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 沈阳天通电力科技有限公司
 SHENYANG TIAN TONG ELECTRIC POWER TECHNOLOGY CO., LTD.
 天通(辽宁)物联科技有限公司
 TIAN TONG (LIAONING) IOT TECHNOLOGY CO., LTD.
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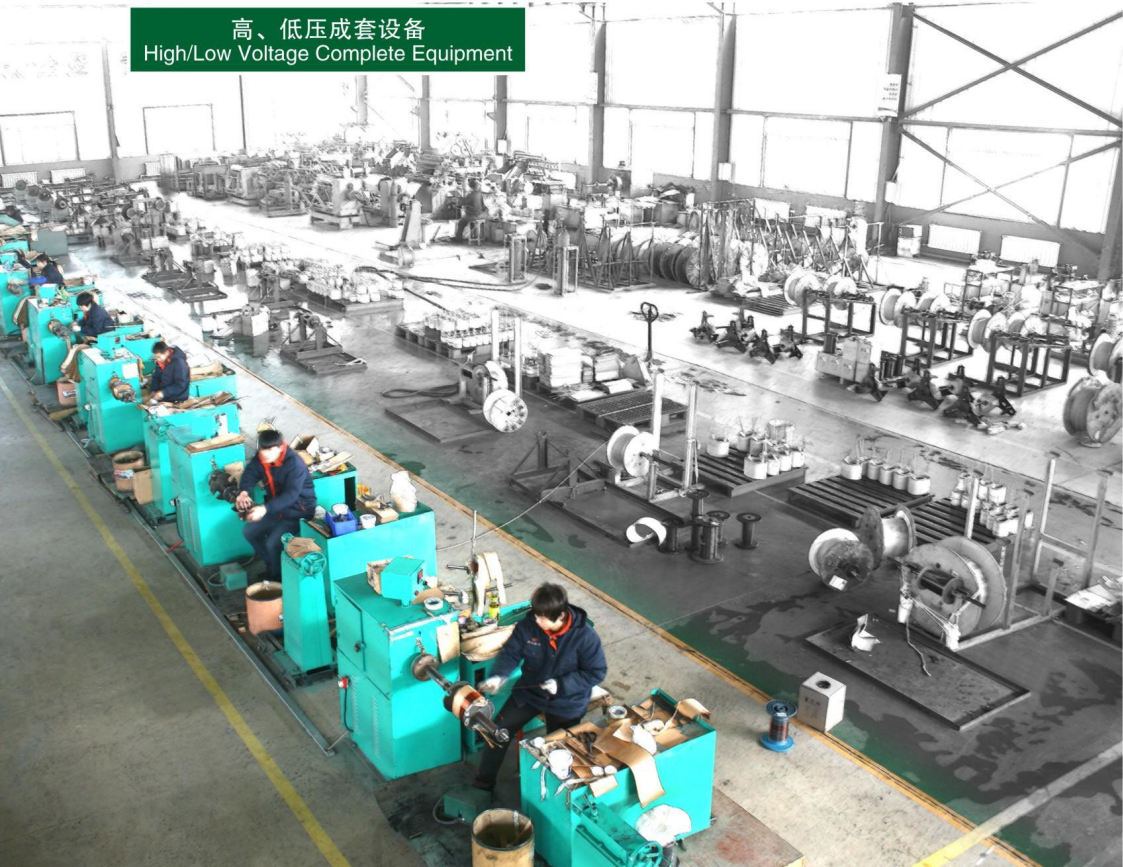
油浸式电力变压器
Oil-Immersed Power Transformer

干式电力变压器
Dry-Type Power Transformer

高压成套开关设备
High-Voltage Complete Switchgears

低压成套开关设备
Low-Voltage Complete Switchgear

高、低压成套设备
High/Low Voltage Complete Equipment



油浸式电力变压器

- 10KV电力变压器
- 35KV电力变压器
- 66KV电力变压器
- 110KV电力变压器
- S13立体三角形卷铁芯电力变压器
- 非晶合金变压器
- TS系列12/0.4 All-Insulated 台式变电站
- 智能型有载调容变压器
- 特种变压器

干式电力变压器

- 树脂浇注干式电力变压器
- SC(B)11系列10KV级
- SC(B)10系列10KV级
- SCZ(B)10系列10KV级
- SC(B)10系列35KV级
- SC10系列35KV级
- SC(B)9系列10KV级
- SCZ(B)9系列10KV级
- SCBH15型非晶合金干式变压器
- 树脂浇注立体卷铁芯变压器
- 真空浸渍干式电力变压器
- SG(B)10系列35KV
- SG(B)11系列10KV
- SG(B)10系列10KV
- SGZ(B)10系列10KV
- 附件

高压成套开关设备

- KYN28A-12型铠装移开式交流金属封闭开关设备
- GGX2-12G型高压真空开关柜
- XGN2-12箱型固定式金属封闭开关设备
- HXGN-12F(R)箱型固定交流金属封闭环网开关柜
- HXGN15A-12型固定式户内交流金属封闭环网开关设备
- XGN15-12箱型固定式金属封闭开关设备
- TT系列高压环网柜
- XGN-12(TT)型固体绝缘开关设备

低压成套开关设备

- GGD型低压固定式成套开关设备
- GCS型低压抽出式成套开关设备
- GCK型低压抽出式成套开关设备
- MNS型低压抽出式成套开关设备
- JP综合配电箱
- 计量箱

预装式变电站

开闭站

美式箱变系列

景观式箱变

地埋式变电站

12KV电缆分支箱

10KV柱上变压器

Oil-Immersed Power Transformer

- 10KV Power Transformer
- 35KV Power Transformer
- 66KV Power Transformer
- 110KV Power Transformer
- S13 Reel Triangle Core Power Transformer
- Amorphous Alloy Transformer
- TS Series 12/0.4 All-Insulated Desk-Type Substation
- Intelligent Regulated Capacity Transformer
- Special Transformer

Dry-Type Power Transformer

- Resin-Cast Dry-Type Power Transformer
- Specifications of SC(B)11 Series 10KV
- Specifications of SC(B)10 Series 10KV
- Specifications of SCZ(B)10 Series 10KV
- Specifications of SC(B)10 Series 35KV
- Specifications of SC10 Series 35KV
- Specifications of SC(B)9 Series 10KV
- Specifications of SCZ(B)9 Series 10KV
- SCBH15 Amorphous Alloy Dry-Type Power Transformer
- Resin Pouring Three Dimensional Vacuum Core Power Transformer
- Vacuum Impregnated Dry-Type Power Transformer
- Specifications of SG(B)10 Series 35KV
- Specifications of SG(B)11 Series 10KV
- Specifications of SG(B)10 Series 10KV
- Specifications of SGZ(B)10 Series 10KV
- Accessories

High-Voltage Complete Switchgears

- KYN28A-12 mode armoured, movable, AC metal-enclosed switchgears
- GGX2-12G model High-Voltage Vacuum Switch Cabinet
- XGN2-12 cubicle-type stationary metal-enclosed switchgear
- HXGN-12F(R) cubicle-type stationary AC metal-enclosed ring main switch cabinet
- HXGN15A-12 model stationary indoor AC metal-enclosed ring main switchgear
- XGN15-12 cubicle-type stationary indoor metal-enclosed switchgear
- TT Series High-Voltage Ring Main Unit
- XGN-12(TT) model Solid-Insulated Switchgear

Low-Voltage Complete Switchgear

- GGD Model Low-Voltage Stationary Complete Switchgear
- GCS Model Low-Voltage Withdrawable Complete Switchgear
- GCK Model Low-Voltage Withdrawable Complete Switchgear
- MNS Model Low-Voltage Withdrawable-Type Complete Switchgear
- JP integrated distribution box
- Metering box

Pre-installed Power Transformers Substation

Switching Station

American Type of Cubicle Transformer Substation Series

Scenic Type Cubicle Transformer Substation

Embedded Transformer Substation

12KV Cable Distribution Cabinet

10KV pole-mounted transformer

产品·企业市场竞争力的体现

Product · Foundation Stone for Enterprise Impingement on Markets

油浸式电力变压器

Oil-Immersed Power Transformer

性能特点 Performance Features

油浸式变压器是一种结构更合理、性能更优良的新型高性能变压器，其核心部分是由闭合铁芯和套在铁芯柱上的绕组组成。此外，还有油箱，储油柜，套管，吸湿器，散热器，分接开关，瓦斯继电器，温度计等。

全密封式配电变压器与普通油浸式变压器相比，取消了储油柜，由波纹油箱的波翅代替油管作为冷却散热元件，波纹油箱由优质冷轧薄钢板在专用生产线上制造，波翅可以随变压器油体积涨缩而涨缩，从而使变压器油与大气隔绝，防止和减缓油的劣化和绝缘受潮，增强运行可靠性，正常运行免维护。

Oil-immersed Power transformers pertain to a new type of performance transformers, each of which has a more rational structure and more excellent performances, with a core part consisting of closed iron cores as well as windings on the core column. Besides, the components include an oil tank, an oil storage cabinet, a moisture absorber, bushings, heat radiators, tapping switches, gas relays, and temperature gauges, etc.

All closed distribution transformer, in comparison with a common oil-immersed transformer, has eliminated the oil storage cabinet and has used corrugated fins on a corrugated oil tank to substitute oil pipes in cooling element design. Among them, the corrugated oil tank is made of quality cold-rolled steel strips and is fabricated on a specific production line, and the corrugated fins are able to dilate or shrink with the volume of a transformer's oil tank enabling isolation between transformer oil and atmosphere, effectively preventing from and delaying both oil deterioration and insulation exposure to moisture, enhancing the operation reliability, and realizing maintenance free under normal running conditions.

优点 Advantages

- 波纹油箱表面经去油、去锈、磷化处理三防（防雨、防潮、防盐雾）漆涂装，适合在冶金，石化等生产环境下使用。
- 器身紧固采用防松结构，保证长途运输和运行中不松动。
- 采用优质橡胶，密封材料有效防老化，杜绝渗漏。
- 全密封式配电变压器配有压力释放阀和温度计。
- 油浸变压器性能符合国家GB1094-1996《电力变压器》GB/T6451-2015《三相油浸式电力变压器技术参数和要求》标准，铁芯采用优质冷轧硅钢片，用阶梯三级接缝，表面涂固化漆，降低了损耗和噪声；线圈采用优质无氧铜导线绕制，散热采用新型油道结构，设计合理，并优化绝缘工艺，提高了机械强度和抗短路能力，外型美观大方、运行可靠。广泛用于变电站（所）及城乡电网。

- Corrugated oil tank surfaces have undergone oil removal, rust removal, phosphorizing treatment before rainwater-proof, moisture-proof, and salt-fog-proof treatments and painting work, so they are applicable under production conditions in metallurgical and petrochemical industries;
- A anti-loose structure is adopted in body fastening in order to ensure no losing may occur during long distance transportation or during normal operation;
- Quality rubber used guarantees sealing materials may effectively prevent from material aging, thereby eliminating leakage phenomena;
- All closed distribution transformers are equipped with a pressure relief valve and a temperature gauge each;
- Each oil-immersed transformer meets such national standards as GB1094-1996《Power transformers》and GB/T6451-2015《Technical Parameters and Technical Requirements for 3-Phase Oil-Immersed Power Transformers》in performances. Its iron core is made of quality cold-rolled silicon steel strips and both 3 stage cascade joints and surface curing paint help to reduce losses and noise. Coils are made from quality oxygen-free copper leads wound as required while heat radiators have adopted a new type of oil line structure. Both rational design above listed and insulation process optimization do help to improve the oil-immersed transformer in mechanical strength and in short-circuit proof capability. With neatly cut profile and reliable operation, oil-immersed transformers have found extensive use in Power substations and on urban and rural grids.

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S13立体三角形卷铁芯变压器	S13 Reel Triangle Core Transformer
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智能型有载调容变压器	Intelligent Regulated Capacity Transformer
特种变压器	Special Transformer



10KV电力变压器

10KV Power Tranformer

本产品占地面积小，免维护，进出线箱盖顶部出线结构，高压，低压侧面箱壁电缆进出线结构（以适用电网为电缆沟走线的方便），高（或低压）箱盖顶部出线三种结构。

变压器器身采用可靠的定位，能保证变压器长途运输和长期运行器身不移位，绕组不变形，可不吊芯，免维护直接连网使用。可供应箱盖与箱沿整体焊死或螺栓加氟丁橡胶密封结构，即均满足各个型号规格生产要求。

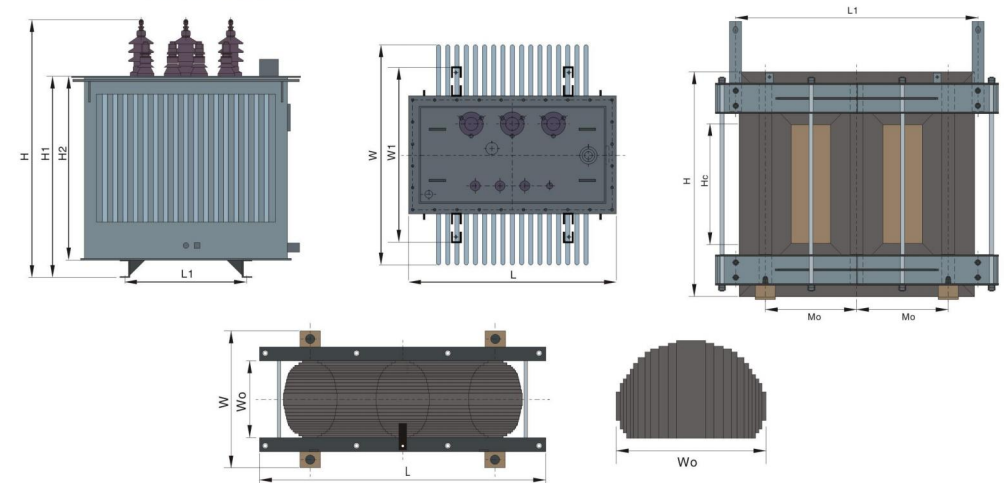
This product line is maintenance free and just requires a small piece of holding land; the cable incoming and outgoing configuration may be: i) cables going out from the enclosure's top cover; ii) high/low-voltage cables coming in and going out of the enclosure's side walls (for the convenience of cable running in corresponding chutes during electric grid construction); or iii) high-voltage (or low-voltage) cables going out from the enclosure's top cover.

The transformer body is reliably positioned for ensuring that no dislocation occurs with the transformer and no deformation occurs with the windings during long-distance transportation or during long-term operation. Without the need of core suspension and being maintenance free, this product line may be used just via direct grid connection. Now below listed configurations are optional in our supply but each of them may satisfy production requirements a configuration totally sealed by welding together the enclosure's top cover and the edge of the enclosure's opening or ii) a bolt plus polychloroprene rubber sealing configuration.

产品特点 Product Characteristics

- 安全、难燃防火、无污染、可直接安装在负荷中心。
- 免维修、安装简便、综合运行成本低
- 防潮性能好，可在100%湿度下正常运行，停运后不经预干燥即可投入运行
- 损耗低、局部放电量低、噪声小、散热能力强、强迫风冷条件下可以150%额定负载运行。
- Safe, Combustion Resistant/Fire Retardant, Without Pollution, Capable of Direct Installation on Load Center;
- Maintenance Free, Convenient to Install, Low in Composite Operation Cost;
- Excellent in Humidity Resistance, Capable of Running Normally under 100% Humidity, Capable of Being Put into Operation after Idleness without Pre-drying Treatment;
- Low Loss, Low Local Discharges, Low Noise, Strong Heat Radiation, Capable of Running under 150% Nominal Load with the aid of Forced Air Cooling.

外形尺寸 Outline Dimension



油浸式电力变压器
Oil-Immersed Power Transformer

S22-M·RL-30~2500/10三相双绕组油浸无载调压配电变压器技术数据
S22-MRL-30 ~ 2500/10 Technical data of three-phase double-winding oil-immersed no-load voltage regulating distribution transformer

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Conn- ection Label	空载损耗 No- Load Loss (W)	负载损耗 Load Loss- es (W)	阻抗电压 Short Circuit Imped- ance (%)	空载电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	轨距 Rail Gauge (mm)
	高压	高压分接范围	低压							
	H.V. (KV)	High Voltage Tap Range (%)	L.V. (KV)							
30	6 6.3 10 10.5	± 2 × 2.5% ± 5%	0.4	Yyn0 or Dyn11	65	455/430	4	0.5	43	400 × 400
50					80	655/625		0.5	43	400 × 660
63					90	785/745		0.5	43	400 × 660
80					105	945/900		0.5	43	400 × 660
100					120	1140/1080		0.45	44	400 × 660
125					135	1360/1295		0.45	44	400 × 660
160					160	1665/1585		0.4	46	550 × 550
200					190	1970/1870		0.4	47	550 × 820
250					230	2300/2195		0.35	47	550 × 820
315					270	2760/2630		0.35	48	660 × 660
400				330	3250/3095	0.35	48	550 × 820		
500				385	3900/3710	0.3	49	660 × 660		
630				460	4460	0.25	49	660 × 660		
800				560	5400	0.18	50	660 × 850		
1000				665	7415	0.17	50	660 × 850		
1250				780	8640	0.17	52	660 × 850		
1600				940	10440	0.15	52	660 × 850		
2000				1085	13180	0.15	53	820 × 1070		
2500				1280	13360	0.15	57	1070 × 1070		

S20-M·RL-30~2500/10三相双绕组油浸无载调压配电变压器技术数据
S20-M RL-30 ~ 2500/10 Technical data of three-phase double-winding oil-immersed no-load voltage regulating distribution transformer

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Conn- ection Label	空载损耗 No- Load Loss (W)	负载损耗 Load Loss- es (W)	阻抗电压 Short Circuit Imped- ance (%)	空载电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	轨距 Rail Gauge (mm)
	高压	高压分接范围	低压							
	H.V. (KV)	High Voltage Tap Range (%)	L.V. (KV)							
30	6 6.3 10 10.5	± 2 × 2.5% ± 5%	0.4	Yyn0 or Dyn11	70	505/480	4	0.5	43	400 × 400
50					90	730/695		0.5	43	400 × 660
63					100	870/830		0.5	43	400 × 660
80					115	1050/1000		0.5	43	400 × 660
100					135	1265/1200		0.45	44	400 × 660
125					150	1510/1440		0.45	44	400 × 660
160					180	1850/1760		0.4	46	550 × 550
200					215	2185/2080		0.4	47	550 × 820
250					260	2560/2440		0.35	47	550 × 820
315					305	3065/2920		0.35	48	660 × 660
400				370	3615/3440	0.35	48	550 × 820		
500				430	4330/4120	0.3	49	660 × 660		
630				510	4960	0.25	49	660 × 660		
800				630	6000	0.18	50	660 × 850		
1000				745	8240	0.17	50	660 × 850		
1250				870	9600	0.17	52	660 × 850		
1600				1050	11600	0.15	52	660 × 850		
2000				1225	14640	0.15	53	820 × 1070		
2500				1440	14840	0.15	57	1070 × 1070		

S13-M-30~2000/10系列三相双绕组油浸无载调压配电变压器技术数据
Technical Data for S13-M-30 ~ 2000/10 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Conn- ection Label	空载损耗 No- Load Loss (W)	负载损耗 Load Loss- es (W)	阻抗电压 Short Circuit Imped- ance (%)	空载电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量(kg) Weight			外型尺寸(mm) Overall Dimension			轨距 Rail Gauge (mm)
	高压	高压分接范围	低压							器身重	油重	总重	长	宽	高	
	H.V. (KV)	High Voltage Tap Range (%)	L.V. (KV)							Core	Oil	Total	L	W	H	
30	6 6.3 10 10.5	± 5%	0.4	Yyn0 or Dyn11	80	630/600	4	0.7	42	130	55	245	710	470	815	400 × 400
50					100	910/870		0.6	42	200	85	380	770	520	910	400 × 400
63					110	1090/1040		0.6	42	235	85	420	800	570	930	400 × 400
80					130	1310/1250		0.55	42	280	85	480	800	590	930	400 × 450
100					150	1580/1500		0.5	42	325	110	565	830	640	990	400 × 450
125					170	1890/1800		0.45	42	395	115	650	870	670	1040	400 × 450
160					200	2310/2200		0.4	43	470	140	780	880	720	1040	550 × 550
200					240	2730/2600		0.4	44	530	145	840	920	840	1110	550 × 550
250					290	3200/3050		0.35	44	620	155	955	950	840	1120	550 × 550
315					340	3830/3650		0.35	44	740	195	1190	980	930	1210	660 × 650
400				410	4520/4300	0.3	44	895	190	1340	1200	770	1210	550 × 700		
500				480	5410/5150	0.3	48	1120	290	1760	1290	840	1380	600 × 800		
630				570	6200	0.3	48	1290	2010	1390	910	1420	600 × 800			
800				700	7500	0.25	50	1520	325	2260	1470	960	1385	660 × 850		
1000				830	10300	0.2	50	1510	345	2370	1650	1120	1390	660 × 950		
1250				970	12000	0.2	51	1980	420	3010	1640	1070	1570	750 × 950		
1600				1170	14500	0.2	51	2260	500	3470	1790	1220	1590	750 × 950		
2000				1550	18300	5	0.2	53	2780	600	4250	1910	1250	1610	820 × 1050	

S11-M-30~3150/10系列三相双绕组油浸无载调压配电变压器技术数据
Technical Data for S11-M-30 ~ 3150/10 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Conn- ection Label	空载损耗 No- Load Loss (W)	负载损耗 Load Loss- es (W)	阻抗电压 Short Circuit Imped- ance (%)	空载电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量(kg) Weight			外型尺寸(mm) Overall Dimension			轨距 Rail Gauge (mm)
	高压	高压分接范围	低压							器身重	油重	总重	长 × 宽 × 高			
	H.V. (KV)	High Voltage Tap Range (%)	L.V. (KV)							Core	Oil	Total	L × W × H			
30	6 6.3 10 10.5	± 5%	0.4	Yyn0 or Dyn11	100	630/600	4	1.5	42	140	80	290	725 × 460 × 900	350x400		
50					130	910/870		1.3	42	201	100	400	780 × 570 × 930	400x450		
63					150	1090/1040		1.2	42	230	110	460	790 × 560 × 950	400x500		
80					180	1310/1250		1.2	42	260	120	500	810 × 650 × 970	400x500		
100					200	1580/1500		1.1	42	310	130	570	845 × 710 × 1010	400x550		
125					240	1890/1800		1.1	42	365	145	660	860 × 670 × 1080	400x550		
160					280	2310/2200		1.0	43	430	140	730	895 × 820 × 1070	450x600		
200					340	2730/2600		1.0	44	510	180	960	930 × 890 × 1130	450x600		
250					400	3200/3050		0.9	44	585	200	1010	955 × 930 × 1155	500x700		
315					480	3830/3650		0.9	44	658	240	1250	980 × 970 × 1150	550x550		
400				570	4520/4300	0.8	44	822	247	1380	1055 × 1060 × 1220	550x800				
500				680	5410/5150	0.8	48	950	285	1640	1420 × 970 × 1220	600x800				
630				810	6200	0.6	48	1100	330	1890	1480 × 990 × 1310	600x800				
800				980	7500	0.6	50	1350	390	2300	1635 × 1115 × 1440	660x950				
1000				1150	10300	0.6	50	1465	445	2620	1715 × 1180 × 1470	610x950				
1250				1360	12000	0.5	51	1715	525	3150	1750 × 1190 × 1500	750x950				
1600				1640	14500	0.5	51	2090	570	3670	1880 × 1320 × 1530	750x950				
2000				1940	18300	0.4	53	2545	770	4250	1930 × 1320 × 1640	800x1050				
2500				2290	21200	0.4	55	3200	970	4850	2060 × 1150 × 1850	1070x1070				
3150				2810	24300	5.5	0.4	57	3550	1230	5680	2250 × 1200 × 2060	1070x1070			

SZ11-200 ~ 2500/10系列三相双绕组油浸有载调压配电变压器技术数据

Technical Data for SZ11-200 ~ 2500/10 Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声 级 Lpa Noise Level (dB)	重量(kg) Weight			外型尺寸(mm) Overall Dimension		轨距 Rail Gauge (mm)								
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H										
													长	宽		高							
200	6 6.3 10 10.5 11	±4x2.5%	0.4	Yyn0 or Dyn11	380	2900	4	0.9	44	590	230	1000	1700 × 750 × 1200		450x600								
250													440	3420		0.9	44	720	270	1200	1750 × 770 × 1250		500x700
315													530	4100		0.8	46	810	300	1350	1800 × 790 × 1300		550x550
400													640	4950		0.7	46	950	330	1550	1850 × 810 × 1350		550x800
500					760	5890	0.7	48	1220	380	1850	1900 × 830 × 1400		600x800									
630					960	7260	0.65	48	1320	400	1950	1950 × 850 × 1450		600x800									
800					1120	2290	0.6	50	1500	460	2150	2000 × 870 × 1500		660x950									
1000					1360	10400	0.55	50	1670	530	2550	2050 × 890 × 1550		610x950									
1250					1560	12300	0.5	51	2020	580	3050	2100 × 910 × 1600		750x950									
1600					1920	14700	0.5	51	2380	660	3600	2150 × 930 × 1650		750x950									
2000					2270	18600	0.5	52	2880	710	4250	2250 × 990 × 1750		800x1050									
2500					2680	21600	0.5	54	3280	780	4900	2300 × 1050 × 1800		1070x1707									



35KV电力变压器 35KV Power Transformer

35KV级系列产品主要用于城乡工农业电网及各工矿企业输电。目前公司已大规模生产了油浸自冷、无励磁调压及有载调压，全密封等90多个新品种结构产品。产品具有性能稳定、可靠性高、结构紧凑、外形美观、节能降耗、免维护、不吊芯等特点。

35KV series product line is mostly used in power transmission and distribution on industrial or agricultural grids in urban or rural areas and power transmission and distribution in industrial or mineral enterprises. Till now, the corporation has initiated a large scale production of 90 or more new varieties of product lines, including but not limited to oil-immersed self cooling power transformers, no-exciting voltage regulating power transformers, on-load voltage regulating power transformers, all closed power transformers, etc. This product line is stable in performance, high in reliability, compact in structure, fine in profile, energy saving, maintenance free, and no core suspension.

产品特点 Product Characteristics

- 噪声低、不污染环境
- 温升低、过载能力大
- 承受突发短路能力强、运行安全可靠
- 损耗低、节能显著
- 绝缘水平高、局部放电量小

- Low Noise, No Environmental Contamination;
- Low Temperature Rise, High Overload Capacity;
- Strong Sudden Short-Circuit Resistance, Safe and Reliable Running;
- Low Losses, Evident Energy Saving Effects;
- High Insulation Level, Low Local Discharges.

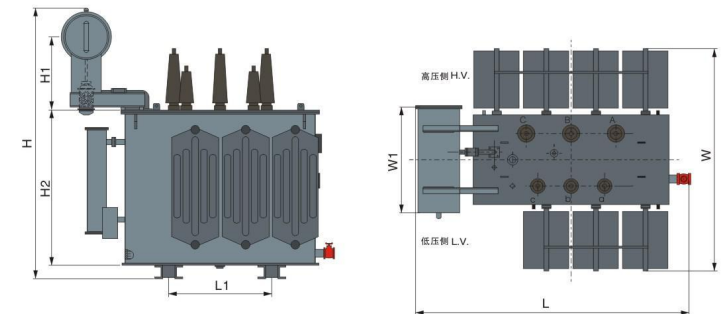
SZ9-200 ~ 2500/10系列三相双绕组油浸有载调压配电变压器技术数据

Technical Data for SZ9-200 ~ 2500/10 Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声 级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)								
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H										
													长	宽		高							
200	6 6.3 10 10.5 11	±4x2.5%	0.4	Yyn0 or Dyn11	480	3060	4	1.5	48	580	240	980	1700 × 750 × 1200		450x600								
250													560	3600		1.4	48	710	270	1150	1750 × 770 × 1250		500x700
315													670	4320		1.4	48	800	310	1300	1800 × 790 × 1300		550x550
400													800	5220		1.3	50	930	330	1500	1850 × 810 × 1350		550x800
500					960	6210	1.2	50	1080	380	1750	1900 × 830 × 1400		600x800									
630					1200	7650	1.1	53	1200	400	1850	1950 × 850 × 1450		600x800									
800					1400	9360	1.0	53	1410	440	2150	2000 × 870 × 1500		660x950									
1000					1700	10980	1.0	55	1600	530	2550	2050 × 890 × 1550		610x950									
1250					1950	13050	0.9	55	1940	580	3050	2100 × 910 × 1600		750x950									
1600					2400	15570	0.8	55	2330	660	3550	2150 × 930 × 1650		750x950									
2000					2520	17820	0.8	56	2680	710	4050	2250 × 990 × 1750		800x1050									
2500					2970	20700	0.8	58	3200	780	4700	2300 × 1050 × 1800		1070x1070									

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
 Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.

外形尺寸 Outline Dimension



S11-630~31500/35系列三相双绕组油浸无载调压电力变压器技术数据

Technical Data for S11-630-31500/35 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)																														
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H																																
													Yym0 或 Dyn11	Yd11																															
630	35	±2x2.5%	0.4	Yym0 或 Dyn11	6.5	1.3	44	290	330	840	1145×935×1790	660	660	660	660	835	7870	0.65	54	1870	960	3920	2210×1260×2450	660																					
800																3.15	6.3	Yd11	985	9405	0.65	55	2020	1110	4210	2260×1310×2540	820																		
1000																			1150	11540	0.65	55	2180	1220	4520	2310×1330×2600	820																		
1250																			10.5	6.3	Yd11	1410	13940	0.55	57	2380	1390	4880	2560×1370×2650	820															
1600																1700	16670	0.45				57	3020	1530	5340	2640×1540×2710	1070																		
2000																2180	18380	0.45				57	3210	1830	6050	2700×1750×2760	1070																		
2500																35-38.5	±2x2.5%	0.4	Yym0 或 Dyn11	6.5	0.95	49	730	570	1660	1815×1060×2100	660	660	660	660	2560	19670	0.45	59	3800	1920	6790	2810×1810×2800	1070						
3150																															3.15	6.3	Yd11	3040	23090	0.45	61	4730	2030	7680	2930×2000×2840	1070			
4000																																		10.5	6.3	Yd11	3620	27360	0.45	63	4900	2140	9350	3030×2880×2880	1070
5000																																					4320	31380	0.45	65	5800	2270	9480	3140×2990×2990	1070
6300																															3.15	6.3	Yd11				5250	35060	0.45	67	7200	2390	11300	3250×3110×3110	1070
8000																																		10.5	6.3	Yd11	7200	38480	0.35	68	8400	2510	13390	3360×3220×3220	1070
10000																																					8700	45320	0.35	70	9360	2650	15450	3470×3340×3340	1475
12500																															3.3	6.3	YNd11				10080	53870	0.3	72	10800	3020	17510	3630×3450×3450	1475
16000																																		12160	65840	0.3	74	13300	3180	21630	3850×3570×3570	1475			
20000																																		6.6	10.5	YNd11	14400	79520	0.3	76	15600	3610	24720	4070×3680×3680	2040
25000																															17020	94050	0.25				77	18300	4240	29870	4290×3810×3810	2040			
31500																															20220	112860	0.25				79	21800	4770	36050	4510×3910×3910	2040			

油浸式电力变压器
Oil-Immersed Power Transformer

S11-50 ~ 2500/35系列三相双绕组油浸无载调压配电变压器技术数据

Technical Data for S11-50 ~ 1600/35 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)									
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H											
													Yym0 或 Dyn11	Yd11										
50	35	±2x2.5%	0.4	Yym0 或 Dyn11	6.5	1.3	44	290	330	840	1145×935×1790	660	660	660	660	160	1200/1140	0.65	54	1870	960	3920	2210×1260×2450	660
100																230	2010/1910	1.1	46	570	350	1170	1185×960×1800	660
125																270	2370/2260	1.1	46	590	455	1335	1210×980×2035	660
160																280	2820/2680	1.0	48	610	450	1340	1310×980×2100	660
200																340	3320/3160	1.0	48	690	510	1440	1700×1020×2100	660
250																400	3950/3760	0.95	49	730	570	1660	1815×1060×2100	660
315																480	4750/4530	0.95	49	830	620	1850	1960×1120×2200	820
400																580	5740/5470	0.85	50	950	680	2150	2080×1200×2400	820
500																680	5910/6580	0.85	50	1190	760	2480	2100×1340×2530	820
630																830	7860	0.65	53	1620	920	3220	2180×1360×2530	820
800																980	9400	0.65	53	1820	1150	3870	2325×1410×2750	820
1000																1150	11500	0.65	55	2300	1300	4600	2375×1600×2895	820
1250																1400	13900	0.6	55	2440	1460	4960	2375×1600×3090	1070
1600																1690	16600	0.6	57	3000	1500	5900	2450×1910×3000	1070

S9-50 ~ 1600/35系列三相双绕组油浸无载调压配电变压器技术数据

Technical Data for S9-50 ~ 1600/35 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)									
	高压KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压KV L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H											
													Yym0 或 Dyn11	Yd11										
50	35	±5%	0.4	Yym0 或 Dyn11	6.5	2	46	290	330	840	1145×935×1790	660	660	660	660	210	1270/1210	0.65	54	1870	960	3920	2210×1260×2450	660
100																290	2120/2020	1.8	48	570	350	1170	1185×960×1800	660
125																340	2500/2380	1.7	48	590	455	1335	1210×980×2035	660
160																360	2970/2830	1.6	50	610	450	1340	1310×980×2100	660
200																430	3500/3330	1.5	50	690	510	1440	1700×1020×2100	660
250																510	4160/3960	1.4	51	730	570	1660	1815×1060×2100	660
315																610	5010/4770	1.4	51	830	620	1850	1960×1120×2200	820
400																730	6050/5760	1.3	52	950	680	2150	2080×1200×2400	820
500																860	7280/6930	1.2	52	1190	760	2480	2100×1340×2530	820
630																1040	8280	1.1	55	1620	920	3220	2180×1360×2530	820
800																1230	9900	1	55	1820	1150	3870	2325×1410×2750	820
1000																1440	12150	1	57	2300	1300	4600	2375×1600×2895	820
1250																1760	14670	0.9	57	2440	1460	4960	2375×1600×3090	1070
1600																2120	17550	0.8	59	3000	1500	5900	2450×1910×3000	1070

S9-630~31500/35系列三相双绕组油浸无载调压电力变压器技术数据

Technical Data for S9-630-31500/35 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)																														
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H																																
													Yym0 或 Dyn11	Yd11																															
630	35	±5%	0.4	Yym0 或 Dyn11	6.5	1.1	55	1820	910	3820	2160×1210×2420	660	660	660	660	1040	8280	1.10	55	1820	910	3820	2160×1210×2420	660																					
800																3.15	6.3	Yd11	1230	9900	1.00	56	1950	1030	4100	2200×1250×2510	820																		
1000																			1440	12150	1.00	56	2110	1150	4400	2240×1260×2560	820																		
1250																			10.5	6.3	Yd11	1760	14670	0.90	58	2210	1310	4750	2480×1290×2610	820															
1600																2120	17550	0.80				58	2820	1440	5200	2550×1460×2660	1070																		
2000																2720	19350	0.70				58	3010	1560	5900	2600×1650×2710	1070																		
2500																35-38.5	±2x2.5%	0.4	Yym0 或 Dyn11	6.5	0.60	60	3500	1680	6630	2630×1700×2760	1070	1070	1070	1070	3200	20700	0.60	60	3500	1680	6630	2630×1700×2760	1070						
3150																															3.15	6.3	Yd11	3800	24300	0.56	62	4430	1790	7510	2650×2000×2810	1070			
4000																																		10.5	6.3	Yd11	4520	28800	0.56	64	4500	1910	8350	2750×2500×2860	1070
5000																																					5400	33030	0.48	66	5400	2060	9280	2850×2600×2900	1070
6300																															6560	36900	0.48				68	6600	2250	11000	2950×2700×3000	1070			
8000																															3.15	6.3	YNd11	9000	40500	0.42	69	7800	2350	13000	3050×2800×3100	1070			
10000																10880	47700	0.42	71	9300	2500	15000	3150×2900×3200	1475																					
12500																12600	56700	0.40	73	10000	2850	17000	3300×3000×3300	1475																					
16000																6.6	10.5	YNd11	15200	69300	0.40	75	12500	3000	21000	3500×3100×3400	1475																		
20000																			18000	83700	0.40	77	14800	3400	24000	3700×3200×3500	2040																		
25000																			21280	99000	0.32	78	17500	4000	29000	3900×3300×3600	2040																		
31500																25280	118800	0.32	80	21000	4500	35000	4100×3400×3700	2040																					

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
 Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.

SZ11-800~31500/35系列双绕组有载调压电力变压器技术数据

Technical Data for SZ11-800~31500/35 Series, Double-Winding, On-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Impe- dence (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 KV L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H		
													35~38.5	±3 × 2.5%	
800	35	±3 × 2.5%	3.15	Yd11	1060	9975	6.5	0.90	55	2290	1490	4560	3080 × 1490 × 2810	660	
1000					1240	12140		0.90	55	2695	1620	5150	3150 × 1570 × 2850	820	
1250					1500	14640		0.90	57	3135	1710	5990	3190 × 1650 × 3020	820	
1600					1920	17480		0.80	57	3520	1810	6720	3270 × 1680 × 3060	1070	
2000					2300	19240		0.80	57	3760	1890	7180	3320 × 1710 × 3110	1070	
2500					2720	20640		0.80	59	4345	2160	8310	3430 × 1810 × 3210	1070	
3150					3230	24710		0.70	61	5335	2390	10190	3510 × 1980 × 3290	1070	
4000					3870	29160		7.0	0.65	63	5940	2670	11340	3650 × 3570 × 3410	1070
5000					4640	34200		10.5	0.65	65	6875	3060	13130	4040 × 3590 × 3610	1070
6300					5630	36770		10.5	0.60	67	8250	3790	15750	4140 × 4030 × 3760	1070
8000	35~38.5	±3 × 2.5%	6.3	YNd11	7870	40610	11	7.5	0.50	68	10340	5050	19740	4820 × 4120 × 3830	1070
10000					9280	48050		0.50	70	11440	5940	21840	4980 × 4170 × 3910	1475	
12500					10950	56860		0.50	72	13310	6890	25410	5150 × 4370 × 4110	1475	
16000					13170	70320		8.0	0.45	74	15455	7320	29500	5320 × 4950 × 4320	1475
20000					15570	82780		10	0.45	76	18040	8710	34440	6050 × 5410 × 4510	2040
25000					19560	95000		10	0.40	77	20120	9670	37700	6290 × 5640 × 4730	2040
31500					21950	114000		10	0.40	79	22870	10790	39580	6550 × 6010 × 4930	2040



66KV电力变压器

66KV Power Transformer

66KV级系列产品广泛用于城乡农网改造工程及工矿企业，目前公司已形成了系列化、规模化生产，产品运行情况良好，受到广大用户的好评。

变压器器身采用可靠的定位，能保证变压器长途运输和长期运行器身不移位绕组不变形、可不吊芯、免维护、直接连网使用。

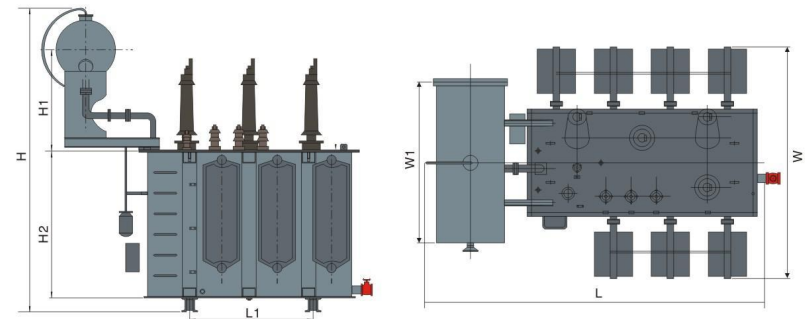
66KV series product line has found a far-flung avail not only in agricultural grid modification within urban and rural areas, but also in industrial or mineral enterprises. Till now, the corporation has formed its series and commercially scaled production and the product line runs well and thereby is highly appraised by our popular users.

The transformer body is reliably positioned for ensuring that no dislocation occurs with the transformer and no deformation occurs with the windings during long-distance transportation or during long-term operation. Without the need of core suspension and being maintenance free, this product line may be used just via direct grid connection.

产品特点 Product Characteristics

- 安全、难燃防火、无污染、可直接安装在负荷中心
- 免维修、安装简便、综合运行成本低
- 防潮性能好，可在100%湿度下正常运行，停运后不经预干燥即可投入运行
- 损耗低、局部放电率低、噪音小、散热能力强、强迫风冷条件下可以150%额定负载运行。
- Safe, Combustion Resistant/Fire Retardant, Without Pollution, Capable of Direct Installation on Load Center;
- Maintenance Free, Convenient to Install, Low in Composite Operation Cost;
- Excellent in Humidity Resistance, Capable of Running Normally under 100% Humidity, Capable of Being Put into Operation after Idleness without Pre-drying Treatment;
- Low Loss, Low Local Discharges, Low Noise, Strong Heat Radiation, Capable of Running under 150% Nominal Load with the aid of Forced Air Cooling.

外形尺寸 Outline Dimension



SZ9-800~31500/35系列双绕组有载调压配电变压器技术数据

Technical Data for SZ9-800~31500/35 Series, Double-Winding, On-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Impe- dence (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 KV L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H		
													35~38.5	±3 × 2.5%	
800	35~38.5	±3 × 2.5%	3.15	Yd11	1320	10500	6.5	1.00	56	2090	1400	4340	2800 × 1290 × 2480	660	
1000					1550	12780		1.00	56	2495	1520	4900	2860 × 1360 × 2520	820	
1250					1880	15410		0.90	58	2935	1600	5700	2900 × 1430 × 2580	820	
1600					2400	18400		0.80	58	3320	1700	6400	2970 × 1450 × 2660	1070	
2000					2880	20250		0.80	58	3560	1790	6830	3010 × 1480 × 2690	1070	
2500					3400	21730		0.80	60	4145	2030	7900	3110 × 1680 × 2710	1070	
3150					4040	26010		7.0	0.72	62	5135	2250	9700	3270 × 3080 × 2900	1070
4000					4840	30690		10.5	0.72	64	5740	2520	10800	3320 × 3120 × 3010	1070
5000					5800	36000		10.5	0.68	66	6675	2880	12500	3670 × 3200 × 3190	1070
6300					7040	38700		10.5	0.68	68	8050	3580	15000	3760 × 3500 × 3330	1070
8000	35~38.5	±3 × 2.5%	6.3	YNd11	9840	42750	11	7.5	0.60	69	10140	4760	18800	4380 × 3580 × 3390	1070
10000					11600	50580		0.60	71	11240	5600	20800	4520 × 3620 × 3450	1475	
12500					13680	59850		0.56	73	13210	6500	24200	4680 × 3800 × 3630	1475	
16000					16460	74020		8.0	0.54	75	15260	6900	28100	4830 × 4500 × 3820	1475
20000					19460	87140		10	0.54	77	17840	8200	32800	5500 × 4700 × 3990	2040
25000					24450	100000		10	0.50	78	19920	9310	35900	5710 × 4930 × 4180	2040
31500					27430	120000		10	0.50	80	22670	10180	38420	5950 × 5220 × 4360	2040

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
 Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.

