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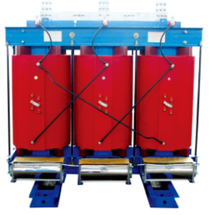
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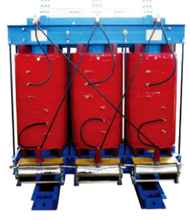
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SC(B)9、CSR9、SC(B)10、SCR10

系列树脂绝缘干式电力变压器







适用范围 Application

SCR9、SCR10系列树脂绝缘缠绕干式电力变压器

用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。

SC9、SCB9、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园筒式，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置(≤5pc)。

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170N/mm^2，弯曲强度提高到220N/mm^2，从整体上提高了树脂固化体的机械性能。

本公司SC(B)9、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。

SCR9，SCR10 series resin-insulated coil dry-type power transformers

In the high-voltage and high-volume dry-type transformers now produced by cast process at home and abroad, stress, minute cracks, and spots where resin has not fully permeated may exist within the winding. And 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)9、SCR9 SC(B)10、SCR10

Series resin-insulated coil dry-type powr transformers

SCR9，SCB9，SC10，SCB10 series resin-insulated coil dry-type power transformers

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 interturn, interlayer, and intersegmental parts, and consequently guarantees the insulation strength of products and minor amount of partial discharge (=5pc).

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 resin cast dry-type transformers, the study of which has been the important task of many dry-type transformer manufacturers at home and abroad.

This 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)9, 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 that 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-5℃(最低贮存温度-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: -5℃(lowest storage 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.

SC(B)9、CSR9、SC(B)10、SCR10

系列树脂绝缘干式电力变压器

执行标准 Standards

GB1094.11–2007 干式电力变压器。
GB/T10228–2008 干式电力变压器技术参数和要求。
GB/T17211–1996 干式电力变压器负载导则。
GB10237–1998 电力变压器绝缘水平和绝缘试验。
JB/T1008–1998 6~220kV级变压器声级。
JB/T56009–1998 干式电力变压器产品质量分等。

GB1094.11–2007 dry–type power transformers
Technical parameters and requirements of GB/T10228–2008 dry–type power transformers
Loading guide for GB/T17211–1996 dry–type power transformers
Insulation level and insulation experiment of GB10237–1998 dry–type power transformers
Noise level of T1008–1998 6~220kV dry–type power transformers
Quality grading of JB/T56009–1998 dry–type power transformers

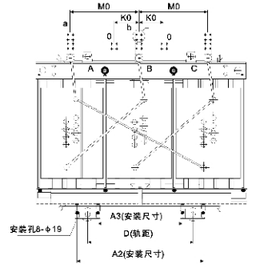
SC9、SCR9、SCB9系列树脂浇注绝缘干式电力变压器
SC9, SCR9, SCB9 series resin cast insulated dry–type power transformers

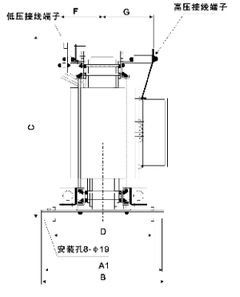
额定容量 (kVA) rated capacity	电压组合 voltage combination		低压 (kV) low voltage	联结组标号 connection symbol	空载损耗 (W) no–load loss	负载损耗 (W) (120℃) load loss	空载电流 (%) no–load current	短路阻抗 (%) short–circuit resistance	绝缘等级 insul–ation class	轨距 (mm) track gauge	噪声水平 (dB) noise level	重量 (Kg) Wight
	高压 (kV) high voltage	高压分接范围 high voltage tapping range										
30	6; 6.3; 6.6; 10; 10.5; 11;	±2×2.5%; 或±5% 或其它	0.4	Yyn0 或 Dyn11	220	750	1.2	4	F/F	470×315	42	315
50					310	1060	1.2			550×550	42	360
80					420	1460	1.1				42	415
100					450	1660	1.1				42	580
125					530	1950	1.0				44	785
160					610	2250	1.0				44	820
200					700	2670	0.9				45	970
250					810	2920	0.9				45	1090
315					990	3670	0.8			660×660	46	1250
400					1100	4220	0.8			820×820	47	1590
500					1310	5170	0.8				47	1740
630					1510	6220	0.8				49	2110
630					1460	6310	0.6	6		820×820	49	2020

SC(B)9、SCR9
SC(B)10、SCR10

Series resin–insulated coil dry–type powr transformers

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) (120℃) load loss	空载电流 (%) no–load current	短路阻抗 (%) short–circuit resistance	绝缘等级 insul–ation class	轨距 (mm) track gauge	噪声水平 (dB) noise level	重量 (Kg) Wight
	高压 (kV) high voltage	高压分接范围 high voltage tapping range										
800	6; 6.3; 6.6; 10; 10.5; 11;	±2×2.5%; 或±5% 或其它	0.4	Yyn0 或 Dyn11	1710	7360	0.6	6	F/F	820×820	50	2300
1000					1990	8600	0.5				50	2830
1250					2350	10260	0.5			1070×1070	52	3350
1600					2750	12420	0.5				52	3970
2000					3400	15300	0.4				54	4800
2500					4000	18180	0.4				54	5400
800	35; 38.5	±2×2.5%; 或 ±5%;	3.15; 6; 6.3; 10; 10.5; 11;	Yd11	2500	9900	1.2	6		820×820	50	3360
1000					2970	11500	1.2				50	4090
1250					3480	13600	1.1			1070×1070	51	4330
1600					4100	16300	1.1				51	5800
2000					4700	19200	1.0	7			52	6590
2500					5400	23000	1.0				53	7550
3150					6700	25800	0.9	8		1475×1475	57	8900
4000					7800	31000	0.9				57	9520
5000					9360	36800	0.7				57	12840
6300					11000	43000	0.7				59	13860
8000				Yd11 或 Ynd11	12600	48500	0.6	9			59	16100
10000					14400	58500	0.6				61	2118
12500					17500	68000	0.5				61	25600
16000					21500	80000	0.5				61	35700





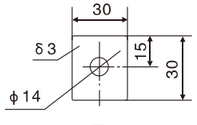
SC(B)9、CSR9、SC(B)10、SCR10

系列树脂绝缘干式电力变压器

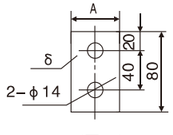
10kV级SCR9、SC9、SCB9系列外型安装尺寸

Overall and installation dimensions of 10kV SCR9, SC9, SCB9 series

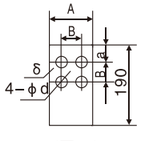
额定容量(kVA) rated capacity		30	50	80	100	125	160	200	250	315	400	500	630	630	800	1000	1250	1600	2000	2500
UK(%)								4									6			
外形尺寸 Overal dimensions	A	800	830	830	920	1050	1090	1150	1180	1230	1360	1360	1410	1470	1510	1600	1680	1740	1900	2010
	B	350	500	500	500	660	660	660	660	770	960	960	960	960	960	960	1255	1255	1255	1255
	C	780	930	980	1025	1085	1085	1090	1190	1127	1229	1307	1375	1316	1419	1480	1615	1764	1851	1955
	D	300	450	450	450	550	550	550	550	660	820	820	820	820	820	820	1070	1070	1070	1070
	E	710	860	910	940	1015	1005	1020	1064	1096	1098	1175	1215	1163	1223	1283	1381	1534	1611	1735
	F	255	257	259	262	275	268	279	284	286	289	298	302	304	315	323	330	341	357	397
	G	274	276	282	289	304	294	308	318	334	337	346	352	354	358	380	380	384	398	401
	M0	270	280	280	300	345	330	355	375	390	425	435	450	470	485	515	540	560	605	650
	K	100	100	150	150	150	150	150	150	150	160	160	160	160	180	180	260	260	260	325
	A3	550	550	550	550	550	550	550	550	660	657	657	657	657	657	657	859	859	859	859
	A2	550	550	550	550	550	550	550	550	660	983	983	983	983	983	983	1281	1281	1281	1281
	A1	300	450	450	450	550	550	550	550	660	910	910	910	910	910	910	1205	1205	1205	1205
低压端子 Low-voltage terminal		图一 Figure 1					图二 δ=4 A=40 Figure2			图二 δ=5 A=50 Figure2		图二 δ=8 A=60 Figure2			图三 δ=8 A=80 φd=φ14 B=40 a=15 Figure3	图三 δ=10 A=80 φd=φ14 B=40 a=20 Figure3	图三 δ=8 A=10 φd=φ18 B=50 a=25 Figure3	图三 δ=10 A=10 φd=φ18 B=50 a=25 Figure3	图四 δ=12 A=120 φd=φ18 a=40 a1=2 Figure4	图四 δ=12 A=180 φd=φ18 a=60 a1=3 Figure4



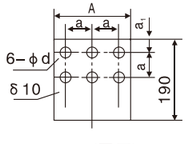
(图一)
Figure 1



(图二)
Figure 2



(图三)
Figure 3



(图四)
Figure 4

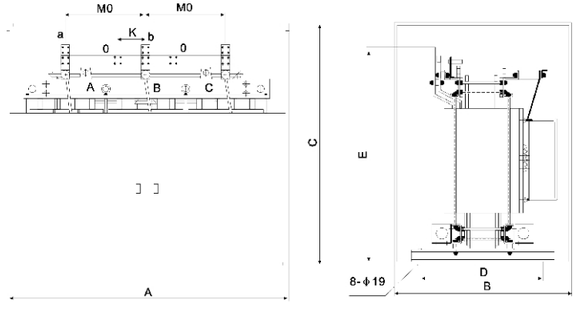
SC(B)9、SCR9 SC(B)10、SCR10

Series resin-insulated coil dry-type powr transformers

10kV级SCR9、SC9、SCB9系列带壳时外形尺寸

Overall dimensions of 10kV SCR9, SC9, SCB9 series with shell

额定容量(kVA) rated capacity	UK(%)	A	B	C	D	E	K	M0
100	4	1250	950	1280	550	1025	150	300
125		1350	950	1330	550	1075	150	330
160		1400	950	1390	550	1085	150	345
200		1430	950	1400	550	1090	150	355
250		1490	950	1420	550	1190	150	375
315		1530	950	1470	550	1200	150	390
400		1650	1070	1525	660	1229	160	425
500		1680	1250	1595	820	1307	160	435
630		1710	1250	1875	820	1375	160	450
630	6	1770	1250	1635	820	1316	160	470
800		1810	1250	1715	820	1419	180	485
1000		1900	1500	1875	820	1480	180	515
1250		2000	1500	1910	1070	1615	260	540
1600		2060	1500	2050	1070	1764	260	560
2000		2200	1500	2130	1070	1851	260	605
2500		2350	1500	2260	1070	1955	325	650

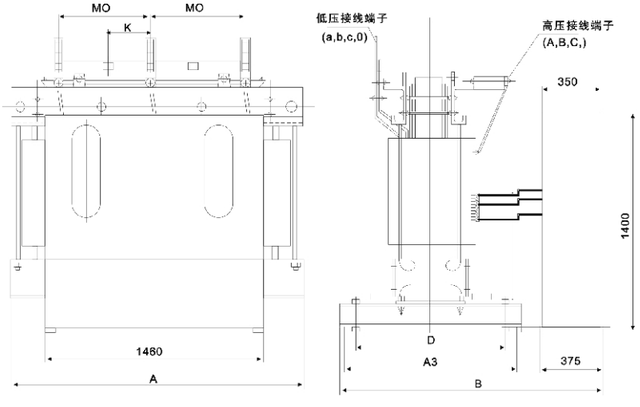


SC(B)9、CSR9、SC(B)10、SCR10
系列树脂绝缘干式电力变压器

10kV级SCRZ9、SCZ9、SCBZ9系列树脂绝缘有载调压干式电力变压器技术参数

Technical parameters of 10kV SCRZ9, SCZ9, SCBZ9 series resin insulated on–load–tap–changing dry–type power transformers

额定容量(kVA) rated capacity	电压组合 voltage combination 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	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 clastrack	轨距(mm) track gauge	噪声水平(dB) noise level
315	6; 6.3; 6.6; 10; 10.5; 11;	±4×2.5%	0.4	Yyn0 或 Dyn11 或其它	990	3825	0.8	4	H级 或 F级	660 × 660	45
400					1100	4490	0.8			820 × 820	46
500					1300	5450	0.8				46
630					1510	6500	0.8				47
630					1460	6630	0.6	6			47
800					1710	7840	0.6				48
1000					1990	9270	0.5				48
1250					2350	11160	0.5			1070 × 1070	49
1600					2750	12420	0.5				49
2000					3740	16100	0.4				50
2500					4500	19170	0.4				50



