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YUEQING YIRUI ELECTRICAPPLIANCE CO.,LTD.

YUEQING YIRUI ELECTRICAPPLIANCE CO.,LTD.

Address: No.555 Chezhan Road,Liushi Town,
Yueqing City, Zhejiang Province, P.R. China.
325600



Transformer selection manual

**SERVICE WHOLEHEARTEDLY,
WITH YOU ALONG THE WAY**

PROFESSIONAL MANUFACTURER

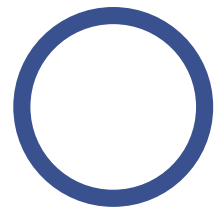
YRO Company integrates production, research and development, sales, and service. Professional production: S11 and S13 series of 10KV, 20KV, and 35KV oil immersed transformers; SCB10 and SCB13 series 10KV, 20KV, and 35KV epoxy cast dry-type power transformers, new energy photovoltaic power generation systems, European style box transformers, solid ring main units, ring main units and low-voltage cabinets, 35KV gas filled cabinets, load switches, standardized low-voltage switchgear, 35KV/10KV photovoltaic prefabricated cabins, and other products. The products have passed the quality inspection of the National Transformer Quality Supervision and Inspection Center, the National Medium and Low Voltage Transmission and Distribution Equipment Quality Supervision and Inspection Center, the PCCC certification of the National Electric Energy Certification Center, and the energy-saving product certification certificate, and have obtained the registration model filing certificate. In the future development, YRO will continue to be guided by modern steps and business management concepts, with the goal of sustainable development and mutual benefit. The company will continue to expand its production scale, improve product quality, and actively strive to develop towards scale and intensification. Taking the development path of prioritizing honest operation and service, increasing investment in technology, accelerating the pace of enterprise development, and moving towards a modern large enterprise that is energy-saving, environmentally friendly, and technology-based.

01 Main production

The main transformer products are SC(Z), SCB, SG series drytype transformers with voltage level 35KV and below and capacity below 50,000KVA; oil-immersed transformers of SFZ, SZ, S series; as well as various types of traction rectifier transformers, excitation transformers, special transformers for railroads, transformers for ships, reactors and so on. The use of CNC core shear line foil winding machine, casting equipment, combined with advanced technology and low energy consumption materials manufacturing, making the products more energy-saving, reliable, low loss, low noise, longer life.

02 The foundation of a business

Quality is the foundation of YRO, and technical innovation is the inexhaustible source of YRO. The company always pays attention to technical innovation and progress, emphasizes product development, and constantly uses new technology, new materials and new techniques to improve product quality. According to ISO9001 quality management system, the company has formulated a scientific and reasonable quality assurance system to ensure that the whole process of product design, development, production, installation and service is under control, and the products are non-leakage and reliable.





CORPORATE ADVANTAGE

The company will continue to leverage its advantages, adhering to the principles of leading technology, serving the market and treating people with integrity, as well as the corporate philosophy of quality first and service first;

Through continuous technological innovation, equipment innovation, service innovation, and management innovation, we aim to develop more and higher quality products and wholeheartedly serve our customers.



DEVELOPING TOGETHER, CREATING BRILLIANCE

The company has a strong technical force and a talent team with complete professional configuration and reasonable personnel structure; We have multiple experts in the field of power transmission and transformation, as well as the transformer industry.

We are willing to sincerely cooperate with domestic and foreign users with excellent technical equipment, satisfactory quality high-quality service, flexible management, and excellent reputation, seeking common development and creating a brilliant tomorrow in the power product industry.



Good quality and service guarantee Your Purchasing Experience

Good faith to customers, benefits to customers,
create a win-win value chain;

Business Excellence, technology innovation,
service integrity.



Specialized in high quality and service
Transformer manufacturer

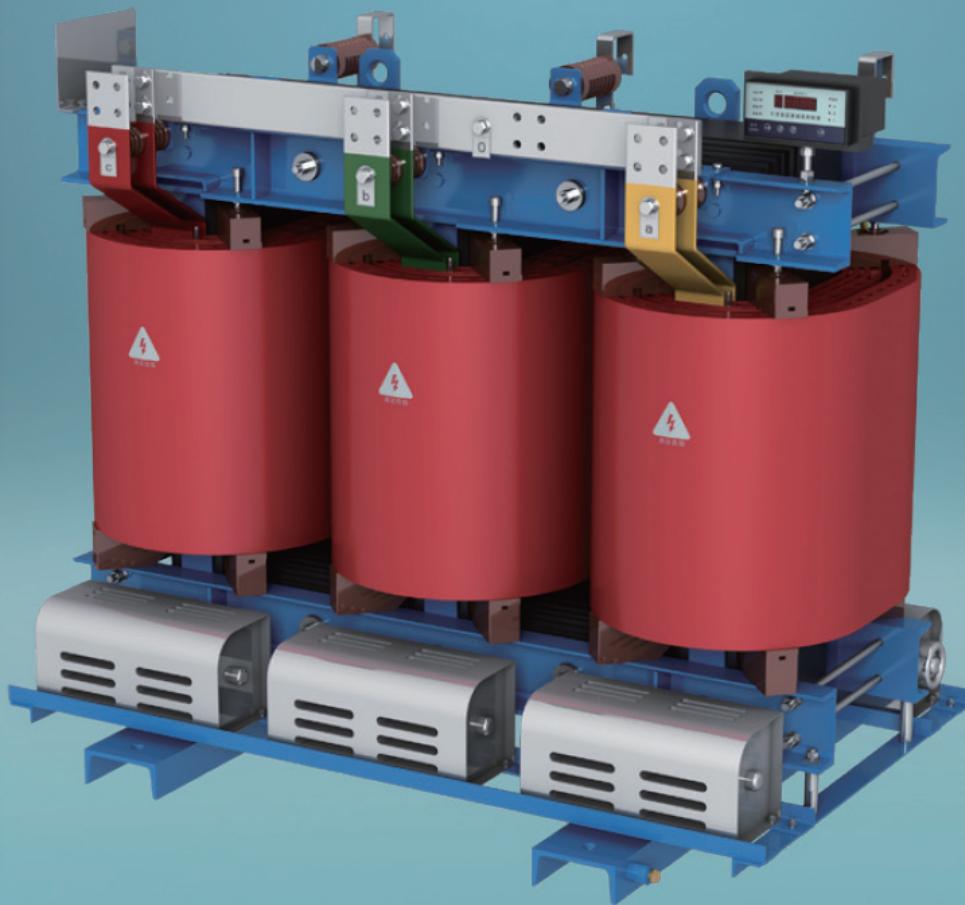
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PROFESSIONAL MANUFACTURER

10KV~35KV

Resin insulation dry transformer



Product characteristics

Low loss, low operating cost, energy saving effects obvious;
Flame retardant, fireproof, explosion-proof, pollution-free;
Good moisture resistance, strong heat dissipation;
Low office, low noise, maintenance-free;
High mechanical strength, strong short-circuit resistance, long life.

Product overview

The resin-insulated dry transformer is safe, fire-resistant, pollution-free, and can be installed directly in the load center. It is maintenance-free, easy to install, low overall operating cost, low loss, good moisture-proof performance can operate normally under 100% humidity, and can be put into operation without predrying after shutdown. The local discharge power is low, the noise is small, the heat dissipation capacity is strong, and the operation can be 120% of the rated load under forced air cooling conditions. Equipped with a perfect temperature protection control system, to provide reliable guarantee for the safe operation of the transformer high reliability. According to the operation research of more than 10,000 products that have been put into operation, the reliability index of the products has reached the international advanced level.

□ Iron core

The core is made of high-quality oriented cold rolled silicon steel sheet material, 45° full oblique joint structure, the core columns bound with insulation tape, the surface of the core is sealed with insulating resin paint to prevent moisture and rust, and the clamp and fastener are treated to prevent rust.

