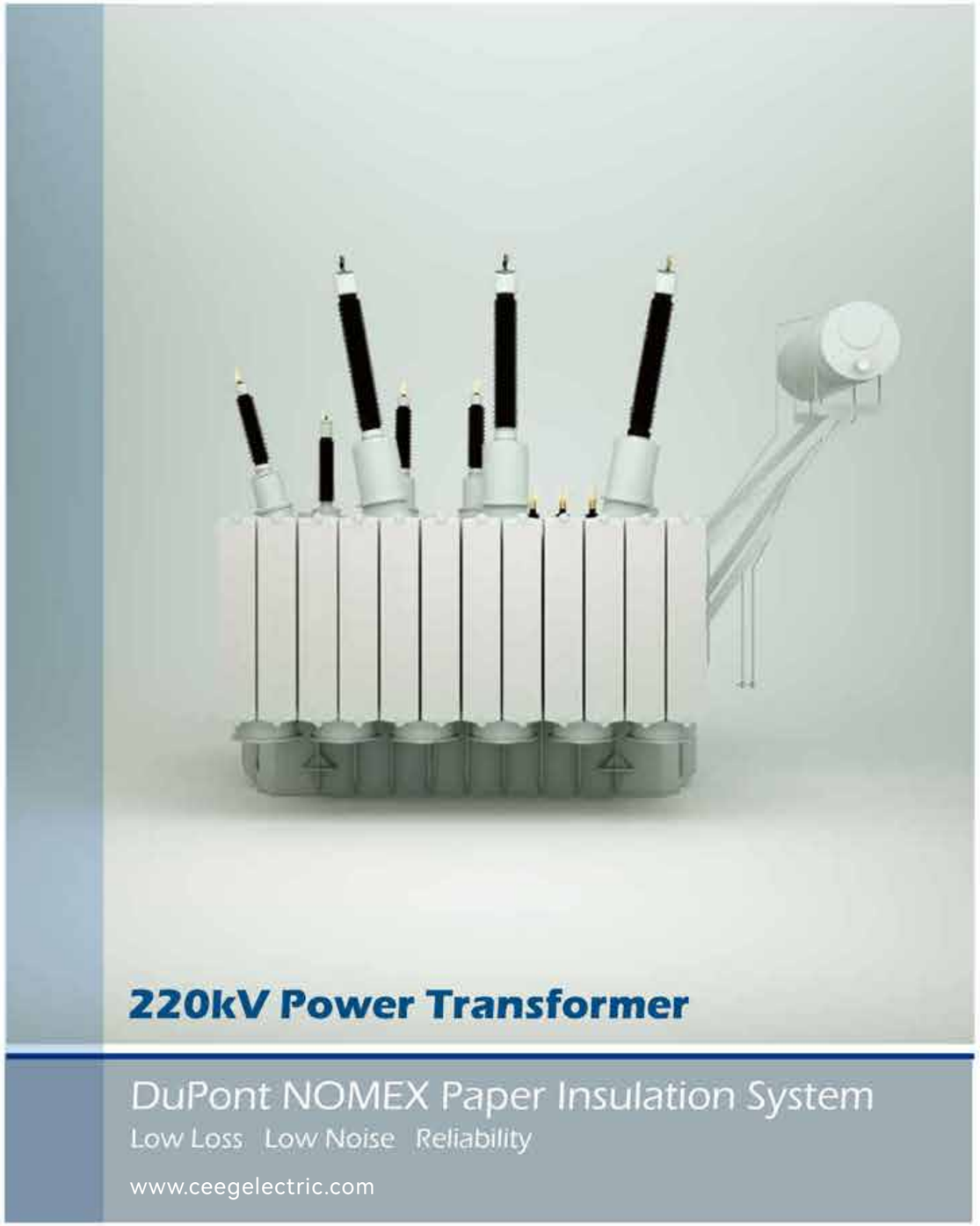

220kV Power Transformer

DuPont NOMEX Paper Insulation System

Low Loss Low Noise Reliability

www.ceegelectric.com

CEEG 中电电气

Delivering premium power to the world

DuPont™ Nomex®

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CEEG 中电电气

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CONTENT

Since its establishment, CEEG has always been adhering to the core values of "vision, innovation, responsibility", and has exported high-quality power to the world. With a focus of 30 years on manufacturing and has formed three pillar industries of power transformers, new energy, and system solutions.

Located in Yangzhong City, Jiangsu Province, China Electric Equipment (Jiangsu) Transformer Manufacture Co.,Ltd is a national high-tech enterprise under China Electric Equipment Group (CEEG), integrating R&D, production, sales and service, specializing in the production of power transmission and distribution equipment.

The company's main products include SG10 open ventilated dry type transformer, SC cast resin dry type transformer, S13 oil immersed transformer, 220kV traction transformer and power transformer, 110kV power transformer, mine explosion-proof transformer, mine explosion-proof switch, high and low voltage switch cabinet, frequency converter, amorphous alloy transformer, substation, wind power transformer, marine transformer, etc. It is committed to providing power, electronics, hydropower, nuclear power, wind power, coal mine , communications, construction, petroleum, chemical, aviation, transportation, railway and other industries to provide world-class power transmission and distribution products and services.

In recent years, CEEG has participated in many national key projects, such as Beijing Olympic project, Nanjing South Railway Station, Shenyang National Games, Nanjing Youth Olympic Games, Shanghai World Expo project, manned space project, Beijing South Railway Station, Shanghai Yangtze River Tunnel and bridge, Shenzhen Ling'ao nuclear power project, etc. its products are exported to Europe, Australia, Southeast Asia, Middle East, Africa and other parts of the world.

Oil transformers mainly include: ordinary insulation system transformer and high temperature resistance insulation system transformer. The product voltage covers 10kV-220kV, and the product series covers distribution transformer, 110-220kV power transformer, 110-220kV electrified railway traction transformer, electrified railway AT power supply autotransformer, rectifier transformer, wind power transformer, photovoltaic transformer, test transformer, amorphous alloy transformer, etc.

Performance Characteristics

Flexible design to meet the needs of different users

First-class product quality in China
The first-class R & D team in the industry ensures that the performance indicators of products meet or exceed the national standards, introduces scientific management mode, and standardizes the operation of each process to ensure the excellent quality of each product.

Flexible design to meet the needs of different users
According to the actual needs of customers, the product structure can be designed flexibly, and all kinds of accessories can be selected according to the requirements of users, so as to meet the personalized needs of different customers.

Safe, no partial discharge, high efficiency and energy saving

1. Seven-stage temperature control technology
2. Low loss: adopt a special design scheme, the no-load loss is 20% lower than the national standard, load loss is 5% lower than the national standard.
3. Low noise: the noise is 3-5 dB lower than the national standard
4. No partial discharge: factory test is less than 40pc
5. Anti short circuit: pass the sudden short circuit test of the national transformer testing center.

Scope of application: widely used in large and medium-sized city power grid and large thermal power plants, industrial and mining enterprises.