SC(B)9、SCR9
SC(B)10、SCR10
Series resin–insulated coil dry–type powr transformers

10kV级SCRZ9、SCZ9、SCBZ9系列外形尺寸图

Overall dimensions of 10kV SCRZ9, SCZ9, SCBZ9 series

额定容量(kVA) rated capacity	315	400	500	630	630	800	1000	1250	1600	2000	2500
Uk(%)	4				6						
尺寸B	1685	1715	1875	1875	1875	1875	1875	1875	2170	2170	2170

注：其余尺寸分别同无载调压SC9、SCB9、SCR9。

Note: Other dimensions are similar to those of no–load–tap–changing SC9, SCB9, and SCR9

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 transformers

额定容量(kVA) rated capacity	电压组合 voltage combination 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	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 nsul-ation class	轨距(mm) track gauge	噪声水平(dB) noise level
315	35 38.5	±2×2.5%; 或±5% 或其它	0.4	Yyn0 或 Dyn11	1170	4510	2.0	6	F级	820 × 820	47
400					1380	5420				820 × 820	47
500					1620	6650				820 × 820	48
630					1860	7300	1.8			820 × 820	48
800					2160	9120				820 × 820	49
1000					2430	10450				820 × 820	50
1250					2840	12730	1.6			1070 × 1070	50
1600					3240	15490				1070 × 1070	51
2000					3830	18240	1.4			1070 × 1070	53
2500					4460	21850				1070 × 1070	54

SC(B)9、CSR9、SC(B)10、SCR10

系列树脂绝缘干式电力变压器

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-try-type distribution transformers

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	噪声水平 noise level	轨距A×B (mm) track qauge
	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	±5%; 或 ±2×2.5	0.4	Dyn11 或 Yyn0	340	1235	2.4	4	42	500×500
100					540	1890	2.2		42	500×500
160					675	2470	1.8		43	500×500
200					740	2945	1.8		44	500×500
250					850	3420	1.6		44	500×500
315					970	4085	1.6		46	660×660
400					1150	4845	1.4		46	820×820
500					1350	5795	1.4		47	820×820
630					1530	6840	1.2	6	47	820×820
800					1755	8265	1.2		48	820×820
1000					2070	9785	1.0		48	820×820
1250					2385	11540	1.0		49	1070×1070
1600					2790	13870	1.0		50	1070×1070
2000					3240	16380	0.8		51	1070×1070
2500					3870	19380	0.8		52	1070×1070

SC(B)9、SCR9 SC(B)10、SCR10

Series resin-insulated coil dry-type powr transformers

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 resin insulated dry-type power transformers

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 clastrack	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%; 或±5% 或其它	0.4	Yyn0 或 Dyn11	190	710	1.0	4	F/F	470×315	40
50					270	1000	1.0			550×550	40
80					360	1380	0.9				40
100					400	1570	0.8				41
125					470	1850	0.75				41
160					540	2130	0.75				43
200					620	2530	0.7				43
250					720	2760	0.7				44
315					880	3470	0.6			660×660	44
400					980	3990	0.6			820×820	45
500					1160	4880	0.6				45
630					1340	5880	0.5				46
630					1300	5960	0.5	6		820×820	47
800					1520	6960	0.5				47
1000					1770	8130	0.4				48
1250					2090	9690	0.4			1070×1070	48
1600					2450	11730	0.4				49
2000					3050	14450	0.3				50
2500					3600	17170	0.3				50

SC(B)9、CSR9、SC(B)10、SCR10
系列树脂绝缘干式电力变压器

SCB11系列环氧树脂浇注干式电力变压器技术参数

Technical parameters of 10kV SCR10,SC10,SCB10 series resin insulated dry-type power transformers

额定容量(kVA) rated capacity	损耗(W)loss 空损	负损 F级	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
30	170	665	4	3.2	Yyn0/Dyn11	880×660×800	400×400
50	240	940	4	2.8		910×660×860	400×400
80	320	1300	4	2		970×660×950	550×550
100	350	1480	4	2.4		980×660×975	550×550
125	415	1735	4	2.2		1030×660×1015	550×550
160	475	2000	4	2.2		1070×660×1030	550×550
200	545	2380	4	2		1130×660×1085	550×500
250	630	2590	4	2		1180×660×1210	550×550
315	770	3265	4	1.8		1210×660×1240	660×660
400	855	3750	4	1.8		1280×960×1320	820×820
500	1015	4590	4	1.8		1320×960×1350	820×820
630	1175	5530	6	1.6		1460×960×1390	820×820
800	1300	6545	6	1.6		1520×960×1420	820×820
1000	1550	7650	6	1.4		1560×960×1480	820×820
1250	1830	9120	6	1.4		1630×1210×1500	1070×1070
1600	2140	11040	6	1.4		1680×1210×1620	1070×1070
2000	2700	13600	6	1.2		1750×1210×1720	1070×1070

SG(B)10-100-2500/10
Series H-level insulated three-phase dry-type power transformers





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

S G (B) 10 - □ / □

电压等级(kV)	voltage grade (kv)
额定容量(kVA)	rated capacity (kVA)
性能水平代号	performance level code
箔式	
干式、空气自冷	dry-type, air self-cooling
三相变压器	three-phase transformers

执行标准 Standards

1、GB1094.11-2007干式电力变压器。
2、GB/T10228-2008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 transformers

2.Technical parameters and requirements of GB/T10228–2008 dry–type power transformers

3.Loading guide for GB/T17211–1998 dry–type power transformers

Insulation level and insulation experiment of GB10237–1998 power transformers

GB4028–1993 shell protection grade (IP code)

Noise level of T1008–1998 6~220kV transformers

Quality grading of JB/T56009–1998 dry–type power transformers

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 operation for 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 repellency 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 transformers.

7. Insulation materials and copper wires can be easily recycled after life cycle without environment pollution.

SG(B)10-100 -2500/10

Series H-level insulated three-phase dry-type power transformers

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.

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 transformers

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 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%或±2×2.5%;	0.4	Yyn0或Dyn11	480	1880		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	2.0		1050	660×400	1090×500×1310	1450×900×1550
315					880	4600			1380	660×660	1240×770×1355	1600×1100×1600
400					1040	5400	1.8		1750	820×820	1310×960×1390	1700×1100×1650
500					1200	6600			1880	820×820	1370×630×1400	1750×1100×1700
630					1340	8050	1.4	6	1950	820×820	1400×960×1445	1800×1250×1750
800					1690	9500			2200	820×820	1470×960×1495	1850×1250×1800
1000					1980	11400	1.2		2490	820×820	1510×960×1505	1900×1250×1800
1250					2380	12500			3050	1070x1070	1620×1255×1585	2000×1300×1850
1600					2730	14900			3690	1070x1070	1660×1588×1675	2050×1300×2000
2000					3320	17500	1.0		4400	1070x1070	1730×1255×1840	2100×1350×2150
2500					4000	20300			4940	1070x1070	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 waveform 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、燥声低：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：产品采用三相五柱式结构，铁心四周采用框架结构保扩，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 five–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

S C B H 15 – □ / □

高压线圈电压等级(KV)	High–tension coil voltage grade (KV)
额定容量(KVA)	Rated capacity (KVA)
性能水平代号	Performance level code
非晶合金铁心	Amorphous alloy core
低压箔式线圈	Low voltage foil coil
树脂浇注式	Resin casting
三相	Three–phase

SCBH15

系列非晶合金干式变压器

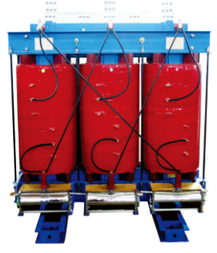
10kV级SCBH15系列非晶合金干式变压器技术参数

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 ×2.5%; 或 ±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	6.0
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 transformers







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	上海市分安局黄浦公局	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	上海市户湾区法院	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 transformers

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	厦门华厦国际电力发展有限公司	1250	2
92	厦门华厦国际电力发展有限公司	1600	4
93	厦门华厦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 transformers

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	凭详工商银行	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	四川九赛沟管理局	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 transformers

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	武汉钢铁股分有限公司	SCB10–2000/10	15
207	武汉钢铁股分有限公司	SCB10–2500/10	20
208	武汉钢铁股分有限公司	SCB10–4000/10	1
209	武汉钢铁股分有限公司	SGB10–2500/10	13
210	武汉钢铁股分有限公司	ZBSCB10–2500/10	12
211	武汉钢铁股分有限公司	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	SCRB9-630-10	2
244	南昌市青山湖隧道工程	SCRB9-800-10	2
245	南昌铁路天集有限公司	SCRB10-1600/10	5
246	南昌铁路天集有限公司	SCRB10-400/10	2

S9 ,S9 -M

Series low—loss energy—saving power transformers





使用条件 Application conditions

-最高气温+40℃ highest temperature
-最低气温-30℃(户外式) lowers temperature
-最高日平均气温+30℃ highest average daily temperature
-最高年平均气温+20℃ highest average yearly temperature

执行标准 Standards

-GB1094.1~2-1996《电力变压器》
-GB/T6451-2008《三相油浸式电力压变器技术参数和要求》
-OBY.500.507产品技术条件

GB1094.1~2-1996 Power Transformers
GB/T6451-2008 Technical Parameters and Requirements of Three-phase Oil-immersed Power Transformers
OBY.500.507 product technological requirements

执行标准 Standards

一、非晶合金铁芯变压器的构成

(1) 变压器铁芯均为三相五柱式两行矩形排列，在两个旁柱中流过零序磁通，磁通不经过箱体，不产生发热的结构，使变压器能满足低噪声、低损耗。

(2) 高低压线圈均为矩形的铜绕组，当线圈偶然发生短路时，能适应较大的机械应力破坏，线圈不产生变形。

(3) 箱体采用冷轧钢板制成的片状散热器，箱体全密封，20年内免维护。

二、非晶合金铁芯变压器的节能效果

非晶合金铁芯变压器，具有低噪音、低损耗等特点，其空载损耗仅为常规S9系列产品的1/5，且全密封免维护，运行费用投入低。

三、非晶合金变压器的特点

非晶合金变压器具有空载运行损耗小而经济运行负荷率相对较低的特点，特别适用农村乡镇、城市居民生活用电，即使在负载率达到50%~80%实行三班制的工矿企业中，选择合适的非晶合金变压器仍然达到投资回收年限的要求。因此，在城市和农村推广使用非晶合金变压器，不仅可以降低变压器的损耗，还可以因为其良好节电效果而带来少建电厂的环保效益。在建设资源节约型社会的今天更具有重大的现实意义。

S9、S9-M

系列低损耗节能电力变压器

1. Compositions of amorphous alloy transformers

(1)The iron cores of transformers are three-phase three-limb and arranged in two-line matrix. The zero-sequence flux passes through two side yokes and will not flow through the body. Without heat-generating structure, the transformers can meet the requirements of low noise and low loss.

(2)Both the high- and low-voltage windings are square copper windings. In case of occasional short circuit, they can bear great mechanical stress and will not lose shape.

(3)Equipped with a plate-type heat sink made of cold steel sheet, the body is wholly sealed and maintenance-free for 20 years.

2. Amorphous alloy transformers are characterized by low noise and low loss, whose no-load loss is 1/5 of that of conventional S9 series. Being wholly sealed, they are maintenance-free and involve low operation cost.

3.Amorphous alloy transformers are characterized by low no-load loss and economical operation with comparatively low load rate, especially suitable for the purpose of electricity consumption of rural and urban residents. Even in three-shift mines and industrial enterprises with a load rate as high as 50%-80%, choosing amorphous alloy transformers still meet the requirement of years in return of investment. Therefore, the promotion of amorphous alloy transformers in urban and rural areas can not only reduce the loss of transformers but also bring environment protection benefit of constructing few power plants due to its good energy-saving effect, which is of great practical significance in developing an energy-saving society.