In addition, the company has also developed a multi-step process of stacking iron cores. The iron cores are automatically stacked by shear lines, and the iron cores are formed without stacking iron yoke, which effectively reduces no-load loss, no-load current and core noise.

□ Low voltage foil coil

For low-voltage and high-current coils, the short-circuit stress is larger, while the number of low-voltage turns is less, the larger the low-voltage current is, the more prominent the ampere-turns problem is when the wire wound type is used, and the heat dissipation problem also needs to be axial winding helix Angle, and the ampere-turns of high and low voltage winding are balanced. Short circuit transformer axial stress is small, secondly because of its thin insulation, the process can be easily set up multi-layer air duct, heat dissipation problem is also better solved. The low-voltage foil coil in our factory is wound by automatic foil winding machine, and the internal welding is welded by argon gas protection on the winding machine, which has high precision, small welding resistance and no external welding process. DMD insulation was used between the winding layers, and the end was sealed and cured with resin after winding.

□ High pressure pouring coil

□ Main materials and features

The coil is made of F-class insulated copper wire as conductor, and glass fiber and epoxy resin composite material as insulation, Its expansion coefficient is similar to that of copper conductor, and it has good impact resistance, temperature resistance and crack resistance. All components of good insulation properties and is particularly suitable for making coils with high voltage levels.

□ Manufacturing process

The coil is wound on a high precision winding machine. When winding, the inner and outer layers of the coil are coated with glass fiber. When the transformer capacity is large, ventilation channels are designed. After winding, vacuum drying is carried out. The whole pouring and curing process is completed according to the process curve transmitted by the process department through the computer network to the pouring control terminal. All processes can be monitored at the computer terminal at any time and automatically adjusted by the computer according to the situation. The precision manufacturing process makes the coil free of bubbles and holes.

□ Temperature control device and air cooling system

Temperature control device fault alarm, overtemperature alarm, overtemperature trip, three-phase inspection, start and stop air cooling device and other functions; The air cooling system adopts the cross flow top blowing cooling fan, which has the characteristics of low noise, high wind pressure and beautiful appearance, and enhances the overload capacity of the transformer. Temperature control adopts intelligent temperature controller to improve the safety and reliability of the regulator operation.

□ Protective housing and cable busbar

Protection shell and transformer for further safety protection, protection grade IP20 IP23, shell material cold-rolled steel plate, stainless steel plate, aluminum alloy plate for users to choose.

The low voltage outlet line is discharged with the standard bus, the side outlet line and the top outlet line can be used, and the special appearance mode can be designed according to the needs of users.

□ Schematic diagram of the incoming line

Distribution transformers can be manufactured according to different interface forms of conventional outlet, standard closed bus outlet and standard side outlet, can also be designed according to user requirements special outlet mode.

Use environment

Ambient temperature

The maximum temperature is +40

The minimum temperature is -

The average temperature of the hottest month is +30

The average temperature of the hottest year is +20

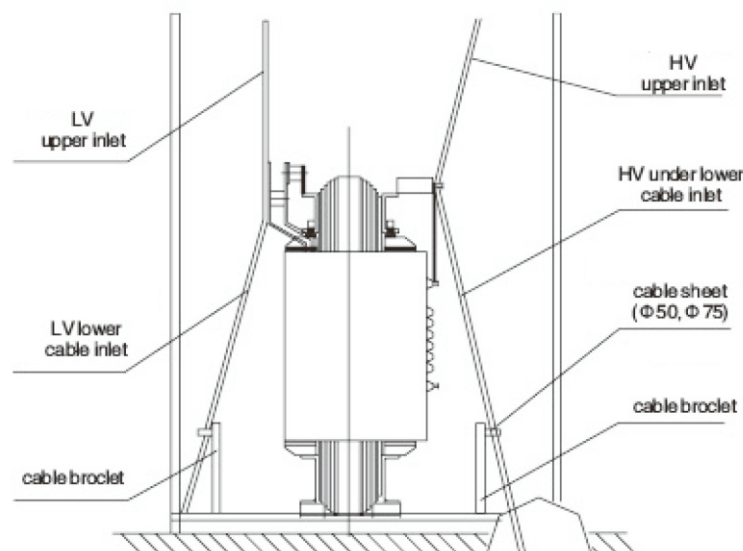
The altitude does not exceed 1000m

The waveform of the supply voltage is similar to that of a sine wave

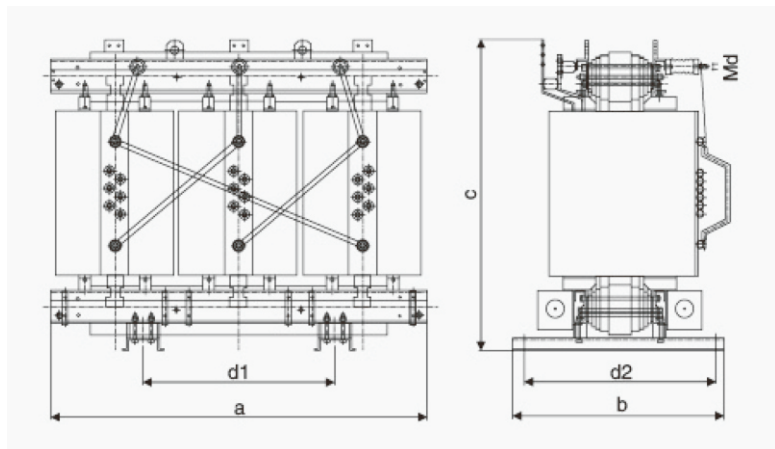
Three-phase power supply voltage should be roughly symmetrical

The installation environment has no significant pollution

Indoor use



Outline dimensions diagram shell

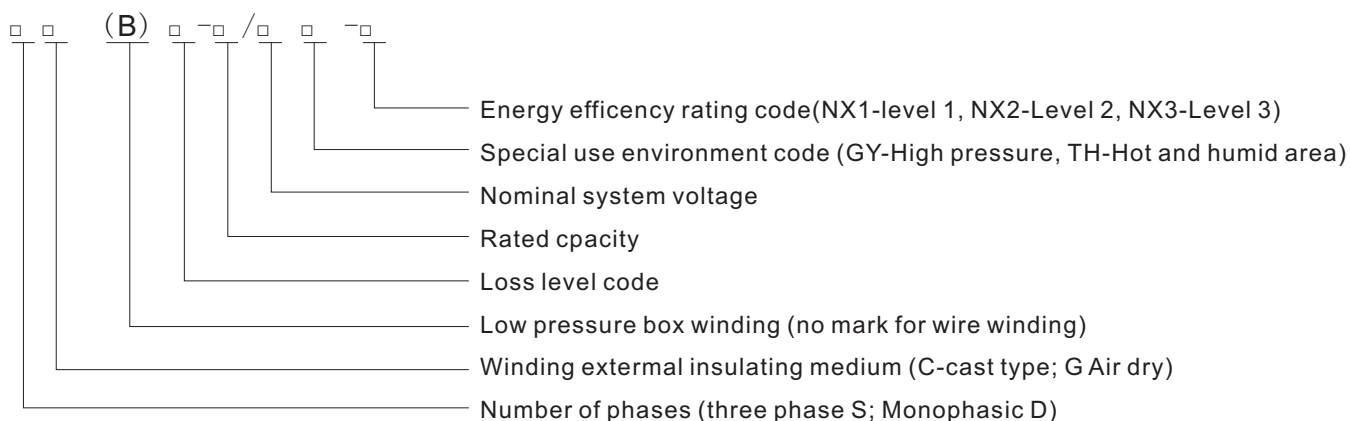


Note:1.For HV lead terminal Md, while capacity SN<1600kVA, Md=M12; while SN 1600kVA, Md=M16.