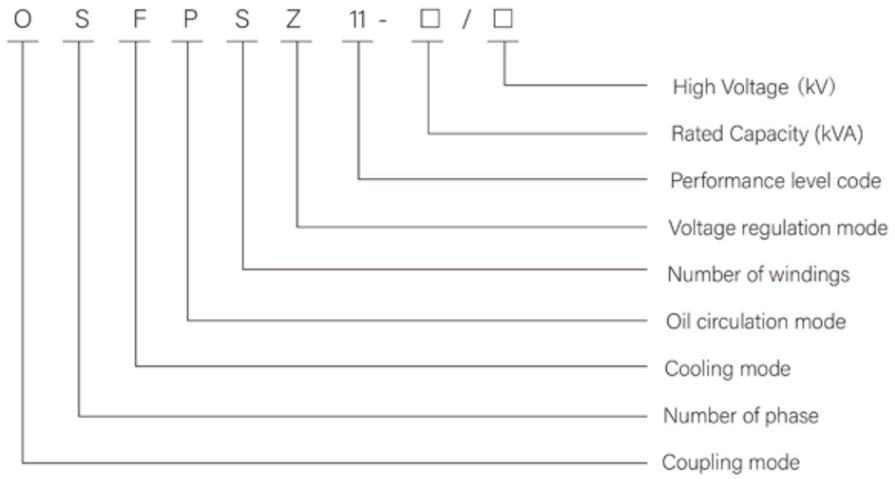
Temperature Control Technology

7 Seven-stage Temperature Control Technology

The structure of high temperature liquid immersed transformer adopts the mature structure and technology of traditional transformer as far as possible, which retains the advantages of reliability, good processability and economy.
The biggest difference between this kind of transformer and the traditional transformer is that the actual situation of the temperature field in the transformer is reasonably considered in the design, and the insulation materials with different temperature resistance grades are reasonably used according to the temperature distribution to form a hybrid insulation system. With the help of transformer temperature field simulation technology, the temperature distribution of transformer (mainly winding and its nearby) can be determined more accurately. According to different temperature range, different grades of insulation materials are selected to give full play to the high temperature resistance of materials, and at the same time, it has good economy. The actual maximum oil temperature of the liquid immersed transformer is set at 95 ℃, which ensures that the transformer has good safety, thermal performance margin and long life expectancy.
For the temperature design of the whole transformer, we put forward and implement the concept of "seven-stage temperature control technology" as the design principle, that is, from the highest temperature winding hot spot to the external low temperature area, we gradually divide it into five levels, and consider the short circuit and overload conditions to form a seven level thermal state to control the temperature:

1. Insulation temperature control technology: different insulation materials are selected for winding and active part according to the temperature of different parts. Control winding hot spot temperature.
2. Temperature control technology of liquid flow circuit: it is a technology to determine and control the temperature of liquid flow in various parts by comprehensively considering the relationship between liquid flow field and temperature field. Control the liquid temperature of boundary layer and top layer near the hot spot of winding.
3. Overload temperature control technology: temperature rise control of various parts of transformer under overload condition. The temperature distribution under overload condition is different from that under rated load, so the temperature rise under overload condition should be paid attention to during design procedure.
4. Iron core temperature control technology: temperature control of insulating parts in contact with iron core.
5. Sealed temperature control technology: the influence and control with temperature change of thermal expansion, deformation, strength of fully sealed oil tank, so as to ensure normal operation of transformer within its allowable temperature range.
6. Component temperature control technology: corresponding level of insulation materials are selceted for components according to the temperature of the location. such as gasket.
7. Short circuit temperature control technology: when the transformer is in short circuit, the value of short circuit current flowing through the winding is very large, but the time is short. Generally, it is calculated according to the insulation process. Heat accumulation and heat dissipation effect should be considered in the condition of multiple short circuit reclosing. Generally speaking, because Nomex ® paper has good high temperature resistance, mechanical strength, dielectric coefficient and dielectric loss with the temperature change very little even in the state of multiple short circuit reclosing, it will not cause mechanical damage and electrical failure due to temperature rise, and also will not lose the life of insulation materials.

Model Description



Technical Advantages

DuPont Nomex Insulation System

CEEG 中电电气 + DUPONT Nomex

CEEG 中电电气
DuPont™ Nomex®
Insulation Systems

World recognized high quality electrical insulating materials

Chemical - there is no weak C-H bond, with good chemical stability

Heat resistance: long term stable operation at 220 ℃; Short term operation at 350 ℃; At 250 ℃, it will not melt, flow and support combustion; No toxic or corrosive gas will be released at 750 ℃

Safety, environmental protection - no toxic reaction to people and animals; he smoke concentration is low and no harmful gas is produced during burning.

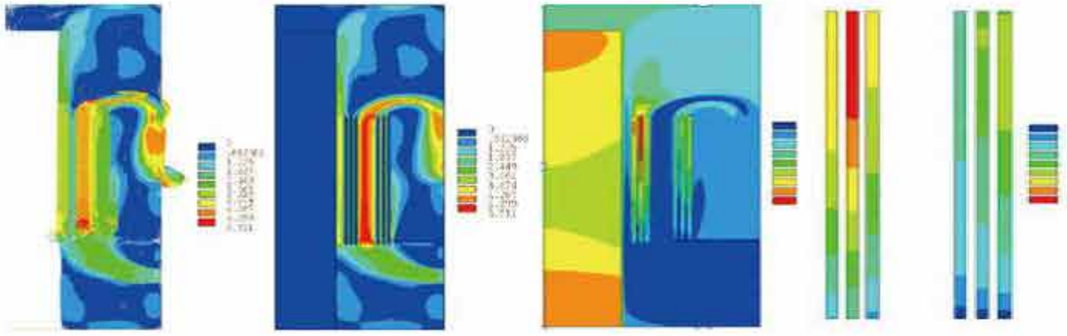
As the main drafter of GB/Z1094.14-2011 "power transformers Part 14: design and application of liquid immersed transformers with high temperature insulating materials", CEEG has successfully developed a series of products with high overload, high reliability, high safety and long life based on the Nomex insulation system of DuPont and the seven level temperature control technology of core. Each performance has reached the industry leading and advanced level.

R & D Team

CEEG has established a strong technology R & D team, it has post doctoral workstation, Jiangsu Electric Power Transformation Equipment Engineering Technology Research Center, Jiangsu graduate workstation, Jiangsu technology center and other technology R & D platforms, it is also in cooperation with the Institute of Electrical Engineering of Chinese Academy of Sciences, Southeast University, Nanjing University of Aeronautics and Astronautics, Jiangsu University, Jiangsu University, Jiangsu University, etc China University of mining and technology and other well-known scientific research institutions and universities jointly to carry out a series of technology research and development and innovation.

Cloud R&D Platform

It integrates the functions of transformer electromagnetic optimization design, parametric drawing, performance analysis and structure optimization, automatic drawing, etc. to realize the sharing of transformer design resources, search, modification and version control of various data information, etc.



Smart operation and maintenance platform

By collecting the key data of temperature, current, voltage, vibration and harmonic of power grid, online power quality analysis and fault alarm can be realized, and can be installed on the mobile terminal.

Key equipments and process layout of transformer

Transformer Test Station

Invest 50 million yuan to build a first-class high-voltage test hall in the industry.