10kV级S9系列和S9-M系列无励磁调压配电变压器技术参数(表一)

Technical parameters of 10kV S9 and S9-M series off-circuit-tap-changing distribution transformers (table 1)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
10	6; 6.3; 10; 10.5; 11;	±2×2.5%; 或 ±5%;	0.4	Yyn0 或 Dyn11	70	300	2.4	4.0	75	50	285	400×400	730×480×950
20					100	500	2.3		115	65	365	400×400	758×510×920
30					130	600	2.1		150	70	300	400×400	780×600×1000
50					170	870	2.0		210	75	370	400×400	798×570×860
63					200	1040	1.9		245	100	450	400×400	860×630×1030
80					250	1250	1.8		325	105	535	400×450	893×670×900
100					290	1500	1.6		380	115	620	550×550	1010×630×920
125					340	1800	1.5		375	135	635	400×550	1170×770×1150

S9、S9-M

Series low-loss energy-saving power transformers

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
160	6; 6.3; 10; 10.5; 11;	±2×2.5%; 或 ±5%;	0.4	Yyn0 或 Dyn11	400	2200	1.4	4.0	500	175	850	550×550	1200×820×1020
200					480	2600	1.3		545	185	920	550×550	1260×860×1055
250					560	3050	1.2		690	183	1010	550×650	1375×860×1070
315					670	3650	1.1		760	200	1245	550×650	1430×980×1090
400					800	4300	1.0		800	220	1400	550×650	1510×1060×1145
500					960	5150	1.0		1000	225	1620	660×750	1560×1070×1230
630					1200	6200	0.9	4.5	1170	300	1880	660×750	1650×1110×1270
800					1400	7500	0.8		1350	345	2205	820×850	1820×1280×1330
1000					1700	10300	0.7		1515	420	2585	820×850	1985×1480×1370
1250					1950	12000	0.6		1890	530	3100	820×850	1780×1760×1420
1600					2400	14500	0.6		2400	580	3740	820×850	2050×1960×1415
2000					2900	17500	0.6		3095	975	5600	820×900	1980×1180×1950

35kV级S9系列双绕组无励磁调压配电变压器技术参数(表二)

Technical parameters of 35kV S9 series double-winding off-circuit tap-changing distribution transformers (table 2)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
50	35;	±2×2.5%; 或 ±5%;	0.4	Yyn0 或 Dyn11	210	1210	2.0	6.5	280	280	780	660×660	1135×925×1730
63					240	1400	1.8		325	300	855	660×660	1150×935×1835
80					250	1700	1.8		410	350	960	660×660	1180×1030×1850
100					290	2020	1.6		460	390	1110	660×660	1210×1080×1885
125					340	2380	1.6		530	430	1300	660×660	1245×1090×1950
160					360	2830	1.6		630	520	1660	660×660	1300×1100×2040
200					430	3330	1.6		770	520	1720	660×660	1340×1120×2040
250					510	3960	1.6		940	600	2000	660×660	1420×1150×2090
315					610	4770	1.5		980	690	2370	660×660	1710×1180×2170
400					730	5760	1.5		1260	700	2830	820×820	1870×1210×2300

S9、S9-M

系列低损耗节能电力变压器

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
500	35;	±2×2.5%; 或 ±5%;	0.4	Yyn0 或 Dyn11	860	6930	1.4	6.5	1600	970	3340	820×820	2380×1250×2420
630					1040	8280	1.4		1770	1040	3960	820×820	2480×1250×2450
800					1230	9900	1.3		2360	1160	4520	820×820	2560×1250×2820
1000					1440	12150	1		2400	1280	4950	820×820	2580×1250×2820
1250					1800	14600	0.9		2650	1350	5580	1070×1070	2600×1300×2820
1600					2100	17500	0.85		3150	1460	6330	1070×1070	2620×1330×300
2000					2600	19000	0.75	7.0	3400	1490	6400	1070×1070	2700×1420×3060
2500					3100	21000	0.75		3700	1520	6700	1070×1070	2800×1523×3140

10kV级S9系列和S9-M系列无励磁调压电力变压器技术参数(表三)

Technical parameters of 10kV S9 and S9-M series off-circuit-tap-changing power transformers (table 3)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
630	6; 6.3; 10; 10.5; 11;	±2×2.5%; 或 ±5%;	3; 3.15; 6.3;	Yd11	1200	6200	1.4	4.5	1430	410	2585	660×750	1690×965×1440
800					1400	7500	1.3	5.5	1640	665	3090	820×820	1885×1160×2125
1000					1700	10300	1.2		1900	700	3300	820×820	1925×1240×2710
1250					1950	12000	1.2		2180	870	4150	820×820	2010×1540×2180
1600					2400	14500	1.1		2720	900	4860	820×820	2100×1760×2305
2000					2900	17500	0.9		3000	940	5230	1070×1070	2120×1860×2315
2500					3430	20200	0.9		3435	1120	5755	1070×1070	2140×2056×2365
3150					4140	23700	0.8		4000	1550	7200	1070×1070	2470×2770×2555
4000	10; 10.5; 11;		3.15; 6.3;		4980	28100	0.7		4790	1620	8500	1070×1070	2720×2480×2860
5000					6020	32300	0.7		5740	1730	9515	1070×1070	2810×2560×2920
6300					7050	36000	0.6		7410	2050	11610	1070×1070	2850×2930×3010

S9、S9-M

Series low-loss energy-saving power transformers

35kV级S9系列无励磁调压电力变压器技术参数(表四)

Technical parameters of 35kV S9 series off-circuit-tap-changing power transformers (table 4)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
800	35; 38.5;	±2×2.5%; 或 ±5%;	3.15; 6.3; 10.5;	Yd11	1300	9000	1.3	6.5	1935	1020	3995	820×820	2435×1240×2300
1000					1500	12000	1.2		2140	1055	4125	820×820	2482×1380×2320
1250					1800	14000	1.1		2290	1085	4200	820×820	2532×1520×2350
1600					2100	17000	1.1		2475	1175	4290	1070×1070	2582×1710×2440
2000					2600	19000	1.0		2790	1295	5380	1070×1070	2632×1884×2537
2500					3100	21000	1.0		3295	1425	5920	1070×1070	2691×2105×2597
3150					3800	24500	1.0	7.0	4045	1735	7645	1070×1070	2842×2430×2617
4000					4600	29000	0.9		4815	1950	8905	1070×1070	2936×2446×2697
5000					5500	33000	0.9		6060	2095	10175	1070×1070	2815×1720×3135
6300					6500	37000	0.9	7.5	7410	2525	12330	1070×1070	3240×2730×3040
8000			3.3; 3.15; 6.3; 6.6; 10.5; 11;	Yd11 Ynd11	8500	42000	0.8		8900	2930	14855	1475×1475	3360×2695×3160
10000					10000	48300	0.8		10700	3350	18100	1475×1475	3400×3460×3320
12500					12000	57300	0.8	7.5	11840	5066	21505	1475×1475	3750×3896×3800
16000					14500	70000	0.7		15260	7411	29800	1475×1475	4300×4050×3820
20000					16000	83000	0.7		16030	7800	31500	2040×1475	4900×4600×4100
25000					2000	103000	0.6		19200	8900	36800	2040×1475	4900×4800×4180
31500					25400	125000	0.6	8.0	22100	9800	43000	2040×1475	4900×4800×4270

10kV级SZ9-M系列双绕组有载调压变压器技术参数(表五)

Technical parameters of 10kV SZ9-M series double-winding on-load-tap-changing transformers (table 5)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
200	6; 6.3; 10;	±4×2.5%; 或 ±3×2.5%;	0.4	Yyn0 或 Dyn11	480	2600	1.3	4.0	640	180	1100	550×550	1400×850×1500
250					560	3050	1.2		770	230	1290	550×550	1450×910×1560
315					670	3650	1.1		880	250	1500	550×650	1460×1050×1580
400					800	4300	1.0		1055	310	1720	550×750	1600×1120×1660

S9、S11 -M

系列低损耗节能电力变压器







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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
500	6; 6.3; 10;	±4×2.5%; 或 ±3×2.5%;	0.4	Yyn0 或 Dyn11	960	5150	1.0	4.0	1235	330	2010	550×750	1660×1280×1720
630					1200	6200	0.9		1520	660	2950	660×850	2010×1325×1930
800					1400	7500	0.8		1760	880	3450	660×850	2060×1335×2010
1000					1700	10300	0.7	4.5	1935	980	4050	820×850	2050×1340×2070
1250					1950	12000	0.6		2285	980	4250	820×850	2120×1350×2130
1600					2400	14500	0.6	5.5	2720	1080	4500	820×900	2180×1370×2190
2000					2900	17500	0.6		3460	1220	6200	850×900	2930×1970×2900

20kV级S11系列无励磁调压油浸式配电变压器技术参数(表六)

Technical parameters of S11 series 20kv resin No excitation voltage oil-immersed distribution transformers (table 6)

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 qauge
	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%; 或 ±2×2.5	0.4	Yyn0 或 Dyn11	90	660	2.1	5.5	660×660
50					130	960	2.0		660×660
63					150	1145	1.9		660×660
80					180	1370	1.8		660×660
100					200	1650	1.6		660×660
125					240	1980	1.5		660×660
160					290	2420	1.4		660×660
200					330	2860	1.3		660×660
250					400	3350	1.2		660×660
315					480	4010	1.1		660×660
400					570	4730	1.0		820×820
500					680	5660	1.0		820×820
630					810	6820	0.9	6	820×820
800					980	8250	0.8		820×820
1000					1150	11330	0.7		820×820
1250					1350	13200	0.7		1070×1070

S11 ,S11 -M

Series low-loss energy-saving power transformers

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 qauge
	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					
1600	20	±5%; 或 ±2×2.5	0.4	Yyn0 或 Dyn11	1630	15950	0.6	6	1070×1070
2000					1950	19140	0.6		1070×1070
2500					2340	22220	0.6		1070×1070

35kV级SZ11系列无励磁调压电力变压器技术参数(表七)

Technical parameters of 35kV SZ11 series off-circuit-tap-changing power transformers (table 7)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
2000	35; 38.5;	±3×2.5	6.3; 6.6; 10.5; 11;	Yd11	2320	19000	1.0	6.5	3340	1725	5785	1070×1070	3170×1820×2727
2500					2640	20900	1.0		4070	2060	6570	1070×1070	3280×1980×2835
3150					3200	24700	0.9	7.0	4620	2310	7480	1070×1070	3370×2160×3065
4000					3920	28980	0.9		5140	2560	9160	1070×1070	3410×2470×3180
5000					4640	33250	0.85	7.5	5600	2700	11000	1475×1475	3500×2800
6300				Ynd11	5600	37050	0.8		7330	3190	13000	1475×1475	4010×2960×3730
8000					7120	41800	0.8		8700	3760	16400	1475×1475	4190×2980×3880
10000					8400	48450	0.75		9900	4100	18200	1475×1475	4350×3620×3725
12500					10080	57480	0.75	8.0	11300	4700	21500	1475×1475	4450×3700×3860
16000					12160	65840	0.7		16100	8200	30600	1475×1475	5030×3940×4057
20000					15600	84550	0.7		16800	8300	33400	2040×1475	5060×3980×4108
25000					16800	99750	0.6	8.5	20400	9800	39300	2040×1475	5080×4260×4168
31500					20560	11880	0.6		24300	11000	46000	2040×1475	5300×4300×4377

绝缘水平Insulation level

型号 model	电压等级 voltage grade	额定短时频耐受电压(有效值) rated short-duration power-frequency withstand voltage (effective value)	额定雷电冲击耐受电压(峰值) rated lightning impulse withstand voltage (peak value)
S9,S11 S9-M SZ9,S11 SZ9-M	6	25	60
	10	35	75
	35	85	200

S9、S11 -M

系列低损耗节能电力变压器

10kV级S11无励磁调压配电变压器技术参数(表八)

Technical parameters of 10kV S11 off-circuit-tap-changing distribution transformers (table 8)

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
30	6 6.3 10 10.5 11	±2×2.5%;或±5%;	0.4	Yyn0或Dyn11	100	600	2.1	4.0	150	75	320	400×400	730×480×950
50					130	870	2.0		210	89	370	400×400	758×510×920
63					150	1040	1.9		255	95	420	400×450	788×530×950
80					180	1250	1.8		280	120	490	400×450	808×580×970
100					200	1500	1.6		360	125	600	400×550	830×760×1160
125					240	1800	1.5		410	135	690	400×550	990×620×1040
160					290	2200	1.4		480	155	815	550×550	1070×680×1100
200					330	2600	1.3		563	168	920	550×650	1170×770×1300
250					400	3050	1.2		665	200	1020	550×650	1230×820×1190
315					480	3650	1.1		751	230	1160	550×650	1295×865×1240
400					570	4300	1.0		880	235	1385	550×750	1385×925×1250
500					680	5150	1.0		1100	260	1670	660×750	1560×1060×1360
630					810	6200	0.9	4.5	1255	310	1920	660×750	1615×1105×1350
800					900	7500	0.8		1585	465	2330	820×850	1725×1190×1390
1000					1150	10300	0.7		1720	510	2680	820×850	1820×1290×1440
1250					1360	12000	0.6		2075	625	2995	820×850	1860×1290×1540
1600					1640	14500	0.6		2215	640	3610	820×850	1340×1700×1560
2000					2150	20000	0.5		2965	805	4570	820×820	1660×1460×1850
2500					2450	23500	0.5		3600	895	5335	1070×1070	1750×1780×1900

10kV级SH15系列非晶合金无励磁调压配电变压器技术参数(表九)

Technical parameters of 10kV SH15 series amorphous alloy off-circuit-tap-changing distribution transformers (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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
30	6 6.3 10 10.5 11	±2×2.5%;或±5%;	0.4	Dyn11	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

