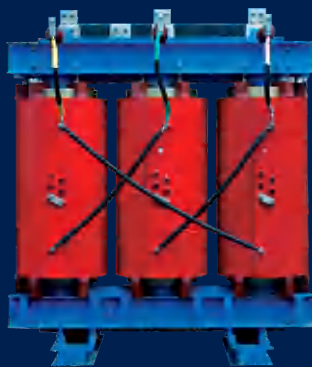


People Electric

Transformer Selection Manual

变压器选型手册



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SC(B)10、SCR10 系列树脂绝缘干式电力变压器



适用范围 Application

SCR10系列树脂绝缘缠绕干式电力变压器

目前国内外现有浇注工艺制造的高电压，大容量干式变压器，其线圈内部可能会产生应力、微小裂缝及存在树脂未能完全浸透之处。而缠绕干式变压器完全能弥补浇注干式变压器以上之不足，具有更节能、机械强度和电气强度极高、抗突发短路能力极强、线圈永不龟裂、运行100%可靠、防爆、过载能力极高、制造周期短、冷热冲击稳定性极佳等优点，特别适宜高电压、大容量、易燃区域的干式变压器选型。

SC10、SCB10系列树脂浇注绝缘干式电力变压器

本系列产品以短玻璃丝为填料的浇注线圈采用分段圆筒式，线圈内部设置有轴向气道以改善散热条件。科学的浇注成型工艺可确保树脂充分渗透到匝间、层间、段间以保证产品的电器绝缘强度及较少的局放量($\leq 5\text{pc}$)。

如何防止树脂浇注体的龟裂，控制浇注体内残留气泡的产生，把局放降低到最小极限一直是国内外干变制造厂的重大课题，是树脂浇注干式变压器的关键制造技术。

本公司通过反复的生产实践及频繁的理化试验，成功地解决了这一尖端难题，使本公司以短玻璃丝为填料的薄绝缘真空浇注型产品，其抗拉强度提高到 $170\text{N}/\text{mm}^2$ ，弯曲强度提高到 $220\text{N}/\text{mm}^2$ ，从整体上提高了树脂固化体的机械性能。

本公司SC(B)10系列树脂浇注薄绝缘干变产品制造技术的独到之处，独成一格的创造点是：

- 1、减薄了包封层的树脂厚度，增强了线圈的散热能力。
- 2、线圈采用玻璃丝毡加强，增强了线圈的机械强度，提高了产品抗突发短路能力，成功地解决了浇注体龟裂的问题。
- 3、线圈采用特殊工艺、极大地减少了线圈内部的局部放电量，提高了线圈电气强度。
- 4、低压线圈采用箔式结构，减少了端部漏磁，提高了产品抗突发短路能力。

SCR10 series epoxy cast resin dry type power transformer

In the high voltage and high volume dry type transformers now produced by cast process domestically and abroad, stress, minute cracks, and spots where resin has not fully permeated may exist within the winding. Coil dry type transformers can completely make up for the above deficiencies, with the characteristics of energy-saving, extremely high mechanical strength and electric strength, strong resistance to short circuit, never cracking winding, explosive-proof, high overload capacity, short production cycle, high stability upon cold and hot impact, etc., especially suitable for models of high voltage, high volume dry type transformers in flammable areas.

SC(B)10、SCR10

Series resin-insulated coil dry-type power transformers

SC 10, SCB10 series Epoxy cast resin dry type power transformer

This series of products are characterized by cast windings filled with chopped strand which take the shape of a segmented cylinder. Within the windings axial airways are designed to improve heat dissipating. Scientific cast mold process ensures that resin can fully permeate into the inter-turn, interlayer, and inter-segmental parts, and consequently guarantees the insulation strength of products and minor amount of partial discharge

How to prevent cracking of resin casts, restrain generation of air bubbles in casts, and reduce partial discharge to the lowest level represents key manufacturing technology of epoxy cast resin dry type transformers, the study of which has been the important task of many dry type transformer manufacturers domestically and abroad.

The company has successfully resolved the extremely difficult problems through repeated practices and frequent physical and chemical experiments, putting forward the thin-insulated vacuum cast products filled with chopped strand whose tensile strength is improved to 170N/mm² and bending strength to 220N/mm². The mechanical performance of resin composites has been enhanced on a whole.

The unique characteristics of the SC(B)10 series resin cast thin-insulated dry-type power transformers are as follows;

strengthen the heat dissipating ability of windings.

Windings are strengthened with filament mats so the windings mechanical strength is improved, products short-circuit resisting capability is enhanced, and the problem of cracking casts is successfully resolved.

Special processing is applied to windings to greatly reduce partial discharge within windings and improve the electric strength of windings.

Low voltage windings adopt foil structure to reduce magnetic leakage at the top and improve short-circuit resisting capability.

使用环境条件 Environmental conditions

- 1、最高气温+40℃。
- 2、最低气温-30℃)。
- 3、最高日平均气温+30℃最高年平均气温+20℃。
- 4、根据用户需要,可提供超出上述范围使用条件的变压器。

- 1.Highest temperature: +40℃
- 2.Lowest temperature: -30℃
- 3.Highest average daily temperature: +30℃ Highest average yearly temperature: +20℃
- 4.Transformers beyond the above application scope are available upon customers' demand.

TRANSFORMER

SC(B)10、SCR10

系列树脂绝缘干式电力变压器

35kV级SCB10系列无励磁调压干式配电变压器技术参数

Technical parameters of 35kV SCB10 series off-circuit-tap-changing dry-type distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载损耗 (W) no-load loss	负载损耗 (W) load loss	空载电流 (%) no-load current	短路阻抗 (%) short- circuit resistance	绝缘 等级 Insula- tion class	轨距(mm) track gauge	噪声 水平 (dB) noise level
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol							
315	35 38.5	$\pm 2 \times 2.5\%$ or $\pm 5\%$ or other	0.4	Yyn0 or Dyn11	1170	4510	2.0	6	F	660x660	50
400					1370	5410				660x660	50
500					1620	6650				660x660	50
630					1860	7690	820x820			50	
800					2160	9120	820x820			50	
1000					2430	10400	820x820			50	
1250					2830	12700	1070x1070			52	
1600					3240	15400	1070x1070			52	
2000					3820	18200	1070x1070			55	
2500					4450	21800	1070x1070			55	

20kV级SCB10系列无励磁调压干式配电变压器技术参数

Technical parameters of 20kV SCR10, series off-circuit-tap-changing dry type distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载损耗 (W) no-load loss	负载损耗 (W) load loss	空载电流 (%) no-load current	短路阻抗 (%) short- circuit resistance	轨距A×B (mm) track gauge	噪声 水平 noise level
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						
50	20 22 24	$\pm 5\%$; or $\pm 2 \times 2.5\%$	0.4	Dyn11 or Yyn0	340	1230	2	6	550x660	50
100					540	1990	1.8		550x660	50
160					670	2470	1.5		660x660	50
200					730	2940	1.5		660x660	50
250					840	3420	1.3		660x660	50
315					970	4080	1.3		660x820	50
400					1150	4840	1.1		660x820	50
500					1350	5790	1.1		660x820	50
630					1530	6840	1.0		820x1070	50
800					1750	8260	1.0		820x1070	50

SC(B)10、SCR10

Series resin-insulated coil dry-type power transformers

20kV级SCB10系列无励磁调压干式配电变压器技术参数

Technical parameters of 20kV SCR10, series off-circuit-tap-changing dry type distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载损耗 (W) no-load loss	负载损耗 (W) load loss	空载电流 (%) no-load current	短路阻抗 (%) short-circuit resistance	轨距A×B (mm) track gauge	噪声水平 noise level
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						
1000	20 22 24	± 5%; or ± 2 × 2.5	0.4	Dyn11 or Yyn0	2070	9780	0.85	6	820x1070	50
1250					2380	11500	0.85		820x1070	52
1600					2790	13800	0.85		1070x1070	52
2000					3240	16300	0.7		1070x1070	55
2500					3870	19300	0.7		1070x1070	55

10kV级SCR10、SC10、SCB10系列树脂绝缘干式电力变压器技术参数

Technical parameters of 10kV SCR10, SC10, SCB10 series epoxy resin dry type power transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination		低压 (kV) low voltage	联结组 标号 connection symbol	空载损耗 (W) no-load loss	负载损耗 (W) load loss	空载电流 (%) no-load current	短路阻抗 (%) short-circuit resistance	绝缘 等级 insulation class	轨距(mm) track gauge	噪声水平 (dB) noise level
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range									
30	6; 6.3; 6.6; 10; 10.5; 11;	± 2 × 2.5%; or ± 5% or other	0.4	Yyn0 or Dyn11	190	710	2	4	F/F	400x550	50
50					270	1000	2			400x550	50
80					370	1380	1.5			550x550	50
100					400	1570	1.5			550x550	50
125					470	1850	1.3			550x550	50
160					540	2130	1.3			550x550	50
200					620	2530	1.1			660x660	50
250					720	2760	1.1			660x660	50
315					880	3470	1.0			660x660	50
400					980	3990	1.0			660x660	50
500					1160	4880	1.0			660x660	50
630					1340	5880	0.85			820x820	50
630					1300	5960	0.85			820x820	50
800					1520	6960	0.85			820x820	50
1000					1770	8130	0.85			820x820	50

SC(B)10、SCR10

系列树脂绝缘干式电力变压器

10kV级SCR10、SC10、SCB10系列树脂绝缘干式电力变压器技术参数

Technical parameters of 10kV SCR10, SC10, SCB10 series epoxy cast rein dry type power transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination		低压 (kV) low voltage	联结组 标号 connection symbol	空载损耗 (W) no-load loss	负载损耗 (W) load loss	空载电流 (%) no-load current	短路阻抗 (%) short- circuit resistance	绝缘 等级 insulation class	轨距(mm) track gauge	噪声水平 (dB) noise level
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range									
1250	6;		0.4	Yyn0 or Dyn11	2090	9690	0.85	6	F/F	820x820	52
1600	6.3;	±2×2.5%; or ±5% or other			2450	11700	0.85			1070x1070	52
2000	10;				3050	14400	0.7			1070x1070	55
2500	10.5; 11;				3600	17100	0.7			1070x1070	55

SCB11系列环氧树脂浇注干式电力变压器技术参数

Technical parameters of SCB11 series epoxy cast resin dry type power transformers

额定容量 (kVA) rated capacity	损耗(W)loss		短路阻抗 (%) short-circuit resistance	空载电流 (%) no-load current	联结组标号 connection symbol	外形尺寸(mm) L×W×H overall dimensions	安装尺寸(mm) Installation dimensions
	空损 no load loss	负损 load loss F级 class					
30	170	710	4	2.3	Yyn0/Dyn11	880 × 660 × 800	400 × 400
50	240	1000	4	2.2		910 × 660 × 860	400 × 400
80	330	1380	4	1.7		970 × 660 × 950	550 × 550
100	360	1570	4	1.7		980 × 660 × 975	550 × 550
125	420	1850	4	1.5		1030 × 660 × 1015	550 × 550
160	480	2130	4	1.5		1070 × 660 × 1030	550 × 550
200	550	2530	4	1.3		1130 × 660 × 1085	550 × 500
250	640	2760	4	1.3		1150 × 660 × 1090	550 × 550
315	790	3470	4	1.1		1150 × 660 × 1100	660 × 660
400	880	3990	4	1.1		1200 × 770 × 1110	820 × 820
500	1040	4880	4	1.1		1320 × 860 × 1130	820 × 820
630	1200	5880	4	0.9		1420 × 960 × 1100	820 × 820
630	1170	5960	6	0.9		1420 × 960 × 1150	820 × 820
800	1360	6960	6	0.9		1500 × 960 × 1190	820 × 820
1000	1590	8130	6	0.9		1550 × 960 × 1220	820 × 820
1250	1880	9690	6	0.9		1620 × 1050 × 1250	1070 × 1070
1600	2200	11730	6	0.9		1690 × 1255 × 1360	1070 × 1070
2000	2740	14450	6	0.7		1700 × 1255 × 1460	1070 × 1070
2500	3240	17170	6	0.7		1920 × 1255 × 1480	1070 × 1070

SG(B)10-100 -2500/10

Series H-level insulated three phase
dry type power transformer

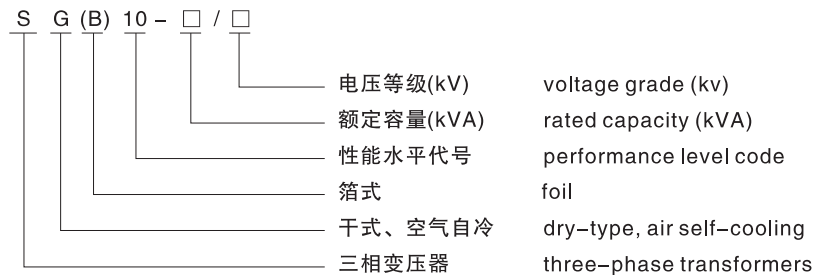


适用范围 Application

该系列产品是我公司参照德国MORA技术自主开发的高性能、高安全、环保型干式变压器，它适用于防火要求高、负荷波动大以及污秽潮湿的恶劣环境中。如：机场、发电厂、冶金作业、医院、高层建筑、购物中心、居民密集区以及石油化工、核电站、核潜艇等特殊环境中。

This series of products are independently developed by our company with reference to the German MORA technology, which are environment-friendly dry type transformers of high performance and high security. It can be applied to dirty and moist environment with high fire-preventing demand and dramatically varying loads, such as airports, power plants, metallurgy workshops, hospitals, high-rises, shopping malls, populated residential areas, and petro-chemical plants, nuclear stations, nuclear submarines.

型号含义 Model designation



执行标准 Standards

- 1、GB1094.11-2007干式电力变压器。
- 2、GB/T10228-2015干式电力变压器技术参数和要求。
- 3、GB/T17211-1998干式电力变压器负载导则。
- 4、GB10237-1998电力变压器绝缘水平和绝缘试验。
- 5、GB4028-1993外壳防护等级(IP代码)。
- 6、JB/T10008-1998 6~220kV级变压器声级。
- 7、JB/T56009-1998干式电力变压器产品质量分等。

SG(B)10-100 -2500/10

系列H级绝缘三相干式电力变压器

- 1.GB1094.11–2007 dry type power transformer
 - 2.Technical parameters and requirements of GB/T10228–2015 dry type power transformer
 - 3.Loading guide for GB/T17211–1998 dry type power transformer
- Insulation level and insulation experiment of GB10237–1998 power transformer
GB4028–1993 shell protection grade (IP code)
Noise level of T1008–1998 6–220kV transformer
Quality grading of JB/T56009–1998 dry type power transformer

性能特点 Capability characteristics

- 1、散热条件好，热寿命长，过负荷能力极强，在120%长期过负荷、IP45条件下无强迫风冷，可长期满负荷运行。
- 2、极高的安全及阻燃性能，在800℃高温长时燃烧下无烟雾产生。
- 3、极强的抗热击能力(可以在-50℃下立即加满负荷)。
- 4、百分百防水密封性，优异的憎水性、防潮性。
- 5、独特的线圈结构和强场计算，使产品几乎无局放产生。
- 6、损耗低，节能效果显著，与SC9系列干式变压器相比空载损耗平均下降10%，负载损耗下降5%。
- 7、寿命期后可轻易将绝缘材料和铜线分离回收利用，不污染环境。

- 1.Good heat dissipating conditions, long heat aging period, extreme over-load capacity, capable of long-term 120% overload,without forced wind-cooling under IP45, capable of full-load operationfor a long term.
- 2.Extremely high safety and anti-burning feature, lasting burning at a high temperature of 800℃ without emitting any smog.
- 3.Extremely strong heat resisting capability (be immediately fully loaded at -50℃).
- 4.100% water-proof, excellent water repellence and moisture resistance.
- 5.Unique winding structure and intense field calculation, with scarce partial discharge.
6. Low loss with great energy-saving effect, no-load loss down by 10% on average and load loss down by 5% compared with SC9 series dry type transformer.
7. Insulation materials and copper wires can be easily recycled after life cycle without environmentpollution.

SG(B)10-100 -2500/10

Series H-level insulated three phase
dry type power transformer

结构特点 Structural characteristics

- 1、独特的瓷绝缘结构，采用MORA公司绝缘筒和高频陶瓷垫块，永不变形。
- 2、高、低线圈先用NOMEX绝缘材料，并经VPI真空加压设备多次浸渍特殊配方的H级绝缘，多次烘焙以后，外用高强度绝缘材料密封，并高温固化。高压线圈采用机械强度高，散热条件好的连续式结构。
- 3、铁芯采用进口优质高导磁性能硅钢片叠装而成，步进式45°全斜结构，绕组与铁芯采用弹性固定装置，使变压器具有较低的空载损耗和噪音。铁芯表面经特殊工艺处理。铁芯由拉螺杆适度夹紧，上、下夹件由拉板连接并与底座，绕组固定为一体，绕组通过弹性垫块固定，缓冲结构可减轻绕组的震动程度和降低噪音。
- 4、引出线端子固定在绕组上部，分接头在绕组中部，低压线端子为板式导电排，并采用冷压焊。

1.Unique ceramic-insulating structure, the shape can be kept permanently with adoption of the insulated cylinder and high-frequency ceramic padding block of MORA Company.

2.High and low windings are first processed with NOMEX insulation materials, then immersed in special-recipe H-level insulation materials for times through VPI vacuum pressure boosting equipment, next after many times of baking, sealed externally with high-strength insulation materials, and solidified under high temperature. High voltage windings adopt continuous structure of high mechanical strength and good heat dissipating conditions.

3.The iron core is made of layered imported high-quality highly-conductive magnetic silicon steel sheets and adopts stepping 45o wholly sliding structure. The coil and iron core are fixed with flexible devices so that the transformer is of low-level no-load loss and noise. The surface of the iron core is processed with special technology. The iron core can be property clipped by a pull screw, with the upper and lower clips connected by a pull plate and fixed together with the base and coil, and the coil being fixed by a flexible padding block. Thus the buffer structure can extenuate the coil violation and reduce the noise.

4.The lead terminal is fixed at the upper part of the coil, with the tap at the middle of the coil. The low-voltage terminal is a conductive plate and adopts cold pressure welding.

TRANSFORMER

SG(B)10-100 -2500/10

系列H级绝缘三相干式电力变压器

SG(B)10-315-2500/10系列H级绝缘三相干式电力变压器技术参数

SG(B)10-315-2500/10 series H-level insulated three phase dry type power transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no- load loss	负载 损耗 (W) load loss	空载 电流 (%) no- load current	短路 阻抗 (%) short- circuit resistance	重量 (kg) Weight	轨距 A×B (mm) track gauge	外形尺寸(mm) L×W×H overall dimensions	带外壳外形尺寸 (mm) L×W×H overall dimensions with shell
	高压 (kV) high voltage	分接 范围 tapping range	低压 (kV) low voltage	联结组 标号 connection symbol								
100	6; 6.3; 6.6; 10; 10.5; 11; ±5% or ±2× 2.5%;	0.4	Yyn0 or Dyn11	480	1880	2.0	4	700	660×400	980×500×920	1340×900×1150	
160				560	2700			750	660×400	1020×500×960	1400×900×1200	
200				620	3100	880	660×400	1050×500×1150	1450×900×1400			
250				760	3850	1050	660×400	1090×500×1310	1450×900×1550			
315				880	4600	1380	660×660	1240×770×1355	1600×1100×1600			
400				1040	5400	1750	820×820	1310×960×1390	1700×1100×1650			
500				1200	6600	1880	820×820	1370×630×1400	1750×1100×1700			
630				1340	8050	1950	820×820	1400×960×1445	1800×1250×1750			
800				1690	9500	2200	820×820	1470×960×1495	1850×1250×1800			
1000				1980	11400	2490	820×820	1510×960×1505	1900×1250×1800			
1250				2380	12500	3050	1070×1070	1620×1255×1585	2000×1300×1850			
1600				2730	14900	3690	1070×1070	1660×1588×1675	2050×1300×2000			
2000				3320	17500	4400	1070×1070	1730×1255×1840	2100×1350×2150			
2500				4000	20300	4940	1070×1070	1780×1288×1930	2150×1350×2200			

SCBH15

series amorphous alloy
dry transformer



产品概述 Brief introduction to products

非晶合金是利用一种先进的超急冷技术，将铁、钴、硼、硅等液态的熔化物喷射到一个转速极高的底盘上并急剧冷却，形成0.02mm-0.04mm的薄带。其具有优异的软磁性能、耐腐蚀性、耐磨性及高电阻率等特点。

变压器用非晶合金铁心与冷轧晶粒趋向硅钢片比较具有如下优点：

1. 非晶合金材料不存在晶体结构，是一种各向同性的软磁材料，磁化功率小。
2. 不存在阻碍磁畴壁移动的结构缺陷，其磁滞损耗要比硅钢片小。
3. 电阻率极高，是硅钢片的3-6倍，其涡流损耗大大降低，单位涡流损耗仅为硅钢片的20%-30%。

SCBH15系列非晶合金干式变压器是一种新型的低损耗节能配电变压器。该产品结合了非晶合金变压器和传统的环氧树脂浇注干式变压器的技术优势，采用全新的结构形式从而使其具有损耗低的突出特点，特别是空载损耗，比常规10系列干式变压器下降70%。该产品还具有结构紧凑、造型美观、低噪音、低温升、过载能力强、电气性能稳定、维护方便等特点。

Amorphous alloy is a thin strip of 0.02mm-0.04mm thickness that is generated by use of an advanced snap-chilling technology from iron, cobalt, boron, silicon and other liquid melts, which are jet onto a chassis that has a very high speed and are then rapidly cooled down. It has excellent soft magnetism, corrosion resistance, wear resistance and high resistivity and other characteristics.