S11-630 ~ 31500/66系列三相双绕组油浸无载调压电力变压器技术数据

Technical Data for S11-630 ~ 31500/66 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H		
													长	宽	
630	63	± 5%	6.3	Yd11	1280	7125	8	1.00	54	3580	2200	6580	2200 × 2130 × 3500		660
800					1520	8550		0.95	55	4090	2440	7320	2270 × 2170 × 3620		820
1000					1760	9880		0.90	55	4650	2760	8270	2360 × 2190 × 3730		820
1250					2080	11970		0.90	57	4720	2920	8520	2480 × 2250 × 3790		820
1600					2480	14060		0.80	57	5350	3080	9530	2750 × 2280 × 3860		1070
2000					2880	16630		0.80	57	6290	3250	10670	2860 × 2300 × 3970		1070
2500					3440	19670		0.70	59	6510	3640	11770	3030 × 2330 × 4010		1070
3150					4080	23090		0.70	61	6730	3700	13200	3160 × 2950 × 4130		1070
4000					4800	27360		0.60	63	7320	3800	14200	3300 × 3450 × 4310		1070
5000					5760	30780		0.65	65	7780	3900	15000	3750 × 3570 × 4350		1070
6300	63	± 2 × 2.5%	6.3	YNd11	7360	34200	9	0.60	67	9260	4050	16640	4100 × 3610 × 4580		1475
8000					8960	40570		0.55	68	13500	4100	21000	4250 × 3670 × 4620		1475
10000					10560	47880		0.55	70	15200	4700	23800	4370 × 3740 × 4740		1475
12500					12480	56810		0.50	72	16500	5500	27400	4500 × 3850 × 4860		1475
16000					15040	69830		0.50	74	17300	6210	31500	4790 × 3910 × 4910		2040
20000					17600	84650		0.45	76	19000	7020	35520	4940 × 4220 × 5200		2040
25000					20800	100040		0.45	77	22000	7300	38800	5210 × 4290 × 5360		2040
31500					24640	120560		0.40	79	26000	7610	43710	5400 × 4370 × 5410		2040

S9-630 ~ 31500/66系列三相双绕组油浸无载调压电力变压器技术数据

Technical Data for S9-630 ~ 31500/66 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H		
													长	宽	
630	63	± 5%	6.3	Yd11	1600	7500	8	1.40	55	3080	2080	5960	2000 × 1850 × 3100		660
800					1900	9000		1.35	56	3590	2300	6680	2060 × 1880 × 3200		820
1000					2200	10400		1.30	56	3950	2560	7370	2140 × 1900 × 3300		820
1250					2600	12600		1.30	58	4220	2720	7820	2250 × 1950 × 3350		820
1600					3100	14800		1.25	58	4850	2880	8830	2500 × 2000 × 3410		1070
2000					3600	17500		1.20	58	5690	3050	9870	2600 × 2100 × 3480		1070
2500					4300	20700		1.10	60	6020	3440	11080	2750 × 2220 × 3550		1070
3150					5100	24300		1.05	62	6230	3500	12500	2870 × 2550 × 3650		1070
4000					6000	28800		1.00	64	6320	3600	13000	3000 × 3000 × 3750		1070
5000					7200	32400		0.85	66	6980	3700	14000	3400 × 3100 × 3820		1070
6300	9200	36000	0.75	68	8020	3850	15200	3600 × 3300 × 3880		1475					
8000	11200	42700	0.75	69	9000	3900	16500	3750 × 3400 × 3940		1475					
10000	13200	50400	0.70	71	11000	4500	19400	3950 × 3500 × 4000		1475					
12500	15600	59800	0.70	73	12800	5300	23500	4000 × 3650 × 4100		1475					
16000	18800	73500	0.65	75	14000	6010	28000	4470 × 3820 × 4200		2040					
20000	22000	89100	0.65	77	16700	6800	33000	4700 × 3950 × 4300		2040					
25000	26000	105300	0.60	78	21000	7100	37600	4800 × 4100 × 4400		2040					
31500	30800	126900	0.55	80	22500	7400	40000	4900 × 4200 × 4600		2040					

SZ11-6300 ~ 31500/66系列三相双绕组油浸有载调压电力变压器技术数据

Technical Data for SZ11-6300 ~ 31500/66 Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压KV L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H		
													长	宽	
6300	63	± 2 × 2.5%	6.3	YNd11	8000	34200	9.0	0.75	67	9370	5020	17500	4720 × 3150 × 3710		1475
8000					9600	40565		0.75	68	12220	6100	21500	4930 × 3210 × 3920		1475
10000					11360	47880		0.70	70	14150	8010	25300	5140 × 3320 × 4120		1475
12500					13440	56810		0.70	72	16960	9500	30400	5280 × 3410 × 4370		1475
16000					16160	69825		0.65	74	18210	10200	33060	5510 × 3510 × 4510		2040
20000					19200	84645		0.65	76	21800	10900	38000	5740 × 3720 × 4730		2040
25000					22720	100035		0.60	77	25500	11700	43200	5940 × 4060 × 4890		2040
31500					26960	120555		0.55	79	32700	12000	51800	6080 × 4220 × 4960		2040

SZ9-6300 ~ 31500/66系列三相双绕组油浸有载调压电力变压器技术数据

Technical Data for SZ9-6300 ~ 31500/66 Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Voltage Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 × 宽 × 高 L × W × H		
													长	宽	
6300	63	± 2 × 2.5%	6.3	YNd11	10000	36000	9.0	0.75	68	8540	3950	15600	4000 × 3000 × 3400		1475
8000					12000	42700		0.75	69	9960	4660	17800	4200 × 3100 × 3500		1475
10000					14200	50400		0.70	71	13200	5400	21740	4300 × 3200 × 3600		1475
12500					16800	59800		0.70	73	14800	6860	25600	4700 × 3500 × 3700		1475
16000					20200	73500		0.65	75	16350	7500	28500	4900 × 3650 × 4100		2040
20000					24000	89100		0.65	77	18900	8300	32500	5000 × 3800 × 4210		2040
25000					28400	105300		0.60	78	23100	8900	38000	5200 × 3950 × 4150		2040
31500					33700	126900		0.55	80	28400	9500	45000	5500 × 4120 × 4800		2040

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
 Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.



110KV电力变压器

110KV Power Transformer

公司生产的110KV级产品已经形成标准化结构，产品类型由原有的9型产品发展到目前的10型、11型、13型产品，同时还推出自冷，风冷免维护，不吊芯等结构的新产品。产品具有：现场免吊芯、高效节能、高阻抗、低损耗、低噪音、低温升、低局放、即一免、两高、四低的性能特点。该系列产品完全满足供电质量高，损耗噪音低，维护隔长的市场需求。

Our produced 110KV series product line has formed a standardized colony, with its versions developed from former 9 versions to present 10, 11 or 13 versions. Furthermore, new product versions with a self-cooling configuration, with an air-cooling & maintenance-free configuration, and with a no-core-suspension configuration have been released into the markets. In featured performance, the product line is core suspension free on site, highly efficient and energy saving, high in impedance, low in loss, in noise, in temperature increase, and in local discharge, i.e., "1 free, 2 highs, and 4 lows". This product line may satisfy market demands requiring high power supply quality, low losses and low noise, and a long interval between overhauls.

产品特点 Product Characteristics

- 110KV电力变压器铁芯采用优质硅钢片，多级阶梯叠积而成。具有低损耗、低噪音、抗短路能力强等特点。
- 已广泛应用于各变电所、发电厂，受到用户的一致好评。我公司生产的SSZ11-4000V/110有载调压电力变压器于2008年通过国家机械部、电力部的联合鉴定。
- 钟罩式油箱，箱壁采用折弯瓦楞结构，增强了油箱的机械强度，外形美观大方；
- 铁心结构独特，采用D型铁轭，45度斜接缝；
- 铁心与油箱全方位定位，可保证运输中抗冲击力；
- 绕组设计原理，线圈采用内外撑条结构，各线圈之间、线圈与铁芯之间采用高强度硬纸筒增强了线圈抗短路冲击的能力；
- 工艺上采用了冷压焊接技术，线圈成套套工艺、硬纸筒加工等多项先进工艺。

- Cores finding use in 110KV power Transformer: They are composed of such quality silicon steel strips as laminated in a multiple-stage cascade, featured in low loss, low noise, and high short-circuit resistance;
- Having been founding popular use in substations, power plants, winning unanimous favor from users. In 2008, our produced SSZ11-4000V/110 on-Load voltage regulating power transformer had been qualified by the joint identification initiated by State Mechanical Ministry and State Ministry of Electric Power;
- Bell-Shaped Oil Tank: With its corrugated tank wall, its mechanical strength is improved and its profile is beautiful and dignified;
- Unique Core Structure: Adopting D-Iron, 45° miter joint;
- Full Bearing Positioning between core and oil tank may guarantee a reliable impact resistance during transportation;
- Winding Design Principles: Inner and outer braces are adopted in coils and highly strong hardboard tubes introduced between coils and between coil and core, in order to enhance each coil's ability to endure short-circuit impulse;
- Manufacturing Process: Such advanced processes as cold pressing and welding processes, coil stack assemblage, and hardboard tube processing process are introduced.

S9-6300 ~ 31500/110系列三相双绕组油浸无载调压电力变压器技术数据

Technical Data for S9-6300 ~ 31500/110 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Voltage Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Impe- dence (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension			轨距 Rail Gauge (mm)				
	高压KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压KV L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 L	宽 W	高 H					
																	中压 M.V. (KV)	中压分 接范围 in the pressure- load (%)	低压 L.V. (KV)	
6300	110	±2X2.5%	6.3	YNd11	9300	36000	10.5	0.77	68	7400	3180	16200	3860	3130	4160	1475				
8000										11200	45000	0.77	69	8700	3820	19860	4050	3280	4360	1475
10000										13200	53000	0.72	71	10250	4450	23300	4240	3420	4580	1475
12500										15600	63000	0.72	73	12700	5320	27100	4460	3620	4710	1475
16000										18800	77000	0.67	75	14800	6400	30320	4690	3810	5060	2040
20000										22000	93000	0.67	77	17200	6870	33400	5550	3860	5820	2040
25000										26000	110000	0.62	78	20430	7560	38900	5620	3900	5930	2040
31500										30800	133000	0.60	80	23820	8060	45100	5930	4060	6000	2040

SZ9-6300 ~ 31500/110系列三相双绕组油浸有载调压电力变压器技术数据

Technical Data for SZ9-6300 ~ 31500/110 Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Voltage Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Impe- dence (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension			轨距 Rail Gauge (mm)				
	高压KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压KV L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长 L	宽 W	高 H					
6300	110	±2X2.5%	6.3	YNd11	10000	36000	10.5	0.80	68	9700	8260	23500	5500	3360	4270	1475				
8000										12000	45000	0.80	69	11800	8570	26870	5770	3560	4460	1475
10000										14200	53000	0.74	71	13500	8940	30360	6060	3970	4650	1475
12500										16800	63000	0.74	73	14500	9120	33500	6180	4090	5400	1475
16000										20200	77000	0.69	75	16200	9420	35600	6220	4190	5730	2040
20000										24000	93000	0.69	77	18200	9650	38800	6250	4220	5860	2040
25000										28400	110000	0.64	78	21500	9860	43600	6390	4340	6000	2040
31500										33800	133000	0.64	80	25200	10120	48500	7090	4540	6050	2040

S9-6300 ~ 31500/110系列三相三绕组油浸无载调压电力变压器技术数据

Technical Data for S9-6300 ~ 31500/110 Series, 3-Phase, Triple-Winding, Oil-Immersed, No-Load Voltage Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗电压 Short Circuit Impe- dence		空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)		
	高压KV H.V. (KV)	中压KV V.I. (KV)	低压KV L.V. (KV)				升压 Stepup	降压 Stepdown			器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H				
6300	110 ±2X2.5%	35	6.3	YNyn0d11	11200	47000	17.5-18.5	高-中 (High-medium)	高-中 (High-medium)	0.82	68	9200	4490	18800	3750 × 3290 × 4100	1475		
8000										13300	56000	0.78	69	11100	5350	21940	4080 × 3380 × 4310	1475
10000										15800	66000	0.74	71	13200	6300	25920	4820 × 3500 × 4500	1475
12500										18400	78000	0.70	73	15400	7460	31700	5700 × 3580 × 4770	1475
16000										22400	95000	0.66	75	18100	8800	36200	5990 × 3700 × 4910	2040
20000										26400	112000	0.65	77	21400	9300	42700	6060 × 3800 × 5100	2040
25000										30800	133000	0.60	78	25100	10500	47800	6170 × 4000 × 5280	2040
31500										36800	157000	0.60	80	30100	11800	54400	6230 × 4120 × 5350	2040

SZ9-6300 ~ 31500/110系列三相三绕组油浸有载调压电力变压器技术数据

Technical Data for SZ9-6300 ~ 31500/110 Series, 3-Phase, Triple-Winding, Oil-Immersed, On-Load Voltage Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination				联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Impe- dence	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension			轨距 Rail Gauge (mm)		
	高压KV H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	中压KV L.V. (KV)	中压分 接范围 in the pressure- load (%)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H					
6300	110	±8X1.25%	35	±2X2.5%	YNYnd11	12000	47000	10.5	0.95	68	10100	6050	21800	4700 × 3350 × 4380	1475				
8000											14400	56000	0.95	69	12780	6970	25900	4900 × 3510 × 4630	1475
10000											17100	66000	0.89	71	14100	8500	31000	5150 × 3520 × 4960	1475
12500											20200	78000	0.89	73	16600	10050	36100	5850 × 3600 × 5490	1475
16000											24200	95000	0.84	75	19700	11900	42700	6060 × 3710 × 5770	2040
20000											28600	112000	0.84	77	23000	12900	48250	6120 × 4200 × 5950	2040
25000											33800	133000	0.78	78	27600	13500	54100	6240 × 4270 × 6060	2040
31500											40200	157000	0.78	80	34300	15300	63700	6380 × 4370 × 6140	2040

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。

Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.



S13立体三角形卷铁芯电力变压器 S13 Reel Triangle Core Power Transformer

S13立体三角形卷铁芯变压器采用最理想的铁芯结构，高性能的硅钢片，先进的工艺，经优化设计精心加工而成，已通过国家权威部门严格检测，其产品达到国内领先水平。

- 与S9相比其空载损耗降低50%，空载电流降低60%；
- 与S11相比其空载损耗降低25%，空载电流降低25%；
- S13-MRL-200/10变压器经权威部门测试噪音只有33.4dB。

S13 reel triangle core transformers have introduced a most ideal core configuration, performance silicon steel strips, and advanced manufacturing processes and are manufactured via optimized design and elaborate processing. Now the product line has been qualified by strict testing made by a national authoritative test center and has attained a domestically leading level in quality and in performance.

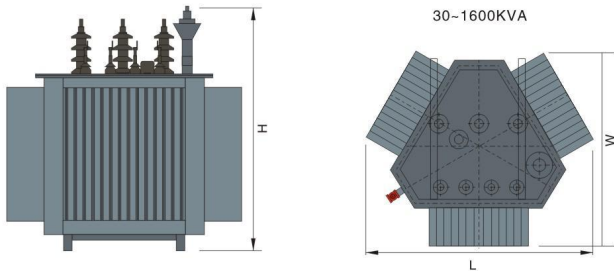
- In comparison with S9, no-load loss is reduced by 50% and no-load current reduced by 60%;
- In comparison with S11, no-load loss is reduced by 25% and no-load current reduced by 25%;
- S13-MRL-200/10 Transformer's noise level is as low as 33.4dB, as tested by an authoritative inspection organization.

产品特点 Product Characteristics

立体卷铁芯变压器突破了传统的平面式结构，采用立体三角形结构，将铁芯的排列方式进行了更加合理的组合，采用三个完全相同的单框拼合而成。实现三相磁路完全对称等长，确保三相供电平衡，并使磁阻大大减小，励磁电流、空载损耗显著降低。使其机械强度更高、结构更加稳定。

Reel triangle core transformers have broken through the traditional plane configuration and instead they have adopted a reel triangle configuration that joins 3 identical single frames together and has realized more rational combination in core arrangement. Therefore, 3 phase magnetic paths can be symmetric and equal in length, which helps to guarantee a balance in 3 phase power supply, to greatly reduce the magnetic reluctance, to bring exciting current and no-load loss obviously lowered, to enable a higher mechanical strength and a more stable structure.

外形尺寸 Outline Dimension



S13-MRL-30~1600/10三相双绕组油浸无载调压电力变压器技术数据 Technical Data for S13-MRL-30~1600/10 Series, 3-Phase, Double-Winding, Oil-Immersed, No-Load Regulating Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Conn- ection Label	空载损耗 No- Load Loss (W)	负载损耗 Load Loss- es (W)	阻抗电压 Short Circuit Impe- dence (%)	空载电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量(kg) Weight			外型尺寸(mm) Overall Dimension		轨距 Rail Cauge (mm)
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H		
													±5%	0.4	
30					80	630/600		0.28	38	185	105	380	870×690×950	400×400	
50					100	910/870		0.25	38	230	110	450	920×730×1050	400×400	
63					110	1090/1040		0.23	38	240	115	475	940×735×1080	400×400	
80					130	1310/1250		0.22	40	300	125	575	960×750×1110	400×400	
100					150	1580/1500		0.21	40	335	130	600	970×750×1150	400×400	
125					170	1890/1800		0.20	40	355	140	638	980×790×1180	400×550	
160	6				200	2310/2200	4	0.19	41	480	155	800	1045×820×1210	550×550	
200	6.3				240	2730/2600		0.18	41	550	180	935	1110×980×1240	550×550	
250	10				290	3200/3050		0.17	42	730	220	1190	1250×1020×1305	550×550	
315	10.5				340	3830/3650		0.16	42	825	230	1310	1270×1060×1390	550×550	
400	11				410	4520/4300		0.16	44	975	260	1520	1290×1065×1420	660×660	
500					460	5410/5150		0.15	44	1120	290	1760	1325×1100×1490	660×660	
630					570	6200		0.15	46	1350	340	2105	1410×1190×1580	660×660	
800					700	7500		0.14	46	1500	380	2410	1540×1270×1610	820×820	
1000					830	10300	4.5	0.13	48	1650	440	2690	1750×1340×1750	820×820	
1250					970	12000		0.12	48	2080	515	3320	1830×1390×1810	820×820	
1600					1170	14500		0.11	49	2430	610	3800	1905×1450×1900	820×820	

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.



非晶合金变压器

Amorphous Alloy Transformer

非晶合金是一种新型带材，非晶合金材料不存在晶体结构，磁化功率小，电阻率高，所以涡流损耗小，用这种材料做铁芯可生产出一种新型节能变压器，是配电网更新换代的理想产品。

铁芯为卷铁芯结构，三相五柱式，截面为矩形。线圈为矩形，高压采用缩醛漆包线绕制，低压采用无氧铜导线或铜箔绕制，增加变压器承受短路的能力。变压器联结组采用Dyn11，避免高次谐波影响，耐不平衡负荷能力强，显著提高供电质量。变压器采用真空注油，可完全排除线圈中的气泡，确保绝缘性能稳定。取消了储油柜，由片式散热器代替油管作为冷却元件，油箱上面有充气垫，可随变压器油体积膨胀而压缩，变压器油与大气隔绝，防止和减缓油质的劣化和绝缘受潮，增强运行可靠性，正常运行免维护。

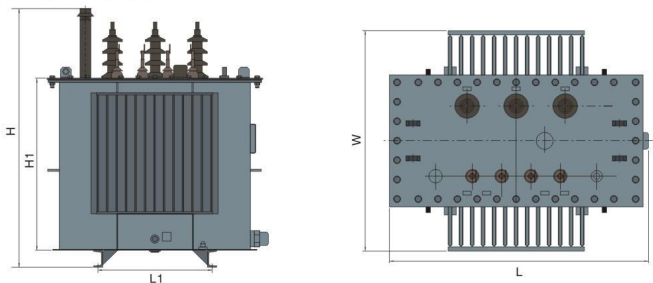
Amorphous alloy is a new kind of strip material. Non-existence of crystalline structures in amorphous alloy materials results in a low magnetizing power and a high resistivity and furthermore a low eddy current loss. Iron cores made of amorphous alloys may be used to produce a new type of energy saving transformers, which have become an ideal product line for distribution grid updating. The core adopts a reel core configuration, 3 phases and 5 poles, having a rectangular cross section profile. The coils are also rectangular in profile, which are fabricated by winding acetal enameled wires on the high-voltage side and fabricated by winding oxygen-free copper leads or by copper foils on the low-voltage side, in order to improve the transformer's ability to withstand short-circuit phenomena. The transformer-interconnecting group has introduced Dyn11 for fear of higher harmonic impacts and such practice has effectively reinforced the endurance capacity against an unbalanced load and remarkably enhanced the power supply quality. The transformer product line has introduced vacuum oil injection that may entirely eliminate bubbling in coils and thereby ensure a stable insulating performance. Without using an oil storage cabinet, instead, finned radiators are available to substitute oil pipes as a cooling element. The inflatable cushion above the oil tank may compress itself with the expansion in transformer oil volume, which helps to isolate transformer oil entirely from atmosphere, thus preventing from and slowing down both oil deterioration and insulation exposure to moisture, intensifying operational reliability, and resulting in a maintenance free operation in normal conditions.

产品特点 Product Characteristics

- 超低损耗特性，省能源、用电效率高；
- 非晶金属材料制造时使用较低能源以及其超低的损耗特性，可大幅节省电力消耗及减少电厂发电量，相对的减少CO₂、SO₂废气的排放，降低对环境污染及温室效应，免保养，无污染；
- 运转温度低、绝缘老化慢、变压器使用寿命长；
- 高过载能力，高机械强度；
- 非晶铁芯在通过较高频率磁通时，仍具有低铁损及低激磁电流的特性而不致产生铁芯饱和的问题，故以非晶铁芯制成SBH15型非晶合金变压器具有较好的耐谐波能力；
- 投资回收效益快。

- Extremely Low Loss, Energy-Saving Features, High Power Consuming Efficiency;
- Amorphous Metal Materials are advantageous in that: They just need to consume lesser energy in material manufacture and with their extremely low losses, power is saved in a large sum, thereby greatly reducing the power plant output, or relatively lowering waste gas (CO₂, SO₂) emission, lessening both environmental pollution and greenhouse effects, and realizing a maintenance free and contamination free state;
- Low in Operating Temperature, Tardy in Insulation Aging, and Long in Transformer Life;
- High Overload Capacity, High Mechanical Strength;
- Amorphous Cores are featured in that: When a magnetic flux pass through amorphous cores in a rather high frequency, these amorphous cores may remain a low iron loss and a low exciting current, which may not result in core saturation. Consequently SBH15 amorphous alloy transformers made from amorphous cores possess a rather fine resistance to harmonic waves;
- Rapid Investment Recovery

外形尺寸 Outline Dimension



非晶合金SBH15-M-30 ~ 2500/10三相双绕组油浸无载调压配电变压器技术数据

Technical Data for SBH15-M-30 ~ 2500/10 Series, Amorphous Alloy, 3-Phase, Double-Winding, Oil-Immersed, No-Load Regulating Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination		联结组 标号 Conn- ection Label	空载 损耗 No- Load Loss (W)	负载 损耗 Load Loss- es (W)	阻抗 电压 Short Circuit Imped- ance (%)	空载 电流 No- Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension			轨距 Rail Gauge (mm)						
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range (%)							低压 L.V. (KV)	器身重 Core	油重 Oil	总重 Total	长 L	宽 W		高 H					
																	重量	长	宽	高	
30	6	± 2x2.5%	0.4	Dyn11	33	630/600	4	1.5	52	230	110	440	1000	780	810	400 × 550					
50					43	910/870		1.2	53	310	130	555	1030	850	850	400 × 550					
63					50	1090/1040		1.2	53	360	135	610	1000	900	845	400 × 550					
80					60	1310/1250		1.0	55	410	145	675	1060	900	865	400 × 550					
100					75	1580/1500		0.9	55	470	165	770	1110	910	920	400 × 550					
125					85	1890/1800		0.8	59	550	180	880	1170	910	950	550 × 660					
160					100	2310/2200		0.6	59	635	195	990	1220	910	985	550 × 660					
200					120	2730/2600		0.6	61	730	230	1150	1290	920	1025	550 × 660					
250					140	3200/3050		0.6	61	855	250	1310	1360	920	1060	550 × 660					
315					6.3	± 5%		0.4	Dyn11	170	3830/3650	4.5	0.5	64	1010	270	1515	1380	860	1165	550 × 660
400					200					4520/4300	0.5		64	1245	340	1870	1510	900	1240	660 × 820	
500					240					5410/5150	0.5		66	1525	395	2185	1640	900	1295	660 × 820	
630					320					6200	0.3		66	1730	575	2720	1740	1120	1300	660 × 820	
800					380					7500	0.3		68	2035	680	3200	2070	1230	1345	660 × 820	
1000					450					10300	0.3		68	2245	765	3640	2260	1350	1385	820 × 1070	
1250					530					12000	0.2		72	2660	840	4215	2360	1350	1445	820 × 1070	
1600					630					14500	0.2		72	3205	965	5000	2530	1390	1525	1070 × 1070	
2000					750					18300	0.2		73	3950	1180	6120	2595	1595	1985	1070 × 1070	
2500					900					21200	0.2		73	5550	1660	8600	2950	1685	2500	1070 × 1070	

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
 Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.



TS系列12/0.4全绝缘台式变电站

TS Series 12/0.4 All-Insulated Desk-Type Substation

变电站产品是电力系统中不可缺少的重要组成部分，其主要起着分配电能、调节电压、保护电网的安全和提高电网的供电质量等作用，同时它也是电网能源损耗的设备之一。变电站的构成决定了它的用电安全性和运行的可靠性，同时能源消耗问题更是供电系统急需解决的重中之重的问题。针对架空变压器目前平日检测盒检修极不方便，高、低压电缆裸露在外，易造成触电伤人等事故，我公司在此环境下自主研发出一种模块化集成化组合式、方便施工人员安装和检修的低损耗、全绝缘台式变电站。

Substation products constitute an indispensable part of an electricity system and mostly functions in electric power distribution, voltage regulation, grid safeguarding, and power supply quality improvement on an electric grid, etc. Besides, a substation pertains to one of energy-consuming facilities on an electric grid and their composition does decide their safety in power consumption and their reliability in operation. Furthermore, here energy consumption is a priority among priorities. With respect to inconveniences in the routine maintenance & care of testing kits in an overhead transformer, and for eliminating injuries and fatal accidents due to electric shocks associated with high-voltage and low-voltage cables exposed to the outside, our corporation has successfully independently developed a low-loss, all-insulated desk-type substation, which is modularized, integrated and combined one that can facilitate construction, installation, and maintenance & care.

使用环境 Environmental Conditions for Product Use

- 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
- 环境温度：-40℃~+40℃
- 空气相对湿度：≤90%
- 装置种类：户外式
 - Sea Level Elevation: 1000m; for any user on an elevation of above 1000 meters, please mention it in your order; in fact, this product may satisfy any user on an elevation of below 4000 meters;
 - Ambient Temperature: -40℃~+40℃
 - Air Relative Humidity: ≤90%
 - Device Type: Outdoor Type

主要执行标准 Significant Implementation Standards

- GB1094.1-2-1996《电力变压器》
- GB1094.3.5-2003《电力变压器》
- GB/T6451-2015《三相油浸式电力变压器技术参数表和要求》
- GB/T17467-1998《高压/低压预装式变电站》
 - GB1094.1-2-1996《Power Transformers》
 - GB1094.3.5-2003《Power Transformers》
 - GB/T6451-2015《Technical Parameter List and Technical Requirements for 3-Phase, Oil-Immersed, Power Transformers》
 - GB/T17467-1998《High-Voltage/Low-Voltage Prefabricated Substation》



我公司生产的全绝缘台式变电站设计科学、合理、富有创意、体积小巧、监测显示仪表装设在一侧方便维修和操作、降低能量消耗、安装容易、经济适用性强、稳定可靠、具有较好的发展前景。

The fully insulated bench substations manufactured by us are scientific, rational and original in design, with compact size, with its monitoring display instrument mounted aside for ease of maintenance and operation, featured by its low energy consumption, easy installation, cost-saving and practicability, stability and reliability, therefore having a huge potential for development.

产品特点 Product Characteristics

- 全绝缘台式变电站各部分采用模块化安装方式，各单元可分体置换。
- 高低压引线采用母线槽方式，无外露电缆线，外形流畅，简洁美观。
- 全绝缘变压器采用S11及以上的油浸变压器，高压侧进线安装全绝缘电缆头，无裸露带电体，安全可靠。低压侧采用低压套管与组合式互感器封装在一起安装，在高低侧有安装检修门，方便施工人员的安装和检修。
- 低压负控箱、低压出线补偿箱安装在台架的下方，便于观测和维护。
- 取消了传统台变的结构方式，全绝缘台式变电站采用侧近线结构，高压侧采用全绝缘电缆头，低压侧出线封装，无裸露带电体。
- 全绝缘台式变电站的台架采用金属新型材料，防腐、环保、美观。
- 低压侧低压套管与组合式电流互感器封装在一起安装，便于安装和检修，全绝缘台式变电站可整体置换，目前国内外尚无其他厂家生产。
- 油温表、油位表、压力释放阀等表计安装高压侧防护箱内，分接开关也安装在高压侧防护箱内，操作方便安全。

- Each and all parts of a all-insulated desk-type substation have adopted modularized installation and each unit may be replaced as an separate one;
- High- and low-voltage leading lines are laid in a bus duct, which, without any cables exposed to the outside, cut a very neat figure, simple and rapid in installation and beautiful and fine in appearance;
- Each all-insulated transformer makes avail of a S11 or above oil-immersed transformer, with a insulated cable connector furnished on the incoming cable of the high-voltage side. Without any naked charged body, it is safe and reliable. On the low-voltage side, low-voltage bushings are packaged together with composite transducers in electrical installation. An access door for installation conveniences is provided respectively on the high-voltage side and on the low-voltage side, which may facilitate construction workers' installation and maintenance care;
- A low-voltage load controlling cabinet and a low-voltage outgoing cable compensation box are both installed below the desk for the convenience of observation and maintenance;
- After eliminating the configuration of a traditional desk-type substation, each all-insulated desk-type transformer has introduced a cable side incoming configuration, to be particular: an all-insulated cable connector is provided on the high-voltage side and side outgoing cables are packaged on the low-voltage side, thus no naked charged body exist;
- The desk adopted in an all-insulated substation is made of a kind of new metal, which is corrosion resistant, environmentally friendly, and beautiful in appearance;
- On the low-voltage side, low-voltage bushings are packaged together with composite current transducers for installation and maintenance conveniences. Each all-insulated desk-type substation may be integrally changed and till now no other manufacturer is able to put out such a unique substation;
- The oil temperature gauge, oil level gauge, pressure relief valve, and other gauges are installed on the high-voltage side within a protective enclosure. The same with the tapping switches for operational convenience and operational safety.

产品结构说明 The Main Executive Standard

全绝缘台式变电站，包括台架、高压防护箱、低压防护箱、全绝缘变压器，低压负控箱和低压出线补偿箱；台架装设在两根电柱之间，上述的全绝缘变压器位于台架上，全绝缘变压器的一侧设置有高压防护箱，全绝缘变压器的另一侧设置有低压防护箱；台架的下面设置有电缆夹层，电缆夹层与台架为一体连接，电缆设在夹层内，无裸露带电体；台架的底端面分别于低压负控箱和低压出线补偿箱为可拆卸的紧固连接，两根电柱上分别设置有高压电缆线槽和低压电缆线槽。

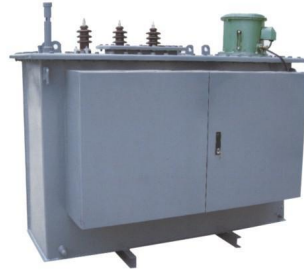
A fully insulated bench substation consists of a bench, a high voltage protective box, a low voltage protective box, a fully-insulated transformer, a lower voltage load control box and a low voltage outgoing line compensation box; the bench is mounted between two electric pillars, and the fully-insulated transformer is fixed onto the bench, with a high voltage protective box provided on one side of the transformer and a low voltage protective box on the other side; under the bench there is a cable interlayer, which is integrated into the bench, where the cable is enclosed in the interlayer, without any electrified body being exposed; the lower end face of the bench is connected tightly with the low voltage load control box and the load voltage outgoing line compensation box, and the connector is detachable; the two electric pillars are designed with a high voltage cable trunk and a high voltage cable trunk respectively.

技术参数 Technical Data

额定容量 Rated Capacity (KVA)	电压组合 Voltage Combination			联结组标号 Connection Group Mark	(S13) 损耗 Losses			电路电阻 Electric Circuit Resistance (%)
	高压 High Voltage (KV)	高压分接范围 High Voltage Tap Range (%)	低压 Low Voltage (KV)		空载损耗 No-Load Loss (KW)	负载损耗 Load Loss (KW)	空载电流 No-Load Current (%)	
30	6	±5或 ±2x2.5	0.4	Dyn11 Yyn0	0.08	0.63/0.60	1.90	4.0
50					0.10	0.91/0.87	1.70	
63					0.11	1.09/1.04	1.40	
80					0.13	1.31/1.25	1.10	
100					0.15	1.58/1.50	1.00	
125					0.07	1.89/1.80	0.90	
160					0.20	2.31/2.20	0.90	
200					0.24	2.73/2.60	0.70	
250					0.29	3.20/3.05	0.70	
315					0.34	3.83/3.65	0.60	
400					0.41	4.52/4.30	0.50	

※注：斜线上方的负载损耗适用于Dyn11联结组，斜线下方的负载损耗适用于Yyn0联结组

Note: The load loss above the oblique line is applicable to Dyn11 interconnection group and that below the oblique line is applicable to Yyn0 interconnection group.



智能型有载调容变压器 Intelligent Regulated Capacity Transformer

智能型有载调容变压器在行业内率先采用分节式结构，既可用于高电压等级，又能用于较低电压等级，并保持其精度不变。以100/200KV/2mA分两节为例，单节时可做100KV/4mA使用，可用于35KV及以下系统电气设备直流高压试验，此时可保证测量的准确性避免大马拉小车；智能型直流高压发生器两节使用时可做200KV/2mA使用，可用于220KV分节、110KV及以下氧化锌避雷器直流试验及交联电缆的直流耐压试验。真正做到一机两用，大大方便了现场用户的使用。

Each of our-produced intelligent on-load capacity regulating transformers has taken the lead in the introduction of a segmental structure in the same industry, which may be used in any place associated either with a high voltage rating or with a low voltage rating while keeping an unchanged precision in either case. Taking 100/200KV/2mA segments for an example, when functioning as a one segment device, it may be used in the 100KV/4mA segmental range, which has found use in DC high voltage testing of an electrical device within a 35KV or less system, and in such circumstance, it helps to guarantee the measurement accuracy and avoid a big horse's pulling of a small carriage; when functioning as a two segment device like an intelligent DC high-voltage generator, it may be used not only in the 200KV/2mA segmental range, but also in 220KV, 110KV or less segmental ranges (for the latter, such as being used in DC testing of a zinc oxide lightning arrester or in DC voltage withstand testing of cross-linking cables), i.e., genuinely realizing one unit for double uses that bring about a lot of conveniences to our onsite users.

产品概述 Product Outlines

电力系统的节能降损是建设节约型社会的重要组成部分。尤其是配电系统面广量大，其节能降损问题既关系千家万户的用电质量，又直接影响供电企业的经济效益。在很多场合，变压器的负载运行存在着明显高峰期与低谷期，低谷期的变压器就接近空载状态，此时的变压器空载损耗约占整个供电损耗的40%左右。因此降低变压器轻负载时的空载损耗对于降低整个供电损耗具有十分重要的意义。

S11-M.ZT型智能有载调容变压器是我公司与中国电力科学技术研究院为适应上述要求而联合开发的一种新型节能变压器，该产品采用智能有载调容技术，降低了变压器的空载损耗，具有显著的节能效果，其分为智能型有载调容配电变压器和智能型有载调容电力变压器。前者适用于季节负荷或昼夜负荷变化较大的农村和城市商业区、工业开发区、居民小区等10kv配电台区和箱式变电站，后者适用于上一级的35kv输变电系统，是智能变配电台区的首选产品，2011年被国家电网公司列入第一重点推广新技术目录。

Energy saving and loss reduction in each electrical system constitute a significant part of a saving-oriented society under construction, especially that a power distribution system has a large coverage that means saving energy and reducing losses not only matter to the quality of power supply consumed by each and every household, but also directly impact the economic benefits of electric power suppliers. In many cases, evident peak and valley periods do exist in terms of a transformer's operating load; in the valley period, the transformer load approximate to zero or a no-load state, i.e., in such duration, the transformer's no-load loss covers about 40% of the total power supply loss. As a result, reducing the no-load loss during a transformer's light loading is very significant to the reduction of the total power supply loss.

A S11-M.ZT intelligent on-load capacity regulating transformer is a new type of energy saving transformer jointly developed by our company and China Electric Power Research Institute (CEPRI) for meeting above-narrated requirements. This product line, including intelligent on-load capacity regulating distribution transformers and intelligent on-load capacity regulating electrical transformers, adopts intelligent on-load capacity regulating technology to lower a transformer's no-load loss, possessing distinct energy saving effects. Among them, intelligent on-load capacity regulating distribution transformers are applicable to 10KV power distribution desk area and packaged substations in rural areas, urban business districts, industrial development zones, residential estates where a large variation does exist in seasonal load or in daily load; while intelligent on-load capacity regulating electrical transformers are applicable to a 35KV power transmission and distribution system in the next higher level, i.e., the first choice in an intelligent power transformation and distribution desk area, which have been listed in the specially promoted new technology catalogue of No.1 priority in 2011 by State Grid Corporation of China (SGCC).

使用环境 Environmental Conditions for Product Use

安装地点 Installation location	户内、户外 indoor, outdoor.
环境温度 ambient temperature	-25℃~+40℃ -25℃ ~+40 ℃.
相对湿度 relative humidity	小于等于95% less than or equal to 95%.
海拔高度 Altitude	1000m以下 1000m.

注：特殊使用环境需在订货时说明
Note: special environment should be stated in the order.

产品特点 Product Characteristics

- 通过降损节能取得良好的经济效益和社会效益
- 解决农村现有台区由于季节性负荷变化所造成的“大马拉小车”和严重过载的问题
- 代替“母子变压器”，节约投资成本、节省占地面积
- 克服了无载调容需停电人工调节的缺陷
- 向配电综合管理系统和电网经济运行系统提供检测数据，符合智能电网要求
- 利于供电管理模式的改变，提高配电网管理水平
- Gaining fine economic and social benefits through reducing loss and saving energy;
- Solving the current issues like "a big house pulls a large carriage" and severe overloads resulted from seasonal load variations in desk areas;
- Substituting "mother-daughter transformers", saving investment costs and the holding land area;
- Overcoming the disadvantage of inevitable manual regulation post power cut-off in terms of no-load capacity regulating operation;
- Providing testing data to both power distribution integrated management system and economic power grid running system and such practice does satisfy intelligent power grid requirements;
- Helping to alter power supply management mode and thereby enhance power distribution management level.

工作原理 Working Principles

智能型有载调容变压器工作原理如图1所示，有载调容控制器通过检测变压器低压侧的电压、电流，来判断当前负荷电流大小，如果满足调容条件则发出调容指令给有载调容开关，有载调容开关根据调容指令进行容量切换，实现变压器内部高、低压线圈的星、角变换和串、并联转换，完成变压器带负载情况下的容量切换。

The operating principle of an intelligent on-load capacity regulating transformer is shown in Fig. 1. To be particular, a on-load capacity regulation controller makes a judgment as to the magnitude of a load current at this moment via testing the voltage and current on the transformer's low-voltage side; thereupon, if capacity regulating conditions are met, then the controller will give a capacity regulation order to an on-load capacity regulating switch that will switch over capacities according to such given order, so as to realize Y-Δ conversion and switching-over between serial and parallel connections. This way, the capacity switching-over is fulfilled on a transformer under loading conditions.

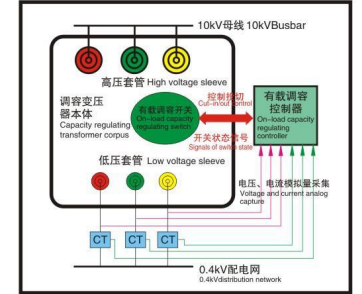
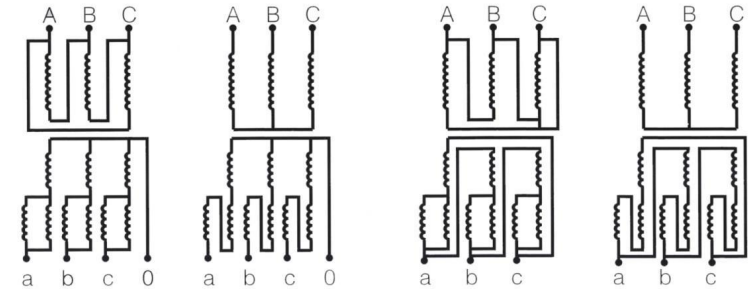


图1 智能型有载调容变压器工作原理图
Fig.1 Intelligent On-load Capacity-regulating Transformer Operating Principle Diagram



Dyn11联结 (大容量) Yyn0联结 (小容量时)
Dyn11 Connection (large capacity) Yyn0 Connection (when the capacity is small)

Dd0联结 (大容量时) Yd0联结 (小容量)
Dd0 Connection (when the capacity is large) Yd0 Connection (small capacity)

图2 有载调容变压器接线原理图
Picture2 On-load Capacity Regulating Transformer Wiring Diagram

图3 有载调容电力变压器接线原理图
Picture3 On-load Capacity Regulating Power Transformer Wiring Diagram

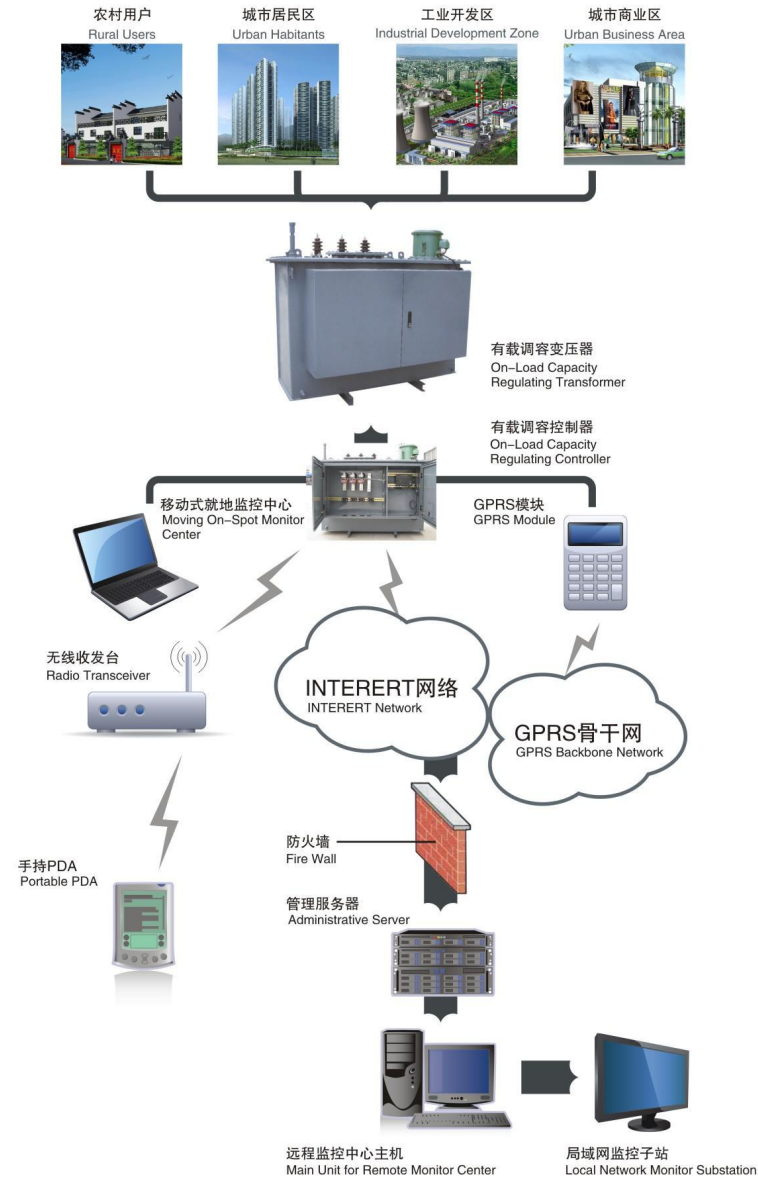
整体方案 Overall Plan

智能型有载调容变压器主要由变压器、有载调容开关、有载调容控制器及附件组成，配电变压器可以通过串口/USB接口与笔记本电脑连接或依靠ZIGBEE低功耗无线收发模块与手持PDA终端连接，实现就地数据下载、数据查看和参数整定；还可通过外置GPRS模块或以以太网模块，将运行数据发送到远方监控中心，实现智能型有载调容变压器远程监控功能。

An intelligent on-load capacity regulating transformer consists of a power distribution transformer, an on-load capacity regulating switch, an on-load capacity regulation controller, and auxiliaries. The power distribution transformer may connect with a notebook computer via a serial interface /USB interface or with the aid of a ZIGBEE radio transceiver module of micro-power consumption, connect with a portable PDA terminal, in order to realize data download, data review, and parameter tuning just on the spot. In addition, via an external GPRS module or an Ethernet module, operating data are transmitted to a remote control center, thereby realizing a remote control function with regard to an on-load capacity regulating transformer.