2.The transformer has no trolley, if needed, the height should be raised 100mm.

3. The size of forced air cooling system (blower) should not exceed machine(axb).

Model meaning



Product standard

GB/T 1094.1-2013 Power transformers-Part 1: General

GB/T 1094.11-2022 Power transformers-Part 11: Dry transformers

GB/T 1094.12-2013 Power transformers-Part 12: Load guidelines for dry power transformers

GB/T 10228-2015 Technical parameters and requirements of dry type transformer

JB/T 3837-2016 Transformer product model preparation method

GB 20052-2020 Power transformer energy efficiency limits and energy efficiency grades

SCB10 series 10kV resin-insulated dry transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss(W)	Load loss (W)	No-load current (%)	Impedance (%)
	HV (kv)	HV Tap Range	LV (kV)			120°C (F class)		
30	6 6.3 10 10.5 11	±5 ±2x2.5	0.4	Dyn11 Yyn0	190	710	2	4
50					270	1000	2	
80					370	1380	1.5	
100					400	1570	1.5	
125					470	1850	1.3	
160					540	2130	1.3	
200					620	2530	1.1	
250					720	2760	1.0	
315					880	3470	1.0	
400					980	3990	1.0	
500					1160	4880	0.85	
630					1340	5880	0.85	
630					1300	5960	0.85	6
800					1520	6960	0.85	
1000					1770	8130	0.85	
1250					2090	9390	0.85	
1600					2450	11730	0.85	
2000					3060	14450	0.7	
2500					3600	17170	0.7	

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference

SCB12 series 10kv resin-insulated dry transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss (W)		No-load current (%)	Impedance (%)	
	HV (kv)	HV Tap Range	LV (kV)			120°C (F class)	145°C (H class)			
30	6 6.3 10 10.5 11	±5 ±2X2.5	0.4	Dyn11 Yyn0	150	710	760	2	4	
50					215	1000	1070	2		
80					295	1380	1480	1.5		
100					320	1570	1690	1.5		
125					375	1850	1980	1.3		
160					430	2130	2280	1.3		
200					495	2530	2710	1.1		
250					575	2760	2960	0.9		
315					705	3470	373	0.8		
400					785	3990	4280	0.8		
500					930	4880	5230	0.8		
630					1070	5880	6290	0.7		
630					1040	5960	6400	0.7		6
800					1210	6960	7460	0.7		
1000					1410	8130	8760	0.7		
1250					1670	9690	10370	0.7		
1600	1960	11730	12580	0.7						
2000	2440	14450	15560	0.6						
2500	2880	17170	18450	0.6						

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference

SCB13 series 10kV resin-insulated dry transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss(W)	Load loss(W)	No-load current (%)	Impedance (%)
	HV (kV)	HV Tap Range	LV (kV)			120°C (F class)		
30	6 6.3 10 10.5 11	±5 ±2x2.5	0.4	Dyn11 Yyn0	135	640	2	4
50					195	900	2	
80					265	1240	1.5	
100					290	1410	1.5	
125					340	1660	1.3	
160					385	1910	1.3	
200					445	270	1.1	
250					515	2480	1.0	
315					635	3120	1.0	
400					705	3590	1.0	
500					835	4390	0.85	
630					965	5290	0.85	6
630					935	5360	0.85	
800					1090	6260	0.85	
1000					1270	7310	0.85	
1250					1500	8720	0.85	
1600					1760	10500	0.85	
2000					2190	13000	0.7	
2500	2590	15400	0.7					

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference

SCB14 series 10kv resin-insulated dry transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss (W)		No-load current (%)	Impedance (%)	
	HV (kv)	HV Tap Range	LV (kV)			120°C (F class)	145°C (H class)			
30	6 6.3 10 10.5 11	±5 ±2X2.5	0.4	Dyn11 Yyn0	130	640	685	2	4	
50					185	900	965	2		
80					250	1240	1330	1.5		
100					270	1410	1520	1.5		
125					320	1660	1780	1.3		
160					365	1910	2050	1.3		
200					420	2270	2440	1.1		
250					490	2480	2665	0.9		
315					600	3120	3355	0.8		
400					665	3590	3850	0.8		
500					790	4390	4705	0.8		
630					910	5290	5660	0.7		
630					885	5360	5760	0.7		6
800					1035	6260	6715	0.7		
1000					1205	7310	7885	0.7		
1250					1420	8720	9335	0.7		
1600	1665	10500	13220	0.7						
2000	2075	13000	14005	0.6						
2500	2450	15400	16605	0.6						

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference

SCB18 series 10kv resin-insulated dry transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss (W)		No-load current (%)	Impedance (%)
	HV (kv)	HV Tap Range	LV (kV)			120°C (F class)	145°C (H class)		
30	6 6.3 10 10.5 11	±5 ±2X2.5	0.4	Dyn11 Yyn0	105	640	685	2	4
50					155	900	965	2	
80					210	1240	1330	1.5	
100					230	1410	1520	1.5	
125					270	1660	1780	1.3	
160					310	1910	2050	1.3	
200					360	2270	2440	1.1	
250					415	2480	2665	0.9	
315					510	3120	3355	0.8	
400					570	3590	3850	0.8	
500					670	4390	4705	0.8	
630					775	5290	5660	0.7	
630					750	5360	5760	0.7	6
800					875	6260	6715	0.7	
1000					1020	7310	7885	0.7	
1250					1205	8720	9335	0.7	
1600					1415	10500	13220	0.7	
2000					1760	13000	14005	0.6	
2500	2080	15400	16605	0.6					

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference

□ **20kV class 50kV~2500kVA non-exciting voltage regulation distribution transformer**

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	No-load loss (W)			No-load current (%)	Impedance (%)
	HV (kv)	HV Tap Range	LV (kV)			100°C (B class)	125°C (F class)	145°C (H class)		
50	20	±2X2.5	0.4	Dyn11 Yyn0	0.305	1.16	1.23	1.31	1.8	6
100					0.485	1.87	1.99	2.13	1.6	
160					0.6	2.33	2.47	2.64	1.4	
200					0.655	2.77	2.94	3.14	1.4	
250					0.755	3.22	3.42	3.66	1.2	
315					0.87	3.85	4.08	4.36	1.2	
400					1.03	4.65	4.84	5.18	1.0	
500					1.21	5.46	5.79	6.19	1.0	
630					1.37	6.45	6.84	7.32	0.9	
800					1.57	7.79	8.26	8.84	0.9	
1000					1.86	9.22	9.78	10.4	0.8	
1250					2.14	10.08	11.5	12.3	0.8	
1600					2.51	1.3	13.8	14.8	0.8	
2000					2.91	15.4	16.3	17.5	0.6	
2500					3.48	18.2	19.3	20.7	0.6	
2000					2.91	16.8	17.8	19.1	0.6	8
2500					3.48	20	21.2	22.7	0.6	

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.

□ **35kV class 50kV~2500kVA non-exciting voltage regulation distribution transformer**

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	No-load loss (W)			No-load current (%)	Impedance (%)
	HV (kv)	HV Tap Range	LV (kV)			100°C (B class)	125°C (F class)	145°C (H class)		
50	35	±2X2.5	0.4	Dyn11 Yyn0	0.405	1.34	1.42	1.52	2.1	6
100					0.565	1.97	2.09	2.23	1.8	
160					0.710	2.65	2.81	3	1.4	
200					0.790	3.13	3.32	3.56	1.4	
250					0.890	3.58	3.80	4.06	1.2	
315					1.05	4.25	4.51	4.82	1.2	
400					1.23	5.10	5.41	5.79	1.0	
500					1.45	6.27	6.65	7.11	1.0	
630					1.67	7.25	7.69	8.23	0.90	
800					1.94	8.60	9.12	9.76	0.90	
1000					2.18	9.86	10.4	11.1	0.70	
1250					2.54	12.0	12.7	13.6	0.70	
1600					2.91	14.6	15.4	16.5	0.70	
2000					3.43	17.2	18.2	19.5	0.70	
2500					4.00	20.6	21.8	23.3	0.70	

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.