The transformer with an amorphous alloy core, compared to cold rolled grain silicon steel sheets has the following advantages:

1. Amorphous alloy materials have no crystal structure, and are an isotropic soft magnetic material, with small magnetizing power.
2. There is no structure defect that impedes the movement of magnetic domain wall, and its hysteresis loss is smaller than silicon steel sheets.
3. Its resistivity is very high, 3-6 times of silicon steel sheets; its eddy current loss has greatly reduced and a unit of the eddy current loss is only 20%-30% of silicon steel sheets.

SCBH15 series amorphous alloy dry transformer is a new low-loss energy-saving distribution transformer. This product combines the technical advantages of amorphous alloy transformers and traditional epoxy resin dry transformers, and has a new structure so that it has the outstanding characteristic of low loss, and especially its no-load loss is 70% lower than conventional 10 series dry transformers. This product also has many advantages such as compact structure, beautiful appearance, low noise, low temperature rise, strong overload capacity, stable electrical performance, and convenient maintenance.

SCBH15

系列非晶合金干式变压器

使用条件 Application conditions

- 1、海拔高度不大1000m(当大于1000m时须特殊设计)。
- 2、环境温度：最高气温+40℃，最热月平均温度+30℃；最低气温-25℃，最热年平均温度+20℃。
- 3、电源电压的波形近似于正弦波；三相电源电压大致对称。
- 4、安装在户内，使用环境无明显污秽。

1. The height above sea level is not more than 1000m (special design shall be required when more than 1000m).
2. Ambient temperature: the maximum temperature is +40℃, and the average temperature in the hottest month is +30℃; the minimum temperature is -25℃, and the average temperature is +20℃ in the hottest year.
3. Supply voltage wave form is similar to sine wave; three phase supply voltage is roughly symmetrical.
4. The product is installed indoors, with no obvious pollution to the environment.

产品特点 Product characteristics

SCBH15系列非晶合金干式变压器具有空载损耗低、无油、阻燃自熄、耐潮及免维护等优点。现在适用普通干式变压器的所有场所均适用于非晶合金变压器(包括机场、车站、城市地铁、高层建筑及发电厂等)，尤其在易燃、易爆及电能短缺的地方更加适合。具体特点为：

- 1、低耗节能：采用具有各向同性的软磁性导磁材料，磁化功率小，电阻率高，涡流损耗低小。用非晶合金材料制成的铁心空载损耗及空载电流很低，只有硅钢片的1/3。变压器的空载损耗比GB/T10228规定值下降75%。可大大降低运行费用，节能效果显著。
- 2、抗腐蚀能力强：非晶合金铁心通过树脂和耐高温硅胶进行全封装处理，有效防止锈蚀和非晶合金碎片脱落，从而有效保护铁心和线圈。
- 3、噪音低：为降低产品运行噪声，在产品设计时选取合理的工作磁密，在产品加工时改进铁心及线圈结构、采用特殊降噪材料等，产品噪声远低于国标JB/T10088要求。
- 4、抗短路能力强：产品采用三相三柱式结构，铁心四周采用框架结构保护，结构紧凑合理。
- 5、温升低，使用寿命长：产品温升低，散热能力强，在强迫风冷条件下可以150%额定负载运行。可选配性能完善的温度控制保护系统，为变压器安全运行提供可靠保障。

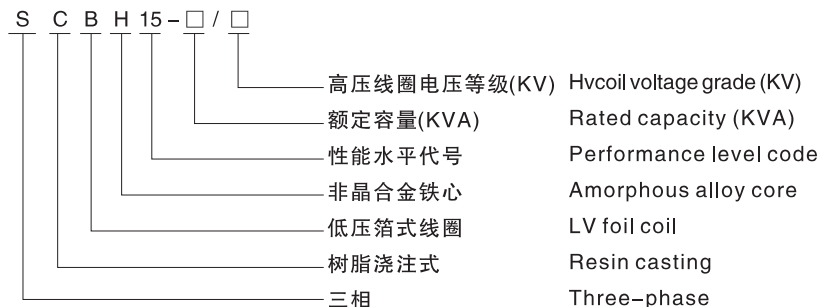
SCBH15

series amorphous alloy
dry transformer

SCBH15 series amorphous alloy dry transformer has such advantages as low no-load loss, no oil, flame retardant and self-extinguishing, moisture-free and maintenance-free. Now, the amorphous alloy transformers are applied to all sites (including airports, railway stations, metros, high-rise buildings and power plants) where normal dry transformers are applied, and especially they are more appropriate for the places with flammable, explosive and power shortage. The specific features are as follows:

1. Low consumption and energy-saving: the permeability magnetic materials with isotropic soft magnetism are used, with small magnetizing power, high resistivity and low eddy current loss. The core made of amorphous alloy has low no-load loss and no-load current, only one-third of silicon steel sheets. The no-load loss of the transformer falls 75% compared to the value provided in GB/T10228. It can significantly reduce operating costs and the energy-saving effect is significant.
2. Strong corrosion resistance: the amorphous alloy core is fully encapsulated with resin and heat-resistant silicone, thus effectively preventing rust and amorphous alloy debris shedding, so as to protect the core and coils effectively.
3. Low noise: to reduce the running noise, a reasonable working flux density is selected in the product design; prior to product processing, the core and coil structure are improved, and special noise-reducing materials are used, so that noise of the product is well below the requirement of the national standard JB/T10088.
4. Strong ability to withstand short circuit: the products adopt three phase three limb structure, adopts the frame structure spread around the core, reasonably compact.
5. Low temperature rise and long service life: the product has low temperature rise and strong heat-sinking capability, and can run with 150% of the rated load under the condition of forced air cooling. A temperature control protection system with perfect performance can be selected and adopted to provide reliable protection for safe operation of the transformer.

型号含义 Model designation



TRANSFORMER

SCBH15

系列非晶合金干式变压器

10kV级SCBH15系列非晶合金干式变压器技术参数

Technical parameters of 10kV SCBH15 series amorphous alloy dry transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination			联结组 标号 connection symbol	空载 损耗 (W) no- load current	负载损耗 (W) load loss			空载 电流 (%) no- load loss	短路 阻抗 (%) short- circuit resistance
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage			100℃ (B)	120℃ (F)	145℃ (H)		
30	6; 6.3; 6.6; 10; 10.5; 11;	± 2 $\times 2.5\%$; or $\pm 5\%$;	0.4	Dyn11	70	670	710	760	1.6	4.0
50					90	940	1000	1070	1.4	
80					120	1290	1380	1480	1.3	
100					130	1480	1570	1690	1.2	
125					150	1740	1850	1980	1.1	
160					170	2000	2130	2280	1.1	
200					200	2370	2530	2710	1.0	
250					230	2590	2760	2960	1.0	
315					280	3270	3470	3730	0.9	
400					310	3750	3990	4280	0.8	
500					360	4590	4880	5230	0.8	
630					420	5530	5880	6290	0.7	
630					410	5610	5960	6400	0.7	
800					480	6550	6960	7460	0.7	
1000					550	7650	8130	8760	0.6	
1250					650	9100	9690	10370	0.6	
1600					760	11050	11730	12580	0.6	
2000					1000	13600	14450	15560	0.5	
2500					1200	16150	17170	18450	0.5	
1600					760	12280	12960	13900	0.6	8.0
2000	1000	15020	15960	17110	0.5					
2500	1200	17760	18890	20290	0.5					

Sales record of dry type power transformer



序号	使用单位	容量	数量(台)
1	南京禄口国际机场	5000	2
2	南京禄口国际机场	1600	6
3	南京禄口国际机场	800	6
4	南京禄口国际机场	630	4
5	徐州江苏铝厂	1250	1
6	南京中央商场	1600	2
7	南京太平洋大厦	1250	2
8	南京城南供电分局	1250	4
9	上海杨树浦电厂	1600	6
10	上海电景制片厂	1250	2
11	上海电景制片厂	1000	2
12	上海电景制片厂	800	2
13	上海第二医科大学	1600	2
14	中国科学院上海分院	1250	1
15	中国科学院上海分院	1000	1
16	上海市公安局黄浦分局	800	1
17	上海市第九人民医院	1250	1
18	上海市第九人民医院	400	1
19	上海交运股份	2000	1
20	上海华山医院	1250	2
21	上海市卢湾区法院	630	1
22	上海电话局	800	1
23	上海兴启房产	1250	1
24	上海浦顺置业	1000	1
25	上海供电局沪南所	1250	2
26	上海供电局沪南所	1000	5
27	福建莆田佳通轮胎厂	2500	8
28	福建莆田佳通轮胎厂	2500	6
29	福建莆田佳通轮胎厂	3150	4
30	福建莆田佳通轮胎厂	630	4
31	漳州广播电视中心大厦	800	3
32	漳州广播电视中心大厦	500	3
33	厦门特区建设工程公司(古楼广场)	500	2

干式电力变压器 部分销售记录

序号	使用单位	容量	数量(台)
34	厦门特区建设工程公司(古楼广场)	400	4
35	江西省五湖宾馆	630	4
36	江西丰城发电厂	1250	6
37	青岛宇通电器设备有限公司	1250	1
38	青岛宇通电器设备有限公司	1600	1
39	青岛四和太平洋中心	1250	2
40	青岛四和太平洋中心	800	2
41	青岛阳光大厦	1000	3
42	青岛交运广场	1250	1
43	青岛济南大厦	1600	1
44	青岛济南大厦	1250	2
45	深圳康佳集团公司	2000	2
46	广东珠海自来水总公司	5000	2
47	广东珠海自来水总公司	250	2
48	广东省交警总队指挥中心	1250	2
49	广东省交警总队指挥中心	1600	2
50	广州电力局调度大楼	800	2
51	广州电力局电力安装工程公司	1000	3
52	广州电力局电力安装工程公司	1250	2
53	广东云浮电力局	800	2
54	广东云浮交警支队	1000	2
55	广州电力局工程公司	1250	1
56	广东省文学艺术中心	1600	1
57	广州恒运电厂	1600	2
58	广州恒运电厂	1250	3
59	广州恒运电厂	1000	8
60	广州恒运电厂	800	2
61	广东阳江体育馆	1000	2
62	广东阳江体育馆	630	1
63	广东宇英电力设备有限公司	2000	2
64	深圳电投实业发展有限公司	1000	8
65	深圳电投实业发展有限公司	800	2
66	深圳电投实业发展有限公司	630	2

Sales record of dry type power transformer

序号	使用单位	容量	数量(台)
67	深圳市东润建筑有限公司	800	2
68	深圳市东润建筑有限公司	500	2
69	深圳华力特成套有限公司	1000	4
70	深圳华力特成套有限公司	800	6
71	深圳经济特区房地产公司	1250	2
72	深圳华丽商场	1250	2
73	深圳华丽商场	1000	4
74	深圳华丽商场	800	2
75	珠海江南商店	1000	2
76	湖南国际会展中心	2000	1
77	湖南国际会展中心	1600	2
78	湖南国际会展中心	1250	1
79	湖南凌津滩水电站	1000	5
80	湖南凌津滩水电站	800	2
81	湖南凌津滩水电站	1250	6
82	福建漳州后石电厂	630	2
83	福建漳州后石电厂	800	3
84	福建漳州后石电厂	1250	4
85	福建漳州后石电厂	2000	5
86	福建漳州后石电厂	2500	2
87	厦门屿电厂	1250	2
88	厦门屿电厂	1600	1
89	厦门屿电厂	2000	4
90	厦门屿电厂	2500	2
91	厦门华夏国际电力发展有限公司	1250	2
92	厦门华夏国际电力发展有限公司	1600	4
93	厦门华夏国际电力发展有限公司	800	6
94	厦门集团力发展有限公司	2000	8
95	厦门集团力发展有限公司	1600	14
96	厦门集团力发展有限公司	1250	22
97	厦门集团力发展有限公司	1000	26
98	厦门集团力发展有限公司	800	18
99	厦门集团力发展有限公司	630	28

干式电力变压器 部分销售记录

序号	使用单位	容量	数量(台)
100	厦门集团力发展有限公司	500	16
101	厦门集团力发展有限公司	315	10
102	珠海供电局	630	4
103	厦门镇海大厦	1250	2
104	厦门嘉隆公寓	800	1
105	厦门南洋大厦	800	2
106	厦门广顺花园	1000	2
107	厦门古楼商城	1250	2
108	厦门古楼商城	800	2
109	厦门高科技FDK公司(日本)	1250	3
110	安徽鸿达房地产开发有限公司	630	1
111	安徽鸿达房地产开发有限公司	800	1
112	安徽鸿达房地产开发有限公司	1250	1
113	安徽鸿达房地产开发有限公司	2000	2
114	芜湖电力实业总公司	1000	4
115	芜湖电力实业总公司	800	6
116	芜湖电力实业总公司	630	4
117	芜湖电力实业总公司	500	5
118	马鞍山中级人民法院	630	2
119	马鞍山电力实业总公司	1250	6
120	马鞍山电力实业总公司	1000	8
121	马鞍山人防工程	800	2
122	铜陵科技大楼	315	2
123	杭州电力局电报承装公司	800	2
124	乐清市土管局	630	2
125	江西烟草大厦	1600	1
126	江西烟草大厦	1250	1
127	井冈山华电能厂	1250	2
128	井冈山华电能厂	1250	4
129	昌北机场	1250	2
130	江西省国税局	1600	6
131	中行江西省分行	1000	2
132	南昌环湖电力物资公司	1250	2

Sales record of dry type power transformer

序号	使用单位	容量	数量(台)
133	南昌环湖电力物资公司	1000	6
134	南昌环湖电力物资公司	630	2
135	江西省工行	630	2
136	江西省人民银行	800	2
137	江西省五湖宾馆	1000	2
138	湖南华银通用电器公司	800	2
139	湖南华银通用电器公司	1000	1
140	湖南华凌大厦有限公司	1250	2
141	湖南省博物馆	1250	2
142	湖南输变电工程有限公司	1000	2
143	衡阳风顺东桥厂	2000	2
144	衡阳风顺东桥厂	1600	2
145	衡阳风顺东桥厂	630	1
146	衡阳风顺东桥厂	1000	1
147	梧州自来水公司	1600	2
148	梧州防洪办	630	2
149	广西合山电厂	800	2
150	凭祥工商银行	630	1
151	北海供电局	630	1
152	武汉供电局	1600	2
153	武汉供电局	1250	4
154	武汉供电局	1000	6
155	黄石供电局	630	9
156	大冶检察院	630	2
157	同济医科大学	800	1
158	海南电力物资公司	500	2
159	海南电力物资公司	800	4
160	海南电力物资公司	1000	2
161	西藏羊卓湖抽水蓄能电站	800	2
162	西藏羊卓湖抽水蓄能电站	630	4
163	西藏羊卓湖抽水蓄能电站	315	2
164	西藏拉萨电业局	1250	2
165	西藏拉萨电业局	1000	1

干式电力变压器 部分销售记录

序号	使用单位	容量	数量(台)
166	西藏拉萨电业局	630	2
167	西藏拉萨电业局	315	4
168	四川乐山菲尼克斯半导体有限公司	1250	2
169	四川绵阳电信局	1000	2
170	四川绵阳地税局	630	2
171	四川九寨沟管理局	1600	1
172	四川泸州供电局	800	4
173	四川中仪公司	630	6
174	四川中仪公司	1000	3
175	重庆市城区供电局	1250	6
176	重庆市城区供电局	1600	4
177	重庆市城区供电局	800	6
178	重庆市城区供电局	1000	8
179	重庆杨家坪供电局	630	5
180	重庆杨家坪供电局	1000	2
181	重庆石板桥水电厂	800	2
182	重庆石板桥水电厂	1000	2
183	云南红河卷烟厂	2000	5
184	云南电信局	630	2
185	云南楚雄卷烟厂	1250	2
186	昆明耀龙供用电有限公司	1250	4
187	昆明耀龙供用电有限公司	1000	8
188	昆明耀龙供用电有限公司	800	12
189	昆明耀龙供用电有限公司	630	6
190	昆明耀龙供用电有限公司	315	4
191	昆明耀龙供用电有限公司	500	10
192	云南电网公司昆明供电局	400	2
193	云南电网公司昆明供电局	100	1
194	云南电网公司昆明供电局	1000	4
195	云南电网公司昆明供电局	1250	2
196	云南电网公司昆明供电局	1600	2
197	云南玉溪大红山铁矿	500	6
198	云南玉溪大红山铁矿	1250	4

Sales record of dry type power transformer

序号	使用单位	容量	数量(台)
199	云南玉溪大红山铁矿	2000	2
200	云南玉溪大红山铁矿	800	4
201	贵阳水城钢铁集团	630	2
202	贵阳水城钢铁集团	1000	2
203	东北大学秦皇岛分校	1000	2
204	珠海供电局	2000	2
205	珠海供电局	1000	4

序号	使用单位	规格型号	数量(台)
206	武汉钢铁股份有限公司	SCB10-2000/10	15
207	武汉钢铁股份有限公司	SCB10-2500/10	20
208	武汉钢铁股份有限公司	SCB10-4000/10	1
209	武汉钢铁股份有限公司	SGB10-2500/10	13
210	武汉钢铁股份有限公司	ZBSCB10-2500/10	12
211	武汉钢铁股份有限公司	ZBSCB10-3500/10	2
212	邯郸钢铁集团有限公司	SC10-2000/10	6
213	邯郸钢铁集团有限公司	SC10-200/10	2
214	昆钢集团	SCR10-500/6	6
215	昆钢集团	SCR10-1600/6	5
216	马钢集团	SCB10-630/6.3	1
217	河北唐山钢铁厂	SC9-2500/10	1
218	广东丰顺县韩江水电有限公司	SCB9-1000/10	2
219	贵州北盘江光照水电站	DC10-800/15.75	12
220	贵州北盘江光照水电站	SCB10-1600/10.5	5
221	贵州北盘江光照水电站	SCBZ10-315/10.5	6
222	湖南铜湾水电站	SCB9-1600/10.5	2
223	湖南铜湾水电站	SCB9-2500/11	2
224	福建洪口水电有限公司	SCR10-630/13.8	3
225	福建洪口水电有限公司	SCB9-630/35	2
226	湖南江华县大林江水电站	SCB9-800/6.3	2
227	湖南江华县大林江水电站	SCB9-630/10.5	1

干式电力变压器 部分销售记录

序号	使用单位	规格型号	数量(台)
228	四川屏山县屏边水电站	SCB10-315/38.5	4
229	四川屏山县屏边水电站	SCB10-160/10.5	3
230	陕西西北火电工程有限公司	SCR9-200/0.4	1
231	晋江热电厂	SCB9-1600/10.5	4
232	晋江热电厂	SCB9-800/10.5	5
233	青海中浩天然气化工有限公司	SCB10-400/6	1
234	青海中浩天然气化工有限公司	SCB10-200/6	2
235	贵州华飞化学工业有限公司	SCB9-630/10.5	1
236	贵州华飞化学工业有限公司	SCB9-1250/35	2
237	山西三元煤业股份有限公司	SCB9-1000/6	1
238	马钢集团姑山矿业有限公司	SCB10-400/10	1
239	马钢集团姑山矿业有限公司	SCB9-315/10	1
240	江苏苏铝铝业有限公司	SCB10-1250/10	1
241	江苏苏铝铝业有限公司	ZSCB10-1500/10	3
242	井冈山笔架山景区索道项目	SGB10-800/10	2
243	南昌市青山湖隧道工程	SCR9-630-10	2
244	南昌市青山湖隧道工程	SCR9-800-10	2
245	南昌铁路天集有限公司	SCR10-1600/10	5
246	南昌铁路天集有限公司	SCR10-400/10	2

S11、S11-M

系列低损耗节能电力变压器



20kV级S11系列无励磁调压油浸式配电变压器技术参数

Technical parameters of S11 series 20kv resin no excitation voltage oil-immersed distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no-load current	负载 损耗 (W) load loss	空载 电流 (%) no-load loss	短路阻抗 (%) short-circuit resistance	轨距A×B (mm) track gauge
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol					
30	20	±5%; or ±2×2.5%	0.4	Yyn0 or Dyn11	100	690/660	2.1	5.5	450×450
50					130	1010/960	2.0		450×450
63					150	1200/1150	1.9		450×450
80					180	1440/1370	1.8		450×450
100					200	1730/1650	1.6		450×450
125					240	2080/1980	1.5		450×450
160					290	2540/2420	1.4		550×550
200					340	3000/2860	1.3	550×550	
250					400	3520/3350	1.2	550×550	
315					480	4210/4010	1.1	550×550	
400					570	4970/4730	1.0	550×550	
500					680	5940/5660	1.0	550×550	
630					810	6820	0.9	6	820×820
800					980	8250	0.8		820×820
1000					1150	11330	0.7		820×820
1250					1380	13200	0.7		820×820
1600					1660	15950	0.6		820×820
2000	1950	19140	0.6	1070×1070					
2500	2340	22220	0.5	1070×1070					

35kV级SZ11系列无励磁调压电力变压器技术参数

Technical parameters of 35kV SZ11 series off-circuit-tap-changing power transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no-load current	负载 损耗 (W) load loss	空载 电流 (%) no-load loss	短路 阻抗 (%) short-circuit resistance	轨距A×B (mm) track gauge	重量(kg) Weight		
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						器身重 tare	绝缘 油重 oil	总重 total
2000	35;	±3×2.5	6.3;	Yd11	2300	19200	0.5	6.5	1070×1070	2800	1900	6800
2500	38.5;		10.5;		2720	20600	0.5		1070×1070	3350	2100	7500

TRANSFORMER

S11、S11-M

Series low loss energy-saving power transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no-load current	负载 损耗 (W) load loss	空载 电流 (%) no-load loss	短路 阻抗 (%) short-circuit resistance	轨距A×B (mm) track gauge	重量(kg) Weight		
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						器身重 tare	绝缘 油重 oil	总重 total
	high voltage	high voltage tapping range	low voltage	connection symbol								
3150	35; 38.5	± 3 × 2.5	6.3; 6.6; 10.5; 11;	Yd11	3230	24700	0.5	7.0	1070 × 1070	3720	2250	8580
4000					3870	29100	0.5		1070 × 1070	4375	2900	10345
5000					4.64	34200	0.5		1475 × 1475	4900	3100	11200
6300				Ynd11	5630	36700	0.5	7.5	1475 × 1475	6410	3300	12280
8000					7870	40600	0.4		1475 × 1475	8390	3610	17150
10000					9280	48000	0.4		1475 × 1475	9150	4720	19740
12500				8.0	10970	56800	0.35	8.0	1475 × 1475	11340	5010	21400
16000					13100	70300	0.35		2040 × 2040	13410	5200	25630
20000					15500	82700	0.3		2040 × 2040	15740	5960	28680
25000					18300	97800	0.3		2040 × 2040	17055	6620	33500
31500				10	21800	116000	0.3	10	2040 × 2040	21800	9400	43020

