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Control Power ,
Hairui transmission and distribution

>> **Control electricity, Hairui transmits and distributes.**

SELECTING MANUAL OF TRANSFORMER

Control Power , >>

Hairui transmission and distribution

- Oil-Immersed Transformer Series
- Resin-Insulated Dry-Type Transformer Series
- Environment-Friendly Dry-Type Transformer Series
- Amorphous Alloy Oil-Immersed Transformer Series



HAIRUI

>> Brief Introduction

Geographical Location and Environment

The enterprise is nestled at the foot of the scenic Yandang Mountains, adjacent to Yueqing Bay and the Yongtaiwen Expressway. It lies approximately 30 kilometers from Wenzhou Airport, railway station, and port, strategically positioned in the Yueqing Economic Development Zone. Boasting a modern, park-style working and living environment, the campus integrates industrial functionality with natural landscapes, creating a harmonious blend of efficiency and comfort.

Corporate Overview

As a technology-driven enterprise, we specialize in R&D, manufacturing, and marketing of intelligent power transmission & transformation equipment, transformers, and high-voltage components. Backed by robust technical expertise, first-class production facilities, advanced manufacturing processes, and strict management systems, we ensure comprehensive pre-sales, in-sales, and after-sales services. Certified to ISO 9001 and ISO 9002 quality management systems, our products guarantee safety, reliability, and stability.

Product Portfolio and Excellence

Specializing in manufacturing, we offer a comprehensive range of products: European and American-style prefabricated substations with enclosures, dry-type and oil-immersed power transformers, high/low voltage switchgear assemblies, high-voltage vacuum circuit breakers, high-voltage load switches, etc.—encompassing over 100 specifications. Our products feature premium material selection, scientific design, exquisite craftsmanship, and aesthetic modeling—embodying scientific rationality, environmental integration, and human-centered principles. Widely adopted by power authorities, urban residential communities, industrial and mining enterprises, they have earned consistent praise for superior performance.

Strategic Vision and Honors

The company adheres to a long-term strategic goal: "Technological Innovation for Brand Excellence", committed to driving development through technology and quality with the mission of enhancing customer satisfaction. Upholding the principle of "building brands through quality", we have been awarded prestigious titles including "National High-Tech Enterprise" and "Top 10 Well-Known Brands of Prefabricated Substations".

Cooperation Invitation

We sincerely welcome domestic and international business partners to join hands for collaborative growth and create greater achievements together.



ZHEJIANG HAIRUI ELECTRIC CO.,LTD.

Controlling Electricity
HaiRui Transmission and Distribution...

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Power Transformer series

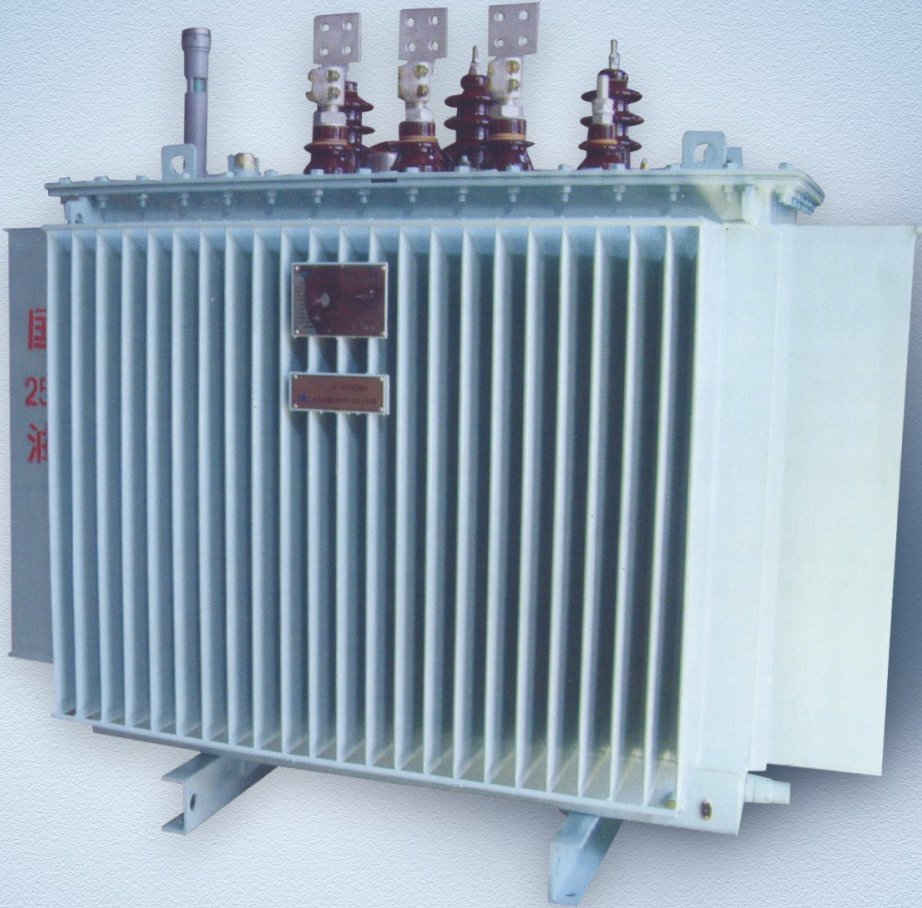
- 10kV Oil-Immersed Power Transformer
- 35kV Oil-Immersed Power Transformer
- 10kV Resin-Insulated Dry-Type Transformer
- 20kV Resin-Insulated Dry-Type Transformer
- 10kV Environment-Friendly Dry-Type Transformer
- 10kV Amorphous Alloy Oil-Immersed Transformer
- S13-M.RL & S11-M.RL Three-Dimensional Triangular Roll-Core Distribution Transformers

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10kV Oil-Immersed Power Transformer

Key Technological Innovations:

- The product features high efficiency and low losses.
- It features excellent internal heat dissipation and stronger short-circuit current resistance.
- It has low no-load and load losses.
- The fully sealed structure enhances operational reliability and enables maintenance-free operation under normal conditions.
- This product has obtained the Energy Conservation Product Certification.



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10KV Oil-Immersed Power Transformer



1. Overview

The three-phase oil-immersed distribution transformers produced by our company adopt a new-type insulation structure for the core body, which enhances the short-circuit resistance. The iron core is made of high-quality cold-rolled silicon steel sheets. The high-voltage windings are all made of high-quality oxygen-free copper wires and adopt a multi-layer cylindrical structure. All fasteners are specially treated.

The product features high efficiency and low losses, which can save a large amount of power consumption and operation costs, with remarkable social benefits. It is a high-tech product promoted by the state.

Standards Compliance:

GB 1094.1-1996 GB 1094.2-1996 JB/T 10088-2004
GB 1094.3-2003 GB 1094.5-2003 GB/T 10237-1988
GB/T6451-2008 GB/T7595-2008 JB/T 3837-2010

Reliable Structure

Our company has made numerous improvements based on traditional structures and mature technologies, such as adopting:

Spiral coils with longitudinal oil ducts for better internal heat dissipation;

Improved effective support for coil end faces, enhancing short-circuit current resistance;

New hoisting structures and core positioning structures to ensure greater reliability during long-distance transportation and operation;

We also have many unique and reliable structural designs to serve you;

Choosing transformers with higher performance levels will incorporate more advanced technical features.

High-quality Materials

The selection of oxygen-free copper wires with lower resistivity, combined with a series of additional surface treatments, results in smoother surfaces free of burrs and sharp edges. This reduces the transformer's load losses and enhances its electrical reliability.

High-quality silicon steel sheets with lower unit losses are chosen to reduce no-load losses as performance requirements increase.

Superior laminated wood insulation components are used, ensuring they remain crack-free and stable even under short-circuit conditions.

Transformer oil that has undergone deep filtration is selected to minimize water, gas, and impurity content, thereby enhancing operational reliability.

Premium rubber sealing materials are employed to resist aging effectively and prevent leaks.

All raw materials undergo quality inspections, and all suppliers are rigorously vetted in accordance with the ISO 9000 national standard.

Good technical and economic performance

The S9 series products have reduced no-load losses, load losses, and no-load current by 10%, 24%, and 46% respectively compared to the S7 series, resulting in a 19% reduction in operating costs.

Based on the S9 series, the S11 series products have an average 30% reduction in no-load losses; the no-load current is 70-85% lower than that of the S9 series; the average temperature rise is reduced by 10K, and the product service life is more than doubled. It can still operate long-term under 20% overload conditions; the average operating noise of the product is reduced by 2-4 decibels.

Good technical and economic performance

Fully Sealed (M)

In the S11-M model, the "M" denotes a fully sealed tank structure. Compared with ordinary oil-immersed transformers, the fully sealed distribution transformer eliminates the oil conservator, with the corrugated fins of the tank replacing oil pipes as cooling and heat dissipation components. The corrugated tank is manufactured from high-quality cold-rolled thin plates on a dedicated production line, and the corrugated fins can expand and contract with the volume change of transformer oil, thus isolating the transformer from the atmosphere. This prevents and slows down oil degradation and insulation moisture ingress, enhancing operational reliability and enabling maintenance-free operation under normal conditions.

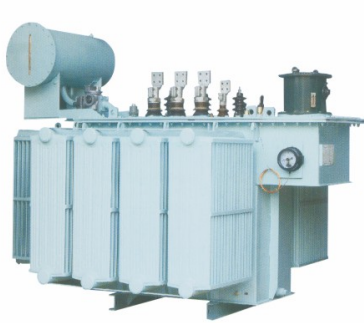
The surface of the corrugated tank undergoes degreasing, derusting, and phosphating treatment before being coated with three-proof paint, making it suitable for use in environments such as metallurgy, petrochemicals, and mines.

Rolled Core

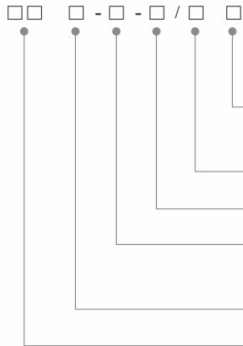
In the S11-M.R model, the "R" indicates the adoption of a rolled core. Made from high-quality low-loss cold-rolled silicon steel sheets without punching or shearing, it eliminates the transverse and longitudinal joints of traditional cores. This achieves lower no-load current and reduces reactive power loss, as well as delivers lower noise levels for enhanced environmental friendliness.

The integral core structure, with clamping parts primarily used to secure the windings, further strengthens the short-circuit current resistance of the coils.

10KV Oil-Immersed Power Transformer



2. Model Designation



- Designations for Special Service Environments (GY - High Altitude, WF - Corrosion - Proof, TA - Dry Tropical, TH - Wet Tropical)
- Voltage ClasskV
- Rated Capacity(kVA)
- Special Purpose or Special Structure Codes (M - Fully Sealed, R - Rolled Core)
- Performance Level Codes (9, 10, 11)
- Product Model Letters (D - Single - phase, S - Three - phase, F - Air - cooled, Z - On - load Tap Changer)

3. Service Conditions for Transformer

Altitude not exceeding 1000m;

Ambient temperature:

Maximum ambient temperature: +40°C;

Average ambient temperature of the hottest month: +30°C;

Maximum annual average ambient temperature: +20°C;

Outdoor minimum ambient temperature: -25°C.

Special conditions: Altitude exceeding 1000m (to be specified in detail when placing an order);

Ambient temperature:

Maximum ambient temperature: +40°C;

Minimum ambient temperature: -45°C;

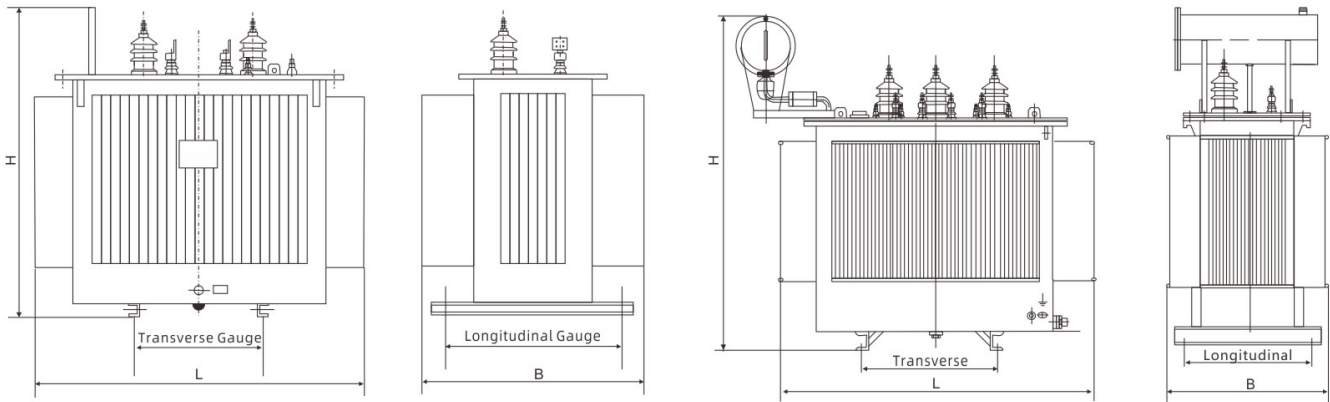
4. Technical Parameters of 10kV Class D9 Series Oil-Immersed Distribution Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
5	11 10.5 10 6.3 6	0.22/ 0.24	II0 or II6	0.035	0.145	4	3.5	50	40	130	530×400×860	350/200
10				0.055	0.260	3.5		65	40	150	550×480×900	400/300
16				0.065	0.365	3.2		80	40	180	580×480×950	400/300
20				0.080	0.430	3.0		100	50	205	600×480×970	400/300
30				0.100	0.625	2.8		115	50	225	600×480×1020	400/300
40				0.125	0.775	2.5		150	55	270	620×500×1050	400/300
50				0.150	0.950	2.3		175	70	310	630×510×1070	400/300
63				0.180	1.135	2.1		190	80	340	650×520×1090	400/300
80				0.200	1.400	2.0		240	100	420	680×540×1100	400/400
100				0.240	1.650	1.9		295	100	490	700×550×1120	400/400
125				0.285	1.950	1.8		370	110	560	730×580×1150	400/400
160				0.365	2.365	1.7		430	130	650	780×600×1160	400/400

Note: High-voltage tapping range: ±5% or ±2×2.5%; Frequency: 50Hz.(The provided overall dimensions are for model selection reference only. The final dimensions shall be subject to the product outline drawing.)

10KV Class Oil-Immersed Power Transformer

5. Overall Dimensions and Installation Dimensions



Fully Sealed Transformer

Technical Parameters of S9 and S9-M Series Oil-Immersed Distribution Transformers

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
5	11 10.5 10 6.3 6	0.4	Yyn or Dyn11	0.05	0.20	4	4	50	45	145	650×450×850	400/300
10				0.07	0.33	3		70	45	170	650×450×880	400/300
20				0.11	0.48	3		115	55	255	745×565×810	400/300
30				0.13	0.63/0.60	2.3		170	55	310	790×660×870	550/400
50				0.17	0.91/0.87	2.0		230	65	395	820×675×950	550/400
63				0.20	1.09/1.04	1.9		260	70	430	845×670×970	550/400
80				0.25	1.31/1.25	1.9		310	85	480	865×715×1000	550/550
100				0.29	1.58/1.50	1.8		360	90	540	880×720×1040	550/550
125				0.34	1.89/1.80	1.7		425	95	600	910×750×1065	550/550
160				0.40	2.31/2.20	1.6		480	115	690	910×750×1140	550/550
200				0.48	2.73/2.60	1.5		580	135	840	1220×745×1190	550/550
250				0.56	3.20/3.05	1.4		670	145	950	1240×775×1220	660/660
315				0.67	3.83/3.65	1.4		775	190	1065	1230×750×1240	660/660
400				0.80	4.52/4.30	1.3		940	220	1255	1330×825×1290	660/660
500				0.96	5.41/5.15	1.2		1155	240	1485	1455×915×1320	660/660
630				1.20	6.20	1.1	4.5	1310	275	1800	1540×920×1385	660/660
800				1.40	7.50	1.0		1495	355	2120	1650×1035×1470	820/820
1000				1.70	10.30	1.0		1705	400	2450	1855×1235×1500	820/820
1250				1.95	12.00	0.9		1990	460	2855	1925×1285×1620	820/820
1600				2.40	14.50	0.8		2345	660	3400	2025×1355×1660	820/820
2000				2.80	19.80	0.6		2470	710	4110	-	820/820
2500				3.30	23.00	0.6		2960	810	4980	-	1070/1070

Note:
High-voltage tap range: ±5% or ±2×2.5%; Frequency: 50Hz.
The load losses above the diagonal line apply to Dyn11 or Yzn11 connection groups, while the load loss values below the diagonal line apply to Yyn0 connection groups.
The provided overall dimensions are for type selection reference only, and the final dimensions shall be subject to the product outline drawing.

10KV Class Oil-Immersed Power Transformer

Technical Parameters of 10kV Class SZ9 Series On-Load Tap-Changing Oil-Immersed Distribution Transformers

Rated Capacity (kVA)	Voltage Combination and Tap Range			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	High-voltage Tap Range (%)	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
200	6 6.3 10	±4×2.51	0.4	Dyn11 Yyn0	0.48	3.06	1.5	4.0	610	180	960	1780×780×1310	660/660
250					0.56	3.60	1.4		705	195	7705	1870×840×1340	660/360
315					0.67	4.32	1.4		815	260	1315	1850×930×1405	660/660
400					0.80	5.22	1.3		990	300	1570	1940×940×1450	660/660
500					0.96	6.21	1.2		1210	325	1835	2030×1000×1510	660/660
630					1.20	7.65	1.1	4.5	1380	370	2250	2060×1080×1550	820/820
800					1.40	9.36	1.0		1570	480	2745	2240×1160×1640	820/820
1000					1.70	10.98	1.0		1790	540	3065	2260×1250×1820	820/820
1250					1.95	13.05	0.9		2090	620	3570	2280×1300×1840	820/820
1600					2.40	15.57	0.8		2456	890	4320	2320×1320×1990	820/820
2000					3.17	20.80	0.6		2600	960	4810	2600×1360×2260	820/820
2500					3.74	24.20	0.5		3110	1095	5830	2640×1440×2310	1070/1070

Note: The provided overall dimensions are for type selection reference only, and the final dimensions shall be subject to the product outline drawing.

Technical Parameters of 10kV Class S9 and S9-M Series Oil-Immersed Power Transformers

Rated Capacity (kVA)	Voltage Combination and Tap Range			Connection Group Designation	Losses (kW)		No-load Current (%)	Short-circuit impedance (%)	Weight (Kg)			Dimensions of S9 (mm) L (Length) × B (Width) × H (Height)		Gauge Longitudinal / Transverse		
	High Voltage	High-voltage Tap Range (%)	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight	Fully Sealed	Non-fully Sealed			
200	6 6.3 10 10.5 11	±5	3 3.15 6.3	Yd11	0.42	3.15	1.8	4.5	620	150	890	1240×870×1150	1530×810×1270	660/660		
250					0.51	3.60	1.7		720	160	1030	1310×880×1170	1595×880×1290			
315					0.61	4.30	1.6		830	210	1225	1410×920×1260	1650×920×1380			
400					0.73	5.20	1.5		1010	245	1480	1440×940×1280	1720×940×1380			
500					0.88	6.20	1.4		1235	265	1725	1590×1010×1370	1860×1010×1450			
630					1.03	7.29	1.1	5.5	1400	300	2090	1655×1070×1360	1890×1070×1510	820/820		
800					1.26	8.91	1.0		1600	390	2540	1710×1160×1375	2080×1160×1600			
1000					1.48	10.44	1.0		1825	440	2830	1835×1250×1570	2150×1250×1790			
1250					1.75	12.42	0.9		2130	510	3295	1880×1280×1550	2170×1280×1830			
1600					2.11	14.85	0.8		2510	690	3990	1910×1300×1760	2210×1300×1990			
2000					2.52	17.82	0.8		2650	750	4400	-	2210×1650×2230			
2500					2.97	20.70	0.8		3170	880	5330	-	2240×1760×2260			
3150					3.51	24.30	0.7		3680	1270	6560	-	2285×2260×2290			
4000	10 10.5 11		3.15 6.3		4.32	28.80	0.7		4375	1580	7520	-	2400×2420×2390	1070/1070		
5000					5.13	33.03	0.7		5280	1830	8975	-	2480×2580×2510			
6300					6.12	36.90	0.6		7065	2310	11930	-	2530×2760×2725			
8000					8.40	40.50	0.55		8370	2525	13980	-	2600×2800×2980			
10000					9.90	47.70	0.55		9970	2860	16150	-	2720×2820×3180	1475/1475		

High-voltage tap range: ±5% or ±2×2.5%; Frequency: 50Hz.
(The provided overall dimensions are for type selection reference only, and the final dimensions shall be subject to the product outline drawing.)

Technical Parameters of 10KV Class SZ9 Series On-load Tap-changer Oil-immersed Power Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Impedance Voltage (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
200	11 10.5 10 6.3 6	6.3 6 3.15 3	Yd11	0.45	3.30	1.8	4.5	650	200	1040	1850×830×1340	660/660
250				0.55	3.80	1.7		760	215	1200	1900×900×1370	
315				0.65	4.52	1.6		870	290	1435	1910×950×1455	
400				0.78	5.46	1.5		1060	330	1730	1990×970×1490	
500				0.94	6.51	1.4		1300	360	2000	2110×1050×1530	
630				1.10	7.67	1.3		1470	405	2420	2130×1100×1580	
800				1.35	9.35	1.2	5.5	1680	520	2945	2290×1180×1660	820/820
1000				1.60	11.00	1.1		1920	580	3280	2320×1250×1880	
1250				1.89	13.00	1.0		2240	670	3790	2330×1300×1910	
1600				2.25	15.60	0.9		2635	900	4590	2370×1320×2050	
2000				2.70	18.70	0.9		2785	960	5050	2610×1650×2270	
2500				3.20	21.70	0.8		3330	1120	6055	2640×1760×2290	
3150				3.75	25.50	0.8		4150	1460	7170	2710×2270×2360	1070/1070
4000				4.60	30.20	0.7		5030	1820	8685	2800×2460×2470	
5000				5.60	34.70	0.7		6110	1940	10300	3130×2580×2560	
6300				6.60	38.70	0.6		8125	2560	13560	3180×2760×2780	

Note: The high voltage of the on-load tap-changing transformer can provide a voltage regulation range of ±4×2.5% or ±3×2.5%.