35kV class 800kV~25000kVA non-exciting voltage regulation distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	No-load loss (W)			No-load current (%)	Impedance (%)			
	HV (kv)	HV Tap Range	LV (kV)			100°C (B class)	125°C (F class)	145°C (H class)					
800	35 36 37 38.5	±2.5 ±5	3.15 6 6.3 10 10.5 11	Dyn11 Yd11 Yyn0	2.02	8.87	9.40	10	0.85	6			
1000					2.40	10.3	10.9	11.6	0.85				
1250					2.81	12.1	12.	13.8	0.75				
1600					3.32	14.6	15.4	16.5	0.75				
2000		±2x2.5 ±5		6 6.3 10 10.5 11	Dyn11 Yd11 Yyn0	3.80	17.2	18.2	19.5	0.65	7		
2500						4.37	20.6	21.8	23.3	0.65			
3150						5.42	23.1	24.5	26.2	0.60	8		
4000						6.31	27.7	29.4	31.5	0.60			
5000						7.53	32.9	34.9	37.4	0.55			
6300						8.91	38.5	40.8	43.7	0.55			
8000						6 6.3 10 10.5 11	Dyn11 Yd11 YNd11	10.1	43.4	46.0	49.3	0.45	9
10000								11.6	52.4	55.5	59.4	0.45	
12500				14.1	60.9			64.6	69.1	0.35	10		
16000				17.3	71.7			76.0	81.3	0.35			
20000				20.6	80.6			85.5	91.5	0.30			
25000				24.3	95.3			101	108	0.30			

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.

35kV class 2000kV~25000kVA on-load voltage regulation power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	No-load loss (W)			No-load current (%)	Impedance (%)		
	HV (kv)	HV Tap Range	LV (kV)			100°C (B class)	125°C (F class)	145°C (H class)				
2000	35 36 37 38.5	±4X2.5	6 6.3 10 10.5 11	Dyn11 Yd11	4.05	17.9	19.0	20.3	0.65	6		
2500					4.69	21.3	22.6	24.2	0.65			
3150					6 6.3 10 10.5 11	Dyn11 Yd11	5.67	24.0	25.4	27.2	0.60	8
4000							6.64	28.7	30.4	32.6	0.60	
5000							7.85	34.0	36.1	38.6	0.50	
6300							9.27	39.4	41.8	44.7	0.50	
8000							10.6	44.8	47.5	50.8	0.45	9
10000							12.1	53.9	57.1	61.2	0.45	
12500							14.7	62.7	66.5	71.1	0.35	
16000							18.1	73.8	78.2	83.7	0.35	
20000					21.4	83.0	88.0	94.2	0.30	10		
25000					25.2	98.2	104	111	0.30			

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.

□ 10kV class SCBH15 series amorphous alloy dry type transformer technical parameters

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss (W)			Impedance Voltage (%)		
	HV (kv)	HV Tap Range	LV (kV)			100°C (B)	125°C (F)	145°C (H)			
30	6	±2.5	0.4	Dyn11 Yyn0	70	670	710	760	4		
50					90	940	1000	1070			
80					±5	120	1290	1380		1480	
100					130	1480	1570	1690			
125					150	1740	1850	1980			
160					170	2000	2130	2280			
200		200			2370	2530	2710				
250		6.3			230	2590	2760	2960			
315		6.6			280	3270	3470	3730			
400		10			310	3750	3990	4280			
500		10.5			±2X2.5	360	4590	4880		5230	
630		11			±5	420	5530	5880		6290	6
630						410	5610	5960		6400	
800						480	6550	6960		7460	
1000						550	7650	8130		8760	
1250						650	9100	9690		10370	
1600	760		11050	11730		12580					
2000	1000		13600	14450		15560					
2500	1200		16150	17170		18450					

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.

□ 10kV class SCBH17 series amorphous alloy dry type transformer technical parameters

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss (W)			Impedance Voltage (%)		
	HV (kv)	HV Tap Range	LV (kV)			100°C (B)	125°C (F)	145°C (H)			
30	6	±2.5	0.4	Dyn11 Yyn0	60	605	640	685	4		
50					75	845	900	965			
80					±5	100	1160	1240		1330	
100					110	1330	1415	1520			
125					130	1565	1665	1780			
160					145	1800	1915	2050			
200		170			2135	2275	2440				
250		195			2330	2485	2665				
315		6.3			235	2945	3125	3355			
400		6.6			265	3375	3590	3850			
500		10			305	4130	4390	4705			
630		10.5			±2X2.5	360	4975	5290		5660	
630		11			±5	350	5050	5365		5760	6
800						410	5895	6265		6715	
1000						470	6885	7315		7885	
1250						550	8190	8720		9335	
1600	645		9945	10555		11320					
2000	850		12240	13005		14005					
2500	1020		14535	15445		16605					

Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.

□ 10kV class SCBH19 series amorphous alloy dry type transformer technical parameters

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss (W)			Impedance Voltage (%)				
	HV (kV)	HV Tap Range	LV (kV)			100°C (B)	125°C (F)	145°C (H)					
30	6	±2.5 ±5	0.4	Dyn11 Yyn0	50	605	640	685	4				
50					60	845	900	965					
80					85	1160	1240	1330					
100					90	1330	1415	1520					
125					105	1565	1665	1780					
160		120			1800	1915	2050						
200		140			2135	2275	2440						
250		160			2330	2485	2665						
315		6.3			±2X2.5 ±5	0.4	Dyn11 Yyn0	195		2945	3125	3355	6
400		6.6						215		3375	3590	3850	
500	10	250	4130	4390				4705					
630	11	295	4975	5290				5660					
630		390	5050	5365				5760					
800		335	5895	6265				6715					
1000		385	6885	7315				7885					
1250		455	8190	8720				9335					
1600		530	9945	10555				11320					
2000		700	12240	13005				14005					
2500		840	14535	15445	16605								

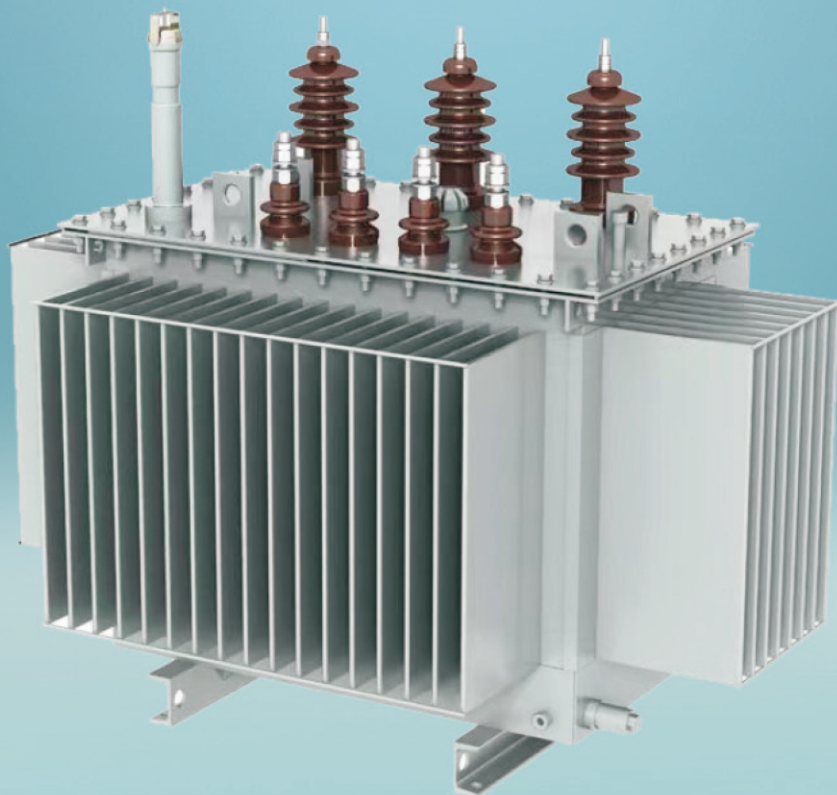
Note: The load loss listed in the table is the value of the reference temperature of different insulation heat resistance classes in brackets (see GB/T1094.11). The load loss of other insulation heat resistance classes not included in the table is converted according to the respective reference temperature, using the data of "Class 155(F)" insulation heat resistance class as a reference.