35kV级S11无励磁调压配电变压器技术参数

Technical parameters of 35kV S11 off-circuit-tap-changing distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no-load current	负载 损耗 (W) load loss	空载 电流 (%) no-load loss	短路 阻抗 (%) short-circuit resistance	轨距A×B (mm) track gauge	重量(kg) Weight		
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						器身重 tare	绝缘 油重 oil	总重 total
	high voltage	high voltage tapping range	low voltage	connection symbol								
50	35; 38.5	± 2 × 2.5%;	0.4	Yyn0 or Dyn11	160	1200/1140	1.3	6.5	450x450	233	263	827
100					230	2010/1910	1.1		450x450	348	310	827
125					270	2370/2260	1.1		450x450	406	340	1037
160					280	2820/2680	1.0		450x450	496	350	1110
200					340	3320/3160	1.0		450x450	557	370	1200
250					400	3950/3760	0.95		550x550	646	400	1360
315					480	4750/4530	0.95		550x550	771	450	1620
400					580	5740/5470	0.85		550x550	890	500	1850
500					680	6910/6580	0.85		550x550	1070	560	2140
630					830	7860	0.65		550x550	1245	610	2420
800					980	9400	0.65		820x820	1450	670	2710
1000					1150	11500	0.65		820x820	1665	760	3280
1250					1400	13900	0.6		820x820	1910	810	3560
1600					1690	16600	0.6		820x820	2187	890	4060
2000					1990	19700	0.55		1070x1070	2720	1059	5161
2500					2360	23200	0.55		1070x1070	3236	1143	5912

S11、S11-M

系列低损耗节能电力变压器

产品描述Standards

使用范围：S11-M系列油浸式变压器可广泛用于高层建筑、商业中心、地铁、机场、车站、工矿企业、钻井平台、采油平台，特别适用于易燃、易爆等防火要求高以及环境恶劣的场所使用。也可用居民区、商业街道、工矿企业和农村动力及照明之用。

结构及特点：全部采用优质晶粒取向冷轧硅钢片的铁芯，全斜无孔绑扎结构，铁芯为多级阶梯形，三接缝或五接缝，空损低、噪音小；线圈：采用优质QQ缩醛漆包圆铜线，无氧铜杆拉制的扁铜钱或铜结绕制而成，其形式有圆筒式、连续式、新型螺旋式、分裂式等，有足够的电气强度、机械强度和散热能力。油箱：采用优质钢板焊接而成，有椭圆型、矩型等结构，散热元件采用片式散热器、膨胀散热器或波纹油箱，油箱在厂内进行可靠的密封试验，内外表面经酸洗、磷化处理，进行三底一面油漆暇涂，既抗腐蚀又美观大方。

Range of use: S11-M series of Henre transformer can be widely used in high-rise buildings, commercial center, subway, airport, station, industrial and mining enterprises, oil drilling platform, platform, particularly applicable to flammable, explosive and other fire safety requirements and the harsh environment of high places. It also be used for residential, commercial street, industrial and mining enterprises and the rural power and lighting purposes.

Structure and characteristics: The use of core quality grain oriented cold-rolled silicon steel sheet, oblique banding structure of non porous, the iron core is a multistage step type three or five joints, seams, air loss low, low noise; coil: shrink up enamelled round copper wire, the use of high-quality QQ, oxygen free copper bar drawn flat copper coins or knot winding and, in the form of cylinder type, continuous, screw type, split type, with enough electric strength, mechanical strength and heat dissipation capability. Tank: welded together by high quality steel plate, elliptic, rectangular structure with radiating elements, using finned radiator, radiator or corrugated expansion tank, oil tank test reliable sealing in the factory, the internal and external surface by pickling, phosphating, three bottom side paint coating is leisure, corrosion resistance and beauty.

10kV级S11无励磁调压配电变压器技术参数

Technical parameters of 10kV S11 off-circuit-tap-changing distribution transformer

额定容量 (kVA)	电压组合 voltage combination				空载 损耗 (W)	负载 损耗 (W)	空载 电流 (%)	短路 阻抗 (%)	轨距A×B (mm)	重量(kg) Weight		
	高压 (kV)	高压分接 范围	低压 (kV)	联结组 标号						器身重 tare	绝缘 油重 oil	总重 total
rated capacity	high voltage	high voltage tapping range	low voltage	connection symbol	no- load current	load loss	no- load loss	short- circuit resistance	track gauge			
30	6	±2 × 2.5%; or ±5%;	0.4	Yyn0 or Dyn11	100	630/600	1.5	4.0	400 × 400	135	65	253
50	6.3				130	910/870	1.3		400 × 400	210	75	335
63	10				150	1090/1040	1.2		400 × 400	235	90	435
80	10.5				180	1310/1250	1.2		400 × 450	270	95	450

TRANSFORMER

S11、S11-M

Series low loss energy-saving power transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no-load current	负载 损耗 (W) load loss	空载 电流 (%) no-load loss	短路 阻抗 (%) short-circuit resistance	轨距A×B (mm) track gauge	重量(kg) Weight		
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						器身重 tare	绝缘 油重 oil	总重 total
	6 6.3 10 10.5 11	±2 ×2.5%; or ±5%;	0.4	Yyn0 or Dyn11								
100					200	1580/1500	1.1	4.0	400×450	338	101	515
125					240	1890/1800	1.1		400×450	375	115	600
160					280	2310/2200	1.0		550×550	465	125	695
200					340	2730/2600	1.0		550×550	538	152	840
250					400	3200/3050	0.9		550×550	610	171	990
315					480	3830/3650	0.9		550×550	733	189	1116
400					570	4520/4300	0.8		550×550	862	220	1357
500					680	5410/5150	0.8	550×550	1078	269	1596	
630					810	6200	0.6	4.5	660×850	1140	280	1690
800					980	7500	0.6		820×820	1260	310	2050
1000					1150	10300	0.6	5.0	820×820	1410	375	2565
1250					1360	12000	0.5		820×820	1705	490	2950
1600					1640	14500	0.5		820×820	2031	614	3569
2000					1940	18300	0.4		820×820	2361	790	4108
2500					2290	21200	0.4		820×820	2837	860	4960

10kV级SH15系列非晶合金无励磁调压配电变压器技术参数

Technical parameters of 10kV SH15 series amorphous alloy off-circuit-tap-changing distribution transformer (table 9)

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no-load current	负载 损耗 (W) load loss	空载 电流 (%) no-load loss	短路 阻抗 (%) short-circuit resistance	重量(kg) Weight			轨距A×B (mm) track gauge	外形尺寸(mm) L×W×H overall dimension
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol					器身重 tare	绝缘 油重 oil	总重 total		
	6 6.3 10 10.5 11	±2 ×2.5%; or ±5%;	0.4	Dyn11									
30					33	600	1.7	4.0	225	100	420	550×550	986×860×810
50					43	870	1.3		305	120	535	550×550	1016×810×840
63					50	1040	1.2		350	130	595	550×550	1056×820×865
80					60	1250	1.1		405	135	660	550×550	1044×865×860
100					75	1500	1.0		430	155	770	550×550	1110×880×815
125					85	1800	0.9		500	165	860	550×550	1146×880×950
160					100	2200	0.7		595	185	990	550×550	1206×880×985
200					120	2600	0.7		675	205	1110	660×660	1266×895×1015

S11、S11-M

系列低损耗节能电力变压器

额定容量 (kVA)	电压组合 voltage combination				空载 损耗 (W)	负载 损耗 (W)	空载 电流 (%)	短路 阻抗 (%)	重量(kg) Weight			轨距A×B (mm)	外形尺寸(mm) L×W×H		
	高压 (kV)	高压分接 范围	低压 (kV)	联结组 标号					器身重 tare	绝缘 油重 oil	总重 total			track gauge	overall dimension
	high voltage	high voltage tapping range	low voltage	connection symbol											
250	6 6.3 10 10.5 11	±2 ×2.5%; or ±5%;	0.4	Dyn11	140	3050	0.7	4.0	810	220	1275	660×660	1310×950×1060		
315					170	3650	0.5		945	245	1475	660×660	1365×835×1105		
400					200	4300	0.5		1195	280	1835	660×820	1310×1030×1195		
500					240	5150	0.5		1375	335	2130	660×820	1385×1125×1195		
630					320	6200	0.3		1610	470	2605	660×820	1505×1305×1295		
800					380	7500	0.3		1910	575	3090	820×1070	1900×1175×1395		
1000					450	10300	0.3	2130	670	3570	820×1070	2115×1275×1420			
1250					530	12000	0.3	2510	710	4140	820×1070	2140×1490×1440			
1600					630	14500	0.3	4.5	3045	820	4950	820×1070	2305×1560×1530		

10kV级S11-M·D系列无励磁调压地下式配电变压器技术参数

Technical parameters of 10kV S11M·D series off-circuit-tap-changing underground distribution transformer (table 10)

额定容量 (kVA)	电压组合 voltage combination				空载 损耗 (W)	负载 损耗 (W)	空载 电流 (%)	短路 阻抗 (%)	重量(kg) Weight			轨距A×B (mm)	外形尺寸(mm) L×W×H		
	高压 (kV)	高压分接 范围	低压 (kV)	联结组 标号					器身重 tare	绝缘 油重 oil	总重 total			track gauge	overall dimension
	high voltage	high voltage tapping range	low voltage	connection symbol											
50	6 6.3 10 10.5 11	±2 ×2.5%; or ±5%;	0.4	Yyn0 or Dyn11	130	870	2.0	4.0	245	165	555	550×550	891×748×1144		
63					150	1040	1.9		295	180	640	550×550	906×630×1204		
80					180	1250	1.8		340	195	710	550×550	926×780×1239		
100					200	1500	1.6		405	215	830	550×550	951×945×1284		
125					240	1800	1.5		470	230	915	550×550	971×875×1334		
160					280	2200	1.4		545	260	1065	550×550	996×1045×1389		
200					340	2600	1.3		635	285	1210	550×550	1041×1060×1419		
250					400	3050	1.2		730	325	1395	550×550	1071×1230×1504		
315					480	3650	1.1		850	365	1610	660×660	1106×1405×1584		
400					570	4300	1.0	1030	395	1880	660×660	1146×1180×1649			
500					680	5150	1.0	1180	430	2110	660×660	1181×1270×1689			
630					810	6200	0.9	1490	535	2725	820×820	1300×1475×1748			
800					980	7500	0.8	4.5	1710	610	3105	820×820	1330×1665×1793		
1000					1150	10300	0.7	1905	695	3590	820×820	1360×1920×1868			

TRANSFORMER

S11-M.ZT

Type intelligent load adjustable-capacity transformer



产品概述 Brief introduction to products

智能型有载调容变压器具有大小两个容量档位，可以根据负载的变化在不停电的情况下自动调整容量运行，当负荷较轻或接近空载时，变压器由大容量调为小容量运行，既大幅度降低了空载损耗，又克服了无载调容需停电人工操作的麻烦，真正达到节能、智能的目的。该产品特别适用于季节性负荷变化幅度大的农村电网、昼夜负荷变化显著的居民小区、路灯变、城市商业区、非全日制工业区及油田抽油机配变，还适用于负荷变化较大的35kV电力变压器。我公司开发的智能型有载调容变压器拥有多项专利，主要由变压器、有载调容开关和安装了有载调容控制器的控制箱组成。其数据存贮、遥信、遥控、遥调、遥测、智能组网、无功补偿控制、防盗等功能，是传统卷铁芯、非晶变压器等节能产品无法比拟的。

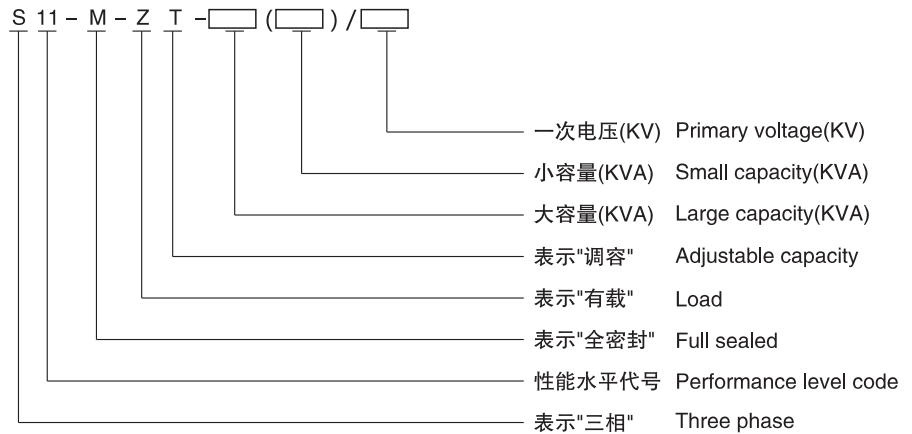
The intelligent load justable-capacity transformer has two large or small capacity tap positions, and can automatically adjust capacity operation without power failure according to the change of load. When the load is lighter and closest on-load, the transformer adjusts the large capacity to small capacity to work. Both greatly reduce the no-load loss and avoid manual operation without power failure, and save the energy. The product is suitable to the rural power grids with load greatly changed in season, to residential area, street lamps, business district, part-time industrial zone and sucker rod pumping variable with greatly changed in day and night, and also suitable to greatly load change of 35kV electric transformer.

Intelligent load adjustable-capacity transformer developed by our company have many patents, mainly made up transformer, adjustable-capacity switch, control box installed load adjustable-capacity control. The data saving, remote communication, remote control, remote regulating, telemetry, intelligent network, reactive power compensation control, guard against the function, and greatly difference with the traditional roll core, amorphous transformer.

S11-M.ZT

系列智能型有载调容变压器

型号其含义 Model designation



性能参数 Specification

表1 10kV S11-M-ZT系列智能型有载调容变压器技术参数:

Form1 10kV S11-M-ZT type intelligent load adjustable-capacity transformer Specification

型号 Type	电压组合(kV) Voltage	联结组别 Vector Group	空载损耗(W) Non-load loss	负载损耗(W) Load loss	短路阻抗(%) Short circuit impedance	空载电流(%) Non-load current
S11-M-ZT-160(50)	10/0.4>	Dyn11 Yyn0	280(130)	2310(870)	4.0	0.8 (1.6)
S11-M-ZT-200(63)			340(150)	2730(1040)	4.0	0.7 (1.5)
S11-M-ZT-250(80)			400(180)	3200(1250)	4.0	0.7 (1.4)
S11-M-ZT-315(100)			480(200)	3830(1500)	4.0	0.7 (1.4)
S11-M-ZT-400(125)			570(240)	4520(1800)	4.0	0.6 (1.3)
S11-M-ZT-500(160)			680(280)	5410(2200)	4.0	0.6 (1.2)
S11-M-ZT-630(200)			810(340)	6200(2600)	4.5	0.5 (1.1)

S11-M.ZT

Type intelligent load adjustable-capacity transformer

节能分析 Energy Saving analysis

年运行费用及投资回收年限：

$$C_y = [8600 \times (P_0 + 0.05 \times I_0 \times SN/100) + 2200 \times (P_k + 0.05 \times UK \times SN/100)] \times 0.5$$
上式中：

C_y 为变压器年运行费用，元；

P_0 为空载损耗，kW；

P_k 为负载损耗，kW；

SN 为额定容量，kVA；

U_k 为短路阻抗百分数，%；

I_0 为空载电流百分数，%；

0.5为电价，元 / (kWh)；8600、2200分别为变压器全年空载、等效满载(负载系数0.5)小时数。

根据上式及相关的性能指标。对S11-M-ZT系列智能型有载调容配电变压器与S11型普通三相油浸式配电变压器的年运行成本进行计算。假定有载调容变压器一年中有3个月大容量方式运行。9个月小容量方式运行，依据配电变压器相应技术参数进行计算，具体数据见表3。

有载调容变压器适应了变电领域向节能、智能化、高效率、稳定供电质量的发展方向，它可以通过跟踪负载变化自动改变终端配电变压器额定输出容量，适时适量保证供电，从而大幅度地降低了变压器空载损耗约40%~50%，可提高电网功率因数，降低配电网中无功分量，减少网络损耗，减少电力电容容量，为节能型配电网的发展开辟一个新的途径，为社会带来良好的经济效益。

The annual operation cost and investment recovery period

$$C_y = [8600 \times (P_0 + 0.05 \times I_0 \times SN/100) + 2200 \times (P_k + 0.05 \times UK \times SN/100)] \times 0.5$$

C_y : transformer annual operation cost, RMB

P_0 : Non-load loss, kW

P_k : Load loss, Kw

SN : Rated capacity kVA

U_k : Short circuit impedance percent, %

I_0 : Non-load current, Percent%

S11-M.ZT

系列智能型有载调容变压器

T0.5 is electricity prices, RMB/(Kwh);8600,2200 Respectively are transformer non-loadallyear,equivalentload(loadfactor0.5)Numberofhours.

Accordingtotherelatedperformanceindicator,tocalculatedannualoperationcost of the S11-M-ZT type intelligent load adjustable-capacity transformer and S11 Ordinarythree-phaseoiledtypedistributiontransformer.Assumethatloadcapac- itortransformerworksinlargecapacitorwithin3monthofoneyear,insmallcapacitor within9month.Accordingtodistributiontransformerrelatedspecificationtocalcu- late,detaildataasform3

The load adjustable-capacity transformer is adapted to the Substation field devel- opment towards energy saving, intelligence, high efficient, reliable power supply quality.It can automatically change terminal distribution transformer rated output ca- pacity by following the load change. Timely and proper keep the power supply, to greatly reduce the transformer non-load loss 40%~50%, to improve the grid power factor, reduce reactive component in distribution net and network loss and electricity capacitor, open a new way to develop energy saving distribution network, to the soci- ety to bring good economic benefit.

表2 S11-M-ZT系列智能型调容配电变压器与S11型配电变压器年运行费用比较

Form2 Compared operation cost between S11-M-ZT type intelligent load adjustable- capacity transformer and S11 type distribution transformer

容量(kVA) capcaity	有载调容配电变压器 年运行费用(元) Annual cost of load adjustable capacity transformer (Yuan)	普通配电变压器 年运行费用(元) annual cost of ordinary transformer(Yuan)	年运行费用降低 金额(元) annual decreased cost (Yuan)	年运行费用 降低(%) annual decreased rate (%)
160(50)	2289	4647	2358	51
200(63)	2710	5550	2840	51
250(80)	3227	6543	3316	51
315(100)	3816	7918	4102	52
400(125)	4588	9531	4943	52
500(160)	5497	11265	5768	51
630(200)	6608	13352	6744	51

TRANSFORMER

S11-M.ZT

Type intelligent load adjustable-capacity transformer

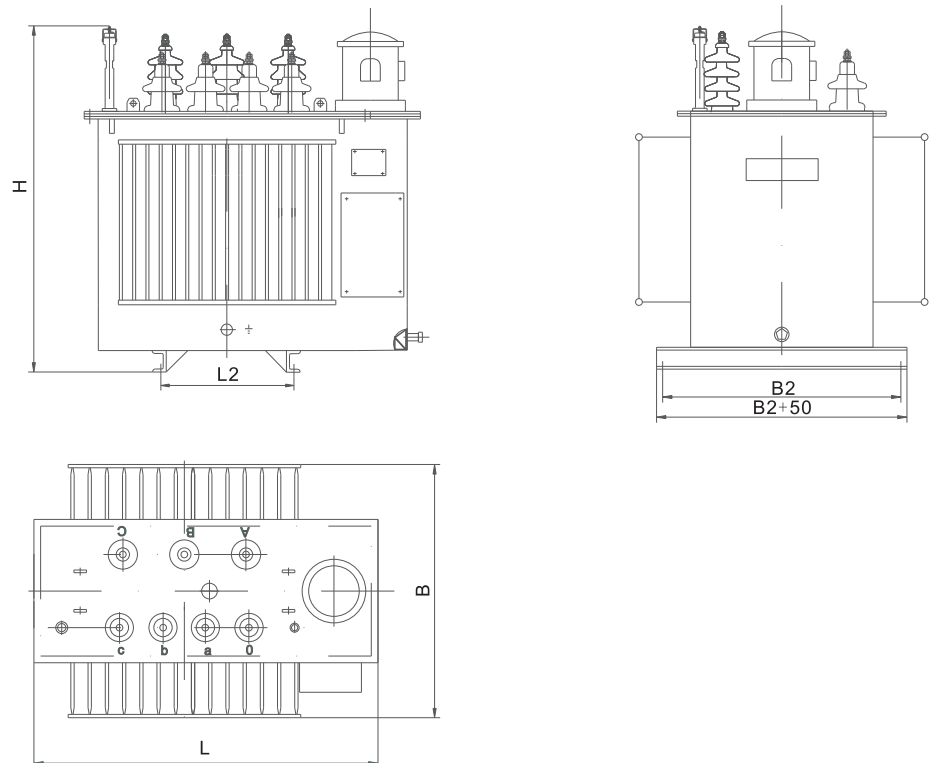
S11-M-ZT series intelligent load adjustable-capacity transformer compared with single S11 type distribution transformer, the annual operating cost is reduced by 51%, compared with the busbar transformer, it also saves installation fees, site fees, etc., the S11-M-ZT series intelligent load adjustable-capacity transformer relative to S11 type distribution transformer, the investment part can be recovered in about 3 years.