Transformer workshop

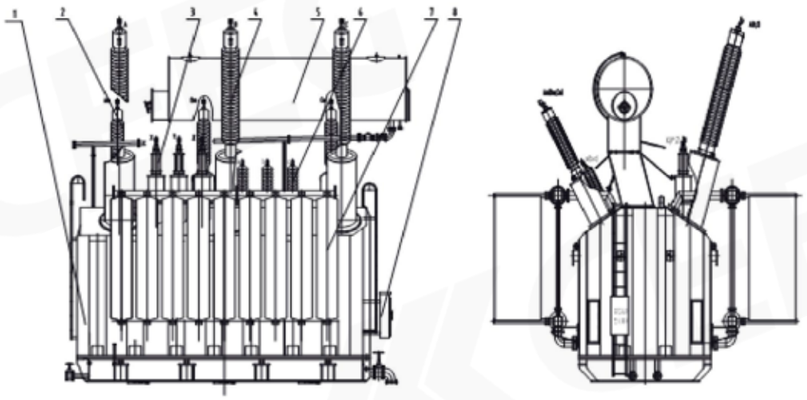
Technical Parameter

S11-220kV 31500kVA-240000kVA three phase three winding non excitation voltage regulating autotransformer

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	Step up Combination No load Loss (KW)	Load Loss (KW)	No load Current (%)	Step down Combination No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%) Step Up	Step Down
31500	220±2×2.5% 230±2×2.5% 242±2×2.5%	115 121	6.6 10.5 21 36 37 38.5	YNa0d11	20	111	0.45	17	94	0.4	HV-MV 12–14 HV-LV 8–12 MV-LV 14–18	HV-MV 8–10 HV-LV 28–34 MV-LV 18–24
40000					23	136	0.45	20	114	0.4		
50000					27	161	0.4	24	136	0.34		
63000					32	190	0.4	28	162	0.34		
90000					40	262	0.34	36	222	0.28		
120000			10.5 13.8 15.75 18 21 36 37 38.5		49	323	0.34	44	273	0.28		
150000					58	384	0.28	52	324	0.26		
180000					67	439	0.28	60	367	0.26		
240000					79	545	0.16	71	478	0.2		

Note:

1. The capacity allocation of step-up structure is (100 / 50 / 100)%, and that of step-down structure is (100 / 100 / 50)%;
2. The short circuit impedance in the table is 100% of the rated capacity;
3. Ttransformer with low voltage of 35kV can also be provided on request;
4. The non tapping structure is preferred, and taps can be set if required;
5. When the annual load rate of transformer is about 40%, the highest operation efficiency can be obtained by using the loss value in the table.



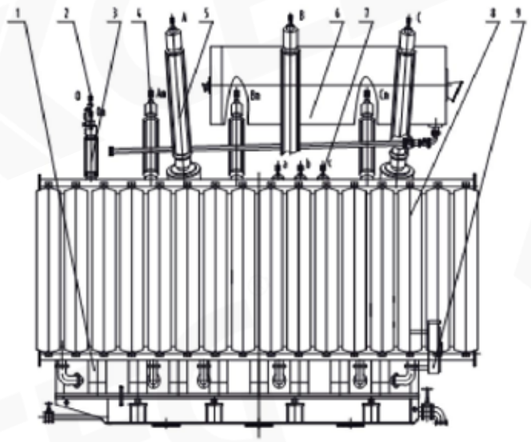
1. Active Part
2. MV Bushing
3. MV Neutral Bushing
4. HV Bushing
5. Oil Conservator
6. LV Bushing
7. Radiator (air cooler)
8. Control Cabinet

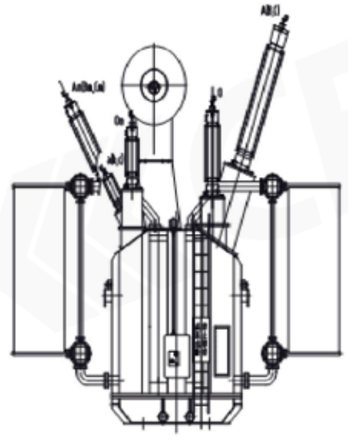
SSZ20-220kV 31500kVA-240000kVA three phase three winding OLTC power transformer (secondary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Capacity Allocation (%)	Impedance(%)
31500	220± 8×1.25%	69 115 121	6.3 6.6 10.5 21 36 37 38.5	YNyn0d11	23.0	138	0.63	100/100/100 100/50/100 100/100/50	HV-MV 12~14 HV-LV 22~24 MV-LV 7~9
40000					27.0	165	0.60		
50000					31.0	194	0.60		
63000					36.0	231	0.55		
90000	230± 8×1.25%		10.5 21 36 37 38.5		47.0	300	0.44		
120000					60.0	369	0.44		
150000					70.0	438	0.39		
180000					81.0	538	0.39		
240000					100	667	0.35		

Note:

1. The data listed in the table are applicable to step-down structure products, and step-up structure products can also be provided as required;
2. transformer with 35kV low voltage can also be provided according to requirements;
3. When the annual load rate of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.





1. Active Part
2. HV Neutral Bushing
3. MV Neutral Bushing
4. MV Bushing
5. HV Bushing
6. Oil Conservator
7. LV Bushing
8. Radiator (air cooler)
9. Control Cabinet

Technical Parameter

OSSZ20-220kV 31500kVA–240000kVA three phase three winding OLTC autotransformer (secondary energy efficiency)

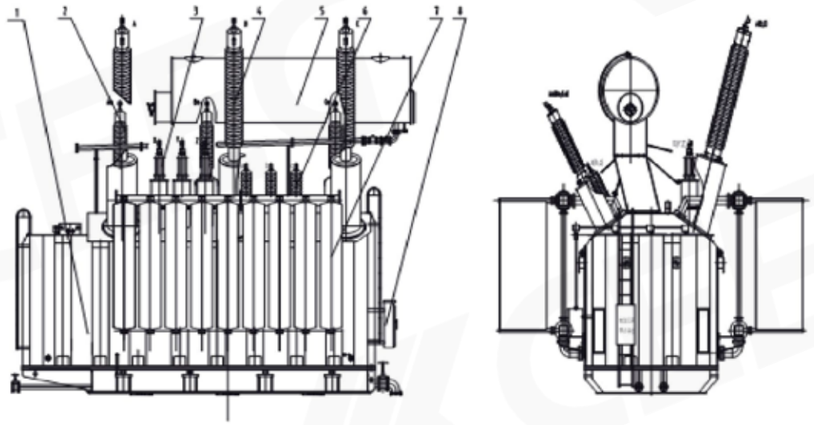
Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Capacity Allocation (%)	Impedance(%)
31500	220±8×1.25% 230±8×1.25%	115 121	6.3 6.6 10.5 21 36 37 38.5	YNa0d11	13.0	92	0.44	100/100/50	HV-MV 8~11 HV-LV 28~34 MV-LV 18~24
40000					16.0	113	0.44		
50000					18.0	134	0.39		
63000					21.0	161	0.39		
90000			10.5 21 36 37 38.5		26.0	211	0.33		
120000					33.0	263	0.33		
150000					39.0	311	0.28		
180000					44.0	358	0.28		
240000					54.0	462	0.24		

Note:

1. The data listed in the table are applicable to the products with reduced pressure structure;

2. Transformer with 35kV low voltage can also be provided according to requirements;

3. When the annual load rate of transformer is between 40% and 45%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. MV Bushing
3. MV Neutral Bushing
4. HV Bushing
5. Oil Conservator
6. LV Bushing
7. Radiator (air cooler)
8. Control Cabinet