PROFESSIONAL MANUFACTURER

10KV~20KV

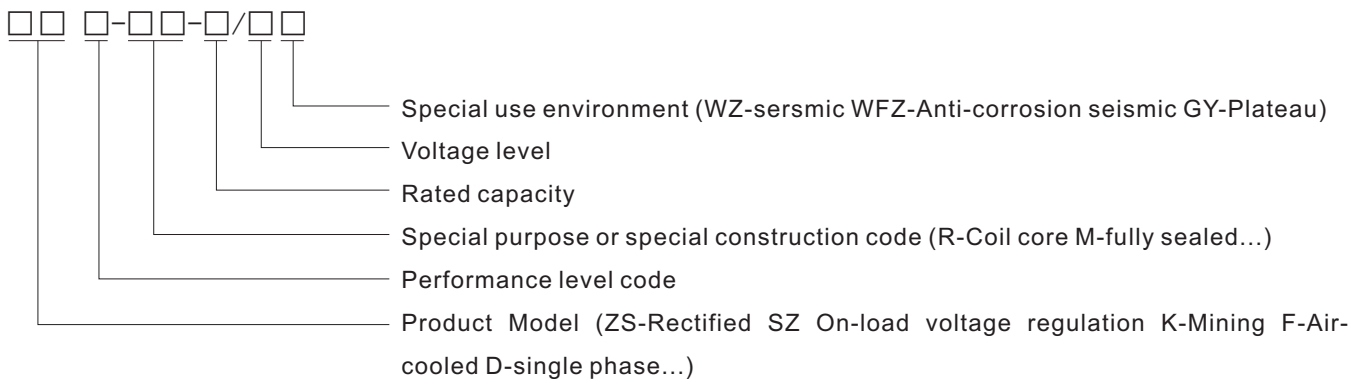
Distribution transformer



Product characteristics

The product has the characteristics of high efficiency, low loss and low noise ;
 Good internal heat dissipation, strong short-circuit resistance;
 Low no-load loss and low load loss ;
 Reilable operation, long life, maintenance-free.

Model meaning



Transformer product standard

- GB/T 1094.1-2013 Power transformers-Part 1:General
- GB/T 1094.2-2013 Power transformers-Part 2:Temperature rise of immersed transformers
- GB/T 1094.3-2017 Power transformers-Part 3:Insulation levels, insulation tests and external insulation air gaps
- GB/T 1094.5-2008 Power transformers-Part 5:Ability to withstand short circuits
- GB/T 6451-2023 Technical parameters and requirements of oil-immersed power transformer
- JB/T 3837-2010 Transformer product model preparation method
- GB20052-2020 Power transformer energy efficiency limits and energy efficiency grades

Special conditions for transformer use

- | | |
|--|--|
| <ul style="list-style-type: none"> The altitude is greater than 1000m; Ambient temperature; The highest temperature is above 40; The minimum temperature is lower than -25; (Details when ordering) | <ul style="list-style-type: none"> The altitude does not exceed 1000m; Ambient temperature; Maximum temperature +4; The maximum daily average temperatuer is +30; The highest annual average temperature +20; Minimum outdoor temperature -25. |
|--|--|

□ S13 series 10kv distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss W 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
30	6 6.3 10 10.5	±5 ±2x2.5	0.4	Dyn11 Yzn11 Yyn0	80	630/9600	1.20	4
50					100	910/870	1.04	
80					110	1090/1040	0.96	
100					130	1310/1250	0.96	
125					150	1580/1500	0.88	
160					170	1890/1800	0.88	
200					200	2310/2200	0.80	
250					240	2730/2600	0.80	
315					290	3200/3050	0.72	
400					340	3830/3650	0.72	
500					410	4520/4300	0.64	
630					480	5410/5150	0.64	
630					570	6200	0.48	4.5
800					700	7500	0.48	
1000					830	10300	0.48	
1250	970	12000	0.40					
1600	1170	14500	0.40					
2000	1360	18300	0.32					
2500	1600	21200	0.32					

Note: For transformers with a rated capacity of 500kVA and below, the load loss values above the slash line in the table apply to the Dyn11, Yzn11 connection group, and the load loss values below the slash line apply to the Yyn0 connection group.

□ S20 series 10kv distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss W 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
30	6 6.3 10 10.5	±5 ±2x2.5	0.4	Dyn11 Yzn11 Yyn0	70	505/480	1.20	4
50					90	730/695	1.04	
80					100	870/830	0.96	
100					115	1050/1000	0.96	
125					135	1265/1200	0.88	
160					150	1510/1440	0.88	
200					180	1850/1760	0.80	
250					215	2185/2080	0.80	
315					260	2560/2440	0.72	
400					305	3065/2920	0.72	
500					370	3615/3440	0.64	
630					430	4330/4120	0.64	
630					510	4960	0.48	4.5
800					530	6000	0.48	
1000					745	8240	0.48	
1250	870	9600	0.40					
1600	1050	11600	0.40					
2000	1225	14640	0.32	5				
2500	1440	14840	0.32					

Note: For transformers with a rated capacity of 500kVA and below, the load loss values above the slash line in the table apply to the Dyn11, Yzn11 connection group, and the load loss values below the slash line apply to the Yyn0 connection group.

□ S22 series 10kv distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss W 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
30	6 6.3 10 10.5	±5 ±2x2.5	0.4	Dyn11 Yzn11 Yyn0	65	455/430	1.20	4
50					80	655/625	1.04	
80					90	785/745	0.96	
100					105	945/900	0.96	
125					120	1140/1080	0.88	
160					135	1360/1295	0.88	
200					160	1665/1585	0.80	
250					190	1970/1870	0.80	
315					230	2300/2195	0.72	
400					270	2760/2630	0.72	
500					330	3250/3095	0.64	
630					385	3900/3710	0.64	
630					460	4460	0.48	4.5
800					560	5400	0.48	
1000					665	7415	0.48	
1250					780	8640	0.40	
1600	940	10440	0.40					
2000	1085	13180	0.32	5				
2500	1280	13360	0.32					

Note: For transformers with a rated capacity of 500kVA and below, the load loss values above the slash line in the table apply to the Dyn11, Yzn11 connection group, and the load loss values below the slash line apply to the Yyn0 connection group.

