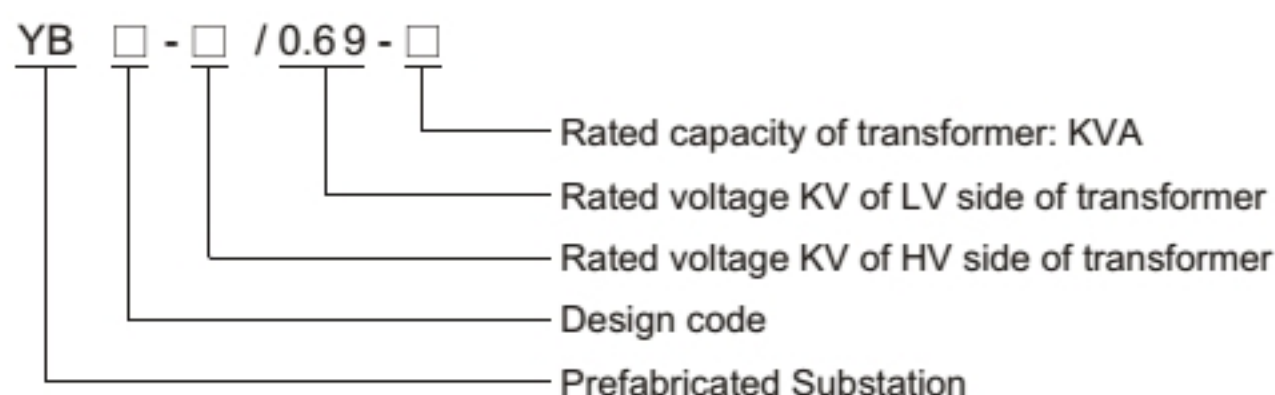
In normal time, the wind turbine output voltage is 690V, so it must be boosted to transmit far away. The wind farm usually use the cable to connect wind generator to wind power special prefabricated substation, boosting the voltage from 690V to 40.5kV, then transmit the power to wind farm's core substation, the core substation will boost the voltage again then connect to state power grid. The wind generator and packaged boosting transformer integration adopt one generator-one transformer unit wiring. This type prefabricated substation is designed and exploited according to this requirement.



### Ambient condition

1. Altitude:  $\leq 1000\text{m}$
2. Ambient temperature:  $-25^{\circ}\text{C}\sim+50^{\circ}\text{C}$
3. Relative humidity: Daily meaning value  $\leq 95\%$ , Month meaning value  $\leq 90\%$
4. Outdoor wind speed  $\leq 35\text{m/s}$
5. Ground gradient  $\leq 30$
6. Seismic intensity  $\leq \text{VII degree}$
7. No flame, explosion, serious pollution, chemical corrosion and severe vibration in mounting place, the pollution degree  $\leq \text{II degree}$ .

### Model



### Standards

Under normal usage condition it accroding to IEC 60694 and GB11022

IEC62271-202 & GB/T17467-1998	H.V./L.V. Prefabricated Substation
IEC62271-102 & GB/T1985	H.V. AC Disconnect switch and earthing switch
IEC62271-105 & GB/T 3804-1990	3kV-63kV AC H.V. Load break switch
IEC 420	H.V. AC Load break switch fuse combined apparatus
IEC62271-200:2003; GB3906-2006	3.6kV-40.5kV AC Metal-clad switchgear and controlling equipments.
IEC60694:1996; GB/T11022-1999	The public technical requirements of H.V. Switch equipment and controlling equipment standard
IEC60439-1:1999; GB7251.1-2005	L.V. Switchgear equipments and controlling equipments, part 1: type test and partial type test switchgear equipments
IEC60060-1:1989; GB/T16927.1-1997	H.V. test technology part1: common test requirements
IEC60529(1989); GB4208-1993	Enclosure protection degree: IP code
DL/T 537-2002	H.V./L.V. prefabricated substation selection guide rule
IEC60076 & GB/T6451	Three phases oil-immersed power distribution transformer's technical data and requirements

## Technical specification

	Item	Unit	Data	
H.V Unit	Rated frequency	Hz	50	
	System voltage	kV	10/11	35
	Max. Operating voltage	kV	12	40.5
	Switch rated voltage	A	400, 630, 1250	
	Switch transfer voltage	A	1000 ~ 3150	
	Rated short time withstand current	kA	12.5(2s or 4s), 16(2s or 4s), 20(2s or 4s)	
	Rated peak withstand current	kA	31.5, 40, 50	
	P.F withstand voltage(Phase to phase, phase to earth )	kV	42/48	95/118
	Lightning impulse withstand voltage (Phase to phase, phase to earth)	kV	75/85	185/215
	Rated short circuit breaking current (Current-limited fuse )	kA	31.5	
	Breaking No-load transformer's capacity	kVA	1250	2500
	Transformer unit	Rated voltage	kV	10(11)/12, 35/40.5
Rated capacity		kVA	30-2500	
Tap-changer scope		%	± 2 × 2.5%, ± 5%	
Vector group			Dyn11, Yyno	
Impedance voltage		%	4, 4.5, 6, 8	
L.V. Unit	Rated voltage	V	690	
	Rated current	A	50 ~ 4000	
	Main circuit rated short time withstand current	kA	15(1s), 30(1s), 50(1s), 65(1s)	
	Main circuit rated peak withstand current	kA	30, 63, 110	
Shell	Protection degree		IP33	
	Noise level	dB	≤ 50	
	Material		Non-metal / Cement / Wooden / Steel	