Technical Parameter

SS20-220kV 31500kVA–300000kVA three phase three winding non excitation voltage regulating power transformer (secondary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%) Step Up	Impedance(%) Step Down
31500	220±2*2.5% 230±2*2.5% 242±2*2.5%	69 115 121	6.3 6.6 10.5 21 36 37 38.5	YNyn0d11	21.0	138	0.56	HV-MV 22~24 HV-LV 12~14 MV-LV 7~9	HV-MV 12~14 MV-LV 22~24 MV-LV 7~9
40000					25.0	165	0.50		
50000					29.0	194	0.44		
63000					34.0	231	0.44		
90000			10.5 13.8 21 36 37 38.5		44.0	300	0.39		
120000					55.0	369	0.39		
150000			10.5 13.8 15.75 21 36 37 38.5		65.0	438	0.33		
180000					73.0	500	0.33		
240000					91.0	616	0.28		
300000					108	726	0.24		

Note:

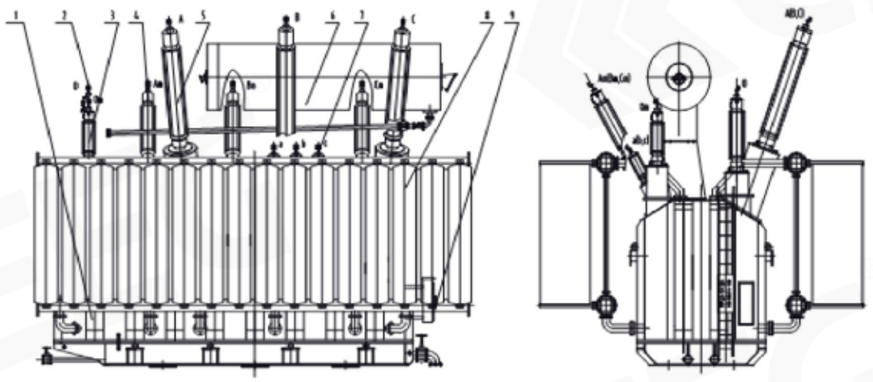
1. the capacity distribution of the load in the table is (100/100/100)%; The capacity distribution of the step up structure can be (100/50/100)%; The capacity distribution of the step-down structure can be (100/100/50)%, or (100/50/100).

2. transformers with rated capacity less than 31500kv.a and other voltage combinations can also be provided as required;

3. transformers with low voltage of 35kV can also be provided;

4. the non tap structure is preferred. If required by operation, tap can be set;

5. when the average load rate of transformer is about 45%, the maximum operating efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. MV Neutral Bushing
4. MV Bushing
5. HV Bushing
6. Oil Conservator
7. LV Bushing
8. Radiator (air cooler)
9. Control Cabinet

S20-220kV 31500kVA～420000kVA three phase double winding non excitation voltage regulating power transformer (secondary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±2×2.5% 242±2×2.5%	6.3 6.6 10.5	YNd11	18.0	115	0.56	12～14
40000				21.0	134	0.56	
50000				25.0	161	0.52	
63000				30.0	188	0.52	
75000		10.5 13.8		34.0	213	0.48	
90000				40.0	246	0.44	
120000				49.0	304	0.44	
150000		10.5 13.8 15.75 18 20		58.0	360	0.40	
160000				60.0	378	0.39	
180000				66.0	413	0.36	
240000				83.0	484	0.33	
300000		15.75 18 20		98.0	577	0.30	
360000				112	662	0.30	
370000				114	675	0.30	
400000				122	716	0.28	
420000				125	742	0.28	

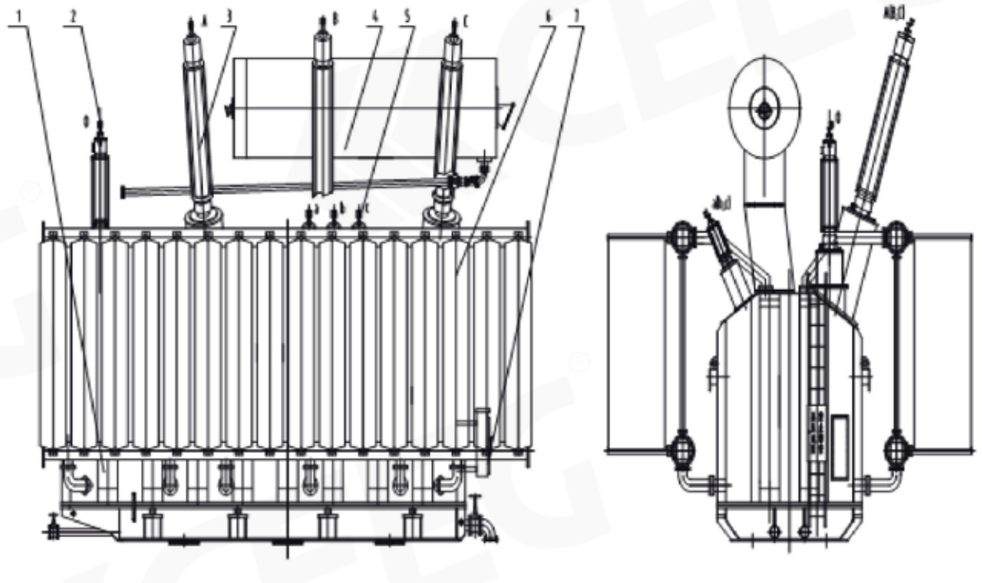
Note:

1. Transformers with rated capacity less than 31500kVA and other voltage combinations can also be provided according to requirements;

2. transformer with low voltage of 35kV can also be provided according to requirements;

3. The non tapping structure is preferred, and taps can be set if required;

4. When the annual average load rate of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

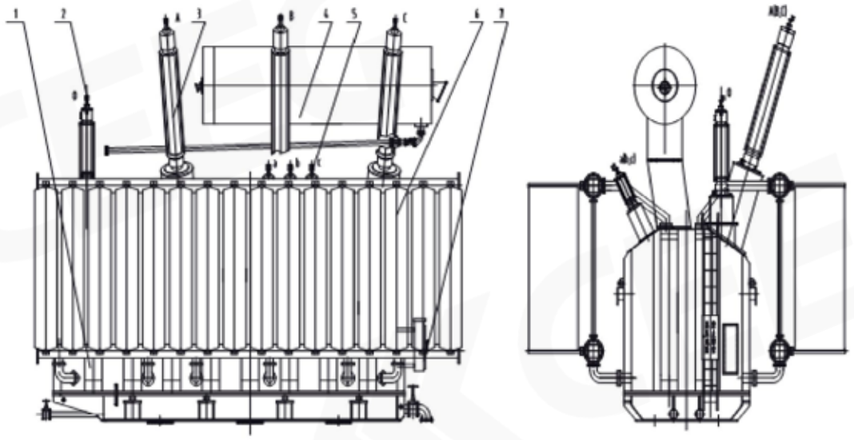
S20-220kV 31500kVA～240000kVA three phase double winding low voltage of 66kVnon excitation voltage regulating power transformer (secondary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±2×2.5% 230±2×2.5%	63 66 69	YNd11	20.0	129	0.71	12～14
40000				23.0	150	0.71	
50000				27.0	180	0.65	
63000				33.0	211	0.65	
90000				43.0	275	0.60	
120000				53.0	330	0.60	
150000				63.0	387	0.54	
180000				72.0	438	0.54	
240000				88.0	543	0.48	

Note:

1. The no-load tap structure is preferred, and the tap can be set if the operation requires;

2. When the annual average efficiency of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

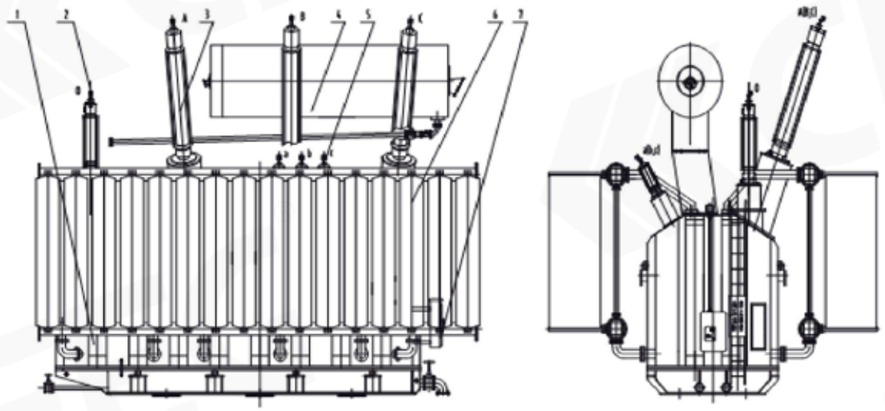
SZ20-220kV 31500kVA–240000kVA three phase double winding OLTC power transformer (secondary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±8×1.25% 230±8×1.25%	6.3 6.6 10.5 21 36 37 38.5	YNd11	20.0	115	0.57	12～14
40000				23.0	134	0.57	
50000				28.0	161	0.53	
63000				33.0	188	0.53	
90000				42.0	246	0.45	
120000		10.5 21 36 37 38.5		51.0	304	0.45	
150000				60.0	360	0.41	
180000				70.0	413	0.38	
120000		66 69		53.0	303	0.45	
150000				62.0	355	0.43	
180000				73.0	406	0.38	
240000				91.0	504	0.30	

Note:

1. 35kV transformer with low voltage can also be provided according to requirements;

2. When the annual average load rate of transformer is about 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

SSZ22-220kV 31500kVA-240000kVA three phase three winding OLTC power transformer (primary energy efficiency)

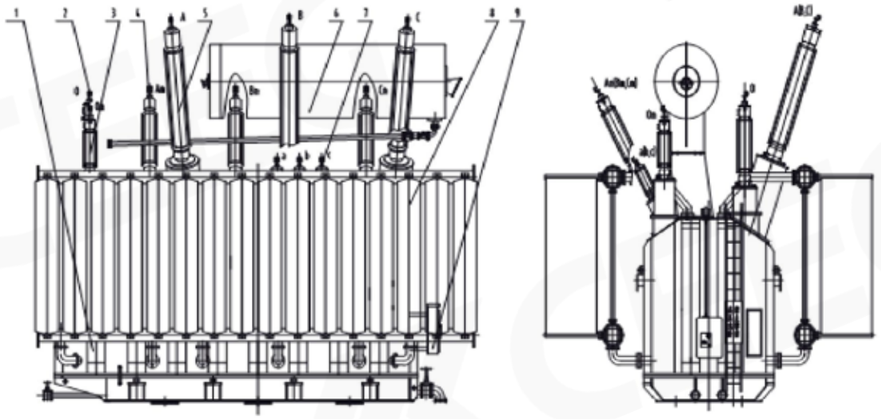
Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Capacity Allocation(%)	Impedance(%)
31500	220±8 ×1.25% 230±8 ×1.25%	69 115 121	6.3 6.6 10.5 21 36 37 38.5	YNyn0d11	19.0	138	0.52	100/100/100 100/50/100 100/100/50	HV-MV 12~14 HV-LV 22~24 MV-LV 7~9
40000					23.0	165	0.51		
50000					26.0	194	0.5		
63000					31.0	231	0.47		
90000			10.5 21 36 37 38.5		40.0	300	0.37		
120000					51.0	369	0.37		
150000					59.0	438	0.33		
180000					68.0	538	0.33		
240000					85.0	667	0.3		

Note:

1. the data listed in the table are applicable to the products of pressure-reducing structure, and the booster structure products can also be provided as required;

2. transformers with low voltage of 35kV can also be provided as required;

3. when the annual load rate of transformer is between 45% and 50%, the maximum operating efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. MV Neutral Bushing
4. MV Bushing
5. HV Bushing
6. Oil Conservator
7. LV Bushing
8. Radiator (air cooler)
9. Control Cabinet

OSSZ22-220kV 31500kVA~240000kVA three phase three winding OLTC autotransformer (primary energy efficiency)

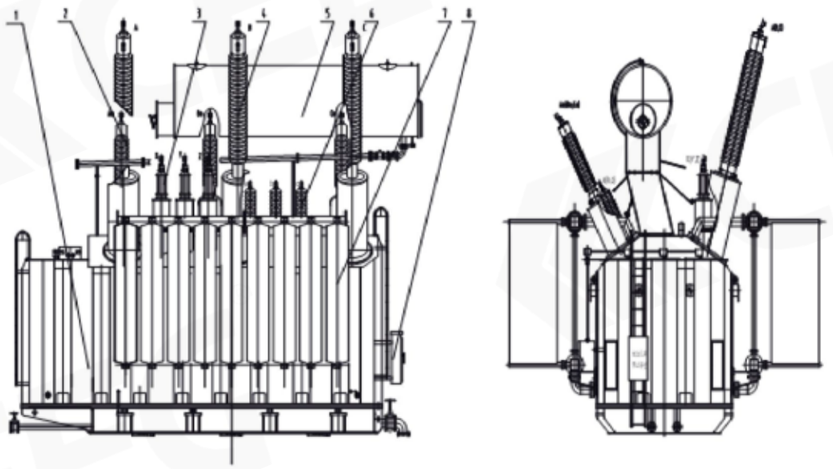
Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Capacity Allocation(%)	Impedance(%)
31500	220± 8×1.25% 230± 8×1.25%	115 121	6.3 6.6 10.5 21 36 37 38.5	YNa0d11	11.0	92	0.37	100/100/50	HV-MV 8~11 HV-LV 28~34 MV-LV 18~24
40000					13.0	113	0.36		
50000					15.0	134	0.33		
63000					18.0	161	0.33		
90000			10.5 21 36 37 38.5		22.0	211	0.28		
120000					28.0	263	0.28		
150000					33.0	311	0.24		
180000					37.0	358	0.24		
240000					46.0	462	0.2		

Note:

1. The data listed in the table are applicable to the products with reduced pressure structure;

2. transformer with low voltage of 35kV can also be provided according to requirements;

3. When the annual load rate of transformer is between 40% and 45%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. MV Bushing
3. MV Neutral Bushing
4. HV Bushing
5. Oil Conservator
6. LV Bushing
7. Radiator (air cooler)
8. Control Cabinet

SS22-220kV 31500kVA-300000kVA three phase three winding non excitation voltage regulating power transformer (primary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%) Step Up	Step Down
31500	220± 2*2.5% 230± 2*2.5% 242± 2*2.5%	69 115 121	6.3 6.6 10.5 21 36 37 38.5	YNyn0d11	18.0	138	0.48	HV-MV 22～24 HV-LV 12～14 MV-LV 7～9	HV-MV 12～14 MV-LV 22～24 MV-LV 7～9
40000					21.0	165	0.42		
50000					24.0	194	0.36		
63000					29.0	231	0.38		
90000			10.5 13.8 21 36 37 38.5		37.0	300	0.33		
120000					46.0	369	0.33		
150000			10.5 13.8 15.75 21 36 37 38.5		55.0	438	0.28		
180000					62.0	500	0.28		
240000					72.0	616	0.22		
300000					91	726	0.20		