Technical Parameters of 10kV Class S11-M Series Oil-immersed Distribution Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
20	11 10.5 10 6.3 6	0.4	Yyno or Dyn11	-	-	-	4	-	-	255	745×565×865	400 / 300
30				0.10	0.63/0.60	2.1		185	70	310	790×660×925	550 / 400
50				0.13	0.91/0.87	2.0		255	85	395	820×675×1030	550 / 400
63				0.15	1.09/1.04	1.9		280	95	430	845×690×1065	550 / 400
80				0.18	1.31/1.25	1.8		320	100	480	865×715×1075	550 / 550
100				0.20	1.58/1.50	1.6		380	110	540	880×720×1120	550 / 550
125				0.24	1.89/1.80	1.5		444	115	600	910×750×1110	550 / 550
160				0.28	2.31/2.20	1.4		510	130	690	910×750×1200	550 / 550
200				0.34	2.73/2.60	1.3		610	150	840	1220×745×1220	550 / 550
250				0.40	3.20/3.05	1.2		720	190	950	1240×775×1300	660 / 660
315				0.48	3.83/3.65	1.1		835	200	1065	1230×750×1345	660 / 660
400				0.57	4.52/4.30	1.0		1010	240	1255	1330×825×1375	660 / 660
500				0.68	5.41/5.15	1.0		1170	260	1485	1455×915×1390	660 / 660
630				0.81	6.200	0.9	4.5	1375	320	1800	1540×920×1510	660 / 660
800				0.98	7.500	0.8		1620	365	2120	1650×1035×1555	820 / 820
1000				1.15	10.300	0.7		1780	405	2450	1855×1235×1600	820 / 820
1250				1.36	12.000	0.6		2065	560	2855	1925×1285×1680	820 / 820
1600				1.64	14.500	0.6		2470	650	3400	2025×1355×1730	820 / 820
2000				1.96	19.800	0.6		2700	695	4460	2190×1900×1950	820 / 820
2500				2.31	23.000	0.6		3230	870	5330	2240×1940×1980	1070 / 1070

1.High-voltage tapping range: ±5% or ±2×2.5%; Frequency: 50Hz. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)
2.The load loss values above the diagonal in the table are applicable to Dyn11 or Yzn11 connection groups, and the load loss values below the diagonal are applicable to Yyn0 connection groups.

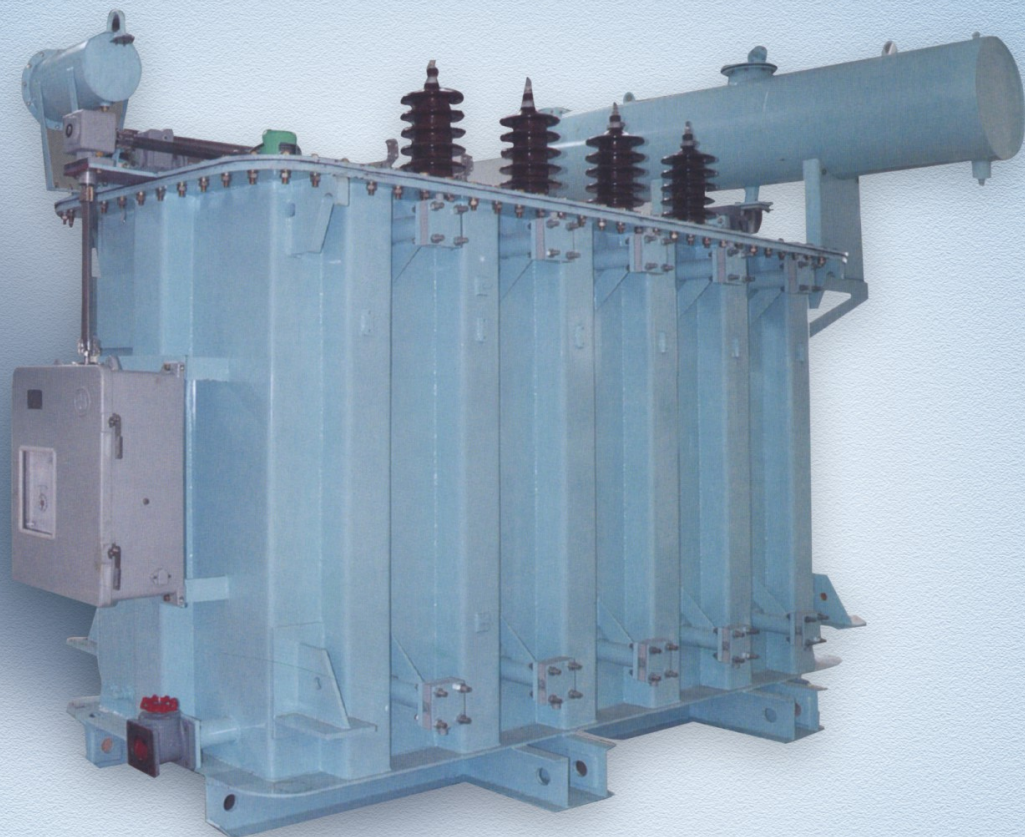
Technical Parameters of 10kV Class S11-M Series Oil-immersed Power Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Impedance Voltage (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Rail Gauge
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
200	11 10.5 10 6.3 6	6.3 6 3.15	Yd11	0.34	3.15	1.8	4.5	650	160	1000	1180×740×1270	660/660
250				0.40	3.60	1.7		770	200	1190	1230×780×1340	
315				0.48	4.30	1.6		900	215	1360	1260×810×1370	
400				0.57	5.20	1.5		1080	260	1650	1380×900×1390	
500				0.68	6.20	1.4		1250	280	1890	1400×920×1450	
630				0.83	6.93	0.9	5.5	1470	340	2245	1580×1020×1430	820/820
800				1.00	8.47	0.8		1735	385	2645	1665×1070×1520	
1000				1.19	9.92	0.7		1910	430	2980	1740×1160×1550	
1250				1.40	11.80	0.6		2210	590	3640	1820×1210×1740	
1600				1.69	14.11	0.6		2640	680	4270	1840×1240×1860	
2000				2.02	16.93	0.6		2890	725	4775	2210×1920×1970	1070/1070
2500				2.38	19.67	0.6		3460	910	5710	2260×1970×1995	
3150				2.81	23.09	0.5		4230	1350	7085	2320×2280×2360	
4000				3.46	27.36	0.5		5025	1675	8150	2460×2480×2475	
5000				4.11	31.38	0.5		6020	1940	9610	2575×2640×2590	
6300				4.90	34.77	0.5		8125	2550	12660	2640×2820×2810	1475/1475
8000				6.52	40.5	0.55		9620	2780	15100	2710×2840×3040	
10000				7.70	47.7	0.55		11660	3070	17480	2850×2880×3265	

Note: High-voltage tapping range: ±5% or ±2×2.5%; Frequency: 50Hz. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)

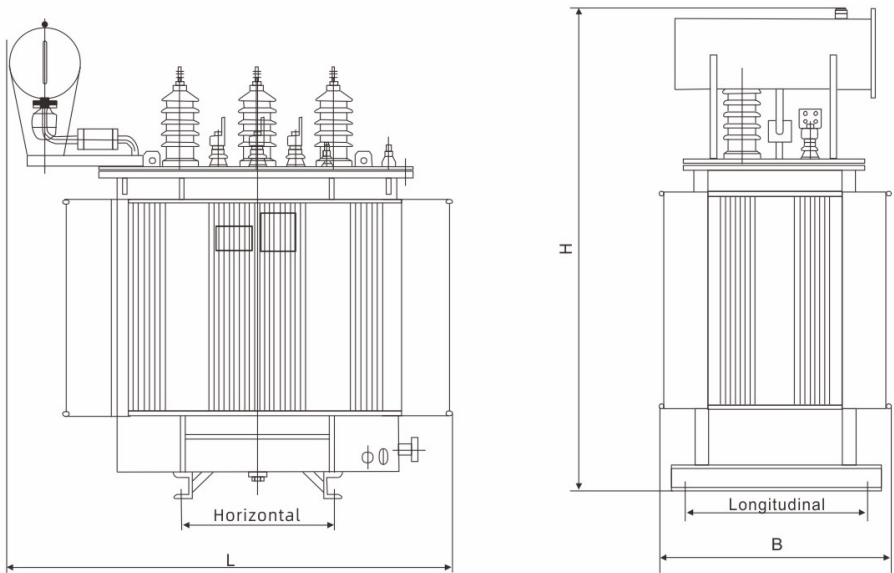
35kV Class Oil-immersed Power Transformer

- Key Technical Innovation Points:**
- The product is characterized by high efficiency and low loss.
 - It has good internal heat dissipation and stronger short-circuit current resistance.
 - Both no-load and load losses are low.
 - This product has passed the energy-saving product certification.



35KV Class Oil-Immersed Power Transformer

1. Outline Dimensions and Installation Dimensions



Technical Parameters of 35kV Class S9 Series Oil-immersed Distribution Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
30	35	36.5	0.4 Yyno	0.165	0.94/0.90	2.0	6.5	150	207	525	1320×550×1540	550/550
50				0.21	1.27/1.21	2.0		210	241	660	1360×700×1570	
80				0.28	1.89/1.80	1.8		280	281	790	1395×730×1630	
100				0.29	2.12/2.02	1.8		335	307	910	1440×760×1700	
125				0.34	2.50/2.38	1.7		400	340	1015	1450×800×1840	660/660
160				0.36	2.97/2.83	1.6		490	375	1235	1470×800×1910	
200				0.43	3.50/3.33	1.5		575	411	1400	1500×800×1950	
250				0.51	4.16/3.96	1.4		655	444	1585	1530×830×1990	
315				0.61	5.01/4.77	1.4		750	476	1735	1550×870×2050	820/820
400				0.73	6.05/5.76	1.3		890	539	2015	1600×940×2100	
500				0.86	7.28/6.93	1.2		1100	618	2400	1750×1000×2180	
630				1.04	8.28	1.1		1280	727	2885	2130×950×2300	
800				1.23	9.90	1.0		1475	770	3265	2210×1075×2350	1070/1070
1000				1.44	12.15	1.0		1775	875	3870	2250×1090×2530	
1250				1.76	14.67	0.9		2045	1025	4395	2210×1740×2590	
1600				2.12	17.55	0.8		2620	1142	5450	2250×2145×2600	
2000	38.5			2.61	21.50	0.6		2790	1205	5875	2320×2170×2650	1070/1070
2500				3.15	23.00	0.6		3230	1260	6435	2340×2180×2400	

Note:

1.The high voltage can provide a voltage regulation range of ±5% or ±2×2.5%. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)

2.The load loss values above the diagonal in the table are applicable to the Dyn11 connection group, and the load loss values below the diagonal are applicable to the Yyn0 connection group.

Technical Parameters of 35kV Class S10 Series Oil-immersed Distribution Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
30	35	0.4	Yyno Dyn11	0.15	0.89/0.84	1.9	6.5	157	217	550	1320×550×1550	550/550
50				0.19	1.21/1.15	1.8		220	253	695	1360×700×1520	
80				0.25	1.80/1.71	1.7		294	290	830	1395×730×1680	
100				0.26	2.01/1.92	1.6		350	320	955	1440×760×1760	
125				0.31	2.38/2.26	1.5		420	357	1065	1450×800×1900	
160				0.32	2.82/2.69	1.4		514	394	1295	1470×800×1950	660/660
200				0.39	3.33/3.16	1.4		603	430	1470	1500×800×2000	
250				0.46	3.95/3.75	1.3		687	466	1665	1530×830×2040	
315				0.55	4.76/4.53	1.3		787	495	1820	1550×870×2100	
400				0.66	5.75/5.47	1.2		934	565	2115	1600×940×2150	
500				0.77	6.92/6.58	1.1		1155	648	2520	1750×1000×2230	820/820
630				0.94	7.88	1.0		1330	763	3030	2730×950×2350	
800				1.11	9.41	0.9		1534	808	3430	2210×1075×2400	
1000				1.30	11.54	0.9		1840	918	4060	2250×1090×2580	
1250				1.58	13.94	0.8		2126	1075	4610	2210×1740×2640	
1600				1.91	16.67	0.6		2724	1195	5720	2250×2145×2650	1070/1070
2000				2.35	20.43	0.5		2900	1265	6165	2320×2170×2700	
2500				2.84	21.85	0.5		3350	1325	6760	2340×2180×2450	

Note:
1.The high voltage can provide a voltage regulation range of ±5% or ±2×2.5%. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)
2.The load loss values above the diagonal in the table are applicable to the Dyn11 connection group, and the load loss values below the diagonal are applicable to the Yyn0 connection group.

Technical Parameters of 35kV Class S11 Series Oil-immersed Distribution Transformer

Rated Capacity (kVA)	Voltage Combination (kV)		Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
30	35	0.4	Yyno Dyn11	0.14	0.89/0.84	1.7	6.5	165	230	580	1320×550×1550	550/550
50				0.17	1.21/1.15	1.6		230	265	730	1360×700×1680	
80				0.22	1.80/1.71	1.7		310	310	870	1395×730×1730	
100				0.23	2.01/1.92	1.4		370	340	1000	1440×760×1810	
125				0.27	2.38/2.26	1.4		440	380	1120	1450×800×1940	660/660
160				0.29	2.82/2.69	1.3		540	415	1360	1470×800×2910	
200				0.34	3.33/3.16	1.2		635	455	1540	1500×800×2050	
250				0.41	3.95/3.75	1.1		725	490	1745	1530×830×2090	
315				0.49	4.76/4.53	1.1		825	525	1910	1550×870×2150	
400				0.58	5.75/5.47	1.0		980	595	2220	1600×940×2200	820/820
500				0.69	6.92/6.58	1.0		7210	680	2(340	1750×1000×2280	
630				0.83	7.88	0.9		1110	800	3175	2130×950×2400	
800				0.98	9.41	0.8		1625	850	3595	2210×1075×2450	
1000				1.15	11.54	0.8		7955	965	4260	2250×1090×2630	
1250				1.41	13.94	0.7		2250	1130	4835	2210×1740×2690	1070/1070
1600				1.70	16.67	0.6		2890	1260	5995	2250×2145×2700	
2000				2.09	20.43	0.5		3070	1330	6445	2320×2170×2750	
2500				2.52	21.85	0.5		3555	1390	7080	2340×2180×2510	

Note:
1.The high voltage can provide a voltage regulation range of ±5% or ±2×2.5%. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)
2.The load loss values above the diagonal in the table are applicable to the Dyn11 connection group, and the load loss values below the diagonal are applicable to the Yyn0 connection group.

Technical Parameters of 35kV Class S9 Series Oil-immersed Power Transformer

Rated Capacity (kVA)	Voltage Combination (kV)			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	High-voltage tapping range (%)	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight		
200	35	±5	3.15	Yd11	0.43	3.30	1.55	6.5	610	365	1310	1240×1270×1680	660/660
250					0.52	3.96	1.4		670	370	1405	1290×1280×1680	
315					0.61	4.77	1.4		825	440	1685	1300×1350×1840	
400					0.75	5.76	1.3		920	530	1910	2020×940×1870	
500					0.87	6.93	1.25		1110	610	2235	2150×1000×1920	820/820
630					1.04	8.28	1.10		1215	630	2420	2260×1060×1920	
800					1.23	9.90	1.00		1540	750	3050	2330×1080×2010	
1000					1.44	12.15	1.00		1795	835	3440	2390×1100×2060	
1250					1.76	14.67	0.90		1960	900	3860	2450×1210×2090	
1600					2.12	17.55	0.80		2275	1025	4540	2475×1230×2300	
2000					2.72	19.35	0.70		2560	1050	4960	2380×2010×2300	
2500					3.20	20.70	0.60		3390	1245	5730	2460×2150×2400	1070/1070
3150					3.80	24.30	0.56	7.0	3785	1500	7600	2550×2220×2420	
4000					4.52	28.80	0.56		4690	1790	8500	2670×2390×2510	
5000					5.40	33.03	0.48		5570	2015	9790	2870×2450×2750	
6300					6.56	36.90	0.48	7.5	7380	2460	12620	3100×2580×2950	1475/1475
8000	35~38.5	±2×2.5	3.15	Ynd11	9.00	40.50	0.42		8870	2650	14100	3250×2680×3150	
10000					10.88	47.70	0.42		10020	2930	16500	3320×2720×3230	
12500					12.60	56.70	0.40		12880	3710	19780	3410×2950×3410	
16000					15.20	69.30	0.40		16120	4280	23950	3520×3180×3570	
20000					18.00	83.70	0.40	8.0	18580	5230	29600	3730×3560×3990	2040/2040
25000					21.28	99.00	0.32		22970	6370	25350	4110×4120×4220	
31500					25.28	118.80	0.32		27600	7740	41900	4760×4570×4390	

Note:
1.The high voltage can provide a voltage regulation range of ±5% or ±2×2.5%. (The provided overall dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)
2.For transformers with a rated capacity of 6300kVA and below, products with a high-voltage tapping range of ±2×2.5% can be provided.
3.For transformers with a low-voltage of 10.5kV and 11kV, products with a connection group label of Dyn11 can be provided.
4.For transformers with a rated capacity of 3150kVA and above, the -5% tapping position is the maximum current tapping.

Technical Parameters of 35kV Class S10 Series Oil-immersed Power Transformers

Rated Capacity (kVA)	Voltage Combination (kV)			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	High-voltage tapping range (%)	Low Voltage		No-Load	Load (75℃)			Weight of Core and Windings	Oil Weight	Total Weight		
200	35	±5	3.15 6.3 10.5	Yd11	0.39	3.16	1.4	6.5	640	385	1380	1240×1270×1740	660/660
250					0.46	3.75	1.3		705	390	1475	1290×1280×1750	
315					0.55	4.53	1.3		860	465	1770	1300×1350×1900	
400					0.66	5.47	1.2		965	560	2005	2020×940×1930	
500					0.77	6.58	1.1		1165	645	2350	2150×1000×1980	820/820
630					0.94	7.88	1.0		1280	665	2545	2260×1060×1980	
800					1.11	9.41	0.90		1620	790	3205	2330×1080×2070	
1000					1.30	11.54	0.90		1885	880	3615	2390×1100×2130	
1250					1.58	13.94	0.81		2060	945	4055	2450×1210×2150	
1600					1.91	16.67	0.72		2390	1080	4770	2475×1230×2360	
2000					2.45	18.38	0.63		2690	1105	5210	2380×2010×2360	
2500					2.88	19.67	0.54		3560	1310	6015	2460×2150×2460	
3150	35~38.5				3.42	23.08	0.50	7.0	3980	1575	7980	2550×2220×2480	1070/1070
4000					4.07	27.36	0.50		4925	1880	8925	2670×2390×2570	
5000					4.86	31.35	0.43		5850	2115	10280	2870×2450×2860	
6300					5.90	35.06	0.43		7750	2585	13250	3100×2580×3010	
8000	35~38.5	±2×2.5	3.15 3.3 6.3 6.6 10.5 11	Ynd11	8.10	38.48	0.38	7.5	9315	2785	14805	3250×2680×3210	1475/1475
10000					9.79	45.32	0.38		10525	3080	17325	3320×2720×3290	
12500					11.34	53.87	0.36		13525	3895	20770	3410×2950×3470	
16000					13.68	65.84	0.36		16925	4495	25150	3520×3180×3630	
20000					16.20	79.52	0.36	8.0	19510	5495	31080	3730×3560×4050	2040/2040
25000					19.15	94.05	0.29		24120	6690	37110	4110×4120×4280	
31500					22.75	112.68	0.29		28980	8130	43995	4760×4570×4450	

Note:

1.The high voltage provides a voltage regulation range of ±5% or ±2×2.5%. (The provided overall dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)

2.For transformers with a rated capacity of 6300kVA and below, products with a high-voltage tapping range of ±2×2.5% can be provided.

3.For transformers with low voltages of 10.5kV and 6.3kV, products with the connection group label Dyn11 can be provided.

4.For transformers with a rated capacity of 3150kVA and above, the -5% tapping position is the maximum current tapping.

Technical Parameters of 35kV S11 Series Oil-immersed Power Transformers

Rated Capacity (kVA)	Voltage Combination (kV)			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse
	High Voltage	High-voltage tapping range (%)	Low Voltage		No-Load	Load (75℃)			Weight of Core and Windings	Oil Weight	Total Weight		
200	35	±5	3.15 6.3 10.5	Yd11	0.34	3.16	1.2	6.5	670	405	1445	1240×1270×1700	660/660
250					0.41	3.75	1.1		735	410	1550	1290×1280×1810	
315					0.49	4.53	1.1		910	485	1855	1300×1350×1960	
400					0.58	5.47	1.0		1015	585	2000	2020×940×1990	
500					0.69	6.58	1.0		1225	675	2460	2150×1000×2040	820/820
630					0.83	7.88	0.9		1335	695	2665	2260×1060×2050	
800					0.98	9.41	0.80		1695	825	3355	2330×1080×2130	
1000					1.15	11.54	0.80		1975	920	3785	2390×1100×2190	
1250					1.41	13.94	0.72		2155	990	4250	2450×1210×2210	
1600					1.70	16.67	0.64		2505	1120	4995	2475×1230×2420	
2000					2.18	18.38	0.56		2815	1155	5460	2380×2010×2430	
2500					2.56	19.67	0.48		3730	1370	6305	2460×2150×2520	
3150	35~38.5				3.04	23.08	0.45	7.0	4165	1650	8360	2550×2220×2540	1070/1070
4000					3.62	27.36	0.45		5160	1970	9350	2670×2390×2630	
5000					4.32	31.35	0.38		6130	2215	10770	2870×2450×2930	
6300					5.25	35.06	0.38		8120	2705	13885	3100×2580×3070	
8000	35~38.5	±2×2.5	3.15 3.3 6.3 6.6 10.5 11	Ynd11	7.20	38.48	0.34	7.5	9760	2915	15510	3250×2680×3270	1475/1475
10000					8.70	45.32	0.34		11025	3225	18150	3320×2720×3350	
12500					10.08	53.87	0.32		14170	4085	21760	3410×2950×3530	
16000					12.16	65.84	0.32		17735	4710	26350	3520×3180×3690	
20000					14.40	79.52	0.32	8.0	20430	5755	32560	3730×3560×4110	2040/2040
25000					17.02	94.05	0.26		25265	7010	38885	4110×4120×4340	
31500					20.22	112.68	0.26		30360	8515	46090	4760×4570×4510	

Note:

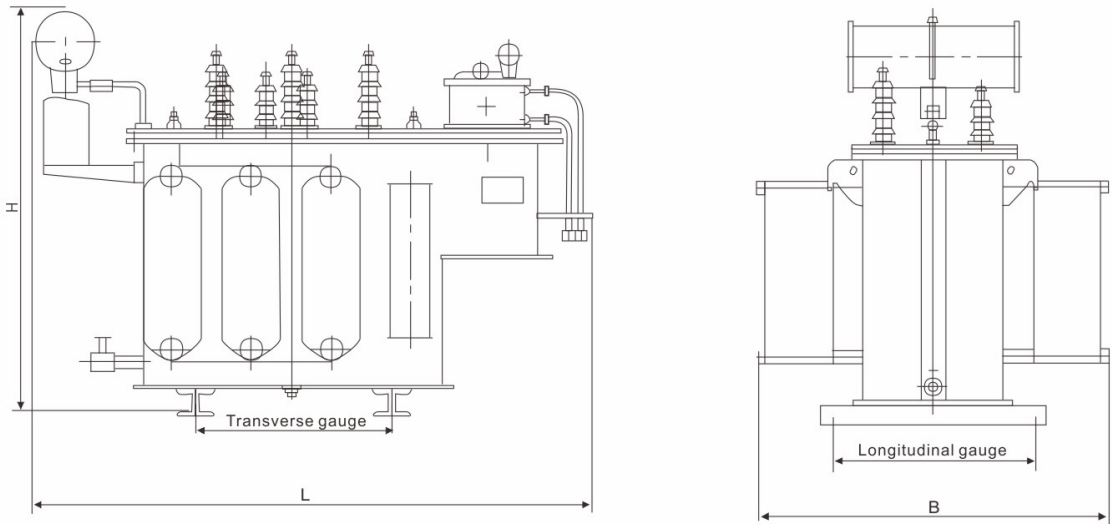
1.The high voltage can provide a voltage regulation range of ±5% or ±2×2.5%. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)

2.For transformers with a rated capacity of 6300kVA and below, products with a high voltage tap range of ±2×2.5% can be provided.