## Main components technical data

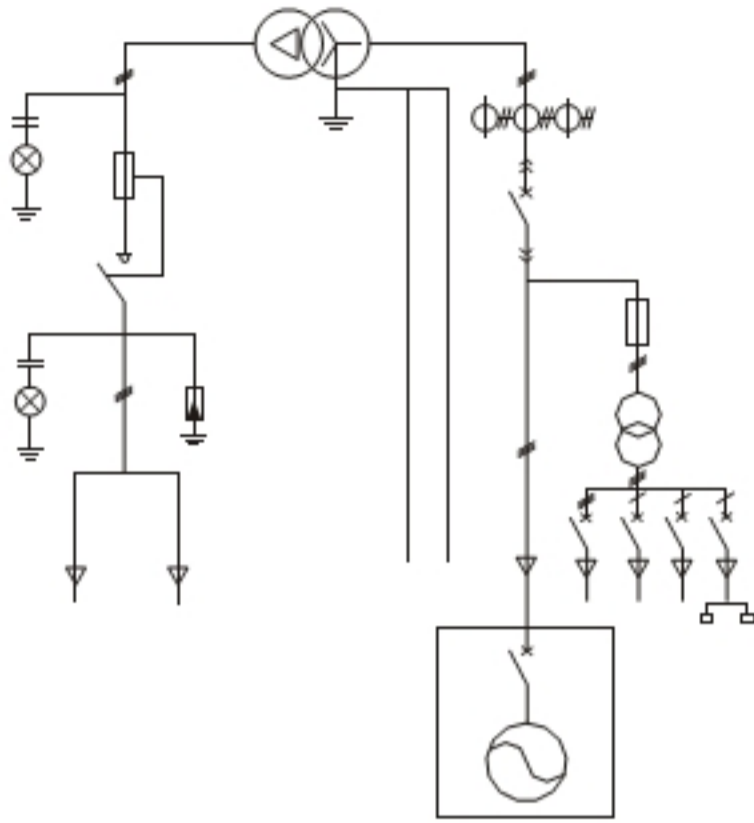
Item	Data	FZRN21-12	FZRN21-40.5	FKN□-40.5R
Max. operating voltage	kV	12	40.5	
Insulation type		air	air	air
LBS rated current	A	630	1250	400、630
Rated capacitor group breaking current	A	125	200	
Switch transfer current	A	3150	3150	1000
LBS rated short time withstand current	kA	31.5(4s)	12.5(4s)	12.5 ~ 31.5(4s)
LBS rated peak withstand current	kA	50	31.5	31.5 ~ 50
P.F withstand voltage(Phase to phase, phase to earth )	kV	42/48	95/118	
Lightning impulse withstand voltage (Phase to phase, phase to earth )	kV	75/85	185/215	
Rated short circuit breaking current(Current-limited fuse )	kA	31.5		
Mechanical life	times	10000		

### Main specification of transformer

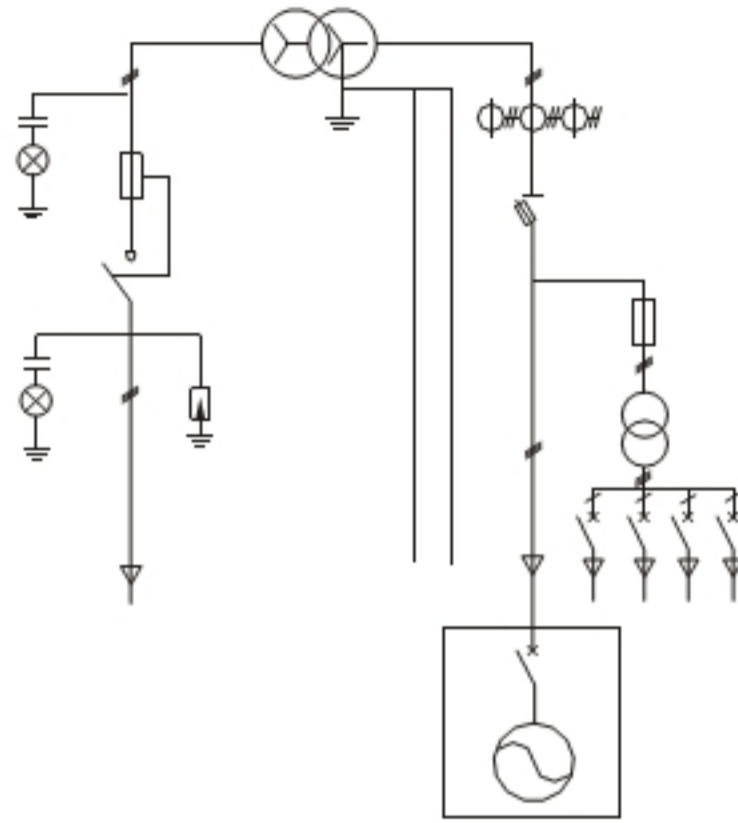
The transformer mainly use the S9(11)-M type absolute sealing transformer, and its capacity is as following:

50,80,100,125,160,200,250,315,400,500,630,800,1000,1250,1600,2000,2500KVA

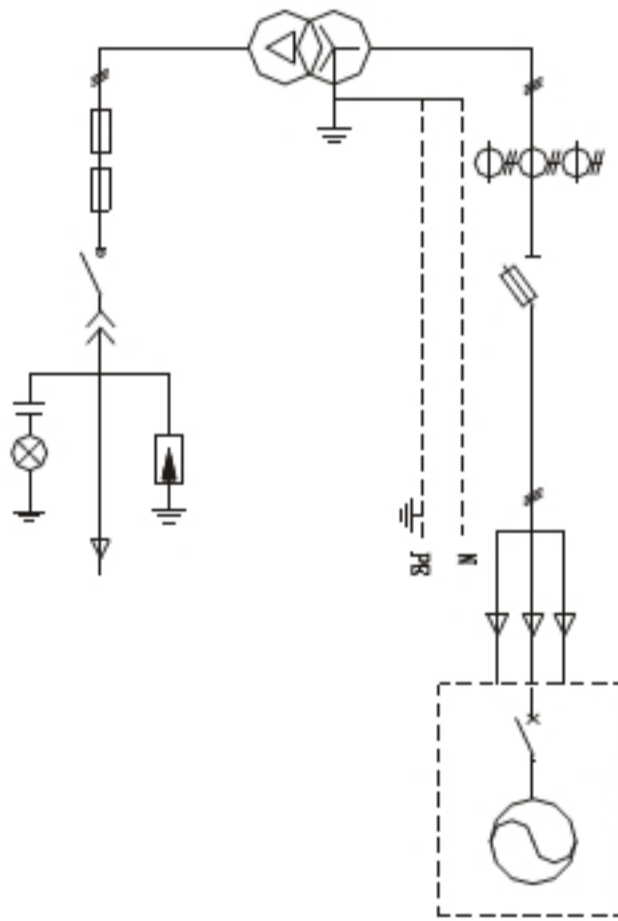
## Main Programs



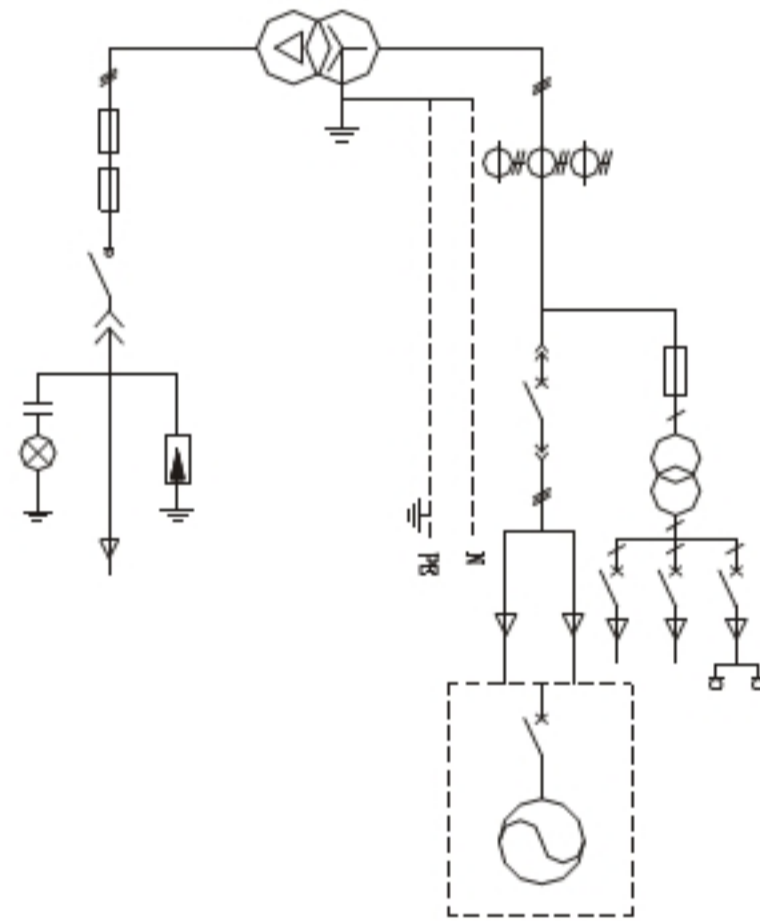
Program 1



Program 2



Program 3



Program 4