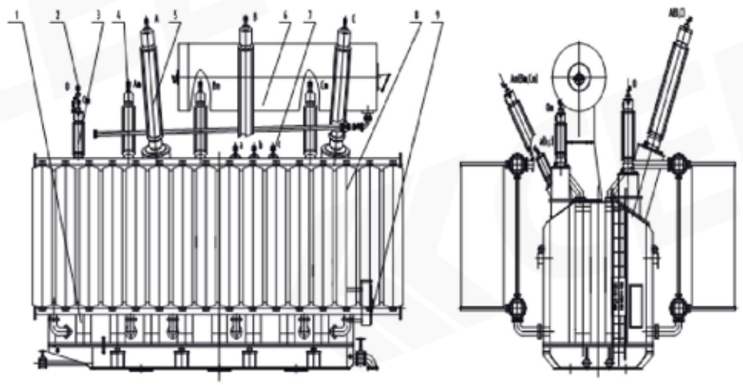
Note:

1. The capacity distribution of the load in the table is (100 / 100 / 100)%; The capacity distribution of boost structure can be (100 / 50 / 100)%; The capacity allocation of Buck structure can be (100 / 100 / 50)% or (100 / 50 / 100)%.

2. Transformers with rated capacity less than 31500kv. A and other voltage combinations can also be provided according to requirements;

3. The transformer with low voltage of 35kV can also be provided;

4. The non tapping structure is preferred, and taps can be set if required; 5. When the annual average load rate of transformer is about 45%, the highest operation efficiency can be obtained by using the loss value in the table.



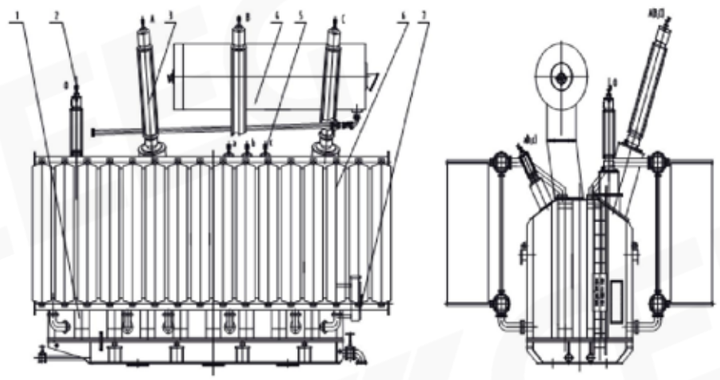
1. Active Part
2. HV Neutral Bushing
3. MV Neutral Bushing
4. MV Bushing
5. HV Bushing
6. Oil Conservator
7. LV Bushing
8. Radiator (air cooler)
9. Control Cabinet

S22-220kV 31500kVA-420000kVA three phase double winding non excitation voltage regulating power transformer (primary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±2×2.5% 242±2×2.5%	6.3 6.6 10.5	YNd11	15.0	115	0.47	12～14
40000				18.0	134	0.48	
50000				21.0	161	0.44	
63000				25.0	188	0.43	
75000		10.5 13.8		29.0	213	0.41	
90000				34.0	246	0.37	
120000				41.0	304	0.37	
150000		10.5 13.8 15.75 18 20		49.0	360	0.34	
160000				51.0	378	0.33	
180000				56.0	413	0.31	
240000				70.0	484	0.28	
300000		15.75 18 20		83.0	577	0.25	
360000				95	662	0.25	
370000				97	675	0.26	
400000				103	716	0.24	
420000				106	742	0.24	

Note:

1. Transformers with rated capacity less than 31500kVA and other voltage combinations can also be provided according to requirements;
2. Transformer with low voltage of 35kV can also be provided according to requirements;
3. The non tapping structure is preferred, and taps can be set if required;
4. When the annual average load rate of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

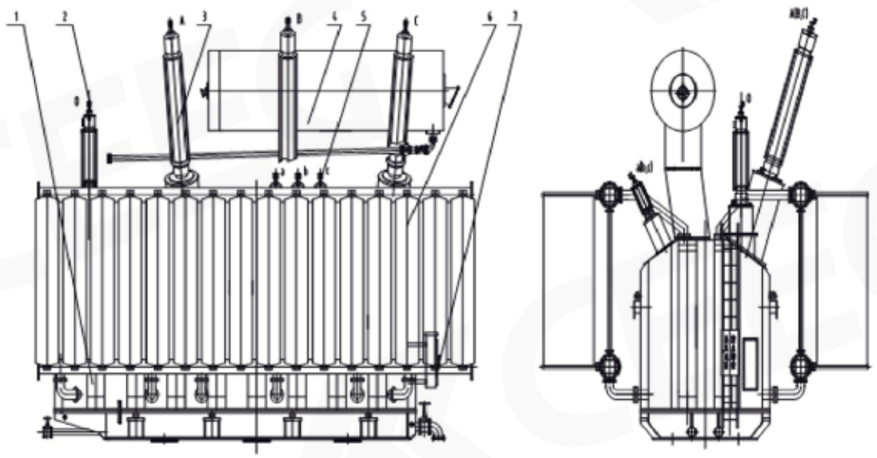
S22-220kV 31500kVA–240000kVA three phase double winding low voltage of 66kV non excitation voltage regulating power transformer (primary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±2×2.5% 230±2×2.5%	63 66 69	YNd11	17.0	129	0.60	12-14
40000				20.0	150	0.62	
50000				23.0	180	0.55	
63000				28.0	211	0.55	
90000				36.0	275	0.50	
120000				45.0	330	0.51	
150000				53.0	387	0.45	
180000				61.0	438	0.46	
240000				75.0	543	0.41	

Note:

1. The no-load tap structure is preferred, and the tap can be set if the operation requires;

2. When the annual average efficiency of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

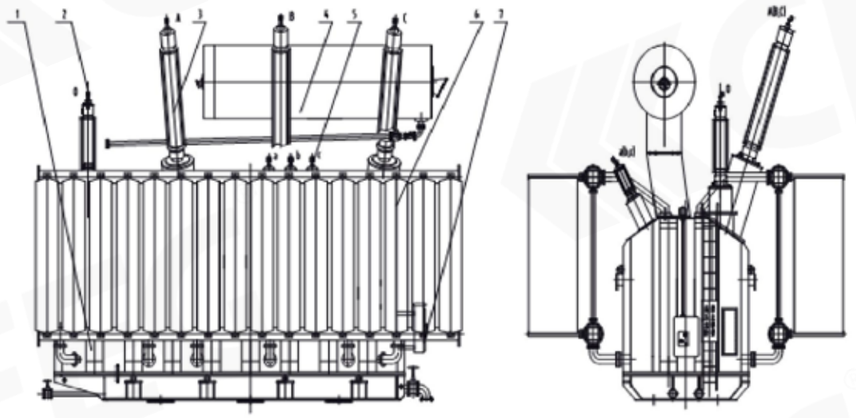
SZ22-220kV 31500kVA～240000kVA three phase double winding OLTC power transformer (primary energy efficiency)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±8×1.25% 230±8×1.25%	6.3 6.6 10.5 21 36 37 38.5	YNd11	20.0	115	0.48	12～14
40000				23.0	134	0.5	
50000				28.0	161	0.45	
63000				33.0	188	0.45	
90000				42.0	246	0.38	
120000		10.5 21 36 37 38.5		51.0	304	0.38	
150000				60.0	360	0.35	
180000				70.0	413	0.32	
120000		66 69		53.0	303	0.38	
150000				62.0	355	0.37	
180000				73.0	406	0.32	
240000				91.0	504	0.25	