3.For transformers with a low voltage of 10.5kV and 11kV, products with a connection group designation of Dyn11 can be provided.

4.For transformers with a rated capacity of 3150kVA and above, the -5% tap position is the maximum current tap.

35KV Class Oil-Immersed Power Transformer



Technical Parameters of 35kV SZ9 Series On-load Tap-changer Oil-immersed Power Transformers

Rated Capacity (kVA)	Voltage Combination (kV)			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse	
	High Voltage	High-voltage tapping range (%)	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight			
800	35	±3×2.5	6.3 10.5	Yd11	1.39	10.40	1.0	6.5	1650	945	3450	2790×1220×2070	820/820	
1000					1.65	12.80	1.0		1920	1050	3860	2830×1240×2090		
1250					1.96	15.40	0.9		2085	1100	4360	2870×1310×2150		
1600					2.39	18.40	0.85		2410	1230	4995	2875×1310×2320		
2000					2.88	20.25	0.80		2720	1280	5460	2980×2080×2320		
2500					3.40	21.73	0.80		3630	1500	6420	3060×2190×2430		
3150	35~ 38.5					4.04	26.01	0.72	7.0	4030	1770	8360	3780×2240×2450	7070/1070
4000						4.84	30.69	0.72		4980	2150	9350	3270×2410×2540	
5000						5.80	36.00	0.68		5900	2420	10960	3490×2480×2780	
6300						7.04	38.70	0.68	7.5	7920	2950	14100	3710×2600×2965	1475/1475
8000						9.84	42.75	0.60		9400	3310	15800	3850×2680×3170	
10000						11.60	50.58	0.60		10500	3960	18980	3960×2750×3250	
12500						13.68	59.85	0.56		13590	5010	23140	4035×2980×3470	
16000						16.46	74.02	0.54	8.0	16930	5980	27350	4140×3200×3600	2040/2040
20000						19.46	87.14	0.54		19240	7060	35600	4370×3580×4110	
25000						23.50	104.00	0.4		23760	8600	41360	4710×4120×4250	
31500					28.10	125.00	0.4		28400	10500	49100	5360×4570×4390		

Note:

- 1.The high voltage of on-load tap-changer transformers can provide a voltage regulation range of $\pm 3 \times 2.5\%$ or $\pm 4 \times 2.5\%$. (The provided outline dimensions are for model selection reference only, and the final dimensions shall be subject to the product outline drawing.)
- 2.For transformers with low voltage of 10.5kV and 6.3kV, products with connection group designation of Dyn11 can be provided.
- 3.The maximum current tap is at the -7.5% tap position.

35KV Class Oil-Immersed Power Transformer

Technical Parameters of 35kV SZ10 Series On-load Tap-changing Oil-immersed Power Transformers

Rated Capacity (kVA)	Voltage Combination (kV)			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal / Transverse		
	High Voltage	High-voltage tapping range (%)	Low Voltage		No-Load	Load (75°C)			Weight of Core and Windings	Oil Weight	Total Weight				
800	35	±3×2.5	6.3 10.5	Yd11	1.25	9.88	0.9	6.5	1735	995	3625	2790×1220×2130	820/820		
1000					1.50	12.16	0.9		2015	1105	4055	2830×1240×2150			
1250					1.77	14.63	0.81		2190	1155	4580	2870×1310×2210			
1600					2.16	17.48	0.77		2535	1295	5245	2875×1310×2380			
2000					2.59	19.24	0.72		2855	1345	5935	2980×2880×2380			
2500					3.06	20.64	0.72		3815	1575	6745	3060×2190×2490			
3150	35~ 38.5					3.64	24.71	0.65	7.0	4235	1860	8780	3180×2240×2510	1070/1070	
4000						4.36	29.16	0.65		5230	2260	9820	3270×2410×2600		
5000						5.22	34.20	0.61		6195	2545	11510	3490×2480×2840		
6300						6.34	36.77	0.61	7.5	8315	3095	14805	3710×2600×3005	1475/1475	
8000						8.86	40.61	0.54		9870	3480	16590	3850×2680×3230		
10000						10.44	48.05	0.54		11025	4160	19930	3960×2750×3310		
12500						12.31	56.86	0.5		14270	5265	24295	4035×2980×3530		
16000						Ynd11	14.81	70.32	0.49	8.0	17780	6280	28720	4140×3200×3660	2040/2040
20000							17.51	82.78	0.49		20205	7415	37380	4070×3580×4170	
25000							21.15	99.75	0.45		24950	9030	43425	4710×4120×4310	
31500	25.29	119.70	0.41	29820	11025		51555	5360×4570×4450							

Technical Parameters of 35kV SZ11 Series On-load Tap-changer Oil-immersed Power Transformers

Rated Capacity (kVA)	Voltage Combination (kV)			Connection Group Designation	Losses (kW)		No-Load Current (%)	Short-Circuit Impedance (%)	Weight (Kg)			Overall Dimensions (mm) L (Length) × B (Width) × H (Height)	Gauge Longitudinal/ Transverse	
	High Voltage	High-voltage tapping range (%)	Low Voltage		No-Load	Load (75℃)			Weight of Core and Windings	Oil Weight	Total Weight			
800	35	±3×2.5	6.3 10.5	Yd11	1.13	9.88	0.9	6.5	1735	995	3625	2790×1220×2130	820/820	
1000					1.35	12.16	0.9		2015	1105	4055	2830×1240×2150		
1250					1.59	14.63	0.81		2190	1155	4580	2870×1310×2210		
1600					1.94	17.48	0.77		2535	1295	5245	2875×1310×2380		
2000					2.33	19.24	0.72		2855	1345	5935	2980×2880×2380		
2500					2.75	20.64	0.72		3815	1575	6745	3060×2190×2490		
3150	35~ 38.5			6.3 6.6 10.5 11	Ynd11	3.28	24.71	0.65	7.0	4235	1860	8780	3180×2240×2510	1070/1070
4000						3.92	29.16	0.65		5230	2260	9820	3270×2410×2600	
5000						4.70	34.20	0.61		6195	2545	11510	3490×2480×2840	
6300						5.71	36.77	0.61	7.5	8315	3095	14805	3710×2600×3005	1475/1475
8000						8.00	40.61	0.54		9870	3480	16590	3850×2680×3230	
10000						9.40	48.05	0.54		11025	4160	19930	3960×2750×3310	
12500			11.10			56.86	0.5	8.0	14270	5265	24295	4035×2980×3530	2040/2040	
16000			13.33			70.32	0.49		17780	6280	28720	4140×3200×3660		
20000			15.76			82.78	0.49		20205	7415	37380	4070×3580×4170		
25000			19.04			99.75	0.45		24950	9030	43425	4710×4120×4310		
31500			22.76			119.70	0.41		29820	11025	51555	5360×4570×4450		

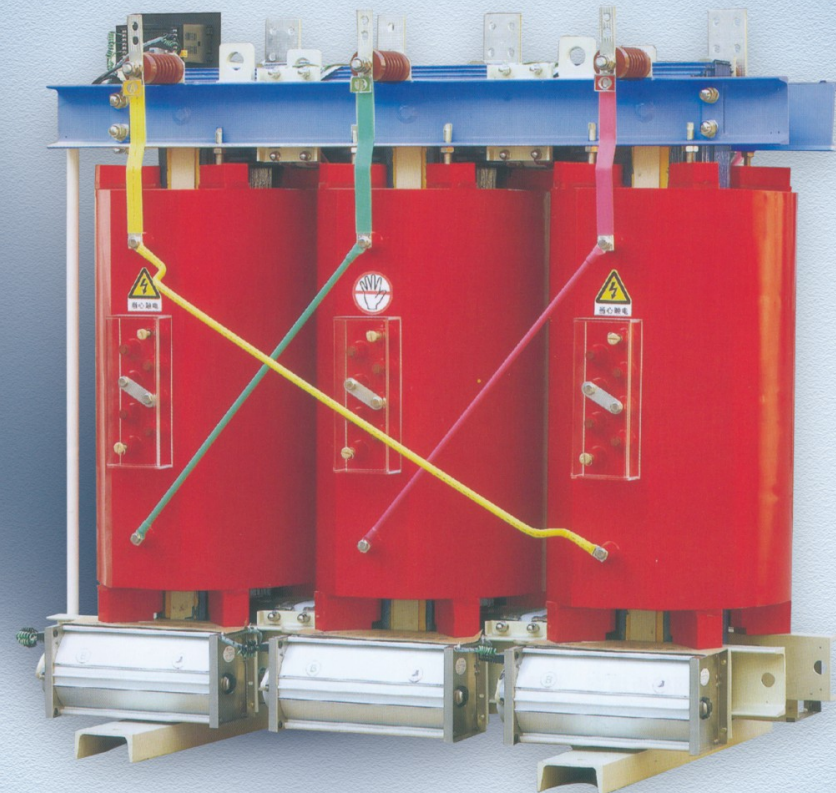
10kV Class Resin-insulated Dry-type Transformer

Advantages:

- Low loss, low noise, and low partial discharge;
- High moisture resistance;
- High reliability and maintenance-free;
- Certified as an energy-saving product.

Main technical innovations:

- The high-voltage side adopts a multi-layer segmented cylindrical structure, and the low-voltage side adopts a foil structure with longitudinal air ducts;
- Flame-retardant resin is used for curing and molding;
- Multifunctional temperature protection control system;
- Square tube clamp structure;
- Technology of three-dimensional simulation for temperature field and noise.



1. Overview

The resin-insulated dry-type transformers are independently developed by our company by introducing advanced foreign technologies, including SC9, SCB9 series and SC10, SCB10 series dry-type transformers with filled thin insulation. As the coils are encapsulated by epoxy resin, they are flame-retardant, fireproof, explosion-proof, maintenance-free, pollution-free, and compact in size, allowing direct installation at the load center. Meanwhile, the scientific and reasonable design as well as casting process enable the products to have lower partial discharge, low noise, and strong heat dissipation capacity. Under forced air cooling conditions, they can operate continuously at 140% of the rated load for a long term. Equipped with an intelligent temperature controller, they feature functions such as fault alarm, over-temperature alarm, over-temperature tripping, and black box, and can be connected to a computer via an RS485 serial interface for centralized monitoring and control.

Due to the above characteristics, the dry-type transformers of our company are widely applied in power transmission and distribution systems, such as important venues like hotels, airports, high-rise buildings, commercial centers, and residential communities, as well as harsh environments such as subways, thermal power plants, ships, and offshore drilling platforms.

Product Standards: GB/T10228-2008, GB1094.11-2007, JB/T10088-2004, GB4208-1993

Rated High Voltage: 10(11, 10.5, 6.6, 6, 3, 6)kV

Rated Low Voltage: 0.4kV

Connection Group: Dyn11 or Yyn0

High Voltage Tap Range: $\pm 5\%$ or $\pm 2 \times 2.5\%$

Insulation Level: L175AC35/L10AC5, Frequency: 50Hz

Core

The core is made of imported high-quality cold-rolled silicon steel sheets with a full oblique joint structure. The core columns are bound with F-class non-woven adhesive tape. The core surface is sealed with insulating resin paint to prevent moisture and rust, reducing no-load loss, no-load current, and core noise. The clamp parts and fasteners undergo special surface treatment, further improving the product's appearance quality.

High-voltage Winding

The high-voltage winding is vacuum-pressurized and cast with filled epoxy resin, which greatly reduces partial discharge and improves the electrical strength of the coil. The inner and outer walls of the winding are filled with glass fiber mesh boards to enhance the mechanical strength of the coil, improving the product's ability to resist sudden short circuits, and the coil will never crack.

Low-voltage Winding

The low-voltage winding adopts a foil structure, solving the problem of axial spiral angle in wire winding to make the ampere-turn more balanced. Meanwhile, the coil uses an axial cooling air duct to enhance heat dissipation capacity. The interlayer of the winding adopts DMD epoxy resin pre-impregnated cloth, which is integrally cured and formed.

Manufacturing Process

The coil is wound on a high-precision winding machine, and the low-voltage winding adopts a foil winding structure. Ventilation ducts are provided for transformers with large capacity. After winding, vacuum drying is carried out. The entire casting and curing process is operated in full compliance with process requirements, and all processes are strictly monitored and adjusted as needed. The precise manufacturing process of casting ensures that the coil has no bubbles or cavities, enabling the manufactured transformer to achieve high-quality standards.

Temperature Control System and Air Cooling System

Cross-flow top-blowing cooling fans are adopted, which feature low noise, high air pressure, and attractive appearance, enhancing the overload capacity of the transformer. The temperature control system uses an intelligent temperature controller, improving the operational safety and reliability of the transformer.

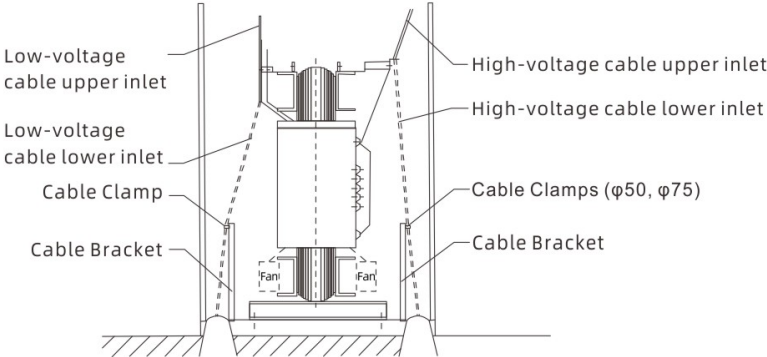
Protective Enclosure and Outlet Busbars

The protective enclosure provides further safety protection for the transformer, with protection grades such as IP20 and IP23. The enclosure materials include cold-rolled steel plates, stainless steel plates, etc., for users to choose from. The low-voltage outlet adopts standard busbar outlets, which can be side outlets or top outlets. Special outlet methods can also be designed for users.

10KV Class Resin-insulated Dry-type Transformer

Transformer Outlet Modes

Conventional outlets, standard enclosed busbars and standard side outlets can be manufactured according to different interface forms, and special outlet modes can also be designed according to user requirements.



Schematic Diagram of Inlet and Outlet Modes

2. Model Meaning



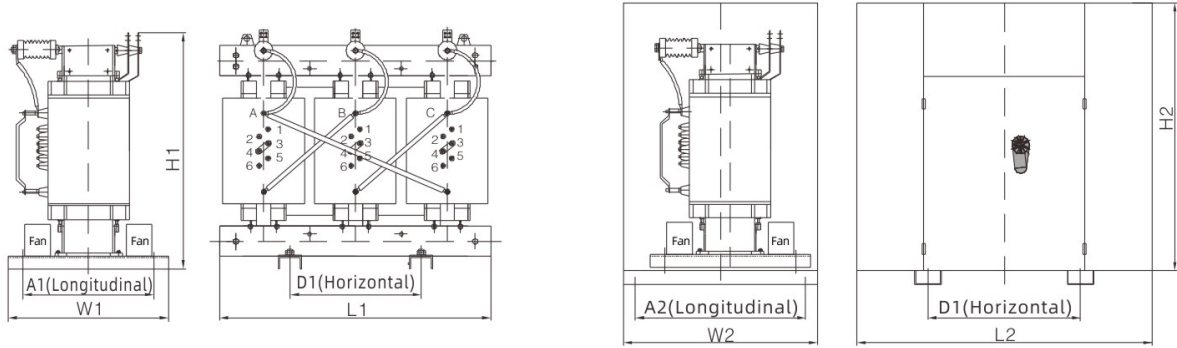
Technical Parameters of 10kV Class SC(B)9 Series Resin-insulated Dry-type Transformers

Rated Capacity (kVA)	Voltage Combination (kV)	Connection Group Designation	Loss (kW)		No-load Current (%)	Short-circuit Impedance (%)	Insulation Temperature Class	Weight (Kg)
			No-load	Load (120℃)				
10	High Voltage 11 10.5 10 6.6 6.3 6	Dyn11 or Yyn0	0.150	0.330	4.5	4	F	130
20			0.185	0.630	4.0			170
30			0.220	0.750	3.2			330
50			0.310	1.060	2.8			380
63			0.370	1.280	2.7			440
80			0.420	1.460	2.6			510
100			0.450	1.670	2.4			590
125			0.530	1.960	2.2			650
160			0.610	2.250	2.2			780
200			0.700	2.680	2.0			930
250	Low Voltage 0.4		0.810	2.920	2.0	6		1040
315			0.990	3.670	1.8			1180
400			1.100	4.220	1.8			1450
500			1.310	5.170	1.8			1630
630			1.510	6.220	1.6			1900
630			1.460	6.310	1.6			1900
800			1.710	7.360	1.6			2290
1000			1.990	8.610	1.4			2700
1250			2.350	10.260	1.4			3130
1600			2.760	12.400	1.4			3740
2000			3.400	15.300	1.2	8		4150
2500			4.000	18.180	1.2			4810
3150			5.140	22.500	1.0			5800
4000			5.960	27.000	1.0			7100

The weight data provided is for model selection reference only. The final weight shall be subject to the actual product.

10KV Class Resin-insulated Dry-type Transformer

3. Outline Dimensions



Outline Dimensions of SC(B)9-□~□/10-0.4

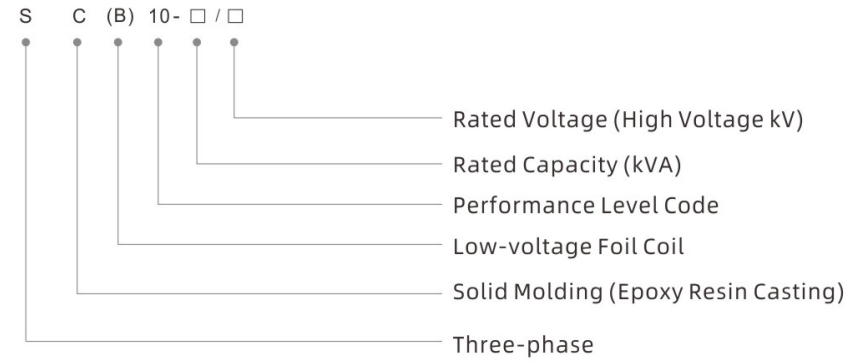
Outline Dimensions of SC(B)9□~□/10-0.4 with Enclosure

Rated Capacity (kVA)	Outline Dimensions (mm)					Outline Dimensions (mm) with Protective Enclosure				
	L1	W1	H1	D1	A1	L2	W2	H2	D2	A2
10	600	400	520	400	400	900	900	1150	400	800
20	600	400	520	400	400	900	900	1150	400	800
30	710	500	720	400	400	1050	950	1200	400	850
50	755	500	750	400	400	1050	950	1200	400	850
63	780	500	765	400	400	1050	980	1300	400	880
80	780	500	765	400	400	1050	980	1300	400	880
100	890	650	830	550	550	1200	1000	1300	550	900
125	910	650	850	550	550	1200	1000	1400	550	900
160	950	750	965	550	660	1250	1150	1450	550	1050
200	1000	750	112C	550	660	1300	1150	1500	550	1050
250	1040	750	1155	660	660	1350	1200	1550	660	1100
315	1080	750	1220	660	660	1400	1200	1650	660	1100
400	1105	750	1225	660	660	1500	1250	1800	660	1150
500	1150	900	1395	660	820	1550	1250	1800	660	1150
630	1340	900	1330	820	820	1700	1300	1700	820	1200
800	1400	900	1470	820	820	1750	1350	1850	820	1250
1000	1460	900	1475	820	820	1850	1350	1900	820	1250
1250	1485	900	1605	820	820	1850	1400	1950	820	1300
1600	1580	1050	1680	950	950	2000	1450	2050	950	1350
2000	1690	1050	1840	950	950	2050	1550	2150	950	1450
2500	1765	1050	1885	1070	950	2150	1600	2200	1070	1500
3150	1950	1170	1900	1070	1070	2350	1600	2250	1070	1500
4000	2030	1170	2000	1070	1070	2400	1600	Z300	1070	1500

Note: Since the product dimensions may be continuously improved, the outline dimensions provided in this sample are for reference only. If special dimensions are required, we can design and produce according to the user's requirements. Please contact our company in a timely manner!

10KV Class Resin-insulated Dry-type Transformer

Model Meaning



Product Standard

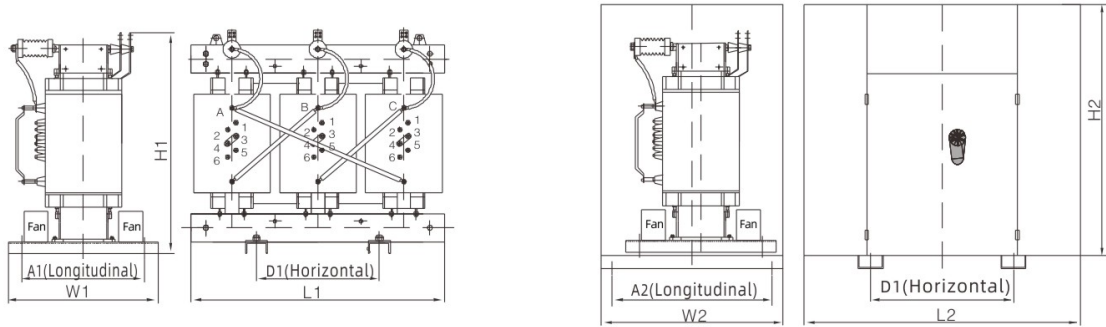
GB/T10228-2008 GB1094.11-2007
JB/T10088-2004 GB4208-1993

Rated High Voltage: 10(11, 10.5, 6.6, 6.3, 6) kV
Connection Group: Dyn11 or Yyn0
Insulation Level: L175AC35/L10AC5

Rated Low Voltage: 0.4 kV
High Voltage Tap Range: $\pm 5\%$ or $\pm 2 \times 2.5\%$
Frequency: 50 Hz

10KV Class Resin-insulated Dry-type Transformer

Outline Dimensions



Outline Dimensions of SC(B)10-□~□/10-0.4

Outline Dimensions of SC(B)10□~□/10-0.4 with Enclosure

Technical Parameters of 10kV Class SC(B)10 Series Resin-Insulated Dry-Type Transformers

Rated Capacity (kVA)	Voltage Combination (kV)	Tap Range (%)	Connection Group Designation	Loss (kW)		No-load Current (%)	Short-circuit Impedance (%)	Insulation Temperature Class	Weight (Kg)
				No-load	Load (120°C)				
10	High Voltage	$\pm 5\%$ $\pm 2 \times 2.5\%$	Dyn11 or Yyn0	0.135	0.305	4.0	4.0	F	135
20				0.170	0.595	3.5			180
30				0.190	0.710	2.4			330
50				0.270	1.000	2.4			380
80				0.370	1.380	1.8			510
100				0.400	1.570	1.8			590
125				0.470	1.850	1.6			650
160				0.540	2.130	1.5			780
200				0.620	2.530	1.4			930
250				0.720	2.760	1.4			1040
315	Low Voltage	$\pm 5\%$ $\pm 2 \times 2.5\%$	Dyn11 or Yyn0	0.880	3.470	1.2	6.0	F	1180
400				0.980	3.990	1.2			1450
500				1.160	4.880	1.2			1630
630				1.340	5.880	1.0			1900
630				1.300	5.960	1.0			1900
800				1.520	6.960	1.0			2290
1000				1.770	8.130	1.0			2700
1250				2.090	9.690	1.0			3130
1600				2.450	11.730	1.0			3740
2000				3.050	14.450	0.8			4150
2500	Low Voltage	$\pm 5\%$ $\pm 2 \times 2.5\%$	Dyn11 or Yyn0	3.600	17.170	0.8	8.0	F	4810
1600				2.450	12.960	1.0			3740
2000				3.050	15.960	0.8			4150
2500				3.600	18.890	0.8			4810
3150				5.140	22.50	0.8			5800
4000				5.980	27.00	0.8			7100

The weight data provided is for model selection reference only. The final weight shall be subject to the actual product.