Compared operation cost between S11-M-ZT type intelligent load adjustable-capacity transformer and S11 type distribution transformer, Annual operation cost average reduce 51%, cut down the installation fee than lash transformer. The more investment of S11-M-ZT type intelligent load adjustable-capacity transformer can recycle in three years.

外观图及安装尺寸 Appearance Picture and installation dimension

10kV智能型有载调容配电变压器外形图

10KV intelligent load adjustable-capacity transformer Appearance Drawing



S11-M.ZT

系列智能型有载调容变压器

表3 S11-M-ZT系列智能型调容配电变压器外形安装尺寸及重量表

Form 3 intelligent load adjustable-capacity transformer installation dimension and weight

容量(kVA)	外形尺寸 (mm)			安装尺寸 (mm)		重量(kg)
	长L	宽B	高H	L2	B2	
160(50)	1380	990	1230	820	820	1100
200(63)	1400	1070	1230	820	820	1220
250(80)	1440	1120	1250	820	820	1370
315(100)	1480	1170	1350	820	820	1620
400(125)	1620	1190	1330	820	820	1910
500(160)	1710	1240	1350	820	820	2200
630(200)	1850	1270	1450	820	820	2660

S13、S13-M

Series low loss energy-saving power transformer



产品概述 Brief introduction to products

S13-M系列全密封变压器外形美观，价格低廉。节能显著，磁路均匀，空载损耗低、噪声低、温升低、免维修、效率高、体积小。采用新型铁芯材料。磁路分布均匀，大大降低了空载激磁电流和空载损耗，由于铁芯为全斜五接缝结构，故运行可靠、体积小、重量轻、噪声低、工艺性好，散热好、温升低、不吊芯结构、不污染环境、免维修、效率高。

使用范围：S13-M系列恒锐变压器可广泛用于高层建筑、商业中心、地铁、机场、车站、工矿企业、钻井平台、采油平台，特别适用于易燃、易爆等防火要求高以及环境恶劣的场所使用。也可用于居民区、商业街道、工矿企业和农村动力及照明之用。

结构及特点：全部采用优质晶粒取向冷轧硅钢片的铁芯，全斜无孔绑扎结构，铁芯为多级阶梯形，三接缝或五接缝，空损低、噪音小；线圈：采用优质QQ-2缩醒漆包圆铜线，无氧铜杆拉制的扁铜钱或铜结绕制而成，其形式有圆筒式、连续式、新型螺旋式、分裂式等，具有足够的电气强度、机械强度和散热能力。油箱：采用优质钢板焊接而成，有椭圆型、矩型等结构，散热元件采用片式散热器、膨胀散热器或波纹油箱，油箱在厂内进行可靠的密封试验，内外表面经酸洗、磷化处理，进行三底一面油漆喷涂，既抗腐蚀又美观大方。

S13-M series full sealed transformer with good appearance, low price, significant energy-saving, magnetic uniformity, low no-load loss, low noise, low temperature-rise, free repair, high efficiency, small size. Using a new type of core material, Uniform distribution of magnetic circuit, so that greatly reduced the no-load exciting current and no-load loss. As the iron core for oblique five joint structure, so the transformer has the advantages of reliable operation, small size, light weight, low noise, good technology, good heat dissipation, low temperature-rise, without lifting the core structure, no environmental pollution, high efficiency, free repair.

Range of use: S13-M series of Henre transformer can be widely used in high-rise buildings, commercial center, subway, airport, station, industrial and mining enterprises, oil drilling platform, platform, particularly applicable to flammable, explosive and other fire safety requirements and the harsh environment of high places. It also be used for residential, commercial street, industrial and mining enterprises and the rural power and lighting purposes.

Structure and characteristics: The use of core quality grain oriented cold-rolled silicon steel sheet, oblique banding structure of non porous, the iron core is a multistage step type three or five joints, seams, air loss low, low noise; coil: shrink up enameled round copper wire, the use of high-quality QQ-2, oxygen free copper bar drawn flat copper coins or knot winding and, in the form of cylinder type, continuous, screw type, split type, with enough electric strength, mechanical strength and heat dissipation capability. Tank: welded together by high quality steel plate, elliptic, rectangular structure with radiating elements, using finned radiator, radiator or corrugated expansion tank, oil tank test reliable sealing in the factory, the internal and external surface by pickling, phosphating, three bottom side paint coating is leisure, corrosion resistance and beauty.

S13、S13-M

系列低损耗节能电力变压器

10kV级S13无励磁调压配电变压器技术参数

Technical parameters of 10kV S13 off-circuit-tap-changing distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no- load current	负载 损耗 (W) load loss	空载 电流 (%) no- load loss	短路 阻抗 (%) short- circuit resistance	重量(kg) Weight			轨距A×B (mm) track gauge	外形尺寸(mm) L×W×H overall dimension
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol					器身重 tare	绝缘 油重 oil	总重 total		
30	6 6.3 10 10.5 11	±2 ×2.5%; or ±5%;	0.4	Yyn0 or Dyn11	80	600	2.1	4.0	150	75	320	400×400	730×480×950
50					100	870	2.0		210	89	370	400×400	758×510×920
63					110	1040	1.9		255	95	420	400×450	788×530×950
80					130	1250	1.8		280	120	490	400×450	808×580×970
100					150	1500	1.6		360	125	600	400×550	830×760×1160
125					170	1800	1.5		410	135	690	400×550	990×620×1040
160					200	2200	1.4		480	155	815	550×550	1070×680×1100
200					240	2600	1.3		563	168	920	550×650	1170×770×1300
250					290	3050	1.2		665	200	1020	550×650	1230×820×1190
315					340	3650	1.1		751	230	1160	550×650	1295×865×1240
400					410	4300	1.0		880	235	1385	550×750	1385×925×1250
500					480	5150	1.0		1100	260	1670	660×750	1560×1060×1360
630					570	6200	0.9		1255	310	1920	660×750	1615×1105×1350
800					700	7500	0.8		1585	465	2330	820×850	1725×1190×1390
1000					830	10300	0.7		1720	510	2680	820×850	1820×1290×1440
1250					970	12000	0.6		2075	625	2995	820×850	1860×1290×1540
1600					1170	14500	0.6		2215	640	3610	820×850	1340×1700×1560
2000					1550	18300	0.5		2965	805	4570	820×820	1660×1460×1850
2500	1830	21200	0.5	3600	895	5335	1070×1070	1750×1780×1900					

S11-M · RL

three-dimensional wound core
distribution transformer



产品概述 Brief introduction to products

S11型立体卷铁芯配电变压器容量范围30–2500KVA。铁芯为三相三柱式内外框卷制结构。机械化程度高，叠片系数大。高、低压线圈在铁芯柱上连续绕制，同心度好，线圈紧实。主要技术经济指标达到同类产品国际先进水平。

S11系列卷铁芯配电变压器损耗低，负载损耗与新S11叠铁芯式配电变压器相同。与GB/T6415–2008 1相比，其空载损耗平均降低了20%。主要材料消耗少，重量轻。空载电流小，磁通完全沿着冷轧硅钢片晶格排列方向。噪声低，与JB/T10088–2004标准值相比，约降低3–5dB。抗短路能力强，可靠性高。夹件主要起拉紧绕组的作用，铁轭绝缘与梯形垫块合为一体，使器身均匀受压。

铁芯：采用30Q120冷轧硅钢片。三相柱内外框卷制结构，芯柱为多级阶梯圆柱形截面。铁芯卷制后经真空退火成型。上、下夹件的拉螺杆拉紧器身。铁芯表面涂刷环氧树脂，保证铁芯不变形，不生锈。

绕组及器身：低压绕组为1–6根导线并绕的四层(或双层)圆筒式，采用纸包扁铜线。高压绕组为多层圆筒式，冲击分布好，采用高强度缩醛漆包圆铜线。线圈直接在卡在铁芯柱上的由齿轮盘和软纸筒组成的转动模上绕制。铁轭绝缘与梯形垫块合为一体，使器身均匀受压。采用新型吊板定位结构，纵向和横向定位，确保器身稳固不位移。

油箱：以波纹油箱为主。亦可设计为长方形片式散热器油箱。

The capacity range of S11 three–dimensional wound core transformer is 30–2500KVA. The core has a three–phase three–column structure with wrapped internal and external frames. The transformer has a high degree of mechanization and a large lamination factor. High and low voltage coils are continuously wound on core columns, so that the concentricity is good and the coils are tight. The main technical and economic indicators have reached the international advanced level of similar products.

The capacity range of S11 three–dimensional wound core transformer is 30–2500KVA. The core has a three–phase three–column structure with wrapped internal and external frames. The transformer has a high degree of mechanization and a large lamination factor. High and low voltage coils are continuously wound on core columns, so that the concentricity is good and the coils are tight. The main technical and economic indicators have reached the international advanced level of similar products.

S11 series wound core distribution transformer has a low loss, and its load loss is the same as new S11 laminated core distribution transformer. Compared with GB/T6415–2008 1, the average no–load loss reduces by 20%. Its main materials have low consumption and light weight. The no–load current is small, and magnetic flux is completely arranged along the direction of cold–rolled silicon steel sheet lattice. Its low noise reduces approximately 3–5dB compared with the standard value of JB/T10088–2004. It has strong ability to withstand short circuit and high reliability. The clamping elements mainly tension the windings, and the iron yoke insulator and ladder–shaped pad are integrated into one body, so that the transformer body undergoes uniform pressure.

Core: 30Q120 cold–rolled silicon steel sheet is used. The core has a three–phase three–column structure with wrapped internal and external frames, and the core column is of multi–level stepped cylindrical cross section.

The wrapped core is annealed and formed in vacuum. The screws of the upper and lower clamping elements tension the transformer body. Epoxy resin is painted onto the core surface to ensure that the core will not be deformed or not rust.

Windings and transformer body: the low–voltage winding is four–layer (or double–layer) cylindrical wound in parallel by 1–6 flat copper wires covered with paper. The high–voltage winding is multi–layer cylindrical, with good distribution of impact, and a high–strength round copper wire covered with acetal paint is used. Coils are directly wound on the rotating die that is clamped on the core column and is made up of a gear disk and soft paper tube. The iron yoke insulator and ladder–shaped pad are integrated into one body, so that the transformer body undergoes uniform pressure. A new hanger plate positioning structure is adopted for vertical and horizontal positioning, to ensure that the transformer body can not be offset.

Fuel tank: mainly refers to a corrugated tank. It can also be designed into a rectangular finned radiator tank.

S11-M · RL

型立体卷铁芯配电变压器

型号含义 Model designation



S11型立体卷铁芯油浸式变压器技术参数

Technical parameters of S11 three-dimensional wound core oil-immersed transformer

额定容量 (kVA)	电压组合 voltage combination				空载 损耗 (W)	负载 损耗 (W)	空载 电流 (%)	短路 阻抗 (%)	重量(kg) Weight			轨距A × B (mm)	外形尺寸(mm) L × W × H		
	高压 (KV)	高压分接 范围	低压 (KV)	联结组 标号					器身重 tare	绝缘 油重 oil	总重 total			track gauge	overall dimension
30	11; 10.5; 10; 6.6; 6.3; 6;	± 5%; or ± 2 × 2.5%;	0.4	Dyn11; Yzn11; Yyn0;	100	630/ 600	0.33	4.0	167	107	358	380 × 550	1010 × 667 × 1159		
50					130	910/ 870	0.30		222	113	423	380 × 550	1025 × 683 × 1224		
80					180	1310/ 1250	0.27		278	153	525	380 × 550	1114 × 727 × 1314		
100					200	1580/ 1500	0.26		278	149	554	380 × 550	1148 × 995 × 1314		
160					280	2310/ 2200	0.24		439	168	746	400 × 660	1045 × 905 × 1376		
200					340	2730/ 2600	0.23		509	197	856	400 × 660	1091 × 944 × 1394		
250					400	3200/ 3050	0.22		591	228	986	400 × 660	1114 × 965 × 1397		
315					480	3830/ 3650	0.21		679	252	1124	550 × 820	1190 × 1031 × 1422		
400					570	4520/ 4300	0.21		818	303	1340	550 × 820	1225 × 1060 × 1477		
500					680	5140/ 5100	0.20		964	375	1618	550 × 820	1394 × 1207 × 1562		
630					810	6200	0.20		1128	417	1939	550 × 820	1467 × 1270 × 1594		
800					980	7500	0.19		1424	526	2417	550 × 820	1570 × 1360 × 1636		
1000					1150	10300	0.18		1660	645	2955	550 × 1070	1731 × 1510 × 1656		
1250					1360	12000	0.17		1802	630	3135	550 × 1070	1761 × 1525 × 1768		
1600					1640	14500	0.16		2255	781	3784	550 × 1070	1740 × 1510 × 1928		
2000					2250	18500	0.15		3166	1239	5637	660 × 1300	1836 × 1699 × 1863		
2500	2400	24000	0.15	3158	1541	6089	660 × 1300	1856 × 1762 × 2088							

S13-M · RL

three-dimensional wound core
distribution transformer



产品概述 Brief introduction to products

S13型立体卷铁芯配电变压器容量范围30–1600KVA。铁芯为三相三柱式内外框卷制结构。机械化程度高，叠片系数大。高、低压线圈在铁芯柱上连续绕制，同心度好，线圈紧实。主要技术经济指标达到同类产品国际先进水平。

S13系列卷铁芯配电变压器损耗低，负载损耗与新S11叠铁芯式配电变压器相同。与GB/T6415–2008 1相比，其空载损耗平均降低了50%。主要材料消耗少，重量轻。空载电流小，磁通完全沿着冷轧硅钢片晶格排列方向。噪声低，与JB/T10088–2004标准值相比，约降低3–5dB。抗短路能力强，可靠性高。夹件主要起拉紧绕组的作用，铁轭绝缘与梯形垫块合为一体，使器身均匀受压。

铁芯：采用30Q120冷轧硅钢片。三相柱内外框卷制结构，芯柱为多级阶梯圆柱形截面。铁芯卷制后经真空退火成型。上、下夹件的拉螺杆拉紧器身。铁芯表面涂刷环氧树脂，保证铁芯不变形，不生锈。

绕组及器身：低压绕组为1–6根导线并绕的四层(或双层)圆筒式，采用纸包扁铜线。高压绕组为多层圆筒式，冲击分布好，采用高强度缩醛漆包圆铜线。线圈直接在卡在铁芯柱上的由齿轮盘和软纸筒组成的转动模上绕制。铁轭绝缘与梯形垫块合为一体，使器身均匀受压。采用新型吊板定位结构，纵向和横向定位，确保器身稳固不位移。

油箱：以波纹油箱为主。亦可设计为长方形片式散热器油箱。

The capacity range of S13 three-dimensional wound core transformer is 30–1600KVA. The core has a three-phase three-column structure with wrapped internal and external frames. The transformer has a high degree of mechanization and a large lamination factor. High and low voltage coils are continuously wound on core columns, so that the concentricity is good and the coils are tight. The main technical and economic indicators have reached the international advanced level of similar products.

S13 series wound core distribution transformer has a low loss, and its load loss is the same as new S11 laminated core distribution transformer. Compared with GB/T6415–2008 1, the average no-load loss reduces by 50%. Its main materials have low consumption and light weight. The no-load current is small, and magnetic flux is completely arranged along the direction of cold-rolled silicon steel sheet lattice. Its low noise reduces approximately 3–5dB compared with the standard value of JB/T10088–2004. It has strong ability to withstand short circuit and high reliability. The clamping elements mainly tension the windings, and the iron yoke insulator and ladder-shaped pad are integrated into one body, so that the transformer body undergoes uniform pressure.

Core: 30Q120 cold-rolled silicon steel sheet is used. The core has a three-phase three-column structure with wrapped internal and external frames, and the core column is of multi-level stepped cylindrical cross section. The wrapped core is annealed and formed in vacuum. The screws of the upper and lower clamping elements tension the transformer body. Epoxy resin is painted onto the core surface to ensure that the core will not be deformed or not rust.

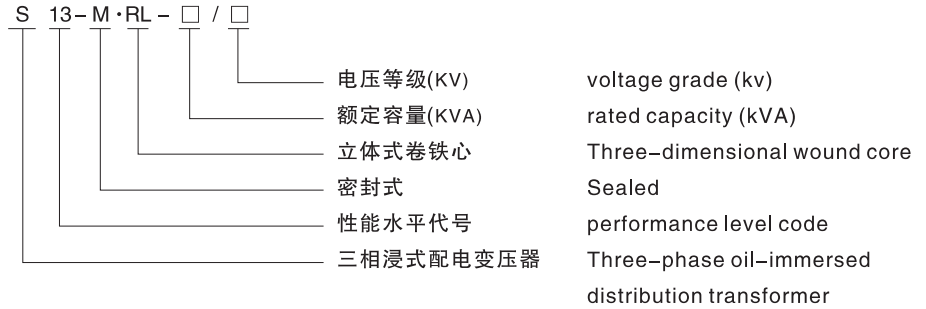
Windings and transformer body: the low-voltage winding is four-layer (or double-layer) cylindrical wound in parallel by 1–6 flat copper wires covered with paper. The high-voltage winding is multi-layer cylindrical, with good distribution of impact, and a high-strength round copper wire covered with acetal paint is used. Coils are directly wound on the rotating die that is clamped on the core column and is made up of a gear disk and soft paper tube. The iron yoke insulator and ladder-shaped pad are integrated into one body, so that the transformer body undergoes uniform pressure. A new hanger plate positioning structure is adopted for vertical and horizontal positioning, to ensure that the transformer body can not be offset.

Fuel tank: mainly refers to a corrugated tank. It can also be designed into a rectangular finned radiator tank.

S13-M·RL

型立体卷铁芯配电变压器

型号含义 Model designation



S13新型节能型立体卷铁芯油浸式变压器技术参数

Technical parameters of S13 new energy-saving three-dimensional wound core oil-immersed transformer

额定容量 (kVA)	电压组合 voltage combination				空载 损耗 (W)	负载 损耗 (W)	空载 电流 (%)	短路 阻抗 (%)	重量(kg) Weight			轨距A×B (mm)	外形尺寸(mm) L×W×H	
	高压 (KV)	高压分接 范围	低压 (KV)	联结组 标号					器身重 tare	绝缘 油重 oil	总重 total			
														high voltage
30	11; 10.5; 10; 6.6; 6.3; 6;	± 2 × 2.5%; or ± 5%;	0.4	Dyn11; Yzn11; Yyn0;	80	630 / 600	0.30	4.0	178	113	377	380×550	1028×682×1199	
50					100	910 / 870	0.24		236	111	435	380×550	1025×683×1224	
80					130	1310 / 1250	0.22		313	146	553	380×550	1096×722×1314	
100					150	1580 / 1500	0.21		356	148	607	380×550	1096×722×1334	
160					200	2310 / 2200	0.19		484	185	797	400×660	1080×935×1441	
200					240	2730 / 2600	0.18		556	228	937	400×660	1109×960×1444	
250					290	3200 / 3050	0.17		655	263	1091	400×660	1196×1036×1457	
315					340	3830 / 3650	0.16		769	274	1269	550×820	1276×1105×1467	
400					410	4520 / 4300	0.16		896	323	1437	550×820	1306×1131×1542	
500					480	5410 / 5100	0.16		1044	433	1872	550×820	1483×1284×1592	
630					4.5	570	6200		0.15	1352	414	2085	550×820	1395×1210×1649
800										1613	496	2481	550×820	1526×1321×1711
1000										1703	656	3000	550×1070	1717×1487×1726
1250										2065	702	3449	550×1070	1711×1482×1829
1600										2592	1045	4450	550×1070	1880×1628×1938

TRANSFORMER

Sales record of oil-immersed transformer serie



序号	型号规格	使用单位	数量(台)
1	S9-315 S9-100	武警水电总队十支队	4
2	S9-200 S9-100等	福建省水利水电物资供应公司	12
3	S9-20 S9-63	安徽省宿松县电瓷厂	6
4	S9-10/10	福建邵武供电局	10
5	S9-50 S9-315	拉萨电业局	29
6	S9-50 S9-200	广东省电力工业局	65
7	S9-50 S9-160	福建安溪祥华水电厂	20
8	S9-50 S9-80	南昌县供电有限公司	121
9	SZ9-200	伊力霍尔果斯海关	1
10	S9-20 S9-100	鹰潭月湖区农电公司	15
11	SM9系列	广东省电力物资总公司	179
12	SM9-315/10	江西抚州电力总公司	2
13	S9-80 S9-100/10	宜春市供电有限公司	31
14	S9-4000/10	泉州恒源电力设备公司	1
15	SZ9-M-1250/10	中国化建巨石公司九江分公司	2
16	SZ9-M-1600/10	中国化建巨石公司九江分公司	1
17	S9-30/10 S9-50/10	樟树市供电局	55
18	S9-3150/11	福建省连江县塘坂水库电站	1
19	S9系列	广东省电力公司(农网改造)	682
20	S9系列	福建省电力公司(农网改造)	186
21	S9-M-1250/10	九江电子材料厂	2
22	S9系列	江西省电力局(农网改造)	2260
23	S9(SZ9)-3150/35	江西省电力局	26
24	S9(SZ9)-2000/35	江西省电力局	15
25	S9-2500/35	江西省电力局	8
26	S9-5000/35	江西省电力局	4
27	S9-20/10 S9-60/10	高安县供电局	38
28	S9系列	宁都县供电局	65
29	S9-30/10 S9-50/10	崇义县供电局	72
30	S9系列	河北省鹿泉供电局(农网)	382
31	S9系列	河北行壠供电局(农网)	86
32	S9系列	西藏电力物资公司(农网改造)	1216
33	S9系列	拉萨电力局(农网)	89