智能型有载调容变压器整体方案结构框图

Structured Block Diagram, Overall Plan for Intelligent On-Load Capacity Regulating Transformers



S13-M.ZT系列智能型三相双绕组油浸有载调容配电变压器技术数据

Technical Data for S13-M.ZT Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Capacity Regulating Intelligent Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Connection Label	空载损耗 No-Load Loss (W)	负载损耗 Load Loss-es (W)	阻抗电压 Short Circuit Impedance (%)	空载电流 No-Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 H.V. (KV)	高压分接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H		
	±5%, ±2×2.5%												Dyn11(Yyn0)		
100(30)	6	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	150(80)	1580(600)	4	0.8(1.6)	42	580	240	960	1340×930×1230		660×820
125(40)					170(90)	1890(735)				640	265	1060	1370×960×1250		660×820
160(50)	6.3	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	200(100)	2310(870)	4	0.7(1.4)	42	710	295	1180	1410×1010×1270		820×820
200(63)					240(110)	2730(1040)				790	330	1310	1430×1100×1270		820×820
250(80)	10	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	290(130)	3200(1250)	4	0.6(1.2)	43	875	365	1460	1470×1150×1290		820×820
315(100)					340(150)	3830(1500)				1030	430	1710	1510×1210×1390		820×820
400(125)	10.5	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	410(170)	4520(1800)	4.5	0.5(1.0)	46	1220	505	2020	1660×1230×1410		820×820
500(160)					480(200)	5410(2200)				1390	580	2310	1750×1280×1430		820×820
630(200)	11	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	570(240)	6200(2600)	4.5	0.4(0.8)	48	1660	690	2760	1890×1310×1490		820×820

S11-M.ZT系列智能型三相双绕组油浸有载调容配电变压器技术数据

Technical Data for S11-M.ZT Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Capacity Regulating Intelligent Distribution Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Connection Label	空载损耗 No-Load Loss (W)	负载损耗 Load Loss-es (W)	阻抗电压 Short Circuit Impedance (%)	空载电流 No-Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 H.V. (KV)	高压分接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H		
	±5%, ±2×2.5%												Dyn11(Yyn0)		
100(30)	6	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	200(100)	1580(600)	4	0.9(1.8)	44	530	220	880	1320×910×1190		660×820
125(40)					240(110)	1890(735)				590	245	980	1350×940×1210		660×820
160(50)	6.3	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	280(130)	2310(870)	4	0.8(1.6)	44	660	275	1100	1380×990×1230		820×820
200(63)					340(150)	2730(1040)				735	305	1220	1400×1070×1230		820×820
250(80)	10	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	400(180)	3200(1250)	4	0.7(1.4)	45	830	345	1370	1440×1120×1250		820×820
315(100)					480(200)	3830(1500)				980	405	1620	1480×1170×1350		820×820
400(125)	10.5	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	570(240)	4520(1800)	4.5	0.6(1.3)	48	1150	480	1910	1620×1190×1330		820×820
500(160)					680(280)	5410(2200)				1320	550	2200	1710×1240×1350		820×820
630(200)	11	±5%, ±2×2.5%	0.4	Dyn11(Yyn0)	810(340)	6200(2600)	4.5	0.5(1.1)	50	1610	665	2660	1850×1270×1450		820×820

S11-ZT系列智能型三相双绕组油浸有载调容电力变压器技术数据

Technical Data for S11-ZT Series, 3-Phase, Double-Winding, Oil-Immersed, On-Load Capacity Regulating Intelligent Power Transformers

额定容量 Rated Capacity (KVA)	电压组合及分接范围 Voltage Combination			联结组标号 Connection Label	空载损耗 No-Load Loss (W)	负载损耗 Load Loss-es (W)	阻抗电压 Short Circuit Impedance (%)	空载电流 No-Load Current (A)	声级 Lpa Noise Level (dB)	重量 Weight			外型尺寸 Overall Dimension		轨距 Rail Gauge (mm)
	高压 H.V. (KV)	高压分接范围 High Voltage Tap Range (%)	低压 L.V. (KV)							器身重 Core	油重 Oil	总重 Total	长×宽×高 L×W×H		
	±5%, ±2×2.5%												D40(Yd11)		
2000(630)	35	±5%, ±2×2.5%	6.3	D40(Yd11)	2300(830)	19240(7870)	6.5	0.4(0.8)	60	5210	1740	8680	3550×2640×2685		1070×1070
2500(800)					2720(980)	20640(9410)				5790	1930	9640	3600×2610×2725		1475×1475
3150(1000)	35	±5%, ±2×2.5%	6.3	D40(Yd11)	3230(1150)	24710(11540)	7.0	0.4(0.72)	65	6410	2140	10670	3630×2530×2800		1475×1475
4000(1250)					3870(1410)	29160(13940)				7180	2400	11970	3670×2770×2900		1475×1475
5000(1600)	38.5	±5%, ±2×2.5%	10.5	D40(Yd11)	4640(1700)	34200(16670)	7.5	0.3(0.68)	68	7880	2630	13120	3730×2660×2960		1475×1475
6300(2000)					5630(2180)	36770(18380)				9060	3020	15090	3870×2710×3020		1475×1475
8000(2500)	38.5	±5%, ±2×2.5%	10.5	D40(Yd11)	7870(2560)	40610(19670)	7.5	0.3(0.6)	70	10560	3520	17600	4150×2760×3200		1475×1475

※注：表中重量、外形尺寸仅供参考，最终尺寸以合同签订后图纸确认为准。
Note: the weight and outline dimensions in the table are for your reference only, and the final dimensions shall be as defined in the contract drawings.

特种变压器 Special Transformer



整流变压器 Rectifier Transformer

基本型号：型号容量 (KVA) / 高压电压级次 (KV)；

基本型号含义：

- ZH-电化学，电解用整流变压器；
- S-三相，F-风冷；
- SP-强迫油循环水冷，K-内附平衡电抗器，Z-有载调压；

Basic Type: Type Capacity (KVA)/Voltage Level on High-Voltage Side (KV);

Basic Type Connotations:

- ZH-Electro-Chemistry, Rectifier Transformer for Electrolysis;
- S-3 Phase, F-Air Cooled;
- SP- Forced Oil Circulation Water-Cooling, K- Internally-Provided Balancing Reactor, Z- On-Load Voltage Regulating;

产品概述 Product Outlines

Z系列整流变压器广泛应用于可控硅整流，硅整流供电，用于铝、镁、锌的冶炼。硝酸、化学药品、农药的生产、点解电镀、牵引等。电压等级6-110KV，频率50-60Hz，容量30-63000KVA。可为用户设计制造两组二次绕组且相位差30°、15°、±7.5°供六相整流、十二相整流用的整流变压器。

Z series rectifier transformers have found far-ranging use in thyristor-controlled rectification. In fact, presently silicon rectifying power supply is available in aluminum, magnesium, and zinc smelting, in the production of chemical drugs and pesticides, in electrolysis and electroplating, in traction drive, etc. (voltage rating: 6-110KV, frequency: 50-60Hz, capacity: 30-63000KVA) We may design and manufacture a special rectifier transformer for our use as follows: i.e., two secondary windings are available, with the phase differences therebetween of 30°, 15°, ±7.5°, which may afford to 6-, or 12-phase rectification in a rectifier transformer.

使用环境 Environmental Conditions for Product Use

- 环境温度-30℃~+40℃；
 - 年平均温度20℃及以上（如果是水冷产品，冷却水温为取当日平均+25℃）；
 - 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
 - 安装场所无严重震动，颠簸和化学腐蚀，户内、外使用。
- Ambient Temperature: -30℃~+40℃;
- Year Average Temperature: 20℃ or above;
- Sea Level Elevation: 1000m; for any user on an elevation of above 1000 meters, please mention it in your order; in fact, this product may satisfy any user on an elevation of below 4000 meters;
- Installation Site shall be free from serious vibration, bumping and chemical corrosion. This product may be used indoors and outdoors.

产品特点 Product Characteristics

我公司生产的整流变压器是按国家行业标准及根据不同生产设备的工艺而设计、损耗低、生产效率高、运行可靠等特点。具体如下：
Our corporation produced rectifier transformers are designed by referring to national industrial standards and in accordance with remanufacturing processes associated with different production equipment, low in loss, high in production efficiency, and reliable in running. The characteristics of this product line are listed as follows:

整流变压器的总体结构特点 Overall Structure Features, Rectifier Transformer

我公司生产的整流变压器的总体结构形式很多，具体为：
There are a variety of overall structures found in our-manufactured rectifier transformers, to be particular:

按整流电路形式分类 Classified by Rectifier Circuit Mode	按调压方式分类 Classified by Voltage Regulation Mode
1. 三相桥式整流变压器结构 2. 双反星形带平衡电抗器的整流变压器结构 3. 双反星形三相五柱式整流变压器结构 1. 3-Phase Bridge-Type Rectifier Transformer Structure 2. Double Reverse Star-Type Rectifier Transformer Structure with a Balancing Reactor 3. Double Reverse Star-Type, 3-Phase, 5-Pole, Rectifier Transformer Structure	1. 无励磁调压整流变压器结构 2. 有载调压整流变压器结构。有 单器身变磁通调压结构 调压加主要结构 串变调压结构 1. Non-Excitation Voltage Regulating Rectifier Transformer Structure 2. On-Load Voltage Regulating Rectifier Transformer Structure, Including: Single-Body, Variable-Flux Voltage-Regulating Substructure Voltage Regulating and Voltage Transforming plus Main Structure Series Voltage-Regulating Substructure
按器身安装方式分类 Classified by Body Installation Mode	按冷却方式分类 Classified by Cooling Mode:
1. 器身连箱盖结构 2. 钟罩式结构。这其中又分为 钟罩式 半钟罩式 三节钟罩式 1. Body-Cover Connection Structure Bell Type 2. Bell Structure, including Semi-Bell Type 3 Segment Bell Type	可分为自冷、风冷、强迫油水冷或风冷及强迫油导向冷却 Self Cooling, Air Cooling, Forced Oil-Water Cooling or Air Cooling + Forced Directed Oil Cooling

此外，变压器还分为主调共箱式和主调分箱式以及内附饱和电抗器，平衡电抗器和外附饱和电抗器、平衡电抗器等结构。总而言之，我公司生产的整流变压器种类繁多，可根据用户的各种要求进行设计制造各结构形式的变压器。

In addition, this type of transformers may include but is not limited to following versions: i.e., i) main unit integrated regulator; ii) main unit detached from regulator; iii) furnished with internally-provided saturation reactors, balance reactors; or iv) furnished with externally-provided saturation reactors, balance reactors, etc. To sum up, there are a variety of our produced rectifier transformers available for your selection; actually we could design and manufacture transformers of different configurations (including rectifier transformers) according to diversified user requirements.

内部结构特点 Internal Structure Features

- 铁芯采用优质冷轧硅钢片，在较大型变压器中，为了降低空载损耗，铁芯片采用全斜接缝。铁芯整体结构采用引进的先进技术。
- 网侧线圈多采用连续式结构，调压线圈多采用层式结构，而网侧线圈一般为双饼式结构。由于利用了电子计算机计算电厂和线圈的冲击特性，使得线圈结构具有优良的电气特性和耐冲击强度。
- 对于较大型的变压器，油箱采用了折板式结构，不仅外形美观，而且大大提高了油箱的机械强度。
- 网侧出线既有箱顶出线，又有箱壁出线，方便与整流装置的连线。
- 变压器网侧出线端子采用环氧浇注形成低电压电杆，使得变压器外形美观紧凑。
- 变压器装有各种温度计，瓦斯继电器、释压器、互感器等保护装置，对高压产品采用隔膜式储油柜以保证变压器的安全可靠运行。

- The core is made of quality cold-rolled silicon steel strips. In relatively heavy duty transformers, total inclined joints are available in core laminations to lower the no-load loss. Advanced technologies are introduced for the optimization of an iron core integral structure;
- A continuous structure is adopted in each coil on the electric grid side while a lamination structure is used mostly in integrating regulator and generally speaking, a double-biscuit structure is available in each oil on the valve side. The introduction of an electronic computer into the data calculation relating to impulse characteristics of a power plant or of a coil does enable the coil structure to possess excellent electrical characteristics and a high impulse resistance;
- For a relatively heavy duty transformer, a folded plate structure is introduced in each oil tank, which helps not only to cut a fine profile, but also to increase the oil tank's mechanical strength;
- Outgoing cables on the valve side may run over the tank cover or along a tank sidewall just for the convenience of rectifier cable connection;
- As the outgoing cable terminal on the transformer valve side, an epoxy-cast, low-voltage conducting rod is available, which is fine in appearance and compact in volume;
- Transformers are equipped with all kinds of temperature gauges, gas relays, pressure relief devices, transducers, and other protective devices; in terms of each high-voltage product, a diaphragm-type oil storage cabinet is introduced to ensure safe and reliable operation of such transformer.

技术参数 Product Parameters

型号 Model	额定容量 Rated Capacity (KVA)	进线电压 Incoming Line Voltage KV	连接组 Connection	调压方式及范围 Mode and Range of Voltage Adjustment	整流方式 Mode of Rectification	外形尺寸 Overall Dimension		重量 Weight	
						长 × 宽 × 高 L × W × H	油重 Oil	总重 Total	
ZHZ-4500/10	4500	10	D,dd	无载开关 ± 5% No-Load Switch ± 5%	同相 逆并 Equal Phase, Reverse Parallel	3974 × 2700 × 4000	5.6	15.5	
ZHS-5000/10	5000	10	D,dd	无载开关 ± 5%可控硅 No-Load Switch ± 5% Thyristor	双桥同相逆并 Double-Bridge Equal-Phase Reverse-Parallel	3974 × 2700 × 4000	5.2	15.6	
ZHSZK-6000/35	6000	35	Y,yy	± 13级有载开关 ± 13-Pole, On-Load Switch	双反星带平衡电抗器，同相逆并 Double Reverse Stars with Balancing Reactor Equal Phase Reverse Parallel	6250 × 2500 × 1057	11.5	27.5	
ZHSZ-8000/35	8000	35	Ydd	有载自耦调压 ± 13级 On-Load Voltage-Regulating	双桥同相逆并 Double-Bridge Equal-Phase Reverse-Parallel	5530 × 3725 × 4200	11.6	30.5	
ZHSZ-10000/35	10000	35	D,dd	± 13级有载开关 ± 13-Pole, On-Load Switch	双桥同相逆并 Double-Bridge Equal-Phase Reverse-Parallel	5570 × 4280 × 4670	14.5	44	
ZHSFPTB-20000/35	20600	35	Ydd	± 13级有载开关， 饱和电抗器 ± 13-Pole, On-Load Switch Saturated Electric Reactor	主调合一，双桥，同相逆并 Main Unit Integrating with Regulator. Double-Bridge, Equal-Phase Reverse-Parallel	5610 × 4480 × 4750	20	80	
ZHSZ-5600/35	5600	35	Y,dd	± 9级有载调压80-105% ± 9 On-Load Voltage-Regulating 80-105%		3460 × 3630 × 3360	6.9	19.4	
ZHSFT-16000/6.3	16000	6.3	D,dd	± 13级自耦有载调压 ± 13-Pole, Automatic Coupling On-Load Voltage-Regulating	主调合一，双桥，同相逆并 Main Unit Integrating with Regulator. Double-Bridge, Equal-Phase Reverse-Parallel	6060 × 3600 × 4420	11.5	46	
ZHSFPT-28000/35	28000	35	Y,dd	± 13级自耦有载调压 5-105% ± 13-Pole, Automatic Coupling On-Load Voltage-Regulating 5-105%	主调合一，双桥，同相逆并 双桥同相逆并 Main Unit Integrating with Regulator, 1 Double-Bridge, Equal-Phase Reverse-Parallel Double-Bridge Equal-Phase Reverse-Parallel	4900 × 2700 × 4370	14.5	56	
ZHSZ-12500/35	12500	35	Y,D,dd	± 19级有载调压，Y-A到换 ± 19-Pole, On-Load Voltage-Regulating Y-A Conversion	双桥同相逆并 Double-Bridge Equal-Phase Reverse-Parallel	5500 × 4110 × 4570	12.35	35	
ZHSFPZ-8000/35	8000	35	Y,dd	27 × 3级有载调压 27 × 3-Pole, On-Load Voltage-Regulating		4500 × 4100 × 4300	8.7	38	
ZHSFPZ-63000/35	6300	37	Y,dd	35级有载开关 35-Pole, On-Load Switch	双桥同相逆并 Double-Bridge Equal-Phase Reverse-Parallel	4300 × 900 × 4250	7.8	35	

● 电炉变压器 Furnace Transformer

电炉变压器型号表示法：基本型号：形式容量或额定容量 (KVA) / 高压侧电压级次 (KV)；

基本型号含义：

- H-电炉，HC-电石炉，S-三相，F-风扇冷却装置，FP-强迫油循环风冷；SP-强迫油循环水冷，D-单相，HU-盐浴炉，Z-有载调压。

Furnace Transformer Type Indication: Basic Type: Nominal or Rated Capacity (KVA)/Voltage Level on High-Voltage Side (KV):

Basic Type Connotations:

- H-Electric Oven, HC-Calcium Carbide Furnace, S-3 Phase, F-Fan Cooler, FP-Forced Oil Circulation Air Cooling; SP- Forced Oil Circulation Water Cooling, D-Single Phase, HU-Salt Bath Furnace, Z-On Load Voltage Regulating.

使用环境 Environmental Conditions for Product Use

- 环境温度 -30℃~+40℃；
- 年平均温度20℃及以上（如果是水冷产品，冷却水温为取当日平均+25℃）；
- 海拔高度1000m及以下，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
- 安装场所无严重震动，颠簸和化学腐蚀，户内、外使用。
- Ambient Temperature: -30℃~+40℃
- Year Average Temperature: 20℃ or above (For a water cooled product line, the cooling temperature is +25℃ in average taken in the same day);
- Sea Level Elevation: 1000m; for any user on an elevation of above 1000 meters, please mention it in your order, in fact, this product may satisfy any user on an elevation of below 4000 meters;
- Installation Site shall be free from serious vibration, bumping and chemical corrosion. This product may be used indoors and outdoors.

产品特点 Product Characteristics

我公司生产的电炉变压器技术上吸取国内外同行业先进技术及工艺，铁芯采用高导磁硅钢片，采用五级步进叠装方式以降低空载损耗及噪音。电磁线采用高质量的无氧铜电磁线。采用特殊结构使变压器具有过载能力强，抗短路能力强等诸多优点，使产品技术性能处于国内领先水平。

Each of our manufactured furnace transformers has technologically adsorbed sophisticated know-how and processes from domestic and foreign craft fellows. The cores are made of high-permeability silicon-steel strip and 5-stage step-by-step lamination has been introduced to reduce both no-load loss and noise. In terms of electromagnetic wires, quality oxygen-free copper ones are used. Furthermore, a special structure is availed to enable a transformer to have a high overload capability and a strong short-circuit resistance, etc. All these practices have brought this product line stand at a domestically leading position in product performance.

产品用途 Product Usage

电炉变压器在冶金工业中适用于冶炼优质合金钢、铁合金等，在化学工业中，用于生产黄磷、电石、合成树脂等。在机械工业中用于铸钢铸铁的熔炼等。电炉变压器是根据各种电炉工作原理，负载特性和运行特点而设计的专业变压器。

Furnace transformers are applied in the smelting of quality alloy steel or quality alloy iron in the metallurgical industry; in the production of yellow phosphorus, calcium carbide, synthetic resins, etc. in the chemical industry; and in the smelting of cast steel or cast iron, etc. in the mechanical industry. Furnace transformers pertain to speciality transformers that are designed in line with an electric furnace's operating principles and its load and operational characteristics.

技术参数 Product Parameters

产品型号 Model	额定容量 Rated Capacity (KVA)	额定电压 (KV) Rated Capacity		联接组标号 Conn- ection Label	总重 Weight (kg)	基础中心距 Distance between Foundation Centers (mm)	外形尺寸 Overall Dimension 长×宽×高 (mm) L×W×H
		一次 Primary	二次 Again				
HJSSP-2400/10	2400	10	200-190-180-115-110-104	D-YD0-11	9230	1070×1070	2400×1670×2750
HJSSP-2800/10	2800	10	190-175-160-110-101-92.5	D-YD0-11	10300	1070×1070	2800×1900×3300
HJSSP-3150/10	3150	10	210-150 5级 -Pole	Yd11	10600	1505×1505	2830×1850×3200
HJSSP-4000/10	4000	10	210-155 4级 -Pole	Dd0	13450	1505×1505	3000×2000×3500
HJSSP-5500/10	5500	10	215-189-150 6级 -Pole	Dd0	15600	1505×1505	3150×2000×3500
HJSSP-7000/10	7000	10	216-161 5级 -Pole	Dd0	17500	1505×1505	3600×2200×3600
HJSSPZ-10000/10	10000	10	240-170 9级 -Pole	Dd0	21000	1505×1505	3800×2420×3900
HJSSPZ-12500/10	12500	10	270-225-150 15级 -Pole	Dd0	27500	2000×2000	4520×3200×4700
HKSPZ9-3600/35	3600	35	76-108	Yd11	14900	1505×1505	3700×1800×3400
HKSP-4200/35	4200	35	88-117.4	Dd0	15650	1505×1505	3700×1800×3460
HKSP-5000/35	5000	35	85-124.7	Yd11	16300	1505×1505	3700×1800×3650
HKSP-6300/35	6300	35	100-124	Dd0	20000	1505×1505	3750×2000×3650
HKSP-6300/35	6300	35	95-135	Yd11	20300	1505×1505	3850×2000×3650
HKSP-8000/35	8000	35	130.9	Yd11	23100	1505×1505	3900×2500×3650
HKSP-12500/35	12500	35	118-150	Dd0	32000	1505×1505	4000×2530×3700
HKSP-25000/35	25000	35	118-150	Dd0	45000	1505×1505	4300×2700×3750

产品·企业市场竞争力的体现

Product · Foundation Stone for Enterprise Impingement on Markets

干式电力变压器

Dry-Type Power Transformer

性能特点 Performance Features

干式电力变压器的铁芯采用高导磁优质晶粒取向冷轧硅钢片，45°全斜步进接缝，铁芯采用特殊的方管拉板结构，芯柱采用绝缘带绑扎，铁芯表面采用特殊树脂涂覆以防潮防锈，有效降低了空载损耗、空载电流和铁芯噪音。

干式电力变压器是一种电气强度、机械强度、耐热强度很高的干式变压器。是城市电网改造的优秀产品，特别适用于高层建筑、机场、电站、商业中心等要求防火、防爆、防潮的重要场所。

Each dry-type power transformer adopts cold-rolled, grain-oriented, quality silicon steel strips of high permeability, 45° total step-by-step mitered joints, and a special core structure consisting of square-tubes and drawplates. Core stems are banded with the aid of insulating tape and the core surface is painted with a special resin coat for moist-proof and rust-proof purposes, so the no-load loss, no-load current, and core noise are effectually reduced.

Each of our supplied dry-type power transformer is a quality one with high electrical strength, high mechanical strength, and high heat resistance, which is used in electric grid modification in urban areas, especially applicable to important points where fire-, explosion-, and moisture-proof

优点 Advantages

- 损耗低，节电效果好，带来了运行上的经济实惠。
- 阻燃、防爆、无污染、免维修、可分散安装在负荷中心，降低投资造价，节约费用。
- 局部放电量小于10PC，线圈不吸潮，不吸尘，机械强度高，可靠性好。
- 抗短路，耐雷电冲击性能好。
- 外壳采用不锈钢、冷板和铝合金三种材料，类型分拔风式、散热式，进出线可以上进上出，下进上出，下进下出。
- 变压器可按用户需要带有温度控制和温度显示系统，可与温控系统配合使用。

- Low Loss and Better Power Saving Performance, which bring about economic benefits in operation;
- Combustion Retardant, Explosion-Proof, Contamination-Free, Maintenance-Free; the product line may be installed on the load center in a detached manner, thereby reducing investment costs and saving expenditures;
- Local Discharge: <10PC; Moisture Free and Dust Proof Coils with a High Mechanical Strength and Satisfactory Reliability;
- High Short-Circuit Resistance and High Lightning Impulse Resistance;
- The Outer Cover Material: stainless steel or cold-rolled steel strips or aluminum alloy; Version: ventilating or radiating; Incoming and Outgoing Cables: top in and top out, or bottom in and top out, or bottom in and bottom out;
- As required by our users, the transformer may be furnished with a temperature control and temperature indication system, thus the transformer could be run in coordination with such a temperature control system.

目录 Catalog

树脂浇注干式电力变压器

- SC(B)11系列10KV级
- SC(B)10系列10KV级
- SCZ(B)10系列10KV级
- SC(B)10系列35KV级
- SC10系列35KV级
- SC(B)9系列10KV级
- SCZ(B)9系列10KV级

SCBH15型非晶合金干式变压器

树脂浇注立体卷铁心变压器

真空浸渍干式电力变压器

- SG(B)10系列35KV
- SG(B)11系列10KV
- SG(B)10系列10KV
- SGZ(B)10系列10KV

附件

Resin-Cast Dry-Type Power Transformer

- Specifications of SC(B)11 Series 10KV
- Specifications of SC(B)10 Series 10KV
- Specifications of SCZ(B)10 series 10KV
- Specifications of SC(B)10 Series 35KV
- Specifications of SC(B)10 series 35KV
- Specifications of SC(B)9 series 10KV
- Specifications of SCZ(B)9 Series 10KV

SCBH15 Amorphous Alloy Dry-Type Power Transformer

Casting Resin Tridimensional Toroidal-core Transformer

Vacuum Impregnated Dry-Type Power Transformer

- Specifications of SG(B)10 series 35KV
- Specifications of SG(B)11 Series 10KV
- Specifications of SG(B)10 series 10KV
- Specifications of SGZ (B)10 series 10KV

Accessories

树脂浇注干式电力变压器

Resin-Cast Dry-Type Power Transformer

型号及含义 Type and Connotations

SC Z (B) 10 - □□□□ / □□

- | | | | | | |
|-------------------------|------------------------------|--------------------------|--------------------------|------------------------|-----------------------|
| ① | ② | ③ | ④ | ⑤ | ⑥ |
| ① 三相固体成型 | ② 有载调压 | ③ 低压箔式线圈 | ④ 性能水平代号 | ⑤ 额定容量 (KVA) | ⑥ 电压等级 (KV) |
| ① 3-Phase Solid Shaping | ② On-Load Voltage Regulation | ③ Low-Voltage Foil Coils | ④ Performance Level Code | ⑤ Rated Capacity (KVA) | ⑥ Voltage Rating (KV) |



执行标准 Implementation Standards

- GB1094.11 干式变压器 — GB1094.11, Dry-Type Power Transformer
- GB1094.1 电力变压器 — GB1094.1, Power Transformer
- GB4208-1993 外壳防护等级 (IP 代码) — GB4208-1993, Cover Protection Grade (IP Code)
- IEC726 电力变压器 — IEC726, Power Transformer
- IEC60076-11 干式变压器 — IEC60076-11, Dry-Type Power Transformer
- GB/T10228-2015 干式电力变压器技术参数和要求 — GB/T10228-2015, Technical Parameters and Technical Requirements for Dry-Type Power Transformers
- GB1094.12 干式电力变压器负载导则 — GB1094.12, Loading Guide for Dry-Type Power Transformers
- GB10237-1998 电力变压器绝缘水平和绝缘试验 — GB10237-1998, Insulation Level and Insulation Testing of Power Transformers
- GB1094.10 变压器声级测试 — GB1094.10 Sound Level for Transformers
- JB/T56009-1998 干式电力变压器产品质量分等 — JB/T56009-1998, Product Quality Grading for Dry-Type Power Transformers
- GB/T20052-2013 能效限定值及能效等级 — GB/T20052-2013 Energy Efficiency Rating And Energy Efficiency Rating

使用环境 Environmental Conditions for Product Use

名称 Descriptions	技术参数 Product Parameters	
	用于户内、户外(IP2X-IP4X外壳可选)使用, 推荐选用空气制冷方式; This product may be used indoors and outdoors (IP2X-IP4X optional cover). Here air cooling is recommended.	
工作温度 Working Temperature	-40°C ~ +40°C	若环境温度超出时, 请在定货时提出 In the event when ambient temperature overweight, please mention it in your order.
海拔高度 Sea Level Elevation	1000m	高海拔地区用户, 在定货中提出, 本产品可满足海拔高度4000m以下的用户要求 For any user on an elevation of above 1000 meters, please mention it in your order; in fact, this product may satisfy any user on an elevation of below 4000 meters.

技术参数 Product Parameters

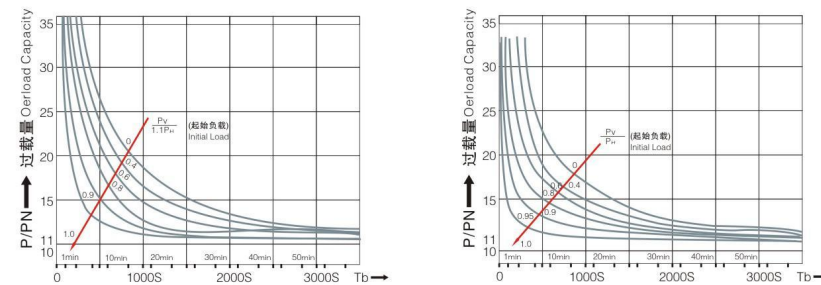
名称 Descriptions	技术参数 Product Parameters	
电压等级 Voltage Level	6-35kV	
容量范围 Capacity Range	30-20000kVA	
调压方式及分接范围 Voltage Regulation Mode and Tapping Range	±2×2.5% (或±5%) 无励磁调压, ±4×2.5% 有载调压 ±2x2.5% (or ±5%) non-exciting voltage regulation, ±4x2.5% on-load voltage regulation	
额定频率 Nominal Frequency	50Hz	
相数 Phase Number	3相 3-phase	
联接组标号 Interconnection Group Mark	Yyn0; Dyn11; Yd11; YNd11 (或按用户要求 or according to user requirements)	
短路阻抗 Short-Circuit Impedance	标准阻抗 (见性能参数表) standard impedance (refer to performance parameter table)	
绝缘耐热等级 Insulation's Thermal Resistance	F级, 最高允许温度155°C, 绕组温升限值100K F grade, maximum allowable temperature 155°C winding temperature rise limit: 100K	
冷却方式 Cooling Mode	空气自冷 self air cooling (AN), 强迫空气冷却 forced air cooling (AF风冷 air cooling)	
绝缘水平 Insulation Level	A. 6kV级产品工频耐电压25kV, 冲击耐压60kV A. 6kV product line, power-frequency withstand voltage 25kV, impulse withstand voltage 60kV; B. 10kV级产品工频耐电压35kV, 冲击耐压75kV B. 10kV product line, power-frequency withstand voltage 35kV, impulse withstand voltage 75kV; C. 20kV级产品工频耐电压50kV, 冲击耐压125kV C. 20kV product line power-frequency withstand voltage 50kV, impulse withstand voltage 125kV; D. 35kV级产品工频耐电压70kV, 冲击耐压170kV D. 35kV product line power-frequency withstand voltage 70kV, impulse withstand voltage 170kV.	

产品特点 Product Characteristics

- 绝缘强度高 High Insulation Strength**
 浇注用环氧树脂具有18-22kV/mm的绝缘击穿场强, 且与电压等级相同的油浸变压器具有大致相同的雷电冲击强度, 绝缘温度等级为F级, 最高允许温度155°C, 绕组温升限值为100K。
 Epoxy resin for casting purpose has following material features: an electric field intensity of 18-22kV/mm upon insulation puncture; a lightning impulse resistance roughly similar to that of an oil-immersed transformer at the same voltage level; insulation temperature level: F; maximum allowable temperature: 155°C; a limit in winding temperature rise: 100K;
- 抗短路能力强 Strong Anti-Short-Circuit Capability**
 由于树脂的材料特性, 加之绕组是整体浇注, 经加热固化成型后成为刚体, 所以机械强度很高, 经突发短路实验证明, 树脂浇注干式变压器因短路而损坏的极少。
 Owing to resin material features above listed, with the aid of integral cast windings that may become a rigid body after heating and curing, a rather high mechanical strength is obtained. Several sudden short-circuit testing prove that there is rare resin-cast, dry-type power transformer damaged due to a short circuit incident.
- 防灾性能突出 Outstanding Disaster-Proof Performance**
 环氧树脂难燃、阻燃并能自行熄灭, 不致引发爆炸等二次灾害。
 Epoxy resin is difficult to combust or combustion retardant and is able to quench by itself without inducing any secondary disaster like explosion.
- 环境性能优越 Advantageous Environmental Related Performance**
 环氧树脂是化学上极其稳定的一种材料, 防潮、防尘, 即使在大气污秽等恶劣环境下也能可靠运行, 甚至可在100%湿度下正常运行, 停运后无需干燥预热即可再次投运。
 Epoxy resin is a rather chemically stable material, moisture-proof and dust-free, which may run reliable in abominable environments such as in a nasty atmosphere and even run normally under 100% humidity before being once more put into operation without any drying or preheating post operation stoppage.
- 免维护 Maintenance Free**
 由于有了完善的温控、温显系统, 目前环氧浇注干变已可作到免维护, 从而可以大大减轻运行人员负担, 并降低运行费用。
 With a perfect temperature controlling & indicating system available for use, currently epoxy resin-cast dry-type transformer may attain maintenance-free benefits and thereby largely reduce operators' burden and operational expenditures.
- 运行损耗低、运行效率高 Low in Operational Loss and High in Operational Efficiency;**
- 噪音低 Low in Noise;**
- 体积小、重量轻、安装调试方便。 Small in Volume, Light in Weight, and Convenient for Installation and Adjustment;**
- 不需要单独的变压器室, 不需吊芯检查, 节约占地面积。 Without needing any separate transformer room or any suspended core inspection, thereby saving holding lands;**
- 过载能力强 Strong Overload Capacity**
 SC (B) 9、10、11系列产品, 当环境温度20°C时, 可长期过载1.16倍, 60分钟以内过载1.5倍; 若投入风机, 使变压器在强迫风冷 (AF) 状态下运行, 可短时1.5倍过载运行。
 For SC(B) 9, 10, 11series product line, under an environmental temperature of 20°C, a 1.16 time long-term overload is allowed (within 60 minutes, a 1.5 time overload is acceptable); when a fan is used to give a forced air cooling (AF) to the transformer, a 1.5 time overload is permitted within a short term.

注意 [变压器高低压进出口总开关及母线(排)的过载能力必须相匹配]
 Note: the master switch for the high/low voltage inlet/outlet of a transformer must be matched with the overloading capacity of the busbar (block).

过负荷曲线 Overload Curve



结构特点及制造工艺 Structural Features & Manufacturing Process

(一) 铁芯结构特点及性能 Features & Performances of Core Structure

铁芯采用全斜接缝同步步进式搭接来保证最佳性能和最低的噪声水平。铁芯按一定的顺序自动剪切，自动叠装，保证单片叠装的精度要求。为达到低噪声的目标，我们选用了磁滞伸缩量较小的 30ZH120 晶粒取向高导磁硅钢片。铁芯所用的硅钢片全部在全自动剪切设备上剪切，确保其剪切精度。同时，SC(B)型产品的铁芯结构采用单片、七步进、纵向阶梯叠片方式。在铁芯紧固装置上，SC(B)型产品改变了传统的夹片、拉杆、穿心螺杆的紧固方式，而采用获国家专利技术的新型钢拉板、钢拉带的紧固结构，采用钢拉板紧固结构，既可以有效地压紧绕组，又可对铁芯柱起束缚作用，避免其弯曲及伸缩，通过蝶形弹簧来保证产品在运行中具有恒定的压紧力。

As far as iron cores are concerned, total inclined joints and step-by-step lapping are adopted for guaranteeing the acquirement of optimum performances and a minimum noise level. Cores are automatically sheared and laminated in a given order for ensuring the attainment of precision requirements in single piece lamination. To attain a targeted low noise, we choose 30ZH120 grain-oriented silicon steel strips of a high magnetic permeability and a small hysteresis-induced expansion or shrinkage. All silicon steel strips used in cores are cut on a full automatic shearing machine for guaranteeing the attainment of an appropriate shearing precision. In addition, for SC(B) series product line, an iron core configuration of longitudinal step cascade lamination of single pieces is available. A new type of core tightening structure that consists of steel drawplates or steel draw belts has found use in SC(B) series product line (such tightening structure has been identified as a utility model by the national patent bureau), which has changed the traditional fastening mode that consists of clamps, drawbars, and through-core screw rods. The steel drawplate fastening structure introduced could not only effectively compress windings, but also validly tighten core stems. Thus bending and expansion/contraction phenomena are avoided. Furthermore, disc springs are used to guarantee a constant compression force during product operation.

(二) 绕组结构的特点 Winding Structure Features

高压绕组采用特种分段圆筒式绕制，绕组在真空下用环氧树脂浇注。通过对整个线圈内部电场强度的暂态分布进行分析，从而确认设计具有最高的耐压强度。SC(B)型产品高压绕组均采用优质无氧铜导线绕制、玻璃纤维增强、薄绝缘、树脂加填料、预埋树脂散热气道、真空状态下浸渍浇注、按特定的温度曲线固化成型。高压绕组采用散热气道轴向多层设置的特种分段圆筒式结构。

低压绕组箱式结构，同上

Firstly, high-voltage windings are fabricated by winding on a special segmental barrel and then epoxy resin casting operation is done under vacuum condition with regard to already-wound windings. An analysis of the transient distribution of electric field intensity within a whole coil has revealed that such design does fruit the maximum compression strength. High-voltage windings finding use in SC(B) series product line are fabricated by winding quality oxygen-free copper leads and intensified by glass fibers before a thin insulation layer is applied. Thereafter, with the aid of resin mixed with packing materials, an air channel made of embedded resin is prepared for the heat radiating purpose; casting is made under vacuum by an impregnating process; and finally the resin-cast product is cured according to a given temperature curve. Each of high-voltage windings is a special multi-layer segmental barrel arranged along the axial direction of the above-said air channel.

The foil structure of low-voltage windings: the same as above.

(三) 绕组性能 Winding Performances

耐冲击能力 Impulse Withstand Capacity

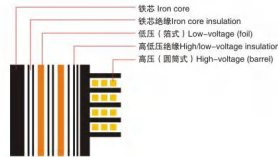
SC(B)型产品高压绕组采用特种分段圆筒式结构，通过改善层间电压的分布，提高了该产品耐受大气过电压和操作过电压的冲击强度。在层间工作电压相同情况下，特种分段圆筒式的绕组结构比普通分段圆筒式的绕组结构优越。

Each of high-voltage windings finding use in SC(B) series product line pertains to a special segmental barrel structure. Here, the improvement of interlayer voltage distribution does help to strengthen this product line's resistance to atmospheric over-voltage and to operational over-voltage. Under a same interlayer operating voltage, a winding structure consisting of a special segmental barrel is advantageous, in comparison with a winding structure consisting of a common segmental barrel.

电场分布 Electrical Field Distribution

线绕浇注式绕组的导体采用以优质无氧铜杆经多次冷拉成矩形的线材，其面与面的交接处都做成较大的圆弧状，不存在尖角毛刺，绕组内导线沿面处电场分布较为均匀，畸变系数小，因此，线绕浇注式产品的局放量小($\leq 5\text{pc}$)。这除与其真空浇注因素有关外，也与其线材的这一点有关。

As the conductor of a wire-wound cast-type winding, a rectangular wire stock is used after multiple cold drawing of a quality oxygen-free copper rod. A large radius arc is formed on the interface and without burrs and sharp corners, a rather evenly distributed electric field does exist along the lead edge within a winding, consequently the distortion factor is small in value. As a result, the wire-wound cast-type product line has a small local discharge ($\leq 5\text{pc}$), which is related to vacuum casting as well as to above-given wire stock.



散热效果 Cooling Effects

由于优质树脂与玻璃纤维构成的复合绝缘具有极高的电气强度和机械强度，SC(B)系列产品表面绝缘仅有3-4mm厚，从而有效地提高了绕组表面的散热效率。散热气道轴向多层设置方案的实施，从结构上保证了绕组内导线有一个散热面的要求。这样对整个绕组来讲，基本上达到了产热与散热的均匀平衡。

A composite insulating layer consisting of pure quality resin and glass fiber has an extremely high electrical strength and an extremely high mechanical strength. The SC(B) series product line has a 3-4mm thick insulation layer on the surface, so it may effectively increase the heat radiating efficiency on the winding surface. The multiple layer arrangement along the axial direction of an air channel for the heat radiating purpose has structurally guaranteed a large enough radiating area as required with respect to leads within each winding. Thus, the whole windings may basically attain an even balance between heat generated and heat radiated.

抗短路能力 Anti-Short Circuit Capability

SC(B)型产品采用的是线绕特种分段圆筒式或圆筒式绕组，经真空浇注后，无论绕组的层间、匝间、段间均一次性浸透树脂。经固化后，树脂、导线、玻璃纤维紧密地结合，构成坚固的整体。

The SC(B) series product line adopts wire-wound, special segmental barrel type windings, or common barrel type windings. After vacuum casting, fully impregnated resin could be filled between layers, between turns, and between segments just by one time pouring. After curing, the resin, leads, and glass fibers are closely combined to form a sound structure.



(四) 绕组加工工艺特点 Winding Processing Features

低压绕组是用铜箔和树脂预浸渍的绝缘层制成。在绕组加工以后线圈放入烘炉固化使之成为有极强抗短路能力的绕组。树脂浇注干式变压器合理的设计以及所使用的高质量的材料和最现代化的浇注技术使得我们的产品具有较低的局部放电量。

在生产工艺中，浇注是一项关键工序，为了保证最佳的绝缘和机械性能，应当有严格的过程控制。一方面，绕组放在预热炉中直到达到规定的浇注温度。另一方面，在连续工作的装置内准备树脂混合。只有在浇注之前，树脂的各种成份才被混合在一起。在这之后，预热的绕组被移送到真空浇注室。一旦浇注室内的真空度达到规定值，树脂就被浇注到模具中。这样，在树脂被浇注到模型中去时，混合的树脂粘度非常低，可以填充空隙，从而达到最低的局部放电水平。在浇注完成以后，绕组经过固化达到最后的良好性能。

Windings on the low-voltage side are fabricated with copper foils and a resin-preimpregnated insulating layer. After winding fabrication, coils are put into a drying oven for the curing purpose, so as to obtain windings of an extremely-strong short-circuit resistance. After being efficiently designed, resin-cast dry-type transformers are fabricated by using quality materials and the most sophisticated casting know-how and all these have enabled this product line of ours to have a rather low local discharge.

Casting is a key processing step in a manufacturing process, so it is requisite to exercise strict process control with respect to casting operations in order to guarantee the attainment of optimum insulation and optimum mechanical performances. On one aspect, windings are put into a preheating oven and remain staying there till a given casting temperature is reached; and on the other aspect, preparations for resin mixing are made within a continuously running device. Actually, resin components mixing shall be done just before casting. After that, already-preheated windings are transferred into a vacuum casting chamber. Once the vacuum within the vacuum casting chamber has reached a given value, the resin prepared is poured into the mould. This way, when resin prepared is poured into the mould, the mixed resin has a rather low viscosity that makes gap filling feasible. Therefore, the minimum local discharge is attained. After casting, windings are cured to gain fine performances at last.