□ S13 series 10kv distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
630	6 6.3 10 10.5	±5 ±2x2.5	3 3.15 6.3	Dyn11 Yzn11 Yyn0	0.655	6.92	0.48	4
800					0.800	8.46	0.48	
1000					0.945	9.91	0.48	
1250					1.12	11.7	0.40	
1600					1.34	14.1	0.32	
2000					1.61	16.9	0.32	
2500					1.90	19.6	0.32	
3150					2.24	23	0.32	
4000					10 10.5		3.15 6.3	
5000	3.28	31.3	0.32					
6300	3.91	35	0.32					

□ SZ13 series 10kv distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
200	6 6.3 10 10.5	±4x2.5	0.4	Dyn11 Yyn0	305	2900	0.80	4
250					350	3420	0.72	
315					425	4100	0.72	
400					510	4950	0.64	
500					610	5890	0.64	
630					770	7260	0.48	
800					895	8890	0.48	4.5
1000					1090	1040	0.48	
1250					1250	1230	0.40	
1600					1540	1470	0.40	
2000					1820	1860	0.32	5
2500					2140	21600	0.32	

□ D13 series 10kV class 5kVA single-phase double-winding non-exciting voltage regulation distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
5	6 6.3 10 10.5 11	±5 ±2x2.5	0.22-0.24 2x(0.22-0.24)	li0 li6	0.025	0.13	0.96	3.5
10					0.035	0.235	0.88	
16					0.045	0.33	0.80	
20					0.050	0.385	0.72	
30					0.065	0.56	0.64	
40					0.080	0.7	0.64	
50					0.095	0.855	0.56	
63					0.115	1.02	0.48	
80					0.130	1.26	0.48	
100					0.150	1.48	0.48	
125					0.185	1.75	0.40	
160					0.230	2.13	0.40	

The performance parameters of other capacity products are determined by negotiation between the manufacturer and the user. Other short circuit impedance values shall be determined by the manufacturer in consultation with the user.

Note: For transformers with a low voltage of 2x(0.22~0.24)kV combination, when the low voltage is (0.22~0.24)kV, the capacity is halved (except when used in parallel).

□ D13 series 20kV class 5kVA~160kVA single-phase double-winding non-exciting voltage regulation distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
5	20 21 22	±5 ±2x2.5	0.22-0.24 2x(0.22-0.24)	li0 li6	0.025	0.135	1.76	3.5
10					0.035	0.245	1.60	
16					0.045	0.345	1.52	
20					0.050	0.405	1.44	
30					0.065	0.585	1.36	
40					0.080	0.735	1.28	
50					0.095	0.900	1.20	
63					0.115	1.07	1.12	
80					0.130	1.32	1.12	
100					0.150	1.56	1.04	
125					0.185	1.84	0.96	
160					0.230	2.23	0.80	

The performance parameters of other capacity products are determined by negotiation between the manufacturer and the user.

Other short circuit impedance values shall be determined by the manufacturer in consultation with the user.

Note 1: For transformers with a low voltage of 2x(0.22~0.24)kV combination, when the low voltage is (0.22~0.24)kV, the capacity is halved (except when used in parallel).

Note 2: The performance parameters in the table also apply to transformers with dual voltages of 20(10)kV

□ S13 series 20kv distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
30	20	±5 ±2x2.5	0.4	Dyn11 Yzn11 Yyn0	0.08	0.66/0.63	1.70	5.5
50					0.10	0.96/0.91	1.60	
80					0.12	1.14/1.09	1.50	
100					0.14	1.37/1.3	1.40	
125					0.16	1.64/1.57	1.30	
160					0.19	1.98/1.8	1.20	
200					0.23	2.41/2.3	1.10	
250					0.70	2.85/2.72	1.00	
315					0.32	3.24/3.18	0.96	
400					0.38	4.00/3.81	0.88	
500					0.46	4.72/4.49	0.80	
630					0.54	5.64/5.38	0.80	
630					0.65	6.48	0.72	6
800					0.78	7.84	0.64	
1000					0.92	10.7	0.56	
1250					1.1	12.5	0.56	
1600					1.33	15.1	0.48	
2000	1.56	19.1	0.48					
2500	1.87	22.2	0.40					

Note 1: Four transformers with a rated capacity of 500kVA and below, the load loss values above the slash line in the table apply to the Dyn11, Yzn11 connection group, and the load loss values below the slash line apply to the Yyn0 connection group.

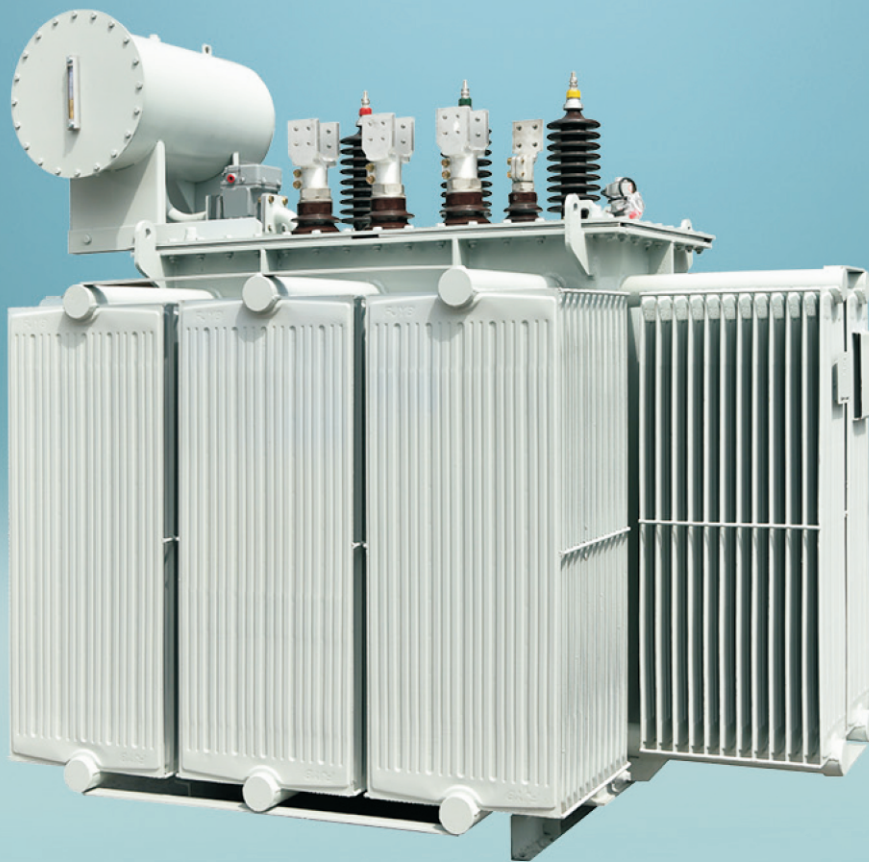
Note 2: The performance parameters in the table also apply to transformers with dual voltages of 20(10)kV.



PROFESSIONAL MANUFACTURER

35KV

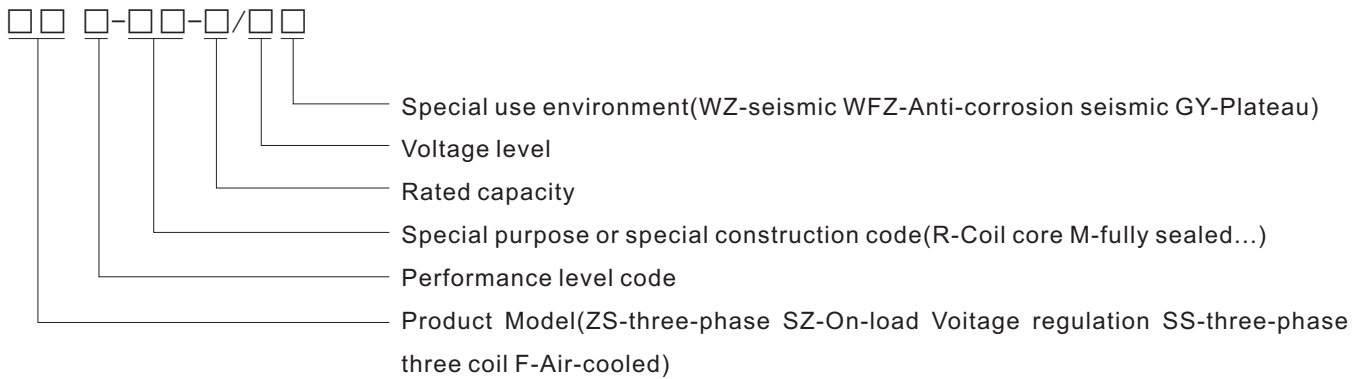
Distribution transformer



Product characteristics

The product has the characteristics of high efficiency, low loss and low noise;
 Good internal heat dissipation, strong short-circuit resistance, high safety performance;
 Low no-load loss and low load loss;
 Reliable operation, long life, maintenance-free.