油浸式变压器系列 部分销售记录

序号	型号规格	使用单位	数量(台)
34	S11系列	河南省南洛电业局	62
35		河南樊阳电力公司	48
36		河南平顶山电力公司	26
37	S9系列	河南郑州电力公司(农网)	109
38	S9系列	黑龙江省电力公司农电工作部(农网)	265
39	S11系列	湖北襄樊电业局(农网)	126
40	S9系列	湖北荆州电业局(农网)	80
41	S9-2000/35-0.4	山东魏桥纺织股份有限公司	5
42	S9-1000/35	福建长岩紫金矿业	1
43	S9-1600/35	新疆乌石化	4
44	S9-2000/10	新疆乌石化	4
45	S9-2500/10	新疆乌石化	6
46	ZS10-M-1600/10	广西来宾东糖药业有限公司	2
47	S10-M-1600/10	广西来宾东糖药业有限公司	4
48	S10-M-2000/10	广西来宾东糖药业有限公司	4
49	S10-M-1000/10	广西来宾东糖药业有限公司	3
50	S10-M-1250/10	广西来宾东糖药业有限公司	1
51	S10-M-630/10	广西来宾东糖药业有限公司	1
52	S10-2000/10	云南玉溪大红山矿业公司	3
53	S10-1600/10	云南玉溪大红山矿业公司	3
54	S10-800/10	云南玉溪大红山矿业公司	4
55	S10-M-3150/35	广西东亚纸业有限公司	2
56	S10-M-400/10	广西东亚纸业有限公司	2
57	S10-M-800/10	广西东亚纸业有限公司	2
58	S10-M-1000/10	广西东亚纸业有限公司	2
59	S10-M-1250/10	广西东亚纸业有限公司	2
60	S10-M-2000/10	广西东亚纸业有限公司	4
61	S10-M-1600/10	广西东亚纸业有限公司	4
62	ZS10-M-1600/10	广西东亚纸业有限公司	2
63	S9-2000/110	福建省连江县塘坂水库电站	2
64	S9-3150/35	福建省连江县塘坂水库电站	5
65	SF9-10000/35-6.3	云南盈江铝厂	2
66	S9-2500/6.3	云南盈江铝厂	2

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Sales record of oil-immersed transformer serie

序号	型号规格	使用单位	数量(台)
67	SZ9-8000/110	广东银钻电力发展有限公司	2
68	SZ9-6300/110	广东银钻电力发展有限公司	1
69	SZ9-5000/110	广东银钻电力发展有限公司	1
70	S9-12500/110	安徽国风塑业股份公司	2
71	SZ9-12500/110	江西省电力公司	2
72	SF9-10000/38.5-10	江西省电力公司	4
73	SZ9-8000/38.5-10	江西省电力公司	6
74	SF9-1250/38.5-6.3	拉萨电力局	2
75	SF9-10000/38.5-6.3	拉萨电力局	4
76	SF9-8000/38.5-6.3	拉萨电力局	2
77	SF9-8000/35	广西电力公司	2
78	SF9-10000/35	广西电力公司	4
79	SZ9-3150/35	湖南桂阳电力局	1
80	S9-16000/110	福建寿宁县蒲洋水电站	1
81	S9-16000/110	上海九龙市场	1
82	SZ9-31500/35	鄂尔多斯市东胜煤碳局	2
83	S9-20000/35	鄂尔多斯市丁家梁煤矿	2
84	S9-20000/35	鄂尔多斯市徐家煤矿	2
85	S9-10000/38.5	兴国县长电发展公司	1
86	S9-6300/35	华能瑞金电厂	1
87	S9-M-50/10	河北三河电力物资电力公司	8
88	S9-M-80/10	河北三河电力物资电力公司	10
89	S9-M-200/10	河北三河电力物资电力公司	5
90	S9-M-315/10	河北三河电力物资电力公司	6
91	S9-M-400/10	河北三河电力物资电力公司	3
92	S9-630/10	河北三河电局电力公司	6
93	S9-1250/10	河北三河电局电力公司	4
94	S9-1600/10	河北三河电局电力公司	2
95	S9-2000/10	河北三河电局电力公司	4
96	S9-50/10	昆明市供电局	22
97	S9-315/10	昆明市供电局	12
98	S9-400/10	昆明市供电局	8
99	S9-630/10	昆明市供电局	14

油浸式变压器系列 部分销售记录

序号	型号规格	使用单位	数量(台)
100	S11-M-200/10	昆明市供电局	6
101	S11-M-250/10	昆明市供电局	10
102	S11-M-315/10	昆明市供电局	12
103	S11-M-1000/10	昆明市供电局	8
104	SZ10-12500/35	河南洛钼集团	2
105	S10-M-1250/10	河南洛钼集团	2
106	S10-M-2000/10	河南洛钼集团	2
107	S10-M-2500/10	河南洛钼集团	2
108	S10-M-800/10	河南香江万基钻业	4
109	S10-M-1000/10	河南香江万基钻业	4
110	S10-M-1250/10	河南香江万基钻业	4
111	S10-M-1600/10	河南香江万基钻业	8
112	S10-M-2500/10	河南香江万基钻业	4
113	S11-M-100/10	大庆市盈科经贸有限公司	8
114	S11-M-125/10	大庆市盈科经贸有限公司	4
115	S11-M-160/10	大庆市盈科经贸有限公司	6
116	S11-M-200/10	大庆市盈科经贸有限公司	8
117	S11-M-250/10	大庆市盈科经贸有限公司	12
118	S11-M-315/10	大庆市盈科经贸有限公司	18
119	S11-M-400/10	大庆市盈科经贸有限公司	16
120	S11-M-500/10	大庆市盈科经贸有限公司	10
121	S11-M-630/10	大庆市盈科经贸有限公司	12
122	S11-M-800/10	新疆新特顺电力设备有限责任公司	2
123	S11-M-1000/10	新疆新特顺电力设备有限责任公司	2
124	S11-M-1250/10	新疆新特顺电力设备有限责任公司	4
125	S9-M系列	新疆新特顺电力设备有限责任公司	121
126	S11-M系列	新疆新特顺电力设备有限责任公司	68
127	SZ9-2000/10	湖北武汉双汇有限公司	4
128	S11-M-1250/10	湖北武汉创源电力工程公司	2
129	S11-M-1600/10	湖北武汉创源电力工程公司	6
130	S9-M-630/10	武汉大连电气公司	2
131	S11-M-1600/10	武汉大连电气公司	8
132	S11--200/10	湖北十堰巨能电力公司	5

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Sales record of oil-immersed transformer serie

序号	型号规格	使用单位	数量(台)
133	S11--250/10	湖北十堰巨能电力公司	8
134	S11-315/10	湖北十堰巨能电力公司	6
135	S11-M-400/10	湖北十堰巨能电力公司	8
136	S9-200/10	湖北十堰巨能电力公司	6
137	S9-250/10	湖北十堰巨能电力公司	4
138	S9-M-400/10	湖北十堰巨能电力公司	12
139	SZ9-8000/10	湖北福星科技股份有限公司	1
140	SZ-1250/10	湖北福星科技股份有限公司	3
141	SZ9-10000/35	湖北福星科技股份有限公司	1
142	S11-M-1250/6	乌石化集团公司	2
143	S11-M-1600/10	乌石化集团公司	1
144	S10-M-250/10	乌石化集团公司	1
145	S10-M-630/10	乌石化集团公司	1
146	S10-M-2000/10	乌石化集团公司	4
147	ZS-M-1600/6.3	福建青山纸业有限公司	2
148	ZS-M-2000/6.3	福建青山纸业有限公司	2
149	S11-M-250/10	福建泉州亿力电力物资有限公司	3
150	S11-M-315/10	福建泉州亿力电力物资有限公司	21
151	S11-M-500/10	福建泉州亿力电力物资有限公司	16
152	S11-M-630/10	福建泉州亿力电力物资有限公司	12
153	S11-M-800/10	福建泉州亿力电力物资有限公司	4
154	S11-M-1000/10	福建泉州亿力电力物资有限公司	6
155	S10-4000/10	云南玉溪大红山矿业公司	5
156	S10-M-3150/35	广西东亚纸业有限公司	2
157	S10-M-400/10	广西东亚纸业有限公司	2
158	S10-M-800/10	广西东亚纸业有限公司	2
159	S9-2500/10	新疆乌石化	6
160	ZS10-M-1600/10	广西来宾东糖纸业有限公司	2
161	S10-M-1600/10	广西来宾东糖纸业有限公司	4
162	S10-M-2000/10	广西来宾东糖纸业有限公司	4
163	S10-M-1000/10	广西来宾东糖纸业有限公司	3
164	S10-M-1250/10	广西来宾东糖纸业有限公司	1
165	S10-M-630/10	广西来宾东糖纸业有限公司	1

油浸式变压器系列 部分销售记录

序号	型号规格	使用单位	数量(台)
166	S9-2000/10	新疆乌石化	4
167	S10-M-1000/10	广西东亚纸业有限公司	2
168	S10-1600/10	云南玉溪大红山矿业公司	3
169	S10-2000/10	云南玉溪大红山矿业公司	3
170	S10-M-1250/10	广西东亚纸业有限公司	2
171	S10-M-2000/10	广西东亚纸业有限公司	4
172	S10-M-1600/10	广西东亚纸业有限公司	4
173	ZS10-M-1600/10	广西东亚纸业有限公司	2
174	S9-6300/110	福建长汀溪水电厂	2
175	S9-1000/35	福建龙岩紫金广业	1
176	S9-16000/35	新疆乌石化	4
177	ZS10-M-4000/10	武汉钢铁股份有限公司	2
178	ZS10-M-2500/10	武汉钢铁股份有限公司	12
179	S11-M-2000/10	武汉钢铁股份有限公司	10
180	S11-M-1600/10	武汉钢铁股份有限公司	8
181	S11-M-2000/10	河北新金永盛钢铁公司	8
182	S11-M-1600/10	河北新金永盛钢铁公司	9
183	S11-M-1250/10	河北新金永盛钢铁公司	4
184	ZS9-1260/10	江西洪都钢厂	2
185	ZS9-1600/10	江西洪都钢厂	4
186	S10-1600/10	江西洪都钢厂	1
187	S9-1600/10/6/0.4	江西洪都钢厂	1
188	S9-M-1250/10	河南信阳钢铁公司	3
189	SFS9-31500/121	四川屏山县屏边水电站	1
190	SFS9-20000/121	四川屏山县屏边水电站	1
191	SSF9-25000/121	华力水电开发有限公司	1
192	SF9-20000/121	云南茂顶河二级水电站	2
193	SF9-50000/110	广东丰顺县韩江水电站有限公司	2
194	SF9-10000/35	金玮公司响水变电站	1
195	ZBW-800/10	江西省火电建设公司	2
196	SZ9-10000/35	内蒙古准旗柴登35KV变电站	1
197	SZ9-8000/35	内蒙古准旗柴登35KV变电站	1
198	SZ9-350/35	内蒙古准旗柴登35KV变电站	1

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Sales record of oil-immersed transformer serie

序号	型号规格	使用单位	数量(台)
199	S11-M-1600/10	宜昌三峡送变电力有限公司	4
200	S11-M-1000/10	宜昌三峡送变电力有限公司	3
201	ZBW-315/10.5	贵州北盘江光照水电站	1
202	ZBW-400/10.5	湖南铜湾水电站	1
203	SF10-25000/35	中国石油乌鲁木齐石化公司	2
204	S10-2500/6	中国石油乌鲁木齐石化公司	10
205	S10-2000/6	中国石油乌鲁木齐石化公司	8
206	S9-1000/6.3	中国石油乌鲁木齐石化公司	7
207	S11-M-800/6.3	大庆辽河油田	22
208	S10-4000/38.5	新疆塔什萨依燃气电站	1
209	S10-2500/10.5	新疆塔什萨依燃气电站	2
210	S11-M-1000/6.3	新疆石和管理局物资供应公司	11
211	S9-4000/35/10.5	甘肃省长庆油田	2
212	S11-3150/35	新疆油田	2
213	S11-M-500/6.3	中油辽河油田	4
214	S11-M-1000/10	胜利油田新邦建设有限公司	1
215	S11-M-2000/6	青海中浩天然气化工有限公司	4
216	S11-M-1600/6	青海中浩天然气化工有限公司	3
217	S9-M-1600/10.5	贵州华飞化学工业有限公司	5
218	S9-M-2000/10.5	贵州华飞化学工业有限公司	2
219	S9-2500/35	山东中农民昌化学工业有限公司	2
220	S11-M-3150/10.5	贵州松河煤业发展有限公司	1
221	SZ9-4000/10	江西天河煤矿	2
222	S10-M-1600/10	福建崇礼紫金矿业有限公司	2
223	S10-M-2000/10	福建崇礼紫金矿业有限公司	2
224	SF10-4000/35	云南玉溪大红山矿业有限公司	4
225	S10-4000/35	云南玉溪大红山矿业有限公司	1
226	S11-M-1250/10	河北中金冶金有限公司	2
227	S9-1250/10	文山麻栗坡紫金钨业集团	1
228	S9-2500/38.5	文山麻栗坡紫金钨业集团	1
229	S11-800/10.5	湖南衡阳新华化工冶金有总公司	10
230	S11-1250/10.5	湖南衡阳新华化工冶金有总公司	6
231	ZBW-1000/10.5	湖南衡阳新华化工冶金有总公司	1

油浸式变压器系列 部分销售记录

序号	型号规格	使用单位	数量(台)
232	S9-2000/35	中核赣州金瑞铀业公司	3
233	S9-630/10	中核赣州金瑞铀业公司	7
234	S9-2000/10	云南栗坡益嘉冶金有限公司	1
235	SFZ9-12500/35	陕西东岭锌业技改工程	2
236	S10-M-1600/10	陕西东岭冶炼有限公司	2
237	S10-M-1000/10	陕西东岭冶炼有限公司	9
238	S9-1600/10	兰坪金鼎锌业有限公司	12
239	S9-2000/10	兰坪金鼎锌业有限公司	5
240	SZ9-3150/35	新疆哈密天隆镍业有限责任公司	1
241	S9-2000/10	内邱县顺达冶炬铸造有限公司	2
242	S9-1600/10	内邱县顺达冶炬铸造有限公司	3
243	SZ11-12500/35	江苏丰源铝业有限公司	1
244	ZS9-1250/10	江苏丰源铝业有限公司	4
245	S11-3150/10	江苏丰源铝业有限公司	3
246	S11-M-2000/10	中国铝业遵义氧化铝有限公司	6
247	S11-M-1600/10	中国铝业遵义氧化铝有限公司	6
248	S11-M-2500/10	中国铝业遵义氧化铝有限公司	2
249	SZ9-20000/35	湖北京兰集团三源水泥有限公司	1
250	S9-M-1600/10	湖北京兰集团三源水泥有限公司	4
251	S9-M-1000/10	湖北京兰集团三源水泥有限公司	2
252	SZ11-2000/35	贵州科特林水泥有限公司	1
253	S9-1250-10	贵州科特林水泥有限公司	2
254	S9-1600/10	贵州科特林水泥有限公司	2
255	SZ11-12500/35	福建水泥股份有限公司	1
256	S9-1250/6	福建水泥股份有限公司	4
257	S9-M-1250/10	漳平红狮水泥有限公司	3
258	S9-M-1600/10	漳平红狮水泥有限公司	5
259	S9-2000/10	湖北金龙水泥有限公司	5
260	S11-M-1600/10	福建泉州美岭水泥有限公司	4
261	S9-3150/10	黑龙江华夏水泥有限公司	1
262	S11-M-1000/10	黑龙江华夏水泥有限公司	1
263	SZ10-16000/110	永州莲花水泥有限公司	1
264	SZ9-200/10	广梅汕铁路有限公司	2

TRANSFORMER

10kV

Underground combination transformer



产品概述 Brief introduction to products

地下式组合变压器是一种将变压器、高压负荷开关和保护用熔断器等安装在油箱之中的紧凑型组合式配电设施。地下式组合变压器安装时置于地坑之中，具有不占用地表空间、可以在一定时间内浸没在水中运行、免维护等特点。由于以上特点，它在北美地区得到了广泛的应用。我国人口众多，城市人口密度大，采用地下式组合变压器对于节约城市配电设施占地面积、提高城市土地利用具有重要意义，因此在城网改造和建设中有广泛的应用价值。

The underground combination transformer is a type of compact combination power distribution device, which integrate transformer, high-voltage load switch, and protective fuse in the oil tank. The underground combination transformer can be installed in the pit and will not take up any space above the ground. It can keep running while immersed in water and is maintenance-free. Based on the above characteristics, it is widely applied in North America. There is a large population in China and the urban population is especially dense, so application of underground combination transformers is of great significance to saving the space occupied by power distribution facility in cities and improving the utilization rate of urban land. Consequently, it is of wide application value in urban network renovation and construction

产品特点 Product characteristics

- 1、运输和起吊极为方便、简单。用户只需直接起吊外壳上的4个吊耳便能吊起整台地下式组合变压器，不需其他的吊具。
- 2、采用全绝缘结构，无需绝缘距离，可靠保证人身安全。
- 3、油箱采用1cr18ni9T低合金结构钢制造。1cr18Ni9Ti综合力学性能、焊接性及低温韧性、冷冲压等性能都非常良好，与Q235-A钢相比，强度提高50%，耐大气腐蚀提高20~38%，低温冲击韧性也很优越，能有效提高油箱综合机械性能。
- 4、油箱表面喷涂按照船舶用表面处理喷涂工艺标准执行，即钢板打磨后喷涂底漆及面漆，有效地保证了油箱外壳的耐候性。
- 5、采用全密封结构，高低压端子的裸露部分通过优质绝缘密封胶与环境隔离。本地埋变安装时置于地坑之中，当地坑浸水乃至淹没地埋变时，仍可在一定时间内安全运行，可抵御洪涝灾害，能有效提高供电系统的可靠性。
- 6、所配的油浸式负荷开关是进口特殊加长型的三相联动开关，具有弹簧操作结构，可完成带负荷开断和关合操作。负荷开关中的二位置开关用于单终端，四位置开关本身具有环网功能，因此地下式组合变压器既可运行于环网，又可运行于终端供电方式，转换十分方便，

10kV

级地下式组合式变压器

提高了供电的可靠性。

- 7、采用于独特的散热片。保证了散热片的机械强度和散热能力。
- 8、安装后不占用地表面积，不影响观瞻。
- 9、适用于防水、防火的地下电网。
- 10、产品出厂之前经过严格的检验，可靠性高。

1. Convenient and simplified transportation and lifting. The user can lift the whole underground combination transformer by directly lifting the four hook bolts on the shell without use of any other equipment.

2. Adopting a wholly insulating structure. No need of insulation distance to ensure personal safety.

3. Oil tanks are made of 1cr18ni9T low-alloy structural steel. The comprehensive mechanical property, weldability and low-temperature toughness, and cold rolling ability of 1cr18ni9Ti are all quite good. Compared with Q235-A, its strength is improved by 50%, and atmospheric corrosion resistance improved by 20-38%. Its low-temperature toughness is also excellent, which can efficiently improve the comprehensive mechanic performance of the oil tank.

4. The surface treatment of the oil tank complies with the technical standards for treatment of ship surface, that is, the steel plate is sprayed with base coat and finish coat after being roughened so as to efficiently protect the weather-resistability of the shell of oil tanks.

5. A wholly sealed structure is adopted. The bare parts of high- and low-voltage terminals are insulated through high-quality insulation sealant. The local underground transformer can be installed in the pit; when water flowed into the pit and even the transformer is immersed in water, it can still work safely for a certain time to withstand damage of floods and efficiently enhance the reliability of power supply system.

6. The equipped oil-immersed load switch is imported specially-lengthened three-phase linked switch, with a spring structure to fulfill on-load opening and closing. The two-position switch in the load switch is used for single terminals, and the four-position switch itself is of the function of a ring network. So underground transformers can be applied in ring network and terminal supply of power, with convenient transition to improve the reliability of power supply.

7. Adopting unique heat sinks to ensure the sinks mechanical strength and heat dissipating ability.

8. Taking up no space after installation, not affecting the outlook.

9. Suitable for water-proof and fire-preventing underground electric grid.

10. The products undergo strict inspection before shipment, enjoying high reliability.

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Underground combination transformer

使用条件Application conditions

1、正常使用条件

A、环境温度：最高气温：+40℃

最低气温：-45℃

最高月平均温度：+30℃

最高年平均温度：+20℃

B、安装环境：无爆炸性、腐蚀性气体，安装场所无剧烈震动冲击，允许在一定时间内部分或全部浸没在水中运行。

C、地震引发的地面加速度：水平方向低于 3m/s^2 ；垂直方向低于 15m/s^2

D、倾斜度：小于 3°

2、特殊使用条件

使用条件特殊时,请与本厂联系协商。

1、normal application conditions

A、environmental temperature: highest temperature: +40℃

lowest temperature: -45℃

highest average monthly temperature: +30℃

highest average yearly temperature: +20℃

B、Installation environment: no explosive and corrosive gas, no violent impulse or impact at the installation site, capable of working when partly or wholly immersed in water

C、ground acceleration caused by earthquakes: horizontal direction: less than 3m/s^2 vertical direction: less than 15m/s^2

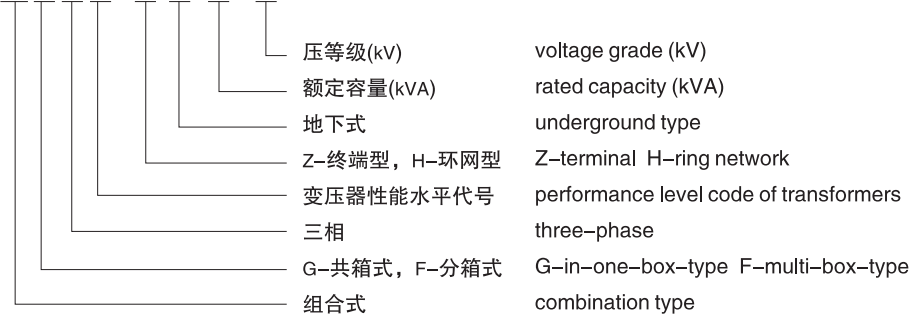
D、tipping degree: less than 3°

2、special application conditions

In case of special application conditions, please contact our company for consultation.