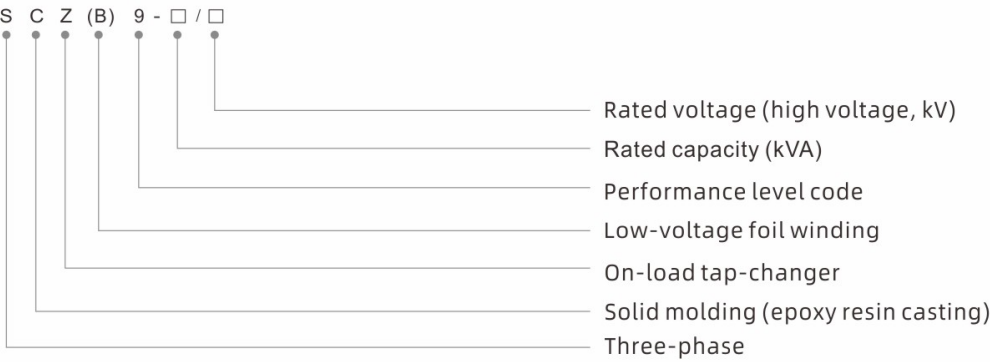
Rated Capacity (kVA)	Outline Dimensions (mm)					Outline Dimensions (mm) with Protective Enclosure				
	L1	W1	H1	D1	A1	L2	W2	H2	D2	A2
10	600	400	520	400	400	900	900	1150	400	800
20	600	400	520	400	400	900	900	1150	400	800
30	710	500	720	400	400	1050	950	1200	400	850
50	755	500	750	400	400	1050	950	1200	400	850
63	780	500	765	400	400	1050	980	1300	400	880
80	780	500	765	400	400	1050	980	1300	400	880
100	890	650	830	550	550	1200	1000	1300	550	900
125	910	650	850	550	550	1200	1000	1400	550	900
160	950	750	965	550	660	1250	1150	1450	550	1050
200	1000	750	1120	550	660	1300	1150	1500	550	1050
250	1040	750	1155	660	660	1350	1200	1550	660	1100
315	1080	750	1220	660	660	1400	1200	1650	660	1100
400	1105	750	1225	660	660	1500	1250	1800	660	1150
500	1150	900	1395	660	820	1550	1250	1800	660	1150
630	1340	900	1330	820	820	1700	1300	1700	820	1200
800	1400	900	1470	820	820	1750	1350	1850	820	1250
1000	1460	900	1475	820	820	1850	1350	1900	820	1250
1250	1485	900	1605	820	820	1850	1400	1950	820	1300
1600	1580	1050	1680	950	950	2000	1450	2050	950	1350
2000	1690	1050	1840	950	950	2050	1550	2150	950	1450
2500	1765	1050	1885	1070	950	2150	1600	2200	1070	1500
3150	1950	1170	1900	1070	1070	2350	1600	2250	1070	1500
4000	2030	1170	2000	1070	1070	2400	1600	2300	1070	1500

Note: Since the product dimensions may be continuously improved, the outline dimensions provided in this sample are for reference only. If special dimensions are required, we can design and produce according to the user's requirements. Please contact our company in a timely manner!

10KV Class Resin-insulated Dry-type Transformer



The Meaning of Model Number

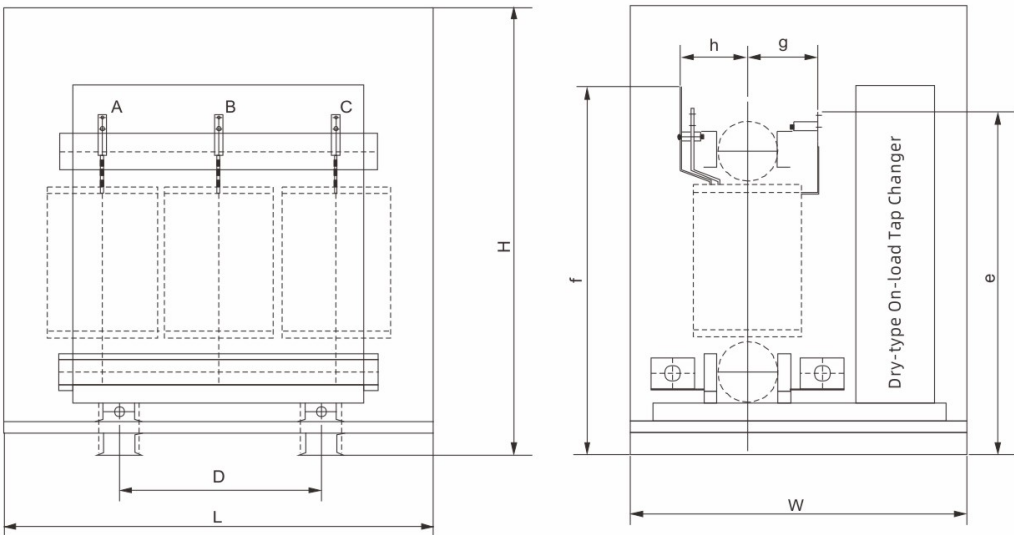


Product standard

Please translate the following text into English:
GB/T 10228-2008, GB 1094.11-2007, JB/T 10088-2004, GB 4208-1993
Rated high voltage: 10 (11, 10.5, 6.6, 6.3, 6) kV
Rated low voltage: 0.4 kV
On-load tap-changing range: (±4×2.5%) or (±3×2.5%)

10KV Class Resin-insulated Dry-type Transformer

Outline Dimensions



SCZ(B)9-□-□/10-0.4 Outline Dimension Drawing

10kV Class SCZ(B)9 Series On-load Tap-changing Resin-insulated Dry-type Transformer

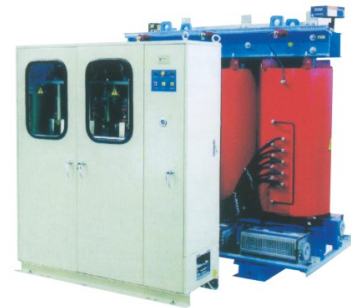
Rated Capacity (kVA)	Voltage Combination (kV)	Connection Group Designation	Loss (kW)		No-load Current (%)	Short-circuit Impedance (%)	Insulation Temperature Class	Weight (Kg)
			No-load	Load (120°C)				
200	High voltage 11	Dyn11 OR Yyn0	0.770	2.810	2.0	4	F	1180
250			0.890	3.060	2.0			1290
315			1.100	3.800	1.4			1430
400			1.250	4.500	1.4			1700
500			1.440	5.500	1.4			1880
630	10.5		1.660	6.500	1.2	6		2150
800	10		7.900	7.900	1.2			2540
1000	6.6		2.200	9.250	1.0			2950
1250	6.3		2.600	11.000	1.0			3380
1600	6		3.030	13.100	1.0			3990
2000	Low voltage 0.4		3.800	16.000	0.8	8		4400
2500			4.400	19.100	0.8			5060
3150			6.360	25.000	1.0			6050
4000			7.370	30.000	1.0			7350

The weight data provided is for model selection reference only. The final weight shall be subject to the actual product.

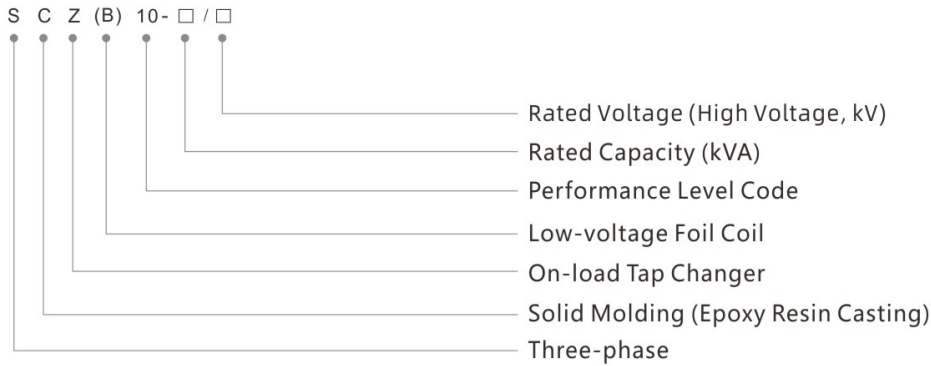
Rated capacity (kVA)	Outline Dimensions with Protective Enclosure (mm)							
	L	W	H	D	e	f	g	h
200	1450	1850	1600	550	1020	1060	315	225
250	1500	1900	1600	660	1090	1120	320	230
315	1500	1950	1600	660	1100	1140	325	235
400	1600	2000	1600	660	1130	1240	360	320
500	1600	2050	1600	820	1180	1310	370	330
630	1800	2050	1600	820	1280	1390	360	320
800	1900	2050	1600	820	1340	1460	360	320
1000	1950	2050	1950	820	1430	1620	370	325
1250	2050	2100	2000	1070	1490	1700	385	340
1600	2100	2150	2100	1070	1570	1790	410	370
2000	2150	2250	2100	1070	1520	1810	430	405
2500	2200	2250	2200	1070	1640	1930	440	420
3150	2350	2350	2250	1070	1600	1900	455	435
4000	2400	2350	2300	1070	1700	2000	470	450

Note: As product dimensions may be continuously improved, the outline dimensions provided in this sample are for reference only. For special dimensions, we can design and manufacture according to user requirements. Please contact our company in a timely manner!

10KV Class Resin-insulated Dry-type Transformer



Model Meaning

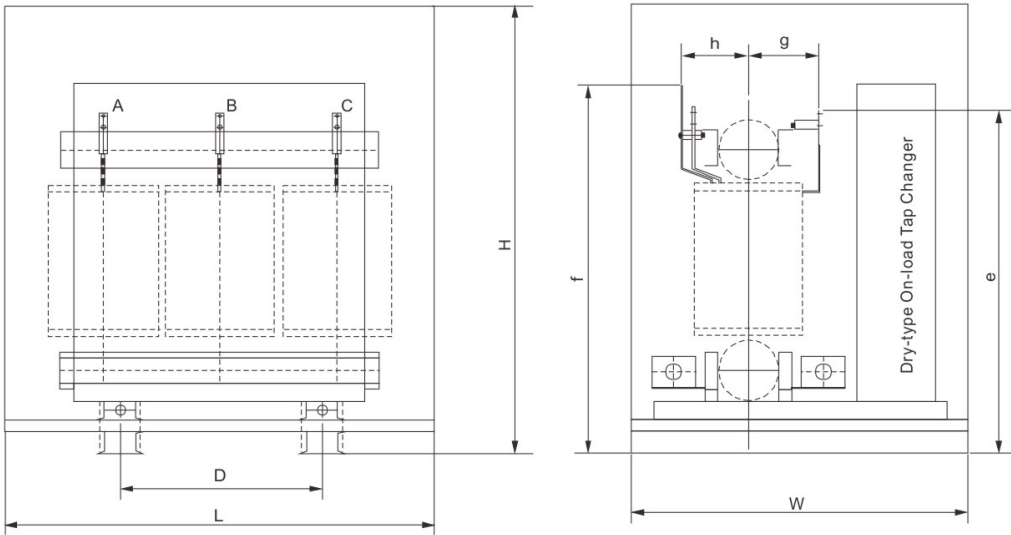


Product Standard

Please translate the following text into English:
GB/T 10228-2008, GB 1094.11-2007, JB/T 10088-2004, GB 4208-1993
Rated High Voltage: 10(11, 10.5, 6.6, 6.3, 6) kV
Rated Low Voltage: 0.4 kV
On-load Tap-changing Range: (±4×2.5%) or (±3×2.5%)

10KV Class Resin-insulated Dry-type Transformer

The external dimensions



SCZ(B)10-□~□/10-0.4 Outline Dimension Drawing

10kV Class SCZ(B)10 Series On-load Tap-changing Resin-insulated Dry-type Transformers

Rated Capacity (kVA)	Voltage Combination (kV)	Connection Group Designation	Loss (kW)		No-load Current (%)	Short-circuit Impedance (%)	Insulation Temperature Class	Weight (Kg)
			No-load	Load (120°C)				
200	High Voltage	Dyn11 or Yyn0	0.690	2.810	1.6	4	F	1180
250			0.790	2.900	1.6			1290
315			0.970	3.610	1.4			1430
400			1.080	4.270	1.4			1700
500			1.280	5.220	1.4			1880
630	10.5		1.475	6.170	1.2	6		2150
800	10		1.670	7.500	1.2			2540
1000	6.6		1.950	8.780	1.1			2950
1250	6.3		2.300	10.450	1.1			3380
1600	6		2.700	12.440	1.1			3990
2000	Low Voltage		3.680	15.200	1.0	8		4400
2500			4.400	18.140	1.0			5060
3150			5.650	23.750	0.8			6050
4000			6.560	28.500	0.8			7350

The weight data provided is for model selection reference only. The final weight shall be subject to the actual product.

Rated Capacity (kVA)	Outline Dimensions with Protective Enclosure (mm)							
	L	W	H	D	e	f	g	h
200	1450	1850	1600	550	1020	1060	315	225
250	1500	1900	1600	660	1090	1120	320	230
315	1500	1950	1600	660	1100	1140	325	235
400	1600	2000	1600	660	1130	1240	360	320
500	1600	2050	1600	820	1180	1310	370	330
630	1800	2050	1600	820	1280	1390	360	320
800	1900	2050	1600	820	1340	1460	360	320
1000	1950	2050	1950	820	1430	1620	370	325
1250	2050	2100	2000	1070	1490	1700	385	340
1600	2100	2150	2100	1070	1570	1790	410	370
2000	2150	2250	2100	1070	1520	1810	430	405
2500	2200	2250	2200	1070	1640	1930	440	420
3150	2350	2350	2250	1070	1600	1900	455	435
4000	2400	2350	2300	1070	1700	2000	470	450

Note: The outline dimensions and weight data provided in this manual are for design and model selection only. The final dimensions shall be subject to the actual product.



20KV Class Resin-insulated Dry-type Transformer

Technical Parameters of 20kV Class SC(B)9 Series Resin-insulated Dry-type Transformers

Rated high voltage: 20kV
Rated low voltage: 0.4kV
High voltage tapping range: ±5% or 2×2.5%

Connection Group: Dyn11 or Yyn0
Insulation Level: L1125AC50/L10AC3

Rated Capacity (kVA)	Voltage Combination(kV)			Connection Group Designation	No-load Loss (kW)	Load Losses (kW) under Different Insulation Temperature Resistance Grades			No-load Current %	Short-circuit Impedance UK(%)
	High Voltage	High voltage tapping range	Low Voltage			B(100°C)	F(120°C)	H(145°C)		
50	20 22 24	±5 ±2×2.5	0.4	Dyn11 Yyn0	0.380	1.230	1.300	1.390	2.4	6.0
100					0.600	1.980	2.100	2.250	1.8	
160					0.750	2.470	2.600	2.800	1.8	
200					0.820	2.950	3.100	3.310	1.6	
250					0.940	3.440	3.500	3.910	1.5	
315					1.080	4.100	4.300	4.600	1.4	
400					1.280	4.900	5.100	5.460	1.4	
500					1.500	5.800	6.100	6.500	1.2	
630					1.700	6.880	7.200	7.750	1.2	
800					1.950	8.230	8.700	9.300	1.2	
1000					2.300	9.720	10.300	11.000	1.0	
1250					2.650	11.500	12.150	13.000	1.0	
1600					3.100	13.780	14.600	15.650	1.0	
2000					3.600	16.300	17.250	18.500	0.8	
2500					4.300	19.350	20.400	21.800	0.8	
2000					3.600	17.800	18.800	20.000	0.8	
2500					4.300	21.300	22.400	23.900	0.8	8.0

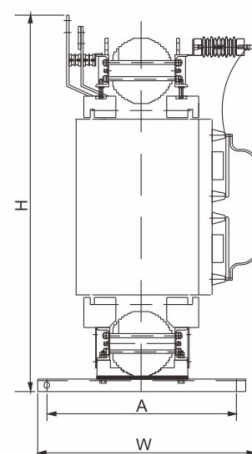
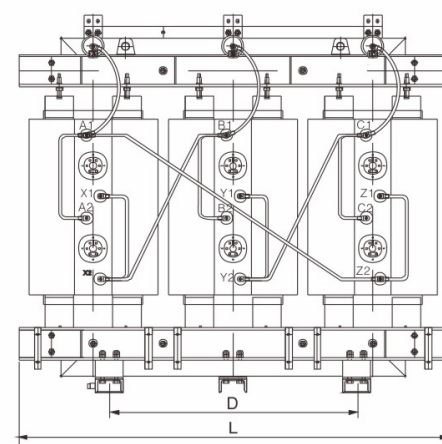
Note: The load losses listed in the table are values at the reference temperature in parentheses (as specified in GB 1094.11).

External dimensions

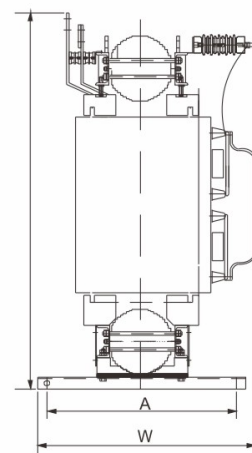
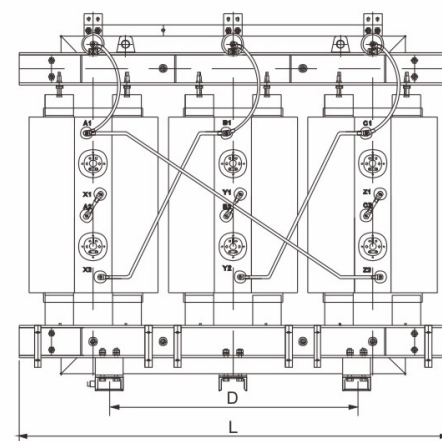
Rated Capacity (kVA)	L	W	H	D	A	
50	1180	750	1010	820	820	
100	1210	780	1060	820	820	
160	1260	800	1100	820	820	
200	1310	840	1100	820	820	
250	1370	880	1170	820	820	
315	1420	880	1230	820	820	
400	1450	910	1280	820	820	
500	1470	910	1380	820	820	
630	1545	950	1495	820	820	
800	1600	980	1560	820	820	
1000	1620	1050	1560	950	820	
1250	1760	1050	1560	950	820	
1600	1800	1070	1660	950	820	
2000	1840	1100	1710	1070	950	
2500	1900	1160	1880	1070	1070	
3150	1980	1240	1920	1070	1070	

Note: As product dimensions may be continuously improved, the outline dimensions provided in this sample are for reference only. For special dimensions, we can design and manufacture according to user requirements. Please contact our company in a timely manner! The voltage can be interchanged between 20kV and 10kV, and the technical parameters comply with the standards of 20kV class.

20KV Class Resin-insulated Dry-type Transformer



Connection
method
at 10kV



Connection
method
at 20kV

20kV-10kV Interchange Wiring Schematic Diagram

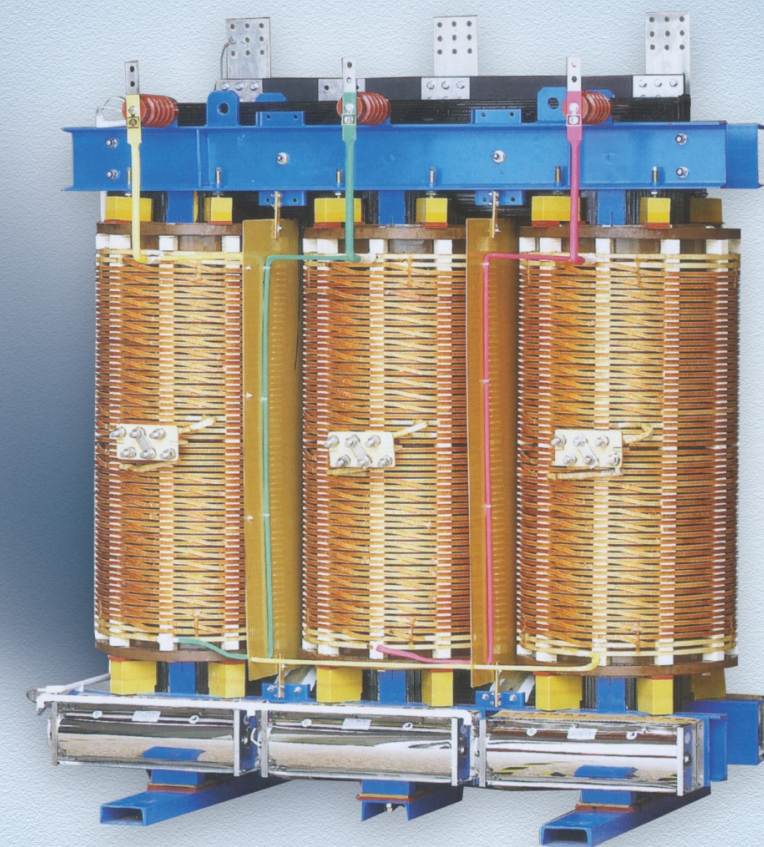
10kV Class Environment-friendly Dry-type Transformer

Advantages:

- ◎ Safe, reliable, and environmentally friendly;
- ◎ Low noise and maintenance-free;
- ◎ Strong overload capacity and high temperature resistance.

Main Technical Innovations:

- ◎ High insulation class;
- ◎ Low partial discharge and no "cracking";
- ◎ Awarded multiple national patent technologies;
- ◎ Core technology of Lei Litong in northern United States.



1. Overview

SG(B)10 type H-class insulated dry-type power transformers feature strong thermal shock resistance, high overload capacity, difficult flammability, high fire resistance, low losses, small partial discharge, low noise, no harmful gas generation, no environmental pollution, insensitivity to humidity and dust, small size, no cracking, and simple maintenance. Therefore, they are most suitable for use in harsh environments with high fire protection requirements, large load fluctuations, and pollution or humidity. Such as airports, power plants, metallurgical operations, hospitals, high-rise buildings, shopping centers, densely populated residential areas, as well as special environments like petroleum, chemical, nuclear power plants, and nuclear submarines.