Note:

1. Transformer with low voltage of 35kV can also be provided according to requirements;

2. When the annual average load rate of transformer is about 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

SSZ18-220kV 31500kVA-240000kVA three phase three winding OLTC power transformer (energy efficiency three)

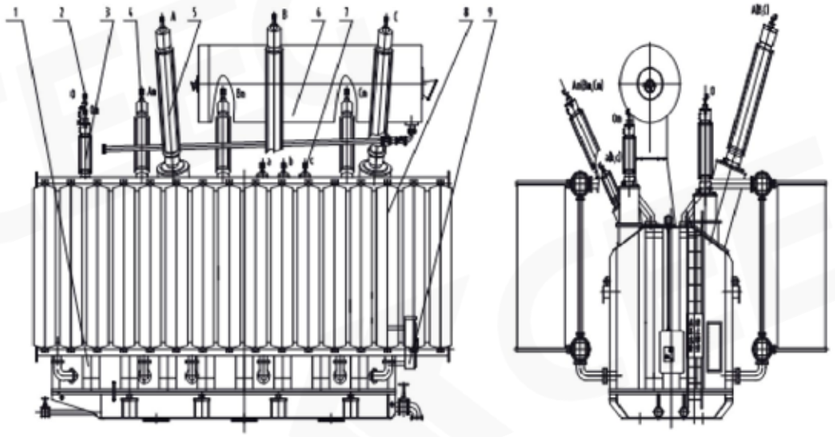
Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Capacity Allocation(%)	Impedance(%)
31500	220± 8×1.25% 230± 8×1.25%	69 115 121	6.3 6.6 10.5 21 36 37 38.5	YNyn0d11	28.0	145	0.77	100/100/100 100/50/100 100/100/50	HV-MV 12~14 HV-LV 22~24 MV-LV 7~9
40000					33.0	174	0.73		
50000					38.0	205	0.74		
63000					45.0	244	0.69		
90000			10.5 21 36 37 38.5		58.0	316	0.54		
120000					74.0	390	0.54		
150000					86.0	463	0.48		
180000					99.0	568	0.48		
240000					123	704	0.43		

Note:

1. The data listed in the table are applicable to step-down structure products, and step-up structure products can also be provided as required;

2. Transformer with low voltage of 35kV can also be provided according to requirements;

3. When the annual load rate of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. MV Neutral Bushing
4. MV Bushing
5. HV Bushing
6. Oil Conservator
7. LV Bushing
8. Radiator (air cooler)
9. Control Cabinet

OSSZ18-220kV 31500kVA-240000kVA three phase three winding OLTC autotransformer (energy efficiency three)

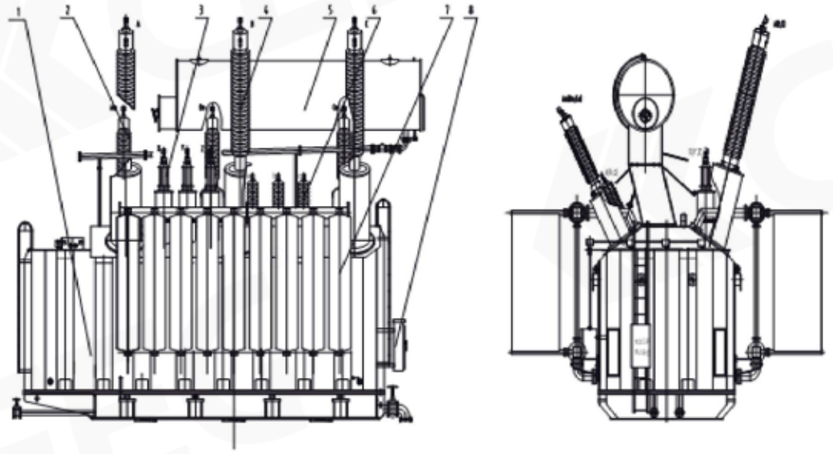
Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Capacity Allocation(%)	Impedance(%)
31500	220± 8×1.25% 230± 8×1.25%	115 121	6.3 6.6 10.5 21 36 37 38.5	YNa0d11	16.0	97	0.54	100/100/50	HV-MV 8~11 HV-LV 28~34 MV-LV 18~24
40000					19.0	119	0.52		
50000					22.0	142	0.48		
63000					26.0	170	0.48		
90000			10.5 21 36 37 38.5		32.0	222	0.41		
120000					41.0	277	0.41		
150000					48.0	329	0.34		
180000					54.0	378	0.34		
240000					66.0	487	0.29		

Note:

1. The data listed in the table are applicable to the products with reduced pressure structure;

2. Transformer with low voltage of 35kV can also be provided according to requirements;

3. When the annual load rate of transformer is between 40% and 45%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. MV Bushing
3. MV Neutral Bushing
4. HV Bushing
5. Oil Conservator
6. LV Bushing
7. Radiator (air cooler)
8. Control Cabinet

SS18-220kV 31500kVA-300000kVA three phase three winding non excitation voltage regulatingpower transformer (energy efficiency three)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	MV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%) Step Up	Step Down
31500	220±2 *2.5% 230±2 *2.5% 242±2 *2.5%	69 115 121	6.3 6.6 10.5 21 36 37 38.5	YNyn0d11	26.0	1145	0.69	HV-MV 22～24 HV-LV 12～14 MV-LV 7～9	HV-MV 12～14 MV-LV 22～24 MV-LV 7～9
40000					30.0	174	0.60		
50000					35.0	2050	0.53		
63000					42.0	244	0.54		
90000			10.5 13.8 21 36 37 38.5		54.0	316	0.48		
120000					67.0	390	0.48		
150000			10.5 13.8 15.75 21 36 37 38.5		80.0	463	0.41		
180000					90.0	527	0.41		
240000					112.0	650	0.34		
300000					133	767	0.30		

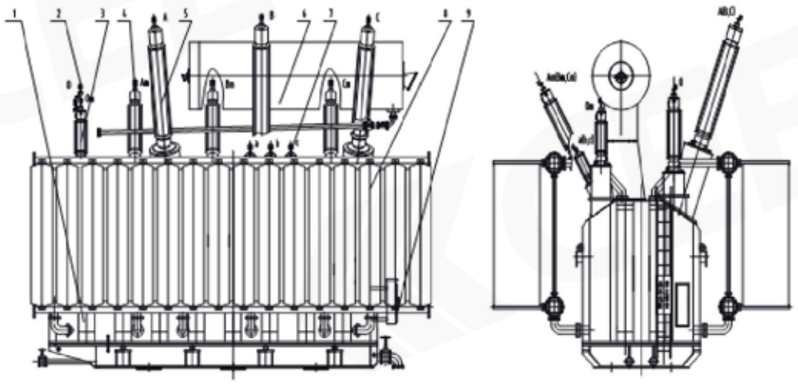
Note:

1. The capacity distribution of the load in the table is (100 / 100 / 100)%; The capacity distribution of boost structure can be (100 / 50 / 100)%; The capacity allocation of Buck structure can be (100 / 100 / 50)% or (100 / 50 / 100)%.