S11 -M·D

Series low-loss energy-saving power transformers

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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
63	6 6.3 10 10.5 11	±2×2.5%;或±5%;	0.4	Dyn11	50	1040	1.2	4.0	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
250					140	3050	0.7		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	4.5	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		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(表十)

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

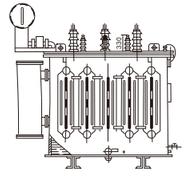
额定容量(kVA) rated capacity	电压组合 voltage combination				空载损耗(W) no-load current	负载损耗(W) load loss	空载电流(%) no-load loss	短路阻抗(%) short-circuit resistance	重量(kg) Weight			轨距A×B(mm) track qauge	外形尺寸(mm) L×W×H overall dimensions
	高压(kV) high voltage	高压分接范围 high voltage tapping range	低压(kV) low voltage	联结组标号 connection symbol					器身重 tare weight	绝缘油重 tare weight	总重 total weight		
50	6 6.3 10 10.5 11	±2×2.5%;或±5%;	0.4	Yyn0或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

S9、S11 -M

系列低损耗节能电力变压器

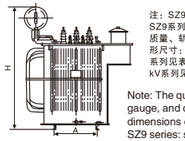
额定容量(kVA) rated capacity	电压组合 voltage combination				空载损耗(W) no-load current	负载损耗(W) load loss	空载电流(%) no-load loss	短路阻抗(%) short-circuit resistance	重量(kg) Weight			轨距A×B(mm) track qauge	外形尺寸(mm) L×W×H overall dimensions
	高压(kV) high voltage	高压分接范围 high voltage tapping range	低压(kV) low voltage	联结组标号 connection symbol					器身重 tare weight	绝缘油重 tare weight	总重 total weight		
315	6 6.3 10 10.5 11	±2×2.5%; 或 ±5%;	0.4	Yyn0 或 Dyn11	480	3650	1.1	4.0	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	4.5	1490	535	2725	820×820	1300×1475×1748
800					980	7500	0.8		1710	610	3105	820×820	1330×1665×1793
1000					1150	10300	0.7		1905	695	3590	820×820	1360×1920×1868

变压器外形尺寸图Overalld imensions of transformers



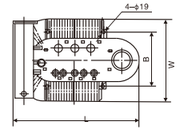
10~35KV级S9~M系列外形尺寸图

Overall dimensions of 10–35kV S9–M series



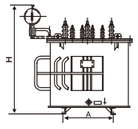
注：SZ9－M、SZ9系列产品的质量、轨距、外形尺寸：10kV系列见表5，35kV系列见表6

Note: The quality, track gauge, and overall dimensions of SZ9–M, SZ9 series: see table 5 for 10kV series, and table 6 for 35kV series



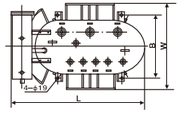
10~35KV级SZ9系列和SZ9~M系列外形尺寸图

Overall dimensions of 10–35kV Sz9, S9–M series



注：S9－M、S9系列产品的质量、轨距、外形尺寸；10kV系列配电变压器见表1，电力变压器见表3。35kV系列配电变压器见表2，电力变压器见表4。

Note: The quality, track gauge, and overall dimensions of S9–M, S9 series: see table 3 for 10kV series distribution transformers, table 2 for 35kV series distribution transformers, and table 4 for power transformers.



10~35KV级S9系列外形尺寸图

Overall dimensions of 10–35kV S9 series

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	福建安溪县祥华水电厂	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	河北行塘供电局（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

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

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	内蒙古淮旗柴登35KV变电站	1
197	SZ9–8000/35	内蒙古淮旗柴登35KV变电站	1
198	SZ9–350/35	内蒙古淮旗柴登35KV变电站	1

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	漳平红师水泥有限公司	3
258	S9–M–1600/10	漳平红师水泥有限公司	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	黑龙江嫩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

S11
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

型立体卷铁芯配电变压器

型号含义 Model designation

S 11– M·RL – □ / □

- 电压等级(KV) voltage grade (kv)
- 额定容量(KVA) rated capacity (kVA)
- 立体式卷铁心 Three–dimensional wound core
- 密封式 Sealed
- 性能水平代号 performance level code
- 三相浸式配电变压器 Three–phase oil–immersed distribution transformer

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) 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 dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
30	11; 10.5; 10; 6.6; 6.3; 6;	±5%; 或 ±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	4.5	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

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

型立体卷铁芯配电变压器

型号含义 Model designation

S 13－M·RL－□ / □

- 电压等级(KV) voltage grade (kv)
- 额定容量(KVA) rated capacity (kVA)
- 立体式卷铁心 Three-dimensional wound core
- 密封式 Sealed
- 性能水平代号 performance level code
- 三相浸式配电变压器 Three-phase oil-immersed distribution transformer

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) 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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
30	11; 10.5; 10; 6.6; 6.3; 6;	±2×2.5%; 或 ±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					570	6200	0.15	4.5	1352	414	2085	550×820	1395×1210×1649
800					700	7500	0.15		1613	496	2481	550×820	1526×1321×1711
1000					830	10300	0.14		1703	656	3000	550×1070	1717×1487×1726
1250					970	12000	0.13		2065	702	3449	550×1070	1711×1482×1829
1600					1170	14500	0.12		2592	1045	4450	550×1070	1880×1628×1938

10kV

Underground combination transformers





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、提高城市土地利用率具有重要意义，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 transformers

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/s²：垂直方向低于15m/s²

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 party or wholly immersed in water

C、ground acceleration caused by earthquakes: horizontal direction: less than 3m/s² vertical direction: less than m/s²

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 Productm odels and applications

Z □ S □ –□· D –□ / 10

压等级(kV)	voltage grade (kV)
额定容量(kVA)	rated capacity (kVA)
地下式	underground type
Z–终端型，H–环网型	Z–terminal H–ring network
变压器性能水平代号	performance level code of transformers
三相	three–phase
G–共箱式，F–分箱式	G–in–one–box–type F–multi–box–type
组合式	combination type

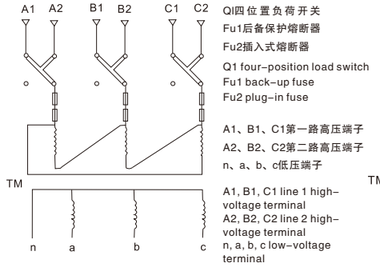
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级地下式组合式变压器

电气原理 electric theory

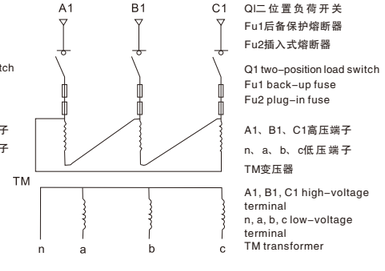
地下式组合变压器的电气原理图如下图所示：

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 equence number	名称 mane	单位 unit	高压侧 high-voltage sides	变压器 transformer	低压侧 low-voltage 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

序号 equence number	名称 mane	单位 unit	高压侧 high-voltage sides	变压器 transformer	低压侧 low-voltage 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 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 qauge	外形尺寸(mm) L×W×H overall dimensions
	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 weight	绝缘油重 tare weight	总重 total weight		
200	6; 6.3; 6.6; 10; 10.5; 11;	±2×2.5%; 或 ±5%;	0.4	Yyn0 或 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	4.5	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.

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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。该类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。

ombined 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 Productm odels and app lications

Z □ S □ –□–□ / 10

- 10 — 电压等级 (kV) Voltage (kV)
- □ — 额定容量 (kVA) Rated capacity (kVA)
- □ — Z–终端型, H–环网型Z– terminal type, and H–ring net type
- □ — 变压器性能水平代号Code of transformer performance
- S — 三相Three phase
- □ — G–共箱式, F–分箱式G – Integrated box–type, F – Split box–type
- Z — 组合式Combined type

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%

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℃, lowest temperature: –30℃
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 for 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℃)，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.

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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℃), 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

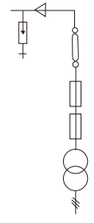
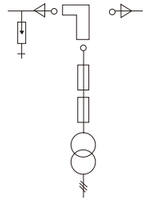
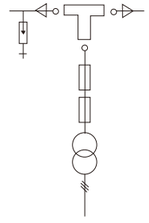
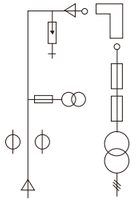
序号 equence number	项目 mane		单位 unit	技术参数 technical parameters
1	额定电压 rated voltage	一次侧 primary	kV	6~10
		二次侧 secondary	kV	0.4
2	额定工作电压 ed working voltage		kV	12
3	额定频率 rated frequency		Hz	50
4	额定容量 rated capacity		kVA	100~1250
5	1分钟工频耐受电压 1–minute power–frequency withstand voltage		kV	35
6	雷电冲击耐受电压 lightning impulse withstand voltage		kV	95
7	2秒短时耐受电流 2–sencond 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			(6~10)±2×2.5%
10	环境温度 environmental temperature		℃	-20~+40
11	允许温升 permissible temperature rise		K	55

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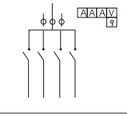
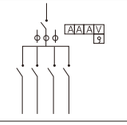
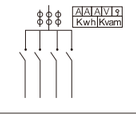
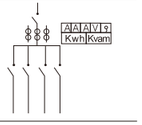
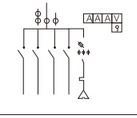
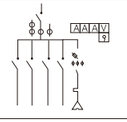
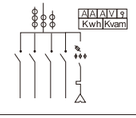
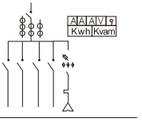
Assembled type Voltage Transformer

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

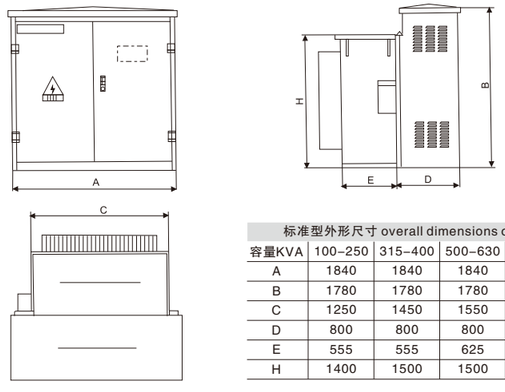
类型	方案1	方案2	方案3	方案4
电气主接线				
元件	支路开关100–630A	主开关630–1250A 支路开关100–630A	支路开关100–630A	主开关630–1250A 支路开关100–630A
类型	方案1	方案2	方案3	方案4
				
元件	支路开关100–630A 补偿容量30–300kVar	主开关630–1250A 支路开关100–630A 补偿容量30–300kVar	支路开关100–630A 补偿容量30–300kVar	主开关630–1250A 支路开关100–630A 补偿容量30–300kVar

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级组合式变压器(美式箱变)

产品外形尺寸 External dimensions of product

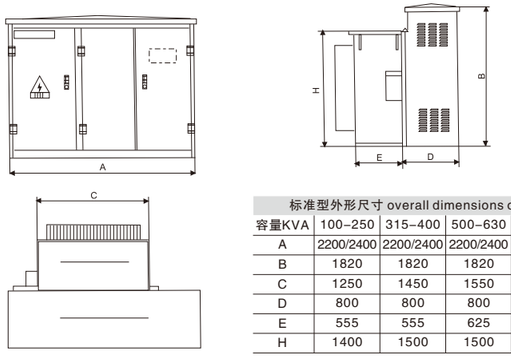
1、标准型外形尺寸图 1、External dimensions of standard product



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 dimensions of enforced product



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	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.