High and Low Voltage Coils

The high and low voltage coils are made of Nomex insulating material, impregnated multiple times with solvent-free impregnating varnish using VPI (Vacuum Pressure Impregnation) equipment, and cured through multiple high-temperature baking processes. The high-voltage coil adopts a continuous structure with high mechanical strength and good heat dissipation, avoiding the disadvantages of multi-layer cylindrical coils, such as high interlayer voltage, poor heat dissipation, easy thermal breakdown, and low mechanical strength, thus improving the operational reliability of the product. The low-voltage coil uses a foil type or large-current spiral structure with longitudinal air ducts. The impregnated coils exhibit excellent moisture resistance, can withstand impacts, never crack, have no partial discharge, and are easy to decompose and recycle after their service life, protecting the environment.

Core

The core is stacked with imported grain-oriented high-permeability silicon steel sheets. With a 45° fully mitered joint structure and elastic fixing devices between the windings and the core, the transformer features low no-load loss and noise. The core surface undergoes special technological treatment, which not only reduces transformer noise but also prevents core corrosion during operation. The core is moderately clamped by tie bolts, while the upper and lower clamps are connected by tie plates and fixed to the base as a whole. The windings are fixed by elastic pads, and the buffer structure reduces winding vibration and noise.

Enclosure

If required by users, our company can provide enclosures with protection ratings of IP20 and Ip23. The meaning of the IP20 protection rating for the enclosure is: solid foreign objects with a diameter of 12mm are not allowed to enter. To ensure the circulation of cooling air, the bottom plate and top of the enclosure are made of mesh panels. In addition to the same requirements as IP20, the IP23 protection rating for the enclosure also prevents water from splashing in at an angle within 60° from the vertical.

Overheat Protection

To protect the coils from overheating, SG(B)10 dry-type transformers with a capacity of 315kVA and above are equipped with a temperature display and protection device. This device uses temperature-sensing elements embedded in the low-voltage windings as the signal source for the digital temperature indicator. When the temperature in the low-voltage windings changes, the temperature-sensing digital indicator displays a new temperature value and executes control and alarm functions based on this value to protect the transformer.

Safety

The new SG(B)10 model is a dry-type transformer with the highest safety performance available today. All insulating materials are non-combustible, self-extinguishing, and non-toxic, with combustible substances accounting for less than 10% of epoxy-cast products. They produce no toxic fumes even when burned at 800°C for an extended period, overcoming the defect of epoxy-cast transformers that release toxic gases during combustion. The new SG(B)10 model demonstrates greater superiority in scenarios with high safety requirements, such as power grids, subways, ships, chemical industries, and metallurgy, as well as in humid, hot, and poorly ventilated environments.

Excellent Moisture Resistance

Nomex-insulated dry-type transformers are fully capable of withstanding water intrusion. They adopt advanced VPI (Vacuum Pressure Impregnation) equipment and vacuum impregnation technology. With UL-approved high-quality impregnating varnish, they can operate continuously for a long term at temperatures of 180°C and above. Nomex paper is completely penetrated and impregnated by the impregnating varnish.

Environmental Protection

The new SG(B)10 model can be decomposed and recycled after its service life, overcoming the defect of epoxy resin cast dry-type transformers. In epoxy resin cast transformers, the curing and fusion of resin and glass fibers into a whole make them non-decomposable after their service life, causing environmental pollution.

Overload Capacity

The SG(B)10 dry-type power transformer adopts new structures, materials, and processes, featuring good heat dissipation, long thermal life, and extremely strong overload capacity. It can work safely and reliably for a long term under 120% overload. In an IP23 environment, it can still operate at full load for a long term without fan cooling.

Reliability

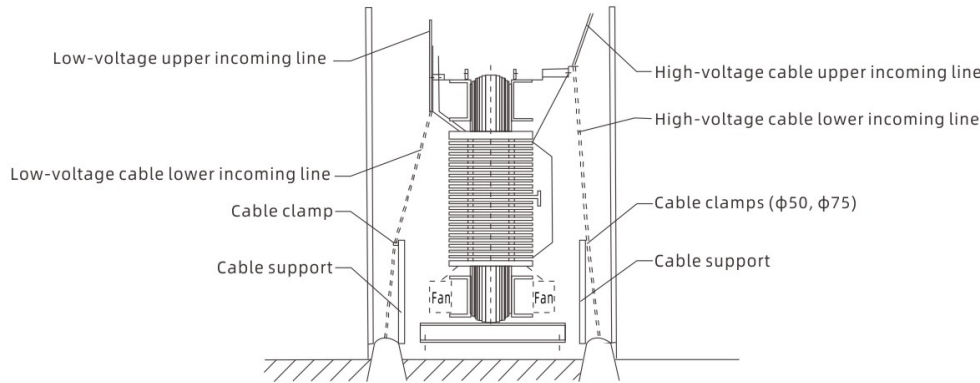
The special coil design, processes, and materials of the new SG(B)10 model endow the product with excellent three-proof performance (moisture-proof, mildew-proof, and salt spray-proof), enabling it to withstand thermal shocks, with no cracking or partial discharge occurring permanently. The Nomex-based insulation system maintains excellent electrical and mechanical properties throughout the transformer's entire service life. Nomex materials are not prone to aging, resistant to shrinkage and compression, and have high tensile strength. Therefore, they ensure that even after years of use, the coil structure remains tight and can withstand short-circuit pressures.

Smaller Volume and Lighter Weight

The new SG(B)10 model uses DuPont Nomex paper as the main insulating material, forming a hybrid insulation system at the hottest spot of the transformer. Compared with epoxy resin cast transformers of the same capacity, this product reduces both size and weight.

Lead wires

The high-voltage outlet terminals are fixed at the upper part of the winding, and the tap joints are at the middle of the winding. Tap changers are performed through connection plates when power is cut off, so as to adjust the output voltage. The low-voltage outlet terminals are plate-type conductive busbars, which are reliably connected to the lead-out busbars through bolts.

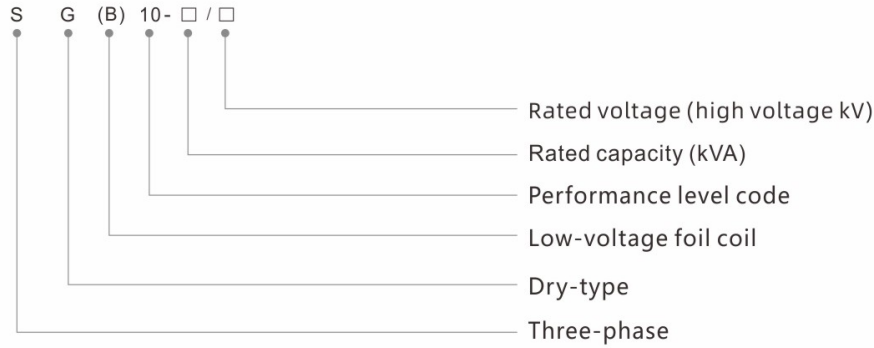


Wiring Inlet and Outlet Schematic Diagram

10KV Class Environment-friendly Dry-type Transformer



2. Model meaning



Service Conditions

According to Article 1.2 of GB 6450-1986 Dry-type Transformers, when the maximum ambient temperature exceeds 40°C or the altitude exceeds 1000m, corrections shall be made in accordance with relevant national standards. Users are required to specify this at the time of ordering.

Product Standard

- B1094.11-2007 Dry-type Transformers
- GB/T 10228-2008 Technical Parameters and Requirements for Dry-type Power Transformers
- GB/T 17211-1998 Loading Guide for Dry-type Power Transformers
- JB/T 10088-2004 Sound Level of 6-220kV Power Transformers
- GB 4208-1993 Degrees of Protection Provided by Enclosures (IP Code)

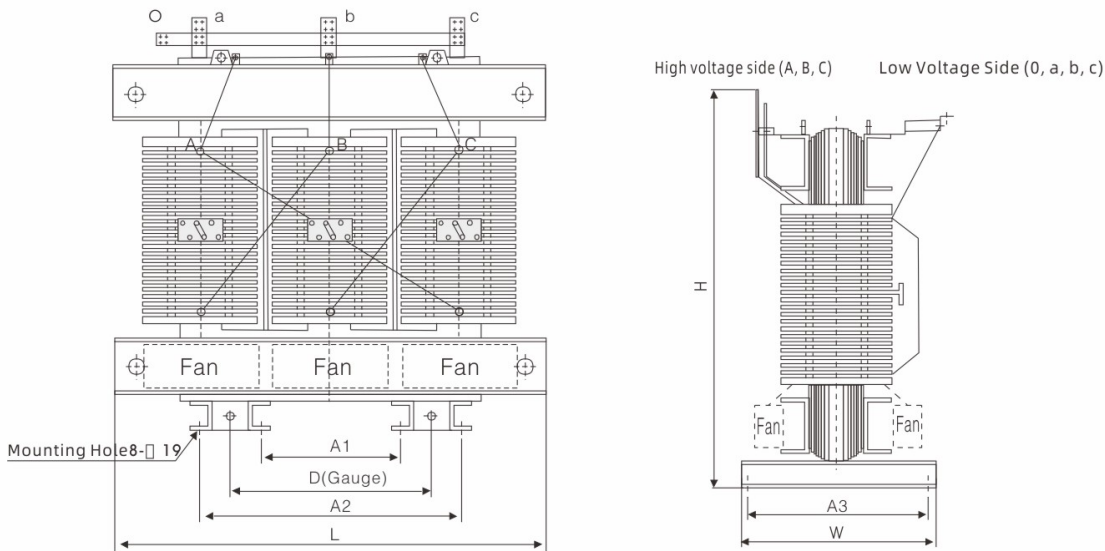
Technical Parameters of 10kV Class SG(B)10 H-class Environment-friendly Dry-type Transformer

Rated capacity (kVA)	Voltage Combination (kV)	Connection Group Label	Loss (kW)		No-load Current (%)	Short-circuit Impedance (%)	Insulation Temperature Class	Weight (kg)
			No-load	Load (145°C)				
80	High Voltage 11 10.5 10 6.6 6.3 6 Low Voltage 0.4	Dyn11 or Yyn0	0.37	1.48	1.8	4	H	490
100			0.40	1.69	1.8			520
125			0.47	1.98	1.6			650
160			0.54	2.28	1.5			740
200			0.62	2.71	1.4			850
250			0.72	2.96	1.4			7005
315			0.88	3.73	1.2			1270
400			0.98	4.28	1.2			1470
500			1.16	5.23	1.2	1750		
630			1.34	6.29	1.0	1970		
630			1.30	6.40	1.0	1970		
800			1.52	7.46	1.0	2350		
1000			1.77	8.76	1.0	2620		
1250			2.09	70.37	1.0	3780		
1600			2.45	72.58	1.0	4700		
2000			3.05	15.56	0.8	4500		
2500			3.60	78.45	0.8	5340		
1600	2.45	13.90	1.0	4100				
2000	3.05	17.11	0.8	4500				
2500	3.60	20.29	0.8	5340				

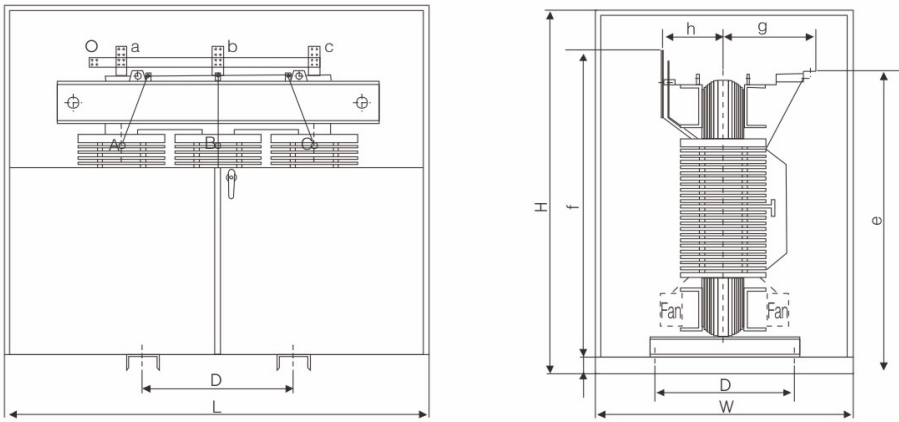
The weight data provided are for model selection reference only. The final weight shall be subject to the actual product.

10KV Class Environment-friendly Dry-type Transformer

3. Overall Dimensions



Dimension drawing of SG(B)10-□~□/10-0.4

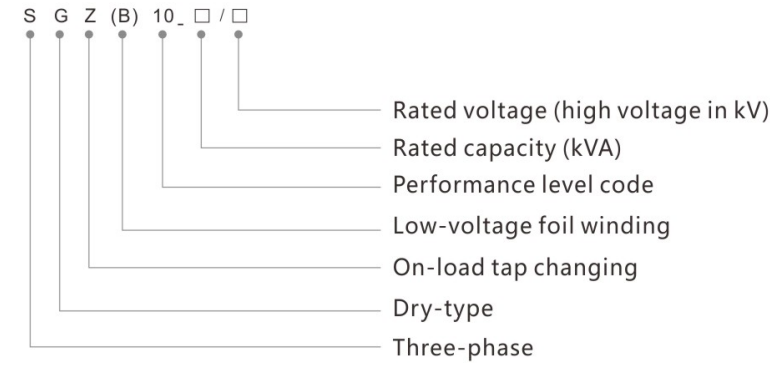


SG(B)10-□~□/10-0.4 with overall dimensions drawing

10KV Environmental-friendly Dry-type Transformer

Rated capacity (kVA)	Outline dimension(mm)							Outline dimensions (mm) with protective casing							
	L	W	H	D	A1	A2	A3	L	W	H	D	e	f	g	h
80	950	550	910	550	550	550	500	1250	900	1330	550	1070	1080	270	225
100	950	600	910	600	600	600	550	1280	900	1330	600	1070	1075	285	245
125	970	600	920	600	600	600	550	1300	900	1350	600	1075	1080	290	245
160	1000	710	965	660	660	660	660	1330	900	1350	660	1120	1125	295	245
200	1040	710	990	660	660	660	660	1360	900	1400	660	1145	1150	300	260
250	1090	710	1045	660	660	660	660	1400	900	1450	660	1200	1210	305	265
315	1120	710	1120	660	660	660	660	1450	950	1500	660	1260	1280	375	270
400	1240	850	1185	820	820	820	800	1600	1100	1650	820	1280	1345	355	310
500	7290	850	7220	820	820	820	800	7650	1200	1650	820	7315	1380	355	310
630	1410	850	1230	820	657	983	800	1850	1300	1650	820	1350	1390	355	330
800	1460	850	1350	820	657	983	800	1850	1300	1750	820	1385	1510	365	340
1000	1480	870	1455	820	657	983	820	1950	1300	1950	820	1500	1615	345	340
1250	1550	960	7550	7070	907	1233	910	2000	1400	1950	1070	7500	1710	395	375
1600	1660	1150	1620	1070	907	1233	1100	2000	1400	2000	1070	1625	1780	405	385
2000	1710	1150	7730	1070	859	1281	1100	2150	1500	2150	1070	1715	1890	410	385
2500	1760	1150	2030	1070	859	1281	1100	2200	1500	2450	1070	1890	2190	440	410

Model meaning



Product standard

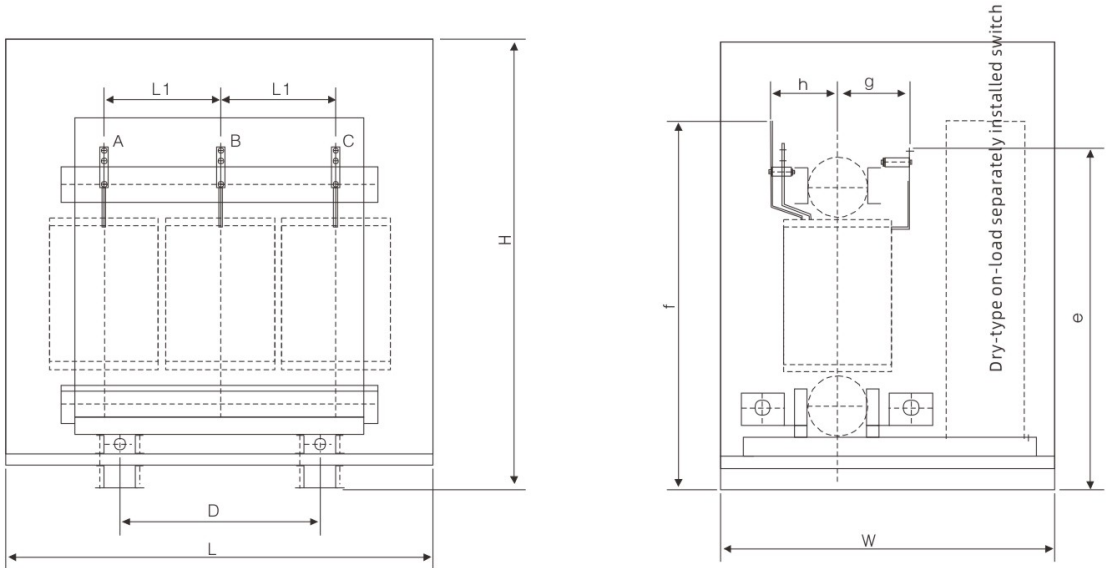
GB/T 10228-2008, GB1094.11-2007
JB/T 10088-2004, GB4208-1993
Rated high voltage: 10(11, 10.5, 6.6, 6.3, 6) kV
Rated low voltage: 0.4 kV
On-load tap changing range: (±4×2.5%) or (±3×2.5%)

Technical Parameters of 10kV Class SGZ(B)10 H-Class On-load Tap-changing Environment-friendly Dry-type Transformer

Rated Capacity (kVA)	Voltage Combination (kV)	High-voltage tapping range (%)	Connection Group Designation	Loss (kW)		No-load Current (%)	Short-circuit Impedance (%)	Insulation Temperature Class	Weight (Kg)
				No-load	Load (145℃)				
200	High voltage 11	$\pm 4 \times 2.5$ $\pm 3 \times 2.5$	Dyn11 Or Yyn0	0.65	3.10	1.8	4	H	1370
250				0.75	3.60	1.8			1520
315				1.10	4.10	1.4			1790
400				1.25	4.80	1.4			2000
500				1.44	5.85	1.4			2270
630	10			1.66	6.95	1.2	6		2530
630	6.6			1.60	7.10	1.2			2530
800	6.3			1.90	8.40	1.2			2930
1000	6			2.20	9.90	1.0			3200
1250	Low voltage 0.4			2.60	11.80	1.0			3770
1600				3.03	14.00	1.0			4720
2000				3.80	17.10	0.8			5170
2500				4.40	20.40	0.8			5860

The provided external dimensions are for model selection reference only. The final dimensions shall be subject to the product outline drawing.

10KV Environmental-friendly dry-type transformer



Outline Dimension Drawing of SGZ(B)10-□□/10-0.4

Rated capacity (kVA)	Outline dimensions (mm) with protective casing								
	L	L1	W	H	D	e	f	g	h
200	1900	365	1600	2100	660	1145	1150	305	215
250	1900	375	1600	2100	660	1200	1205	305	220
315	1900	385	1600	2100	660	7225	1205	315	225
400	1900	420	1600	2100	820	1330	1350	325	285
500	2000	435	1700	2100	820	1360	1380	325	285
630	2000	480	1700	2100	820	7360	1380	325	285
800	2100	485	1700	2100	820	1455	1500	340	295
1000	2100	500	1700	2700	820	1500	7570	345	295
1250	2200	545	1800	2300	1070	1540	1655	370	325
1600	2200	580	1800	2300	1070	1585	1695	400	355
2000	2300	600	1800	2300	1070	1730	1885	375	365
2500	2300	620	1800	2300	1070	1830	1980	395	370



10kV Class Amorphous Alloy Oil-immersed Transformer

Key technical innovation points:

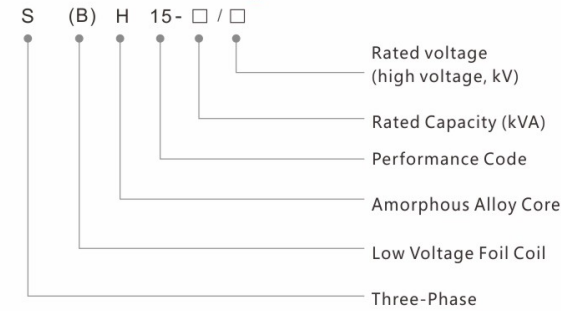
- ◎ Remarkable energy-saving effect, with load loss only 25%-35% of that of conventional products;
- ◎ Superior performance, safe, reliable and environmentally friendly;
- ◎ High mechanical strength, strong short-circuit withstand capability, safe and reliable operation;
- ◎ Low noise, simple installation and maintenance-free;
- ◎ This product has passed the energy-saving product certification.

10KV Class Amorphous Alloy Oil-immersed Transformer

1. Overview

Transformers can convert the grid voltage into the voltage required by the system or load, achieving the transmission and distribution of electrical energy. This transformer can replace transformers with silicon steel core and is widely used in outdoor distribution systems. The large-scale grid connection and operation of this product can achieve good energy-saving effects and reduce air pollution. It is particularly suitable for areas with insufficient power, large load fluctuations, and difficult daily maintenance. Due to the fully sealed structure of the transformer, the insulating oil and insulating medium are not polluted by the atmosphere, so it can operate in humid environments. It is an ideal distribution equipment for urban and rural distribution networks.

2. Model Meaning



3. Structural Features

The transformer core is made of amorphous alloy strips by rolling. The no-load loss is reduced by about 80% compared with that of the S9-type transformer and about 25% lower than the specified value in JB/T 10318. The low-voltage side adopts copper foil coils to enhance the transformer's ability to withstand short circuits. The connection group adopts Dyn11 to reduce the impact of harmonics on the power grid and improve the power supply quality. The oil tank and the tank cover are welded into an integrated fully sealed structure to extend the service life and eliminate the need for maintenance. The transformer uses vacuum oil injection to completely eliminate bubbles in the coils and ensure stable insulation performance. Each transformer undergoes a full-wave lightning impulse test with a peak voltage 25% higher than the national standard before leaving the factory to ensure the safe and reliable operation of the transformer.

4. Technical Parameters of 10kV Class SH15-M Series Amorphous Alloy Oil-immersed Transformer

Rated Capacity (kVA)	Voltage Combination (kV)	Low voltage	Connection group designation	Loss (kW)		No-load current (%)	Short-circuit impedance (%)	Weight (Kg)			Overall Dimensions (mm) (Length L × Width B × Height H)	Torque (Longitudinal / Transverse)
				No-load	Load (75°C)			Body Weight	Oil weight	Total weight		
30	11 10.5 10 6.3 6	0.4	Dyn11	0.033	0.600	1.7	4	240	80	410	920 × 600 × 980	400 × 550
50				0.043	0.870	1.3		310	110	510	950 × 620 × 1040	400 × 550
63				0.050	1.040	1.2		350	125	570	990 × 670 × 1040	400 × 550
80				0.060	1.250	1.1		410	135	630	1030 × 720 × 1040	400 × 660
100				0.075	1.500	1.0		475	150	720	1060 × 770 × 1070	400 × 660
125				0.085	1.800	0.9		550	170	830	1060 × 900 × 1070	400 × 660
160				0.100	2.200	0.7		630	190	960	1060 × 930 × 1150	400 × 660
200				0.120	2.620	0.7		670	210	1040	1110 × 930 × 1170	550 × 820
250				0.140	3.050	0.7	750	240	1160	1180 × 1010 × 1180	550 × 820	
315				0.170	3.650	0.5	810	264	1240	1180 × 1010 × 1180	550 × 820	
400				0.200	4.300	0.5	860	290	1330	1200 × 1010 × 1180	550 × 820	
500				0.240	5.150	0.5	950	320	1460	1270 × 1160 × 1200	660 × 1070	
630				0.320	6.200	0.3	1120	380	1860	1450 × 1240 × 1330	820 × 1070	
800				0.380	7.500	0.3	1340	410	2230	1520 × 1380 × 1460	820 × 1070	
1000				0.450	10.30	0.3	1620	540	2700	1720 × 1460 × 1510	820 × 1070	
7250				0.530	12.00	0.2	1900	640	3180	1780 × 1500 × 1690	820 × 1070	
1600				0.630	14.50	0.2	2560	680	4240	1880 × 1540 × 1970	820 × 1070	
2000				0.750	17.40	0.2	2900	980	4920	2080 × 1580 × 1970	820 × 1070	
2500				0.900	20.20	0.2	3940	1160	6560	2350 × 1580 × 2020	820 × 1070	

Note: High voltage tapping range: ±5% or 2×2.5%; Frequency: 50Hz; Insulation level: L1 75AC35 / L1 0AC5.