SC(B)11系列 10KV级30~2500KVA树脂绝缘干式电力变压器产品技术数据

Technical Data for SC(B)11 Series 10KV 30-2500KVA Resin-insulated Dry-type Power Transformer

表 Table.1:

型号 Model	Po W	Pk 120°C W	UK %	Io dB A	Lp Kg	GT Kg	外形图 Outside drawing (Three-phase)	外形尺寸 (mm) Outline Dimension L x W x H	底座尺寸 (mm) size of basement L1/L2 x l-n x Φ18	高压出线 High voltage outlet M1/M2-M10	低压出线 Low voltage outlet K1 x K2/K3-Φ3(图)
SC11-30/10	180	710		1.8	43	370	图Pic.2	950 × 1000 × 835	400/410 × 80-4 × Φ18	250/260-M10	85 × 255/220-Φ=3[图a]
SC11-50/10	250	1000		1.8	43	520	图Pic.2	950 × 1000 × 890	550/410 × 120-4 × Φ18	250/260-M10	90 × 270/220-Φ=3[图a]
SC11-80/10	340	1380		1.6	44	660	图Pic.2	1040 × 1100 × 930	550/410 × 120-4 × Φ18	250/302-M10	90 × 270/235-Φ=3[图a]
SC11-100/10	360	1570		1.6	44	720	图Pic.2	1090 × 1100 × 985	550/410 × 120-4 × Φ18	250/305-M10	95 × 285/238-Φ=4[图a]
SC11-125/10	420	1850		1.2	45	810	图Pic.2	1180 × 1100 × 1010	550/410 × 120-4 × Φ18	250/309-M10	95 × 285/240-Φ=4[图a]
SC11-160/10	490	2130		1.2	45	1010	图Pic.2	1130 × 1100 × 1030	660/430 × 140-4 × Φ18	260/312-M10	95 × 290/256-Φ=4[图b]
SCB11-200/10	560	2530		1.2	46	1065	图Pic.3	1280 × 1100 × 1078	660/430 × 140-4 × Φ18	260/315-M10	204.5 × 409/195-Φ=6[图c]
SCB11-250/10	650	2760		1.2	46	1220	图Pic.3	1310 × 1100 × 1103	660/430 × 140-4 × Φ18	260/320-M10	209.5 × 419/200-Φ=6[图c]
SCB11-315/10	790	3470	4	1.0	46	1345	图Pic.3	1340 × 1100 × 1138	660/430 × 140-4 × Φ18	280/325-M10	216.5 × 433/211-Φ=6[图c]
SCB11-400/10	880	3990		1.0	47	1545	图Pic.3	1390 × 1100 × 1203	660/430 × 140-4 × Φ18	350/328-M10	222.5 × 445/214-Φ=6[图d]
SCB11-500/10	1050	4880		1.0	47	1760	图Pic.3	1430 × 1200 × 1268	660/460 × 140-4 × Φ18	350/339-M10	229.5 × 459/227-Φ=8[图d]
SCB 11-630/10	1210	5680		0.8	48	2125	图Pic.3	1500 × 1200 × 1385	660/460 × 190-8 × Φ18	350/345-M10	241 × 482/235-Φ=10[图d]
SCB11-630/10	1170	5960		0.8	48	2045	图Pic.3	1630 × 1200 × 1225	660/460 × 190-8 × Φ18	350/341-M10	262.5 × 525/231-Φ=10[图e]
SCB11-800/10	1370	6960		0.8	48	2400	图Pic.3	1660 × 1300 × 1450	820/510 × 190-8 × Φ18	350/349-M10	267.5 × 535/239-Φ=10[图e]
SCB11-1000/10	1600	8130	6	0.6	50	2835	图Pic.3	1760 × 1300 × 1485	820/510 × 190-8 × Φ18	400/360-M10	283.5 × 567/258-Φ=12[图e]
SCB11-1250/10	1880	9690		0.6	51	3355	图Pic.3	1797 × 1400 × 1630	820/560 × 190-8 × Φ18	400/362-M10	293 × 586/259-Φ=12[图e]
SCB11-1600/10	2210	11730		0.6	51	4090	图Pic.3	1940 × 1400 × 1705	820/560 × 190-8 × Φ18	400/387-M10	314.5 × 629/291-Φ=14[图f]
SCB11-2000/10	2720	14450		0.4	52	4845	图Pic.3	2017 × 1450 × 1870	820/560 × 220-8 × Φ18	400/389-M10	329.5 × 659/293-Φ=14[图g]
SCB11-2500/10	3200	17170		0.4	52	5810	图Pic.3	2127 × 1450 × 2020	820/560 × 220-8 × Φ18	400/400-M10	347 × 694/298-Φ=18[图g]

注:外形尺寸仅供参考

Note: The outline dimensions are only for reference

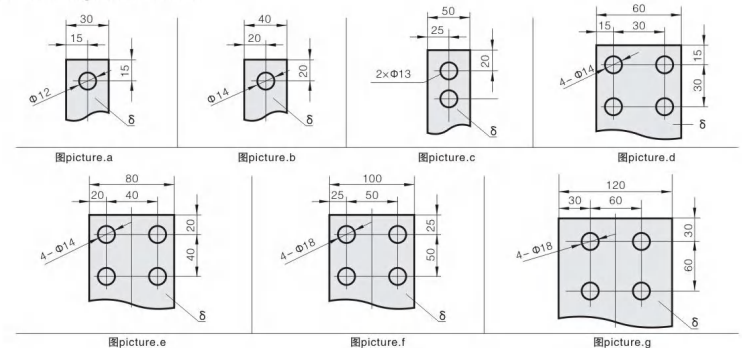
额定高压电压 (Rated voltage of H.V. side): 10 (11、10.5、6.6、6.3、6、3.15) KV;

额定低压电压 (Rated voltage of L.V. side): 0.4KV;

联结组别 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase)

图1 低压出线端子

Picture.1 Low Voltage Outlet Terminal



SC(B)10系列 10KV级30~2500KVA树脂绝缘干式电力变压器产品技术数据

Technical Data for SC(B)10 Series 10KV 30~2500kVA Resin-insulated Dry-type Power Transformer

表 Table.1:

型号 Model	Po W	Pk W	UK %	Io %	Lp dB A	GT Kg	外形图 Outside drawing (Three-phase)	外形尺寸 (mm) Outline dimensions L×W×H	底座尺寸 (mm) size of basement L1/L2×F×H×Φ18	高压出线 High voltage outlet M1/M2-Mj	低压出线 Low voltage outlet K1×K2/K3-5[图]
SC10-30/10	190	710	1.8	43	370	图Pic.2	950×1000×835	400/410×80-4×Φ18	250/260-M10	85×255/220-δ=3[图a]	
SC10-50/10	270	1000	1.8	43	520	图Pic.2	950×1000×890	550/410×120-4×Φ18	250/260-M10	90×270/220-δ=3[图a]	
SC10-80/10	370	1380	1.6	44	660	图Pic.2	1040×1100×930	550/410×120-4×Φ18	250/302-M10	90×270/235-δ=3[图a]	
SC10-100/10	400	1570	1.6	44	720	图Pic.2	1090×1100×985	550/410×120-4×Φ18	250/305-M10	95×285/238-δ=4[图a]	
SC10-125/10	470	1850	1.2	45	810	图Pic.2	1180×1100×1010	550/410×120-4×Φ18	250/309-M10	95×285/240-δ=4[图a]	
SC10-160/10	545	2130	1.2	45	1010	图Pic.2	1130×1100×1030	660/430×140-4×Φ18	260/312-M10	95×290/256-δ=4[图b]	
SCB10-200/10	620	2530	1.2	46	1065	图Pic.3	1280×1100×1078	660/430×140-4×Φ18	260/315-M10	204.5×409/195-δ=6[图c]	
SCB10-250/10	720	2760	1.2	46	1220	图Pic.3	1310×1100×1103	660/430×140-4×Φ18	260/320-M10	209.5×419/200-δ=6[图c]	
SCB10-315/10	880	3470	1.0	46	1345	图Pic.3	1340×1100×1138	660/430×140-4×Φ18	280/325-M10	216.5×433/211-δ=6[图c]	
SCB10-400/10	975	3990	1.0	47	1545	图Pic.3	1390×1100×1203	660/430×140-4×Φ18	350/328-M10	222.5×445/214-δ=6[图d]	
SCB10-500/10	1160	4880	1.0	47	1760	图Pic.3	1430×1200×1268	660/460×140-4×Φ18	350/339-M10	229.5×459/227-δ=8[图d]	
SCB 10-630/10	1340	5880	0.8	48	2125	图Pic.3	1500×1200×1385	660/460×190-8×Φ18	350/345-M10	241×482/235-δ=10[图d]	
SCB10-630/10	1300	5960	0.8	48	2045	图Pic.3	1630×1200×1225	660/460×190-8×Φ18	350/341-M10	262.5×525/231-δ=10[图d]	
SCB10-800/10	1520	6960	0.8	49	2400	图Pic.3	1660×1300×1450	820/510×190-8×Φ18	350/349-M10	267.5×535/239-δ=10[图e]	
SCB10-1000/10	1770	8130	0.6	50	2835	图Pic.3	1760×1300×1485	820/510×190-8×Φ18	400/360-M10	283.5×567/258-δ=12[图e]	
SCB10-1250/10	2090	9690	0.6	51	3355	图Pic.3	1797×1400×1630	820/560×190-8×Φ18	400/362-M10	293×586/259-δ=12[图f]	
SCB10-1600/10	2450	11730	0.6	51	4090	图Pic.3	1940×1400×1705	820/560×190-8×Φ18	400/387-M10	314.5×629/291-δ=14[图f]	
SCB10-2000/10	3050	14450	0.4	52	4845	图Pic.3	2017×1450×1870	820/560×220-8×Φ18	400/389-M10	329.5×659/293-δ=14[图g]	
SCB10-2500/10	3600	17170	0.4	52	5810	图Pic.3	2127×1450×2020	820/560×220-8×Φ18	400/400-M10	347×694/298-δ=18[图g]	

注:外形尺寸仅供参考
Note: The outline dimensions are only for reference

额定高压电压 (Rated voltage of H.V. side): 10 (11, 10.5, 6.6, 6.3, 6, 3.15) KV;
额定低压电压 (Rated voltage of L.V. side): 0.4KV;
联结组别 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase)

图1 低压出线端子

Picture.1 Low Voltage Outlet Terminal

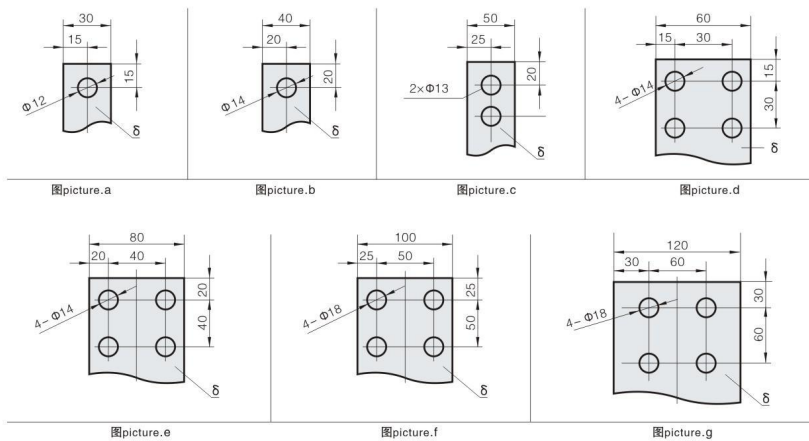


图2 外形尺寸

Picture.2 Outline Dimension

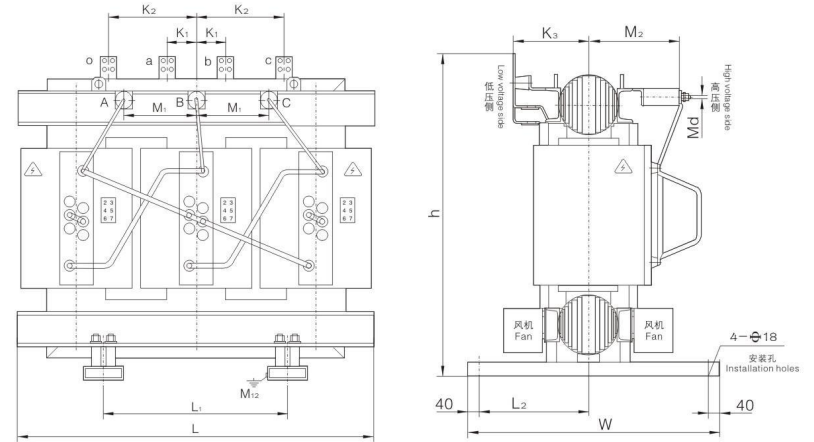
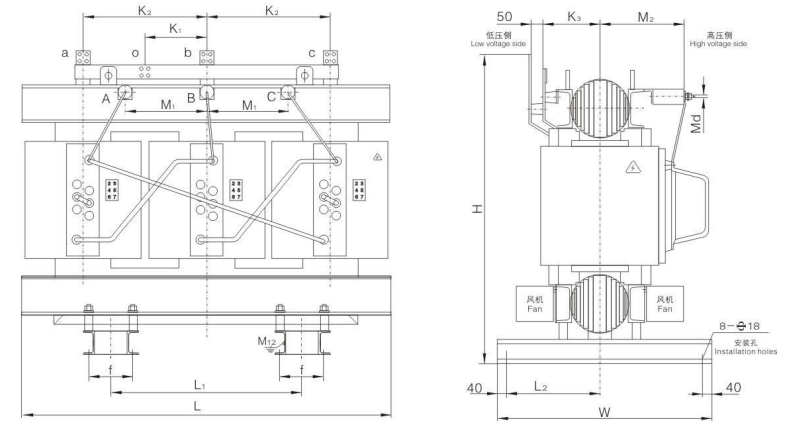


图3 外形尺寸

Picture.3 Outline Dimension



注: 强迫风冷系统(风机)尺寸不超过本体尺寸(L×W)范围
Note: The size of forced air cooling system(fan) should not exceed the size of main body(L×W)

SC(B)10系列 10KV级30~2500KVA树脂绝缘干式电力变压器-配防护外壳及出线方式

Technical Data for Protective Casing and Outlet Mode of SC(B)10 Series 10KV 30~2500KVA Resin-insulated Dry-type Power Transformer

表 Table.2:

型号 Model	UK %	GT (Kg)	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions L×W×H		底座尺寸 (mm) Size of basement L1/L2×F1-n×Φ18	附注 Note
				(常规产品) Normal product L×W×Hh	(配套开关柜产品) Assorted product with cabinet L×W×Hh		
SC10-30/10	450	图Pic.5	1200×1000×1100/835	1200×1000×H(2200)/835	400/410×80-4×Φ18	1) 高、低出线端子尺寸参见表(一)及图(一、二、三); 2) 外形尺寸仅供设计选型参考; 3) 与低压开关柜配套干变产品标准(侧出线)外壳高度尺寸H=2200mm,同时可根据用户订货时需要的尺寸订购; 4) 外壳除采用铝合金材料外,可根据用户需要设计,制造其它材料和要求的防护等级; Note: (1)The dimensions of high voltage and low voltage outlet terminals are detailed in Tab.1, fig.1, Fig.2 and Fig.3. (2)The outline dimensions are only for reference. (3)The dry-type transformer, which matches the low voltage switch cabinet, has a standard casing height H=2200mm; in addition, we can produce transformers with dimensions which are required by customers. (4)Usually, we adopt aluminum alloy for the casing; we can also adopt other materials required by customers and we can produce the transformer casing with protection level required by customers.	
SC10-50/10	610	图Pic.5	1300×1000×1200/890	1300×1000×H(2200)/890	550/410×120-4×Φ18		
SC10-80/10	760	图Pic.5	1400×1100×1300/930	1400×1100×H(2200)/930	550/410×120-4×Φ18		
SC10-100/10	880	图Pic.5	1400×1100×1300/985	1400×1100×H(2200)/985	550/410×120-4×Φ18		
SC10-125/10	970	图Pic.5	1400×1100×1300/1010	1400×1100×H(2200)/1010	550/410×120-4×Φ18		
SC10-160/10	1080	图Pic.5	1600×1100×1400/1030	1600×1100×H(2200)/1030	660/430×140-4×Φ18		
SCB10-200/10	1220	图Pic.5	1600×1100×1400/1078	1600×1100×H(2200)/1078	660/430×140-4×Φ18		
SCB10-250/10	1375	图Pic.5	1600×1100×1400/1103	1600×1100×H(2200)/1103	660/430×140-4×Φ18		
SCB10-315/10	1500	图Pic.5	1600×1100×1400/1138	1600×1100×H(2200)/1138	660/430×140-4×Φ18		
SCB10-400/10	1700	图Pic.5	1600×1100×1400/1203	1600×1100×H(2200)/1203	660/430×140-4×Φ18		
SCB10-500/10	1920	图Pic.5	1700×1200×1500/1268	1700×1200×H(2200)/1268	660/460×140-4×Φ18		
SCB10-630/10	2305	图Pic.6	1800×1200×1600/1385	1800×1200×H(2200)/1385	660/460×190-8×Φ18		
SCB10-630/10	2225	图Pic.6	1900×1200×1600/1225	1900×1200×H(2200)/1225	660/460×190-8×Φ18		
SCB10-800/10	2600	图Pic.6	2000×1300×1750/1450	2000×1300×H(2200)/1450	820/510×190-8×Φ18		
SCB10-1000/10	3035	图Pic.6	2000×1300×1750/1485	2000×1300×H(2200)/1485	820/510×190-8×Φ18		
SCB10-1250/10	3550	图Pic.6	2100×1400×1900/1630	2100×1400×H(2200)/1630	820/560×190-8×Φ18		
SCB10-1600/10	4320	图Pic.6	2200×1400×1900/1705	2200×1400×H(2200)/1705	820/560×190-8×Φ18		
SCB10-2000-10	5065	图Pic.6	2300×1450×2200/1870	2300×1450×H(2200)/1870	820/560×220-8×Φ18		
SCB10-2500/10	6075	图Pic.6	2400×1450×2200/2020	2400×1450×H(2200)/2020	820/560×220-8×Φ18		

注:外形尺寸仅供设计选型参考

Note: The outline dimensions are only for reference

额定高压电压 (Rated voltage of H.V. side): 10 (11、10.5、6.6、6.3、6、3.15) KV;

额定低压电压 (Rated voltage of L.V. side): 0.4KV;

联结组别 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase)

外壳 Casing

采用框架组装式铝合金外壳, 对于干变进一步的安全防护, 满足干变产品与低压配电屏置于同一配电室, 并根据用户需要配置高、低母线(排)出线接口, 铝合金外壳合理紧凑、外形美观、钢性好。

The casing is a framework modular casing; further safety protection should be conducted for the transformer; the transformer and the low voltage distribution panel should be installed in the same distribution room. High/low voltage bus outlet interfaces are installed according to the customer's requirements. The casing is compact, pretty in appearance and fine in rigidity.

外壳防护等级 Protection Level of Casing

常用外壳防护等级为IP20及IP23标准防护, IP20它可防止直径大于12mm的固体异物进入, 确保用电安全; 若需进一步防止与垂直线成60°角以内的水滴入, 则可选用户外使用的IP23外壳[注: IP23外壳会使变压器散热能力下降, 导致容量较小的变压器降容量约5%使用, 容量较大的降容量约10%使用]。

The common protection level is Ip20or Ip23 standard protection; IP20 can prevent a particle with a diameter larger than 12mm from entering into the casing, thus guarantee the safety; IP23 can prevent water drops, which is within an angle of 60 from entering into the casing.[Note:IP23 casing will cause the decrease of heat radiating ability of transformer. So the capacity will be reduced 5%for a low capacity transformer and 10%for a large capacity transformer.]

出线方式 Outlet Mode

- 1、外壳内配备高压及低压电缆进(出)线支撑架, 参见图(四);
- 2、低压(铜母排)上部(侧、顶)出线, 外壳在上(侧、顶)部预留母排出线接口, 参见图(五)、(六), 变压器与(开关柜)之间的母排由用户根据实际情况自行连接;
- 3、容量≥200KVA变压器低压铜母排(左或右)侧出线可根据需要配制到如图(七)所示位置; 其中SCB10-2000-2500/10, m=120, 其余m=100。
- 4、根据用户订货具体情况需要, 外壳配开相应出线口。

- 1) Bracket for inlet (outlet)wires is equipped in the casing, see Fig.4;
- 2) Outlet wires are at the low voltage(copper bus-bar)upper(side, top)part;pre-holes is processed for the outlet wires on the upper (side, top)part of casing; see Fig.5, Fig.6; the customer connects the bus-bar between transformer and switch cabinet according to the actual conditions;
- 3) If the transformer possesses a capacity ≥200KVA, the lateral outlet(right or left)of low voltage copper bus-bar can be placed as showed in Fig.7; for SCB10-2000-2500/10,m=120, for other types, m=100;
- 4) Outlet holes are punched on the casing as required by customers.

图4 进出线方式示意

Picture.4 Sketch Drawing of Inlet and Outlet Mode

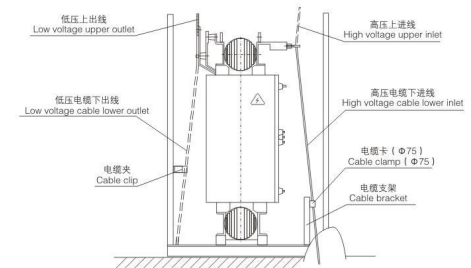


图5 外壳外形尺寸

Picture.5 Outline Dimensions of Casing

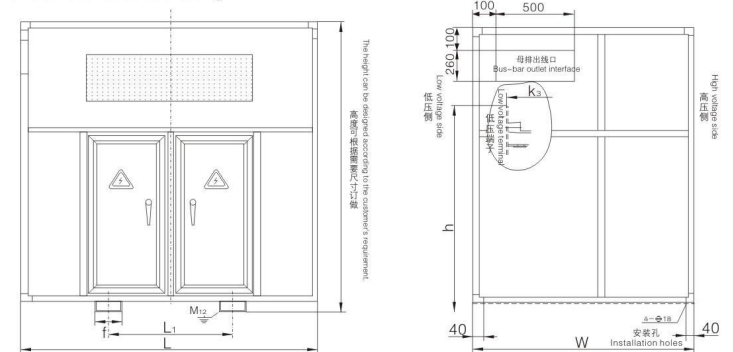
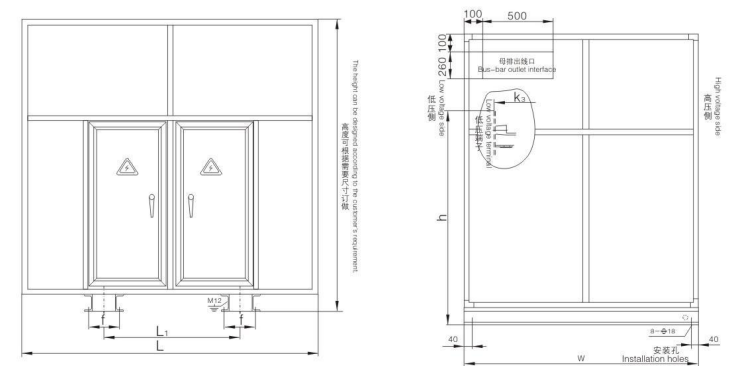


图6 外壳外形尺寸

Picture.6 Outline Dimensions of Casing



SCZ(B)10系列 10KV级200~2500KVA有载调压树脂绝缘干式电力变压器产品技术数据

Technical Data for SCZ (B) 10 series 10KV 200~2500KVA Resin-insulated Dry-type on-load Regulating Power Transformer

表 Table.3:

型号 Model	Po W	Pk 120°C W	UK %	Io %	Lp dB A	GT Kg	外形图 Outside drawing (Three-phase)	外形尺寸 (mm) Outline dimensions L×W×H	底座尺寸 (mm) size of basement L1,L2×l×n×Φ18	高压出线 High voltage outlet M1,M2-M3	低压出线 Low voltage outlet K1×K2(K3-B-图)
SCZ10-200/10	630	2550	1.2	44	1350	图Pic.8	1600×1400×1400/1085	660/450×140-4×Φ18	260/318-M10	100×300/263-δ=4[图b]	
SCZ10-250/10	740	2780	1.2	44	1480	图Pic.8	1600×1400×1400/1100	660/450×140-4×Φ18	260/322-M10	100×300/268-δ=5[图b]	
SCZ10-315/10	990	3610	1.0	45	1660	图Pic.8	1700×1400×1500/1160	660/480×140-4×Φ18	260/326-M10	105×315/272-δ=6[图c]	
SCZ10-400/10	1130	4280	1.0	45	2040	图Pic.8	1700×1400×1500/1245	660/480×140-4×Φ18	280/336-M10	110×330/282-δ=6[图d]	
SCZB10-500/10	1300	5230	1.0	45	2230	图Pic.8	1700×1400×1500/1210	660/480×140-4×Φ18	350/338-M10	225×450/224-δ=6[图d]	
SCZB10-630/10	1500	6180	0.8	46	2610	图Pic.9	1900×1500×1600/1350	660/510×190-8×Φ18	350/341-M10	230×460/229-δ=8[图d]	
SCZB10-630/10	1440	6370	0.8	46	2520	图Pic.9	1900×1500×1600/1240	820/510×190-8×Φ18	350/341-M10	252.5×505/229-δ=8[图d]	
SCZB10-800/10	1710	7510	0.8	47	2950	图Pic.9	2000×1500×1700/1320	820/510×190-8×Φ18	350/345-M10	260×520/233-δ=8[图e]	
SCZB10-1000/10	1980	8790	0.6	49	3520	图Pic.9	2000×1500×1700/1450	820/510×190-8×Φ18	350/356-M10	275×550/246-δ=10[图e]	
SCZB10-1250/10	2340	10450	0.6	49	4000	图Pic.9	2150×1600×1900/1600	820/560×190-8×Φ18	350/359-M10	282.5×565/249-δ=10[图f]	
SCZB10-1600/10	2730	12450	0.6	49	4690	图Pic.9	2200×1600×1900/1735	820/560×190-8×Φ18	400/371-M10	300×600/263-δ=12[图f]	
SCZB10-2000/10	3420	15200	0.4	50	5570	图Pic.9	2300×1600×2200/1900	820/560×220-8×Φ18	400/382-M16	310×620/274-δ=12[图g]	
SCZB10-2500/10	3960	18150	0.4	52	6630	图Pic.9	2400×1600×2200/2030	820/560×220-8×Φ18	400/389-M16	325×650/284-δ=15[图h]	

注 Note:

1.外形尺寸仅供设计选型参考;

The outline dimensions are only for reference;

2.高、低压出线端子尺寸,与同容量无载调压干变的相同,具体尺寸参见图(一);

The dimensions of high/low voltage outlet terminals are as same as that of no-load regulating transformer with the same capacity, see Drawing.1 for more detail.

额定高压电压 (Rated voltage of H.V. Side): 10 (11、10.5、6.6、6.3、6、3.15) KV;

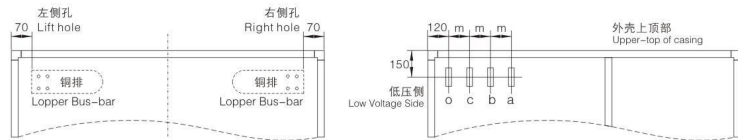
额定低压电压 (Rated voltage of L.V. Side): 0.4KV;

联结组标号 (Vector group): Dyn11,Yyn0, 50Hz, 3相(Three-phase),

分接范围 (tapping range): ±4×2.5% (9档) (9 steps)

图7 低压铜排侧出线示意图

Picture.7 Sketch Drawing of Low Voltage Copper Bus-bar Outlet



为提高供电质量,干式变压器在配备有载分接开关后可进行带负荷电压调整,有载分接开关配有自动控制器,便于现场或远程控制,并可根据用户需要提供相应的计算机接口。

- 有载调压树脂绝缘干式变压器多选用真空型有载分接开关,该型开关可独立安装在变压器的左、右侧面或高压正面;
- 也可根据用户需要选用(空气式)复合型有载分接开关,该型开关同变压器本体安装在一起,结构紧凑、占地面积小、安装方便;
- 可根据需要配置其它类型有载分接开关;
- 有载调压干式变压器如需并联运行时,必须配置同步控制器,且并联运行的台数不可超过4台。

To improve the quality of electricity supply, we can conduct on-load voltage regulation if the dry-type transformer equips an on-load tapping switch. The on-load tapping switch equips an automatic controller, which facilitates the field control or remote control. Computer interface is provided as required by customers.

- Resin-insulated dry-type on-load regulating transformer usually adopts vacuum on-load tapping switch, which can be installed independently on the right(left) side of transformer or the front face of high voltage side.
- Complex on-load tapping switch (air type) is also available to meet the customer's need. This kind of tapping switch is installed on the main body, so it possesses the advantages such as compact structure, less area occupation and easy installation.
- Other kinds of on-load tapping switches are also available if needed.
- Isynchronous controller is necessary if parallel running is adopted by several dry-type on-load regulating transformers, and the number of transformers should be no more than 4.

图8 外形尺寸

Picture.8 Outline Dimension

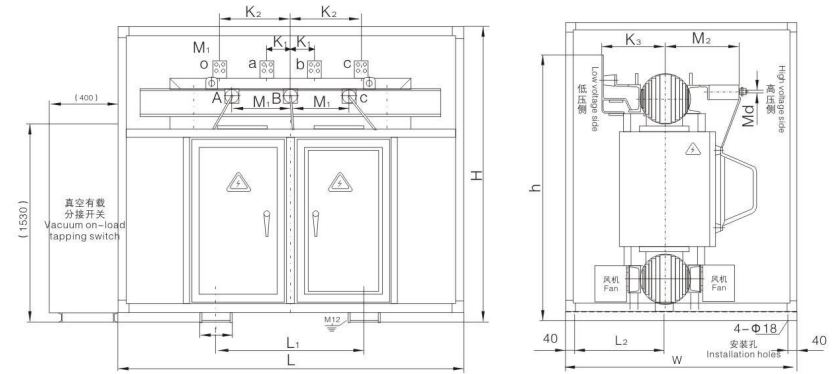
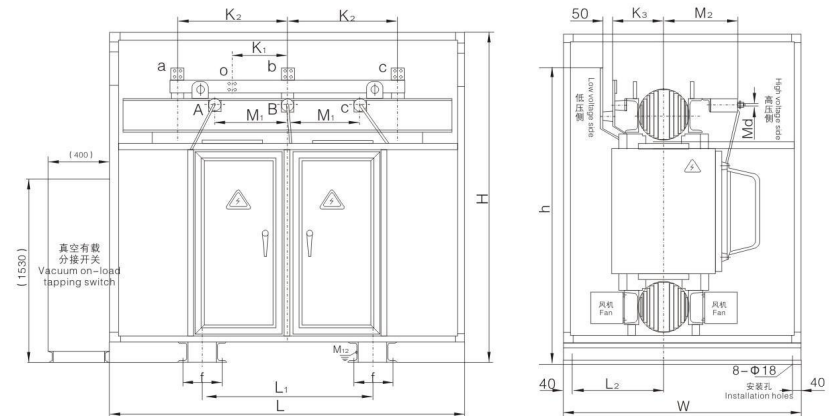


图9 外形尺寸

Picture.9 Outline Dimension



注: 强迫风冷系统(风机)尺寸不超过本体尺寸(L×W)范围
Note: The size of forced air cooling system(fan) should not exceed the size of main body(L×W)

SC(B)10系列 35/0.4KV级50~2500KVA树脂绝缘干式电力变压器产品技术数据

Technical Data for SC (B) 10 Series 35/0.4KV 50~2500KVA Resin-insulated Dry-type Power Transformer

表 Table.4:

型号 Model	Po W	Pk 120°C W	UK %	Io %	Lp dB A	GT Kg	外形图 Outside drawing (Three-phase)	外形尺寸 (mm) Outline dimensions L×W×H	底座尺寸 (mm) size of basement L1/L2×f-n×Φ18	高压出线 High voltage outlet M1/M2-Md	低压出线 Low voltage outlet K1×K2/K3-δ-[图]
SC10-50/35	450	1430	6	2.8	50	650	图Pic.10	1280×830×1380	550/415×120-4×Φ18	350/540-M10	120×360/240-δ=3[图a]
SC10-100/35	630	2090		2.4	51	1100	图Pic.10	1300×850×1470	550/425×120-4×Φ18	350/550-M10	125×375/250-δ=4[图a]
SC10-160/35	790	2810		1.8	51	1320	图Pic.10	1450×920×1540	660/460×140-4×Φ18	350/560-M10	140×420/260-δ=4[图b]
SC10-200/35	880	3330		1.8	51	1470	图Pic.10	1470×920×1590	660/460×140-4×Φ18	350/570-M10	140×420/260-δ=4[图b]
SC10-250/35	990	3800		1.6	51	1650	图Pic.10	1490×920×1680	660/460×140-4×Φ18	350/570-M10	145×435/270-δ=5[图b]
SC10-315/35	1180	4510		1.6	51	1840	图Pic.10	1600×950×1730	660/475×140-4×Φ18	350/570-M10	150×450/280-δ=6[图c]
SC10-400/35	1380	5415		1.4	51	2130	图Pic.11	1600×950×1760	660/475×140-4×Φ18	350/570-M10	300×600/290-δ=6[图d]
SCB10-500/35	1620	6650		1.4	52	2560	图Pic.11	1750×1010×1790	820/505×140-4×Φ18	380/570-M10	310×620/300-δ=6[图d]
SCB10-630/35	1860	7700		1.2	52	2760	图Pic.11	1780×1010×1840	820/505×190-8×Φ18	380/580-M10	320×640/340-δ=8[图d]
SCB10-800/35	2160	9120		1.2	52	3720	图Pic.11	1900×1050×1930	820/510×190-8×Φ18	380/580-M10	330×660/360-δ=8[图e]
SCB10-1000/35	2430	10450	1.0	52	4330	图Pic.11	2000×1050×1950	820/510×190-8×Φ18	400/590-M10	345×690/390-δ=10[图e]	
SCB10-1250/35	2840	12730	0.9	53	5080	图Pic.11	2080×1070×2080	820/535×190-8×Φ18	400/630-M10	365×730/400-δ=10[图f]	
SCB10-1600/35	3240	15490	0.9	53	6190	图Pic.11	2150×1275×2150	1070/637×190-8×Φ18	400/655-M10	380×760/430-δ=12[图f]	
SCB10-2000/35	3830	18240	0.9	54	6590	图Pic.11	2230×1275×2270	1070/637×220-8×Φ18	450/655-M12	395×790/435-δ=12[图g]	
SCB10-2500/35	4460	21850	0.9	55	7760	图Pic.11	2400×1275×2380	1070/637×220-8×Φ18	450/660-M12	435×870/440-δ=15[图h]	

注：外形尺寸仅供设计选型参考
Note: The outline dimensions are only for reference

额定高压电压 (Rated voltage of H.V. Side): 35 (38.5) KV;
额定低压电压 (Rated voltage of L.V. Side): 0.4KV;
联结组标号 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase),
绝缘水平 (Insulation level): LH170AC70/LI (0) AC3 (KV)

图10 外形尺寸
Picture.10 Outline Dimension

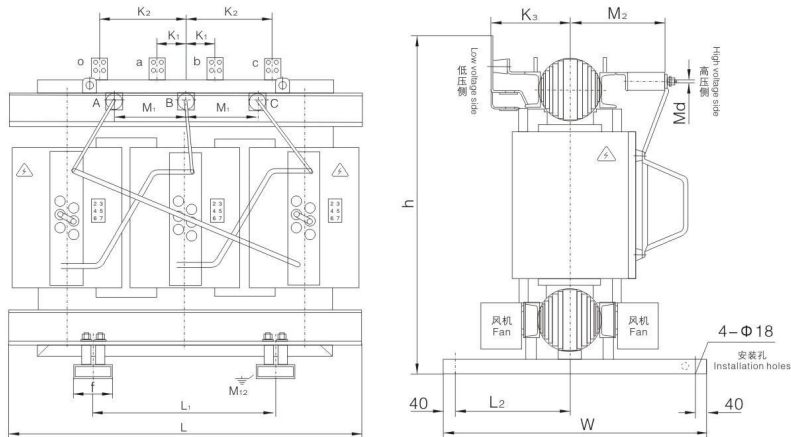


图11 外形尺寸
Picture.11 Outline Dimension

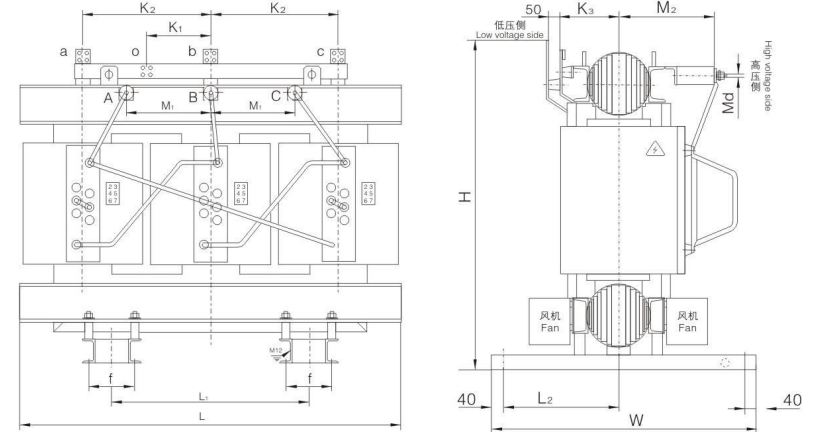
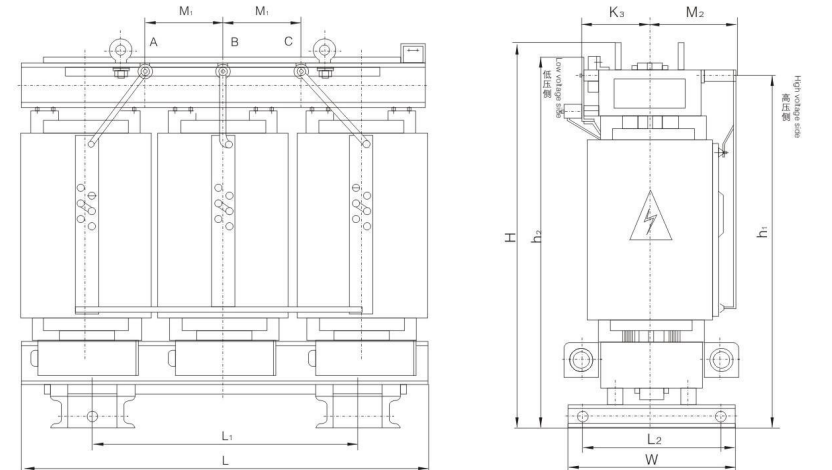


图12 外形尺寸
Picture.12 Outline Dimension



注：强迫风冷系统（风机）尺寸不超过本体尺寸（L×W）范围
Note: The size of forced air cooling system(fan) should not exceed the size of main body(L×W)

SC10系列 35/10KV级800~20000KVA树脂绝缘干式电力变压器产品技术数据
Technical Data for SC (B) 10 series 35/10KV 800~20000KVA Resin-insulated Dry-type Power Transformer

表 Table.5:

型号 Model	Po W	Pk 120°C W	UK %	Io %	Lp dB A	GT Kg	外形图 Outside drawing (Three-phase)	外形尺寸 (mm) Outline dimensions L×W×H	底座尺寸 (mm) size of basement L1/L2×f	高压出线 High voltage outlet M1×M3/M2×-h1-Md	低压出线 Low voltage outlet K3×h2
SC10-800/35	2250	9410	6	1.1	55	4390	图Pic.12	2100×1220×1850	1070×820	450×0/634×1705-M10	355×1815
SC10-1000/35	2670	10930		1.1	55	5340	图Pic.12	2300×1300×1880	1150×820	450×0/652×1735-M10	370×1845
SC10-1250/35	3130	12920		1.0	57	6090	图Pic.12	2380×1300×1885	1150×820	500×0/666×1740-M10	375×1850
SC10-1600/35	3690	15490	7	1.0	57	7240	图Pic.12	2450×1350×1915	1350×820	500×0/670×1770-M10	385×1880
SC10-2000/35	4230	18240		0.9	59	7670	图Pic.12	2580×1350×1975	1350×820	550×0/683×1830-M10	400×1940
SC10-2500/35	4860	21850		0.9	59	8740	图Pic.12	2670×1400×2130	1450×820	650×0/689×1990-M10	410×2100
SC10-3150/35	6030	24510	8	0.8	61	10560	图Pic.13	2930×1500×2260	1850×1070	700×0/712×2120-M10	430×2230
SC10-4000/35	7020	29450		0.8	61	12440	图Pic.13	3070×1500×2310	1950×1070	1045×470/736×2270-M10	445×2350
SC10-5000/35	8370	34960		0.7	61	14640	图Pic.13	3200×1500×2420	2000×1070	1090×490/753×2380-M10	460×2460
SC10-6300/35	9900	40850	9	0.7	63	16740	图Pic.13	3310×1600×2590	2040×1475	1125×500/774×2475-M10	475×2570
SC10-8000/35	11340	46080		0.6	63	19090	图Pic.13	3450×1780×2640	2040×1475	1170×520/788×2525-M12	495×2620
SC10-10000/35	12960	55580		0.6	65	23070	图Pic.14	3650×1780×2780	1240×1475	1240×560/816×2670-M12	515×2750
SC10-12500/35	15750	64600	10	0.5	65	27450	图Pic.14	3790×1780×2960	1285×1475	1285×580/839×2815-M16	540×2930
SC10-16000/35	19350	76000		0.5	66	33680	图Pic.14	4000×1800×3130	1350×1475	1350×610/859×3050-M16	562×3055
SC10-20000/35	22950	85500		0.5	68	41250	图Pic.14	4320×1800×3290	1460×1475	1460×700/883×3210-M20	586×3215

注:外形尺寸仅供设计选型参考
Note: The outline dimensions are only for reference

额定高压电压 (Rated voltage of H.V. Side): 35 (38.5) KV;
额定低压电压 (Rated voltage of L.V. Side): 10 (10.5, 6.3, 6) KV;
联结组标号 (Vector group): Yd11, Ynd11, 50Hz, 3相 (Three-phase),
绝缘水平 (Insulation level): LI170AC70/LI75AC35 (KV)

图13 外形尺寸
Picture.13 Outline Dimension

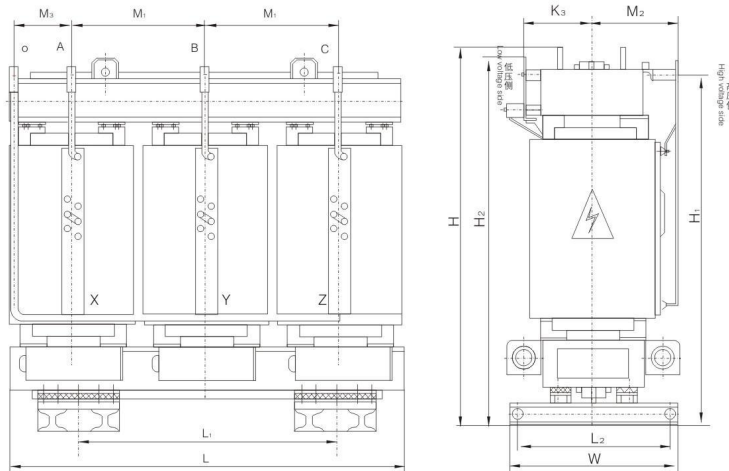


图14 外形尺寸
Picture.14 Outline Dimension

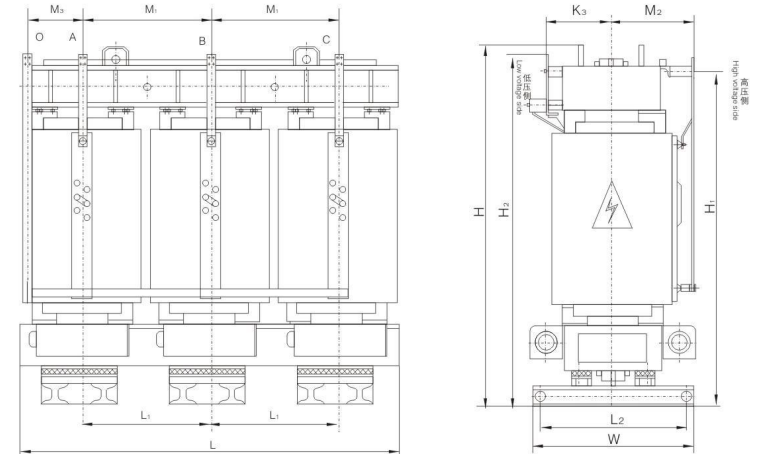
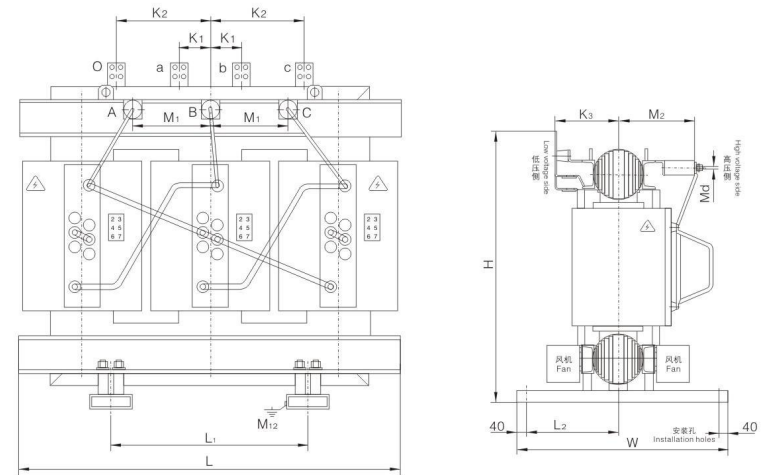


图15 外形尺寸
Picture.15 Outline Dimension



SC(B)9系列 10KV级30~2500KVA树脂绝缘干式电力变压器产品技术数据

Technical Data for SC (B) 9 series 10KV 30~2500KVA Resin-insulated Dry-type Power Transformer

表 Table.6:

型号 Model	Po W	PK 120°C W	UK %	Io %	Lp dB A	GT Kg	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions L×W×H	底座尺寸 (mm) size of basement L1/L2×f-n×Φ18	高压出线 High voltage outlet M1/M2-Md	低压出线 Low voltage outlet K1×K2/K3-δ=3[图a]
SC9-30/10	220	750	4	2.4	44	370	图Pic.15	950×1000×835	400/410×80-4×Φ18	250/260-M10	85×255/220-δ=3[图a]
SC9-50/10	310	1060		2.4	44	520	图Pic.15	950×1000×890	550/410×120-4×Φ18	250/260-M10	90×270/220-δ=3[图a]
SC9-80/10	420	1460		1.8	45	660	图Pic.15	1040×1100×930	550/410×120-4×Φ18	250/302-M10	90×270/235-δ=3[图a]
SC9-100/10	450	1670		1.8	45	720	图Pic.15	1090×1100×985	550/410×120-4×Φ18	250/305-M10	95×285/238-δ=4[图a]
SC9-125/10	530	1960		1.6	46	810	图Pic.15	1180×1100×1010	550/410×120-4×Φ18	250/309-M10	95×285/240-δ=4[图a]
SC9-160/10	610	2250		1.6	46	1010	图Pic.15	1130×1100×1030	660/430×140-4×Φ18	260/312-M10	90×290/256-δ=4[图b]
SCB9-200/10	700	2680		1.4	46	1065	图Pic.16	1280×1100×1078	660/430×140-4×Φ18	260/315-M10	204.5×409/195-δ=6[图c]
SCB9-250/10	810	2920		1.4	47	1220	图Pic.16	1310×1100×1103	660/430×140-4×Φ18	260/320-M10	209.5×419/200-δ=6[图c]
SCB9-315/10	990	3670		1.2	47	1345	图Pic.16	1340×1100×1138	660/430×140-4×Φ18	280/325-M10	216.5×433/211-δ=6[图c]
SCB9-400/10	1100	4220		1.2	48	1545	图Pic.16	1390×1100×1203	660/430×140-4×Φ18	350/328-M10	222.5×445/214-δ=6[图d]
SCB9-500/10	1310	5170	1.2	48	1760	图Pic.16	1430×1200×1268	660/460×140-4×Φ18	350/339-M10	229.5×459/227-δ=8[图d]	
SCB9-630/10	1510	6220	1.0	49	2125	图Pic.16	1500×1200×1385	660/460×190-8×Φ18	350/345-M10	241×482/235-δ=10[图d]	
SCB9-630/10	1460	6310	1.0	49	2045	图Pic.16	1630×1200×1225	660/460×190-8×Φ18	350/341-M10	262.5×525/231-δ=10[图d]	
SCB9-800/10	1710	7360	1.0	51	2400	图Pic.16	1660×1300×1450	820/510×190-8×Φ18	350/349-M10	267.5×535/239-δ=10[图e]	
SCB9-1000/10	1990	8610	1.0	51	2835	图Pic.16	1760×1300×1485	820/510×190-8×Φ18	400/360-M10	283.5×567/258-δ=12[图e]	
SCB9-1250/10	2350	10260	6	1.0	52	3355	图Pic.16	1797×1400×1630	820/560×190-8×Φ18	400/362-M10	293×586/259-δ=12[图f]
SCB9-1600/10	2760	12400	1.0	52	4090	图Pic.16	1940×1400×1705	820/560×190-8×Φ18	400/387-M10	314.5×629/291-δ=14[图f]	
SCB9-2000/10	3400	15300	0.8	53	4845	图Pic.16	2017×1450×1870	820/560×220-8×Φ18	400/389-M16	329.5×659/293-δ=14[图g]	
SCB9-2500/10	4000	18180	0.8	54	5810	图Pic.16	2127×1450×2020	820/560×220-8×Φ18	400/400-M16	347×694/298-δ=18[图g]	

注：外形尺寸仅供设计选型参考
Note: The outline dimensions are only for reference

额定高压电压(Rated voltage of H.V. Side): 10 (11、10.5、6.6、6.3、6、3.15) KV;
额定低压电压(Rated voltage of L.V. Side): 0.4KV;
联结组别 (Vector group): Dyn11, Yyn0 50Hz, 3相 (Three-phase)