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、拥有自有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

RZZS□-□/□

- 额定电压(kV) Rated voltage (kV)
- 额定容量(kVA) Rated capacity (kVA)
- 变压器性能水平代号 Code of transformer performance level
- 三相 Three-phase
- 柱上式 Pole-mounted
- 智能型 Intelligent
- 企业代号 Enterprise code

10kV

级柱上智能组合式变压器

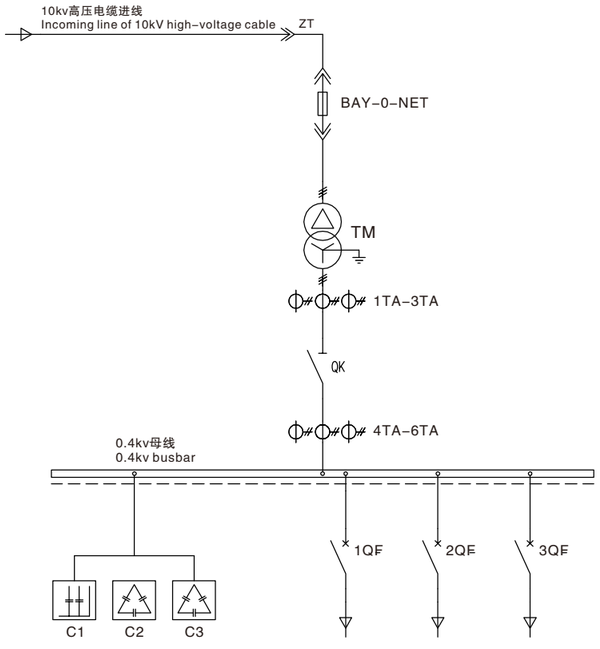
主要技术参数 Technical parameters

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1min 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		±2×2.5%或±5%
9	短路阻抗Short circuit impedance	%	4
10	联结组别Link group		Dyn11或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

10kV

Pole-mounted smart combined transformer

一次原理图 Primary schematic diagram

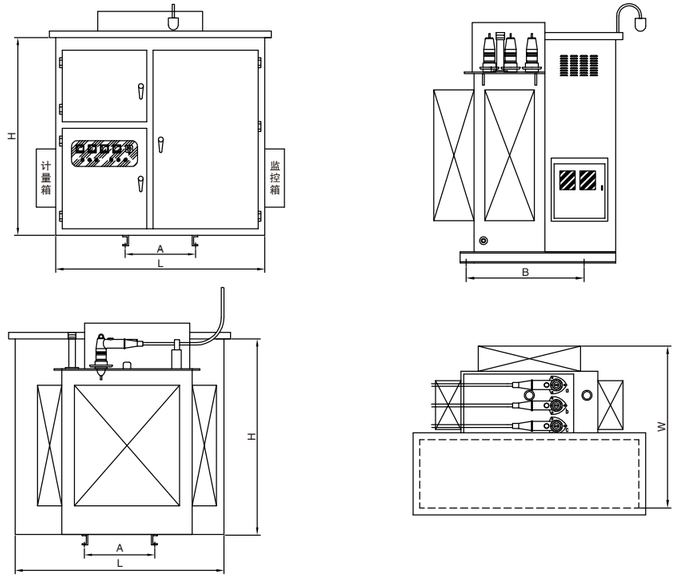


Zt:肘型电缆头	Zt:Elbow cable head
Bay-O-Net:熔断器	Bay-O-Net:Fuse
TM:低损耗节能变压器	TM:Low-loss energy-saving transformer
QK:刀开关	QK:Knife switch
QF:智能型塑壳式断路器	QF:Intelligent molded case circuit breaker
C:智能电容器	C:Intelligent capacitor
TA:电流互感器	TA:Current transformer

10kV

级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考参，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，是将高压电器设备、变压器、低压电器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选的新型成套设备。

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；
空气相结温度不超过90%（+25℃）；
地震水平加速度不大于0.4m/s^2，垂直加速度不大于0.2m/s^2；
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/s^2
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 andmodelofproduct

Z B W □ -□/□

- 电压等级(KV) Voltage (KV)
- 额定容量(KVA) Rated capacity (KVA)
- 设计序号 Design serial number
- 户外型 Outdoor type
- 变电站 Transformer sbustation
- 组合式 Combined

ZBW
Series combined transformer substation

主要技术参数 Externaldimensionsofproduct

序号	项目	单位	高压电器	变压器	低压电器
1	额定电压Ue	kV	7.2、12	6/0.4、10/0.4	0.4
2	额定容量Se	kvA		目型：200~1250	
3	额定电流Le	kvA	200~630		100~3000
4	额定开断电流	A	负荷开关400~630A		15~63
		kA	组合电器取决于熔断器		
5	额定短时耐受电流	kA	20(2S)	200~400kvA	15(1S)
			12.5(4S)	400kvA	30(1S)
6	额定峰值耐受电流	kA	31.5、50	200~400kvA	30
				400kvA	63
7	额定关合电流	kA	31.5、50		
8	工频耐受电压1min	kV	相对地及相间42、30	油变：35/5min	≤300V时2kV
			隔离断口48、34	干变：28/5 min	300,660V时2.5kV
9	雷电冲击	kV	相对地及相间75.60	75	
			隔离断口85、75		
10	噪声水平	dB		油变：＜55	
				干变：＜65	
11	防护等级		IP33	IP23	IP33
12	外形尺寸	根据所选变压器容量和形式，选定不同的外形尺寸。			

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；变压器室设有自起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.

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)

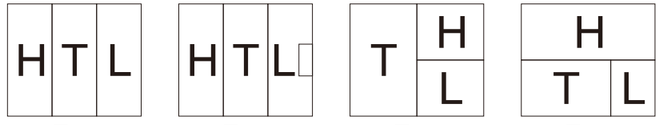


图1-1　图1-2　图1-3　图1-4

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

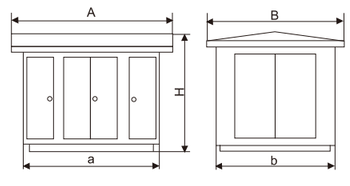


图2 ZBW系列箱式变电站外形图("目"字型排列)
Figure 2: External drawing of ZBW series box-type transformer substation ("B" type configuration)

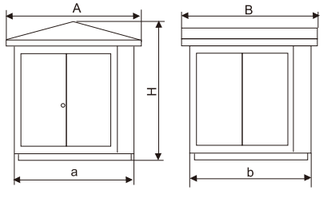


图3 ZBW系列箱式变电站外形图("品"字型排列)
Figure 3: External drawing of ZBW series box-type transformer substation ("Delta" configuration)

ZBW

系列组合变电站

类别			A	a	B	b	H	最佳适用场所
三相	目字型	100–630kvA	4140	3750	2590	2290	2320	工矿、油田、建筑施工等
		800–1250kvA	5184	4880	2500	2290	2626	生活小区
	品字型	50–400kvA	2500	2300	2400	2200	2320	
单相	目字型	≤50kvA	2500	2300	1260	1060	2215	路灯供电
		80–100kvA	2500	2300	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

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)
高压侧电压（kV）	HV side voltage (kV)
变压器容量（kVA）	Transformer capacity (kVA)
风力发电	Wind power generation
终端型	Terminal
共箱式	Shared box

使用环境条件 Working conditions

1、环境温度

最高：+40℃　最低：–40℃

2、海拔高度　≤2000m

3、湿度　日平均≤100%，月平均≤90%

4、地震裂度　8度（中国12级度标准）

5、户外风速　不大于50m/s　风压100kgf/m^2

6、耐污等级　III级污秽地区

7、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

8、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. HumidityDaily average ≤ 100%; monthly average ≤ 90%
4. Earthquake intensity8 (Chinese standard 12–magnitude scale)
5. Outdoor wind speedNo large than 50m/s; wind pressure 100kgf/m^2
6. AntipollutionClass III region
7. Installation positions: Outdoor places without risks of fire, explosion, conductive dust, corrosive gases
8. Ice covering10mm

产品特点 Features forproduct

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 disconnector + 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

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、双绕阻、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±2*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

ZGS-Z · F
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(μΩ) Main circuit resistance (μΩ)	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

ZGS-Z · F
Wind substation,wind power generation prefabricated substation

高压避雷器性能表 HV Lightening 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	0.75Ulma下的泄漏电流（μA） Leakage current under 0.75Ulma (μA)	不大于30 Not more than30
6	8/20μS标称放电电流下残压（kV） Residual voltage at 8/20μS nominal discharge current (kV)	不大于134 Not more than134
7	2000μS方波电流（幅值，A） 2000μS rectangular wave current (amplitude, A)	不小于400 not less than400
8	4/10μS大电流冲击耐受电流（kV） 4/10μS heavy current impulse withstand current (kV)	不小于65 not less than65
9	1.05Uc下的局部放电量 Partial discharge at 1.05Uc	小于14PC less than14PC

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

ZGS-Z · F
风力变电站
风力发电箱式变电站

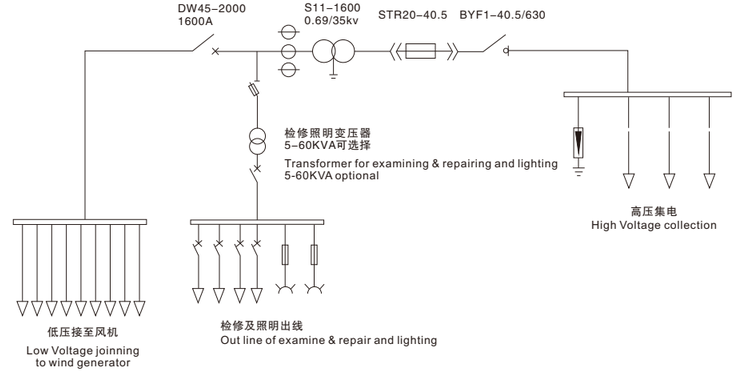
钢板迷宫式折边，配以高强度耐老化的密封件，可使高低压箱体的防护等级达IP54；
1、箱式变电站接地系统
箱变内设有专用接地铜母线，贯穿各室，箱内各室金属非带电部件及金属构件均与接地母线有效连接，底座设有专用的铜质接地螺丝（M12）与接地母线连接，底座外侧另设有四个专用的铜质接地螺丝[M12]，供用户与基础接地网连接用；
2、箱式变电站使用寿命：
箱变的整体寿命按30年设计（高低压熔丝等易损件的更换除外）；

a. Overall layout: “品” 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.

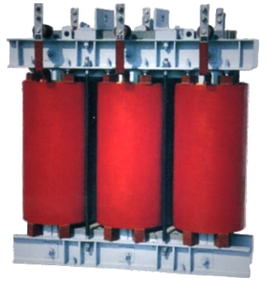
ZGS-Z · F
Wind substation,wind power generation prefabricated substation

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 chsem es



高压电动机起动电抗器



用途 Use

CKSC型干式铁芯串联电抗器是电力系统无功补偿装置的重要配套设备。电力电容器与干式铁芯电抗器串联后，能有效地抑制电网中的高次谐波，限制电容器的合闸涌流及操作过电压，改善系统的电压波形，提高电网功率因数，对电力电容器及其它电力设备的安全运行起到了较大作用。

CKSC dry iron core series reactors are important equipment for reactive compensation devices of power systems. When power capacitors are connected with dry iron core reactance in series, they can effectively inhibit the high order harmonics in the power grids, limit the switch on rush currents and operating overvoltage of capacitors, improve the voltage waveforms of the systems, increase the grid power factor, and play an important role for the safety of power capacitors and other electrical devices.

结构特点 Construction eatures

1、CKSC型干式铁芯串联电抗器的铁芯采用优质进口冷轧低损耗硅钢片，芯柱由多个气隙分成均匀小段，气隙中采用环氧板，以保证电抗器气隙长期运行下而不发生变化。
2、铁芯端面采用优质硅钢片端面胶，使硅钢片牢固地结合在一起，大大减小了运行时的噪音，并具有较好的防腐性能。
3、线圈为环氧浇注型，线圈内外敷设环氧玻璃网格布作增强，采用H级环氧浇注体系在真空状态下进行浇注，该线圈不但绝缘性能好，而且机械强度高，能耐受大电流冲击和冷热冲击而不开裂。
4、环氧浇注线圈不吸水、局部放电量低，可在恶劣环境条件下安全运行。
5、线圈上下端部采用环氧垫块和硅橡胶防震垫，有效减小了线圈运行时的震动。

1. CKSC dry iron core series reactors use imported quality cold-rolled silicon steel sheets of low loss; the stem is separated into even sections by air gaps, which have epoxy plates inside, to ensure that the air gaps will not deform after long operation
2. The ends of the iron core use quality end adhesives for silicon steel sheets for sound bounding, to significantly reduce noise and keep good anticorrosion features.
3. The coils are of the epoxy casting type, and epoxy glass mesh fabrics are applied inside and outside the coils. Class H epoxy casting system is used for casting under vacuum conditions. The coils not only feature good isolation but also high mechanical strength, and can withstand large currents and cold and hot impulse without cracking.
4. The epoxy casting coils do not absorb water and has low local discharge, suitable for safety operation under severe conditions.
5. The upper and lower ends of coils have epoxy pads and silicon rubber cushion pads to noticeably reduce vibration when the coils are working.

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HV capacity series reactance

使用环境条件 Working onditions

1、海拔高度不超过2000米。
2、运行环境温度-25℃~+45℃，相对湿度不超过90%。
3、周围无有害气体，无易燃易爆物品。
4、周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

1. The elevation above sea level should not exceed 2,000 meters.
2. The working temperature is -25℃~+45℃, and the relative humidity shall be no higher than 90%.
3. The reactors shall be installed a positions without hazardous gas or inflammable or explosive substances.
4. The environment shall have good ventilation, and ventilation devices should be used if a reactor is installed in a cabinet.