Model meaning



Transformer product standard

- GB/T 1094.1-2013 Power transformers - Part 1: General
- GB/T 1094.2-2013 Power transformers - Part 2: Temperature rise of immersed transformers
- GB/T 1094.3-2017 Power transformers - Part 3: Insulation levels, insulation tests and external insulation air gap
- GB/T 1094.5-2008 Power transformers - Part 5: Ability to withstand short circuits
- GB/T 6451-2023 Technical parameters and requirements of oil-immersed power transformer
- JB/T 3837-2010 Transformer product model preparation method
- GB 20052-2020 Power transformer energy efficiency limits and energy efficiency grades

Normal service conditions of the transformer

The altitude does not exceed 1000m;
 Ambient temperature;
 Maximum temperature + 40°C
 The maximum daily average temperature is + 30°C
 The highest annual average temperature + 25°C
 Minimum outdoor temperature -25°C

□ S13 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
50	35	±5 ±2x2.5	0.4	Dyn11 Yy0	0.130	1.14/1.08	1.00	6.5
100					0.185	1.91/1.81	0.88	
125					0.215	2.25/2.15	0.88	
160					0.225	2.68/2.55	0.80	
200					0.270	3.15/3.00	0.80	
250					0.320	3.75/3.57	0.76	
315					0.385	4.51/4.30	0.76	
400					0.465	5.45/5.20	0.68	
500					0.545	6.56/6.25	0.68	
630					0.665	7.47	0.52	
800					0.785	8.93	0.52	
1000					0.920	10.9	0.52	
1250					1.12	13.2	0.48	
1600					1.35	15.8	0.48	
2000					1.59	19.7	0.44	
2500					1.89	23.2	0.44	

Note: For transformers with a rated capacity of 500kVA and below, the load loss values above the slash line in the table apply to the Dyn11 connection group and the load loss values below the slash line apply to the Yyn0 connection group.

□ S13 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
630	35	±5 ±2x2.5	3.15	Yd11	0.66	7.47	0.52	6.5
800					0.78	8.93	0.52	
1000					0.92	10.9	0.52	
1250					1.12	13.2	0.44	
1600					1.35	15.8	0.36	
2000					1.74	17.4	0.36	
2500					2.05	18.6	0.36	
3150					2.4	21.9	0.36	
4000					2.9	25.9	0.36	
5000					3.5	29.7	0.36	
6300	35~38.5	±2x2.5	3.15	Ynd11	4.2	33.3	0.36	8
8000					5.8	36.5	0.28	
10000					7.0	43.0	0.28	
12500					8.0	51.1	0.24	
16000					9.7	62.5	0.24	
20000					11.5	75.5	0.24	
25000					13.6	89.3	0.20	
31500					16.2	106.4	0.20	

□ S20 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
3150	35~38.5	±5 ±2x2.5	3.15 6.3 10.5	Yd11	2	20.7	0.36	7
4000					2.3	4.6	0.36	
5000					2.8	28.2	0.36	
6300					3.4	31.5	0.36	
8000					4.7	34.6	0.28	
10000		±2x2.5	3.15 3.3 6.3 6.6 10.5	Ynd11	5.7	40.8	0.28	8
12500					6.5	48.4	0.24	
16000					7.9	59.2	0.24	
20000					9.4	71.6	0.24	
25000					11.1	84.6	0.20	
31500	13.1	100.8	0.20	10				

□ S22 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
3150	35~38.5	±5 ±2x2.5	3.15 6.3 10.5	Yd11	1.7	20.7	0.36	7
4000					2.0	24.6	0.36	
5000					2.4	28.2	0.36	
6300					2.9	31.5	0.36	
8000					4.0	34.6	0.28	
10000		±2x2.5	3.15 3.3 6.3 6.6 10.5	Ynd11	4.8	40.8	0.28	8
12500					5.5	48.4	0.24	
16000					6.7	59.2	0.24	
20000					7.9	71.6	0.24	
25000					9.4	84.6	0.20	
31500	11.1	100.8	0.20	10				

□ SZ13 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)			
	HV (kv)	HV Tap Range	LV (kV)								
2000	35	±3x2.5	3.15 6.3 10.5	Yd11	1.84	18.2	0.40	6.5			
2500					2.18	19.6	0.40				
3150	35~38.5				6.3 10.5	Ynd11	2.6	23.5	0.40	7	
4000							3.1	27.6	0.40		
5000							3.7	32.5	0.40		
6300							4.5	34.9	0.40		
8000			6.3 6.6 10.5	6.3			Ynd11	6.3	38.6	0.32	7.5
10000								7.4	45.6	0.32	
12500								8.7	54	0.28	8
16000								10.5	66.8	0.28	
20000	12.4	78.6			0.28						
25000	14.6	92.9	0.24	10							
31500	17.4	110.2	0.24								

□ SZ20 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)	
	HV (kv)	HV Tap Range	LV (kV)						
3150	35~38.5	±3x2.5	6.3 10.5	Yd11	2.1	22.2	0.40	7	
4000					2.5	26.2	0.40		
5000					3	30.8	0.40	7.5	
6300					3.7	33.0	0.40		
8000					5.1	36.5	0.32		
10000					6	43.2	0.32		
12500			6.3 6.6 10.5	6.3	Ynd11	7.1	51.1	0.28	8
16000						8.5	63.3	0.28	
20000						10.1	74.4	0.28	
25000						11.9	88.0	0.24	10
31500	14.2	104.4				0.24			

□ SZ22 series 35kV power transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss kW 75°C	No-load current (%)	Short-circuit impedance (%)	
	HV (kv)	HV Tap Range	LV (kV)						
3150	35~38.5	±3x2.5	6.3 10.5	Yd11	1.8	22.2	0.40	7	
4000					2.1	26.2	0.40		
5000					2.6	30.8	0.40		
6300					3.1	33.0	0.40		
8000			6.3 6.6 10.5	Ynd11		4.3	36.5	0.32	7.5
10000						5.1	43.2	0.32	
12500						6.0	51.1	0.28	8
16000						7.2	63.3	0.28	
20000						8.5	74.4	0.28	
25000						10.1	88.0	0.24	
31500						12.0	104.4	0.24	



PROFESSIONAL MANUFACTURER

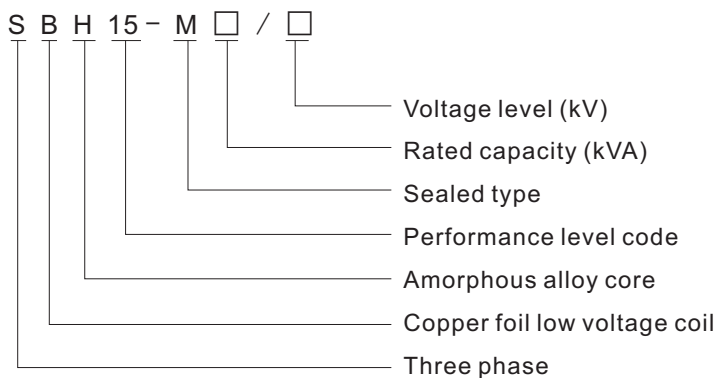
OIL-IMMERSED Amorphous alloy
core distribution transformers



Product characteristics

- Energy-saving products, no-load loss than S9 transformer reduced by about 75%;
- Low loss, less heat, low temperature rise, stable operation;
- Advanced and reasonable structure, strong short-circuit resistance;
- Strong overload capacity, safe and reliable, strong corrosion resistance, maintenance-free.