图16 外形尺寸
Picture.16 Outline Dimension

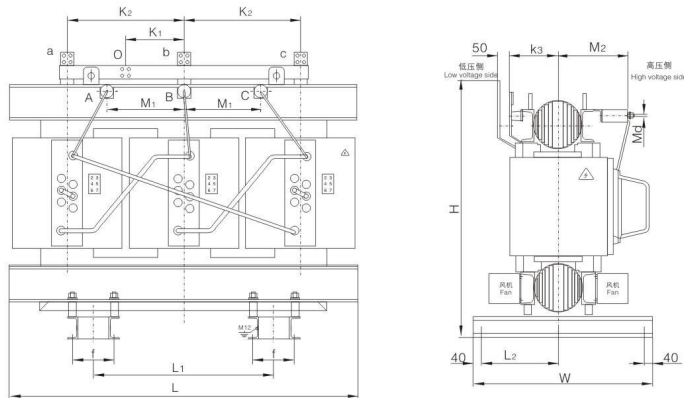


图17 外壳外形尺寸
Picture.17 Outline Dimensions of Casing

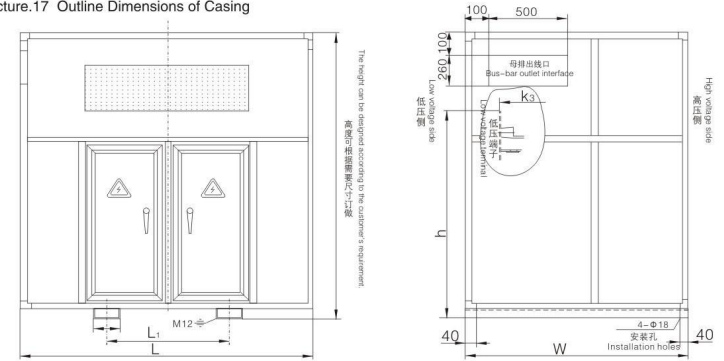


图18 外壳外形尺寸
Picture.18 Outline Dimensions of Casing

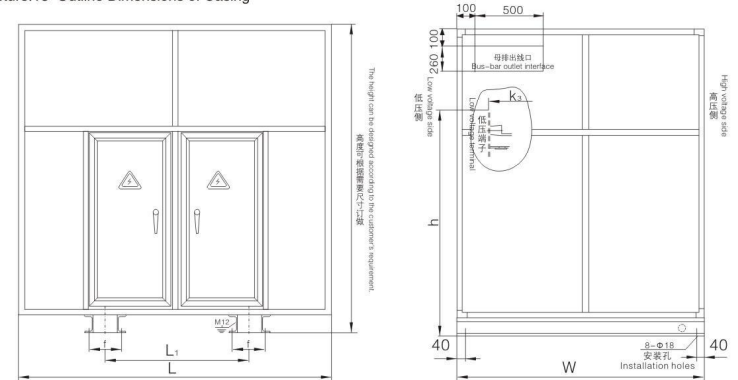
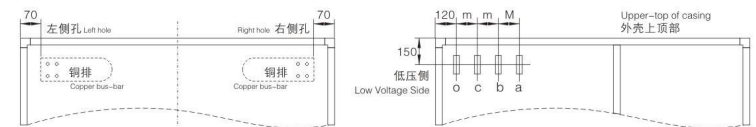


图19 低压铜排侧出线示意图
Picture.19 Sketch Drawing of Low Voltage Copper Bus-bar Outlet



SC(B)9系列 10KV级30~2500KVA树脂绝缘干式电力变压器-配防护外壳及出线方式

Technical Data for Protective Casing and Outlet Mode of SC (B) 9 Series 10KV 30~2500KVA Resin-insulated Dry-type Power Transformer

表 Table.7:

型号 Model	UK %	GT Kg	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions L x W x H		底座尺寸 (mm) Size of basement L1/L2 x f-n x Φ18	附 注 Note
				L x W x H/h (常规产品) Normal product	L x W x H/h (配套开关柜产品) Assorted product/switch cabinet		
SC9-30/10	450	图Pic.17	1200 × 1000 × 1100/835	1200 × 1000 × H(2200)/835	400/410 × 80-4 × Φ18	1)高、低出线端子尺寸参见表(一)及图(一、十五、十六) 2)外形尺寸仅供设计选型参考 3)与低压开关柜配套干变产品标准(侧出线)外壳高度尺寸H≥2200mm,同时可根据用户订货时需要的尺寸订做。 4)外壳除采用铝合金材料外,可根据用户需要设计,制造其它材料和要求的防护等级; Note: (1)The dimensions of high voltage and low voltage outlet terminals are detailed in Tab.1, Drawing.1, Drawing.15 and Drawing.16. (2)The outline dimensions are only for reference. (3)The dry-type transformer, which matches the low voltage switch cabinet, has a standard casing height H≥2200mm; in addition, we can produce transformers with dimensions which are required by customers. (4)Usually, we adopt aluminum alloy for the casing; we can also adopt other materials required by customers and we can produce the transformer casing with protection level required by customers.	
SC9-50/10	610	图Pic.17	1300 × 1000 × 1200/890	1300 × 1000 × H(2200)/890	550/410 × 120-4 × Φ18		
SC9-80/10	760	图Pic.17	1400 × 1100 × 1300/930	1400 × 1100 × H(2200)/930	550/410 × 120-4 × Φ18		
SC9-100/10	880	图Pic.17	1400 × 1100 × 1300/985	1400 × 1100 × H(2200)/985	550/410 × 120-4 × Φ18		
SC9-125/10	970	图Pic.17	1400 × 1100 × 1300/1010	1400 × 1100 × H(2200)/1010	550/410 × 120-4 × Φ18		
SC9-160/10	1080	图Pic.17	1600 × 1100 × 1400/1030	1600 × 1100 × H(2200)/1030	660/430 × 140-4 × Φ18		
SCB9-200/10	1220	图Pic.17	1600 × 1100 × 1400/1078	1600 × 1100 × H(2200)/1078	660/430 × 140-4 × Φ18		
SCB9-250/10	1375	图Pic.17	1600 × 1100 × 1400/1103	1600 × 1100 × H(2200)/1103	660/430 × 140-4 × Φ18		
SCB9-315/10	1500	图Pic.17	1600 × 1100 × 1400/1138	1600 × 1100 × H(2200)/1138	660/430 × 140-4 × Φ18		
SCB9-400/10	1700	图Pic.17	1600 × 1100 × 1400/1203	1600 × 1100 × H(2200)/1203	660/430 × 140-4 × Φ18		
SCB9-500/10	1920	图Pic.17	1700 × 1200 × 1500/1268	1700 × 1200 × H(2200)/1268	660/460 × 140-4 × Φ18		
SCB9-630/10	2305	图Pic.18	1800 × 1200 × 1600/1385	1800 × 1200 × H(2200)/1385	660/460 × 190-8 × Φ18		
SCB9-630/10	2225	图Pic.18	1900 × 1200 × 1600/1225	1900 × 1200 × H(2200)/1225	660/460 × 190-8 × Φ18		
SCB9-800/10	2600	图Pic.18	2000 × 1300 × 1750/1450	2000 × 1300 × H(2200)/1450	820/510 × 190-8 × Φ18		
SCB9-1000/10	3035	图Pic.18	2000 × 1300 × 1750/1485	2000 × 1300 × H(2200)/1485	820/510 × 190-8 × Φ18		
SCB9-1250/10	3550	图Pic.18	2100 × 1400 × 1900/1630	2100 × 1400 × H(2200)/1630	820/560 × 190-8 × Φ18		
SCB9-1600/10	4320	图Pic.18	2200 × 1400 × 1900/1705	2200 × 1400 × H(2200)/1705	820/560 × 190-8 × Φ18		
SCB9-2000/10	5065	图Pic.18	2300 × 1450 × 2200/1870	2300 × 1450 × H(2200)/1870	820/560 × 220-8 × Φ18		
SCB9-2500/10	6075	图Pic.18	2400 × 1450 × 2200/2020	2400 × 1450 × H(2200)/2020	820/560 × 220-8 × Φ18		

注:外形尺寸仅供设计选型参考
Note: The outline dimensions are only for reference

外壳 Casing

采用框架组装式外壳,对干变做进一步的安全防护,满足干变产品与低压配电屏置于同一配电室,并根据用户需要配置高、低压母线(排)出线接口,铝合金外壳合理紧凑、外形美观、刚性好。

The casing is a framework modular aluminum alloy casing; further safety protection should be conducted for the transformer; the transformer and the low voltage distribution panel should be installed in the same distribution room. High/low voltage bus outlet interfaces are installed according to the customer's requirements. The casing is compact, pretty in appearance and fine in rigidity.

外壳防护等级 Protection Level of Casing

常用外壳防护等级为IP20及IP23标准防护,IP20可防止直径大于12mm的固体异物进入确保用电安全;若需进一步防止与垂直线成60°角以内的水滴入,则可选用户外使用的IP23外壳。[注:IP23外壳会使变压器散热能力下降,导致容量较小的变压器降容量约5%使用,容量较大的降容量约10%使用]。

The common protection level is Ip20 or Ip23 standard protection; IP20 can prevent a particle with a diameter larger than 12mm from entering into the casing, thus guarantee the safety; IP23 can prevent water drops, which is within an angle of 60 from the vertical line, from entering into the casing.[Note:IP23 casing will cause the decrease of heat radiating ability of transformer. So the capacity will be reduced 5%for a low capacity transformer and 10% for a large capacity transformer.]

出线方式 Outlet Mode:

- 1、外壳内配备高压及低压电缆进(出)线支撑架,参见图(四);
- 2、低压(铜母排)上部(侧、顶)出线,外壳在上(侧、顶)部预留母排出线口,参见图(十七)、(十八),变压器与(开关柜)之间的母排由用户根据实际情况自行连接;
- 3、容量≥200KVA变压器低压铜母排(左或右)横侧出线可根据需要配制到如图(十九)所示位置;其中SCB9-2000-2500/10, m=120其余m=100。
- 4、根据用户订货具体情况需要,外壳配开相应出线口。

- 1) Bracket for inlet (outlet)wires is equipped in the casing ,see Fig.4;
- 2) Outlet wires are at the low voltage(copper bus-bar)upper(side, top)part;pre-holes is processed for the outlet wires on the upper (side, tip)part of casing; see Fig.17, Fig.18; the customer connects the bus-bar between transformer and switch cabinet according to the actual conditions;
- 3) If the transformer possesses a capacity≥ 200KVA, the lateral outlet(right or left)lf low voltage copper bus-bar can be placed as showed in Fig.19; for SCB9-2000-2500/10, m=120, for other types, m=100;
- 4) Outlet holes are punched on the casing as required by customers.

图20 外形尺寸
Picture.20 Outline Dimension

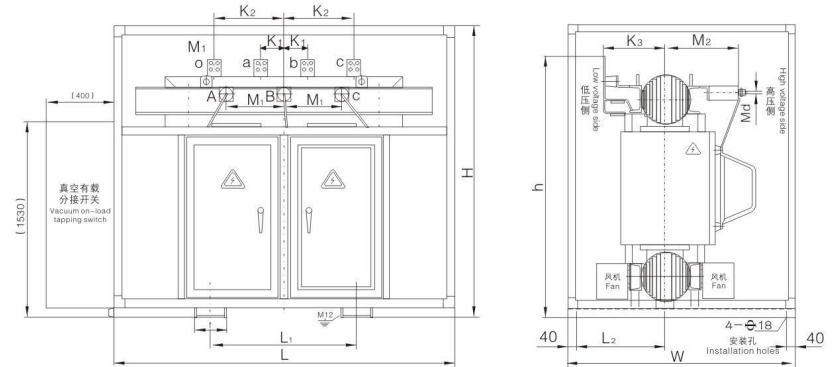
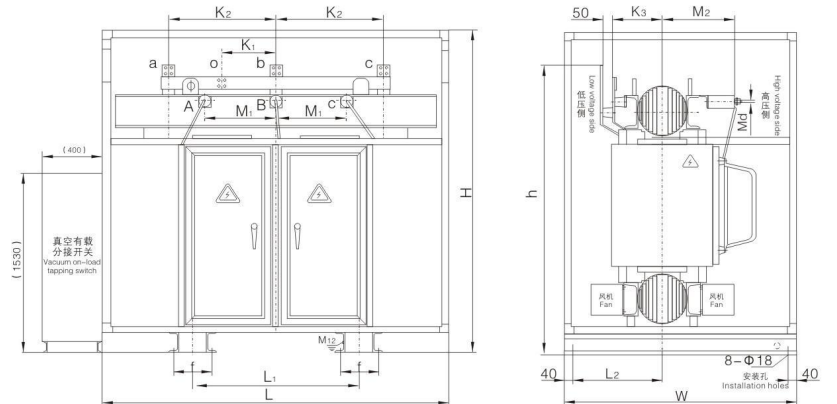


图21 外形尺寸
Picture.21 Outline Dimension



SCZ(B)9系列 10KV级200~2500KVA有载调压树脂绝缘干式电力变压器技术数据

Technical Data for Specifications of SCZ(B) 9 Series 10KV 200~2500KVA Resin-insulated Dry-type on-load Regulating Power Transformer

表 Table.8:

型号 Model	Po W	Pk 120°C W	UK %	Io %	Lp dB A	Gt kg	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions L×W×H	底座尺寸 (mm) Size of basement L1,L2×l-n×Φ18	高压出线 High voltage outlet M1/M2-Md	低压出线 Low voltage outlet K1×K2/K3-δ=3[图]
SCZ9-200/10	700	2680	4	1.4	44	1310	图Pic.20	1600×1400×1400/1085	660/450×120-4×Φ18	260/318-M10	100×300/263-δ=4[图b]
SCZ9-250/10	820	2920		1.4	44	1440	图Pic.20	1600×1400×1400/1100	660/450×120-4×Φ18	260/322-M10	100×300/268-δ=5[图b]
SCZ9-315/10	1100	3800		1.4	45	1620	图Pic.20	1700×1400×1500/1160	660/480×120-4×Φ18	260/326-M10	105×315/272-δ=6[图c]
SCZ9-400/10	1250	4500	4	1.4	45	2000	图Pic.20	1700×1400×1500/1245	660/480×120-4×Φ18	280/336-M10	110×330/282-δ=6[图d]
SCZB9-500/10	1440	5500		1.4	45	2190	图Pic.21	1700×1400×1500/1220	660/480×120-4×Φ18	350/338-M10	225×450/224-δ=6[图d]
SCZB9-630/10	1660	6500		1.2	46	2630	图Pic.21	1900×1500×1600/1350	660/510×190-8×Φ18	350/341-M10	230×460/229-δ=8[图d]
SCZB9-630/10	1600	6700	6	1.2	46	2590	图Pic.21	1900×1500×1600/1240	660/510×190-8×Φ18	250/341-M10	252.5×505/229-δ=8[图d]
SCZB9-800/10	1900	7900		1.2	47	3100	图Pic.21	2000×1500×1700/1320	820/510×190-8×Φ18	350/345-M10	260×520/233-δ=8[图e]
SCZB9-1000/10	2200	9250		1.0	49	3670	图Pic.21	2000×1500×1700/1455	820/510×190-8×Φ18	350/356-M10	275×550/246-δ=10[图e]
SCZB9-1250/10	2600	11000	6	1.0	49	4070	图Pic.21	2150×1600×1900/1600	820/560×190-8×Φ18	350/359-M10	282.5×565/249-δ=10[图f]
SCZB9-1600/10	3030	13100		1.0	49	4770	图Pic.21	2200×1600×1900/1735	820/560×190-8×Φ18	400/371-M10	300×600/263-δ=12[图f]
SCZB9-2000/10	2800	16000		0.8	50	5690	图Pic.21	2300×1600×2200/1900	820/560×220-8×Φ18	400/382-M16	310×620/274-δ=12[图g]
SCZB9-2500/10	4400	19100	6	0.8	52	6760	图Pic.21	2400×1600×2200/2030	820/560×220-8×Φ18	400/389-M16	325×650/284-δ=15[图h]

注 Note:

1. 外形尺寸仅供设计选型参考;

The outline dimensions are only for reference;

2. 高、低出线端子尺寸, 与同容量无载调压干变的相同, 具体尺寸参见图(一);

The dimensions of high/low voltage outlet terminals are as same as that of no-load regulating transformer with the same capacity, see Drawing.1 for more detail.

额定高压电压 (Rated voltage of H.V. Side): 10 (11、10.5、6.6、6.3、6、3.15) KV;

额定低压电压 (Rated voltage of L.V. Side): 0.4KV;

联结组标号 (Vector group): Dyn11, Yyn0, 50Hz, 3相 (Three-phase),

分接范围 (tapping range): ±4×2.5% (9档) (9 steps)

为提高供电质量, 干式变压器在配备有载分接开关后可进行带负荷电压调整, 有载分接开关配有自动控制器, 便于现场或远程控制, 并可根据用户需要提供相应的计算机接口。

- (1) 有载调压树脂绝缘干式变压器多选用真空型有载分接开关, 该型开关可独立安装在变压器的左、右侧面或高压正面;
- (2) 可根据用户需要选用 (空气式) 复合型有载分接开关, 该型开关同变压器本体安装在一起, 结构紧凑、占地面积小、安装方便;
- (3) 可根据需要配置其它类型有载分接开关;
- (4) 有载调压干式变压器如需并联运行时, 必须配置同步控制器, 且并联运行的台数不可超过4台。

To improve the quality of electricity supply, we can conduct on-load voltage regulation if the dry-type transformer equips an on-load tapping switch. The on-load tapping switch equips an automatic controller, which facilitates the field control or remote control. Computer interface is provided as required by customers.

- 1) Resin-insulated dry-type on-load regulating transformer usually adopts vacuum on-load tapping switch, which can be installed independently on the right(left) side of transformer or the front face of high voltage side.
- 2) Complex on-load tapping switch (air type) is also available to meet the customer's need. This kind of tapping switch is installed on the main body, so it possesses the advantages such as compact structure, less area occupation and easy installation.
- 3) Other kinds of on-load tapping switches are also available if needed.
- 4) Isochronous controller is necessary if parallel running is adopted by several dry-type on-load regulating transformers, and the number of transformers should be no more than 4.



SCBH15型非晶合金干式变压器

SCBH15 Amorphous Alloy Dry-Type Power Transformer

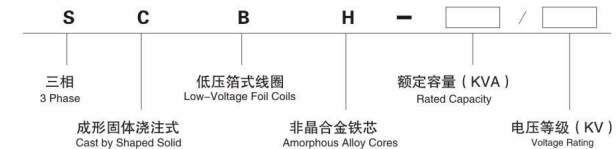
我公司运用成熟的设计技术和多年来制造油浸式非晶合金变压器的经验开发制造了非晶合金干式变压器产品。

非晶合金干式变压器无油, 没有燃烧的危险, 安装在室内, 可深入负荷中心, 节能效果显著, 适应高密度负荷的现代化城市发展的需要。非晶合金干式变压器大幅度降低空载损耗, 是当代最先进的节能型干式变压器。

We have successfully developed and manufactured amorphous alloy dry-type transformers by availing our mature design techniques and our many years of experiences in oil-immersed amorphous alloy transformers manufacturing.

Amorphous alloy dry-type transformers, oil free and without any combustion danger, are installed indoors or even fixed deep into the load center and thereby have an obvious energy saving effect, being suitable for the municipal development needs in a modernized city of a high load density. As the most advanced energy-saving dry-type transformer, an amorphous alloy dry-type transformer may largely lower the no-load loss.

型号含义 Type Connotations



产品特点 Product Characteristics

本产品低压为箔式线圈, 采用铜箔绕制, 高压线圈采用F级高强度漆包线绕制, 采用玻璃纤维加强的环氧树脂包封结构具有优良的耐潮和抗裂性能, 铁芯由非晶合金带材卷制而成, 采用矩形截面, 四框五柱式结构, 空载损耗比普通干式变压器降低四分之三。

On the low-voltage side of this product line are foil type coils fabricated by winding copper foils; and on the high-voltage side of this product line are high-voltage coils fabricated by winding F grade highly strong enameled wires. The introduction of a glass fiber-intensified epoxy resin packaging structure makes it possess excellent moisture- and rupture-resistance. The cores are prepared by winding amorphous alloy strips and each of it has a rectangular cross section and a four-frame and five-pole structure, with the no-load loss reduced by 3/4 that of a common dry-type transformer.

使用环境 Environmental Conditions for Product Use

- 环境温度 最高气温 +40°C; 最热月平均温度 +30°C; 最低气温 -25°C; 最热年平均温度 +20°C;

- 海拔不超过1000m;
- 电源电压的波形近似于正弦波;
- 三相电源电压应大致对称;
- 安装环境无明显的污秽;
- 户内使用。

- Ambient Temperature
Maximum Atmospheric Temperature +40°C; Average Temperature in Normal Hottest Month +30°C
Minimum Atmospheric Temperature -25°C; Average Temperature in Normal Hottest Month +20°C
- Sea Level Elevation: > 1000m
- Power Supply Voltage Wave Form Similar to Sine Wave
- 3-Phase Power Supply Voltage: Roughly Symmetric as it is
- Installation Environment: Free from Visible Dirts
- For Indoor Use

产品用途 Product Use

本产品具有空载损耗低、无油、阻燃自熄、耐潮、抗裂和免维修等优点。凡是现在使用普通干变的场所都可由非晶干变所取代，可用于高层建筑、商业中心、地铁、机场、车站、工矿企业和发电厂。特别适合于易燃、易爆等防火要求高的场所安装使用。

This product line is advantageous, such as low in no-load loss, oil free, combustion retardant, self-extinguishing, moisture proof, rupture resistant, maintenance free, etc. Amorphous dry-type transformers may substitute common dry-type transformers in all circumstances and find use in high-rise buildings, business centers, subways, airports, train or bus stations, industrial or mineral enterprises, and power plants, being especially suitable for installation and application in circumstances where higher fire proof requirements (combustible and/or explosive) are indispensably necessary.

节能效果 Energy Saving Effects

●非晶干变的空载损耗比现行国际GB/T10228-1997规定的数值降低四分之三。

以630KVA为例，空载损耗降低1220W。

假设：无功经济当量K1=0.1KW/KVar 年运行时间t=8760h 电费单价A=0.6/KWh 一台SCBH型的非晶干变代替SCB型干变运行可降低运行损耗P为：

- The no-load loss of an amorphous dry-type transformer is reduced to 1/4 the value stated under the currently valid national standard GB/T10228-1997.

Taking 630KVA for an instance, the no-load loss has reduced by 1220W.

Assumptions: Reactive Economic Equivalent K1=0.1KW/KVar, Yearly Operation Duration t=8760h, Power Rate A=0.6/KWh, if a SCBH amorphous dry-type transformer is used to substitute a SCB dry-type transformer, then a reduction in operation loss P:

$$P=[1.62+0.1 \times 1.6 \times 630 \times 10^{-2}]-[0.4+0.1 \times 0.2 \times 630 \times 10^{-2}]=2.1KW$$

运行一年的经济效益和社会效益如下：

The economic and social benefits after one year's running are presented below:

节约电能	Electric Power-Saving	18396°
少排放二氧化碳	Less Carbon Dioxide Emission	23.9吨 T
节约电费	Electricity Charge-Saving	11037元 RMB

少排放二氧化硫	Less Sulfur Dioxide Emission	420公斤 KG
节煤	Coal Saving	9.2吨 T
少排放二氧化氮	Less Nitrogen Dioxide Emission	230公斤 KG

技术参数 Product Parameters

额定容量	Rated Capacity	100-1000KVA
相数	Phase Number	3相(Three-phase)
频率	Frequency	50Hz
联结组	Connection Group	Dyn11
高压额定电压	Nominal Voltage, High Voltage	3, 6, 10kv
分接范围	Tapping Range	± 2 × 2.5%

低压额定电压	Nominal Voltage, Low Voltage	0.4kv
绝缘耐电等级	Insulation Rating	F级Grade
绕组平均温升	Average Temperature Rise in Windings	≤ 125K
噪音水平	Noise Level	JB/T10088-1999
局部放电	Local Discharge	≤ 10pC

绝缘水平 Insulation Level

电压等级	设备最高电压有效值	额定短时工频耐受电压有效值	额定雷电冲击耐受电压全波峰值
Voltage Rating	Maximum Equipment Voltage (Effective Value)	Rated Power-Frequency Short-Duration Withstand Voltage (Effective Value)	Rated Lightning Impulse Withstand Voltage (Full-Wave Peak Value)
kv	kv	kv	kv
≤1	≤1.1	3	-
3	3.5	10	40
6	6.9	20	60
10	11.5	35	75

性能参数 Performance Features

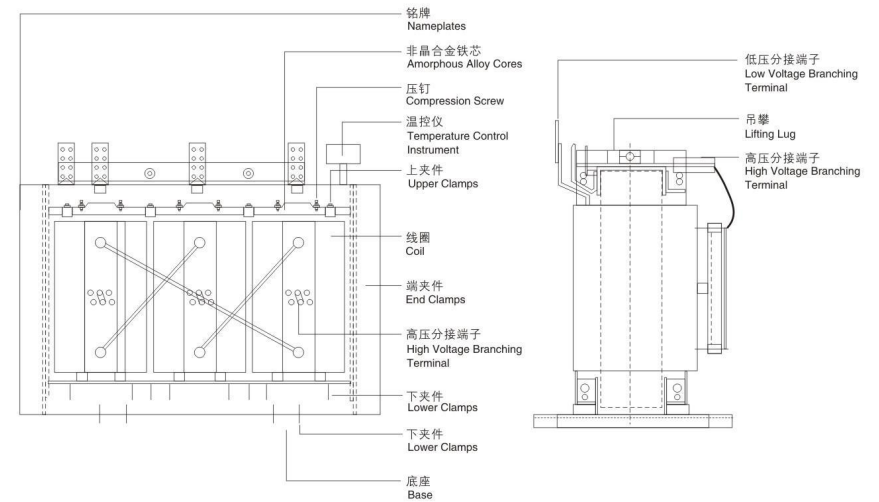
型号 Model	额定容量 Rated Capacity (KVA)	空载损耗 No-Load Loss (W)	空载电流 No-Load Current (A)	负载损耗 Load Loss-es 120°C W	阻抗电压 %
SCBH15-100/10	100	130	1.2	1570	4
SCBH15-160/10	160	170	1.1	2130	
SCBH15-200/10	200	200	1.0	2530	
SCBH15-250/10	250	230	1.0	2760	
SCBH15-315/10	315	280	0.9	3470	
SCBH15-400/10	400	310	0.8	3990	
SCBH15-500/10	500	360	0.8	4880	6
SCBH15-630/10	630	410	0.7	5960	
SCBH15-800/10	800	480	0.7	6960	
SCBH15-1000/10	1000	550	0.6	8130	
SCBH15-1250/10	1250	650	0.6	9690	
SCBH15-1600/10	1600	760	0.6	11730	
SCBH15-2000/10	2000	1000	0.5	14450	
SCBH15-2500/10	2500	1200	0.5	17170	

注：根据用户需要可提供其他损耗水平和阻抗电压的产品。其余符合国际GB1094.1和GB/T22072-2008规定。

Note: We may supply products of other loss level and other impedance voltage as per user requirements. The remaining indexes conform to provisions stipulated under GB1094.1 and GB/T22072-2008.

图22 外形尺寸

Picture.22 Outline Dimension



树脂浇注立体卷铁芯电力变压器 Resin Pouring Three Dimensional Wound Core Power Transformer



型号含义 Type Connotations

S C (B) □ - RL - □ / □
① ② ③ ④ ⑤ ⑥ ⑦

- | | |
|-------------|--------------------------------|
| ①三相 | Three-phase |
| ②“成型”固体浇注 | "Shaping" solid casting |
| ③低压箔式线圈 | Low-Voltage Foil Coils |
| ④产品性能水平代号 | Product performance level code |
| ⑤立体卷铁芯 | Tridimensional Toroidal-core |
| ⑥额定容量 (KVA) | Rated capacity (KVA) |
| ⑦电压等级 (KV) | Voltage class (kv) |

产品特点 Product Features

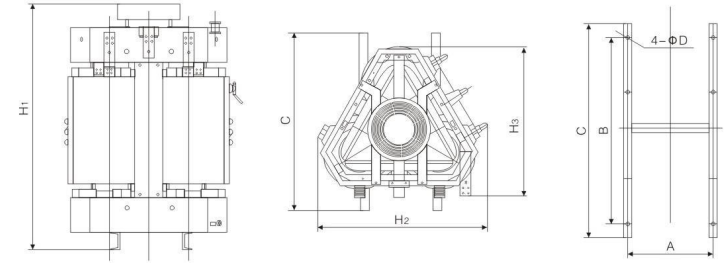
- 低压平衡出线方法，确保三角形变压器的低压出线平衡；
 - 高压线圈三相端子之间的连接采用专利技术，缩小变压器安装面积；
 - 更加合理的顶置散热结构，确保变压器运行安全；
 - 变压器的整体传输效率可达99.2%以上。
- The low-voltage balanced outlet approach ensures the low-voltage outlet balance of the tridimensional toroidal-core transformer;
- The three-interphase high-voltage wiring built-in technology patent reduces the installation area of the transformer by 60% or more;
- The appropriate top heat radiation structure ensures the transformer to run safely;
- The overall transmission efficiency of the tridimensional toroidal-core load loss reduced transformer achieves to 99.2% or above.

应用范围 Scope of Application

高层建筑、购物中心、机场、地铁、车站、码头、石油、化工、核电站、船用变、居民密集区、轻轨、电工等需防火、防爆场所、风力发电和太阳能等新能源

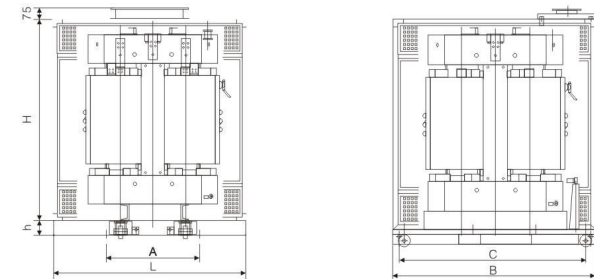
High-rise buildings, shopping center, airport, metro, bus station, dock, petroleum, chemical, nuclear power station, power transformation for ship, resident compact district, light rail, electrical and other occasions where are required to prevent fire and explosion. Wind power generation and solar energy and other new energy

图23 外形尺寸
Picture.23 Outline Dimension



容量 Capacity	KVA	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500
外形尺寸 Outline dimension (mm)	H1	1180	1210	1230	1250	1300	1305	1420	1460	1470	1540	1620	1730	1880	2030	2075
	H2	755	770	790	830	885	970	1030	1040	1090	1150	1180	1310	1340	1530	1595
	H3	650	670	690	740	195	820	870	885	900	980	1020	1030	1145	1260	1320
安装尺寸 Installation dimension (mm)	A	300	300	300	300	400	400	400	400	400	450	500	500	550	550	550
	B	820	820	820	820	820	820	820	820	820	1070	1070	1070	1070	1070	1070
	C	1020	1020	1020	1020	1020	1020	1020	1020	1020	1270	1270	1270	1270	1270	1270
	D	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19

图24 外形尺寸
Picture.24 Outline Dimension



容量 Capacity	KVA	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500
外形尺寸 Outline dimension (mm)	L	1250	1250	1250	1350	1350	1450	1450	1550	1550	1650	1650	1800	1800	2050	2050
	B	1550	1550	1550	1600	1600	1700	1700	1750	1750	1850	1850	2050	2050	2200	2200
	H	1350	1350	1350	1400	1400	1500	1500	1550	1550	1700	1700	1950	1950	2150	2150
	h	1200	1200	1200	120	120	120	120	120	120	120	120	140	140	140	140
安装尺寸 Installation dimension (mm)	A	720	720	720	720	720	790	790	790	790	790	900	900	900	900	900
	C	1450	1450	1450	1500	1450	1600	1600	1650	1650	1750	1750	1950	1950	2100	2100
kg		830	930	1040	1150	1040	1670	1670	1850	2070	2470	2850	3320	3930	4660	5580

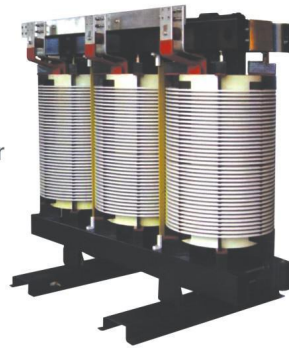
真空浸渍干式电力变压器

Vacuum Impregnated Dry-Type Power Transformer

型号含义 Type Connotations

S G (B) □ - □ / □
 ① ② ③ ④ ⑤ ⑥

- | | |
|--------------|----------------------------------|
| ① 三相变压器 | Three-phase transformer |
| ② 真空浸渍干式 | Vacuum impregnating dry-type |
| ③ 低压箱式绕组 | Insulation heat resistance level |
| ④ 性能水平代号 | Performance level code |
| ⑤ 额定容量 (KVA) | The rated capacity (kVA) |
| ⑥ 电压等级 (KV) | Voltage level (kV) |



执行标准 Implementation Standards

- IEC60076-11: 2004<<电力变压器、干式变压器>>
- GB1094.11<<干式电力变压器>>
- GB/T10228-2015<<干式电力变压器技术参数和要求>>
- GB/1094.12<<干式电力变压器负载导则>>
- GB1094.3-2003<<电力变压器第三部分绝缘水平绝缘试验和外绝缘空气间隙>>
- GB4208-1993<<外壳防护等级 (IP) 码>>
- JB/T10088-2004<<6kV-500kV级电力变压器声级>>
- IEC60076-11, 2004 "Power Transformers, Dry-Type Power Transformers"
- GB1094.11, "Dry-Type Power Transformers"
- GB/T10228-2015, "Technical Parameters and Technical Requirements for Dry-Type Power Transformers"
- GB/1094.12, "Loading Guide for Dry-Type Power Transformers"
- GB1094.3-2003, "Part III. Insulation Level, Insulation Testing and External Insulation Air Gap for Power Transformers"
- GB4208-1993, "Cover Protection Grade (IP Code)"
- JB/T10088-2004, "6kV-500kV Sound Level for Power Transformers"

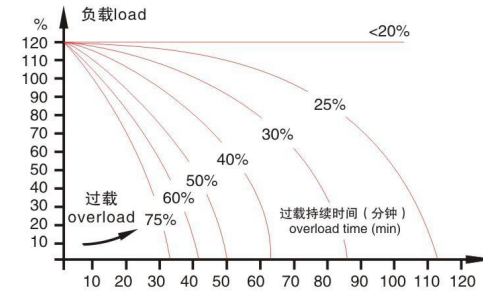
使用环境 Environmental Conditions for Product Use

名称 Descriptions	技术参数 Technical Parameters	
	用于户内、户外(IP2X-IP4X外壳可选)使用, 推荐选用空气制冷方式; This product may be used indoors and outdoors (IP2X-IP4X optional cover). Here air cooling is recommended.	
工作温度 Working Temperature	-40℃ ~ +40℃	若环境温度超出时, 请在定货时提出 In the event when ambient temperature overweight, please mention it in your order;
海拔高度 Sea Level Elevation	1000m	高海拔地区用户, 在定货中提出, 本产品可满足海拔高度4000m以下的用户要求 For any user on an elevation of above 1000 meters, please mention it in your order; in fact, this product may satisfy any user on an elevation of below 4000 meters.
湿度 Humidity	≤93%的场所 Anywhere	产品对空气湿度无严格要求 no strict product requirement upon air temperature
抗震等级 Earthquake Resistance	8级 Degree	

技术参数 Product Parameters

名称 Descriptions	技术参数 Technical Parameters	
电压等级 Voltage Level	35kV、24kV、10kV (10.5kV、11kV)、6kV (6.6kV、6.3kV)、3kV (3.15kV)、0.4kV;	
分接范围 Tapping Range	±2×2.5%或or±5%;	
容量 Capacity	5000KVA以下below;	
连接组别 Interconnection Group	Dyn11或or Yyn0 (优先推荐用户采用Dyn11) (Dyn11 is recommended to users in priority)	
相序 Phase Sequence	C, b, o, a (面对低侧) (Facing low-voltage side)	
绝缘水平 Insulation Level	35kV:H.V.线路端子(line terminal)LI/AC.170/70kV, 10kV:H.V.线路端子(line terminal)LI/AC.75/35kV, 0.4kV:L.V.线路端子(line terminal)LI/AC.-/3kV;	
绝缘耐热等级 Insulation Thermal Resistance	H级grade (180℃);	
调压方式 Voltage Regulation	无励磁调压; 若用户要求有载调压, 也可以单独设计; non-exciting voltage regulation; if any user ask for on-load voltage regulation, voltage regulation could be independently designed.	
其他配置 Other Configurations	外罩、风机温度控制仪根据用户要求确定。 outer cover, cooling fan temperature controller is to be determined as per user requirements.	

产品特点 Product Characteristics



1、过载能力强 Strong Overload Capacity

H级空气绝缘开敞通风式干变 (OVDT) 突出优点是过载能力强——因其绝缘层较薄, 通风散热较好, 采用C级材料 (220℃ Nomex®纸) 作变压器主绝缘制造产品, 利用了C级材料 (220℃) 到H级 (180℃) 之间的绝缘温升裕度, 变压器有很强的过载能力, 一般允许在120%过负荷的情况下长期连续运行; 在IP23环境下无需风机冷却, 仍可长期满负荷运行。

A H grade air-insulating, open ventilated, dry-type transformer (OVDT) has an outstanding advantage, i.e., a high overload capacity——With a thin insulating layer and fine ventilation or fine heat radiation, certain C grade material (220℃Nomex® paper) is used as the main insulation material (manufactured article) for a transformer. With the aid of an insulating layer's temperature rise tolerance from C grade material (220℃) to H grade material (180℃), a transformer may have a rather fine overload capacity and usually a long-term continuous operation under 120% overload is permitted; and such long-term continuous operation may be kept in a IP 23 outer cover even without fan cooling;

2、绝缘耐热等级高 Higher Insulation and Heat Tolerance Levels

H级180℃的绝缘系统, 即辅助绝缘材料耐热温度为180℃, 主要绝缘材料如导线绝缘达到C级 (220℃), 有效防止绝缘材料的热击穿、承受热冲击的性能好。

It adopts a H grade (180℃) insulation system, i.e., the auxiliary insulation material's thermal resistant temperature is as high as 180℃, with the leading insulation material (such lead insulation) has attained C grade (220℃, which could validly prevent from thermal puncture in insulation material, so the product line has a fine anti-thermal impact performance;

3、抗短路能力强 Powerful Anti-Short-Circuit Capability

因采用的Nomex®纸具有很高的机械强度、耐热性能, 故其抗短路能力强。

As Nomex® paper used has a rather high mechanical strength and heat endurance, the anti-short-circuit capability is strong;

4、局放量低 Low Local Discharges

采用成熟真空压力浸渍工艺，配合优良的绝缘材料，使变压器的整体局放<5PC，工作电压下可长期可靠工作。

The adoption of both mature vacuum impregnation process and quality insulation material results in a total local discharge of a transformer of less than 5PC and the transformer could run reliably for a long run under a normal operating voltage;

5、制造方便、维护简单 Convenient to Manufacture and Simple to Care

产品制造无需浇注设备与模具，产品的设计不受模具尺寸的限制，具有较好的灵活性；绕组的修理、更换方便、易操作，重量轻，安装方便。

The product manufacture does not need any casing equipment or mould, so the product design will not be restricted by the mould sizing and it is very flexible to deal with. The product line's windings are convenient to repair or change and easy to operate, light in weight and convenient to install;

6、安全、可靠性高 Highly Safe and Reliable

由于Nomex®纸具有优良的防潮性能、阻燃性能、热化学稳定性能，使得该种变压器在户内，尤其是人口密度较大，通风不良的高层建筑，地下室中得以广泛应用，产品不易老化。

Nomex® paper has outstanding moisture resistance, combustion retardance, and thermo-chemical stability, all of which enable this transformer series to find extensive use in densely populated areas, in poor-ventilated high-rise buildings or basements; the product line is not likely to age;

7、环保性能优越、对使用环境不敏感

Advantageous Environmental Performances and Insensitivity to Environments for Product Use

产品在设计制造、运行、最终处理过程均符合ISO4001及有关环保标准法规的要求，回收方便；借助Nomex®绝缘系统优良耐潮性能，同时经过真空压力H级绝缘漆浸渍，使该产品整体具备三防能力（防潮，防盐雾，防霉），对灰尘、污秽不敏感。

This product line is in compliance with ISO4001 and appropriate environmental protection standards and other regulatory requirements (if applicable) and is convenient to recover, with the aid of a Nomex® insulation system that has a fine moisture-proof performance, and through vacuum impregnation in H grade insulating varnish, this product line possesses a (three-prevention) capability (moisture-proof, salt fog-free, and mold resistant) and thus is insensitive to dusts or dirtiness.

结构特点及制造工艺 Structural Features and Manufacturing Process



铁芯结构 Iron Core Structure

本公司节能环保型真空浸渍干式变压器，铁芯结构为三相三柱结构，采用先进的铁芯横剪设备，及进口优质晶粒取向冷轧硅钢片，和四级接缝结构，有效降低谐波引起的磁滞伸缩，降低空载电流，减小噪音。铁芯外涂H级三防漆，保证产品寿命期间内不生锈。

A 3-phase 3-pole core structure is availed in each of our-supplied, environmental friendly and energy saving, vacuum impregnated dry-type transformers. For optimized core fabrication, an advanced core transverse shearing machine is introduced, quality grain-oriented cold-rolled silicon steel strips are imported, and a four stage joint structure is adopted. All these help to effectively reduce harmonic wave-induced hysteresis expansion and contraction; no-load current; and noise. H grade "three-prevention" varnish is painted on each core's external surface for ensuring no rust may appear during the product line's service life.

铁芯绝缘 Iron Core Insulation

采用H级绝缘板，不吸潮，有效防止绝缘电阻偏低。底座采用H级硅橡胶垫块，减小产品振动，避免与底座产生共振。

H grade insulating plates are used and without moisture absorption, they may validly prevent from a too low insulation resistance value. H grade silicon rubber footpads are availed to lessen vibration of this product line and to avoid resonant vibration between this product line and its seat.

铁芯夹件 Iron Core Clamps

采用优质冷轧钢板（而非槽钢）卷制焊接而成，并经过喷砂处理后，静电喷涂。美观、坚固、可靠。

Iron core clamps are fabricated by wrapping and welding quality cold-rolled steel sheets (other than groove steel) before sand blasting and electrostatic spray painting. They are neat in profile, and sound in structure, and reliable in operation.

撑板 Supporting Plates

低压绕组与铁芯之间采用撑板定位，将铁芯与低压绕组间气隙分隔，起到截断对称声源的相关途径作用，从而达到降低产品噪音目的。

Supporting plate positioning is introduced between every low-voltage winding and every iron core and so-resulted air-borne gaps between every iron core and every low-voltage winding help to cut off the routes and actions relating to a symmetric sound source and thereby reduce the noise of this product line.

低压线圈 Low-Voltage Coils

低压线圈为饼式、箔式结构，该结构线圈有诸多优点：

Low voltage coils has a disc or foil structure and such advantages as listed below:

- 线圈中间设有气道，利于散热。
- 端绝缘容易压紧，具有更高的机械强度。
- 采用聚酯亚胺端圈端绝缘水平提高。
- 导线间进行绝缘隔离，减少涡流损耗。
 - An air channel is provided amid coils for facilitating heat radiation;
 - Coil end insulations are easy to compress in assembling and have a higher mechanical strength too;
 - Adoption of polyesterimide helps to enhance insulating effects on coil ends;
 - Insulating isolation between leads helps to reduce the eddy current loss.

高压线圈 High-Voltage Coils

对于较大容量的干式变压器高压线圈采用饼式结构，线圈上下端线饼间包了绝缘。极低的匝间电压和均匀连续的绝缘，使产品局部放电量很低（<5PC）。饼和饼之间设有气道，使线圈散热条件最好。

对于较小容量的干式变压器高压线圈采用半密封结构，通过改善层间电压的分布，提高了该产品耐受过电压的冲击强度，层间电压大大降低，降低了层间电场强度，防尘性能优越，散热效果显著，分段和绕制方法灵活。

For dry-type transformers with a large capacity, a disc structure is introduced in their high-voltage coils and an insulating layer is added on each coil's upper and lower disc ends. An extremely low inter-turn voltage and an even and continuous insulating layer make this product line have a rather low local discharge (<5PC). The air channel provided between discs brings about best heat radiating conditions in coils.

For dry-type transformers with a small capacity, a semi-package structure is introduced in their high-voltage coils and thus-resulted improvement of interlayer voltage distribution helps to enhance this product line's voltage impulse withstand strength, to greatly lower the interlayer voltage, and accordingly to reduce the interlayer electric field intensity. In addition, as a result, the dust-proof performance is eminent; the heat radiating effects are still distinct, and flexible segmenting and winding methods are really helpful too.

绝缘筒 Insulating Barrel

高压匝间采用强度极高的聚酯亚胺绝缘筒。机械强度高，耐压水平达18kV/mm，又经过特殊工艺处理，使电场更均匀，产品耐压水平轻松达到标准规定等级。

An extremely strong Polyesterimide insulating barrel with a high mechanical strength and with a voltage withstand capacity of 18kV/mm is introduced between high-voltage side and low-voltage side. In addition, after special process treatment, a more evenly distributed electric field is obtained and the product line's voltage withstand level easily meets such a grade as stipulated in an applicable standard.

机械韧性 Mechanical Ductility

结构致密的Nomex®制品具有较高的强度，回弹性和柔性，而且抗撕裂和磨蚀性能良好。

Dense Nomex® article has rather high strength, elastic resilience and flexibility, as well as fine anti-rupture and anti-abrasion performances.