性能参数 Perform ance

1、耐高温等级达到F级(155℃)；正常运行时，干式铁芯电抗器的铁芯温升不大于85K，线圈温升不大于95K。
2、电抗器能在1.35倍额定电流下长期运行。
3、电抗器的噪声不大于国家标准。
4、电抗器耐压水平符合JB5346-1998《串联电抗器》的规定。

1. The high temperature resistance reaches class F (155℃). During normal operation, the temperature rise of the dry iron core reactors is no large than 85 K, and that of the coils is no larger than 95K
2. The reactors are able to work for a long time at 1.35 times of the rated current.
3. Noise generated by the reactors is no higher than levels specified in relevant national standard.
4. The withstand voltages of the reactors are as per JB5346-1998 Series Reactors.

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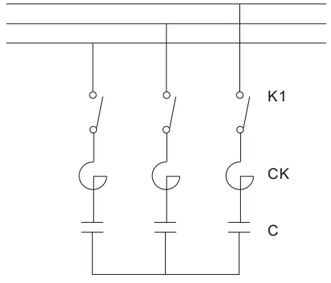
高压电动机起动电抗器

型号说明 Model designation

CK S C－□ / □－□

额定电抗率X_L/X_C	Rated reactance X_L/X_C
配用电抗器额定相电压(V)	Rated phase voltage of reactor (V)
电抗器三相容量(kvar)	Reactor 3-phase capacity (kvar)
环氧浇注	Epoxy casting
三相	3-phase
串联电抗器	Series reactor

接线方式 Wiring



Y形连接
Y type Link

HV capacity series reactance

串联电抗器参数及外形尺寸 Series reactor parameters and dimensions

CKSC型，10kV，三相，XL/XC=1%，匹配电容器电压：11kV
CKSC type; 10 kV, 3-phase; XL/XC=1%; voltage of capacitor: 11kV

电抗器型号 Reactor model	匹配电容器规格(kvar) Specification of reactor	电抗器容量(kvar) Reactor capacity	电感量(mH) Reactor inductance	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸(mm) Installation dimensions
CKSC-1.0/10-1%	100	1.0	3×38.52	500×360×400	350×300,4-φ12
CKSC-2.0/10-1%	200	2.0	3×19.26	530×360×450	350×300,4-φ12
CKSC-3.0/10-1%	300	3.0	3×12.84	530×360×460	350×300,4-φ12
CKSC-4.5/10-1%	450	4.5	3×8.569	530×360×510	350×300,4-φ12
CKSC-6.0/10-1%	600	6.0	3×6.420	710×450×660	400×350,4-φ12
CKSC-7.5/10-1%	750	7.5	3×5.133	710×450×690	400×350,4-φ12
CKSC-9.0/10-1%	900	9.0	3×4.285	740×450×700	400×350,4-φ12
CKSC-10.0/10-1%	1000	10.0	3×3.285	740×450×710	400×350,4-φ12
CKSC-12.0/10-1%	1200	12.0	3×3.210	770×500×750	500×400,4-φ14
CKSC-15.0/10-1%	1500	15.0	3×2.570	770×500×780	500×400,4-φ14
CKSC-18.0/10-1%	1800	18.0	3×2.140	800×500×790	500×400,4-φ14
CKSC-20.0/10-1%	2000	20.0	3×1.926	800×500×820	500×400,4-φ14
CKSC-24.0/10-1%	2400	24.0	3×1.605	800×500×880	500×400,4-φ14
CKSC-27.0/10-1%	2700	27.0	3×1.427	830×500×880	500×400,4-φ14
CKSC-30.0/10-1%	3000	30.0	3×1.284	830×500×920	500×400,4-φ14

高压电动机起动电抗器



用途 Use

交流异步电动机在额定电压下起动时，初始起动电流是很大的，往往超过额定电流的许多倍(一般是5~7倍)，为了减少起动电流，不使对电网造成影响，通常用降低电压的方法来起动交流异步电动机，常用的降压方法是采用的电抗器或自藕变压器，交流电动机的起动过程很短(一般数秒钟至二分钟)，起动后就将降压起动用的电抗器或自藕变压器切除。该产品是根据高压异步电动机的启动性设计的，匹配电动机功率220~140kW。

When AC asynchronous motors are started at the rated voltage, their initial staring current is large, often over many (5–7 generally) times of the rated current. To reduce the starting current and avoid affecting the power grid, the voltage is often reduced to start AC asynchronous motors. A frequently used method is to use a reactor or autotransformer. The starting process of AC motor is quite short (normally lasting for seconds to two minutes), and the reactor or autotransformer is removed after starting. This product is designed to address the starting characteristics of HV asynchronous motors whose power is 220~140kW.

结构特点 Construction

1.QKSC型干式铁芯起动电抗器的铁芯采用优质进口冷扎硅钢片，芯柱由多个气隙分成均匀小段，气隙采用环氧板作为隔绝，并采用高温高强粘接剂，以保证气隙在电抗器运行时不发生变化。
2.铁芯端面采用优质硅钢片端面胶，使硅钢片牢固地结合在一起，大大减小了运行中的噪音，并具有较好的防腐蚀性。
3.线圈浇注式结构，线圈主绝缘采用环氧树脂，真空浇注，并采用网格布增强，该线圈不但绝缘性能好，而且机械强度高，不吸湿，能耐受电机启动时的大电流冲击和冷热冲击而不开裂。

1. CKSC dry iron core series reactors use imported quality cold–rolled silicon steel sheets of low loss; the stem is separated into even sections by air gaps, which are isolated with epoxy plates, and high–temperature and high–strength adhesives are used to ensure that the air gaps will not deform during reactor operation.
2. The ends of the iron core use quality end adhesives for silicon steel sheets for sound bounding, to significantly reduce noise and keep good anticorrosion features.
3. The coils are of the casting type, and the primary insulation of the coils is epoxy cast under vacuum conditions. Mesh fabrics are applied. The coils not only feature good isolation but also high mechanical strength. The epoxy casting coils do not absorb and can withstand large currents and cold and hot impulse without cracking.

HV capacity series reactance

使用环境条件 Working conditions

1.海拔高度不超过1000米。
2.运行环境温度为–25℃~+45℃。
3.安装于户内无剧烈震动，无任何有害气体或粉尘的场合，无易燃易爆物品。
4.当起动时间满2分钟(一次或数次之和)，应冷却6小时才可再次起动。

1. The elevation above sea level should not exceed 1,000 meters.
2. The working temperature is –25℃~+45℃.
3. The reactors shall be installed at indoor positions without strong vibration, hazardous gas or dust, or inflammable or explosive substances.
4. After the (cumulative or one–off) starting time reaches 2 minutes, restarting is only allowed after 6 hours of cooling.

性能参数 Performance

1.耐温等级达到F级(155℃)。
2.干式铁芯起动电抗器损耗低于油浸电抗器的损耗。
3.干式铁芯起动电抗器的噪声不大于国家标准。

1. The high temperature resistance reaches class F (155℃).
2. The loss of dry iron core reactors is lower than the loss of oil–immersed reactors.
3. Noise generated by dry iron core reactors is no higher than levels specified in relevant national standard.

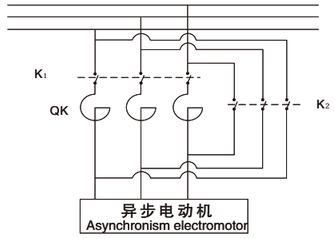
型号说明 Model designation

QK S C — □/□

额定相电压(V)	Rated phase voltage (V)
起动容量(kvar)	Starting capacity (kvar)
干式空气冷却	Dry air cooling
S:三相	S: 3-phase
起动电抗器	Starting reactor

高压电动机起动电抗器

接线方式 Wiring



起动电抗器参数及外形尺寸 Starting reactor parameters and dimensions

起动电抗器型号 Starting reactormodel	起动容量 (kvar) Starting capacity	起动电流 (A) Starting current	每相电抗 (O) Reactance per phase	电抗外形尺寸 (L×W×H) Reactor dimensions	被起动电动机 Started motor	
					型号 Model	功率(kW) Power
QKSC-400/6	395	123	8.667	870×330×700	Y355-4	220
QKSC-450/6	445	139	7.669	870×340×730	Y355-4	250
QKSC-500/6	495	154	6.992	910×345×740	Y355-4	280
QKSC-550/6	555	173	6.162	930×350×760	Y355-4	315
QKSC-630/6	620	194	5.496	940×355×785	Y400-4	355
QKSC-700/6	700	219	4.868	960×360×800	Y400-4	400
QKSC-800/6	785	246	4.333	980×360×820	Y400-4	450
QKSC-850/6	855	267	3.993	1010×385×840	Y400-4	500
QKSC-1000/6	965	301	3.542	1030×385×880	Y400-4	560
QKSC-1100/6	1080	338	3.154	1090×390×905	Y450-4	630
QKSC-1250/6	1215	380	2.805	1105×390×920	Y450-4	710
QKSC-1400/6	1365	427	2.496	1120×410×970	Y450-4	800
QKSC-1600/6	1540	481	2.216	1140×410×1015	Y450-4	900
QKSC-1900/6	1845	499	2.469	1150×420×1060	Y500-4	1000
QKSC-2100/6	2040	552	2.232	1170×430×1095	Y500-4	1120
QKSC-2300/6	2275	615	2.003	1140×440×1120	Y500-4	1250
QKSC-2600/6	2545	688	1.791	1250×445×1145	Y500-4	1400

Filter reactor





用途 Use

该滤波电抗器用于低压滤波柜中，与滤波电容器相串联，调谐至某一谐振频率，用来吸收电网中相应频率的谐波电流。低压电网中有大量整流、变流、变频装置等谐波源，其产生的高次谐波会严重危害主变及系统中其它电器设备的安全运行。滤波电抗器与电容器相串联后，不但能有效地吸收电网谐波，而且提高了系统的功率因数，对于系统的安全运行起到了较大的作用。

The filter reactors are used in LV filter cabinets for series connection with filter capacitors. They are tuned to a certain resonance frequency to absorb the corresponding harmonic current in the power grid. LV power grids have many current rectifying, current transformation, frequent conversion devices which are harmonic sources. Their higher harmonics would significantly affect the safe operation of the main transformer and other electrical equipment in the systems. The filter reactors in series connection with filter capacitors can not only absorb harmonic current in the power grid, but also improve the power factor of the entire system, playing an important role of system safety.

结构特点 Construction

1、该滤波电抗器分为三相和单相两种，均为铁心干式。
2、铁芯采用优质低损耗进口冷轧取向硅钢片，芯柱由多个气隙分成均匀小段，气隙采用环氧层压玻璃布板作间隔，采用高温高强度粘接剂粘接，以保证电抗气隙在运行过程中不发生变化。
3、线圈采用H级漆包扁铜线绕制，排列紧密且均匀。
4、电抗器的线圈和铁芯组装成一体后经过预烘→真空浸漆→热烘固化这一工艺流程，采用H级浸渍漆，使电抗器的线圈和铁芯牢固地结合在一起。
5、电抗器的夹件、坚固件等采用非磁性材料，确保电抗器具有较高的品质因数，确保具有较好的滤波效果。
6、外露部件均采取了防腐蚀处理，引出端子采用了镀锡铜管端子。

1. The filter reactors are of two types, 3-phase and single phase. Both types are dry iron core ones.
2. The iron core use imported quality cold-rolled silicon steel sheets of low loss; the stem is separated into even sections by air gaps, which are isolated with epoxy laminated glass fabric plates, and high-temperature and high-strength adhesives are used to ensure that the air gaps will not deform during reactor operation.
3. The coils are wound with class II enameled flat copper wire which is evenly and closely arranged.
4. After the coils and iron cores of the reactors are assembled together, they go through the process for pre-baking → vacuum coating dip → baking and curing. Class H impregnating varnish is used to ensure that the coils and iron cores are firmly bounded.

5. Clamps and fasteners of the reactors are made of non–magnetic materials, to ensure that the reactors have a high quality factor and satisfactory filtering effects.
6. All exposed parts have undergone anticorrosion treatment, and tinned copper tube terminals are used for outgoing terminals.

使用环境条件 Working conditions

1、海拔高度不超过2000米。
2、运行环境温度–25℃~+45℃，相对湿度不超过90%。
3、周围无有害气体，无易燃易爆物品。
4、周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

1. The elevation above sea level should not exceed 2,000 meters.
2. The working temperature is –25℃~+45℃, and the relative humidity shall be no higher than 90%.
3. The reactors shall be installed a positions without hazardous gas or inflammable or explosive subst ances.
4. The environment shall have good ventilation, and ventilation devices should be used if a reactor is installed in a cabinet.