Model meaning



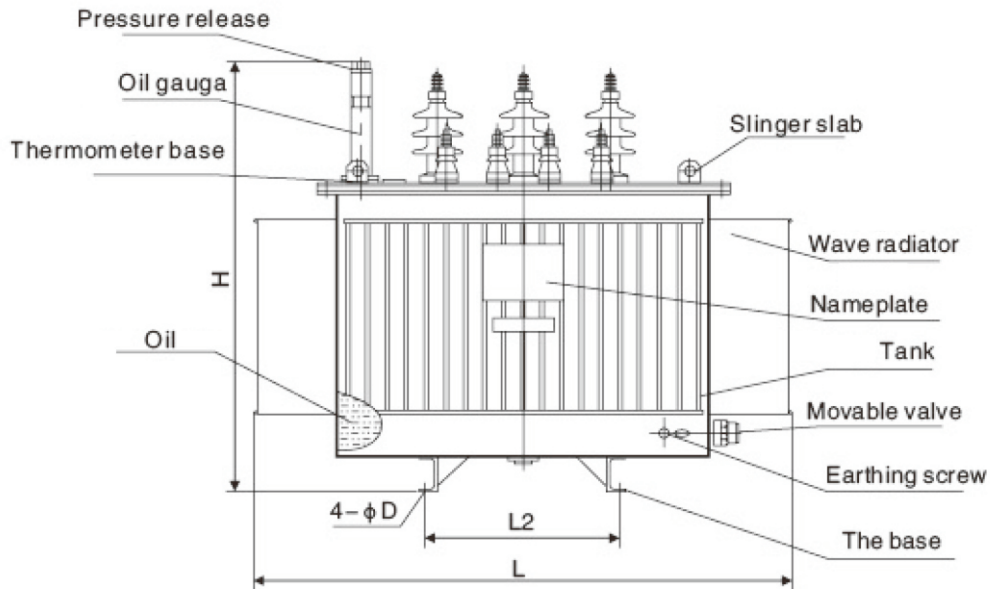
Product introduction

The transformer can convert the voltage of the grid into the voltage required by the system or the load, and realize the transmission and distribution of electric energy. The transformer can replace the transformer of silicon steel sheet iron core and is widely used in outdoor distribution system. The large-scale operation of this product into the network can achieve good energy-saving effect and reduce the pollution to the atmosphere, adopts a fully sealed structure, insulating oil and insulating media are not polluted by the atmosphere, so it can operate in a humid environment, and is the ideal distribution equipment in the vast distribution network in cities and rural areas.

Pass the short-circuit test

Because amorphous alloy core can not withstand the action of mechanical force, and the mechanical strength of rectangular coil is weak, amorphous alloy transformer through short circuit test has become a technical problem in transformer field. The company has successfully overcome this difficulty with mature technical experience, and has designed and developed the SBH15-M 2500/10 distribution transformer by itself. In shenyang national transformer quality supervision and inspection center passed the short circuit test, which marks the company's amorphous alloy transformer design and manufacturing technology in the international leading level.

Overall dimension



Product outline drawing

Product insulation level

The classification of voltage	Effective value	Rated short-time power frequency (Effective value)	Rated full-waved lightning impulse bearing voltage(max)
≤1	≤1	5	--
6	6.9	25	75
10	11.5	35	95
20	23	55	125

Transformer product standard

- GB/T 1094.1-2013 Power transformers - Part 1:General
- GB/T 1094.2-2013 Power transformers - Part 2:Temperature rise of immersed transflmers
- GB/T 1094.3-2017 Power transformers - Part 3:Insulation levels,insulation tests and external insulation air gap
- GB/T 1094.5-2008 Power transformers - Part 5:Ability to withstand short circuits
- GB/T 6451-2023 Technical parameters and requirements of oil-immersed power transformer
- JB/T 3837-2010 Transformer product model preparation method
- GB 20052-2020 Power transformer energy efficiency limits and energy efficiency grades

□ Single-phase oil-immersed amorphous alloy core distribution transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (kW)	Load loss (kW)	No-load current (%)	Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)					
5	6 6.3 10 10.5 11	±5 ±2x2.5	2x(0.22~0.24) and 0.22~0.24	Ii0 II6	0.02	0.15	2.4	3.5
10					0.02	0.26	2.2	
16					0.02	0.37	2.0	
20					0.03	0.43	1.8	
30					0.03	0.63	1.6	
40					0.04	0.78	1.4	
50					0.04	1.10	1.2	
63					0.05	1.14	1.0	
80					0.06	1.40	0.9	
100					0.07	1.65	0.8	
125					0.9	1.95	0.7	
160					0.10	2.37	0.7	

□ SBH15 series 10kV amorphous alloy oil immersed transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load Loss(W)		Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)			Dyn11/Yzn11	Yyn0	
30	6 6.3 10 10.5 11	±5 ±2x2.5	0.4	Dyn11	33	630	600	4
50					43	910	870	
63					50	1060	1040	
80					60	1310	1250	
100					75	1580	1500	
125					85	1890	1800	
160					100	2310	2200	
200					120	2730	2600	
250					140	3200	3050	
315					170	3830	3650	
400					200	4520	4300	
500					240	5410	5150	
630				Dyn11 Yyn0	320	6200	6200	4.5
800					380	7500	7500	
1000					450	10300	10300	
1250					530	12000	12000	
1600	630	14500	14500					
2000	5	720	18300	18300				
2500		865	21200	21200				

SBH21 series 10kV amorphous alloy oil immersed transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load Loss(W)		Short-circuit impedance (%)
	HV (kv)	HV Tap Range	LV (kV)			Dyn11/Yzn11	Yyn0	
30	6 6.3 10 10.5 11	±5 ±2x2.5	0.4	Dyn11	33	535	510	4
50					43	780	745	
63					50	930	890	
80					60	1120	1070	
100					75	1350	1285	
125					85	1615	1540	
160					100	1975	1880	
200					120	2330	2225	
250					140	2735	2610	
315				170	3275	3120	4.5	
400				200	3865	3675		
500				240	4625	4400		
630				320	5300	5300		
800				380	6415	6415		
1000				450	8800	8800		
1250				530	10260	10260		
1600				630	12400	12400		
2000				710	14800	14800		5
2500				860	16300	16300		

□ SBH25 series 10kV amorphous alloy oil immersed transformer

Capacity (kVA)	Voltage combination and Tap range			Vector group symbol	No-load loss (W)	Load Loss(W)		Short-circuit impedance (%)	
	HV (kv)	HV Tap Range	LV (kV)			Dyn11/Yzn11	Yyn0		
30	6 6.3 10 10.5 11	±5 ±2x2.5	0.4	Dyn11	25	510	480	4	
50					35	735	700		
63					40	880	840		
80					50	1060	1010		
100					60	1270	1215		
125					70	1530	1450		
160					80	1870	1780		
200				Dyn11 Yyn0	95	2210	2100		
250					110	2590	2470		
315					135	3100	2950		
400					160	3660	3480		
500					190	4380	4170		
630					250	5020	5020		4.5
800					300	6075	6075		
1000					360	8340	8340		
1250					425	9720	9720		
1600	500	11745	11745						
2000	5	550	14000	14000					
2500		670	15450	15450					