热稳定性 Thermal Stability

低于200℃的温度对Nomex®制品的电气和机械性能影响很小或没有影响。即使在相当高的温度下，Nomex®制品仍能保持其性能的有效值。而且，这些有效的性能在连续暴露于220℃下时能够至少保持10年。

Below 200°C, electrical and mechanical performance of Nomex®articles are less or even not affected. Even in a rather high temperature, Nomex®articles still could keep valid values of such performances. Besides, upon continuous exposure to a <200°C environment, these valid performances may be kept for at least 10 years.

化学兼容性 Chemical Compatibility

Nomex®制品基本上与大多数的溶剂都不发生反应，而且由于没有弱酸的碳氢键的存在，非常耐酸和碱的腐蚀。可以与各种类型的浸渍漆、油、树脂、氟碳化物以及冷冻剂相容。由于Nomex®制品不能被消化，因此不会遭到昆虫、真菌或霉菌的破坏。

Nomex®articles basically do not react with most solvents and are extremely acid- and alkaline- resistant due to no existence of hydrocarbon bonds of a weak acid. They are compatible with many impregnating varnishes, oils, resins, fluorocarbons, and refrigerants. As Nomex®articles could not be digested, they will not be damaged by insects, fungi or molds.

低温性能 Low Temperature Performance

Nomex®制品的独特的聚合结构使其已在许多低温场合得到应用，在液氟的沸点（77k）下，Nomex 410纸以及Nomex 993型层压板具有超过室温下的抗强度值。

Nomex®articles have a unique polymer structure that enables them to find use in many low temperature occasions: at the boiling point of liquid fluorine (77k), both Nomex 410 paper and Nomex 993 laminated plates have a low temperature endurance capacity higher than that under room temperature.

吸潮性 Moisture Absorbance

在相对湿度为95%的状态下，致密的Nomex®纸张及层压板可保持90%完全干燥时的介电强度。同时，很多机械性能实际上得到了改善。

Under a relative humidity of 95%, either dense Nomex®paper or dense Nomex®laminated plates have a dielectric strength under a relative humidity of 90%, i.e., a dielectric strength in a totally dry condition.

抗辐射 Radiation Resistant

800兆拉德（8Mgy）的离子辐射基本上对Nomex®制品不产生影响，经过8次这样照射后，Nomex®制品仍能保持有效的机械和电气性能。

800 Megarad (8Mgy) ion radiations basically have no impact on Nomex®articles, for even after 8 time exposures, Nomex®articles still remain valid both in mechanical performance and in electrical performance.

无毒/耐火 Non-Toxic/Fire-Proof

Nomex®制品不会对人或动物产生任何已知的有毒反应。Nomex®制品不会融化，且因其在220℃时的限氧指数（LOI）大于20.8（在一般空气中的燃烧临界值）故也不会燃烧。

Nomex®articles have no known toxic reaction in humans or in animals. They will not melt and because the limiting oxygen index (LOI) @ 220°C is more than 20.8 (generally a critical combustion value in air), they will not ignite either.

陶瓷件的大量应用 A Large Amount of Ceramic Pieces as Used

高压线圈垫片采用陶瓷垫片，增加了爬电距离。本产品与树脂浇注产品相比可燃物质仅为其1/10。

As high-voltage coil gaskets, porcelain ones are adopted to add the creepage distance. In comparison with a resincast one, this product line only contains 1/10 inflammable substances.

H级无溶剂绝缘漆 Solvent-Free Insulating Paint, Class H

本公司采用H级绝缘漆，其主要原料均为进口材料。无毒、环保，在相对湿度93%的状态下，可保持完全干燥时的介电强度。Our corporation adopts H grade insulating varnish that is made mostly of imported starting materials. Toxic free and environmentally friendly, this varnish, even under a relative humidity of 93%, may remain a dielectric strength in dry conditions.

SG(B)10系列 35KV 级500~3150KVA H级空气绝缘干式电力变压器产品技术数据

Technical Data for SG10 series 35KV 500~3150KVA Dry-type power Transformer H Level Air-insulated Dry Outline Dimensions
表 Table.9:

型号 Type	UK %	Po W	Pk 75℃	Io %	Lp dB A	尺寸 (mm) Outline dimensions L×W×H	GT kg
SGB10-500/35	6	1620	7080	1.4	55	1700X1270X2300	3300
SGB10-630/35	6	1860	8270	1.2	55	1700X1270X2300	3600
SGB10-800/35	6	2160	9740	1.2	55	1905X1270X2400	4000
SGB10-1000/35	6	2430	11210	1.0	55	2000X1270X2400	4600
SGB10-1250/35	6	2835	13590	0.9	55	2100X1470X2500	5100
SGB10-1600/35	6	3240	16530	0.9	55	2200X1675X2500	6200
SGB10-2000/35	6	3830	19480	0.9	56	2300X1675X2500	7500
SGB10-2500/35	6	4460	23370	0.9	57	2400X1675X2600	7650
SGB10-3150/35	8	6030	26130	0.8	57	2500X1675X2600	10000

注：外形尺寸仅供设计选型参考
Note: The outline dimensions are only for reference

SG(B)11系列 10KV级30~2500KVA H级空气绝缘干式电力变压器产品技术数据

Technical Data for SG(B)11 Series 10KV 30~2500kVA H Level Air-insulated Dry-type Power Transformer
表 Table.10:

型号 Type	Po W	Pk 145℃ W	UK %	Io %	Lp dB A	GT Kg	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions	
								L1×W1×H1 (无防护外罩) Without protective covering	L×W×H/c (有防护外罩) With protective covering
SG11-30	180	760	4	1.8	43	410	图Pic.22	910×1000×940	1200×1000×1100/400
SG11-50	250	1070		1.8	43	610	图Pic.22	980×1000×970	1300×1000×1200/550
SG11-80	340	1480	6	1.6	44	520	图Pic.22	980×1100×1030	1300×1100×1200/550
SG11-100	360	1690		1.6	44	630	图Pic.22	1000×1100×1085	1400×1100×1300/550
SG11-125	420	1980	6	1.2	45	670	图Pic.22	1100×1100×1100	1400×1100×1300/550
SG11-160	490	2280		1.2	45	1055	图Pic.22	1130×1100×1030	1600×1100×1400/660
SGB11-200	560	2710	4	1.2	46	1310	图Pic.22	1200×1100×1230	1600×1100×1400/660
SGB11-250	650	2960		1.2	46	1380	图Pic.22	1260×1100×1170	1600×1100×1400/660
SGB11-315	790	3730	6	1.0	46	1580	图Pic.22	1340×1200×1213	1700×1200×1500/660
SGB11-400	880	4280		1.0	47	1870	图Pic.22	1350×1200×1340	1700×1200×1600/660
SGB11-500	1050	5230	6	1.0	47	2005	图Pic.22	1420×1200×1358	1700×1200×1600/660
SGB 11-630	1210	6290		0.8	48	2230	图Pic.22	1500×1200×1420	1800×1200×1700/660
SGB11-630	1170	6400	6	0.8	48	2065	图Pic.22	1560×1200×1365	1800×1200×1700/820
SGB11-800	1370	7460		0.8	48	2490	图Pic.22	1600×1200×1375	1900×1300×1700/820
SGB11-1000	1600	8760	6	0.6	50	2895	图Pic.22	1670×1300×1445	1900×1300×1700/820
SGB11-1250	1880	10370		0.6	51	3350	图Pic.22	1720×1400×1685	2100×1400×1950/820
SGB11-1600	2210	12580	6	0.6	51	3940	图Pic.22	1810×1400×1715	21000×1400×1950/820
SGB11-2000	2720	15560		0.4	52	4800	图Pic.22	1930×1450×1900	2300×1450×2200/820
SGB11-2500	3200	18450	6	0.4	52	5590	图Pic.22	2010×1450×2045	2300×1450×2200/820

注Note:
 (1)外形尺寸仅供设计选型参考；
 The outline dimensions are only for reference.
 (2)有防护外壳外尺寸不包括小车轮，可根据用户要求配小车轮（尺寸另计）；
 The external limit dimensions of casing with protective covering do not include the small wheel.The small wheel is selected according to the customer's needs
 (the size of wheel should be considered additionally).
 (3)根据用户需求，SG10型变压器可提供防护等级为IP20和IP23的外壳，外壳 配树脂绝缘干式变压器。
 According to the customer's needs,IP20 and casings are selectable for Sg10 transformer.The layout of casing is as that of resin-insulated dry-type transformer.
 额定高压电压 (Rated voltage of H.V. side): 10 (11、10.5、6.6、6.3、6、3.15) ± 2 × 2.5% 或 ± 5%KV;
 额定低压电压 (Rated voltage of L.V. side): 0.4KV;
 联结组别 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase)

SG(B)10系列 10KV级30~2500KVA H级空气绝缘干式电力变压器产品技术数据

Specifications of SG (B) 10 series 10KV 30~2500KVA H Level Air-insulated Dry-type Power Transformer

表 Table.10:

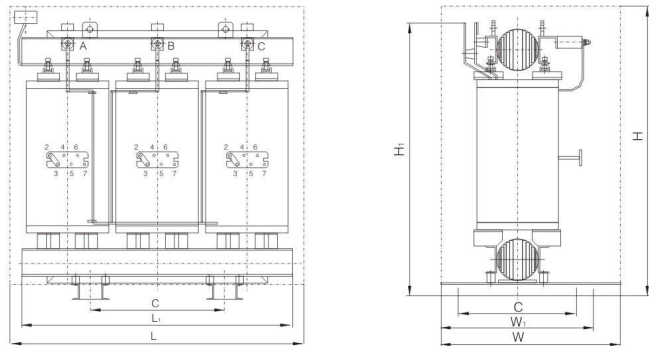
型号 Type	Po W	Pk 145°C W	UK %	Io %	Lp dB A	GT kg	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions	
								L1 × W1 × H1(无防护外罩) Without protective covering	L × W × H/C(有防护外罩) With protective covering
SG10-30	190	760	4	1.0	43	410	图Pic.25	910 × 1000 × 940	1200 × 1000 × 1100/400
SG10-50	270	1070		1.0	43	610	图Pic.25	980 × 1000 × 970	1300 × 1000 × 1200/550
SG10-80	370	1480		1.0	44	520	图Pic.25	980 × 1100 × 1030	1300 × 1100 × 1200/550
SG10-100	400	1690		0.8	44	630	图Pic.25	1000 × 1100 × 1085	1400 × 1100 × 1300/550
SG10-125	470	1980		0.8	45	670	图Pic.25	1100 × 1100 × 1100	1400 × 1100 × 1300/550
SG10-160	540	2280		0.8	45	1055	图Pic.25	1130 × 1100 × 1130	1600 × 1100 × 1400/660
SGB10-200	620	2710		0.8	46	1310	图Pic.25	1200 × 1100 × 1230	1600 × 1100 × 1400/660
SGB10-250	720	2960		0.7	46	1380	图Pic.25	1260 × 1100 × 1170	1600 × 1100 × 1400/660
SGB10-315	880	3730		0.6	47	1580	图Pic.25	1340 × 1200 × 1213	1700 × 1200 × 1500/660
SGB10-400	980	4280		0.6	48	1870	图Pic.25	1350 × 1200 × 1340	1700 × 1200 × 1600/660
SGB10-500	1160	5230	6	0.6	48	2005	图Pic.25	1420 × 1200 × 1358	1700 × 1200 × 1600/660
SGB10-630	1340	6290		0.6	49	2230	图Pic.25	1500 × 1200 × 1420	1800 × 1200 × 1700/660
SGB10-630	1300	6400		0.5	49	2065	图Pic.25	1560 × 1200 × 1365	1800 × 1200 × 1700/820
SGB10-800	1520	7460		0.5	50	2490	图Pic.25	1600 × 1200 × 1375	1900 × 1300 × 1700/820
SGB10-1000	1770	8760		0.5	50	2895	图Pic.25	1670 × 1300 × 1445	1900 × 1300 × 1700/820
SGB10-1250	2090	10370		0.5	52	3350	图Pic.25	1720 × 1400 × 1685	2100 × 1400 × 1950/820
SGB10-1600	2450	12580		0.5	52	3940	图Pic.25	1810 × 1400 × 1715	2100 × 1400 × 1950/820
SGB10-2000	3050	15560		0.4	53	4800	图Pic.25	1930 × 1450 × 1900	2300 × 1450 × 2200/820
SGB10-2500	3600	18450		0.4	53	5590	图Pic.25	2010 × 1450 × 2045	2300 × 1450 × 2200/820

注Note:

- 外形尺寸仅供设计选型参考；
The outline dimensions are only for reference.
- 有防护外壳外形尺寸不包括小车轮，可根据用户要求配小车轮（尺寸另计）；
The external limit dimensions of casing with protective covering do not include the small wheel. The small wheel is selected according to the customer's needs (the size of wheel should be considered additionally).
- 根据用户需求，SGB10型变压器可提供防护等级为IP20和IP23的外壳，外壳 配制同树脂绝缘干式变压器。
According to the customer's needs, IP20 and casings are selectable for Sg10 transformer. The layout of casing is as that of resin-insulated dry-type transformer.

额定高压电压 (Rated voltage of H.V. side): 10 (11、10.5、6.6、6.3、6、3.15) ± 2 × 2.5% 或 ± 5% KV;
额定低压电压 (Rated voltage of L.V. side): 0.4KV;
联结组别 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase)

图25 外形尺寸
Picture.25 Outline Dimension



SGZ(B)10系列

10KV级315~2500KVA H级空气绝缘有载调压干式电力变压器产品技术数据

Specifications of SGZ (B) 10 series 10KV 315~2500KVA H Level Air-insulated Dry-type on-load Regulating Power Transformer

表 Table.11:

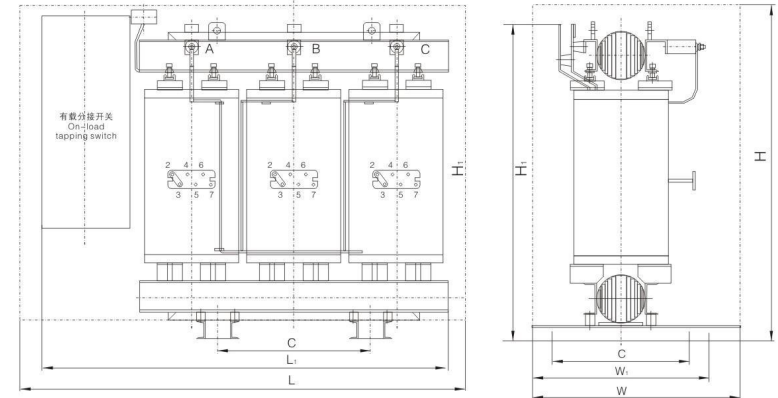
型号 Type	Po W	Pk 145°C W	UK %	Io %	Lp dB A	GT kg	外形图 Outside drawing	外形尺寸 (mm) Outline dimensions L × W × H		
								L × W × H/1(无防护外罩) Without protective covering	L × W × H/C(有防护外罩) With protective covering	
SGZ10-315/10	990	3900	4	2.4	44	1510	图Pic.26	2000 × 1200 × 1200/660	2150 × 1300 × 1600/660	
SGZ10-400/10	1130	4560		1.2	48	2020	图Pic.26	2000 × 1200 × 1380/660	2150 × 1300 × 1680/660	
SGZB10-500/10	1300	5560		1.2	48	2420	图Pic.26	2050 × 1200 × 1500/660	2200 × 1300 × 1800/660	
SGZB10-630/10	1500	6600		1.0	49	2800	图Pic.26	2100 × 1300 × 1800/820	2300 × 1400 × 1900/820	
SGZB10-630/10	1440	6750		1.0	49	2610	图Pic.26	2100 × 1300 × 1800/820	2300 × 1400 × 1900/820	
SGZB10-800/10	1710	7980		1.0	51	2990	图Pic.26	2100 × 1300 × 1600/820	2300 × 1400 × 1900/820	
SGZB10-1000/10	1980	9410		1.0	51	3360	图Pic.26	2400 × 1300 × 1750/820	2500 × 1400 × 2000/820	
SGZB10-1250/10	2340	11210		6	1.0	52	3980	图Pic.26	2550 × 1300 × 1850/820	2700 × 1400 × 2000/820
SGZB10-1600/10	2730	13300			1.0	52	4840	图Pic.26	2700 × 1400 × 2000/820	2900 × 1500 × 2250/820
SGZB10-2000/10	3420	16150			0.8	53	5420	图Pic.26	2700 × 1500 × 2150/820	2800 × 1600 × 2250/1070
SGZB10-2500/10	3960	19380	0.8		54	6700	图Pic.26	2850 × 1500 × 2280/820	3000 × 1600 × 2480/1070	

注Note:

- 外形尺寸仅供设计选型参考；
The outline dimensions are only for reference.
- 有防护外壳外形尺寸不包括小车轮，可根据用户要求配小车轮（尺寸另计）；
The external limit dimensions of casing with protective covering do not include the small wheel. The small wheel is selected according to the customer's needs (the size of wheel should be considered additionally).
- 根据用户需求，SGZ10型变压器可提供防护等级为IP20和IP23的外壳，外壳 配制同树脂绝缘干式变压器。
According to the customer's needs, IP20 and casings are selectable for Sg10 transformer. The layout of casing is as that of resin-insulated dry-type transformer.

额定高压电压 (Rated voltage of H.V. side): 10 (11、10.5、6.6、6.3、6、3.15) ± 2 × 2.5% 或 ± 5% KV;
额定低压电压 (Rated voltage of L.V. side): 0.4KV;
联结组别 (Vector group): Dyn11, Yyn0, 50Hz, 3相(Three-phase)

图26 外形尺寸
Picture.26 Outline Dimension



附件 Accessories



(一) 罩壳 Cover

采用框架组装式外壳，满足干变产品与低压配电屏置于同一配电室，并根据客户需要高、低压母线（排）出线接口，外壳结构紧凑、外观美观、钢性好。用于室内的干变，通常采用IP20的标准防护外壳，它可以防止直径大于12mm的固体异物进入确保用电安全不出事。用于室外干变，则可选用户外使用的IP23外壳。

A frame-assemblage outer cover is availed to satisfy following requirements: i.e., i) putting a dry-type transformer and a low-voltage distribution panel into a same distribution room and ii) making both high- and low-voltage buses' (bus bars) outgoing cable interfaces and outer cover rational in arrangement, compact in volume, beautiful in appearance, and fine in rigidity, as demanded by the customers. An indoor dry-type transformer usually adopts a standard IP20 protective outer cover that may prevent from a solid foreign matter of a 12mm diameter entering into the transformer and thereby ensure that no trouble incurs in electric safety. For an outdoor dry-type transformer, an IP23 outer cover for outdoor use may be selected.

[注：IP23外壳会使变压器散热能力下降，导致容量较小的变压器降容量约5%使用，容量较大的降容量约10%使用]
[Note: The IP23 outer cover may lower a transformer's radiating capacity; and as a result, for a small capacity transformer, a reduction in capacity is as much as 5% or so and for a large capacity transformer, a reduction in capacity is as much as 10% or so.]

(二) 温度控制系统 Temperature Control System

温度测量与控制系统通过在线热点埋设热敏电阻（PT100、PTC）来对绕组温度进行检测与控制；一方面通过面板显示测量温度或数据输出，另一方面，根据测量温度和控制温度设定值，发出相应的风机启停、报警、跳闸等控制信号。

对于常规产品，测温点在靠近铁芯的低压线圈上端，实现直接测温；对于高电压产品，采用间接测温方式，热敏电阻探头与绕组导体有较大绝缘距离及温差。

A temperature measurement and control system measures and controls winding temperatures via such thermally-sensitive resistances (PT100, PTC) as pre-buried on hot points on each coil; on one hand, either measured temperatures or data outputs are displayed on a panel and on the other hand, corresponding control signals for fan on/off actuating, alarming, or tripping are sent in line with both measured temperature and control temperature set value.

For conventional products, temperature measurement points are taken near the upper end of a core's high-voltage coils in order to realize direct temperature measurement; for high-voltage product lines, indirect temperature measurement is availed and there exists a large enough insulation distance and a large enough temperature difference between a thermal sensitive resistance probe and a winding conductor.

(三) 强迫风冷系统 Forced Air Cooling System

强迫风冷系统由温度控制器根据变压器的温度变化控制，实现开启与关闭操作。干式变压器冷却方式为自然空气冷却（AN）和强迫空气冷却（AF）

自然空气冷却（AN）时，正常使用条件下，变压器可连续输出100%的额定容量；强迫空气冷却（AF）时，正常使用条件下，变压器输出容量可提高50%，适用于各种急救过负荷或断续过负荷运行；但由于负载损耗和阻抗电压增幅较大，故不推荐强迫空气冷却（AF）长时间连续过载运行。

对自然空气冷却（AN）和强迫空气冷却（AF）的变压器，均需保证变压器具有良好的通风能力，当变压器安装在地下室或其它通风能力较差环境时，须增设散热通风装置，通风量按每1kW(Po+Pk)2-4m³/min风量选取。

In a forced air cooling system, a temperature controller functions according to the transformer temperature change to realize on/off actuation. Dry-type transformers adopt either natural air cooling (AN) or forced air cooling (AF).

During natural air cooling (AN), under normal operating conditions, a transformer may output 100% rated capacity in a continuous manner; during forced air cooling (AF), under normal operating conditions, a transformer's output capacity may increase by 50%, thereby being suitable for operations under any emergent overload or under any intermittent overload; however, forced air cooling (AF) is not recommended for continuous overload operation for a long duration, due to a large increase in load loss and in impedance voltage.

For a transformer adopting natural air cooling (AN) or forced air cooling (AF), it is necessary to ensure a fine ventilating capacity with either transformer; in the event when a transformer is installed in a underground chamber or when a transformer is installed within an enclosure having a rather poor ventilation, it is necessary to add heating radiators or ventilators, with the ventilation quantity taken as per (Po+Pk)2-4m³/min/1KW.

严格的检测程序 使您获得最高的可靠性

Strict Testing Procedures Enable Your Acquisition Of A Highest Reliability.

线圈冲击耐压试验 Coil Impulse Withstand Voltage Test

高压绕组是浇注式变压器中最关键的部分，其制造质量直接决定了产品的质量。通过使用最严格的制造控制，保证了产品的可靠性。高压线圈在绕制以后和浇注之前，要经过重复脉冲测试。确认没有问题，线圈才在真空下浇注。在浇注之后，测量局部放电水平以确保高压绝缘系统中没有气隙或气泡存在。

High-voltage windings constitute the most key part of a resin-cast transformer, so their manufacturing quality may determine the transformer's product quality. The implementation of strict manufacturing control could guarantee the product quality. Post high-voltage coil winding operation and prior to casting operation, repeated pulse testing is made, for coil-related vacuum pouring could not be done before pulse testing confirmation. After casting, the local discharge level is measured to ensure no air gap or air bubble existing within the high-voltage insulation system.

型式试验 Type Approval Tests

- 1、温升试验
- 2、雷电冲击

1. Temperature Rise Test
2. Lightning Impulse Test

出厂试验 Factory Acceptance Tests

每一台变压器在出厂前都要根据国家标准经过严格的试验检查，进行的出厂试验主要项目有：
Each transformer will be subjected to strict testing according to the national standards' before delivery. The testing items mainly conlude

- | | |
|---------------------|--|
| ● 绝缘电阻测量 | - Insulation Resistance Measurement |
| ● 绕组电阻测量 | - Winding Resistance Measurement |
| ● 电压比测量及电压矢量关系的校定 | - Voltage Ratio Measurement and Voltage Vector Relationship Calibration |
| ● 短路阻抗（主分接）和负载损耗的测量 | - Measurement of Short-Circuit Impedance (Principal Tapping) and Load Loss |
| ● 空载电流和空载损耗的测量 | - Measurement of No-Load Current and No-Load Loss |
| ● 外施耐压试验 | - Applied Voltage Withstand Test |
| ● 感应耐压试验 | - Induction Voltage Withstand Test |
| ● 局部放电测量 | - Local Discharge Measurement |

特殊试验 Special Tests

- 1、噪声水平试验
- 2、测量零序阻抗

1. Noise Level Test
2. Zero-Sequence Impedance

产品·企业市场竞争力的体现
Product·Foundation Stone for Enterprise Impingement on Markets

高压成套开关设备

High-Voltage Complete Switchgears

性能特点 Performance Features

高压成套设备（高压配电柜）是指在电压3kV及以上，频率50Hz及以下的电力系统中运行的户内和户外交流开关设备。主要用于电力系统（包括发电厂、变电站、输电线路和工矿企业等用户）的控制和保护，既可根据电网运行需要将一部分电力设备或线路投入或退出运行，也可在电力设备或线路发生故障时将故障部分从电网快速切除，从而保证电网中无故障部分的正常运行及设备、运行维修人员的安全。因此，高压成套设备是非常重要的输配电设备，其安全、可靠运行对电力系统的安全、有效运行具有十分重要的意义。

Complete high-voltage equipment (high-voltage distribution cabinets) refers to indoor or outdoor AC switchgears running in a 3kV or more, 50Hz or less electrical system and mostly find use for electric control and protection in electrical systems (including but not restricted to users like power plants, substations, power transmission and distribution lines, and industrial or mineral enterprises). To be particular with such electric control and protection, according to electric grid running requirements, these switchgears are used to bring a part of electrical equipment or lines put into or bring it get out of operation; or in the event when any failure occurs with any electrical equipment or any line, these switchgears are used to rapidly cut off the failed part from the electric grid as a whole, thereby ensuring the normal operation of the non-failed part on the electric grid and the safety of equipment and of operators and servicemen. Hence, complete high-voltage equipment pertains to rather important electric power transmission and distribution devices and their safe and reliable operation possesses a great significance to the safe and reliable running of electrical systems.

使用条件 Environmental Conditions for Product Use

- 环境温度：-20℃ ~ +40℃；
- 海拔高度不超过2000M；
- 周围空气相对湿度不大于95%（25℃时）；
- 在矿井下无瓦斯煤尘爆炸危险、无剧烈振动的场所；
- 在不足以腐蚀金属和破坏绝缘的气体及蒸汽的环境中；
- 允许有少量垂直滴水的地方。

- Ambient Temperature: -20℃~+40℃;
- Sea Level Elevation: > 2000m
- Relative Humidity in Ambient Air: > 95% (25℃);
- In a mineral well, any place underground free from gas or coal dust explosion risks and free from violent vibration;
- In an environment where no gas or vapor may corrode metals or damage insulation;
- In any place where a few water drops are allowed.

目录 Catalog

KYN28A-12型铠装移开式交流金属封闭开关设备	KYN28A-12 mode armoured, movable, AC metal-enclosed switchgears
GGX2-12G型高压真空开关柜	GGX2-12G model High-Voltage Vacuum Switch Cabinet
XGN2-12箱型固定式金属封闭开关设备	XGN2-12 cubicle-type stationary metal-enclosed switchgear
HXGN-12F(R)箱型固定交流金属封闭环网开关柜	HXGN-12F(R) cubicle-type stationary AC metal-enclosed ring main switch cabinet
HXGN15A-12型固定式户内交流金属封闭环网开关设备	HXGN15A-12 model stationary indoor AC metal-enclosed ring main switchgear
XGN15-12箱型固定式金属封闭开关设备	XGN15-12 cubicle-type stationary indoor metal-enclosed switchgear
TT系列高压环网柜	TT Series High Voltage Ring Main Unit
XGN-12(TT)型固体绝缘开关设备	XGN-12(TT) model Solid-insulated Switchgear

KYN28A-12型铠装移开式交流金属封闭开关设备

KYN28A-12 Mode Armoured, Movable, AC Metal-Enclosed Switchgears



KYN28A-12型铠装移开式交流金属封闭开关设备，系3.6-12千伏三相交流50Hz单母线及母线分段系统的成套配电装置。主要用于发电厂、中小型发电机送电、工矿企业事业配电以及电业系统的二次变电所的受电、送电及大型高压电动机启动等，实行控制保护、监测之用。

KYN28A-12 armoured, movable, AC metal-enclosed switchgears pertain to a complete power distribution device with regard to a 3.6-12 kV, 3-phase, AC 50Hz single-bus system or bus sectionalization system and mostly find use for electricity transmission in power plants or in middle- and small-size power generators, for electricity distribution in industrial or mineral enterprises or public institutions, for electricity receiving or sending in secondary substations of the electrical industry system, for heavy duty high-voltage motors starting, and for implementing control protection or monitor, etc.

型号含义 Type Connotations

K	Y	N	28A	—	12	(Z)
①	②	③	④	⑤	⑥	
① 铠装						① Armored
② 抽出式						② Draw-Out Type
③ 户内						③ Indoor
④ 设计序号						④ Design No.
⑤ 额定电压 (kV)						⑤ Nominal Voltage (kV)
⑥ 真空断路器						⑥ Vacuum Circuit Breaker Installed

使用环境 Environmental Conditions for Product Use

- 周围空气温度：最高+40℃；最低-25℃；
 - 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
 - 相对湿度：日平均值不大于95%，月平均值不大于90%；
 - 周围空气不受腐蚀性气体、水蒸汽明显污染；
 - 无经常性剧烈震动；
 - 在超过GB3906规定的正常条件下使用时，由用户和制造厂协商。
- Ambient Air Temperature: maximum +40℃; minimum -25℃;
 - Sea Level Elevation: 1000m; for any user on an elevation of above 1000 meters, please mention it in your order; in fact, this product may satisfy any user on an elevation of below 4000 meters;
 - Relative Humidity: Daily Average Value >= 95%; Monthly Average Value > 90%;
 - Ambient air is not subject to the evident contamination by any corrosive gases or water vapor;
 - No regular violent vibration occurred;
 - With regard to any use other than in normal conditions stipulated under GB3906, it is necessary to initiate a negotiation between user and manufacturer.

技术参数 Product Parameters

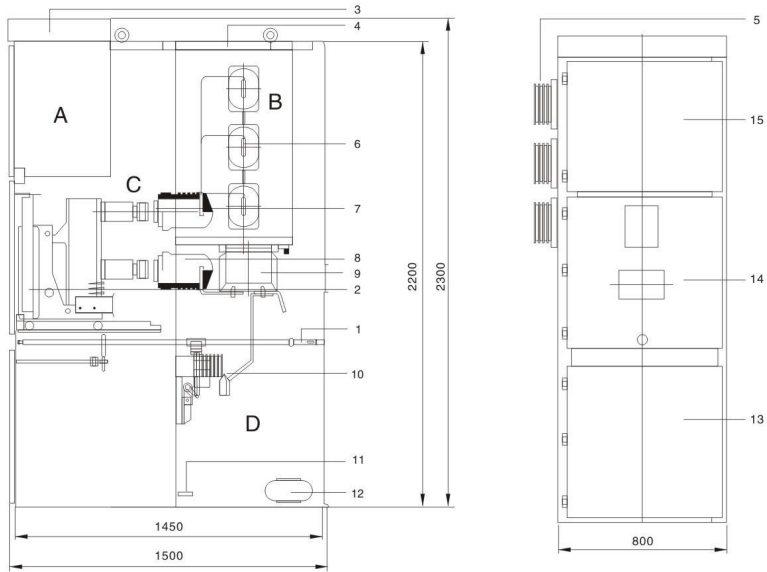
序号 No.	名称 Descriptions	单位 Unit	参数 Parameters
1	额定电压 rate voltage	kV	3.6, 7.2, 12
2	额定绝缘水平 1min工频耐受电压 nominal insulation level 1min power-frequency withstand voltage	kV	42/48 (断开) Distance
3	雷电冲击耐受电压 (峰值) lightning impulse withstand voltage (peak)	kV	75/85 (断开) Distance
4	额定频率 nominal frequency	Hz	50
5	额定电流 rated current	A	630 ~ 3150
6	额定短时耐受电流 (4S) rated short-time withstand current (4S)	kA	20, 25, 31.5, 40, 50
7	额定峰值耐受电流 rated peak value withstand current	kA	50, 63, 80, 100, 125
8	额定短路开断电流 rated short-circuit drop-out current	kA	20, 25, 31.5, 40, 50
9	额定短路关合电流 (峰值) rated short-circuit making current (peak)	kA	40, 50, 63, 80, 100, 125
10	辅助控制回路额定电压 auxiliary control loop's nominal voltage	V	AC110V, DC110V, DC220V, AC220V
11	保护等级 protection level		外壳为IP4X, 隔壁间, 断路器室门打开时为IP2X outer cover: IP4X; when the partition room door or the circuit breaker room door is open: IP2X.

产品特点 Product Characteristics

- 本开关柜由固定的柜体和可抽出部件（简称手车）两大部分组成。开关柜的外壳和各功能单元的隔板均采用敷铝锌钢板制成。
- 柜壳密封度高，防止设备受杂物和虫害侵入，防护等级IP4X，断路器室门完全打开时的防护等级为IP2X。
- 所有的操作均可在柜门关闭状态下进行。
- 简单且有效的闭锁，可防止误操作，符合“五防”要求。
- 开关柜可安装成双重柜并列，即安装成面对面排列。由于开关柜的安装与调试均可在正面进行，所以可靠墙安装以节省占地面积；同时亦有适合双面维护的非靠墙安装的结构，这样可满足不同的安装场合的需要。

- This kind of switch cabinets each consists of a fixed cabinet body and a withdrawable part (handcart for short). The cabinet's outer cover and division plates in every functional unit are made of aluminum-zinc-coated steel plates;
- The cabinet enclosure is highly sealed for fear of any foreign matter or any pest's invading into the equipment. Under normal operation, the protection level is as high as IP4X and in the event when the circuit breaker room door is entirely opened, the protection level remains on IP2X;
- All equipment operations may be done with the cabinet door closed;
- Simple an efficacious interlock may prevent from mis-operation and satisfy "five-protection" requirements;
- The Switch cabinets could be installed in parallel (i.e., face-to-face in double rows). As the installation and adjustment of these switchgears may be done on the front surface, they could be wall mounted to save holding lands. In contrast, there is also a no-wall installation arrangement suitable for double-sided maintenance & care, only that it is adopted just for meeting diversified requirements under different installation occasions.

内部结构布置图 Internal Structural Arrangement



A 仪表室
Instrument Room

B 母线室
Bus Room

C 断路器室
Circuit Breaker Room

D 电缆室
Cable Room

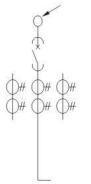
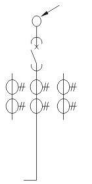
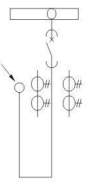
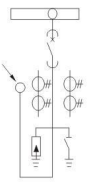
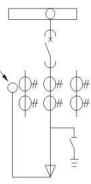
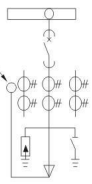
1. 接地开关联锁机构
Interlocking Mechanism for Earthing Switches
2. 断路器
Circuit Breaker
3. 小母线室
Minor Bus Room
4. 泄压装置
Pressure Relief Device
5. 穿墙套管
Wall Bushing
6. 母线
Bus
7. 活门联锁机构
Valve Interlocking Mechanism

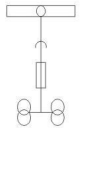
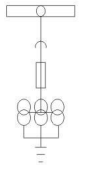
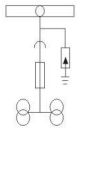
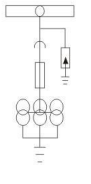
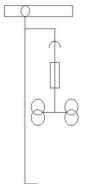
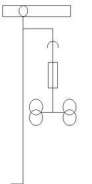
8. 触头盒
Contact Box
9. 电流互感器
Current Transducer
10. 接地开关
Earthing Switch
11. 接地母线
Earthing Bus
12. 零序电流互感器
Zero-Sequence Current Transducer
13. 下门
Relay Room Door
14. 断路器室门
Lower Door
15. 继电器室仪表门
Instrument Door in Relay Room

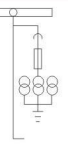
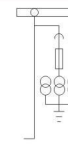



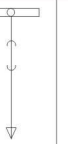
开关柜一次接线方案 Cabinet's Primary Wiring Plan






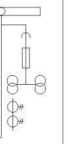
方案编号 Plan Code	001	002	003	004	005	006
主电路方案 Main Circuit Scheme						
柜体尺寸 (WxDxH) Cabinet Dimensions (WxDxH)	800 (1000) x1500x2300					
额定电流 (A) Nominal Current (A)	630-3150					
一次主要设备元件 Primary Elements for Key Equipment	真空断路器 Vacuum Circuit Breaker	1	1	1	1	1
	电流互感器LZZBJ9-12(C) Current Transducer LZZBJ9-12(C)	2	2	2	3	3
	电压互感器JDZ18-12 Voltage Transducer JDZ18-12					
	高压熔断器XRNP-12 High-Voltage Fuse Protector XRNP-12					
	接地开关JN15-12 Earthing Switch JN15-12		1	1		1
避雷器YH5WS-17/50 Lightning Arrester YH5WS-17/50			3			3
回路名称 Loop Name	受电、馈电 Electricity Receiving, Electricity Feeding					
备注 Remarks	额定电流1600A及以上，则柜宽为1000mm For a nominal current of 1600A or above, Cabinet Width: 1000mm					

方案编号 Plan Code	007	008	009	010	011	012
主电路方案 Main Circuit Scheme						
柜体尺寸 (WxDxH) Cabinet Dimensions (WxDxH)	800 (1000) x1500x2300					
额定电流 (A) Nominal Current (A)	630-3150					
一次主要设备元件 Primary Elements for Key Equipment	真空断路器 Vacuum Circuit Breaker	1	1	1	1	1
	电流互感器LZZBJ9-12(C) Current Transducer LZZBJ9-12(C)	2	2	3	3	2
	电压互感器JDZ18-12 Voltage Transducer JDZ18-12					
	高压熔断器XRNP-12 High-Voltage Fuse Protector XRNP-12					
	接地开关JN15-12 Earthing Switch JN15-12					
避雷器YH5WS-17/50 Lightning Arrester YH5WS-17/50						
回路名称 Loop Name	联络 (右) Interconnection (Right)	联络 (左) Interconnection (Left)	联络 (右) Interconnection (Right)	联络 (左) Interconnection (Left)	架空进线 (右联络) Overhead Incoming Cable (Right Interconnection)	架空进线 (左联络) Overhead Incoming Cable (Left Interconnection)
备注 Remarks	额定电流1600A及以上，则柜宽为1000mm For a nominal current of 1600A or above, Cabinet Width: 1000mm					

方案编号 Plan Code	013	014	015	016	017	018	
主电路方案 Main Circuit Scheme							
柜体尺寸 (WxDxH) Cabinet Dimensions (WxDxH)	800 (1000) x1500x2300						
额定电流 (A) Nominal Current (A)	630-3150						
一次主要设备元件 Primary Elements for Key Equipment	真空断路器 Vacuum Circuit Breaker	1	1	1	1	1	1
	电流互感器LZZBJ9-12(C) Current Transducer LZZBJ9-12(C)	3	3	2	2	3	3
	电压互感器JDZ18-12 Voltage Transducer JDZ18-12						
	高压熔断器XRNP-12 High-Voltage Fuse Protector XRNP-12						
接地开关JN15-12 Earthing Switch JN15-12				1	1	1	
避雷器YH5WS-17/50 Lightning Arrester YH5WS-17/50				3		3	
回路名称 Loop Name	架空进线 (右联络) Overhead Incoming Cable (Right Interconnection)	架空进线 (左联络) Overhead Incoming Cable (Left Interconnection)	架空进出线 Overhead Incoming and Outgoing Cables				
备注 Remarks	额定电流1600A及以上, 则柜宽为1000mm For a nominal current of 1600A or above, Cabinet Width: 1000mm						

方案编号 Plan Code	019	020	021	022	023	024	
主电路方案 Main Circuit Scheme							
柜体尺寸 (WxDxH) Cabinet Dimensions (WxDxH)	800 (1000) x1500x2300						
额定电流 (A) Nominal Current (A)	630-3150						
一次主要设备元件 Primary Elements for Key Equipment	真空断路器 Vacuum Circuit Breaker						
	电流互感器LZZBJ9-12(C) Current Transducer LZZBJ9-12(C)						
	电压互感器JDZ18-12 Voltage Transducer JDZ18-12	2	3	2	3	2	2
	高压熔断器XRNP-12 High-Voltage Fuse Protector XRNP-12	3	3	3	3	3	3
	接地开关JN15-12 Earthing Switch JN15-12						
避雷器YH5WS-17/50 Lightning Arrester YH5WS-17/50			3	3			
回路名称 Loop Name	电压互感器 Voltage Transducer		电压互感器+避雷器 Voltage Transducer + Lightning Arrester		电压互感器+母联 Voltage Transducer + Bus Bar		
备注 Remarks	额定电流1600A及以上, 则柜宽为1000mm For a nominal current of 1600A or above, Cabinet Width: 1000mm						

方案编号 Plan Code	025	026	027	028	029	030
主电路方案 Main Circuit Scheme						
柜体尺寸 (WxDxH) Cabinet Dimensions (WxDxH)	800 (1000) x1500x2300					
额定电流 (A) Nominal Current (A)	630-3150					
一次主要设备元件 Primary Elements for Key Equipment	真空断路器 Vacuum Circuit Breaker					
	电流互感器LZZBJ9-12(C) Current Transducer LZZBJ9-12(C)					
	电压互感器JDZ18-12 Voltage Transducer JDZ18-12	3	3			
	高压熔断器XRNP-12 High-Voltage Fuse Protector XRNP-12	3	3			
	接地开关JN15-12 Earthing Switch JN15-12					
避雷器YH5WS-17/50 Lightning Arrester YH5WS-17/50						
回路名称 Loop Name	电压互感器+母联 Voltage Transducer + Bus Bar		母联 Bus Bar		隔离 Isolation	隔离+联络 (右) Isolation + Interconnection (Right)
备注 Remarks	额定电流1600A及以上, 则柜宽为1000mm For a nominal current of 1600A or above, Cabinet Width: 1000mm					

方案编号 Plan Code	031	032	033	034	035	036	
主电路方案 Main Circuit Scheme							
柜体尺寸 (WxDxH) Cabinet Dimensions (WxDxH)	800 (1000) x1500x2300						
额定电流 (A) Nominal Current (A)	630-3150						
一次主要设备元件 Primary Elements for Key Equipment	真空断路器 Vacuum Circuit Breaker						
	电流互感器LZZBJ9-12(C) Current Transducer LZZBJ9-12(C)						
	电压互感器JDZ18-12 Voltage Transducer JDZ18-12				2	2	3
	高压熔断器XRNP-12 High-Voltage Fuse Protector XRNP-12				3	3	3
	接地开关JN15-12 Earthing Switch JN15-12			1			
避雷器YH5WS-17/50 Lightning Arrester YH5WS-17/50							
回路名称 Loop Name	隔离+联络 (左) Isolation + Interconnection (Left)	出线变相 Phase Changing of Outgoing Cable		计量+右联 Measurement + Right Interconnection	计量+左联 Measurement + Left Interconnection	计量+右联 Measurement + Right Interconnection	
备注 Remarks	额定电流1600A及以上, 则柜宽为1000mm For a nominal current of 1600A or above, Cabinet Width: 1000mm						

订货须知 Ordering Instructions

KYN28-12开关柜订货时请提供下列技术资料:

When ordering any KYN28-12 switch cabinet, please provide under-listed technical data:

- 一次线路系统图; 额定短路开断电流; 额定电流; 额定电压; 电流互感器的变比; 各馈线回路额定电流; 电压互感器的变比; 以及其它主要电气元件型号规格。
- 各柜选用的二次线路方案原理及端子排图
- 开关柜排列图及平面布置图
- 主母线规格
- 小母线布置图
- 电器件汇总表
- Primary Circuit System Diagram; Nominal Short-Circuit On/Off Current; Nominal Current; Nominal Voltage; Transformation Ratio of a Current Transducer; Nominal Current for Each Feeder Loop; Transformation Ratio of a Voltage Transducer; and Types & Specifications of Other Significant Electrical Elements;
- Secondary Circuit Plan Principles and Terminal Arrangement Sketch for Each Cabinet
- Switch Cabinet Arrangement Sketch and Plan Layout
- Main Bus Specifications
- Minor Bus Distribution Diagram
- Summary List of Itemized Electric Components



GGX2-12G型高压真空开关柜

GGX2-12G model High-Voltage Vacuum Switch Cabinet

本产品是在原电力部、机械部联合设计的GGX2-12型开关柜的基础上改进而成，在涵括GGX2-12开关柜所有优点的基础上，使开关柜的内部结构更趋合理，从而减小柜体体积；操作机构的模块化使操作更简单，全机械“五防”联锁更可靠，二次保护既可选用继电器保护，也可选用微机保护，借助微机的强大功能可方便的实现遥测、遥信、遥调、遥控功能，本产品符合GB3906、DL404、IEC298等标准。

本产品适用于额定电压3.6~12KV、频率50Hz的三相交流电力系统，用于接受和分配电能并对电路实行控制、保护和监测。

This product line is a modification version of GGX2-12 switch cabinets that were jointly designed by former Electric Power Ministry and former Mechanical Ministry. With all advantages of GGX2-12 versions included, the modified ones are more rational in internal structure and reduced in cabinet volume. Modularization of the operating mechanism makes GGX2-12G versions simple to operate; entirely mechanical "five-protection" interlock makes GGX2-12G more reliable to manipulate; and optional for secondary protection are relay protection and microcomputer protection and the latter's powerful functions do facilitate the realization of remote measuring, remote signaling, remote regulating, and remote controlling functions. This product line meets standards like GB3906, DL404, IEC298, etc.

This product line is applicable to 3.6-12KV (nominal voltage), 50Hz, 3-phase AC electrical systems for electric power receive and distribution and for electric circuit control, protection and monitor.