性能参数 Performance

1、可用于400V、660V系统。
2、额定绝缘水平3kV/min。
3、电抗器各部位的温升限值：铁芯不超过85K，线圈温升不超过95K。
4、电抗器噪声不大于50dB。
5、三相电抗器的任意两相电抗值之差不大于±2%。
6、耐温等级H级(180℃)以上。

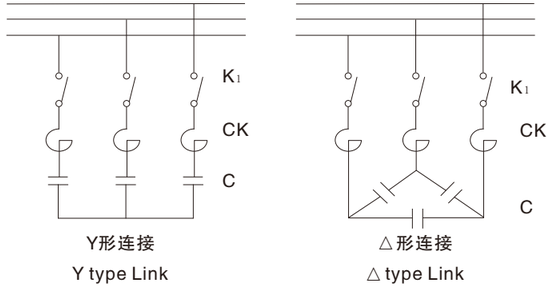
1. Use with 400V and 660V systems.
2. Rated insulation 3kV/min.
3. Temperature rise limits of reactor positions: no larger than 85K for iron core; no larger than 85K for iron core
4. The noise of the reactors shall not be larger than 50dB.
5. The difference of reactance between any two phases of a 3–phase reactor shall be no larger than ±2%.
6. Temperature resistance is over class H (180℃).

型号说明 Model designation

LK □ G — □ — □ / □

额定电感量(μH)	Rated inductance (μH)
额定电流(A)	Rated current (A)
系统额定电压(kV)	Rated system voltage (kV)
干式空气冷却	Dry air cooling
S:三相；D:单相	S: 3-phase; D: single phase
滤波电抗器	Filter reactor

接线方式 Wiring



Y形连接
Y type Link

△形连接
△type Link

滤波电抗器参数及外形尺寸 Filter reactor parameters and dimensions

滤波电抗器一般没有标准的规格，根据每次的滤波要求而专门设计，下面仅以三相滤波电抗器为例，其典型参数及尺寸如下表：

Generally, filter reactors have standard specifications and are designed to meet specific filtering needs. The typical parameter and dimensions of a 3–phase filter reactor are given in the table below.

滤波电抗器

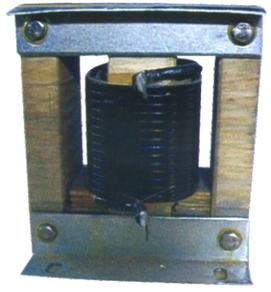
5次滤波电抗 Quintic filter reactor

电抗器型号 Reactor model	电抗器电感量（μH） Reactor inductance	电容器电容量（kvar） Reactor electric capacity	额定总电流(A) Rated total current	额定谐波电流(A) Rated harmonic current	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸 (mm) Installation dimensions
LKSG-0.4-30/2175	2175	20	30	20	铜：250×175×215	铜：190×115,4-φ10
					铝：260×175×230	铝：200×115,4-φ10
LKSG-0.4-40/1740	1740	25	40	25	铜：260×175×220	铜：200×115,4-φ10
					铝：260×175×265	铝：200×115,4-φ10
LKSG-0.4-45/1450	1450	30	45	30	铜：290×175×235	铜：230×115,4-φ10
					铝：280×175×290	铝：220×115,4-φ10
LKSG-0.4-60/1088	1088	40	60	40	铜：290×185×270	铜：230×125,4-φ10
					铝：290×185×315	铝：230×125,4-φ10
LKSG-0.4-75/870	870	50	75	50	铜：290×195×285	铜：230×135,4-φ12
					铝：290×195×320	铝：230×135,4-φ12
LKSG-0.4-90/725	725	60	90	60	铜：290×200×295	铜：230×135,4-φ12
					铝：290×200×360	铝：230×135,4-φ12
LKSG-0.4-105/621	621	70	105	70	铜：320×200×310	铜：260×135,4-φ12
					铝：320×200×365	铝：260×135,4-φ12
LKSG-0.4-120/544	544	80	120	80	铜：320×200×335	铜：260×135,4-φ12
					铝：350×200×405	铝：290×135,4-φ12
LKSG-0.4-135/483	483	90	135	90	铜：350×200×350	铜：290×135,4-φ12
					铝：350×200×405	铝：290×135,4-φ12
LKSG-0.4-150/435	435	100	150	100	铜：350×200×370	铜：290×135,4-φ12
					铝：350×210×420	铝：290×145,4-φ12
LKSG-0.4-180/363	363	120	180	120	铜：350×210×405	铜：290×145,4-φ12
					铝：380×210×450	铝：320×145,4-φ12
LKSG-0.4-225/290	290	150	225	150	铜：380×210×445	铜：320×145,4-φ12
					铝：380×210×530	铝：320×145,4-φ12
LKSG-0.4-270/242	242	180	270	180	铜：380×240×425	铜：320×165,4-φ12
					铝：380×240×505	铝：320×165,4-φ12
LKSG-0.4-300/218	218	200	300	200	铜：380×240×455	铜：320×165,4-φ12
					铝：380×240×545	铝：320×165,4-φ12

Filter reactor

电抗器型号 Reactor model	电抗器电感量（μH） Reactor inductance	电容器电容量（kvar） Reactor electric capacity	额定总电流(A) Rated total current	额定谐波电流(A) Rated harmonic current	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸 (mm) Installation dimensions
LKSG-0.4-375/174	174	250	375	250	铜：540×350×530	铜：400×300,4-φ14
					铝：540×350×610	铝：400×300,4-φ14
LKSG-0.4-450/145	145	300	450	300	铜：540×350×575	铜：400×300,4-φ14
					铝：540×350×665	铝：400×300,4-φ14
LKSG-0.4-525/124	124	350	525	350	铜：540×350×625	铜：400×300,4-φ14
					铝：540×350×690	铝：400×300,4-φ14
LKSG-0.4-595/109	109	400	595	400	铜：540×350×665	铜：400×300,4-φ14
					铝：540×350×770	铝：400×300,4-φ14
LKSG-0.4-670/97	79	450	670	450	铜：590×350×695	铜：400×300,4-φ14
					铝：590×350×800	铝：400×300,4-φ14
LKSG-0.4-745/87	87	500	745	500	铜：590×350×750	铜：400×300,4-φ14
					铝：590×350×855	铝：400×300,4-φ14
LKSG-0.4-820/79	79	550	820	550	铜：590×350×785	铜：400×300,4-φ14
					铝：590×350×910	铝：400×300,4-φ14
LKSG-0.4-895/73	73	600	895	600	铜：590×350×830	铜：400×300,4-φ14
					铝：590×350×965	铝：400×300,4-φ14

低压平波电抗器



用途 Use

低压平波电抗器用于整流回路之中，抑制整流后的波纹脉动分量，并使整流后的电流连续不断，改善输出的直流波形，保证直流设备的正常运行。

LV smoothing reactors are used in current rectification circuits, to inhibit the wave pulse component and keep continuous current after current rectification, improve the DC waveform, and ensure proper working of DC equipment.

结构特点 Construction

1、该电抗器为单相结构，均为铁心干式。
2、铁芯采用优质低损耗进口冷轧硅钢片，芯柱由多个气隙分成均匀小段，气隙采用环氧层压玻璃布板作间隔，并涂以专用粘接剂，以保证电抗气隙在运行过程中不发生变化且无噪音。
3、线圈采用H级或C级漆包铜扁线绕制，排列紧密且均匀，外表不包绝缘层，小容量线圈采用层式结构，大容量线圈采用饼式结构，具有较好的通风散热效果。
4、电抗器的线圈和铁芯组装成一体后经过预烘→真空浸漆→热烘固化这一工艺流程，采用H级浸渍漆，使电抗器的线圈和铁芯牢固地结合在一起，不但大大减小了运行时的噪音，而且具有极高的耐热等级，可确保电抗器在高温下亦能无噪音地安全运行。
5、电抗器芯柱部分紧固件采用无磁性材料，确保电抗器具有较低的温升。
6、外露部件均采取了防腐蚀处理，引出端子采用镀锡铜管端子或铜排。

1. The reactors are of single phase and the dry iron core type.
2. The iron core use imported quality cold–rolled silicon steel sheets of low loss; the stem is separated into even sections by air gaps, which are isolated with epoxy laminated glass fabric plates, and high–temperature and high–strength adhesives are used to ensure that the air gaps will not deform during reactor operation.
3. The coils are wound with class II or C enameled flat copper wire which is evenly and closely arranged. No insulation exists on the surface. Small capacity coils are of layers, while large capacity coils are of a cake structure, to have good ventilation and heat dissipation effects.
4. After the coils and iron cores of the reactors are assembled together, they go through the process for pre–baking → vacuum coating dip → baking and curing. Class H impregnating varnish is used to ensure that the coils and iron cores are firmly bounded. This practice only significantly reduces noise and has a high heat resistance class, to ensure that the reactors work safely without causing noise at high temperatures.
5. Stem fasteners of the reactors are made of non–magnetic materials, to ensure that the

reactors have low temperature rise.
6. All exposed parts have undergone anticorrosion treatment, and tinned copper tube or copper bar terminals are used for outgoing terminals.

使用环境条件 Working conditions

1.海拔高度不超过2000米。
2.运行环境温度–25℃~+45℃，相对湿度不超过90%。
3.周围无有害气体，无易燃易爆物品。
4.周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

1. The elevation above sea level should not exceed 2,000 meters.
2. The working temperature is –25℃~+45℃, and the relative humidity shall be no higher than 90%.
3. The reactors shall be installed a positions without hazardous gas or inflammable or explosive substances.
4. The environment shall have good ventilation, and ventilation devices should be used if a reactor is installed in a cabinet.

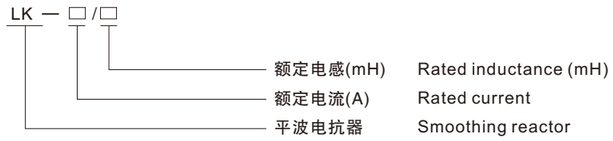
性能参数 Performance

1、可用于1000V以下的各电压等级的整流系统；
2、额定绝缘水平3kV/min；
3、电抗器各部位的温升限值：铁芯不超过85K，电圈温升不超过95K；
4、电抗器噪声不大于45db；
5、电抗器能在额定直流电流和脉动分量下长期运行；
6、耐温等级H级(180℃)以上。

1. Use with current rectifications systems under 1000V.
2. Rated insulation 3kV/min.
3. Temperature rise limits of reactor positions: no larger than 85K for iron core; no larger than 85K for iron core.
4. The noise of the reactors shall not be larger than 45dB.
5. The reactors can work for a long time under the rated DC current and pulse component.
6. Temperature resistance is over class H (180℃).

低压平波电抗器

型号说明 Model designation



平波电抗器参数及外形尺寸 Smoothing reactor parameters and dimensions

以Z2直流电动机为例，平波电抗器的参数如下表

Take a Z2 DC motor for example. The parameters of the smoothing reactor are given below

电抗器型号 Reactor model	额定电流 (A) Rate current	电感值 (mH) Inductance	外形尺寸 L×W×H(mm) Exterior dimensions	直流电动机 DC Motor		
				型号 Model	功率(kW) Power	电压(V) Voltage
LK–6/80	6	80	150×165×135	Z2–11	0.4	110
LK–3/323	3	323	160×165×155	Z2–21	0.4	220
LK–9/54	9	54	165×175×160	Z2–11	0.6	110
LK–4.5/215	4.5	215	165×175×160	Z2–21	0.6	220
LK–12/42	12	42	170×175×175	Z2–11	0.8	110
LK–6/167	6	167	170×175×170	Z2–21	0.8	220
LK–15/30	15	30	170×185×165	Z2–11	1.1	110
LK–8/120	8	120	165×185×190	Z2–21	1.1	220
LK–21/23	21	23	190×185×200	Z2–11	1.5	110
LK–11/93	11	93	190×185×210	Z2–21	1.5	220
LK–28/16	28	16	190×185×215	Z2–11	2.2	110
LK–14/65	14	65	195×185×215	Z2–21	2.2	220
LK–38/12	38	12	190×195×245	Z2–11	3	110
LK–20/48	20	48	190×195×250	Z2–21	3	220
LK–50/9	50	9	195×205×250	Z2–11	4	110
LK–26/38	26	38	190×205×275	Z2–21	4	220
LK–72/6.79	72	6.79	215×205×315	Z2–11	5.5	110
LK–36/28	36	28	210×205×325	Z2–21	5.5	220
LK–95/4.9	95	4.9	210×205×365	Z2–11	7.5	110