产品型号及含义Product models and applications

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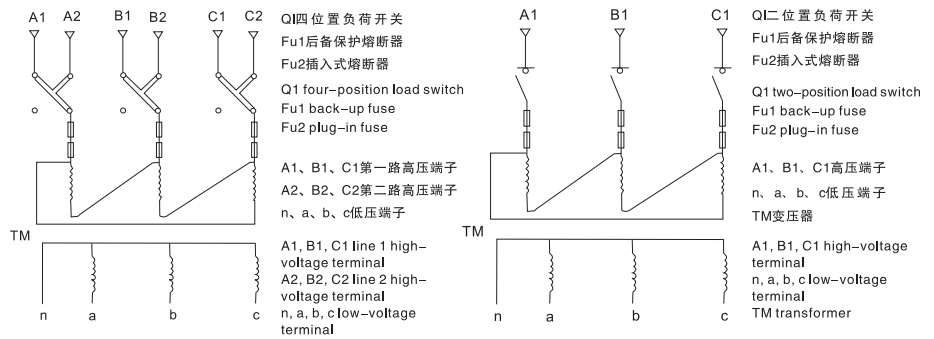
10kV

级地下式组合式变压器

电气原理electric theory

地下式组合变压器的电气原理图如下图所示：

the illustration of the electric theory of underground combination transformer is as follow:



环网型地下式组合变压器

ring network type underground combination transformer

终端型地下式组合变压器

terminal type underground combination transformer

主要技术参数Technical parameters

序号 sequence number	名称 description	单位 unit	高压侧 HV sides	变压器 transformer	低压侧 LV side
1	额定电压 rated voltage	kV	0		0.4
2	最高工作电压 highest working voltage	kV	12		
3	额定容量 rated capacity	kVA		200~1000	
4	额定电流(元件) rated current (components)	A	10~630		300~2000
5	短时耐受电流 short-time withstand current	kA	12.5		15~75
6	额定短时耐受时间 rated short-time withstand current	S	2		1
7	峰值耐受电流 peak withstand current	kA	31.5		30~165

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Underground combination transformer

序号 equence number	名称 Description	单位 unit	高压侧 HV sides	变压器 transformer	低压侧 LV side
8	工频耐压 power-frequency withstand voltage	kV	35	35	5
9	雷电冲击耐压 lightning impulse withstand voltage	kV	75	75	
10	高压限流熔断器额定开断电流 rated breaking current of high-voltage current-limiting fuse	kV	50		
11	噪声音水平 noise level	dB	≤48		
12	额定频率 rated frequency	Hz	50		

11系列地下式组合变压器参数

parameters of 11 series underground combination transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载 损耗 (W) no- load loss	负载 损耗 (W) load loss	空载 电流 (%) no- load loss	短路 阻抗 (%) short- circuit resistance	重量(kg) Weight			轨距A×B (mm) track gauge	外形尺寸(mm) L×W×H overall dimension
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol					器身重 tare	绝缘 油重 oil	总重 total		
200	6; 6.3; 6.6; 10; 10.5; 11; ±2 × 2.5%; or ±5%;	0.4	Yyn0 or Dyn11	340	2600	1.3	4.0	635	580	1560	660×660	1560×930×1450	
250				400	3050	1.2		730	600	1710	660×660	1560×1030×1485	
315				480	3650	1.1		850	615	1880	660×660	1560×1130×1535	
400				570	4300	1.0		1030	625	2110	660×660	1560×1130×1605	
500				680	5150	1.0	1180	650	2385	660×660	1555×1430×1645		
630				810	6200	0.9	1490	675	2925	820×820	1595×1635×1705		
800				980	7500	0.8	1710	760	3315	820×820	1640×1845×1750		
1000				1150	10300	0.7	1905	910	3885	820×820	1720×2185×1825		

注:以上数据仅供设计时参考, 订货时以实物为准。

Note: All the figures above are only for reference in design. The actual sizes of ordered products may vary.

10kV

级组合式变压器(美式箱变)

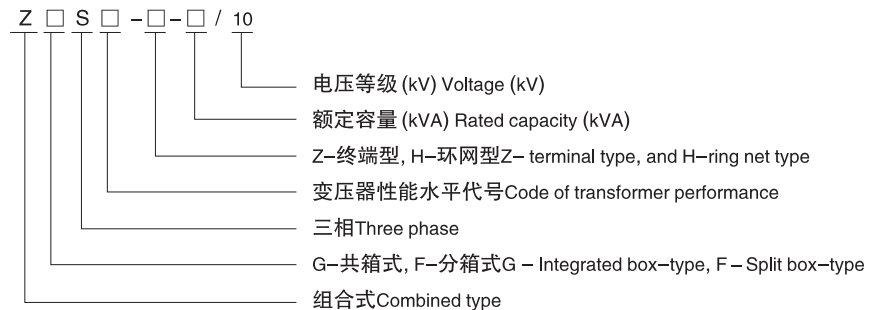


电气原理 electric theory

组合变压器，俗称美式箱变，具有供电可靠、结构合理、安装迅速、灵活、操作方便、体积小等卓越性能，广泛用于工业园区、居民小区、商业中心、城市道路以及高层建筑等各种场所。该产品与目前国内生产的欧式箱变不同在于：美式箱变是将变压器铁心、高压负荷开关、保护用熔断等设备一体化设计、放置于同一油箱中，因而体积较小。

combined transformer, commonly named as American box-type transformer, has outstanding features including reliable power supply, compact structure, fast and flexible installation, convenient operation, small size, etc. It can be widely used in industrial areas, residential communities, commercial centers, urban roads, high-rise buildings and other premises. The difference between this kind of product and European box-type transformer domestically manufactured is: American box-type transformer is designed with integration of transformer core, high-voltage load switch, protective fuse and other devices, and placed in an oil tank for relatively comparably smaller size.

产品型号及含义 Product models and applications



使用环境 Operating conditions

环境温度：最高气温+40℃，最低气温-30℃

海拔：≤1000m

风速：相当34m/s（不大于700Pa）

湿度：日相对湿度平均值不大于95%

月相对湿度平均值不大于95%

10kV

Assembled type Voltage
Transformer

防震：水平加速不大于 0.4m/s^2 ，垂直加速度不大于 0.15m/s^2

安装地点倾斜度：不大于 30°

安装环境：无爆炸性、腐蚀性气体，安装场所无剧烈震动冲击

订购本产品超出上述条件的规定时，可与本公司协商。

Ambient temperature: Highest temperature: $+40^\circ\text{C}$, lowest temperature: -30°C

Altitude above sea level: no more than 1,000 m

Wind speed: 34 m/s (no more than 700Pa)

Humidity: daily average of relative humidity no more than 95%

Monthly average of relative humidity no more than 95%

Shock resistance: horizontal acceleration no more than 0.4m/s^2 , vertical acceleration no more than 0.15m/s^2

Slope of installation site: no more than 30°

Installation conditions: free of explosive and corrosive gas, no severe vibration and shock

When the product is ordered for operating conditions out of the scope specified above, please inform the Company in advance.

产品特点 Features of product

体积小，结构紧凑，仅为同容量欧式箱变的三分之一左右。

全密封，全绝缘结构，无需绝缘距离，可确保人身安全。

既可用于环网，又可用于终端，转换十分方便，提高了供电的可靠性。

变压器性能卓越：低损耗、低噪音、低温升、过载能力强、抗短路、耐冲击能力强。

电缆接头可操作200A负荷电流，在紧急情况下可作为负荷开关操作，并具有隔离开关的特点。

采用双熔丝保护，降低了运行成本，插入式熔断器熔丝为双敏熔丝（温度、电流）。

选用高燃点油(R-TEMP油，燃点高达 312°C)，可置于建筑内消除火灾隐患。

采用Dyn11接法及三相五柱式结构，优点是电压质量高，中性点不飘移、噪音低、防雷性好。

Small size, compact structure, only one third of the size of European box-type transformer with same capacity

The product is fully enclosed and equipped with complete insulation structure without requiring insulation clearance to ensure personal safety.

It is suitable for both ring net and terminal and can be changed conveniently for an enhanced reliability of power supply.

Outstanding performances of transformer: low noise, low loss, low temperature rise, strong overload capacity, and resistance to short circuit and impact.

10kV

级组合式变压器(美式箱变)

The cable connector can be operated at load current of 200A and operated as load switch under emergency circumstances. It also has features similar to isolating switch.

Adopt double fuse protection to reduce operating cost, and the plug fuse is fuse of double sensitivity (temperature and current).

Due to use of oil with high ignition point (R-TEMP oil, the ignition point is up to 312°C), it can be used in buildings and eliminate risk of fire.

Adopt Dyn11 connection and three-phases five-poles structure with advantages such as high quality of voltage, no displacement of neutral point, low noise and good lightning protection.

主要技术参数 External dimensions of product

序号 sequence number	项目 description	单位 unit	技术参数 technical parameters	
1	额定电压 rated voltage	一次侧 primary	kV	6~10
		二次侧 secondary	kV	0.4
2	额定工作电压 ed working voltage	kV	12	
3	额定频率 rated frequency	Hz	50	
4	额定容量 rated capacity	kVA	100~1250	
5	1分钟工频耐受电压 1-minute power-frequency withstand voltage	kV	35	
6	雷电冲击耐受电压 lightning impulse withstand voltage	kV	95	
7	2秒短时耐受电流 2-second short-time withstand current	kV	12	
8	高压后备限流熔断器遮断容量 interrupting capacity of high-voltage back-up current-limiting fuse	kV	50	
9	无载调压 no-load-tap-change		$(6\sim 10) \pm 2 \times 2.5\%$	
10	环境温度 environmental temperature	°C	-20~+40	
11	允许温升 permissible temperature rise	K	55	

10kV

Assembled type Voltage Transformer

电气原理图 Electric theory

1、高压接线方案图 high-voltage connection diagram

编号 number	I	II	III	IV
系统方案 systematic scheme				
	终端供电 terminal power supply	双电源供电 double-power supply	环网、双电源供电 ring network, double-power supply	高压计量方案 high-voltage measure scheme
FYN-12 高压负荷开关	315-630A	315-630A	315-630A	315-630A
FYN-12 high-voltage load switch				

2、低压接线方案图 low-voltage connection diagram

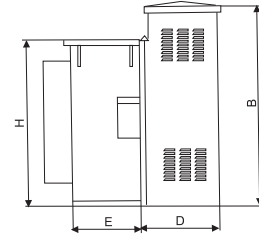
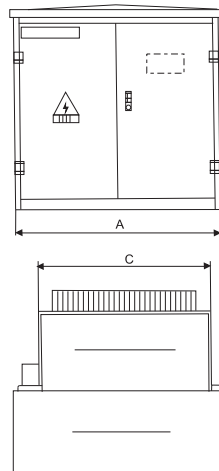
类型 Type	方案1 scheme 1	方案2 scheme 2	方案3 scheme 3	方案4 scheme 4
电气主接线 main electric connection				
元件 element	支路开关100-630A branch switch	主开关630-1250A main switch 支路开关100-630A branch switch	支路开关100-630A branch switch	主开关630-1250A 支路开关100-630A branch switch
类型 type	方案1 scheme 1	方案2 scheme 2	方案3 scheme 3	方案4 scheme 4
元件 element	支路开关100-630A branch switch 补偿容量30-300kVar compensation capacitor	主开关630-1250A main switch 支路开关100-630A branch switch 补偿容量30-300kVar compensation capacitor	支路开关100-630A branch switch 补偿容量30-300kVar compensation capacitor	主开关630-1250A main switch 支路开关100-630A branch switch 补偿容量30-300kVar compensation capacitor

10kV

级组合式变压器(美式箱变)

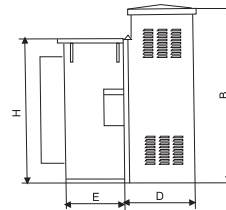
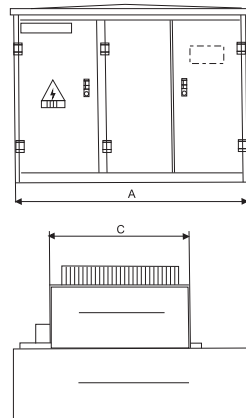
产品外形尺寸External dimension

1、标准型外形尺寸图 1、External dimension of standard type



标准型外形尺寸 overall dimensions of standard type					
容量KVA	100-250	315-400	500-630	800-1000	1250
A	1840	1840	1840	2000	2200
B	1780	1780	1780	1780	1780
C	1250	1450	1550	1700	2000
D	800	800	800	800	800
E	555	555	625	725	855
H	1400	1500	1500	1500	1550

加强型外形尺寸External dimension of enforced type



标准型外形尺寸 overall dimension of standard type					
容量KVA	100-250	315-400	500-630	800-1000	1250
A	2200/2400	2200/2400	2200/2400	2200/2400	2200/2400
B	1820	1820	1820	1820	1820
C	1250	1450	1550	1700	2000
D	800	800	800	800	800
E	555	555	625	725	855
H	1400	1500	1500	1500	1550

注：以上外形尺寸仅供设计时参考，订货时以实物尺寸为准。

Note: The above external dimensions are for reference only and the order should be performed based on the real size.

TRANSFORMER

10kV

Pole-mounted smart combined transformer



概述 Overview

柱上智能组合式变压器，为人民电器集团自主研发、拥有自主知识产权的新一代智能型配电产品。该产品是由低损耗节能式变压器、智能型柱上变压器控制柜、计量箱及监控设备等部件组成。该产品安装于户外配变台架上，是传统台变和JP柜的新型替代产品。

Pole-mounted smart combined transformer, researched and developed independently by People Electric Appliance Group, is a new-generation intelligent power distribution product with its own intellectual property right. This product is composed of low-loss energy-saving transformer, pole-mounted intelligent transformer control cabinet, measuring box and monitoring equipment and so on. The product is installed on outdoor distribution transformer rack, and is a new alternative for traditional transformer and JP cabinets.

柱上智能组合式变压器的推广应用，可以简化设备的安装流程，节省设备的安装时间和空间，提高设备的安全性能，降低设备的运行能耗，节省设备的投资，同时具备了有效防止设备盗窃和窃电行为的功能，具有安装、操作、检修方便，智能化保护和监控，智能型无功补偿等优点，产品性能达到国内先进水平。

The application of pole-mounted smart combined transformer can simplify the installation process of equipment, save the time and space of equipment installation, improve safety performance of equipment, reduce energy consumption of equipment in operation, and save equipment investment; meanwhile, it can effectively prevent equipment theft and electricity stealing, and has the advantages such as convenient installation, operation and maintenance, intelligent protection and monitoring and intelligent reactive power compensation; the product's performance has reached the domestic advanced level.

型号含义 Model designation



10kV

级柱上智能组合式变压器

主要技术参数 Technical parameters

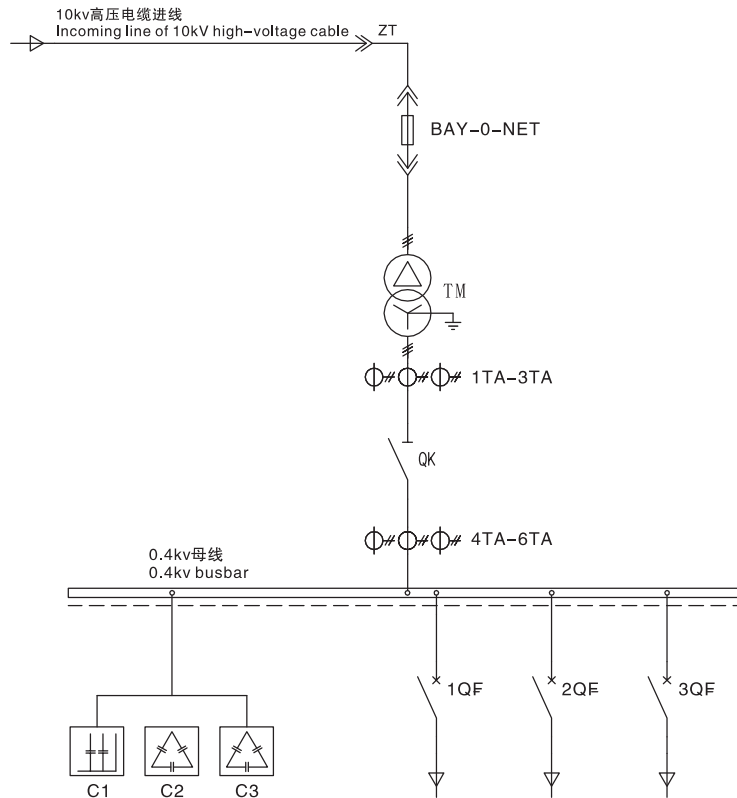
序号 No.	项目 Item	单位 Unit	技术参数 Technical parameters
1	一次额定电压Rated primary voltage	kV	6~10
2	二次额定电压Rated secondary voltage	kV	0.4
3	最高工作电压Maximum working voltage	kV	12
4	额定频率Rated frequency	Hz	50
5	额定容量Rated capacity	kVA	100~400
6	1分钟工频耐压1 min power frequency withstand voltage	kV	35
7	雷电冲击耐压Lightning impulse withstand voltage	kV	75
8	调压范围Voltage range		$\pm 2 \times 2.5\%$ or $\pm 5\%$
9	短路阻抗Short circuit impedance	%	4
10	联结组别Link group		Dyn11 or Yyno
12	进出线方式Inlet and outlet methods		电缆或架空线 Cable and overhead line
13	出线回路Outlet circuit	回	2~3
14	无功补偿容量Reactive power compensation capacity		变压器容量 Transformer capacity 10%~40%
15	补偿方式Compensation mode		智能补偿 Intelligent compensation
16	一次侧保护方式Method of primary side protection		熔断器保护 Fuse protection
17	一次侧保护方式Method of primary side protection		智能断路器保护 Intelligent circuit breaker protection
18	环境温度Ambient temperature		-20~+40
19	使用条件Conditions of usage	℃	户外式 Outdoor type
20	安装方式Installation method		水泥杆双杆安装 Cement double pole installation

TRANSFORMER

10kV

Pole-mounted smart combined transformer

一次原理图 Primary schematic diagram



Zt:肘型电缆头

Zt:Elbow cable head

Bay-O-Net:熔断器

Bay-O-Net:Fuse

TM:低损耗节能变压器

TM:Low-loss energy-saving transformer

QK:刀开关

QK:Knife switch

QF:智能型塑壳式断路器

QF:Intelligent molded case circuit breaker

C:智能电容器

C:Intelligent capacitor

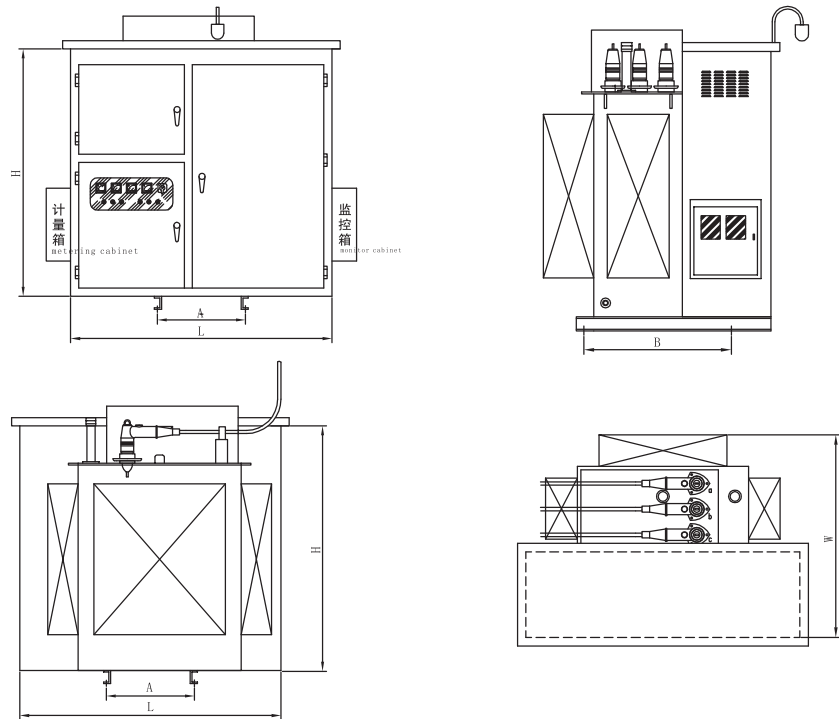
TA:电流互感器

TA:Current transformer

10kV

柱上智能组合式变压器

产品外形尺寸 External dimensions of product



容量Capacity(KVA)	L	W	H	A	B
100	1100	960	1100	400	750
125	1100	980	1100	400	750
160	1200	1035	1200	550	850
200	1200	1050	1200	550	850
250	1200	1085	1200	550	850
315	1300	1115	1200	550	850
400	1300	1155	1200	550	850

注：以上外形尺寸仅供设计时参考，订货时以实物尺寸为准。

Note: the above dimensions are only reference for design, and the full size shall prevail when ordering.

ZBW

Series combined transformer substation



适用范围 Scope of application

ZBW系列组合式变电站，俗称欧式箱变，是将高压电气设备、变压器、低压电气设备等组合成紧凑型成套配电装置，用于城市高层建筑、城乡建筑、居民小区、高新技术开发区、中小型工厂、矿山油田以及临时施工用电等场所，作配电系统中接受和分配电能之用。

ZBW系列组合式变电站，具有成套性强、体积小、结构紧凑、运行安全可靠、维护方便、以及可移动等特点，与常规土建式变电站相比，同容量的组合式变电站占地面积通常仅为常规变电站的1/10~1/5，大大减少了设计工作量及施工量，减少了建设费用。在配电系列中，可用于环网配电系统，也可用于双电源或放射终端配电系统，是目前城乡变电站建设和改造的新型成套设备。

ZBW系列组合式变电站符合SD320-1992《箱式变电站技术条件》和GB/T17467-1997《高压/低压预装式变电站》的标准。

ZBW series combined transformer substation, commonly named as European box-type transformer, is a kind of compact power distribution device that integrates high voltage electrical devices, transformer, low voltage electrical devices together. It can be used in high-rise buildings, buildings in urban and rural areas, residential communities, high-tech development areas, small & medium size factories, mining areas, oil fields, temporary construction sites, and other premises, and can also be used for acceptance and distribution of power in power distribution system.