使用环境 Environmental Conditions for Product Use

- 环境温度：上限+40℃；下限-15℃
- 海拔高度：不超过1000m
- 相对湿度：日平均值≥95%；月平均值≥90%。
在高湿期内温度急降时允许产生凝露。
- 地震烈度：不超过8度。
- 周围空气不受腐蚀性气体，水蒸气明显污染。无经常性剧振动。

- Ambient Temperature: Upper Limit, +40℃; Lower Limit, -15℃
- Sea Level Elevation: NMT 1000m
- Relative Humidity: Daily Average Value ≥ 95%; Monthly Average Value ≥ 90%;
Upon a precipitate drop in temperature during certain high humidity period, dewing is permitted.
- Earthquake Intensity: NMT 8 Degree
- Ambient air is not subject to the evident contamination by any corrosive gases or water vapor. No regular violent vibration occurred.

型号含义 Type Connotations

GGX2-12G

① ② ③ ④ ⑤

- | | |
|-------------|---------------------------|
| ① 高压设备 | ① High-Voltage equipment |
| ② 固定箱型 | ② Stationary Cubicle-type |
| ③ 设计序号 | ③ Design No. |
| ④ 额定电压 (kV) | ④ Nominal Voltage (kV) |
| ⑤ 改进型 | ⑤ Improved type |

技术参数 Product Parameters

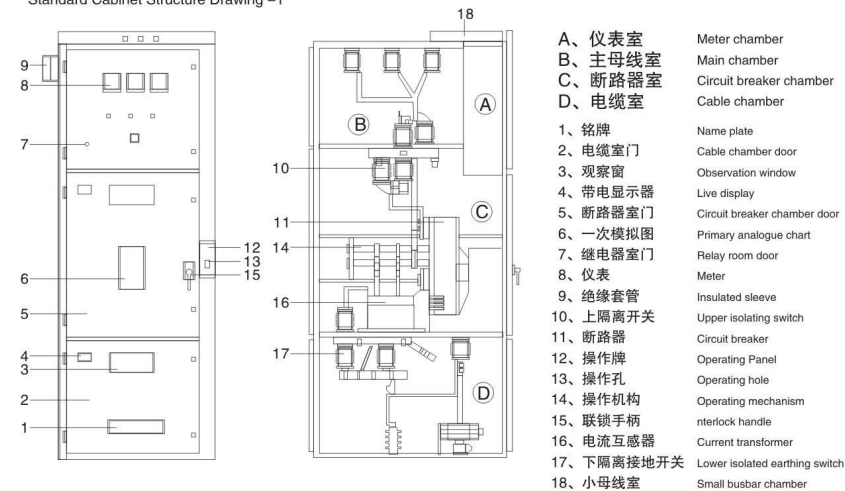
序号 Number	名称 Descriptions	单位 Unit	参数值 Parameters				
1	额定电压 rated voltage	KV	3.6	7.2	12		
2	额定频率 rated current	HZ	50				
3	1分钟工频耐压(有效值) 1 min power-frequency with stand voltage (valid value)	相对地、相间 back-to-back, face-to-face	KV	24	32	42	
		断口向 rupture direction	KV	26	36	48	
	额定雷电冲击耐压(峰值) rated lightning impulse withstand voltage(peak value)	相对地、相间 back-to-back, face-to-face	KV	40	69	75	
		断口向 rupture direction	KV	43	66	85	
4	额定电流 rated current	A	630,1250,1600,2000,2500,3150,4000				
5	额定开断电流 rate drop-out current	KA	20	25	31.5	40	50
6	额定动稳定电流(峰值) rated dynamic stable current (peak value)	KA	50	63	80	100	125
7	额定热稳定电流(有效值) rated thermal stable current (valid value)	KA	20	25	31.5	40	50
8	额定热稳定时间 rated thermal stable duration	S	4			3	
9	防护等级 protection level		IP2X				

产品特点 Product features

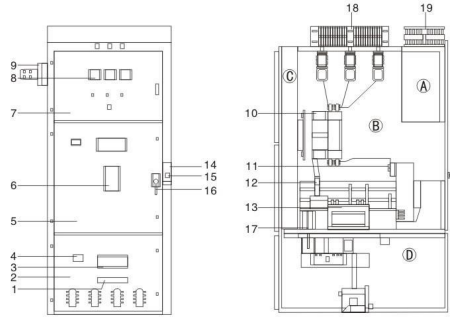
GGX2型开关柜为箱型固定式金属封闭开关设备，柜体骨架为角钢焊接或全组装柜体。开关柜由以下功能室如母线室、小母线室、仪表室、断路器室、电缆室、架空母线室、旁路母线室和装于柜体右侧中部的隔离开关操作机构联锁组成。主要功能室设有排气通道用于释放故障产生的高压气体。各柜之间设有防止故障蔓延的相间绝缘套管。

GGX2 switch cabinets pertain to one kind of box-type, fixed, metal-enclosed switchgear with an angle steel-welded cabinet frame or with a totally assembled cabinet body. Each switchgear consists of functional rooms (such as the main bus room, minor bus room, instrument, room, circuit breaker room, cable room, overhead bus room, and by-pass bus room) and isolating switch operating mechanism interlock that is installed in the middle of the cabinet's right side. The main functional room is equipped with an air ventilating channel for releasing accident-incurred high-pressure gases. Inter-cabinet insulation bushings are provided between cabinets for the prevention of accidents spreading, if any.

标准柜体结构图-1 Standard Cabinet Structure Drawing-1

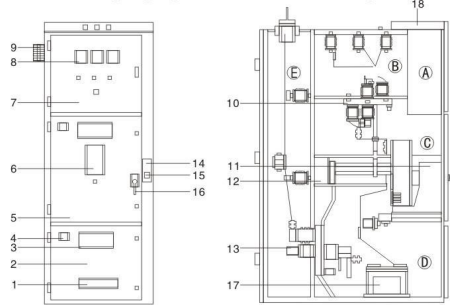


大电流电缆柜体结构图-2
High current cable cabinet structure drawing 2



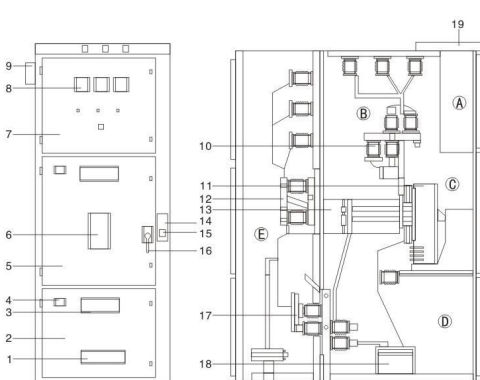
- | | |
|---------|-------------------------|
| A、仪表室 | Meter chamber |
| B、主要元件室 | Main element room |
| C、泄压通道 | Pressure relief passage |
| D、电缆室 | Cable room |
-
- | | |
|------------|--------------------------------|
| 1、铭牌 | Nameplate |
| 2、电缆室门 | Cable chamber door |
| 3、观察窗 | Observation window |
| 4、带电显示器 | Live display |
| 5、断路器室门 | Circuit breaker chamber door |
| 6、一次模拟图 | Primary analogue chart |
| 7、继电器室门 | Relay room door |
| 8、仪表 | Meter |
| 9、绝缘套管 | Insulated sleeve |
| 10、上隔离开关 | Upper isolating switch |
| 11、断路器 | Circuit breaker |
| 12、操作机构 | Operating mechanism |
| 13、电流互感器 | Current transformer |
| 14、操作牌 | Operating panel |
| 15、操作孔 | Operating hole |
| 16、联锁手柄 | Interlock handle |
| 17、下隔离接地开关 | Lower isolated earthing switch |
| 18、排风室 | Ventilation room |
| 19、小母线室 | Small busbar chamber |

架空进出线柜体结构图-3
Overhead incoming/outgoing line cabinet structure drawing 3



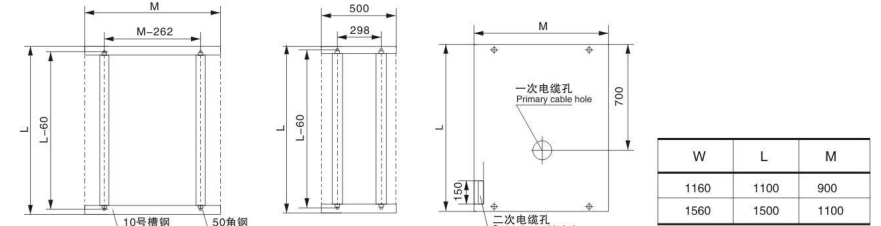
- | | |
|----------|-----------------------------|
| A、仪表室 | Meter chamber |
| B、主母线室 | Main busbar chamber |
| C、断路器室 | Circuit breaker chamber |
| D、电流互感器室 | Current transformer chamber |
| E、架空母线室 | Overhead busbar |
-
- | | |
|------------|--------------------------------|
| 1、铭牌 | Nameplate |
| 2、电缆室门 | Cable chamber door |
| 3、观察窗 | Observation window |
| 4、带电显示器 | Live display |
| 5、断路器室门 | Circuit breaker chamber door |
| 6、一次模拟图 | Primary analogue chart |
| 7、继电器室门 | Relay room door |
| 8、仪表 | Meter |
| 9、绝缘套管 | Insulated sleeve |
| 10、上隔离开关 | Upper isolating switch |
| 11、断路器 | Circuit breaker |
| 12、操作机构 | Operating mechanism |
| 13、下隔离接地开关 | Lower isolated earthing switch |
| 14、操作牌 | Operating panel |
| 15、操作孔 | Operating hole |
| 16、联锁手柄 | Interlock handle |
| 17、电流互感器 | Current transformer |
| 18、小母线室 | Small busbar |

旁路柜体结构图-4
Bypass cabinet structure drawing 4



- | | |
|----------|--------------------------|
| A、仪表室 | Meter chamber |
| B、主母线室 | Main busbar chamber |
| C、断路器室 | Circuit breaker chamber |
| D、电流互感器室 | Current transformer room |
| E、旁路室 | Bypass room |
-
- | | |
|------------|-------------------------|
| 1、铭牌 | Nameplate |
| 2、电缆室门 | Cable chamber door |
| 3、观察窗 | Observation window |
| 4、带电显示器 | Live display |
| 5、断路器室门 | Circuit breaker chamber |
| 6、一次模拟图 | Primary analogue chart |
| 7、继电器室门 | Relay room door |
| 8、仪表 | Meter |
| 9、绝缘套管 | Insulated sleeve |
| 10、上隔离开关 | Upper isolating switch |
| 11、断路器 | Circuit breaker |
| 12、旁路隔离开关 | Passby isolating switch |
| 13、操作机构 | Operating mechanism |
| 14、操作牌 | Operating panel |
| 15、操作孔 | Operating hole |
| 16、联锁手柄 | Interlock handle |
| 17、下隔离接地开关 | Current transformer |
| 18、电流互感器 | Current transformer |
| 19、小母线室 | Small busbar |

安装地基尺寸图 Installation Foundation Dimension Drawing



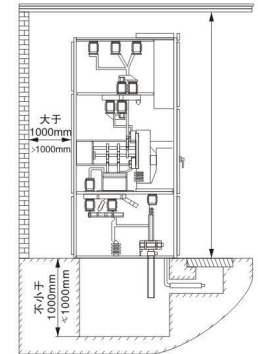
注：一次电缆孔和二次电缆孔图示为基本尺寸，用户可根据实际情况加大尺寸，但是不能影响柜体结构和地基强度
Note: the figure of primary cable hole and secondary cable hole shows basic dimension, users can enlarge size as per actual situations, but should not affect cabinet structure and foundation strength.

订货须知 Ordering Instructions

订货时应提供下列资料

- 主接线及系统图、排列图及平面布置图
- 用户提供二次原理图、端子排列图，若无端子排列图应以制造厂排列顺序为准。
- 电气设备汇总表
- 需要母线桥（柜间桥还是墙柜桥）时需提供跨度和高度尺寸
- 特殊环境下使用的开关柜应在订货时提出
- 需要其它或特殊附件时应提出种类和数量

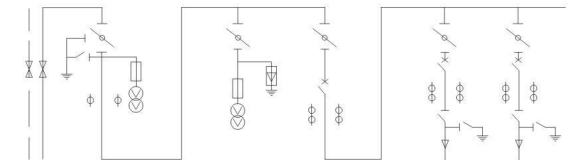
- It is necessary to provide following information upon ordering:
- Main wiring and system diagram, arrangement diagram and floor plan.
 - User should provide secondary schematic diagram and terminal arrangement diagram, if terminal arrangement diagram is not available, it is necessary to follow the arrangement sequence specified by manufacturer.
 - Summary table of electric equipments
 - Where busbar bridge (bridge between cabinets or bridge between wall and cabinet) is required, it is necessary to provide span and height dimension.
 - It is necessary to indicate switch cabinet to be used under special circumstances upon ordering.
 - It is necessary to indicate type and quantity where other or special attachments are required.



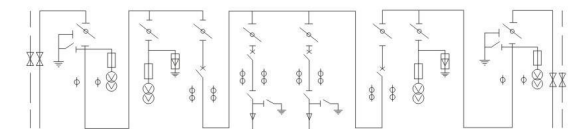
高压成套开关设备
High-Voltage Complete Switchgears

方案应用实例 Example of Program Application

单电源电缆进出线典型方案
Typical program for single-power-source incoming/outgoing cable



双电源电缆进出线典型方案
Typical program for double-power-source incoming/outgoing cable



XGN2-12箱型固定式金属封闭开关设备

XGN2-12 Cubicle-Type Stationary Metal-Enclosed Switchgear

XGN2-12箱型固定式金属封闭开关设备，适用于3.6-12kV、50Hz，额定电流630-3150A三相交流，单母线和单母线带旁路或双母线系统中作为接受和分配电能之用，安装于户内场所。可满足各种类型发电厂、变电站（所）及工矿企业的使用要求。

XGN2-12 cubicle-type stationary metal-enclosed switchgear applies to 3.6-12kV/50Hz, rated current 630-3150A 3-phase AC, is used for power receiving and distribution in single busbar, single busbar with bypass or dual-busbar system, and is installed in indoor location. It can meet usage requirements of various types of power plants, transformer substation (plant) and industrial and mining enterprises.



型号含义 Type Connotations

X G N 2-12 □ □ / □ - □

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① 箱式结构	Cubicle-type structure
② 固定式	Stationary type
③ 户内	Indoor
④ 设计序号	Design serial number
⑤ 额定电压kV	Rated voltage kV
⑥ 断路器类型 (Z真空断路器, 少油断路器无代号)	Type of circuit breaker (Z for vacuum circuit breaker, and no code for oil-minimum circuit breaker)
⑦ 主回路方案代号	Program code of main circuit
⑧ 操动机构类型 (D电磁, T弹簧)	Operating mechanism type (D for electromagnetism and T for spring)
⑨ 额定电流A	Rated current A
⑩ 额定短路开断电流kA	Rated short-circuit breaking current kA

产品特点 Product Features

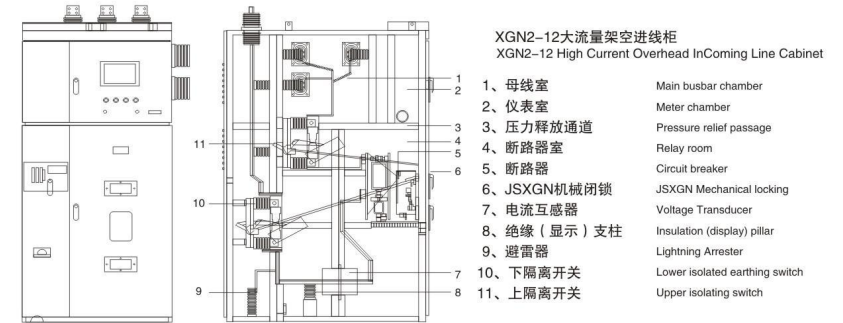
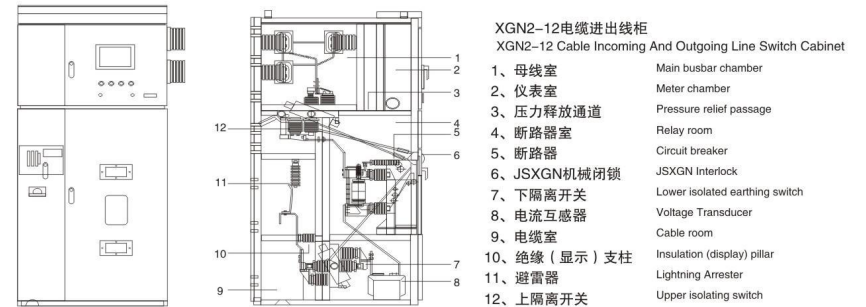
本开关柜为金属封闭结构，防护等级为IP4X，主开关柜采用ZN28A-10系列真空断路器，配有CD10、CD17A系列电磁操动机构或CT19B系列弹簧操动机构，隔离开关采用GN30-12系列旋转式隔离开关，GN22-10大电流隔离开关系列产品。主开关、隔离开关、接地开关及柜门之间的连锁机构采用强制性机械闭锁方式，符合“五防”功能、具有结构合理、安全可靠、操作简便、维护方便等特点。

This switch cabinet is of metal-enclosed structure, degree of protection is IP4X, main switch cabinet adopts ZN28A-10 series of vacuum circuit breaker, and is configured with CD10/CD17A series of electromagnetic operating mechanism or CT19B series of spring operating mechanism, disconnecting switch adopts GN30-12 series of rotary disconnecting switch, and GN22-10 large current disconnecting switch series of product. Interlock mechanism between main switch, disconnecting switch, earthing switch and cabinet door adopts compulsory mechanical locking mode, is in compliance with "five-proof" function, and features characteristics such as reasonable structure, safety and reliability, convenient operation and convenient maintenance, etc.

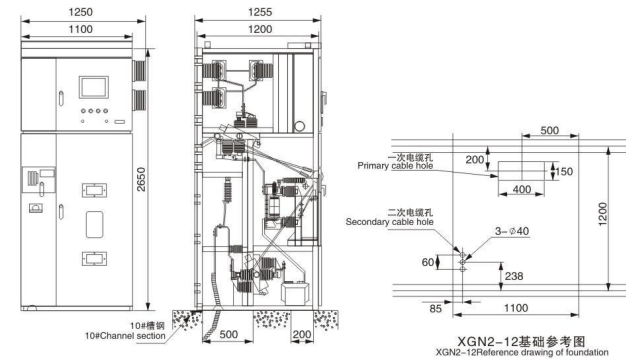
技术参数 Product Parameters

名称 Descriptions	单位 Unit	参数 Parameters
额定频率 Rated frequency	Hz	50
额定电压 (最高工作电压) Rated voltage (maximum operating voltage)	kV	3.6, 7.2, 12
额定电流 Rated current	A	630-3150
额定短路开断电流 Rated short-circuit breaking current	kA	16, 20, 31.5, 40
额定短路关合电流 (峰值) Rated short-circuit making current (peak)	kA	40, 50, 80, 100
额定短路动稳定电流 (峰值) Rated short-circuit dynamic stable current (peak)	kA	40, 50, 80, 100
额定热稳定电流 Rated thermal stable current	kA	16, 20, 31.5, 40
额定热稳定时间 Rated thermal stable time	S	4
额定绝缘水平 Rated insulation level	1min工频耐受电压 1min power frequency withstand voltage	相间、相对地42, 隔离断口48 Phase-to-phase and phase-to-ground 42, isolating distance 48
	雷电冲击耐受电压 (峰值) Lightning impulse withstand voltage (peak)	相间、相对地75, 隔离断口85 Phase-to-phase and phase-to-ground 75, isolating distance 85
操作方式 Operation mode		电磁式, 弹簧储能式 Electromagnetic type, spring energy-storage type
外形尺寸: 宽 × 深 × 高 Exterior dimension: W × D × H	mm	1100 × 1200 × 2650 (一般型) 1100 × 1200 × 2650 (ordinary type)
重量 Weight	kg	1000
防护等级 Degree of protection		IP4X

内部结构布置图 Internal Structural Arrangement



产品安装 Installation Foundation Dimension Drawing





HXGN-12F(R)箱型固定交流金属封闭环网开关柜

HXGN-12F(R) Cubicle-Type Stationary AC Metal-Enclosed Ring Main Switch Cabinet

HXGN-12F(R)型箱型固定交流金属封闭开关设备（简称环网柜），是额定电压12KV，额定频率50HZ的交流高压成套电器装置，主要用于三相交流环网，终端配电网和工业用电设备，起接受、分配电能和保护等作用。

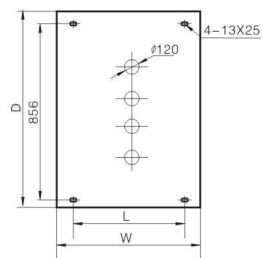
As a AC high-voltage complete electric device of rated voltage 12KV and rated frequency 50HZ, HXGN-12F (R) cubicle-type stationary AC metal-enclosed switchgear (abbreviated as ring main cabinet) is mainly used for 3-phase AC ring main, terminal power distribution grid and industrial power consumption equipment, and plays role of power receiving, power distribution and protection, etc.

产品特点 Product Characteristics

- 1、采用全组装结构，轻巧美观，可任意组合安装，便于无限扩展延伸。
 - 2、即可配FN12-12型压气式负荷开关、组合电器，也可配FN25-12型真空负荷开关、组合电器，且安装尺寸完全一致，体积小，三相联动结构，具有明显的隔离断口。
 - 3、负荷开关、组合电器，其安装方式灵活，可左右侧装、正装、倒装。
 - 4、可手动和电动操作，并具有远动遥控功能。
 - 5、设有完善的机械联动、联锁装置，完全达到“五防”功能。
 - 6、采用联动防护绝缘活门，遮挡带电触头，确保人身安全。
 - 7、采用正面操作维护，可靠墙安装。
 - 8、面板装有观察窗，可清楚观察柜内元件工作状态。
 - 9、负荷GB3906标准。
1. Adoption of full-assembling structure, lightness and good looking, any combination for installation and convenience for limitless expansion.
 2. Configuration of FN12-12 pressure-operated load-breaking switch, composite electric apparatus, and FN25-12 model of vacuum load-breaking switch and composite electric apparatus, completely identical installation dimension, small volume, 3-phase linkage structure and prominent isolating distance.
 3. Load-breaking switch and composite electric apparatus of flexible installation mode, including left/right side installation, normal installation and reversed installation.
 4. Manual and power-driven operation, and remote control function.
 5. Optimized mechanical linkage and interlock device, complete compliance with "five-proof" function.
 6. Adoption of linkage protection insulation shutter and sheltered live contact for assurance of physical safety.
 7. Adoption of frontal operation maintenance and reliable wall-installation.
 8. Panel is installed with observation window for clear observation of operating status of component in cabinet.
 9. Load in compliance with standard Gb3906.

外形尺寸 Outline Dimensions

H	W	D	L
1900	440	900	290
	660		510
2000	440	900	290
	660		510



技术参数 Product Parameters

序号 Number	项目 Items	单位 Unit	FN12-12	FN25-12
1	额定电压 Rated voltage		12	
2	1min工频耐受电压 1min power frequency withstand voltage	KV	对地及相间42; 隔离断口48; Phase-to-ground and phase-to-phase 42; isolating distance 48;	
3	雷电冲击耐受电压(峰值) Lightning impulse withstand voltage (peak)		对地及相间75; 隔离断口85 Phase-to-ground and phase-to-phase 75; isolating distance 85;	
4	额定频率 Rated frequency	Hz	50	
5	主母线额定电流 Rated current of main busbar	A	630	
6	额定电流 Rated current		630	
7	额定电流下电寿命 Electric life under rated current	次	2000	10000
8	开断空载变压器容量 Breaking no-load transformer capacity	KVA	1250	
9	额定短时耐受电流 Rated short-time withstand current	KA/S	20/4; 接地开关20/2 earthing switch20/2	
10	额定峰值耐受电流 Rated peak withstand current		50	
11	额定短路关合电流(峰值) Rated short-circuit making current (peak)	KA	50	
12	熔断器额定电流 Rated current of fuse	A	100	
13	额定转移电流 Rated transfer current		1200	2000
14	额定短路开关电流 Rated short-circuit switch current	KA	31.5	
15	配用熔断器型号 Model of configured fuse		S□LAJ-12 (XRNT□-10)	
16	机械寿命 Mechanical life	次	2000	10000
17	辅助回路1min工频耐压 1min power frequency withstand voltage of auxiliary circuit	KV	2	
18	电动操作机构工作电压 Operating voltage of power-driven operation mechanism	V	交流AC 110; 220V	交直流AC/DC 110; 220V
19	防护等级 Degree of protection		IP2X	

主电路方案 Main Circuit Scheme	主电路方案编号 Main Circuit Scheme number	11	12	13	14	15		
	单线图 Single line diagram							
主电路元件 Electric component of main circuit	分方案编号 Sub-plan Number		A	B	C	A	B	C
	负荷开关 Load-breaking switch	1	1	1	1	1	1	1
	电流互感器LZZBJ9-12 Current Transducer LZZBJ9-12		1	2	3			
	电压互感器JDZ10-10 Voltage Transducer							
	熔断器XRNT-10 Fuse XRNT					3	3	3
	避雷器YHSW-17 Lightning Arrester	3	3	3	3	3	3	3
带电显示DXN-12 Live display DXN-12	1	1	1	1	1	1	1	
外形尺寸宽×高×深 Outline Dimension (width × depth × height)		660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900
用途 Usage		架空进线电缆馈线 Overhead incoming line and cable feed line						

主电路方案编号 Main Circuit Scheme number		16	17	18	19	20
主电路方案 Main Circuit Scheme	单线图 Single line diagram					
	分方案编号 Sub-plan Number		A B C		A B C	
主电路元件 Electric component of main circuit	负荷开关 Load-breaking switch			1	1 1 1	
	电流互感器 Current Transducer LZBJ9-12		1 2 3		1 2 3	
	电压互感器 Voltage Transducer JDZ10-10					
	熔断器 Fuse XRNT XRNT-10					3
	避雷器 Lightning Arrester YH5W-17					
	带电显示 Live display DXN-12	1	1 1 1	1	1 1 1	1
	外形尺寸宽×高×深 Outline Dimension (width x depth x height)	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900
用途 Usage	架空进线电缆馈线 Overhead incoming line and cable feed line					

主电路方案编号 Main Circuit Scheme number		21	22	23	24	25
主电路方案 Main Circuit Scheme	单线图 Single line diagram					
	分方案编号 Sub-plan Number	A B C		A B C		A B C
主电路元件 Electric component of main circuit	负荷开关 Load-breaking switch	1 1 1	1	1 1 1		
	电流互感器 Current Transducer LZBJ9-12	1 2 3		1 2 3		1 2 3
	电压互感器 Voltage Transducer JDZ10-10		2	2 2	2	2 2 2
	熔断器 Fuse XRNT XRNT-10	3 3 3	3	3 3 3	3	3 3 3
	避雷器 Lightning Arrester YH5W-17					
	带电显示 Live display DXN-12	1 1 1	1	1 1 1	1	1 1 1
	外形尺寸宽×高×深 Outline Dimension (width x depth x height)	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900
用途 Usage	联络 Interconnection	测量 Measurement	测量、联络 Interconnection, Measurement			

主电路方案编号 Main Circuit Scheme number		26	27	28
主电路方案 Main Circuit Scheme	单线图 Single line diagram			
	分方案编号 Sub-plan Number		A B C	A B C
主电路元件 Electric component of main circuit	负荷开关 Load-breaking switch	1	1 1 1	
	电流互感器 Current Transducer LZBJ9-12		1 2 3	1 2 3
	电压互感器 Voltage Transducer JDZ10-10	2	2 2 2	2 2 2
	熔断器 Fuse XRNT XRNT-10	3	3 3 3	3 3 3
	避雷器 Lightning Arrester YH5W-17			
	带电显示 Live display DXN-12	1	1 1 1	1 1 1
	外形尺寸宽×高×深 Outline Dimension (width x depth x height)	660 × 1900 × 900	660 × 1900 × 900	660 × 1900 × 900
用途 Usage	测量、联络 Interconnection, Measurement	测量 Measurement		

HXGN15A-12型 固定式户内交流金属封闭环网开关设备

HXGN15A-12 Model
Stationary Indoor AC Metal-Enclosed Ring Main Switchgear

HXGN15A-12 (F·R) 型固定式户内交流金属封闭环网开关设备是为城市电网改造和建设需要而生产的新型高压开关柜。在供电系统中亦作为开断负荷电流和短路电流以及关合短路电流之用，适用于交流3~12kV、50Hz的配电系统中。广泛地用于城市电网建设和改造工程、工矿企业、高层建筑和公共设施等，作为环网供电单元和终端设备，起着电能的分配、控制和电气设备的保护作用，也可以装在预装变电站中。

HXGN15A-12 model stationary indoor AC metal-enclosed ring main switchgear is a new type of high-voltage switch cabinet manufactured for urban power grid reconstruction and construction. It is also used for break of load current and short-circuit current and make of short-circuit current in power supply system, and applies to power distribution system of AC 3~12kV and 50Hz. Widely used in urban power grid construction and reconstruction project, industrial and mining enterprises, high building and public facilities, etc. It acts as ring main power supply unit and terminal equipment, and plays a role of power distribution and control and electric equipment protection, and can be installed in prefabricated transformer substation.

型号含义 Type Connotations

H	X	G	N	15A	-12	(F·R)		
①	②	③	④	⑤	⑥	⑦	⑧	
①环网	②箱型	③固定式	④户内	⑤设计序号	⑥额定电压(kV)	⑦真空负荷开关	⑧熔断器	Design serial number Rated voltage (kV) Vacuum load-breaking switch Fuse



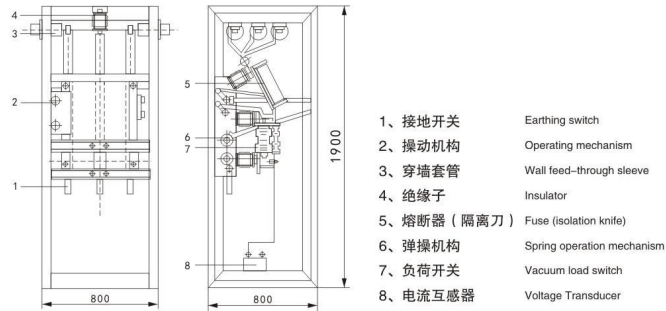
产品特点 Product Characteristics

- 柜体为组装式结构，全金属封闭结构，其防护等级达IP3X。
 - 柜内主要原件真空负荷开关（压气式负荷开关，六氟化硫负荷开关），可以与熔断器、接地开关、电压互感器、电流互感器配套使用或单独使用，满足运行的不同要求，开断负荷电流和短路电流及关合短路电流
 - 装有限流式带有撞击器触头脱扣装置的熔断器。
 - 具有明显隔离断口、操作联动机构及联锁机构。
- The cabinet body is of assembling structure and full metal-enclosed structure, of which the degree of protection is up to IP3X.
 - As the main component in cabinet, vacuum load-breaking switch (pressure-operated load-breaking switch and sulphur hexafluoride load-breaking switch) can be used in combination with fuse, earthing switch, voltage transformer and current transformer or be used separately, so as to meet different operation requirements, break load current and short-circuit current and make short-circuit current.
 - Fuse equipped with current-limiting tripping device featuring impactor triggering.
 - Prominent isolating distance, operation linkage mechanism and interlock mechanism.

技术参数 Technical Parameters

序号 Number	名称 Descriptions	单位 Unit	参数 Parameters
1	额定电压 rated voltage	kV	12
2	额定电流 rated current	A	负荷开关柜 Vacuum load switch 630
	组合电器柜 Combined electric control cabinet 200		
3	额定短路开断电流 Rated short-circuit breaking current	kA	31.5 (组合电器) Composite electric apparatus
4	额定负载开断电流 Rated load breaking current	A	630
5	额定短时耐受电流 Rated short-time withstand current	kA	20
6	额定峰值耐受电流 Rated peak withstand current	kA	50
7	额定工频耐受电压 Power frequency withstand voltage	kV	42 (断口distance, 48)
8	雷电冲击耐受电压 Rated lightning impulse withstand voltage	kV	75 (断口distance, 85)
9	机械寿命 Mechanical life	次	10000
10	额定交接电流 (组合电器) Rated takeover current Composite electric apparatus	A	3150
11	操作方式 Operation mode		手动或电动 manual operation/motor operation
12	防护等级 protection level		IP3X

内部结构布置图 The Arrangement of Its Internal Structure



主要电路方案 Main Circuit Scheme

主电路方案编号 Main Circuit Scheme number		11	12	13	14
主电路方案 Main Circuit Scheme	单线图 Single line diagram				
	真空负荷开关 Vacuum load switch FZN21-12/T630-20	1			
主电路器元件 Electric component of main circuit	熔断器组合电器 Fuse-combination unit FZRN21-12D/T125-31.5		1	1	1
	电流互感器 Current Transducer LZJB9-10			2	2
	电压互感器 Voltage Transducer JDZ-10				
	熔断器 Fuse XRNT SFLAJ-10/□A		3	3	3
	熔断器 Fuse XRNT XRNP-10/□A				
	避雷器 Lightning Arrester YH5WS-17/50	3	3	3	3
	带电显示 Live display DXN-□1-1	Q	T	T	T
用途 Usage	电缆进出线 Cable incoming line	电缆出线 Cable outgoing line	电缆出线 Cable outgoing line	电缆出线 Cable outgoing line	
外形尺寸 宽×深×高 Outline Dimension (W×D×H)	800×900×1900				

主电路方案编号 Main Circuit Scheme number		15	16	17	18
主电路方案 Main Circuit Scheme	单线图 Single line diagram				
	真空负荷开关 Vacuum load switch FZN21-12/T630-20			1	1
主电路器元件 Electric component of main circuit	熔断器组合电器 Fuse-combination unit FZRN21-12D/T125-31.5	1			
	电流互感器 Current Transducer LZJB9-10		2	2	
	电压互感器 Voltage Transducer JDZ-10		2	2	2
	熔断器 Fuse XRNT SFLAJ-10/□A	3			
	熔断器 Fuse XRNT XRNP-10/□A		3	3	3
	避雷器 Lightning Arrester YH5WS-17/50				3
	带电显示 Live display DXN-□1-1	Q	Q	T	T
用途 Usage	联络 Interconnection	计量+联络 Measurement +Interconnection	电缆出线+计量 Cable outgoing line +Measurement	电缆出线+PT Cable outgoing line +PT	
外形尺寸 宽×深×高 Outline Dimension (W×D×H)	800×900×1900				

XGN15-12箱型固定式金属封闭开关设备

XGN15-12 Cubicle-Type Stationary Indoor Metal-Enclosed Switchgear

XGN15-12箱型固定式金属封闭开关设备，适用于额定电压12kV，额定频率50Hz的环网供电系统，双电源辐射供电系统或单电源配电系统，作为变压器、电容器、电缆、架空线等电力设备的控制和保护装置。亦适用于箱式变电站，用作高压配电部分，它是我国城市电网改造和建设所需要的新一代高压电器成套设备。广泛应用于工业及民用电网及供电末端。特别适用于小型二次配电站、开闭所、工矿企业、城市居民小区、机场、铁路、隧道、高层建筑等电力系统中作为接受和分配电能之用。

XGN15-12 cubicle-type stationary indoor metal-enclosed switchgear applies to ring main power supply system of rated voltage 12kV and rated frequency 50Hz, double-power-source radiation power supply system or single-power-source distribution system, and acts as control and protection device of electric equipments such as transformer, capacitor, cable and elevated line, etc. It also applies to cubicle-type transformer substation and is used for high-voltage power distribution as a new generation of complete high-voltage electric equipment required for reconstruction and construction of urban power grid of China. It is widely used in industrial and civil power ring main and power supply terminal. It especially applies to small-size secondary power distribution station, switching station, industrial and mining enterprises, urban residential district, airport, railway, tunnel and high building for power receiving and power distribution in power system.



型号含义 Type Connotations

X G N 15 -12 □ / □ □ □ -□
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

- ①箱式 Cubicle-type
 - ②固定安装 Stationary installation
 - ③户内 Indoor
 - ④设计序号 Design serial number
 - ⑤额定电压(kV) Rated voltage (kV)
 - ⑥FR组合电器 FR composite electric apparatus
 - ⑦SF6负荷开关 SF6 load-breaking switch
 - ⑧额定短时耐受电流 Rated short-time withstand current
 - ⑨额定短路开断电流 Rated short-circuit breaking current
 - ⑩额定电流 Rated current
- 环境特征代号
TH 用于湿热带
TA 用于干热带
G 用于高海拔
- 操作方式
D 电动机操动
S 手动操动
- Operational mode
D: motor operation
S: manual operation

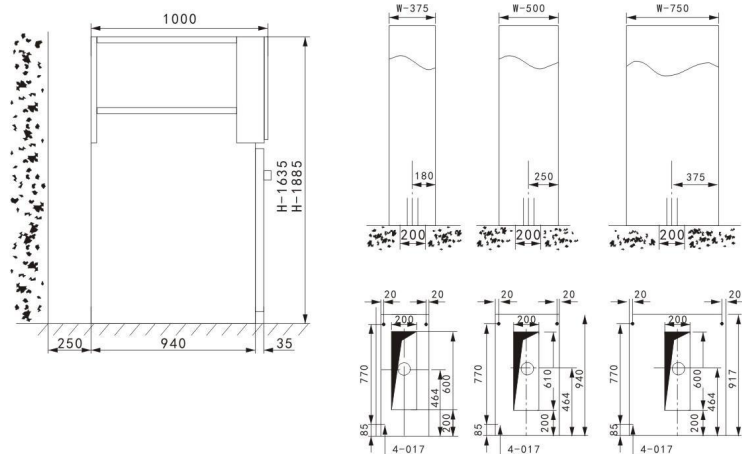
产品特点 Product Characteristics

- 该产品为金属铠装封闭式，柜内空气绝缘，配带“五防”功能。
- 具有终端变电站接线及适应可扩展环网供电的接线。
- 本系列环网柜设备采用规范部件，如选用真空断路器、SF6负荷开关、接地开关、熔断器、电流互感器、二次仪表，通过这些部件的组合广泛满足各种设计方案的要求。
- SF6负荷开关的操作机构分电动和手动两种。其中，手动操作机构分为K型：单弹簧（不可配熔断器）；A型：双弹簧（可配熔断器）。
- 根据需要，可以增加低压箱，能够满足继电保护及其它有关电器元件安装空间的需要。
- 产品具有可靠的机械联锁装置，断口绝缘强度高，大爬距设计，出线端均用压罩保护，特殊的动密封和固定密封设计，加上先进的技术性能及轻便灵活的装配方案，可以完全满足市场不断变化的要求。

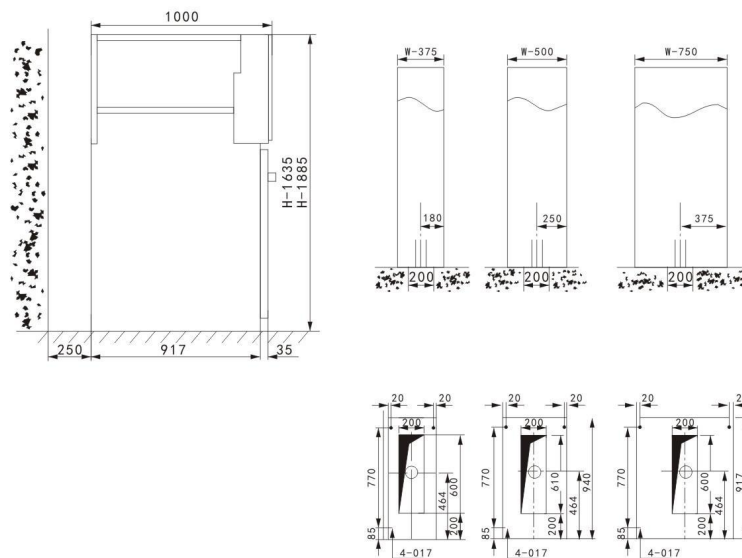
The product is metal-clad enclosed type, with air insulation in cabinet and “live-proof” functions. It features terminal transformer substation wiring and wiring adaptive for expansion of ring main power supply. The series of ring main cabinet equipment adopts normalized parts, such as vacuum circuit breaker, SF6 load-breaking switch, earthing switch, fuse, current transformer and secondary instrument, which are combined to meet requirements of various design programs. Operation mechanism of SF6 load-breaking switch falls into two categories: power-driven and manual. In which, manual operation mechanism is divided into type K: single-spring (no fuse is allowed to be installed); type A: double-spring (fuse is allowed to be installed). As per demand, low-voltage cubicle can be added, and demand for relay protection and installation space of other relevant electric components can be met. Featuring reliable mechanical interlock device, high isolating distance insulating strength, large creepage design, spring cup protection of outgoing line terminal, special dynamic seal and fixing seal design, advanced technical performance and easy/flexible assembling program, the product can meet continuously changing demand of market completely.

产品安装 Installation Foundation Dimension Drawing

II 型 (FLN48)



I 型 (FLN36)



技术参数 Product Parameters

名称 Descriptions	单位 Unit	参数 Parameter		
		负荷开关柜 Load-breaking switch cabinet	组合电器 (负荷开关熔断器) Composite electric apparatus (load-breaking switch fuse)	
额定电压 Rated voltage	kV	12	12	
主母线额定电流 Rated current of main busbar	A	630	630	
额定电流 Rated current	A	630	125	
额定频率 Rated frequency	Hz	50	50	
额定短时耐受电流 Rated short-time withstand current	kV	20		
额定短路持续时间 Rated short-circuit period	S	3		
额定峰值耐受电流 Rated peak withstand current	kA	63		
额定短路开断电流 Rated short-circuit breaking current	kA		31.5	
额定短路关合电流 Rated short-circuit making current	kA	63	80	
额定闭环开断电流 Rated close-loop breaking current	A	630		
额定电缆充电开断电流 Rated cable charging breaking current	A	10		
接地开关额定短时耐受电流 Rated short-time withstand current of earthing switch	kA	20		
接地开关额定短路持续时间 Rated short-circuit period of earthing switch	S	3		
接地开关额定峰值耐受电流 Rated peak withstand current of earthing switch	kA	63		
额定转移电流 Rated transfer current	A		1700	
额定绝缘水平 Rated insulation level	1min工频耐受电压 1min power frequency withstand voltage	kV	对地、相间42 Phase-to-ground and phase-to-phase 42	隔离断口48 Isolating distance 48
	额定雷电冲击耐受电压 Rated lightning impulse withstand voltage	kV	对地、相间75 Phase-to-ground and phase-to-phase 75	隔离断口85 Isolating distance 85
机械寿命 (负荷开关/接地开关) Mechanical life (load-breaking switch/earthing switch)	次	5000	2000	
辅助回路1min工频耐受电压 1min power frequency withstand voltage of auxiliary circuit	kV	2	2	
防护等级 Degree of protection		IP3X	IP3X	

订货须知 Ordering Instructions

订货时应提供下列资料

- 主接线及系统图、排列图及平面布置图
- 用户提供二次原理图、端子排列图，若无端子排列图应以制造厂排列顺序为准。
- 电气设备汇总表
- 需要母线桥（柜间桥还是墙柜桥）时需提供跨度和高度尺寸
- 特殊环境下使用的开关柜应在订货时提出
- 需要其它或特殊附件时应提出种类和数量

It is necessary to provide following information upon ordering:

- Main wiring and system diagram, arrangement diagram and floor plan.
- User should provide secondary schematic diagram and terminal arrangement diagram, if terminal arrangement diagram is not available, it is necessary to follow the arrangements sequence specified by manufacturer.
- Summary table of electric equipments
- Where busbar bridge (bridge between cabinets or bridge between wall and cabinet) is required, it is necessary to provide span and height dimension.
- It is necessary to indicate switch cabinet to be used under special circumstances upon ordering.
- It is necessary to indicate type and quantity where other or special attachments are required.