2. Transformers with rated capacity less than 31500kv. A and other voltage combinations can also be provided according to requirements;

3. The transformer with low voltage of 35kV can also be provided;

4. The non tapping structure is preferred, and taps can be set if required; 5. When the annual average load rate of transformer is about 45%, the highest operation efficiency can be obtained by using the loss value in the table.



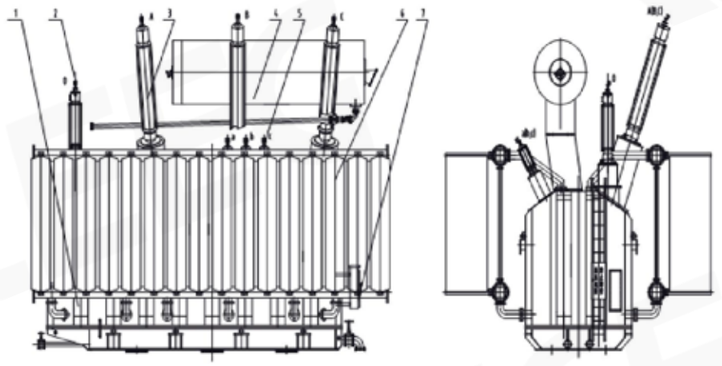
1. Active Part
2. HV Neutral Bushing
3. MV Neutral Bushing
4. MV Bushing
5. HV Bushing
6. Oil Conservator
7. LV Bushing
8. Radiator (air cooler)
9. Control Cabinet

S18-220kV 31500kVA-420000kVA three phase double winding non excitation voltage regulating power transformer (energy efficiency three)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±2×2.5% 242±2×2.5%	6.3 6.6 10.5	YNd11	22.0	122	0.68	12～14
40000				26.0	142	0.69	
50000				31.0	170	0.64	
63000				37.0	199	0.64	
75000		10.5 13.8		42.0	225	0.59	
90000				49.0	259	0.54	
120000				60.0	321	0.54	
150000		10.5 13.8 15.75 18 20		71.0	380	0.49	
160000				74.0	399	0.48	
180000				82.0	436	0.45	
240000				102.0	511	0.41	
300000				121.0	609	0.37	
360000		15.75 18 20		138	698	0.37	
370000				141	713	0.37	
400000				150	755	0.34	
420000				154	783	0.34	

Note:

1. Transformers with rated capacity less than 31500kVA and other voltage combinations can also be provided according to requirements;
2. Transformer with low voltage of 35kV can also be provided according to requirements;
3. The non tapping structure is preferred, and taps can be set if required;
4. When the annual average load rate of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

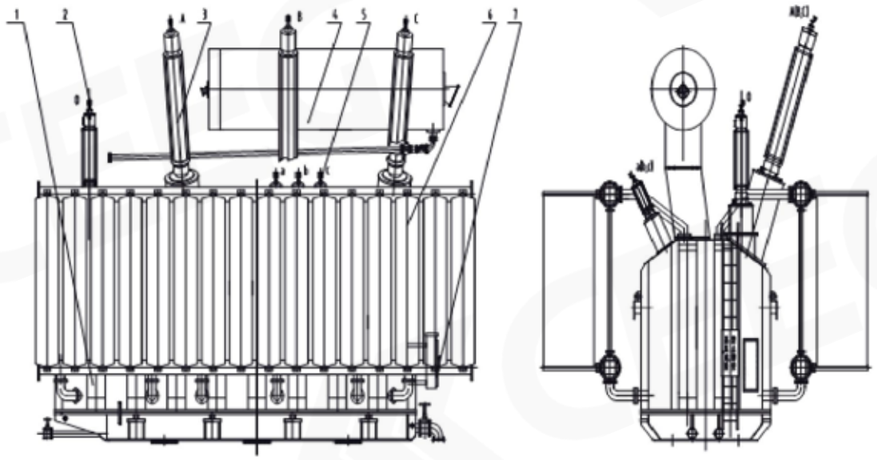
S18-220kV 31500kVA-240000kVA three phase double winding low voltage of 66kV non excitation voltage regulating power transformer (energy efficiency three)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±2×2.5% 230±2×2.5%	63 66 69	YNd11	24.0	136	0.85	12～14
40000				29.0	159	0.90	
50000				34.0	190	0.82	
63000				40.0	222	0.79	
90000				53.0	291	0.74	
120000				65.0	349	0.74	
150000				78.0	409	0.67	
180000				88.0	463	0.66	
240000				109.0	573	0.59	

Note:

1. The no-load tap structure is preferred, and the tap can be set if the operation requires;

2. When the annual average efficiency of transformer is between 45% and 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet

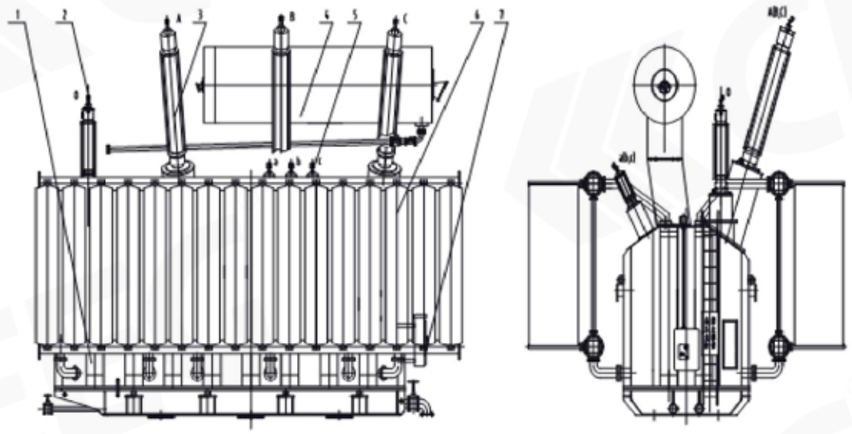
SZ18-220kV 31500kVA-240000kVA three phase double winding OLTC power transformer (energy efficiency three)

Rated Capacity (kVA)	Voltage combination and tapping range HV (kV)	LV (kV)	Vector Group	No load Loss (KW)	Load Loss (KW)	No load Current (%)	Impedance(%)
31500	220±8×1.25% 230±8×1.25%	6.3 6.6 10.5 21 36 37 38.5	YNd11	24.0	122	0.68	12～14
40000				29.0	142	0.7	
50000				34.0	170	0.64	
63000				40.0	199	0.64	
90000				51.0	259	0.55	
120000		10.5 21 36 37 38.5		63.0	321	0.56	
150000				74.0	380	0.51	
180000				86.0	436	0.47	
120000		66 69		65.0	320	0.55	
150000				77.0	374	0.53	
180000				90.0	428	0.47	
240000				112	532	0.37	

Note:

1. Transformer with low voltage of 35KV can also be provided according to requirements;

2. When the annual average load rate of transformer is about 50%, the highest operation efficiency can be obtained by using the loss value in the table.



1. Active Part
2. HV Neutral Bushing
3. HV Bushing
4. Oil Conservator
5. LV Bushing
6. Radiator (air cooler)
7. Control Cabinet