S13-M.RL、S11-M.RL Three-dimensional triangular wound core distribution transformer



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S13-M.RL、S11-M.RL Three-dimensional triangular wound core distribution transformer

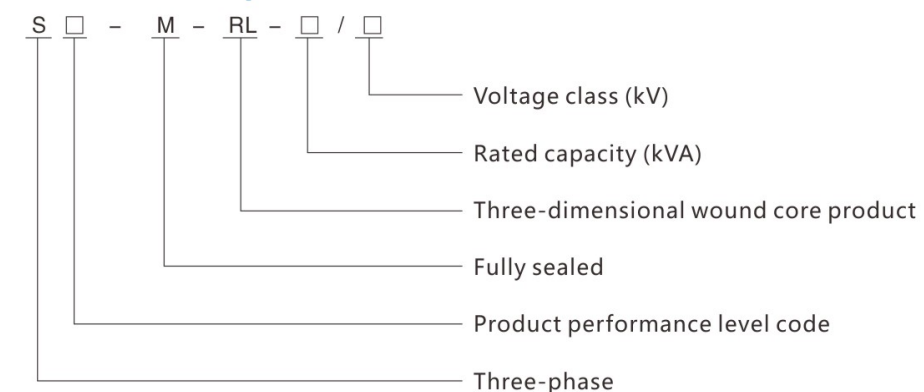
1. Overview

China is a major energy producer and also a major energy consumer. According to statistics, in the power system, line losses account for about 10% of the total power generation, among which transformer losses account for about 3% of the total power generation. If transformer losses are reduced by 10%, it can save tens of billions of kilowatt-hours of electricity annually. Therefore, promoting the use of new energy-saving transformers is of great significance for achieving the national goals such as reducing energy consumption per unit of GDP by about 20% and reducing the total discharge of major pollutants by 10% during the "11th Five-Year Plan" period.

At present, for transformers with laminated core structures, reducing transformer losses can only be achieved by selecting high-quality grain-oriented cold-rolled silicon steel sheets, increasing the usage of silicon steel sheets and copper wires, or using high-priced imported materials. Increasing material usage is equivalent to increasing primary energy consumption. In the context of social energy shortages, especially when raw materials such as silicon steel sheets and copper are soaring in price, this method of achieving product energy saving through excessive material consumption is not advisable. Therefore, optimizing the design of the transformer core structure and adopting advanced processes in the production process are the best choices to achieve energy saving and consumption reduction of transformers.

The cores of traditional distribution transformers all have a planar structure, which has the drawback of unequal three-phase magnetic circuits. To reduce losses in planar-structured transformers, it is necessary to consume more materials. In contrast, the three-phase coils of three-dimensional wound core transformers are arranged in a three-dimensional equilateral triangle, with symmetric three-phase magnetic circuits, the shortest magnetic path, and minimal losses. The core has no joints, which reduces magnetic resistance, significantly lowering no-load losses and no-load current, achieving the effect of energy saving and material conservation.

2. Model Description



3. Technical Objectives

Technical performance target values of S11-M.RL three-dimensional triangular wound core distribution transformer:

- ① Compared with the S9 transformer with the same capacity and laminated core structure, no-load loss is reduced by 30%, no-load current is reduced by more than 70%, and noise is reduced by 6-10 dB(A);
- ② Compared with the S11 transformer with the same capacity and laminated core, the S11 three-dimensional wound core transformer saves about 20% of silicon steel sheet usage, 2-3% of copper usage, reduces no-load current by 70%, and reduces noise by 5 dB(A)-9 dB(A);

Technical performance target values of S13-M.RL three-dimensional triangular wound core distribution transformer:

- ① Compared with the on-line operating S7 transformer with the same capacity, no-load loss is reduced by 55%, load loss is reduced by 33%, no-load current is reduced by more than 85%, and noise is reduced by 8-13 dB(A).
- ② Compared with the S9 transformer with the same capacity, no-load loss is reduced by 50%, no-load current is reduced by more than 80%, and noise is reduced by 8 dB(A)-11 dB(A).
- ③ Compared with the S11 transformer with the same capacity, without increasing materials, no-load loss is reduced by more than 25%, no-load current is reduced by 70%, and noise is reduced by 7 dB(A)-10 dB(A).
- ④ Compared with the S13 transformer with the same capacity and laminated structure, it saves more than 20% of silicon steel sheet usage, 2-3% of copper usage, and reduces noise by 5 dB(A)-8 dB(A).

4. Technical route

1. The key technologies lie in:

core design, core winding, core vacuum annealing, coil winding, and R&D and manufacturing of related tooling equipment.

1. Core design technology: The high-efficiency energy-saving S13-M.RL three-dimensional triangular wound core transformer is developed by our company based on the mass production of S11-type three-phase wound core transformers (with planar core arrangement). Through magnetic circuit analysis, it breaks through the framework of traditional structures. Three identical rectangular semi-circular cross-section wound cores are combined into an equilateral three-dimensional three-phase transformer core, making the three-phase core magnetic circuit completely symmetrical, significantly reducing magnetic resistance, exciting current, and no-load loss, and becoming a new type of high-efficiency energy-saving triangular wound core transformer with lower operation noise and a more compact structure. The key technology lies in the design of three single frames. The curve cutting machine design software is used for analysis, design, and calculation to ensure good fitting of the joint surfaces when the three single frames are assembled.

2.Core winding technology: The design of the wound core winding machine is the key technology. Each single frame is formed by sequentially and continuously winding several silicon steel strips into a trapezoidal cross-section structure. The winding of the single frame is carried out on a special wound core winding machine. When the strip is wound by this core winding machine, the machine will automatically and accurately complete a 30-degree inclination of the strip, featuring no air gaps, low loss, and low noise. Meanwhile, after winding, it ensures good fitting of the joint surfaces when the three single frames are assembled. In the processes of shearing, handling, and stacking silicon steel sheets for laminated cores, mechanical actions such as impact, collision, compression, and beating from fixtures and workstation tools, as well as thermal stress, increase the internal stress of the laminated core. In contrast, the wound core processing is less affected by the above factors, and the increase in internal stress is not significant.

3.Core annealing technology: For the annealing process technology, the annealing temperature and time (heating, heat preservation, cooling) are controlled according to factors such as the grade of silicon steel sheets, the number of cores loaded into the furnace, the core diameter, and the temperature inside the furnace, ensuring that after annealing, the core process coefficient is 1.05-1.10, which can basically eliminate internal stress, with no high magnetic resistance existing in all parts of the magnetic circuit, and the no-load loss and exciting current can be significantly reduced. The annealing curve is strictly monitored during the annealing process, and adjustments are made in a timely manner in case of abnormalities.

4.Wound core winding: The design of the wound core winding machine is also a key technology, including key technologies such as coil mold design, power device design, insulation part treatment during coil winding, and coil tap treatment.

2. Key processes:

Process flow:

Use the broken line cutting machine design software for design calculation to determine the material size.

Carry out straight strip cutting with a longitudinal cutting machine according to the designed straight strip size.

Use the broken line cutting machine to cut the straight strip into trapezoidal materials according to the designed size.

Use the core winding machine to wind the trapezoidal strip into a single frame.

Fix and clamp the three frames with an annealing fixture.

Anneal.

Assemble the three single frames.

The key processes are as follows:

① Core winding.

② Each single frame is formed by continuously winding several trapezoidal strips with different widths. During winding, the special winding machine automatically displaces the strip synchronously to one side for asymmetric winding, making the cross-section have a 30-degree inclination angle, thereby ensuring good fitting of the joint surfaces when the three single frames are assembled.

③ Clamping of the single core frame.

④ Annealing of the single core frame must be carried out under the clamping of the fixture to prevent the shape of the single frame from changing during cutting or annealing.

⑤ Annealing.

The annealing of the three-dimensional triangular wound core single frame is carried out in a vacuum annealing furnace. The core annealing process and the technical operation procedures of the annealing furnace have a great impact on product quality.

⑥ Assembly; the assembly of the three-dimensional triangular wound core should be carried out on the assembly fixture. During assembly, adjust the front and rear positions of each single frame to ensure that the three joint surfaces are completely and tightly fitted, and the two joint surfaces should be aligned in the up, down, left, and right directions to prevent misalignment. Then use binding straps to bind the three assembled core columns respectively, ensuring they are tightly bound, and the binding height should be slightly lower than the upper position of the window width.

⑦ Coil winding; the gear coupling of the three-dimensional triangular wound core winding machine should be appropriately adjusted to ensure smooth operation during coil winding, the electromagnetic wire arrangement should be uniform, and the insulation parts and coil taps should be treated during coil winding.

3.Project Innovation and Advancement

In the power transformer industry, both laminated cores and wound cores have long suffered from the drawback of unequal three-phase magnetic circuits.

Innovation of the S13-M.RL three-dimensional triangular wound core transformer: It breaks through the framework of traditional planar structures by using three identical rectangular semi-circular cross-section wound cores to form an equilateral three-dimensional three-phase transformer core. This design makes the three-phase core magnetic circuit completely symmetrical, significantly reduces magnetic resistance, and remarkably decreases exciting current and no-load loss, creating a new type of high-efficiency energy-saving triangular wound core transformer with lower operation noise and a more compact structure.

Advancement: Compared with planar laminated cores in terms of performance and material usage, the three-dimensional triangular structure offers the following advantages:

Energy saving: The no-load loss of S13 is 25% lower than the national standard value of S11, and the no-load current of S13 is 80% lower than the national standard value of S11.

Material saving and consumption reduction: It saves 20% of silicon steel sheet usage and 2-3% of copper usage.

Ultra-low noise: The noise is 7-10 dB (A) lower than the national standard value of S11.

Specific analysis:

A. Material saving and cost reduction

The average magnetic path length of the three magnetic circuits of the three-dimensional triangular wound core is significantly shorter than that of the laminated core. Meanwhile, the wound core has 4 fewer large sharp corners and 4 fewer small sharp corners than the laminated core, reducing core material loss.

When processing silicon steel strips into trapezoidal strips for the three-dimensional triangular wound core, a nesting cutting method is

used, resulting in no waste material during cutting. In contrast, the processing of silicon steel sheets for laminated cores requires corner punching, and the punched corner materials become waste, causing approximately 5% material waste.

The cross-section of the core column of the three-dimensional triangular wound core is a quasi-polygon, with a section filling factor of 0.95-0.96. The core column cross-section of the laminated core is ladder-shaped, with a section filling factor of 0.89-0.925. Therefore, under the same cross-sectional area, the average turn length of the core wire package of the three-dimensional triangular wound core is 2-3% shorter than that of the laminated core, saving 2-3% of copper materials.

Both three-dimensional triangular wound cores and planar wound cores are of the wound type. However, the planar wound core is formed by first winding two smaller inner frames, combining them, and then winding a larger outer frame around the outside, while the three-dimensional triangular wound core is composed of three identical smaller single frames. Under the same capacity, the three-dimensional triangular wound core saves approximately 15% of silicon steel strips compared to the planar wound core.

Both laminated cores and planar wound cores feature a planar layout, whereas the three core columns of the three-dimensional triangular wound core transformer are arranged in an equilateral triangle in three-dimensional space, boasting a high space utilization coefficient. This reduces the length of coil conductors, saving copper materials, lowering load losses, conserving raw materials, and thus reducing the transformer's weight. Moreover, the approximate triangular structure makes its volume smaller than conventional products, with a compact structure, beautiful appearance, and small footprint.

B. Performance Enhancement and Loss Reduction

The average magnetic path of the three-dimensional triangular wound core is shorter than that of the laminated core, resulting in a significantly lighter weight. Under the same process coefficient, the no-load loss of the three-dimensional triangular wound core is notably lower, indicating better performance.

The three-dimensional triangular wound core undergoes annealing during manufacturing, with a process coefficient of 1.05-1.10, which basically eliminates internal stress and ensures no high magnetic resistance in the magnetic circuit, thus significantly reducing no-load loss and exciting current. In contrast, laminated cores generally do not undergo annealing, with a process coefficient of 1.20-1.40.

Whether the laminated core transformer uses direct joint or (mitered lap joint) lamination, there are joints. The joints of silicon steel sheets form air gaps in the magnetic circuit, creating high magnetic resistance and flux saturation zones where energy loss concentrates. The three-dimensional triangular wound core transformer has no joints, eliminating losses caused by air gaps at joints and fully leveraging the high magnetic permeability of high-quality core materials.

C. Noise Reduction

Laminated cores are stacked from silicon steel sheets of specific shapes according to certain rules. The silicon steel sheets are not tightly packed, and vibration occurs under electromagnetic force during operation, leading to significant noise.

The three-dimensional triangular wound core is formed by sequentially winding several trapezoidal strips, with tight spacing between silicon steel strips. The magnetic conduction direction of the silicon steel strips is completely consistent with the magnetic circuit direction of the core, resulting in minimal vibration during operation. It solves the noise problem caused by discontinuous magnetic circuits in laminated cores, reducing noise by 8-15 dB(A) compared to laminated core transformers, basically achieving a silent state.

D. Three-Phase Balance

The three core columns of laminated core transformers are arranged in a plane, making their magnetic path lengths inconsistent: the middle core column has the shortest magnetic path, while the two side columns have longer paths—with the average magnetic path length of the side columns over 20% longer than that of the middle column. This causes significant differences in losses among the three core columns (the middle column has the lowest loss, and the side columns have higher losses), leading to three-phase imbalance.

The three-dimensional triangular wound core is composed of three identical single frames, with the three core columns arranged in an equilateral triangle. The magnetic path lengths of the three core columns are completely consistent and the shortest, resulting in uniform losses and thus three-phase balance.

5.Market Demand Forecast

Market Demand Analysis Driven by Rapid Economic Growth for Newly Installed Transformers: In 2006, China produced 7,364.5 million kVA of transformers, a 17.73% increase from 2005. By the end of 2007, China's installed power capacity reached 638 million kW. Based on a conservative estimate of 6% annual growth in installed capacity, the annual new installed capacity is 38 million kW, driving a demand for 460 million kVA of transformer capacity. According to the "11th Five-Year Plan" grid planning and the 2020 vision report of the State Grid Corporation, during the "11th Five-Year Plan" period, the State Grid will add 60,000 km of 330 kV and above transmission lines, 300 million kVA of transformer capacity, with an investment of approximately 900 billion yuan. By 2010, China's cross-regional power transmission capacity will exceed 40 million kW, with a transmission volume of over 180 billion kWh. It can be concluded that the newly installed transformer market still faces a bright development prospect.

In addition to the demand growth for newly installed transformers driven by rapid economic growth, there is currently a huge demand for replacing old transformers in grid operation. According to survey statistics (2003 data), the total capacity of 10 kV distribution transformers in operation nationwide is 1,502.6 million kVA, of which the total capacity of "64" and "73" series high-loss transformers with a service life exceeding 20 years is 238 million kVA (excluding the total capacity of S7 transformers in operation). Among them, the total capacity of high-loss distribution transformers in industries such as steel, cement, fertilizer, chlor-alkali, and electrolysis is 22.04 million kVA. Since 1999, the state has stipulated to stop producing S7 series distribution transformers. If the total capacity of S7 transformers in operation is included, the demand for eliminating old transformers and replacing them with new energy-saving transformers will exceed 600 million kVA. Recently, China Southern Power Grid surveyed the distribution transformers in operation across its five managed provinces, finding that the total capacity of public distribution transformers in urban distribution networks is 38,013 MVA (excluding special distribution transformers, which are several times the number of public ones). Among them, high-loss distribution transformers account for 6,732 MVA in public distribution transformers, and the number would be several times higher if special distribution transformers are included. In July this year, the State Council issued the Notice of the General Office of the State Council on Establishing a System of Government Mandatory Procurement of Energy-Saving Products, clearly stipulating that government departments at all levels must mandatorily procure energy-saving products. With the implementation of the State Council's energy-saving evaluation plan and energy-saving/emission-reduction measures at all levels, these high-loss distribution transformers will inevitably be phased out soon.

The S13 new energy-saving three-dimensional triangular wound core transformer features unique magnetic circuit design. First, compared with traditional manufacturing processes, it has a higher raw material utilization rate for the core. Second, its no-load loss and no-load current are reduced by over 25% and 70% respectively compared to the widely used S11 series transformers (which have been in service for more than 7 years). It boasts advantages such as energy conservation, material saving, environmental friendliness, ultra-low noise, and a relatively reasonable price, offering excellent technical and economic performance. This product is bound to win wide favor from users and will have huge market demand. It can be predicted that the future development prospect of the S13 new energy-saving three-dimensional triangular wound core transformer will be even broader.

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Cases and solid insulation ringnet cabinet series

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- DFW-12 Box-type Outdoor Switchgear for AC Switching Equipment
- HRS-12 Standardized SF6 Fully Insulated and Sealed Metal-Enclosed Compact Switchgear
- HRS-24 SF6 Fully Insulated and Sealed Metal-Enclosed Compact Switchgear
- HRS-40.5 SF6 Fully Insulated and Sealed Common-Box Ring Main Switchgear
- HRGT-12 Standardized Solid Fully Insulated and Sealed Metal Switchgear
- HRE-12 Standardized Environmentally Friendly Gas-Insulated Metal Switchgear



Application Scenarios of Hairui Ring Main Unit (Switching Station)



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Why choose Hairui ring main units (RMUs)?



With more than ten years of manufacturing high and low voltage switchgear assemblies, hundreds of customers have been operating stably and safely.



The industry's first to use robotic welding, with good sealing and no leakage.



Vacuum chamber helium leak detection control system and standardized pressure withstand test. Good products require strict inspection.



It has strong environmental adaptability and can be used at temperatures from -40℃ to +60℃.



High safety level, protection performance up to Ip67.



High dielectric strength and excellent insulation performance.

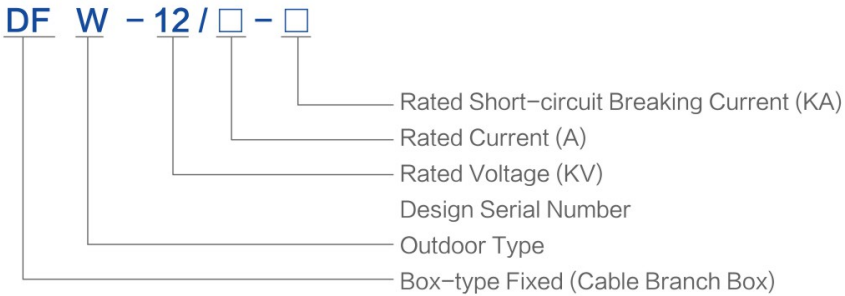
DFW-12 Box - type Switchgear for AC Switching Equipment



1. Overview

The DFW-12 Outdoor Prefabricated Substation (also known as the Outdoor Switchgear Cabinet) integrates the HRS-12 Fixed-type AC Metal-enclosed Switchgear (SF6 Gas-insulated Ring Main Unit) within a weatherproof enclosure. This configuration forms a complete cable network distribution switchgear solution, making it the preferred outdoor switchgear for smart grid automation, overhead line undergrounding, and cable network modernization projects.

2. Model and Its Meaning



3. Execution Standard

GB3906-2006	(3.6KV-40.5KV AC Metal-enclosed Switchgear and Controlgear)
GB1984-2014	(High-voltage AC Circuit Breaker)
GB3804-2004	(3.6KV-40.5KV High-voltage AC Load Switch)
GB1985-2014	(High-voltage AC Disconnect Switches and Earthing Switches)
DL/T593-2006	(Common Technical Requirements for High-voltage Switchgear and Controlgear Standards)
GB/T2423.1-2008	(Environmental Testing for Electrical and Electronic Products)
GB16926-2009	(High-voltage AC Load Switch-Fuse Combination Equipment)

4. Normal Service Environment

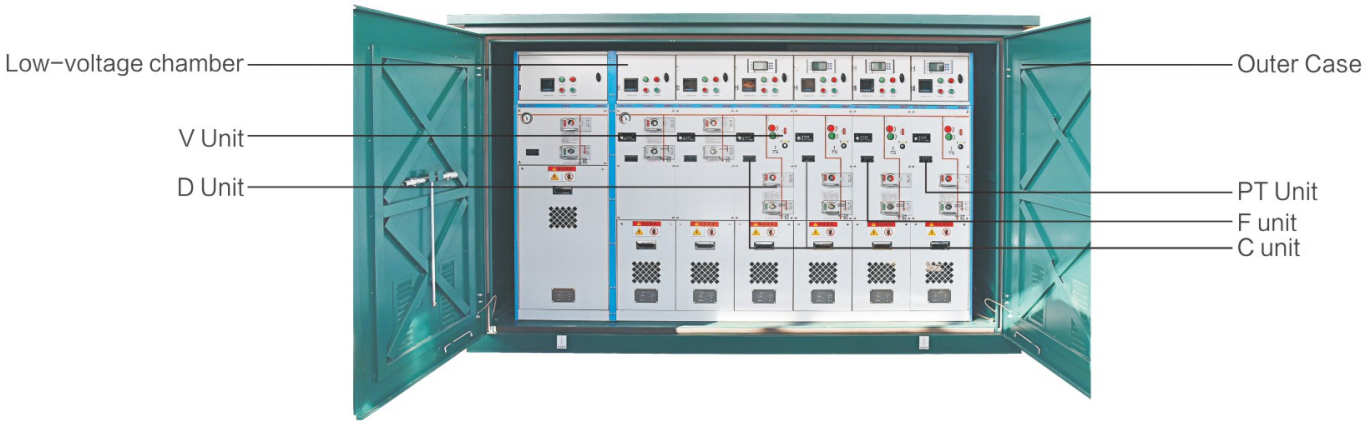
It generally operates and serves under normal indoor and outdoor conditions, complying with the IEC 60694 standard. The specific operating limits are as follows:
Environmental temperature:
Maximum temperature: +60°C;
Maximum temperature (24-hour average): +35°C;
Minimum temperature: -40°C.
Humidity:
Maximum average relative humidity (24-hour measurement): 95%;
Maximum average relative humidity (one-month measurement): 90%.
Maximum installation altitude without decompression required: 2000 meters.
Wind pressure: Not exceeding 700Pa (equivalent to wind speed 35m/s).
Seismic intensity: Not exceeding magnitude 8.
Safety pollution grade: Grade IV.
Protection class:
Gas tank protection class: IP67;
Outer case protection class: IP4X.