ZBW series combined transformer substation is characterized with features including high integrity, small size, compact structure, safe and reliable operation, convenient maintenance, portable, etc. Compared to conventional transformer requiring civil work, the combined transformer with same capacity needs only one-tenth to one-fifth of the floor area for conventional transformer so that the design work, construction work and construction expense is reduced significantly. It also can be used in ring net power distribution system and double power supply or terminal power distribution system. This new complete set of product is an ideal choice for construction and modification of transformer in urban and rural areas.

ZBW series combined transformer substation complies with standards of SD320-1992 "Technical specifications for box-type transformer" and GB/T17467-1997 "High voltage/low voltage prefabricated substations".

ZBW

系列组合变电站

工作条件Operating conditions

海拔高度不超过1000m;

环境温度最高不超过+40℃，最低不低于-25℃，24小时周期内平均温度不超过+35℃。

户外风速不超过35m/s;

空气相对湿度不超过90% (+25℃) ;

地震水平加速度不大于0.4m/s²，垂直加速度不大于0.2m/s²;

无火灾、爆炸危险、严重污秽、化学腐蚀及剧烈震动的场所。

特殊使用条件，订货时与我公司协商解决。

Attitude above sea level: no more than 1,000 m

Ambient temperature: highest temperature +40℃, lowest temperature -25℃, average temperature in 24 hours no more than +35℃

Outdoor wind speed no more than 35m/s

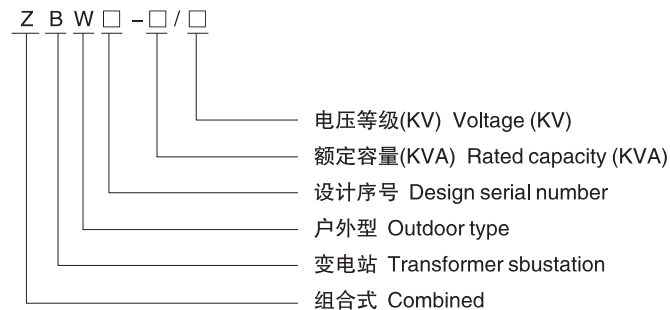
Air relative humidity no more than 90% (+25℃)

Shock resistance: horizontal acceleration no more than 0.4m/s², vertical acceleration no more than 0.2m/s²

Installation conditions: no risk of fire and explosion, free of serious contamination, chemical corrosion and severe vibration and shock

For special operating conditions, please inform the Company in ordering and solve it through negotiation.

型号及其含义Description and model of product



主要技术参数 Main technical parameters

序号 No	项目 Item	单位 unit	高压电器 HV electrics	变压器 Transformer	低压电器 LV electrics
1	额定电压Ue rated voltage	kV	7.2、12	6/0.4、10/0.4	0.4
2	额定容量Se rated capacity	kVA		目型：200~1250	
3	额定电流Le rated current	kVA	200~630		100~3000
4	额定开断电流 rated breaking current	A	负荷开关400~630A loaded switch		15~63
		kA	组合电器取决于熔断器 combined electrics depends on the fuse		
5	额定短时耐受电流 rated short time withstand current	kA	20(2S)	200~400kVA	15(1S)
			12.5(4S)	400kVA	30(1S)
6	额定峰值耐受电流 rated peak with stand current	kA	31.5、50	200~400kVA	30
				400kVA	63
7	额定关合电流 rated closing current	kA	31.5、50		≤300V时2kV when ≤300V, 2K
8	工频耐受电压1min industry frequency withstand voltage	kV	相对地及相间42、30 phase to earth and between phases	油变：35/5min oil transformer	300,660V时2.5kV when 300, 600V, 2.5K
			隔离断口48、34 isolated fracture	干变：28/5 min dry type transformer	
9	雷电冲击 lighting impulse	kV	相对地及相间75.60 phase to earth and between phases	75	
			隔离断口85、75 isolated fracture		
10	噪声水平 noise level	dB		油变：<55 oil transformer	
				干变：<65 dry type transformer	
11	防护等级 protection level		IP33	IP23	IP33
12	外形尺寸 outline dimension		根据所选变压器容量和形式，选定不同的外形尺寸。 select different size according to the chosen capacity and type		

产品结构特点Structural features of product

1、本产品由高压配电装置、变压器及低压配电装置联接而成，分成三个功能隔室，即高压室、变压器室和低压室。高、低压室功能齐全，高压侧一次供电系统，可布置成环网供电、终端供电、双电源供电等多种供电方式，还可装设高压计量装置，满足高压计量的要求。变压器室可选择S9、S11系列低损耗油浸式变压器和SC(B)9、SCR9、SC(B)10、SCR10系列干式变压器；变压器室设有自启动强迫风冷系统及照明系统，低压室根据用户要求可采用面板或柜装式结构组成用户所需供电方案，有动力配电、照明配电、无功功率补偿、电能计量和电量测量等多种功能，满足用户的不同要求，并方便用户的供电管理和提高供电质量。

2、高压室结构紧凑合理、并具有全面防误操作的“五防”联锁功能。变压器在用户有要求时，可设有轨道能方便地从变压器室两侧大门进出。各室均有自动照明装置，另外高、低

ZBW

系列组合变电站

压室所选用全部元件性能可靠、操作方便、使产品运行安全可靠、操作维护方便。

3、采用自然通风和强迫通风两种方式、使通风冷却良好。变压器室和低压室均有通风道，排风扇有温控装置，按整定温度能自动启动和关闭，保证变压器满负荷运行。

4、箱体结构能防止雨水和污物进入采用特种钢板或铝合金板制作，经防腐处理，具备长期户外使用的条件。确保防腐、防水、防尘性能，使用寿命长，同时外形美观。

This product consists of high voltage power distribution device, transformer and low voltage power distribution device. It is divided into three function compartments, high voltage compartment, transformer compartment and low voltage compartment. Both high voltage and low voltage compartments are provided with all functions, the primary power supply system on high voltage side can be configured in various power supply methods, such as ring net power supply, terminal power supply, power supply with double supply. High voltage metering instrument can also be installed on high voltage side to satisfy the requirements for high voltage measurement. For transformer compartment, S9, S11 series low loss oil immersed transformer, and SC(B)9, SCR9, SC(B)10, SCR10 series dry transformer are available, and the transformer compartment is equipped with self-start forced air cooling system and lighting system. The low voltage compartment can be equipped with panel or cabinet type structure based on customer's requirements, and has various functions including distribution for drive power, power distribution for lighting, compensation of reactive power, metering of electricity energy, and measurement of electricity consumption to meet various demands of customers and provide customers with convenient management and high quality in terms of power supply.

High voltage compartment is designed with compact structure and interlock function of "Five preventions" to completely protect from mis-operation. Upon customer's request, the transformer can be equipped with guide rail for convenient access through the gates on both sides of the transformer. All compartments are provided with auto lighting system, furthermore, both high voltage and low voltage compartments are made of reliable and easy to operate elements so that the product can be operated safely and stably, maintained conveniently.

The product has good cooling and ventilation effect due to application of both natural ventilation and forced ventilation. Both transformer compartment and low voltage compartment are equipped with ventilation ducts, the exhaust fan is provided with temperature regulating device and can start or stop automatically according to the preset temperature to ensure the transformer to be operated under full load.

The box structure is designed with special steel sheet or aluminum alloy sheet to prevent entry of rain water and dirty. The box is treated with anti-corrosion measures and is suitable for outdoor use for long time. The box is provided with features including resistance to corrosion, water proof, dust proof, long useful life and good external appearance.

ZBW

Series combined transformer substation

平面布置形式及外形尺寸Plane layout and external dimensions

1、ZBW系列箱式变电站，根据排列方式分：

“目”字型排列(图1-1、图1-2)；

“品”字型排列(图1-3、图1-4)；

ZBW series box-type transformer substation, based on its configuration, can be classified as follows

"B" type configuration (see figure 1-1 and figure 1-2)

"Delta" configuration (see figure 1-3 and figure 1-4)



图1-1



图1-2

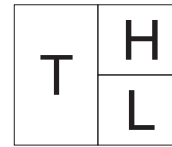


图1-3

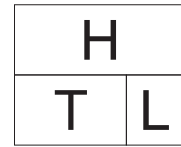


图1-4

图为ZBW系列箱式变电站平面布置形式图 H-高压室 T-变压器室 L-低压室

Configuration diagram of ZBW series box-type transformer substation is shown in the figure.

H – high voltage compartment, T–transformer compartment, L–low voltage compartment

2、外形尺寸见图2、图3、表2 For external dimensions see figure 2, 3 and table 2

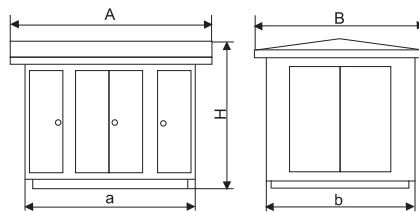


图2 ZBW系列箱式变电站外形图(“目”字型排列)
Figure 2: External drawing of ZBW series box-type transformer substation (“B” type configuration)

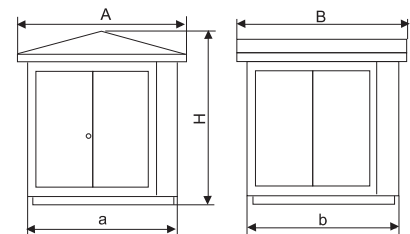


图3 ZBW系列箱式变电站外形图(“品”字型排列)
Figure 3: External drawing of ZBW series box-type transformer substation (“Delta” configuration)

ZBW

系列组合变电站

类别 categories		A	a	B	b	H	最佳适用场所 Best suitable occasion	
三相 three phases	目字型 B type	100-630kVA	4140		2590	2290	2320	工矿、油田、建筑施工等 industry mine, oil field, building construction
		800-1250kVA	5184		2500	2290	2626	
	品字型 Delta type	50-400kVA	2500		2400	2200	2320	生活小区 residential subdistricts
单相 single phase	目字型 B type	≤50kVA	2500		1260	1060	2215	路灯供电 street lamp power supply
		80-100kVA	2500		1840	1640	2215	

注：以上外形尺寸仅供设计时参考，订货时以实物尺寸为准。

Note: The above mentioned external dimensions are for reference only, and the order should be performed based on real size.

订货须知Notes to order

订货时请提供以下资料：

箱式变电站型式；

变压器型号和容量；

高、低压回路主接线方案图；

有特殊要求的电气元件型号和参数；

外壳颜色；

备品、备件的名称、数量以及其它要求。

The following information shall be provided for order:

Type of box-type transformer substation

Model and capacity of transformer

Connecting diagram of high and low voltage circuits

Models and parameters of electrical elements with special requirements Color of housing

Description, quantity and other requirements for spare parts and elements

TRANSFORMER

ZGS-Z · F

Wind substation, wind power generation prefabricated substation



概述 Overview

ZGS-Z · F40.5/0.69系列风力变电站是将风电机组发出的0.6–0.69kV电压升高到35kV或10kV后，并网输出的专用变电设备，是我公司根据国内风力发电市场要求而量身定做的专供风力发电用的新产品。它的出现适应了全国大范围建立风力发电场的趋势，是集可靠性、安全性、实用性、经济性于一体的理想的风力发电系统的配套产品。

ZGS-Z · F40.5/0.69 series of wind substations specifically transforms 0.6–0.69kV outputted by wind power generator units to 35kV or 10kV for transmission with power grids. The series is newly developed especially to meet the needs in Chinese market. They are intended for supply to wind farms to be newly built widely around China, featuring reliability, safety, usability and economy, and being ideal for working with wind power generation systems.

型号含义 Model designation

ZGS-Z · F-□-40.5/0.69

□	低压侧电压 (kV)	LV side voltage (kV)
40.5	高压侧电压 (kV)	HV side voltage (kV)
0.69	变压器容量 (kVA)	Transformer capacity (kVA)
ZGS-Z	风力发电	Wind power generation
F	终端型	Terminal
-	共箱式	Shared box

使用环境条件 Working conditions

- 环境温度
最高: +40℃ 最低: -40℃
- 海拔高度 ≤2000m
- 湿度 日平均≤100%，月平均≤90%
- 地震裂度 8度 (中国12级度标准)
- 户外风速 不大于50m/s 风压100kgf/m²
- 耐污等级 III级污秽地区
- 安装场所 户外，安装在无火灾、爆炸危险、无导电埃、化学腐蚀性气体的场所
- 覆冰厚度 10mm

ZGS-Z·F

风力变电站
风力发电箱式变电站

1. Ambient temperature
Max.: +40℃ Min.: -40℃
2. Altitude asl ≤ 2000m
3. Humidity Daily average ≤ 100%; monthly average ≤ 90%
4. Earthquake intensity 8 (Chinese standard 12-magnitude scale)
5. Outdoor wind speed No large than 50m/s; wind pressure 100kgf/m²
6. Antipollution Class III region
7. Installation positions: Outdoor places without risks of fire, explosion, conductive dust, corrosive gases
8. Ice covering 10mm

产品特点 Features of product

- 1、本产品的变压器采用优质硅钢片材料，经电磁优化设计后，其空载损耗和负载损耗均比同类产品低，最大限度地保证了风能的充分利用；
- 2、安全：高压部分采用负荷开关+熔断器组合电器，可以快速可靠地保护变压器，低压部分可采用断路器或刀熔开关作为主开关，配置小容量变压器提供箱变和风塔的0.4kV照明及检修用电；
- 3、耐高温、过负荷运行能力强；
- 4、寿命长：使用寿命超过20年；
- 5、免维护：寿命期内无须滤油、换油，变压器的密封件与变压器同寿命；
- 6、防护等级高：风力变的箱体采用双层门密封结构，所有门的闭合处都采用密封胶条密封，通风口设有防尘装置，能有效防止沙尘、雨雪对风力变的侵扰，防护等级达到IP54；

1. The transformer in the substation is made with quality silicon steel. Through electromagnetic optimization, the no load loss and load loss of the transformer are the lowest among compared with similar products, to ensure the maximum utilization of wind energy.
2. Safety: The HV component uses a switch disconnecter + fuse combination for prompt and reliable protecting the transformer; while the LV component uses a circuit breaker or knife fuse switch as the main switch. A small transformer is used to provide 0.4kV electricity for lighting and servicing for the prefabricated substation and wind power towers.
3. Resistance against high temperatures, work under overload
4. Long service life: over 20 years
5. Maintenance free: No oil filtration or replacement is required during the service life. Sealing parts are as durable as the transformer.
6. High protection class: The wind substation transformer is of a sealed structure with two

TRANSFORMER

ZGS-Z · F

Wind substation, wind power generation prefabricated substation

doors. All gaps are sealed with rubber strips. Ventilation openings have dustproof devices to resist sand, storm and interference from the wind substation transformer. The protection class is IP54.

技术参数 Technical data

变压器特性及性能表 Transformer Characteristics and Specification

序号 S/N	项目 Item	保证值 Guaranteed value
1	型式 Type	三相、双绕组、油浸自冷、低损耗、全密封免维护 3-phase, dual windings, oil-immersed and self-cooling, low loss, fully-sealed, and maintenance-free
2	最高工作电压 (kV) Max. working voltage (kV)	40.5
3	额定频率 (Hz) Rated frequency (Hz)	50
4	额定容量 (kVA) Rated capacity (kVA)	800-1600
5	电压比 (kV) Voltage ratio (kV)	$38.5 \pm 2 \cdot 2.5\% / 0.69$
6	联接组别 Connection groups	D,yn11
7	阻抗电压 Impedance voltage	4.5%-6.5%
8	调压方式 Voltage regulation mode	无励磁分接开关 off circuit tap changer
9	变压器油 Transformer oil	克接玛依4.5#绝缘油 Kelamayi 4.5# insulating oil
10	额定短时工频耐受电压 (kV) Rated short duration power frequency withstand voltage (kV)	95kV/1min
11	雷电冲击耐受电压峰值 (kV) Peak lightning impulse withstand voltage (kV)	215
12	冷却方式 Cooling type	ONAN
13	外壳防护等级 Enclosure protection class	油箱IP68, 箱体IP54 Oil tank: IP68; box: IP54
14	温升 (k) Temperature rise (k)	线圈: 63k, 顶层油: 53k Coil: 63k; top level oil: 53k
15	空载电流 (%) No load current (%)	0.6%
16	噪音水平 (db) Noise level (db)	不大于50db No larger than 50db

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 风力变电站
 风力发电箱式变电站

高压负荷开关性能表 HV Load Switch Performance

序号 S/N	项目 Item	保证值 Guaranteed value
1	型号 Model	ZGS-Z·F40.5/0.69
2	电压等级 (kV) Voltage class (kV)	40.5
3	最大相对相电压 (kV) Max. phase-to-phase voltage (kV)	40.5
4	最大相对地电压 (kV) Max. phase-to-earth voltage (kV)	40.5
5	额定短时工频耐受电压 (kV) Rated short duration power frequency withstand voltage (kV)	95kV/1min
6	雷电冲击耐受电压峰值 (kV) Peak lightning impulse withstand voltage (kV)	200
7	额定电流 (A) Rated current (A)	630
8	短时耐受电流(有效值-10周波) Short time withstand current (effective value - 10 cycles)	20kA/2s
9	额定开断能力(A) Rated breaking capacity (A)	630
10	主回路电阻($\mu\Omega$) Main circuit resistance ($\mu\Omega$)	不大于150 Not more than150
11	机械寿命(次) Mechanical life (times)	不小于20000 Not less than20000

高压熔断器性能表 HV Fuse Performance Table

序号 S/N	项目 Item	保证值 Guaranteed value
1	型号 Model	STR20-40.5
2	额定电压 (kV) Rated voltage (kV)	40.5
3	额定电流 (A) Rated current (A)	100
4	额定频率 (Hz) Rated frequency (Hz)	50
5	额定开断能力 (kA) Rated breaking capacity (kA)	40
6	熔丝额定电流 (A) Fuse wire rated current (A)	20~100可选 20~100whether

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Wind substation, wind power generation prefabricated substation

高压避雷器性能表 HV Lightning Arrester Performance Table

序号 S/N	项目 Item	保证值 Guaranteed value
1	型号 Model	HY5WZ-51/134
2	额定电压 (kV) Rated voltage (kV)	51
3	持续运行电压 (kV) Continuous operating voltage (kV)	40.8
4	直流参考电压 (kV) DC reference voltage (kV)	73
5	0.75U _{1ma} 下的泄漏电流 (μA) Leakage current under 0.75U _{1ma} (μA)	不大于30 Not more than 30
6	8/20 μS标称放电电流下残压 (kV) Residual voltage at 8/20 μS nominal discharge current (kV)	不大于134 Not more than 134
7	2000 μS方波电流 (幅值, A) 2000 μS rectangular wave current (amplitude, A)	不小于400 not less than 400
8	4/10 μS大电流冲击耐受电流 (kV) 4/10 μS heavy current impulse withstand current (kV)	不小于65 not less than 65
9	1.05U _c 下的局部放电量 Partial discharge at 1.05U _c	小于14PC less than 14PC

风力变壳体结构 Wind substation transformer construction

a、总体布置：品字型；

b、底座结构：底座由标准槽钢焊接；焊接成型后将底座整体放入表面处理池中进行前期预处理，工序包括四个部分：酸洗、磷化、底漆、面漆（烘烤）；面漆选用进口优质户外漆，漆膜厚度为0.3mm；

c、箱体结构：变压器油箱为6.0厚热轧钢板焊接而成，采用全自动CO₂气体保护焊接工艺，散热片为1.0mm优质低碳冷板制作，采用等离子焊接工艺，严格保证焊接质量，确保油箱永无渗透油之忧，前箱体由2.5厚冷轧优质钢板弯制而成，门板由30mm厚夹层复合钢板（夹层填充材料聚丙烯泡沫或聚胺脂，厚度为30mm），具有抗幅射、隔热、隔音、防凝露等优点；箱体门锁材料为铸铝型专用锁，带把手和锁盒盖，具有强度高，寿命长、防雨、防锈、防盗特点，非常适用于户外电力成套设备。铰链采用高强度内铰链，表面镀锌处理；门框内侧镶有高弹性、耐老化的密封胶条，门下侧设有缓冲风钩。

d、箱顶结构：材料为冷轧钢板发泡成型，发泡层厚度30mm，发泡层与顶隔板之间设有100mm排风通道；箱顶整体成形后具有高强度、隔热、抗幅射、抗凝露等特点，可承受冬季300mm的覆雪厚度或10mm的覆冰厚度；

e、箱体表面处理：喷塑（户外型），保证十年不褪色，三十年不受腐；颜色：按厂标；

f、箱体防护等级：变压器油箱：IP68；考虑到箱变的按装地环境恶劣，高低压箱体均用冷轧

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风力变电站
风力发电箱式变电站

钢板迷宫式折边，配以高强度耐老化的密封件，可使高低压箱体的防护等级达IP54；

1、箱式变电站接地系统

箱变内设有专用接地铜母线，贯穿各室，箱内各室金属非带电部件及金属构件均与接地母线有效连接，底座设有专用的铜质接地螺丝（M12）与接地母线连接，底座外侧另设有四个专用的铜质接地螺丝[M12]，供用户与基础接地网连接用；

2、箱式变电站使用寿命：

箱变的整体寿命按30年设计（高低压熔丝等易损件的更换除外）；

a. Overall layout: “delta” shaped

b. Base construction: The base is made with welded standard channel steel. The welded base has been treated in the surface treatment tank for pre-treat with four processes, including pickling, phosphorization, primer application and finish (baking). The finish coat is of high quality for outdoor applications. The thickness of coating is 0.3 mm.

c. Box construction: The transformer oil tank is made with hot-rolled steel plate 6.0 thick welded by means of automatic CO2 gas shielded welding. The heat dissipation fins are made of quality low carbon cold plates 1.0 mm thick. The fins are welded with plasma welding to ensure welding quality and avoid oil leakage. The front box is made with bent cold-rolled quality steel plates of 2.5 thick. The door panels are made with 30 mm sandwiched compound steel plates (with interlayer filled with polypropylene foam or polyurethane, 30 mm thick), featuring resistance against radiation, heat, noise and condensation. The box door locks are special cast aluminum locks with handles and cover, and are strong, durable, rainproof, rustproof, and burglarproof, ideal for outdoor electrical equipment. The hinges are high strength inner hinges, with surface galvanized. The side lining of door frames are made of high elasticity and aging-resistant sealing rubber strips, and there are buffer wind hookers under doors.

d. Box top construction: The box is made of cold-rolled steel plates by means of foam forming. The thickness of the foam course is 30 mm. There is a 100mm ventilation passage between the foam course and the top plate. The formed box top features high strength, heat isolation, radiation resistance and condensation resistance, and withstand covering of 300 mm snow or 10 mm ice.

e. Box surface treatment: Plastic spraying (outdoor) ensures no color fading in ten years, and no corrosion in thirty years. Colors are as per the manufacturer's standards.

f. Box protection class: Transformer oil tank: IP68. Considering the severe conditions of installation sites, both HV and LV boxes uses labyrinth sides of cold-rolled steel plates, together with highly strong and aging-resistant sealing parts to achieve the protection class of IP54 for HV and LV boxes.