LV smoothing reactor

电抗器型号 Reactor model	额定电流 (A) Rate current	电感值 (mH) Inductance	外形尺寸 L×W×H(mm) Exterior dimensions	直流电动机 DC Motor		
				型号 Model	功率(kW) Power	电压(V) Voltage
LK–50/20	50	20	215×205×380	Z2–21	7.5	220
LK–125/3.78	125	3.78	230×205×415	Z2–11	10	110
LK–65/15	65	15	235×205×405	Z2–21	10	220
LK–170/2.85	170	2.85	235×215×450	Z2–11	13	110
LK–85/11.6	85	11.6	235×215×480	Z2–21	13	220
LK–220/2.25	220	2.25	255×215×515	Z2–11	17	110
LK–110/8.9	110	8.9	250×215×555	Z2–21	17	220
LK–280/1.75	280	1.75	400×350×540	Z2–11	22	110
LK–140/7.1	140	7.1	255×235×530	Z2–21	22	220
LK–375/1.31	375	1.31	405×350×610	Z2–11	30	110
LK–190/5.25	190	5.25	255×255×595	Z2–21	30	220
LK–500/1.0	500	1.0	425×400×755	Z2–11	40	110
LK–250/3.99	250	3.99	480×400×570	Z2–21	40	220
LK–330/2.98	330	2.98	475×400×630	Z2–21	55	220
LK–450/2.22	450	2.22	490×400×715	Z2–21	75	220
LK–590/1.67	590	1.67	575×450×690	Z2–21	100	220
LK–730/1.35	730	1.35	580×450×750	Z2–21	125	220
LK–930/1.06	930	1.06	585×450×840	Z2–21	160	220
LK–1150/0.854	1150	0.854	595×500×935	Z2–21	200	220

低压平波电抗器

7次滤波电抗 Septuplicate filter reactor

电抗器型号 Reactor model	电抗器电感量（μH） Reactor inductance	电容器电容量（kvar） Reactor electric capacity	额定总电流(A) Rated total current	额定谐波电流(A) Rated harmonic current	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸 (mm) Installation dimensions
LKSG-0.4-30/921	921	20	30	18	铜：250×155×180	铜：190×95,4-φ10
					铝：260×155×180	铝：200×95,4-φ10
LKSG-0.4-35/737	737	25	35	22	铜：260×155×180	铜：200×95,4-φ10
					铝：260×155×195	铝：200×95,4-φ10
LKSG-0.4-45/614	614	30	45	25	铜：260×165×175	铜：200×105,4-φ10
					铝：250×160×220	铝：190×105,4-φ10
LKSG-0.4-55/461	461	40	55	35	铜：260×175×205	铜：200×115,4-φ10
					铝：260×175×220	铝：200×115,4-φ10
LKSG-0.4-70/368	368	50	70	45	铜：280×175×230	铜：220×115,4-φ10
					铝：290×175×240	铝：230×115,4-φ10
LKSG-0.4-85/307	307	60	85	55	铜：280×175×240	铜：220×115,4-φ10
					铝：290×185×240	铝：230×125,4-φ10
LKSG-0.4-100/263	263	70	100	60	铜：290×185×230	铜：230×125,4-φ10
					铝：290×185×275	铝：230×125,4-φ10
LKSG-0.4-115/230	230	80	115	70	铜：290×185×240	铜：230×125,4-φ10
					铝：280×195×270	铝：230×135,4-φ10
LKSG-0.4-130/205	205	90	130	80	铜：290×195×250	铜：230×135,4-φ10
					铝：300×195×290	铝：240×135,4-φ10
LKSG-0.4-145/184	184	100	145	90	铜：290×195×285	铜：230×135,4-φ12
					铝：330×195×295	铝：270×135,4-φ12
LKSG-0.4-170/154	154	120	170	105	铜：290×195×290	铜：230×135,4-φ12
					铝：320×195×320	铝：260×135,4-φ12
LKSG-0.4-210/123	123	150	210	130	铜：320×195×315	铜：260×135,4-φ12
					铝：350×205×335	铝：290×145,4-φ12
LKSG-0.4-255/102	102	180	255	160	铜：320×195×355	铜：260×135,4-φ12
					铝：350×205×380	铝：290×145,4-φ12
LKSG-0.4-285/92	92	200	285	180	铜：350×195×375	铜：290×135,4-φ12
					铝：380×205×390	铝：320×145,4-φ12

注：电容电压525V
Note: Capacitor voltage 525V

LV smoothing reactor

11次滤波电抗 11th filter reactor

电抗器型号 Reactor model	电抗器电感量（μH） Reactor inductance	电容器电容量（kvar） Reactor electric capacity	额定总电流(A) Rated total current	额定谐波电流(A) Rated harmonic current	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸 (mm) Installation dimensions
LKSG-0.4-25/395	395	20	25	15	铜：220×145×135	铜：160×85,4-φ8
					铝：230×145×140	铝：170×85,4-φ8
LKSG-0.4-35/316	316	25	35	20	铜：230×145×150	铜：170×85,4-φ8
					铝：230×145×165	铝：170×85,4-φ8
LKSG-0.4-40/263	263	30	40	25	铜：230×155×150	铜：170×95,4-φ8
					铝：220×155×175	铝：160×95,4-φ8
LKSG-0.4-60/197	219	40	60	35	铜：260×155×180	铜：200×95,4-φ8
					铝：250×155×200	铝：190×95,4-φ8
LKSG-0.4-75/158	158	50	75	45	铜：250×165×185	铜：190×105,4-φ8
					铝：260×165×200	铝：200×105,4-φ8
LKSG-0.4-85/132	132	60	85	55	铜：300×175×180	铜：240×115,4-φ8
					铝：260×175×205	铝：200×115,4-φ8
LKSG-0.4-100/113	113	70	100	60	铜：250×175×190	铜：190×115,4-φ8
					铝：260×175×215	铝：200×115,4-φ8
LKSG-0.4-115/99	99	80	115	70	铜：250×175×205	铜：190×115,4-φ8
					铝：260×175×255	铝：200×115,4-φ8
LKSG-0.4-130/88	88	90	130	80	铜：290×175×215	铜：230×115,4-φ8
					铝：290×175×240	铝：230×115,4-φ8
LKSG-0.4-145/79	79	100	145	90	铜：280×175×240	铜：220×115,4-φ10
					铝：290×175×255	铝：230×115,4-φ10
LKSG-0.4-170/58	66	120	170	105	铜：290×175×245	铜：230×115,4-φ10
					铝：290×175×280	铝：230×115,4-φ10
LKSG-0.4-210/53	53	150	210	130	铜：290×185×255	铜：230×125,4-φ10
					铝：290×185×295	铝：230×125,4-φ10
LKSG-0.4-255/44	44	180	255	160	铜：290×185×290	铜：230×125,4-φ10
					铝：290×185×335	铝：230×125,4-φ10
LKSG-0.4-285/39	39	200	285	180	铜：290×185×305	铜：230×125,4-φ10
					铝：290×195×365	铝：230×135,4-φ12

注：电容电压525V
Note: Capacitor voltage 525V

低压平波电抗器

CKSC型，10kV系统，三相，XL/XC=6%，匹配电容器电压：11kV
CKSC type; 10kV system; 3-phase; XL/XC=6%; capacitor voltage: 11kV

电抗器型号 Reactor model	匹配电容器规格(kvar) Capacitor specification	电抗器容量(kvar) Reactor capacity	电感量(mH) Inductance	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸(mm) Installation dimensions
CKSC-6/10-6%	100 kvar	6 kvar	3×233.223	680×450×670	400×350,4-φ12
CKSC-9/10-6%	150 kvar	9 kvar	3×153.514	740×450×700	400×350,4-φ12
CKSC-12/10-6%	200 kvar	12 kvar	3×115.501	740×500×770	500×400,4-φ14
CKSC-18/10-6%	300 kvar	18 kvar	3×77.246	770×500×800	500×400,4-φ14
CKSC-27/10-6%	450 kvar	27 kvar	3×51.388	800×500×770	500×400,4-φ14
CKSC-30/10-6%	500 kvar	30 kvar	3×46.289	830×500×850	600×400,4-φ14
CKSC-36/10-6%	600 kvar	36 kvar	3×38.500	860×500×7850	600×400,4-φ14
CKSC-45/10-6%	750 kvar	45 kvar	3×30.781	890×550×910	600×450,4-φ14
CKSC-54/10-6%	900 kvar	54 kvar	3×25.694	890×550×990	600×450,4-φ14
CKSC-60/10-6%	1000 kvar	60 kvar	3×23.100	920×550×1000	600×450,4-φ14
CKSC-72/10-6%	1200 kvar	72 kvar	3×19.250	920×550×1080	600×450,4-φ14
CKSC-90/10-6%	1500 kvar	90 kvar	3×15.410	950×550×1130	600×450,4-φ14
CKSC-108/10-6%	1800 kvar	108 kvar	3×12.833	1100×600×1200	700×500,4-φ16
CKSC-126/10-6%	2100 kvar	126 kvar	3×11.005	1130×600×1250	700×500,4-φ16
CKSC-144/10-6%	2400 kvar	144 kvar	3×9.625	1130×600×1330	700×500,4-φ16
CKSC-162/10-6%	2700 kvar	162 kvar	3×8.559	1310×650×1250	800×550,4-φ18
CKSC-180/10-6%	3000 kvar	180 kvar	3×7.700	1310×650×1300	800×550,4-φ18
CKSC-198/10-6%	3300 kvar	198 kvar	3×7.002	1340×700×1340	800×600,4-φ18
CKSC-216/10-6%	3600 kvar	216 kvar	3×6.420	1340×700×1400	800×600,4-φ18
CKSC-240/10-6%	4000 kvar	240 kvar	3×5.778	1330×700×1450	800×600,4-φ18
CKSC-252/10-6%	4200 kvar	252 kvar	3×5.503	1370×700×1490	800×600,4-φ18
CKSC-288/10-6%	4800 kvar	288 kvar	3×4.814	1370×700×1570	800×600,4-φ18
CKSC-300/10-6%	5000 kvar	300 kvar	3×4.622	1400×800×1580	900×700,3-φ18
CKSC-360/10-6%	6000 kvar	360 kvar	3×3.851	1430×800×1660	900×700,3-φ18
CKSC-480/10-6%	8000 kvar	480 kvar	3×2.888	1610×800×1800	1000×700,3-φ18

LV smoothing reactor

CKSC型，10kV系统，三相，XL/XC=12%，匹配电容器电压：12kV
CKSC type; 10kV system; 3-phase; XL/XC=12%; capacitor voltage: 12kV

电抗器型号 Reactor model	匹配电容器规格(kvar) Capacitor specification	电抗器容量(kvar) Reactor capacity	电感量(mH) Inductance	外形尺寸 L×W×H(mm) Exterior dimensions	安装尺寸(mm) Installation dimensions
CKSC-12/10-12%	100 kvar	12 kvar	3×551.074	740×500×700	500×400,4-φ14
CKSC-18/10-12%	150 kvar	18 kvar	3×367.383	770×500×880	500×400,4-φ14
CKSC-24/10-12%	200 kvar	24 kvar	3×275.537	800×500×940	500×400,4-φ14
CKSC-36/10-12%	300 kvar	36 kvar	3×183.691	830×500×1020	600×400,4-φ14
CKSC-54/10-12%	450 kvar	54 kvar	3×121.897	890×550×1080	600×450,4-φ14
CKSC-120/10-12%	1000 kvar	120 kvar	3×54.993	980×550×1290	700×450,4-φ16
CKSC-144/10-12%	1200 kvar	144 kvar	3×45.843	1010×600×1320	700×500,4-φ16
CKSC-180/10-12%	1500 kvar	180 kvar	3×36.637	1190×600×1300	800×550,4-φ16
CKSC-216/10-12%	1800 kvar	216 kvar	3×30.545	1220×600×1360	800×500,4-φ16
CKSC-252/10-12%	2100 kvar	252 kvar	3×26.190	1250×600×1400	800×500,4-φ16
CKSC-288/10-12%	2400 kvar	288 kvar	3×22.902	1330×700×1560	800×600,4-φ16
CKSC-324/10-12%	2700 kvar	324 kvar	3×20.363	1360×700×1590	900×600,4-φ18
CKSC-360/10-12%	3000 kvar	360 kvar	3×18.331	1390×700×1620	900×600,4-φ16
CKSC-396/10-12%	3300 kvar	396 kvar	3×16.657	1390×700×1700	900×600,4-φ16
CKSC-432/10-12%	3600 kvar	432 kvar	3×15.272	1600×800×1570	900×700,4-φ18
CKSC-480/10-12%	4000 kvar	480 kvar	3×13.748	1600×800×1680	900×700,4-φ18
CKSC-504/10-12%	4200 kvar	504 kvar	3×13.088	1600×800×1660	900×700,4-φ18
CKSC-576/10-12%	4800 kvar	576 kvar	3×11.456	1630×800×1800	900×700,4-φ18
CKSC-600/10-12%	5000 kvar	600 kvar	3×10.994	1660×800×2060	900×700,4-φ18