DFW-12 Box - type Switchgear for AC Switching Equipment

5. Main Technical Parameters

NO.	Item	C module	F module	V module
		Load switch	Combination apparatus	Vacuum Circuit Breaker
1	Rated Voltage	12		
2	1min Power Frequency Withstand Voltage (KV)	42/48		
3	Lightning Impulse Withstand Voltage (KV)	75/85		
4	Rated Current (A)	630	125	630
5	Transfer Current (A)	1800		
	Closed Loop Breaking Current (A)	630		
	Cable Charging Breaking Current (A)	10		
	5% Active Load Breaking Current (A)	31.5		
	Ground Fault Breaking Current (A)	31.5		
	Short-circuit Breaking Current (KA)		31.5	20
6	Short-circuit Making Current (KA)	63	80	20
7	Short-time Withstand Current (KA)	20		20
8	Short-circuit Duration (S)	4		4
9	Mechanical Life (Times)	5000	5000	10000
10	SF6 Gas Pressure (bar)	1.2/12 20°C		
11	Annual Leakage Rate	0.1%		
12	Protection Class	IP67/4X (Gas tank / Housing)		

6. Structural Characteristics



7. Intelligent terminal DTU can be configured.

The intelligent control module enables the unit to have conventional "three-remote" functions, supports network communication, and uses a USB interface to achieve application software upgrades and parameter configuration. It communicates with SCADA (Supervisory Control and Data Acquisition) systems, distribution automation (DA/DMS) master stations, distribution automation secondary master stations, or substation monitoring systems to complete the remote monitoring, fault detection, and control functions of the distribution system and equipment.

8. Ordering Notes

- ◆ Before signing the contract, both the supplier and the demander shall confirm the technical parameters and technical solutions of the product.
- ◆ Within one month after signing the contract, the manufacturer shall provide the basic drawings for the user's confirmation.
- ◆ The scope and quantity of spare parts and auxiliary equipment to be equipped by the user shall be specified in the technical agreement or supply contract.
- ◆ If the user requires the manufacturer to provide technical training and/or installation services, it shall be specified in the contract.
- ◆ The general tools and common materials used for installation and maintenance shall be prepared by the user.
- ◆ The specifications and models of cables and cable terminals shall be specified at the time of ordering and ordered by the user.

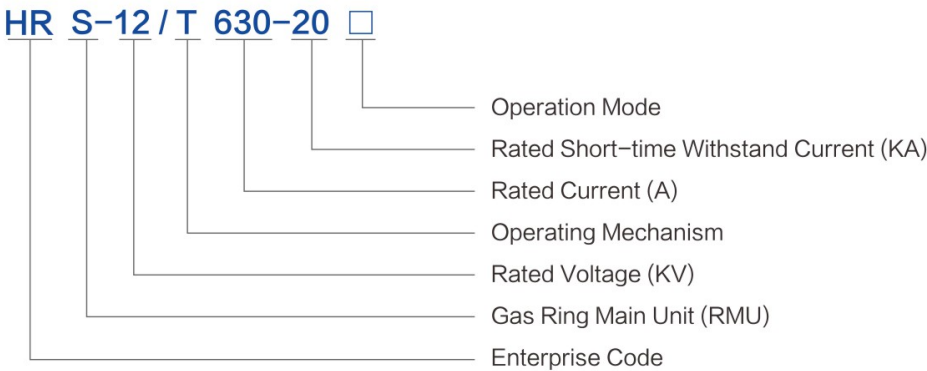
HRS-12 Standardized SF6 fully insulated, fully sealed metal-clad compact switchgear



1. Overview

HRS-12 standardized SF6 fully insulated and fully sealed common-tank ring main switchgear is a new-generation miniaturized modular switchgear, with up to 6 modules configurable within the same SF6 insulated gas tank. The gas tank adopts a stainless-steel shell formed by world-advanced laser welding technology to ensure airtightness. It is filled with SF6 gas and undergoes simultaneous vacuum-pumping and nitrogen leak detection. Switch moving parts such as load switches, grounding switches, circuit breakers, fuse insulating cylinders, and busbars are all sealed within the stainless-steel gas tank. The protection class of the inflatable housing reaches IP67. The gas tank is equipped with an explosion-proof diaphragm, which can discharge from the lower explosion-proof port when the internal pressure exceeds a certain level, effectively preventing damage to personnel, cables, and other switchgear in the substation. The HRS-12 series gas-insulated switchgear features compact structure, full insulation, full enclosure, long service life, maintenance-free operation, small footprint, safety, reliability, and immunity to working environments. It is widely applied in industrial and civil cable ring networks and power supply terminals, especially suitable for small secondary substations, switchgears, industrial and mining enterprises, airports, railways, commercial districts, high-rise buildings, high-speed railways, subways, tunnels, and other fields.

2. Model and Its Meaning



3. Execution Standards

- GB3906-2006 (3.6KV-40.5KV AC Metal-Clad Switchgear and Controlgear)
- GB1984-2014 (High-voltage AC Circuit Breakers)
- GB3804-2004 (3.6KV-40.5KV High-voltage AC Load Switches)
- GB1985-2014 (High-voltage AC Disconnectors and Earthing Switches)
- DL/T593-2006 (Common Technical Requirements for High-voltage Switchgear and Controlgear Standards)
- GB/T2423.1-2008 (Environmental Testing for Electrical and Electronic Products)
- GB16926-2009 (High-voltage AC Load Switch - Fuse Combination Apparatus)

HRS-12 Standardized SF6 fully insulated, fully sealed metal-clad compact switchgear

4. Normal Service Environment

It generally operates and serves under normal indoor and outdoor conditions, in compliance with IEC 60694 standard. The specific operating limits are as follows:

- Ambient temperature:
- Maximum temperature: +60℃;
- Maximum temperature (24-hour average): +35℃;
- Minimum temperature: -40℃;
- Humidity:
- Maximum average relative humidity (measured over 24 hours): 95%;
- Maximum average relative humidity (measured over one month): 90%;
- Maximum altitude without the need for decompression during installation: 2000 meters;
- Wind pressure: Not exceeding 700Pa (equivalent to a wind speed of 35m/s);
- Seismic intensity: Not exceeding degree 8;
- Safety pollution grade: Grade IV ;
- Protection class:
- Gas tank protection class: IP67;
- Outer case protection class: IP4X.

5. Main Technical Parameters

NO.	Item	C module	F module	V module
		Load switch	Combination apparatus	Vacuum Circuit Breaker
1	Rated Voltage	12		
2	1min Power Frequency Withstand Voltage (KV)	42/48		
3	Lightning Impulse Withstand Voltage (KV)	75/85		
4	Rated Current (A)	630	125*	630
5	Transfer Current (A)		1800	
	Loop Breaking Current (A)	630		
	Cable Charging Breaking Current (A)	10		
	5% Active Load Breaking Current (A)	31.5		
	Ground Fault Breaking Current (A)	31.5		
	Short-circuit Breaking Current (KA)		31.5*	20
6	Short-circuit Making Current (KA)	63	80*	20
7	Short-time Withstand Current (KA)	20		20
8	Short-circuit Duration (S)	4		4
9	Mechanical Life (Times)	5000	5000	10000
10	SF6 Gas Pressure (bar)	1.2/12 (20℃)		
11	Annual Leakage Rate	0.1%		
12	Protection Class	IP67/4X (气箱/外壳)		

*Indicates being dependent on or limited by fuses.

6. Configurable Intelligent Terminal DTU

The intelligent control module enables the unit to have conventional "three-remote" functions, supports network communication, and uses a USB interface for application software upgrades and parameter configuration. It communicates with SCADA (Supervisory Control and Data Acquisition) systems, distribution automation (DA/DMS) master stations, secondary distribution automation master stations, or substation monitoring systems to complete remote monitoring, fault detection, and control functions for the distribution system and equipment.

7.Ordering Notes

- ◆ Before signing the contract, both the supplier and the demander shall confirm the technical parameters and technical solutions of the product.
- ◆ Within one month after signing the contract, the manufacturer shall provide the basic drawings for the user's confirmation.
- ◆ The scope and quantity of spare parts and auxiliary equipment to be equipped by the user shall be specified in the technical agreement or supply contract.
- ◆ If the user requires the manufacturer to provide technical training and/or installation services, it shall be clearly stated in the contract.
- ◆ The general tools and common materials for installation and maintenance shall be prepared by the user.
- ◆ The specifications and models of cables and cable terminals shall be specified at the time of ordering, and shall be ordered by the user.

HRS-24 Sf6 fully insulated and fully sealed metal-clad compact switchgear



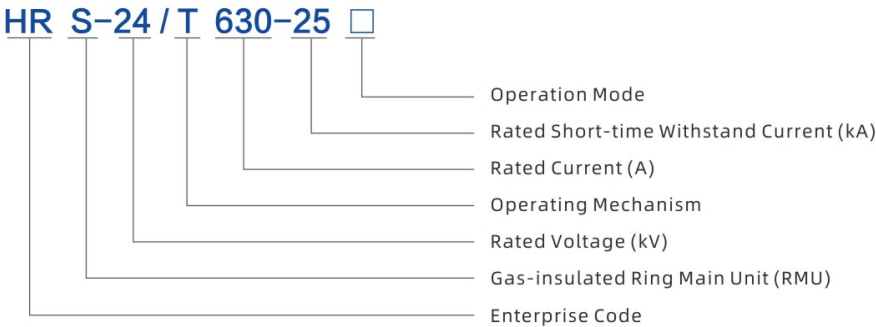
1. Overview

HRS-24 SF6 Fully Insulated and Fully Sealed Common-Tank Ring Main Switchgear

HRS-24 SF6 fully insulated and fully sealed common-tank ring main switchgear is a new-generation miniaturized modular switchgear, with up to 5 modules configurable within the same SF6 insulated gas tank. The gas tank adopts a stainless-steel shell formed by world-advanced laser welding technology to ensure airtightness. It is filled with SF6 gas and undergoes simultaneous vacuum-pumping and nitrogen leak detection. Switch moving parts such as load switches, grounding switches, circuit breakers, fuse insulating cylinders, and busbars are all sealed within the stainless-steel gas tank. The protection class of the inflatable housing reaches IP67. The gas tank is equipped with an explosion-proof diaphragm, which can discharge from the lower explosion-proof port when the internal pressure exceeds a certain level, effectively preventing damage to personnel, cables, and other switchgear in the substation.

The HRS-24 series gas-insulated switchgear features a compact structure, full insulation, full enclosure, long service life, maintenance-free operation, small footprint, safety, reliability, and immunity to working environments. It is widely applied in industrial and civil cable ring networks and power supply terminals, especially suitable for small secondary substations, switchgears, industrial and mining enterprises, airports, railways, commercial districts, high-rise buildings, high-speed railways, subways, tunnels, and other fields.

2. Model and Its Meaning



3. Executive Standards

- GB3906-2006 (3.6kV-40.5kV AC Metal-Clad Switchgear and Controlgear)
- GB1984-2014 (High-voltage AC Circuit Breakers)
- GB3804-2004 (3.6kV-40.5kV High-voltage AC Load Switches)
- GB1985-2014 (High-voltage AC Disconnectors and Earthing Switches)
- DL/T593-2006 (Common Technical Requirements for High-voltage Switchgear and Controlgear Standards)
- GB/T2423.1-2008 (Environmental Testing for Electrical and Electronic Products)
- GB16926-2009 (High-voltage AC Load Switch-Fuse Combinations)

HRS-24 Sf6 fully insulated and fully sealed metal-clad compact switchgear

4. Normal Service Environment

It generally operates and serves under normal indoor and outdoor conditions, in compliance with IEC 60694 standard. The specific operating limits are as follows:

- Ambient Temperature:
Maximum temperature: +60°C;
Maximum temperature (24-hour average): +35°C;
Minimum temperature: -40°C.

Humidity:
Maximum average relative humidity (measured over 24 hours): 95%;
Maximum average relative humidity (measured over one month): 90%.

Maximum altitude without the need for pressure reduction during
- installation: 2000 m.
Wind pressure: No more than 700 Pa (equivalent to a wind speed of 35 m/s).
Seismic intensity: No more than degree 8
Safety pollution class: Class IV.
Protection class:
Gas tank protection class: Ip67;
Outer case protection class: IP4X.

5. Main Technical Parameters

NO.	Item	C module	F module	V module
		Load switch	Combination apparatus	Vacuum Circuit Breaker
1	Rated Voltage	24		
2	1min Power Frequency Withstand Voltage (KV)	65/79		
3	Lightning Impulse Withstand Voltage (KV)	125/145		
4	Rated Current (A)	630	125*	630
5	Transfer Current (A)		1600	
	Loop Breaking Current (A)	630		
	Cable Charging Breaking Current (A)	10		
	5% Active Load Breaking Current (A)	31.5		
	Ground Fault Breaking Current (A)	31.5		
	Short-circuit Breaking Current (KA)		31.5*	20
6	Short-circuit Making Current (KA)	63	80*	20
7	Short-time Withstand Current (KA)	20		20
8	Short-circuit Duration (S)	4		4
9	Mechanical Life (Cycles)	5000	5000	10000
10	SF6 Gas Pressure (bar)	1.4/24 (20°C)		
11	Annual Leakage Rate	0.1%		
12	Protection Class	IP67/4X (气箱/外壳)		

*Indicates being dependent on or limited by fuses.

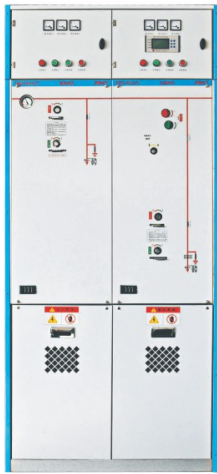
6. Configurable intelligent terminal DTU

The intelligent control module enables the unit to have conventional "three-remote" functions, supports network communication, and uses a USB interface for application software upgrades and parameter configuration. It communicates with SCADA (Supervisory Control and Data Acquisition) systems, distribution automation (DA/DMS) master stations, secondary distribution automation master stations, or substation monitoring systems to complete remote monitoring, fault detection, and control functions for the distribution system and equipment.

7. Ordering Notes

- Before signing the contract, both the supplier and the demander shall confirm the technical parameters and technical solutions of the product.
- Within one month after signing the contract, the manufacturer shall provide the basic drawings for the user's confirmation.
- The scope and quantity of spare parts and auxiliary equipment to be equipped by the user shall be specified in the technical agreement or supply contract.
- If the user requires the manufacturer to provide technical training and/or installation services, it shall be specified in the contract.
- General tools and common materials used for installation and maintenance shall be provided by the user.
- The specifications and models of cables and cable terminals shall be specified at the time of ordering and ordered by the user.

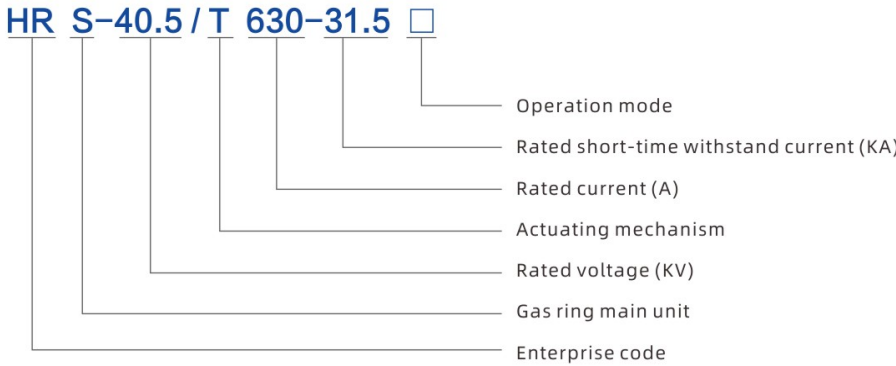
HRS-40.5 SF6 fully insulated and fully sealed common box type ring main switchgear



1. Overview

HRS-40.5 SF6 fully insulated and fully sealed common box type ring main switchgear is a new-generation miniaturized modular switchgear, with up to 3 modules configurable within the same SF6 insulated gas chamber. The gas chamber is made of stainless steel shell through world-advanced laser welding technology to ensure its tightness. It is filled with SF6 gas, and subjected to synchronous vacuum-pumping and nitrogen leak detection. Switch moving parts such as load break switches, grounding switches, circuit breakers, fuse insulating cylinders, and busbars are all sealed in the stainless steel gas chamber. The protection class of the inflatable housing reaches IP67. The gas chamber is equipped with an explosion-proof diaphragm, which can discharge from the lower explosion-proof port when the internal pressure of the switch exceeds a certain level, effectively preventing damage to personnel, cables and other switchgear in the substation. The HRS-40.5 series gas-insulated switchgear features compact structure, full insulation, full enclosure, long service life, maintenance-free operation, small footprint, safety, reliability, and immunity to working environment. It is widely applied in industrial and civil cable ring networks and power supply terminals, especially suitable for small secondary substations, switchgears, industrial and mining enterprises, airports, railways, commercial districts, high-rise buildings, high-speed railways, subways, tunnels and other fields.

2. Model and Its Meaning



3. Execution Standard

- GB3906-2006 (3.6KV-40.5KV AC Metal-Clad Switchgear and Controlgear)
- GB1984-2014 (High-voltage AC Circuit Breakers)
- GB3804-2004 (3.6KV-40.5KV High-voltage AC Load Switches)
- GB1985-2014 (High-voltage AC Disconnectors and Earthing Switches)
- DL/T593-2006 (Common Technical Requirements for High-voltage Switchgear and Controlgear Standards)
- GB/T2423.1-2008 (Environmental Testing for Electrical and Electronic Products)
- GB16926-2009 (High-voltage AC Load Switch-Fuse Combinations)

HRS-40.5 SF6 FULLY INSULATED AND FULLY SEALED COMMON-BOX TYPE RING MAIN SWITCHGEAR

4. Normal Service Environment

It generally operates and serves under normal indoor and outdoor conditions, complying with the IEC 60694 standard. The specific operating limits are as follows:

- Ambient Temperature:
 - Maximum temperature: +60°C;
 - Maximum temperature (24-hour average): +35°C;
 - Minimum temperature: -40°C.
- Humidity:
 - Maximum average relative humidity (measured over 24 hours): 95%;
 - Maximum average relative humidity (measured over one month): 90%.
- Maximum Altitude without Decompression during Installation: 2000 m.
- Wind Pressure: Not exceeding 700 Pa (equivalent to wind speed 35 m/s).
- Seismic Intensity: Not exceeding Grade 8.
- Safety Pollution Level: Class IV .
- Protection Class:
 - Gas chamber protection class: Ip67;
 - Outer casing protection class: IP4X.

5. Main Technical Parameters

NO.	Item	C module	F module	V module
		Load switch	Combination apparatus	Vacuum Circuit Breaker
1	Rated voltage	40.5		
2	1min power frequency withstand voltage (KV)	95/118		
3	Lightning impulse withstand voltage (KV)	185/215		
4	Rated current (A)	1250	125*	1250
5	Short-circuit breaking current (KA)	31.5	31.5*	20
6	Short-circuit making current (KA)	80	80*	20
7	Short-time withstand current (KA)	31.5		20
8	Short-circuit duration (S)	4		4
9	Mechanical life (times)	5000	5000	10000
10	SF6 gas pressure (bar)	1.3~1.4 (20℃)		
11	Annual leakage rate	0.1%		
12	Protection class	IP67/4X (Gas chamber / housing)		

*Indicates that it is dependent on or limited by the fuse.

6.Intelligent terminal DTU can be configured.

The intelligent control module enables the unit to have conventional "three-remote" functions, supports network communication, and uses a USB interface to realize the upgrade of application software and parameter configuration. It communicates with SCADA (Supervisory Control and Data Acquisition) systems, distribution automation (DA/DMS) master stations, distribution automation secondary master stations, or substation monitoring systems to complete the remote monitoring, fault detection, and control functions of the distribution system and equipment.

7. Ordering Notes

Before signing the contract, both the supplier and the demander shall confirm the technical parameters and technical solutions of the product. Within one month after signing the contract, the manufacturer shall provide the basic drawings for the user's confirmation. The scope and quantity of spare parts and auxiliary equipment to be equipped by the user shall be specified in the technical agreement or supply contract. If the user requires the manufacturer to provide technical training and/or installation services, it shall be specified in the contract. General tools and common materials for installation and maintenance shall be provided by the user. The specifications and models of cables and cable terminals shall be specified at the time of ordering and ordered by the user.

HRGT-12 Standardized solid fully insulated and fully sealed metal switchgear



1. Overview

The HRGT Standardized Solid Insulated Ring Main Unit is our company's new generation of solid insulated switchgear, designed for smart grid applications. This system offers high operational safety and is widely used in 12kV secondary distribution networks.

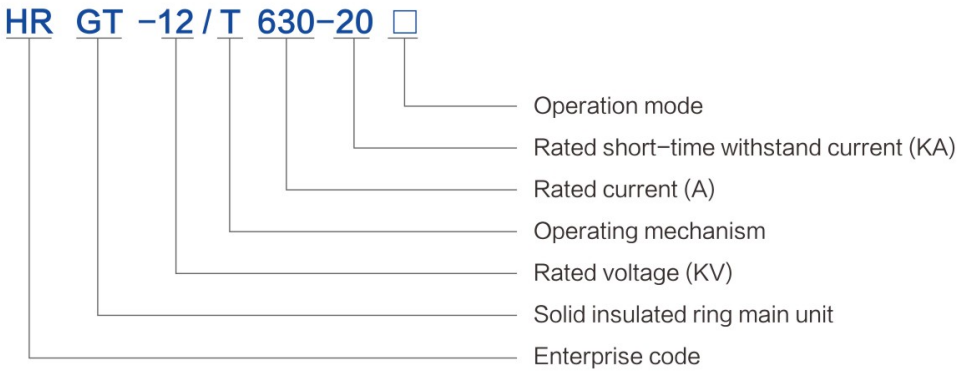
The HRGT unit is engineered with a mature vacuum interrupter technology, requiring no maintenance and certified for 10,000 operational cycles. All high-voltage live components are single-phase insulated using specially formulated materials that provide excellent dielectric properties and thermal dissipation. The uniquely designed insulation structure optimizes the electric field distribution, minimizing the risk of internal arcing.

Inside the fully enclosed metal enclosure, both primary components and operating mechanisms are protected from environmental factors. The use of vacuum interrupters and solid insulation ensures the system is environmentally friendly, making it a perfect replacement for SF6-based switchgear. Additionally, eliminating the need for gas pressure testing or routine maintenance, as well as post-service recovery costs, significantly reduces the total cost of ownership.

The compact design allows bottom-entry/exit cable connections via a front-accessible cable compartment, saving valuable floor space and enabling installation in challenging environments. All components are enclosed within a metal casing certified to withstand internal arcing up to 20kA/1s.

Operator safety is prioritized through multiple design features. In addition to the integrated switch position indicators, visual inspection windows on the front panel allow direct verification of the disconnecter and earthing switch positions.