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Wind substation, wind power generation prefabricated substation

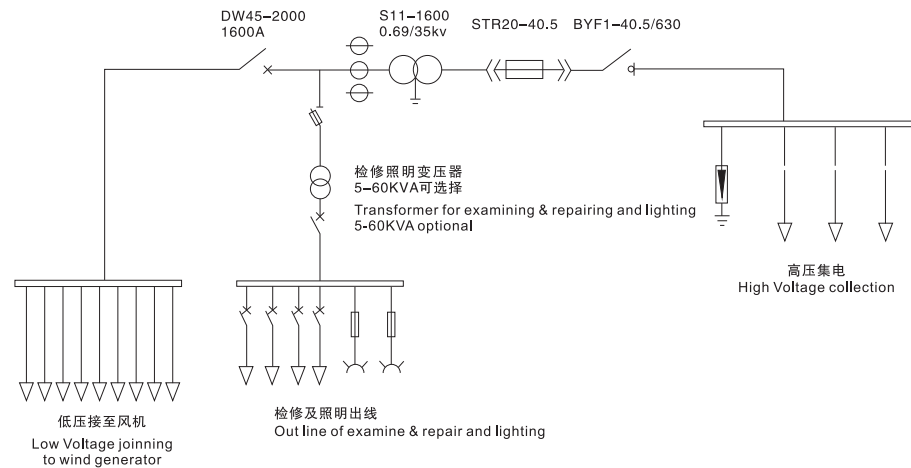
1. Earthing of prefabricated substation

Prefabricated substations have special earthing copper bus through all chambers. All metallic unelectrified parts and metallic components are effectively connected to the earthing bus. There is a special copper earthing screw (M12) connected to the earthing bus. The base has another 4 special copper earthing screws (M12) for connection with the foundation earthing network.

2. Service life of prefabricated substation:

The design service life of prefabricated substations is 30 years (except wearable parts such as HV and LV fuse wires).

典型方案 Typical schemes



35kV

光伏发电组合式变压器/ 预装式变电站



产品描述Standards

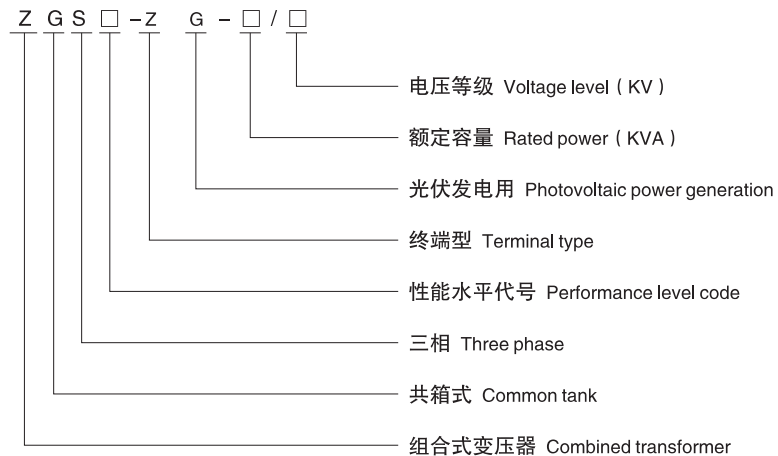
太阳能资源丰富、分布广泛，是21世纪最具发展潜力的可再生能源。随着全球能源短缺和环境污染等问题日益突出，太阳能光伏发电因其清洁、安全、便利、高效等特点，已成为世界各国普遍关注重点发展的新型产业。

Solar energy is rich in resources and has a wide distribution, also is the renewable energy sources which have the best development potential in 21th century. Since the global energy shortage and environment pollution problem increasingly prominent, photovoltaic power generation by solar energy have become the new industry generally concerned and prioritized by worldwide since the characteristics such as clean, safety, convenience and efficient.

型号及其含义Description and model of product

方案一：光伏发电组合式变压器(美变结构)

Program 1: Photovoltaic power generation combined transformer (pad-mounted type)



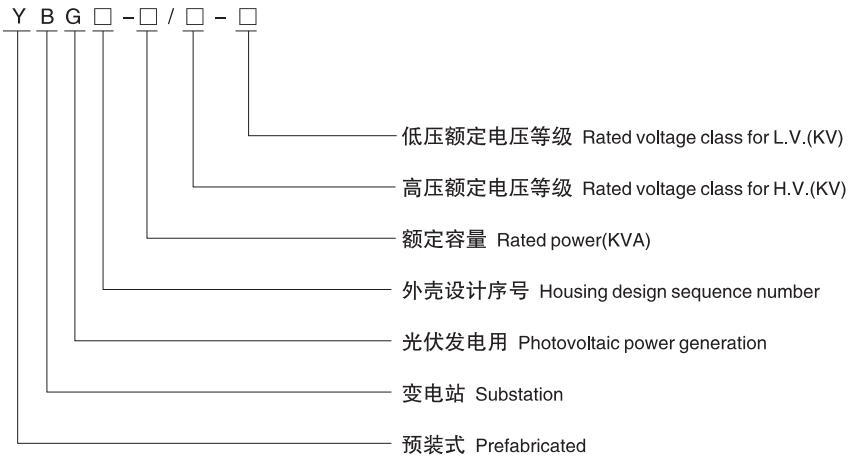
TRANSFORMER

35kV

Photovoltaic power generation combined transformer / prefabricated substation



方案二：光伏发电预装式变电站(华变结构)额定容量(KVA)
Program 2: Photovoltaic power generation prefabricated substation



方案三：高压/低压预装式变电站(欧变结构)型号与方案二相同
Program 3: HV/LV prefabricated substation

正常使用环境条件Normal ambient condition

- 3.1 海拔一般不超过1000m
- 3.2 环境温度范围为：-25℃~+45℃
- 3.3 户外风速不超过35m/s
- 3.4 防震：水平加速0.3m/s;垂直加速度不大于0.15m/s²
- 3.5 防秽等级：Ⅲ级
- 3.6 安装地点：户外

超出上述正常使用环境条件时，本公司可根据用户使用要求进行个性化设计。

- 3.1 Altitude is not exceeding 1000m.
- 3.2 Ambient temperature range: -25℃~+45℃
- 3.3 Outdoor wind speed is not more than 35m/s
- 3.4 Seismic: horizontal acceleration 0.3m/s²; Vertical acceleration is not more than 0.15 m/s²
- 3.5 Pollution level: Ⅲ
- 3.6 Setting condition: Outdoor

We can design according to the special requirements which are beyond above condition.

35kV

光伏发电组合式变压器/
预装式变电站

主要技术参数Main technical parameter

电压

系统电压：35KV、36.75KV、38.5KV

高压侧最高工作电压40.5KV

低压侧额定电压：0.27KV、0.3KV、0.315KV、0.4KV

额定频率：50Hz

额定绝缘水平

高压开关工频耐压：95KV

变压器本体工频耐压：85KV

冲击峰值耐压：200KV

变压器低压侧工频耐压：5KV

相数：三相

防护等级：油箱IP68，高低压室IP54，高压室门打开后IP3X

Voltage:

System voltage: 35KV、36.75KV、38.5KV

Highest system voltage for high voltage side: 40.5KV

Highest system voltage for low voltage side: 0.27KV、0.3KV、0.315KV、0.4KV

Rated frequency: 50Hz

Rated insulation level:

Power frequency withstand voltage for HV switch: 95KV

Power frequency withstand voltage for main transformer: 85KV

Impulse withstand voltage peak value: 200KV

Power frequency withstand voltage for LV side of transformer: 5KV

Number of phase: 3

Protection degree: IP 68 for tank, IP54 for HV/LV compartment, IP3X when HV compartment door is opened.

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35kV

Photovoltaic power generation combined transformer / prefabricated substation

主要元件参数 Main element data

光伏发电组合式变压器（美变结构）的主要元件参数

For Photovoltaic power generation combined transformer (pad-mounted type)

常规变压器技术参数

Technical data for normal transformer

变压器容量 (kVA) Rated power	高压组合及分接范围 Tapping range			联接组标号 Connection symbol	空载损耗 (KW) No load loss	负载损耗 (KW) On load loss	阻抗 (%) Impedance
	高压 (kV) high voltage	分接范围 (%) tapping range	低压 (kV) low voltage				
1000	35	±2×2.5	0.315	Yd11,d11	按客户要求 According to requirement	按客户要求 According to requirement	6.5
1100	36.75		0.27				
1250	38.5		0.4				

高压油浸式负荷开关技术参数

Technical data for HV oil immersed load switch

描述Description	参数Data
型号Model	BYFI-40.5(手动操作manual operated)
电压等级Voltage class(KV)	40.5
工频耐压Power frequency withstand voltage(KV)	95
雷电冲击电压Lighting impulse withstand voltage(KV)	200
额定电流Rated current(A)	630
额定短时耐受电流及时间 Rated short time withstand current and duration(KV)/2s	20
开断电流能力Breaking current capacity(A)	630
机械寿命Mechanical life	2000times(次)

高压油浸式熔断器技术参数

Technical data for HV oil immersed fuses

描述Description	参数Data
型号Model	XRNT-40.5
熔断器额定电流Rated current for fuses(A)	40
熔体额定电流Rated current for fuse-element(A)	16(500KVA,630KVA) 31.5(1000KVA,1100KVA,1250KVA)
熔断器短路开断电流 Short circuit breaking current for fuses(KA)	31.5

熔断器熔断后，可以在现场方便地更换熔丝。
Make convenient fuse-element replacement in site after fuse is fusing.

35kV

光伏发电组合式变压器/
预装式变电站

高压避雷器技术参数

Technical data for HV surge arrester

描述Description	参数Data
型号Model	YH5WZ-51/134
型式	硅橡胶外套无间隙金属氧化锌避雷器Silicone rubber coat non-clearance metal zinc oxide lightning arrester
额定电压	51
持续运行电压	40.8
额定电流Rated current(A)	≧ 73
直流1mA参考电压	
标称放电电流(KV)(峰值)	≧ 5
标称放电电流残压(KV)(峰值)Nominal discharge current residual voltage(KV)(peak value)	≧ 134
2ms方波电流耐受值(A)(峰值)2ms rectangular wave current withstand level(A)(peak value)	600~800

低压框架断路器技术参数

Technical data for LV air circuit breaker

描述Description	参数Data
额定电压Rated voltage(V)	400
额定电流Rated current(A)	1250、1600、2000、2500、3200
短时耐受电流及时间Rated short time withstand current and duration(kA/1s)	50

照明检修变压器

Lighting maintenance transformer

型号 Type	额定容量 Rated power	高压组合 Tapping range		联结组标号 Connection symbol	相数 Number of phase	频率 Frequency
		高压 (kV) high voltage	低压 (kV) low voltage			
SG10-□/0.315/0.4	按客户要求	0.315 (0.3、0.27、0.4)	0.4KV	Dyn11	三相 three	50Hz

光伏发电预装式变电站（华变结构）的主要元件参数

Main element data for photovoltaic power generation prefabricated substation

变压器技术参数与方案一相同

Transformer technical data is same with program 1

TRANSFORMER

35kV

Photovoltaic power generation combined transformer / prefabricated substation

高压真空隔离负荷开关、熔断器组合电器技术参数

Technical data of HV vacuum disconnecter load switch and fuses combined appliance

描述Description	参数Data
型号Model	FZRN21C-40.5D(手动和电动操作manual operated and electric operated)
电压等级Voltage class(KV)	40.5
工频耐压Power frequency withstand voltage(KV)	95
雷电冲击电压Lighting impulse withstand voltage(KV)	185
额定电流Rated current(A)	以熔断器为准The fuse shall prevail
额定短时开断电流 Rated short time breaking current(KA)	20/31.5
机械寿命Mechanical life	1000times(次)

高压空气式熔断器技术参数

HV air fuses technical data

描述Description	参数Data
型号Model	XRNT-40.5
熔断器额定电流Rated current for fuses(A)	40
熔体额定电流Rated current for fuse-element(A)	16(500KVA,630KVA) 31.5(1000KVA,1100KVA,1250KVA)
熔断器短路开断电流 Short circuit breaking current for fuses(KA)	31.5
熔断器熔断后，可以在现场方便地更换熔丝。 Make convenient fuse-element replacement in site after fuse is fusing.	

高压避雷器、低压框架断路器、照明检修变压器等元件技术参数与方案一相同。

All element data of HV surge arrester, LV air circuit breaker and lighting maintenance transformer is same with program 1.

方案三的主要元件参数（欧变结构）技术参数与方案二相同。

All element data of prefabricated substation is same with program 2

35kV

光伏发电组合式变压器/ 预装式变电站

产品结构特点Product structure characteristics

一、光伏发电组合式变压器（美变结构）的产品结构特点

- 1、箱变结构氛围变压器本体、高压室、低压室、检测室。开关操作室和熔断器室六个部分，可按“目”字型或“品”字型排列。
- 2、高压侧采用终端型负荷开关加熔断器保护，熔断器为全范围限流型保护熔断器。
- 3、负荷开关和熔断器安装在变压器邮箱内，利用变压器的绝缘油作为绝缘介质和散热介质，整体上具有结构紧凑、散热性能好等优点。
- 4、高压侧出现采用高压干式套管支撑铜母线结构，可方便多根电缆线连接。低压侧出现可直接出线或按用户要求配置低压出线方案。
- 5、箱变门采用防风型铰链，箱体上所有的门向外开，开启角度不小于90°并设有定位装置。门都有密封措施，装有门封条，具有缓冲功能，并装有把手，暗门能防雨、防堵、防锈、和防破坏。
- 6、箱体为密封防盗结构，采用隐蔽式高强度螺栓及耐油腈橡胶垫圈密封箱盖，整个箱体无外露可拆卸螺栓。
- 7、箱体采用不锈钢板制作，油漆为进口汽车漆，全部采用焗漆方式，防盐雾、防湿热、防霉菌、户外耐候性能强。光伏电站所处区域温度低、温差大、湿度大、多风沙，箱变具备合理的防护结构，防尘结构以及耐低温性能，能满足恶劣环境条件下正常安全运行要求。

二、光伏发电预装式变电站（华变结构）的产品结构特点

- 1、箱变分为高压室，低压室以及变压器三个部分，按照“目”字型排列。除变压器散热片和器身敞露在箱体外部，其余所有带电间隔均密封在独立的隔室内。各室内用隔板隔离成独立的间隔，并在箱体内设有下人孔，方便安装及维修。
- 2、箱体内外表面平整，无锈蚀、涂层脱落和磕碰损伤现象，涂料层牢固均匀，无明显反差反光。
- 3、箱体基座和所有外露金属件均进行防腐、防锈处理，并喷涂持久的防护层。
- 4、箱体顶盖装设防雨的密封盖板和防雨檐，双层结构的箱体顶盖能防止热辐射。
- 5、箱变门的设计尺寸与所装用的设备尺寸相配合，箱变门采用内铰链，箱体上所有的门向外开，开启角度大于90°。
- 6、箱体采用不锈钢板制作，油漆为进口汽车漆，全部采用焗漆方式，放盐雾、防湿热、防霉菌、户外耐候性能强。光伏电站所处区域温度低、温差大、湿度大、多风沙，箱变具有合理的防护结构，防尘结构以及耐低温性能，能满足恶劣环境条件下正常安全运行要求。

35kV

Photovoltaic power generation combined transformer / prefabricated substation

三、方案三的产品结构特点(欧变结构)

- 1、箱变分为高压室，低压室以及变压器三个部分，按照“目”字型排列。
- 2、光伏预装式变电站的变压器主要采用立体卷铁心干式变压器，性能符合低损耗节能型变压器要求。
- 3、箱体内外表面平整、无锈蚀，涂层脱落和磕碰损伤现象，涂料牢固均匀，无明显反差和反光。
- 4、箱体基座和所有外露金属件均进行防腐、防锈处理，并喷涂持久的防护层。
- 5、箱体顶盖装设预防的密封盖板和防雨檐，双层结构的箱体顶盖能防止热辐射。
- 6、箱变门的设计春雨所装用的设备尺寸相配合，箱变门采用内铰链，箱体上所有的门向外开，开启角度大于90°
- 7、箱体采用不锈钢板制作，油漆为进口汽车漆，全部采用烤漆方式，防盐雾、防湿热、防霉菌、户外耐候性能强。光伏发电站所处区域温度低、温差大、湿度大、多风沙，箱变具备合理的防护结构，防尘结构以及耐低温性能，能满足恶劣环境条件下正常安全运行要求。

For Photovoltaic power generation combined transformer (pad-mounted type)

- 1、The structure contain six parts such as transformer, HV compartment, LV compartment, inspection room, switch operating room and fuses compartment. It can be arranged in “目” type or “品” type.
- 2、HV side is equipped with terminal type load switch with protection by fuse, which is full range restricted current for protection.
- 3、Load switch and fuse are assembled in transformer tank, take advantage of the insulation oil is medium for insulating and heat dissipation, the integral is impact structure and good cooling performance.
- 4、HV side outgoing feeder is dry type bushing supporting copper bus bar structure that is convenient for connecting multiple cables, LV side can be directed outgoing feeder or according to requirements of user.
- 5、The door of substation is equipped with anti-wind hinge, also the door opens outward, with open angle not less than 90 degree, meanwhile without positioning device equipped is not allowed. The door is adopted with sealing; door gasket is equipped for buffering, also the handle and hidden door are needed with characteristics such as rain-proof, anti-blocking, anti-rust and vandal-proof.
- 6、The substation is sealed and anti-burglary, hidden high strength bolt and oil proof nitrile rubber gasket is adopted for cover sealing, there is no dismantled bolts existed in external housing.
- 7、The housing is made of stainless plate, with imported paint used for automotive

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光伏发电组合式变压器/ 预装式变电站

coating, which is salt spray proofing, hot and humid resistant, fungus proofing and strong weather ability for outdoor condition. Since the setting position for photovoltaic power generation substation with low ambient temperature, large temperature difference, high humidity and heavy sandstorm, substation has performances such as reasonable protective structure, dust proof structure and low temperature resistant which can meet normal requirement of safe operation under severe environment condition.

For Photovoltaic power generation prefabricated substation

- 1、 The structure contains three parts such as HV compartment, LV compartment and transformer. It can be arranged in “目” type. All electrified intervals are sealed inside separated compartment except radiators and active parts of transformer are exposed in substation. Each compartment is divided into separated intervals by clapboard and equipped with lower man hole for assembly and maintenance conveniently
- 2、 Interior and external surface of substation is smooth with no rust, coating shedding and bump damage appearance. Coating is firm, uniform and no obvious contrast reflection.
- 3、 The base and all exposed metal parts of substation should be deal with anticorrosive, anti-rust processing and durable protective coating.
- 4、 The top cover for substation is equipped with rain proof sealing cover plate and brim; the double-decker structure can prevent heat radiation.
- 5、 The design dimension of substation door is matched with equipment assembled; the door is equipped with internal hinge and opens forward with open angle more than 90 degree.
- 6、 The housing is made of stainless plate, with imported paint used for automotive coating, which is salt spray proofing, hot and humid resistant, fungus proofing and strong weather ability for outdoor condition. Since the setting position for photovoltaic power generation substation with low ambient temperature, large temperature difference, high humidity and heavy sandstorm, substation has performances such as reasonable protective structure, dust proof structure and low temperature resistant which can meet normal requirement of safe operation under severe environment condition.

For HV/LV prefabricated substation:

- 1、 The structure contains three parts such as HV compartment, LV compartment and

TRANSFORMER

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Photovoltaic power generation combined transformer / prefabricated substation

transformer. It can be arranged in “目” type.

2、 The transformer of Photovoltaic power generation prefabricated substation mainly is dry type and rolled core structure, performance is accord with requirements of low loss and energy saving.

3、 Interior and external surface of substation is smooth with no rust, coating shedding and bump damage appearance. Coating is firm, uniform and no obvious contrast reflection.

4、 The base and all exposed metal parts of substation should be deal with anticorrosive, anti-rust processing and durable protective coating.

5、 The top cover for substation is equipped with rain proof sealing cover plate and brim; the double-decker structure can prevent heat radiation.

6、 The design dimension of substation door is matched with equipment assembled; the door is equipped with internal hinge and opens forward with open angle more than 90 degree.

7、 The housing is made of stainless plate, with imported paint used for automotive coating, which is salt spray proofing, hot and humid resistant, fungus proofing and strong weather ability for outdoor condition. Since the setting position for photovoltaic power generation substation with low ambient temperature, large temperature difference, high humidity and heavy sandstorm, substation has performances such as reasonable protective structure, dust proof structure and low temperature resistant which can meet normal requirement of safe operation under severe environment condition.

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