2. Model and Its Meaning



HRGT-12 Standardized solid fully insulated and fully sealed metal switchgear

3. Execution Standard

- ◆ International Standards:
IEC 62271-1-2007 High-voltage switchgear and controlgear - Part 1: Common specifications
IEC 62271-200-2003 High-voltage switchgear and controlgear for rated voltages above 1 kV and up to 52 kV
- ◆ National Standards:
GB 3906-2006 3.6~40.5 kV AC metal-clad switchgear and controlgear
GB/T 11022-2011 Common specifications for high-voltage switchgear and controlgear standards
GB 1984-2014 High-voltage AC circuit-breakers
GB 1985-2014 High-voltage AC disconnectors and earthing switches
GB 3804-2014 3.6 kV~40.5 kV high-voltage AC load switches
GB 16926-2009 AC load switch - fuse combination units
DL/T 404-2007 3.6~40.5 kV AC metal-clad switchgear and controlgear
DL/T 593-2006 Common specifications for high-voltage switchgear and controlgear standards
- ◆ State Grid Corporation of China Standards:
Q/GDW 730-2012 Technical specifications for 12 kV solid-insulated ring main units

4. Normal Service Environment

It generally operates and serves under normal indoor and outdoor conditions, in compliance with IEC 60694 standard. The specific operating limits are as follows:

Ambient Temperature:
Maximum temperature: +60°C;
Maximum temperature (24-hour average): +35°C;
Minimum temperature: -40°C.

Humidity:
Maximum average relative humidity (measured over 24 hours): 95%;
Maximum average relative humidity (measured over one month): 90%.

Maximum Altitude without Decompression during Installation: 2000 m.

Wind Pressure: Not exceeding 700 Pa (equivalent to wind speed 35 m/s).

Seismic Intensity: Not exceeding Grade 8.

Safety Pollution Level: Class IV.

Protection Class:
Gas chamber: Ip67;
Outer casing: IP4X.

5. Main Technical Parameters

NO.	Item	C module	F module	V module
		Load switch	Combination apparatus	Vacuum Circuit Breaker
1	Rated voltage	12		
2	1min power frequency withstand voltage (KV)	42/48		
3	Lightning impulse withstand voltage (KV)	75/85		
4	Rated current (A)	630	125*	630
5	Transfer current (A)		3150	
	Closed-loop breaking current (A)			
	Cable charging breaking current (A)			
	5% active load breaking current (A)			
	Ground fault breaking current (A)			
	Short-circuit breaking current (KA)	25	31.5*	20
6	Short-circuit making current (KA)	63	80*	20
7	Short-time withstand current (KA)	25		20
8	Short-circuit duration (S)	4		4
9	Mechanical life (times)	10000	5000	10000
10	Protection class	IP4X (外壳)		

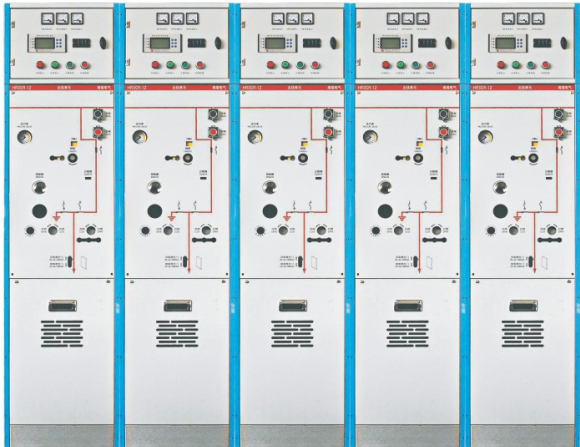
*Indicates being dependent on or limited by the fuse.

6. Intelligent terminal DTU can be configured.

The intelligent control module enables the unit to have conventional "three-remote" functions, supports network communication, and uses a USB interface to realize the upgrade of application software and parameter configuration. It communicates with SCADA (Supervisory Control and Data Acquisition) systems, distribution automation (DA/DMS) master stations, secondary distribution automation master stations, or substation monitoring systems to complete the remote monitoring, fault detection, and control functions of the distribution system and equipment.

7. Ordering Notes

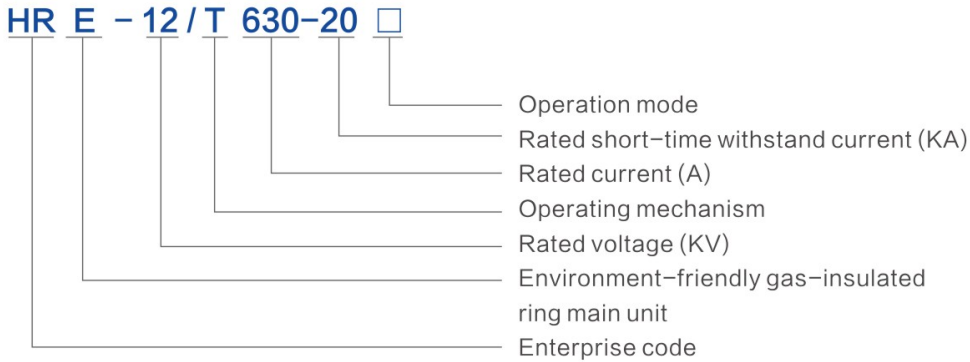
- ◆ Before signing the contract, both the supplier and the demander shall confirm the technical parameters and technical solutions of the product.
- ◆ Within one month after signing the contract, the manufacturer shall provide the basic drawings for the user's confirmation.
- ◆ The scope and quantity of spare parts and auxiliary equipment to be equipped by the user shall be specified in the technical agreement or supply contract.
- ◆ If the user requires the manufacturer to provide technical training and/or installation services, it shall be specified in the contract.
- ◆ General tools and common materials for installation and maintenance shall be provided by the user.
- ◆ The specifications and models of cables and cable terminals shall be specified at the time of ordering and ordered by the user.



1. Overview

The HRE-12 standardized ring main unit is a fully sealed, fully insulated, expandable, safe, and reliable switchgear. It is mainly applied in the secondary distribution system of power distribution networks, providing more reliable electrical equipment for public power grid systems. The HRE-12 standardized model features a hermetically sealed stainless steel casing filled with low-pressure environment-friendly gas. All live components and switching functions are enclosed within this casing, eliminating the impact of the external environment on the primary high-voltage circuit. This design meets the requirements of reliability, safety, and maintenance-free operation. It is widely used in industrial and civil cable ring networks and power supply terminals, especially suitable for small secondary substations, switchgear stations, industrial and mining enterprises, airports, railways, commercial districts, high-rise buildings, high-speed railways, subways, tunnels, and other fields.

2. Model and Its Meaning



3. Execution Standards

Please translate the following text into English:
GB 3906-2006 (3.6 kV-40.5 kV AC Metal-Clad Switchgear and Controlgear)
GB 1984-2014 (High-Voltage AC Circuit-Breakers)
GB 3804-2004 (3.6 kV-40.5 kV High-Voltage AC Load Switches)
DL/T 593-2006 (Common Technical Requirements for High-Voltage Switchgear and Controlgear Standards)
GB/T 2423.1-2008 (Environmental Testing for Electrical and Electronic Products)
GB 16926-2009 (High-Voltage AC Load Switch-Fuse Combination Units)

4. Normal Service Environment

It generally operates and serves under normal indoor and outdoor conditions, in compliance with IEC 60694 standard. The specific operating limits are as follows:

Ambient Temperature:
Maximum temperature: +60°C;
Maximum temperature (24-hour average): +35°C;
Minimum temperature: -40°C.
Humidity:
Maximum average relative humidity (measured over 24 hours): 95%;
Maximum average relative humidity (measured over one month): 90%.
Maximum Altitude without Decompression during Installation: 2000 m.

Wind Pressure: Not exceeding 700 Pa (equivalent to wind speed 35 m/s).
Seismic Intensity: Not exceeding Grade 8.
Safety Pollution Level: Class IV.
Protection Class:
Gas chamber: Ip67;
Outer casing: IP4X.

5. Main Technical Parameters

NO.	Item		HRE-12-C	HRE-12-T	HRE-12-V
1	Rated voltage	kV	12		
2	Rated current	A	630	125	630
3	Rated frequency	Hz	50		
4	Rated short-circuit making current	kA	50	125	50
5	Rated short-circuit breaking current	kA	/	50	20
6	Rated short-time withstand current	kA	20	/	20
7	Rated peak withstand current	kA	50	/	50
8	Rated transfer current	A	/	1400	/
9	Rated power frequency withstand voltage	Between phases and to earth	kV	42/1min	
		Isolating break	kV	48/1min	
		Auxiliary and control circuits	kV	2/1min	
10	Rated lightning impulse withstand voltage	Between phases and to earth	kV	75	
		Isolating break	kV	85	
11	Mechanical life	次	5000	5000	10000
12	Main circuit resistance	μ Ω	≤ 150	≤ 300	≤ 150
13	Rated inflation pressure (gauge pressure at 20°C)	Mpa	0.02		
14	Minimum functional pressure (gauge pressure at 20°C)		0		
15	Annual gas leakage rate		≤ 0.01%		
16	Protection class: casing/cabinet		IP67/IP4X		

6. Configurable Intelligent Terminal DTU

The intelligent control module enables the unit to have conventional "three-remote" functions, supports network communication, and uses a USB interface for application software upgrades and parameter configuration. It communicates with SCADA (Supervisory Control and Data Acquisition) systems, distribution automation (DA/DMS) master stations, secondary distribution automation master stations, or substation monitoring systems to complete remote monitoring, fault detection, and control of the distribution system and equipment.

7. Ordering Notes

- ◆ Before signing the contract, both the supplier and the demander shall confirm the technical parameters and technical solutions of the product.
- ◆ Within one month after signing the contract, the manufacturer shall provide the basic drawings for the user's confirmation.
- The scope and quantity of spare parts and auxiliary equipment to be equipped by the user shall be specified in the technical agreement or supply contract.
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- ◆ General tools and common materials for installation and maintenance shall be provided by the user.
- ◆ The specifications and models of cables and cable terminals shall be specified at the time of ordering and ordered by the user.

YBW YBM (ZBW) Series of Prefabricated Substations



YBW YBM(ZBW)Series of Prefabricated Substations

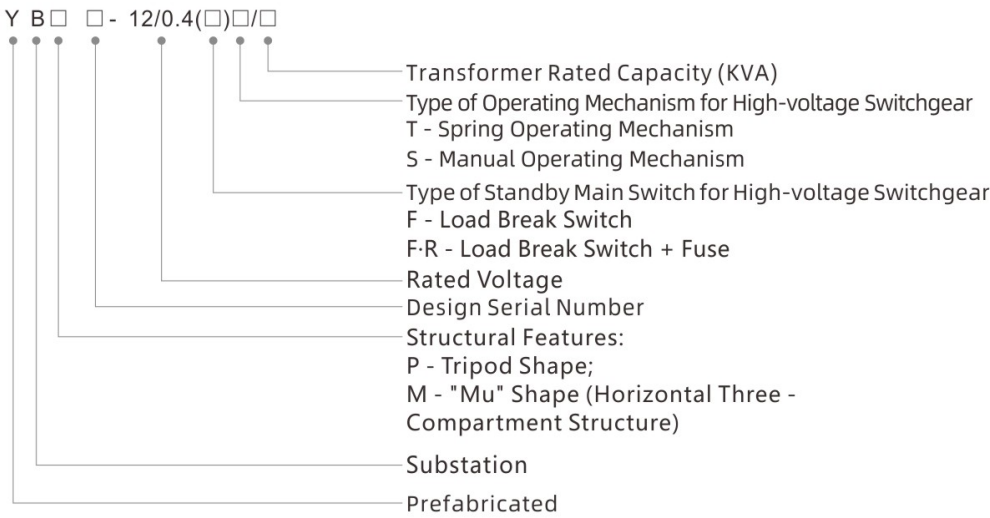
1. Overview

The YBW and YBM (ZBW) series prefabricated substations are compact packaged power distribution devices that integrate high-voltage electrical equipment, transformers, low-voltage electrical equipment, etc. They are used in urban high-rise buildings, urban and rural constructions, luxury villas, plazas and parks, residential communities, high-tech development zones, small and medium-sized factories, mines, oilfields, and temporary construction power consumption sites, etc., to receive and distribute electrical energy in the power distribution system.

The YBW and YBM (ZBW) series prefabricated substations feature strong performance, small volume, compact structure, safe and reliable operation, convenient maintenance, and mobility. Compared with conventional civil construction substations, the floor area of a prefabricated substation with the same capacity is usually only 1/10 to 1/5 of that of a conventional substation, which greatly reduces the design and construction workload and construction costs. In the power distribution system, it can be used in ring network power distribution systems, as well as dual-power or radial terminal power distribution systems. It is a new type of packaged equipment for the construction and transformation of urban and rural substations.

This product complies with the standards of GB/T 17467 High-voltage/Low-voltage Prefabricated Substations and SD 320 Technical Conditions for Packaged Substations.

2. Model Designation



3. Normal Service Environment Conditions

- 1.Altitude: 1000m and below.
 - 2.Ambient temperature: -25℃ to +40℃, with an average temperature within a 24-hour period not exceeding +35℃.
 - 3.Wind speed: No more than 35m/s.
 - 4.Relative air humidity: No greater than 0.4m/S², vertical acceleration no greater than 0.2m/S.
 - 5.Seismic horizontal acceleration: No more than 90% (+25℃).
 - 6.The site of use should be free from conductive dust and corrosive, flammable, or explosive hazardous materials harmful to metals and insulators.
 - 7.The installation site should have no severe vibration, and the vertical slope should not exceed 3 degrees.
- Note: For special service conditions, please negotiate with our company when placing an order.



High-voltage Chamber



Low-voltage Chamber



Transformer Chamber

4. Technical Parameters

Table 1

NO.	Project	Unit	High-voltage Apparatus	Transformer	Low-voltage Apparatus
1	Rated Voltage Ue	KV	7.2/12	6/0.4 10/0.4	6/0.4 10/0.4
2	Rated Capacity Se	KVA		Eye-shaped : 200~1250 Triangular-shaped : 50~800	Maximum2 × 1250
3	Rated Current Le	A	200~630		100~3000
4	Rated Breaking Current	A KA	Load Switch 400~630A The switchgear assembly depends on the fuse.		15~63
5	Rated Short-time Withstand Current (seconds)	KA	20×(2) 12.5×(4)	200~400KVA 400KVA	15 × 1 30 × 1
6	Rated Peak Withstand Current	KA	31.5 50	200~400KVA 400KVA	30 63
7	Rated Making Current	KA	31.5 50		
8	Power Frequency Withstand Voltage for 1min	KV	Between Phase and Earth, and Between Phases30/42 Isolating Break 34/48	Oil-immersed : 35/5min Dry-type:28/5min	When ≤ 300V, 2KV. When it is 300 - 600V, it is 2.5kV.
9	Lightning Impulse	KV	Between Phase and Earth, and Between Phases 60/75 Isolating Break 75/85	75 75	
10	Noise Level	dB		Oil-immersed: < 55 Dry-type: < 65	
11	Protection Level			IP23D	
12	Outline Dimension	According to the scheme and the selected high-low voltage switchgear and transformer, different outline dimensions are selected.			

5. Structural Features

This product is composed of high-voltage power distribution devices, transformers, and low-voltage power distribution devices, divided into three functional compartments: the high-voltage chamber, transformer chamber, and low-voltage chamber. The high and low-voltage chambers are fully functional. The primary power supply system on the high-voltage side can be arranged in various power supply modes such as ring network power supply, terminal power supply, and dual-power supply. It can also be equipped with high-voltage metering components to meet high-voltage metering requirements. The transformer chamber can select S9, S11, and other low-loss oil-immersed transformers and dry-type transformers. The transformer chamber is equipped with an automatic forced air cooling system and lighting system. According to the power supply scheme required by users, the low-voltage chamber has multiple functions such as power distribution, lighting distribution, reactive power compensation, electric energy metering, and power measurement to meet different user requirements and facilitate user power supply management and improve power supply quality.

The high and low-voltage chambers are reasonably and compactly arranged for convenient operation and maintenance. The high-voltage switchgear has an anti-misoperation interlocking function. According to user requirements, the transformer can be easily moved in and out of the transformer chamber door from the track, and the transformer can be equipped with a labyrinth ventilation device on the track as required. Each chamber is equipped with an automatic lighting device. In addition, the components selected for the high and low-voltage switchgear have reliable performance, simple operation, and convenient maintenance.

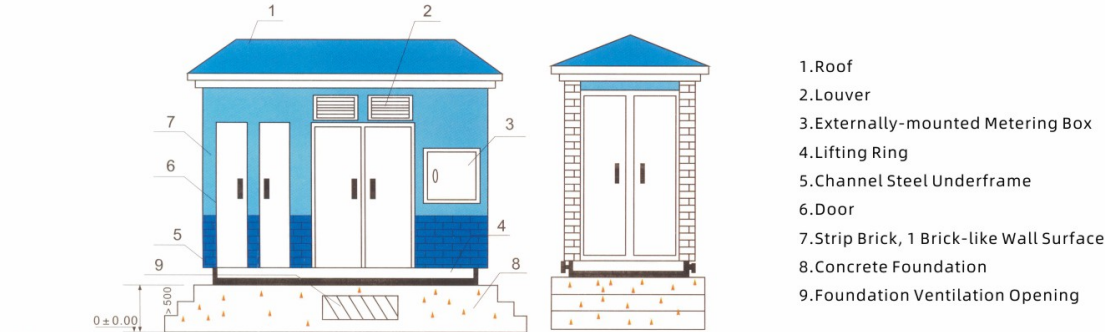
The top cover of the substation has a double-layer heat insulation structure to reduce the effect of sunlight radiation. There are ventilation holes under the eaves around it, forming a convection effect with each functional chamber for ventilation and heat dissipation. The base is a steel structure with sufficient strength and rigidity. It adopts two ventilation methods, natural ventilation and forced ventilation, to ensure good ventilation and cooling performance. The transformer chamber is equipped with a temperature controller that can automatically control the transformer temperature to ensure the transformer operates at full load.

According to different use environments and conditions, different structural forms and materials can be selected to meet different use requirements and ensure the normal operation of the substation. The substation shell can be made of non-metallic building materials, ordinary steel plates, stainless steel plates, aluminum alloy plates, color steel composite plates, etc. After partial or full surface treatment, it is suitable for long-term outdoor use, ensuring anti-corrosion, waterproof, and dustproof performance, long service life, and beautiful appearance.

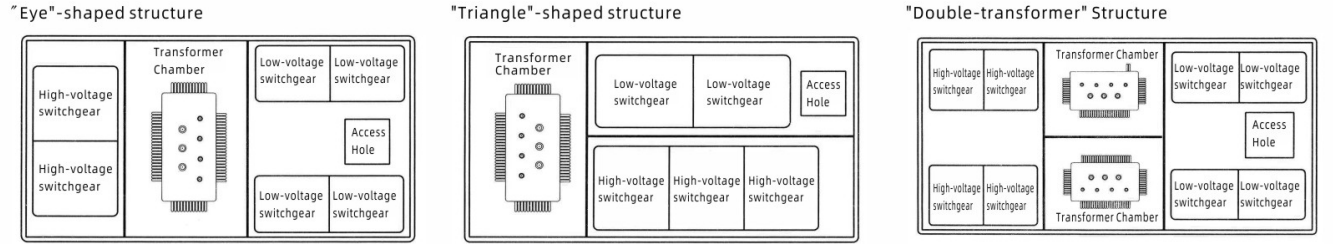
The basic structural forms are roughly divided into:
Scenic box-type substations made of non-metallic building materials or other materials;
General box-type substations made of ordinary steel plates;
High-corrosion-resistant box-type substations made of stainless steel or aluminum alloy plates;
Thermal insulation box-type substations made of color steel composite plates;
Other structural forms of box-type substations.

The inlet and outlet modes are generally cable inlet and outlet. If there are special requirements, other inlet and outlet modes can be used.

6. Schematic Diagram of Common Non-metallic Box-type Substation Enclosure



7. Structural Type



8. Civil Foundation Drawing of "Ground-mounted" Non-metallic Box-type Substation

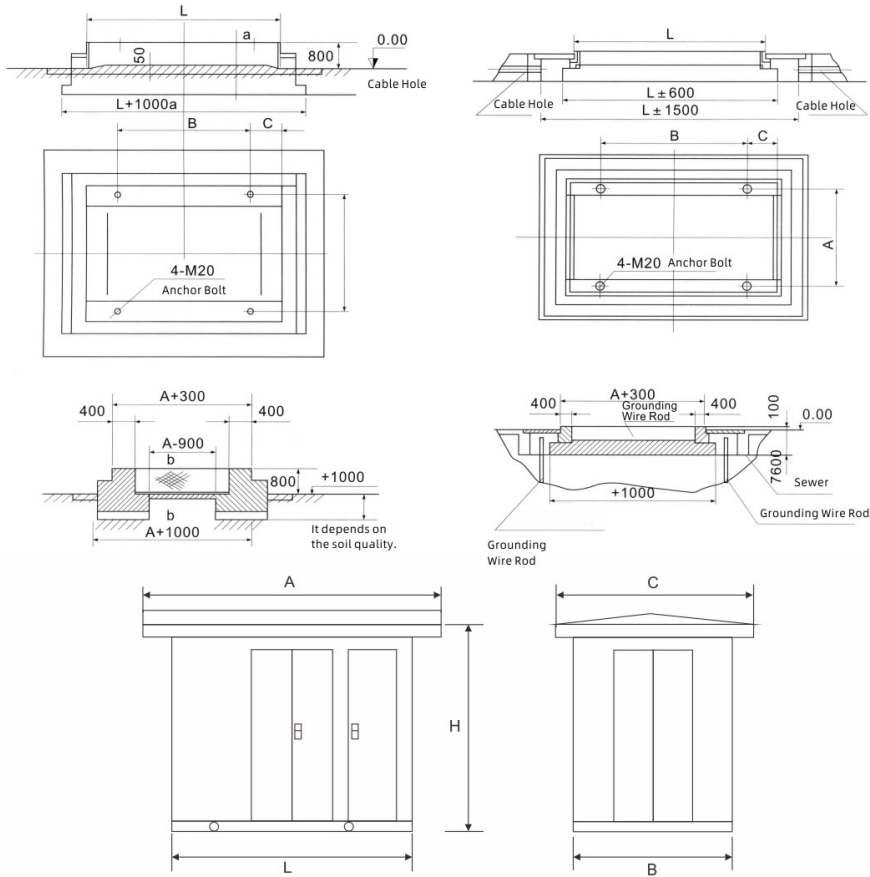


Figure 2 Outline Drawing of YBM and YBP (ZBW) Series Prefabricated Substations (in "Mu"-shaped Arrangement)

9. Outline Dimensions

(mm) Table 2

Model	Transformer Capacity (KVA)	T	L	B	H	A	C
YBW	100~250	According to the transformer	3000	2000	2520	3320	2320
	315~630		4000	2600	2560	4320	2920
	800~1000		4600	2600	2560	4920	2920
	1250		5000	3000	2980	5320	3320
	1250						
YBM	100~250	Determined according to the low-voltage outgoing lines.		2000	2520	Determined according to the low-voltage outgoing lines.	2320
	315~630			2600	2560		2920
	800~1000			2600	2560		2920
	1250			3000	2980		3320
	1250						