TT系列高压环网柜

TT Series High Voltage Ring Main Unit

天通企业专业生产的新型SF6全绝缘全封闭的环网系列产品，其产品可广泛地应用在12KV/24KV的配电领域。TT-N,TT-F,TT-U,SF6绝缘环网柜和内装的TT-N,TT-F,TT-U,SF6 insulating Ring Main Unit and TT-N,TT-F,TT-U12/24KV六氟化硫负荷开关或真空开关，下面总的简称TT系列高压环网柜。产品具有下面几个非常优越的特点：

Tiantong enterprise produces professionally the new types of SF6 full insulating and full sealing Ring main Unit series products. Its products can be used widely in the electrical distribution area of 12KV/24KV.TT-N,TT-F,TT-U,SF6 insulating Ring Main Unit and TT-N,TT-F,TT-U12/24KV sulfur hexafluoride load switch or vacuum switch built in it are called generally as TT series high voltage ring main unit. These products have following very preferable features:

使用环境 Environmental Conditions for Product Use

- 海拔高度：≤2500米 — Sea Level Elevation: ≤2500m
- 适应环境温度：-40℃~+60℃ — Ambient Temperature: -40℃-65℃
- 潮湿、多尘、盐污、矿山 — moist,dusty,salt contaminative situations,mine
- 浸水使用≤24小时 — submersion in a short time(≤24h)

产品符合标准 Product Standard

国际标准 International Standard	IEC56	IEC298	IEC129	IEC420	中国标准 Chinese Standard	GB3804 GB3906 GB11022 JB3855 等和电力行业标准 Etc. and Electrical Trade Standard
	IEC255	IEC694	IEC265-1	IEC801		

产品特点 Product Characteristics

●产品的五防功能 Protection Functions

- 防误分、合开关：加装挂锁时在操作前须领取某柜钥匙才能对该柜进行操作，实现防误分、合开关。
- 防带负荷分、合隔离开关：真空开关柜上面的真空开关操作机构与下面的隔离开关操作机构之间有一联锁连杆，保证了先合隔离开关再合真空开关，充分真空开关再分离真空开关，真空开关合上后，隔离开关被锁死，隔离开关打开后，真空开关不能动作。
- 防误入带电间隔：在下面前封板未封住之前，接地开关处于接地而无法操作，继而无法合负荷（或隔离）开关或真空开关，只有前封板封住后才能打开接地开关，继而合负荷（或隔离）开关，间隔内接地无电时，才能进入，间隔内不接地时有电，无法进入。
- 防带电挂地线：合了负荷（或隔离）开关带电时，接地开关被锁住，无法操作接地开关。
- 防带地线（接地）时合闸：接地开关合闸接地时，负荷（或隔离）开关被锁住，无法操作合闸。

- Switch protecting from false switching on or off :when a cabinet has a padlock,the cabinet can only be operated with the key obtained before operation.In this way,it is realized to protect from false switching on or off.
- Isolating switch protecting from switching on or off with load:there is an interlock tie bar between the vacuum switch operating mechanism on the vacuum switch cabinet and isolating switch operating mechanism below it.This can ensure to switch on first the isolating switch,then switch on the vacuum switch and switch off first the vacuum switch,then switch off the isolating switch.After the vacuum switch has been switched on,the isolating switch is latched up.Even the isolating switch is open,the vacuum switch can not be operated.
- Protection from miss coming into an active cubicle:before the lower front cover is not sealed,the earthing switch is in earthing condition and it can not be operated and the load (or isolating)switch or vacuum switch can not be also switched on. The earthing switch can only be open after sealing the front covers,and then the load(or isolating)switch is switched on. The personnel can only come into the cubicle when earthing without electricity in the cubicle and it can not come in to the cubicle when the cubicle is live without earthing.
- Impending protection of the earth wire form active:when the earthing switch is active after switching on the load(or isolating)switch,it is locked down and can not be operated.
- Switching-on protection from that with earth wire(at earthing):when the earthing switch is switching on for earthing,the load(or isolating)switch is locked down and can not be operated.

●全密封、全绝缘 Full Seal, Full Insulation

●模块化设计 Modular Design

TT系列环网柜采用模块化的设计方案，其基本模块单元为负荷开关模块、组合电器模块、真空开关模块及其它特殊功能模块。上述几个模块任意组合就形成了共箱式的组合模块。在组合模块里，任意一个功能都与基本模块的内部结构大致相同。任何模块之间都可以利用侧面扩展连接器进行扩展连接。

The modular design scheme is used into TT series Ring main Unit. Its basic module unit is load switch module,combination apparatus module,vacuum switch module and other special function module.Arbitrary combination as thion of these modules can form a combination module of shared box type.In the combination module,each function is identical basically with the interior structure of basic module.An side expanding connector can be used for expanding connection between any module.

●灵活的侧出线 and 扩展方式 Flexible Side Outgoing Feeder And Expanding Mode

●全密封的电能计量柜和电压测量柜 Fully Sealed Electric Energy Metering Cabinet And Voltage Measuring Cabinet

- 全绝缘、全密封的PT和CT;PT和CT可更换;
- 整个计量柜和测量柜达到IP67等级（可选）
- Full insulated and full sealed PT & CT;PT and CT are changeable;
- Entire metering cabinet and measuring cabinet achieve Ip67 class (optional) .

●小巧的全密封电源模块 Small and Full Sealed Power Supply Module

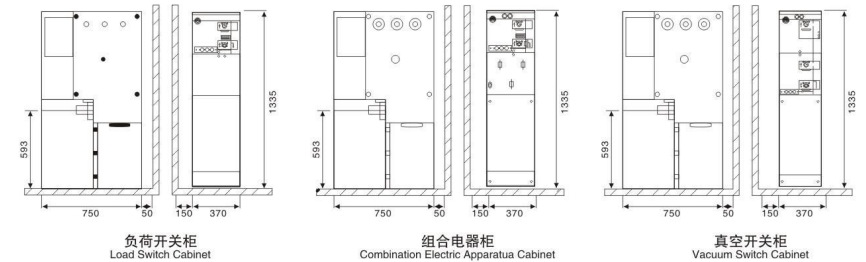
技术参数 Product Parameters

序号 No.	名称 Name	单位 Unit	参数 Parameter				
			负荷开关柜 Load switch	组合电器柜 Fuse-switch	630真空开关柜 Vacuum type switch	1250A真空开关柜 Vacuum type circuit breaker	
1	负荷开关型号 Model of load switch		TT-N	TT-F	TT-U	TT-U	
2	额定电压 Rated voltage	KV	12/24				
3	额定电流 Rated current	A	630/1250	125(受限于熔断器) (Limited by fuse)	630	1250	
4	额定频率 Rated frequency	Hz	50				
5	额定 绝缘 水平 Rated Insulation level	相间、相对地1min工频耐压（有效值） Power frequency withstand voltage between phases and phase and earth at 1min(effective value) 隔离断口1min工频耐压（有效值） Power frequency withstand voltage of isolated fracture at 1min (effective value) 相间、相对地雷电冲击耐压（峰值） Thunderbolt shock withstand voltage between phases and phase and earth (peak) 隔离断口雷电冲击耐压（峰值） Thunderbolt shock withstand voltage of isolated fracture (peak) 辅助回路和控制回路1min工频耐压 Power frequency withstand voltage of auxiliary loop and control loop at 1min	42/65		42		
			48/79		48		
			75/125		75		
			85/145		85		
			2		2		
6	主母线额定电流 Rated current of main bus	A	630/1250		1250		
7	额定短时耐受电流3秒 Rated short time withstand current 3sec.	KA	20/16				
8	额定短时耐受电流4秒 Rated short time withstand current 4sec.	KA		20/16	25		
9	额定峰值耐受电流 Rated peak withstand current	KA	50/40		50/40	50	
10	额定短路开断电流(峰值) Rated short circuit breaking current(peak)	KA	50/40	125/100	50/40	50	
11	额定有功负载开断电流 Rated active loading making capacity	A	60/1250		630	1250	
12	额定短路开断电流 Rated short circuit breaking capacity	KA		40(受限于熔断器) (Limited by fuse)	20/16	25	
13	额定转移电流 Rated transfer current	A	1500/1000				
14	熔断器最大额定电流 Fuse max.Rated current	A	125/100				
15	机 械 寿 命 Mechanical life	真空开关 Vacuum switch	10000				
		负荷开关 Load switch	次	5000	3000	(隔离开关)5000 (isolating switch)5000	
		接地开关 Earthing switch		2000			
		回路电阻 Loop resistance	μ Q	≤300	≤650(含熔断器) (Incl.Fuse Barrel)	≤300	≤150
17	SF6气体绝对压力（20℃表压） Absolute pressure of SF6 gas(at 20℃, psig)	Bar	1.40				
18	防护等级：SF6气体及熔断器开关柜外壳 Protection class : SF6gas and fuse barrel/switch cabinet shell		IP67/IP3X				
19	SF6气体年泄露率 Leakage rate of SF6 gas per year		≤0.1%/年/year				

产品的主要结构概况 Main Structure Of Our Products

本产品主要是由主开关室（带操作机构），电缆接线室，柜盖板所组成，需要时还可在柜顶加装二次线槽。负荷开关柜外型尺寸见下图左；组合电器柜外形尺寸见下图右；

This product is consisted of a main switch chamber(with operation mechanism),cable connecting chamber and cover. In case of require,a second neck groove can be laid on the cabinet top.For outline dimension of the load switch cabinet,see following left fig;for outline dimension of the combination electric apparatus cabinet,see following right fig:



本产品有负荷（或隔离）开关的三位操作机构和真空开关的二工位操作机构：

- a手动直操机构：对负荷开关柜，用手柄直接进行手动的合分及接地分合；对真空开关柜中的真空开关的操作，用手柄直接进行手动的合分闸，真空开关只有合分二工位，无接地位置；
- b手动直操机构：对组合电器柜，与a相似，但合闸后同时对弹簧进行分闸储能，储能后，可通过分闸按钮，熔断器撞针来进行分闸；
- c电动操作机构：与a、b相似，但所有操作用马达进行（就地分闸按钮、遥控和自动化），其操作电源为DC：24、48、110V和DC，AC:220V，具体操作程序和方法，请见柜前板的操作示意及说明。

负荷（或隔离）开关的三工位开关的动触刀，在结构上已避免了接地档与负荷（或隔离）档同合的可能性。真空开关（上）与隔离开关（下）的操作机构之间有一联锁连杆，保证了隔离开关先合后分的顺序。此外，还具备如下联锁：

- 负荷（或隔离）开关合闸后，接地开关不能动作；
 - 接地开关合闸后，负荷（或隔离）开关不能动作；
 - 只有当负荷（或隔离）开关分闸，接地开关合闸后，才能构打开柜前门进行检修。
- 其他情况，柜前门一律被锁死；
- 柜前门未关好，接地开关不能分闸，因而负荷（或隔离）开关不能合闸；
 - 当开关柜作为联络柜或电缆进线使用时，接地开关与进线电缆之间能实行强制闭锁。

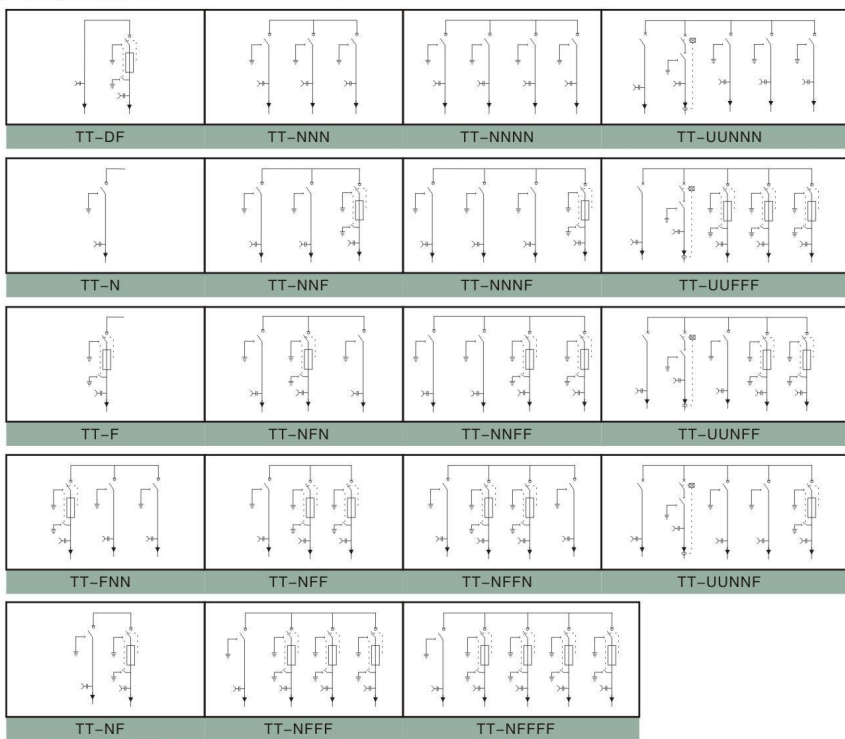
This product has an operation mechanism with three positions for load switch (or isolating switch) and an operation mechanism with two positions for vacuum switch:

- Manual direct operation mechanism:for the load switch cabinet, directly manually switching on and off and earthing switching on and off with off with a handle,for operation of the vacuum switch in the vacuum switch cabinet,directly manually switching on and off with a handle.The vacuum switch has only two positions for switching on and off,no earthing position.
- Manual direct operation mechanism:the combination electric apparatus cabinet is similar with above-mentioned a.item,but at switching on ,it has stored the energy for switching off of spring.After energy storage,it is can be switched off by a switching-off button,firming pin of fuse.
- Electrical operation mechanism:the combination electric apparatus cabinet is similar with above-mentioned a.and b.item,but its all operations should be carried out by a motor(local switching on and off button,remote control and automation).Its operation power supply is DC24V,48V,110V and DC & AC 220V.For its concrete operational procedure and method,see the operation sketch on the front panel.

The movable contact blade with three positions of the load (or isolating) switch.There is an interlock bar between the operation mechanisms of the vacuum (top) and isolating switches(bottom),and so, it can ensure the acting sequence of isolating switch to first switch on before switch off.Furthermore,it has also following interlocks:

- The earthing switch can not act after the load(or isolating)switch switched on;
- The load (or isolating)switch can not act after the earthing switch switched on;
- The maintenance work can only be carried out form the front door of the cabinet after switching off the load(or isolating)switch and switching on the earthing switch can switch.In other any cases,the front door of the cabinet is latched up.
- If the front door of the cabinet is closed no good,then the earthing switch can not switch off,and so the load(or isolating)switch can not switch on.
- When the switch cabinet is used as a liaison cabinet or cable incoming feeder,enforcedly latch up be carried out between the earthing switch and incoming cable.

产品系列说明 Product Series Explanation



注：TT系列高压环网柜提供19种标准组合
Note: Nineteen Standard Combination of TT Series High Voltage Ring Main Unit

TT系列高压环网柜标准组合提供下列公用配置

Standard Combination Of The TT Series High Voltage Ring Main Unit Can Be Provided With Following Public Configuration

- 进线套管的电压显示器 - Voltage in dicator of incoming sleeve
- 每个气室安装一个监察SF6密度压力表（可选带常开信号接点） - One gage is installed in each gas chamber to monitor SF6 pressure and density (Normal open signal contact is optional)
- 吊装用的吊耳 - Lifting lug
- 相应的操作手柄 - Relevamt operation handle
- 630A母线 - 630a bus
- 有接地时的接地母排 - Earthing busbar in case of earthing

TT系列高压环网柜标准组合还可提供下列可选·附件

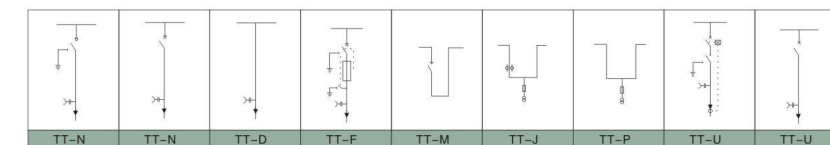
Standard Combination Of The TT Series High Voltage Ring Main Unit Cab Also Be Provided With Following Accessory

- 短路/接地故障指示器 - Short circuit/earthing fault indicator
- 负荷开关的电动分合闸操作电机 DC:24V/48V/110V/220V AC:110V/220V - Operation motor for electrical switching on & off of the load switch AC:24V/48/110V/220V AC:110V/220V
- 预留母线扩展·侧面扩展或顶部扩展 - Reserved bus for sode or top expansion
- 外部母线（顶部扩展） - External bus (for top expansion)
- 开关柜顶部的二次线槽 - Secondary neck groove on top of cabinet
- 环形电流互感器及电表 - Annuloid current transformer and ampere meter
- 高度为272或450mm的底座 - Base frame of 272 or 450mm height

TT系列高压环网柜模块 TT Series High Voltage Ring Main Unit Module

N带接地开关的负荷开关模块	Load switche module with earthing switch	(宽度width=325mm或600mm)
N不带接地开关的负荷开关模块	Load switche module without earthing switch	(宽度width=325mm或600mm)
D不带接地开关的电缆连接模块	Cable connecting module without earthing switch	(宽度width=325mm)
F负荷开关熔断器组合电器模块	Combination electric apparatus module for fuse-switch	(宽度width=325mm)
M母线负荷开关分段模块	Segment module for load switch of bus	(宽度width=600mm)
J电能计量模块	Electric energy metering module	(宽度width=695mm)
P电压测量模块	Voltage measuring module	(宽度width=325mm或500中间距)
U带隔离开关的真空开关模块	Vacuum switch module with isolating switch	(宽度width=325mm)
U带隔离开关的1250A真空开关	1250A Vacuum switch module with isolating switch	(宽度width=600mm)

注：单个TT系列高压环网柜模块必须加扩展头后才能使用。1250A的U柜宽度为600mm
Note: individual TT series high voltage ring main unit module can only be used after adding expander.the width of 1250A module U is 600mm




注：以上环网柜模块均可加装全密封的电源模块，以解决操作电源及电压信号的采集。其重量相应增加约50kg
Note: above ring main unit modules can add full sealed power module for collection of power supply and voltage signals.Its weight increases approx.50kg.

●630A/1250A带接地开关的负荷开关模块TT-N



630A/1250A Module TT-N of Load Switch with Earthing Switch

	带接地开关的负荷开关模块TT-N除前述的标准配置与可选附件外，还有标准配置 Load switch module TT-N with earthing switch in addition to above standard configurations and optional accessory,there are also standard configurations.	可选配置 Optional Configuration
	<ul style="list-style-type: none"> - 三工位负荷开关 - 三工位单弹簧操作机构，有1个负荷开关操作轴和1个接地开关操作轴 - 负荷开关和接地开关位置指示 - 位于前部水平布置的出线套管，1套或2套630A的400系列螺旋式套管【注】 - 对于所有的开关功能，都在面板上有方便的加装挂锁装置 - 接地开关与电缆室前面板的连接 - Load switch/earthing switch with three positions; - Single spring operation mechanism with three positions has independent operation shaft of load switch and earthing switch; - Position indicator for load switch and earthing switch; - Outgoing sleeve laid at front part,one or double 400 series helically sleeve of 630A,depends on volume; - Padlock device on the front panel for all switching functions; - Interlock between the earthing switch and the front panel in front of cable chamber. <p>【注】 630A N柜为1套，1250A N为2套 Note: 630A N module is 1 sets, 1250A N module is 2 sets</p>	<ul style="list-style-type: none"> - 在电缆进线套管处加装HY5WZ4-17/50型避雷器或双电头 - 钥匙互锁 - 辅助触点 - 负荷开关位置：2常开 2常闭 - 接地开关位置：2常开 2常闭 - HY5wz4-17/50type armeter and dual cable joint can be installed at incoming cable sleeve; - Key interlock; - Auxiliary contact; - Position of load switch:two Normally open two normally close - Position of earthing switch: two Normally open two normally close


●630A/1250A不带接地开关的负荷开关模块TT-N
630A/1250A Module TT-N of Load Switch without Earthing Switch

<p>不带接地开关的负荷开关模块TT-N除前述的标准配置与可选附件外, 还有标准配置 Load switch module TT-N without earthing switch in addition to above standard configurations and optional accessory, there are also standard configurations.</p>  <ul style="list-style-type: none"> - 二位负荷开关 - 二位单弹簧操作机构, 有1个负荷开关操作轴 - 负荷开关位置指示 - 位于前部水平布置的出线套管, 1套或2套630A的400系列螺纹式套管【注】 - 对于所有的开关功能, 都在面板上有方便的加装挂锁装置 <p>- Load switch with two positions; - Single spring operation mechanism with two positions has one operation shaft of load switch - Position indicator for load switch - Outgoing sleeve laid at front part and 400 series helically sleeve of 630A, depends on the device's volume; - Padlock device on the front panel for all switching functions. - Interlock between the earthing switch and the front panel in front of cable chamber. 【注】: 630A N柜为1套, 1250A N柜为2套 Note: 630A N module is 1 sets, 1250A N module is 2 sets</p>	<p>可选配置 Optional Configuration</p> <ul style="list-style-type: none"> - 在电缆进线套管处加装HY5WZ4-17/50型避雷器或双电瓷头 - 钥匙互锁 - 辅助触点 - 负荷开关位置: 2常开 2常闭 <p>- HY5WZ4-17/50type arrester and dual cable joint can be installed at incoming cable sleeve; - Key interlock - Auxiliary contact; - Position of load switch: two Normally open two normally close</p>
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●不带接地开关的电缆连接模块TT-D、母线负荷开关分段模块TT-M
Cable Connecting Module TT-D without Earthing Switch and Segment Module TT-M of Bus Load Switch

<p>不带接地开关的电缆连接模块TT-D除前述的标准配置与可选附件外, 还有标准配置 Cable connecting module TT-D without earthing switch in addition to above stand and configurations and optional accessory, there are also standard configurations</p>  <ul style="list-style-type: none"> - 位于前部水平布置的出线套管, 630A的400系列螺纹式套管 - Outgoing sleeve horizontally laid at front part and 400 series bolt sleeve of 600A 	<p>可选配置 Optional Configuration</p> <ul style="list-style-type: none"> - 在电缆进线套管处可加装HY5WZ4-17/50型避雷器或双电瓷头 - HY5WZ4-17/50 type arrester and double cable head can be installed at cable incoming sleeve
<p>母线负荷开关分段模块TT-M除前述的标准配置与可选附件外, 还有标准配置 Segment module TT-M of load switch in addition to above standard configurations and optional accessory, there are also standard configurations.</p>  <ul style="list-style-type: none"> - 二位负荷开关 - 二位单弹簧操作机构, 有1个负荷开关操作轴 - 负荷开关位置指示 - 对于所有的开关功能, 都在面板上有方便的加装挂锁装置 <p>- Load switch with two positions; - Single spring operation mechanism with two positions has one operation shaft of load switch - Position indicator for load switch - There is convenient padlock device on the front panel for all switching functions; Interlock between the earthing switch and the front panel in front of cable chamber</p>	<p>可选配置 Optional configuration</p> <ul style="list-style-type: none"> - 钥匙互锁 - 辅助触点 - 负荷开关位置: 2常开 2常闭 <p>- Key interlock - Auxiliary contact; - Load switch position: two normal open two normal close</p>

●负荷开关熔断器组合电器模块TT-F
Combination Electric Apparatus Module TT-F of Fuse-Switch

<p>除前述的标准配置与可选附件外, 还有标准配置 In addition to above standard configurations and optional accessory, there are also standard configurations.</p>  <ul style="list-style-type: none"> - 三位负荷开关, 熔断器前端与熔断器末端接地开关机械联动 - 三位双弹簧操作机构, 有两个独立的负荷开关和接地开关操作轴 - 负荷开关和接地开关位置指示 - 熔断器筒 - 熔断器水平放置 - 熔断器跳闸指示 - 位于前部水平布置的出线套管, 200A的200系列插入式套管 - 对于所有的开关功能, 都在面板上有方便的加装挂锁装置 - 用于变压器保护的熔断器参数12、24kV, max 125A熔断器 - 接地开关与电缆室前面板的互锁 <p>- Load/earthing switches with three positions; - Double spring operation mechanism with three positions has two independent load switches and operation shafts for earthing switch; - Position indicator for load/earthing switches; - Fuse sleeve; - Fuse is horizontal laid; - Fuse trip indicator; - Outgoing sleeve horizontally laid at front part and 200 series insert type sleeve of 200A - There is convenient padlock device on the front panel for all switching functions; - Parameter of fuse for production of transformer: 12kV, max 125A fuse - Interlock between the earthing switch and the front panel in front of cable chamber.</p>	<p>可选配置 Optional configuration</p> <ul style="list-style-type: none"> - 并联跳闸线圈DC: 24V/48V/110V/220V, AC: 110V/220V - 并联分闸线圈DC: 24V/48V/110V/220V, AC: 110V/220V - 进线带电接地闭锁 (当套管带电时闭锁接地开关) AC: 110V/220V - 辅助触点 - 负荷开关位置: 2常开 2常闭 - 接地开关位置: 2常开 2常闭 - 熔断器熔断 1常开 <p>- Shunt tripping coil DC: 24V/48V/110V/220V, AC: 110V/220V - Shunt tripping coil DC: 24V/48V/110V/220V, AC: 110V/220V - The incoming wire is locked up when it earths actively (The earthing switch is locked up when the Sleeve is active), AC: 110V/220V; - Auxiliary contact; Load switch position: two normal open, two normal close; Earthing switch position: two normal open, two normal close; Fuse fusing: one normal open</p>
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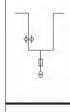
●带隔离开关的630A真空开关模块TT-U
Module TT-U of 630A Vacuum Switch with Isolating Switch

<p>除前述的标准配置与可选附件外, 还有标准配置 In addition to above standard configurations and optional accessory, there are also standard configurations.</p>  <ul style="list-style-type: none"> - 630A的母线 - 630A的变压器/线路保护用真空开关 - 真空开关用两位双弹簧操作机构 - 真空开关下部三位隔离/接地开关 - 三位隔离/接地开关单弹簧操作机构 - 真空开关和三位开关机械联锁 - 真空开关和三位开关位置指示 - 自供电源电子式保护继电器MPFB (带保护CT) - 跳闸线圈 (用于继电器动作) - 位于前部水平布置的出线套管, 630A的400系列螺纹式套管 - 指示套管带电的容性电压指示器 - 对于所有的开关功能, 都在面板上有方便的加装挂锁装置 - SF6气体压力表 (每个SF6气箱中仅有一处) - 接地开关与电缆室前面板的互锁 <p>- 630V bus - 630V transformer/vacuum switch for line protection - Double spring operation mechanism with two positions for vacuum switch - Isolating/earthing switches with three positions under vacuum switch - Single spring operation mechanism for isolating/earthing switches with three positions - Mechanical interlocking between vacuum switch and three position switch - Mechanical interlocking between vacuum switch and three position switch - Position indicator for vacuum switch and three position switch - Power self-supply type electronic protection relay MPFB(with protection CT) - Trip coil(used for relay action) - Outgoing sleeve horizontally laid at front part and 400 series bolt sleeve of 600A - Capacitive voltage indicator for indicating the active sleeve - Pressure meter of SF6 gas(only one for each SF6 gas tank) - Interlock between the earthing switch and the front panel in front of cable chamber</p>	<p>选择配置与特性 Optional configuration and characteristics</p> <ul style="list-style-type: none"> - 真空开关操作用电动机 24V/48V DC, 110V/220V, DC/AC - 并联跳闸线圈 24V/48V DC, 110V/220V DC/AC - 并联合闸线圈 24V/48V DC, 110V/220V DC/AC - 测量环形电流互感器及电流表 - 计量环形电流互感器及电表表 - 钥匙互锁 (如Ronis锁) - 进线带电接地闭锁 (当套管带电时闭锁接地开关) 110V/220V AC - 辅助触点 - 真空开关位置: 2常开 2常闭 - 接地开关位置: 2常开 2常闭 - 隔离开关位置: 2常开 2常闭 - 真空开关跳闸信号: 1常开 - 二次装置可装设于开关柜顶部的低压箱 - 其它继电器如SPAJ140 <p>- Motor used for vacuum switch operation: 24V/48V DC, 110V/220V, DC/AC - Shunt tripping coil 24V/48V DC, 110V/220V, DC/AC - Shunt switch on coil: 24V/48V DC, 110V/220V, DC/AC - Ring current measuring transformer and ampere gauge - Ring current metering transformer and ampere gauge - Key interlock(e.g. Ronis lock) - The incoming wire is locked up when it earths actively/the earthing switch is locked up when the sleeve is active/110V/220V AC - Auxiliary contact; - Vacuum switch position: two normal open, two normal close - Isolating switch position: two normal open, two normal close - Earthing switch position: two normal open, two normal close - Vacuum switch trip signal: one normal open - Secondary device can be installed in the low voltage box on the top of vacuum switch - Other relay such as SPAJ140</p>
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●带隔离开关的1250A真空开关模块TT-U
Module TT-U of 1250A Vacuum Switch with Isolating Switch

<p>除前述的标准配置与可选附件外, 还有标准配置 In addition to above standard configurations and optional accessory, there are also standard configurations.</p>  <ul style="list-style-type: none"> - 1250A的母线 - 1250A的变压器/线路保护用真空开关 - 真空开关用两位双弹簧操作机构 - 真空开关下部三位隔离/接地开关 - 三位隔离/接地开关单弹簧操作机构 - 真空开关和三位开关机械联锁 - 真空开关和三位开关位置指示 - 自供电源电子式保护继电器MPFB (带保护CT) - 跳闸线圈 (用于继电器动作) - 两套位于前部水平布置的出线套管, 630A的400系列螺纹式套管 - 指示套管带电的容性电压指示器 - 对于所有的开关功能, 都在面板上有方便的加装挂锁装置 - SF6气体压力表 (每个SF6气箱中仅有一处) - 接地开关与电缆室前面板的互锁 - 宽x高x深=600x1335x750 <p>- 1250A bus - 1250A transformer/vacuum switch for line protection - Double spring operation mechanism with two positions for vacuum switch - Isolating/earthing switches with three positions under vacuum switch - Single spring operation mechanism for isolating/earthing switches with three positions - Mechanical interlocking between vacuum switch and three position switch - Position indicator for vacuum switch and three position switch - Trip coil(used for relay action) - Power self-supply type electronic protection relay MPFB(with protection CT) - Trip coil(used for relay action) - Outgoing sleeve horizontally laid at front part and 400 series bolt sleeve of 600A - Dual-capacitive Voltage indicator for indicating the active sleeve - Pressure meter of SF6 gas(only one for each SF6 gas tank) - Interlock between the earthing switch and the front panel in front of cable chamber - Width x Height x Length=600 x 1335 x 750</p>	<p>选择配置与特性 Optional configuration and characteristics</p> <ul style="list-style-type: none"> - 真空开关操作用电动机 24V/48V DC, 110V/220V, DC/AC - 并联跳闸线圈 24V/48V DC, 110V/220V DC/AC - 并联合闸线圈 24V/48V DC, 110V/220V DC/AC - 测量环形电流互感器及电流表 - 计量环形电流互感器及电表表 - 钥匙互锁 (如Ronis锁) - 进线带电接地闭锁 (当套管带电时闭锁接地开关) 110V/220V AC - 辅助触点 - 真空开关位置: 2常开 2常闭 - 接地开关位置: 2常开 2常闭 - 隔离开关位置: 2常开 2常闭 - 真空开关跳闸信号: 1常开 - 二次装置可装设于开关柜顶部的低压箱 - 其它继电器如SPAJ140 <p>- Motor used for vacuum switch operation: 24V/48V DC, 110V/220V, DC/AC - Shunt tripping coil: 24V/48V DC, 110V/220V, DC/AC - Shunt switch on coil: 24V/48V DC, 110V/220V, DC/AC - Ring current measuring transformer and ampere gauge - Ring current metering transformer and ampere gauge - Key interlock(e.g. Ronis lock) - The incoming wire is locked up when it earths actively/the earthing switch is locked up when the sleeve is active/110V/220V AC - Auxiliary contact; - Vacuum switch position: two normal open, two normal close - Isolating switch position: two normal open, two normal close - Earthing switch position: two normal open, two normal close - Vacuum switch trip signal: one normal open - Secondary device can be installed in the low voltage box on the top of vacuum switch - Other relay, such as SPAJ140</p>
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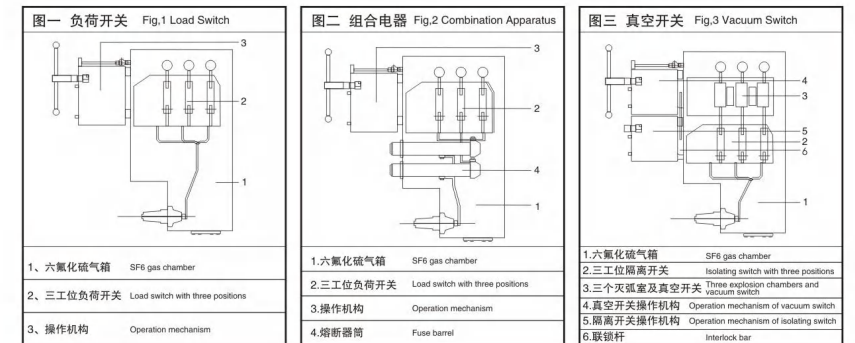
●电能计量模块TT-J、电压测量模块TT-P
Electric Energy Metering Module TT-J and Voltage Measuring Module TT-P

<p>除前述的标准配置与可选附件外, 还有标准配置 In addition to above standard configurations and optional accessory, there are also standard configurations.</p>  <ul style="list-style-type: none"> - 2只LZX-12型电流互感器 - 2只JDZ3-10型电压互感器 - 6只400系列套管, 用于外母线连接 - 3只保护PT的熔断器XRNP-12 - 1只带转换开关的电压表 <p>- Two LZX-12 current transformers - Two JDZ3-10 voltage transformers - Six 400series sleeves used for connection of external bus - Three fuses XRNP-12 used for protection of PT - One voltmeter with changeover switch</p>	<p>可选配置 Optional Configuration</p> <ul style="list-style-type: none"> - 可更换为3只LZX-12型电流互感器 - 可更换为3只JDZ3-10电压互感器 - HY5WZ4-17/50型避雷器 - 一般供普通型, 特殊要求供IP67型 <p>- It can be changed into three LZX-12 current transformers. - It can be changed into three JDZ3-10 voltage transformers. - HY5WZ4-17/50 type arrester. - Common type used for general application, IP 67 type used for special application.</p>
<p>电压互感器柜TT-P模块 Voltage transformer cabinet-module TT-P Standard configuration:</p> <ul style="list-style-type: none"> - 下部电缆进/出线 - 2只JDZ3-10型电压互感器 - 3只保护PT的熔断器XRNP-12 - 1只带转换开关的电压表 <p>- Cable incoming/outgoing from bottom - Two JDZ3-10 voltage transformers - Three fuses XRNP-12 used for protection of PT - One voltmeter with changeover switch</p>	<p>可选配置 Optional configuration</p> <ul style="list-style-type: none"> - 可更换为3只JDZ3-10型电压互感器 - HY5WZ4-17/50型避雷器 - 一般供普通型, 特殊要求供IP67型 <p>- It can be changed into three JDZ3-10 voltage transformers. - HY5WZ4-17/50 type arrester. - Common type used for general application, IP 67 type used for special application.</p>

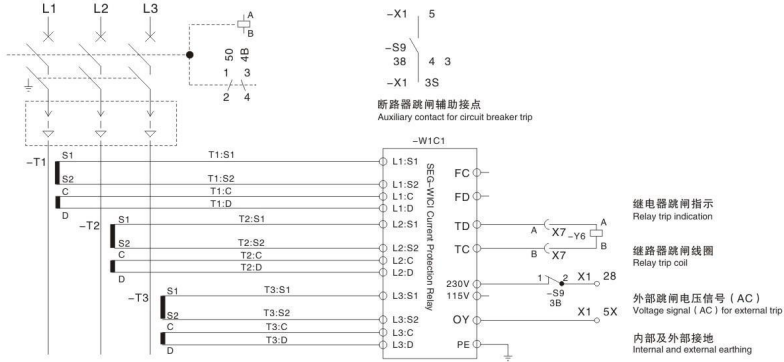
单独负荷开关、单独组合电器、单独真空开关
Independent Load Switch, Combination Apparatus and Vacuum Switch

天通企业推出TT系列高压开关, 其性能参数与相应的开关柜完全相同, 气箱内也充SF6气体, 可供能制造外围壳体的电器成套厂, 其组合方式与柜体的组合方式相同。其宽度: 1单元为325, N单元为325N (N ≤ 5)

Tiantong enterprise has developed a separate load switch, and its performance Parameter is same as relevant load switch cabinet, its gas chamber is charged also with SF6 gas. The separate load switch can be supplied the electric appliance complete factory which has the capability for manufacturing the peripheral shell. Its combination method is same as the combination method of cabinet body. Its width: first unit is 325 and N unit is 325N(N ≤ 5).



真空开关保护线路图、变压器/线路保护 Protection Line Diagram of Vacuum Switch and Transformer/Line Protection



TT系列高压环网柜 TT Series High Voltage Ring Main Unit

提供了变压器保护方式：负荷开关熔断器组合电器。
Protection method of transformer: Electrical apparatus combined by load switch and fuse

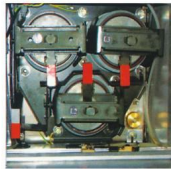
使用负荷开关熔断器组合电器模块 Use of The Electrical Apparatus Module Combined By load switch and fuse

变压器保护为限流高压熔断器与负荷开关的组合。熔断器室将安装在一个位于单元前部独立的有闭锁的外壳后面。负荷开关使用弹簧储能机构，该机构可由熔断器撞针所触发。

为了便于熔断器的更换，可以使用操纵柄来拆卸熔断器室的端盖。熔断器的跳闸机构前置，保证了整个系统的防水性能。

Protection of transformer uses the combination of a current limiting high voltage fuse and load switch. Fuse chamber will be installed at back of a separate shell with locking device posted at front of that unit. Load switch will use a spring energy accumulator switch can be activated by a fuse strik.

In order to replace the fuse expediently, a operation handle can be used for dismantling the end cover of the fuse chamber. The trip mechanism of the fuse is installed front, so it can ensure the water proof performance of entire system.



熔断器-变压器对照参考表 Cross reference list between fuse and transformer

100%	变压器额定容量 Rated Capacity Transformer (KVA)														CEF			
UN (KV)	25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600		
6	6	16	16	25	25	25	40	40	50	50	80	100	125	160	160		7.2KV	
6.6	6	16	16	25	25	25	40	40	50	50	63	80	100	125	160			
10	6	10	10	16	16	25	25	25	40	40	50	50	80	80	125	125		12KV
11	6	6	10	16	16	25	25	25	25	40	50	50	63	80	100	125		
12	6	6	10	16	16	16	25	25	25	40	40	50	63	80	100	125		24KV
24	6	6	6	10	10	10	16	16	20	20	25	31.5	31.5	40	40	63		

本表格数据是基于使用SIBA或EFEN或XRNT-12型熔断器并在没有过负荷的正常操作条件下得到的。
The data in this list is based on use of SIBA, EFEN or XRNT-12 type fuse and obtained under normal operation condition without overload

方案说明 Project Description

方案一 Project 1

方案编号 Plan Code	TT.1U	TT.2U	TT.3F	TT.4F	TT.5F
TT-UUFFF 一组最多为5个单元，超过5个单元时需扩展母线连接。 A group has max 5 units. It needs an expand bus for connection when exceed 5 units					
柜体尺寸 (WxD) Cabinet Dimensions (WxD)	1670x750				

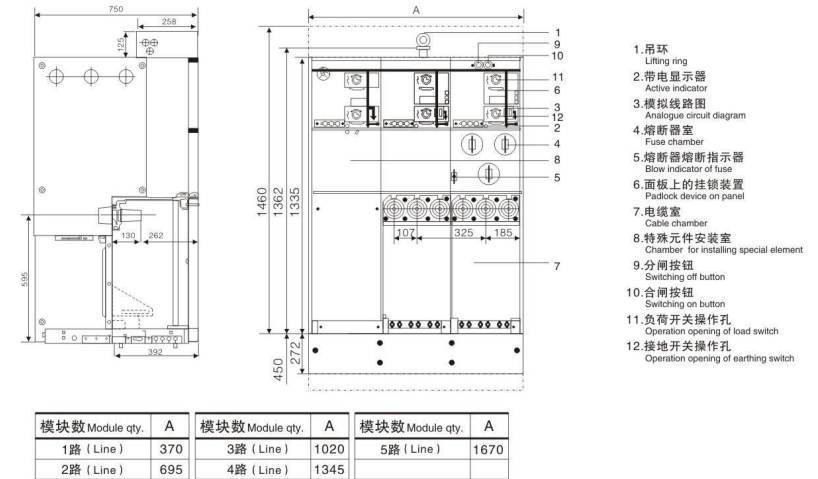
方案二 Project 2

方案编号 Plan Code	TT.1N	TT.2N	TT.3F	TT.4F	TT.5F	TT.6F	TT.7F
NNFFF=NF 一组最多为5个单元，超过5个单元时需扩展母线连接。 A group has max 5 units. It needs an expand bus for connection when exceed 5 units							
柜体尺寸 (WxD) Cabinet Dimensions (WxD)	2372x750						

方案三 Project 3

方案编号 Plan Code	TT.1U	TT.2U	TT.3J	TT.4F	TT.5F	TT.6F
UU=J=FFF 高压侧计量 Metering at high voltage side						
柜体尺寸 (WxD) Cabinet Dimensions (WxD)	2424x750					

TT系列高压环网柜柜结构及尺寸图 Structure and Dimensional Drawing of TT Series High Voltage Ring Main Unit



XGN-12(TT)型固体绝缘开关设备

XGN-12(TT) Model Solid-Insulated Switchgear

XGN-12(TT)是一种智能环保型开关设备，是配电自动化系统的一个重要组成部分。XGN-12(TT)型开关设备主要有三种功能单元，即V单元（断路器单元），C单元（负荷开关单元），F单元（组合电器单元）。当系统要求配置多个单元时，可以在左右侧任意扩展，根据不同的设计方案任意排列，实现不同的配置要求。

每个单元在结构上分为仪表室、操作机构、一次电路三个部分。仪表室可配微机保护（智能控制器）和其它表计；操作机构为专用弹操机构，也可配加电动操作机构；一次电路采用APG自动凝胶工艺，将母线、隔离开关和灭弧室完全固封在环氧树脂中，并有专用接头和母线相连。

XGN-12(TT)型固体绝缘开关设备具有结构紧凑、全绝缘、长寿命、免维护、占用空间小、安全可靠、不受环境影响等优点，广泛应用于工业及民用的环网和终端供电，特别适用于小型二次配电站、开闭所、工矿企业、机场、铁路、商业区、高层建筑、高速公路、地铁、隧道等领域。

XGN-12(TT), as a key part of the automatic power distribution system, is a type of intelligent and eco-friendly switchgear. The XGN-12(TT) type switchgear composes of three functional units, unit V (circuit breaker unit), unit C (load switch unit) and unit F (combined electric apparatus unit). When the system is required to be equipped with multiple units, it can be extended freely on both right and left sides, and arranged at random in accordance with different design schemes, thus satisfying different requirements for configuration.

Structurally, each unit consists of the instrument chamber, the operating mechanism and the primary circuit. The instrument chamber can be provided with microprocessor-based protection and other meters and gauges; the operating mechanism is a mechanism designed exclusively for spring operating, and if required, an electric operating mechanism can be equipped additionally; the primary circuit features its automatic pressure gelation (APG) process, through which the busbar, isolating switch and arc extinguish chamber are totally enclosed in epoxy resin together, with the busbar connected with a special-purpose connector.

With its advantage of compact structure, full insulation, long service life, maintenance-free, less space occupation, good safety & reliability, and being free from environmental impact, the XGN-12(TT) type solid-insulated switchgear is widely applied to power supply to industrial and civil ring networks and terminals, specially to smaller secondary substations, switching stations, industrial and mining establishments, airports, railways, commercial districts, high-rise building, expressways, subways and tunnels, etc.

使用环境 Environmental Conditions for Product Use

- 海拔高度：≤5000米
- 适应环境温度：-45℃~+45℃
- 最高日平均气温：+40℃，最高年平均气温+35℃
- 风速：不大于34m/s
- 空气相对湿度：≤95%（+25℃）
- 地面倾斜度：≤5℃
- 地震烈度：不超过8度
- 安装地点无火灾、爆炸危险、化学性腐蚀及剧烈震动
- Sea Level Elevation: ≤5000m
- Ambient Temperature: -45℃~+45℃
- Mean daily Max. temperature: +40℃, mean yearly Max. temperature: +35℃
- Wind velocity: not higher than 34m/s
- Relative Humidity: ≤95%（+25℃）
- Ground inclination: ≤5℃
- Earthquake Intensity: NMT 8 Degree
- Equipment should be installed at places free from fire, explosion hazard, chemical corrosion and violent vibration.

技术参数 Product Parameters

名称 Descriptions		V单元		C单元		F单元		
额定电压 (KV)	Rated voltage	12	24	12	24	12	24	
额定频率 (HZ)	Rated frequency	50		50		50		
额定电流 (A)	Rated current	800	630	630	630	630	630	
额定短路开断电流 (KA)	Rated short-circuit breaking current	25	20	/	/	31.5	31.5	
额定电缆充电开断电流 (A)	Rated cable charging breaking current	/	/	10	10	/	/	
额定短时耐受电流 (KA)	Rated short-time withstand current	25	20	20	20	/	/	
额定短时耐受时间 (S)	Rated short-time withstand time	4		4		/		
额定峰值耐受电流 (KA)	Rated peak withstand current	63	50	50	50	/	/	
额定短路关合电流 (KA)	Rated short-circuit making current	63	50	50	50	/	/	
额定开断转移电流 (A)	Rated breaking transfer current	/	/	/	/	3150	3150	
额定绝缘水平 Rated insulation level	额定雷电冲击耐受电压(KV) Rated lightning impulse withstand voltage	相间、相对地 Phase-to-phase and phase-to-ground	75	125	75	125	75	125
	隔离断口 Isolating distance		85	145	85	145	85	145
	相间、相对地 Phase-to-phase and phase-to-ground		42	65	42	65	42	65
	额定工频耐受电压(KV1min) Rated power-frequency withstand voltage	隔离断口 Isolating distance		48	79	48	79	48
	辅助控制回路 Subsidiary control loop		2	2	2	2	2	2
机械寿命 (次)	Mechanical life	10000		10000		10000		
主回路电阻 (μΩ)	Major loop resistance	≤140		≤140		≤700		



产品特点 Product Characteristics

- 性能优异环氧树脂
Excellent Performance of Epoxy Resin
XGN-12(TT)型固体绝缘全封闭开关设备采用特殊环氧树脂作绝缘材料而生产出来的。这种环氧树脂有优异的性能：
The XGN-12(TT) type solid-insulated totally enclosed switchgear is produced from the special epoxy resin as insulating material. This type of epoxy resin boasts its excellent performance:
- 具有优异的电绝缘性能。
Excellent electric insulation property
介电强度Dielectric strength: 20-30KV/mm
体积电阻率Volume resistivity: (ρ_v)1×10¹³-15Ω.m
介电损耗角正切Dielectric loss angle tangent: (tgδ) <0.004 (50Hz)
- 1、耐热可达200℃以上，在高温下也有良好的绝缘性能；
2、化学性能稳定，具有优异的耐碱性、耐酸性和耐溶剂性和良好的抗温度老化、抗辐射老化性能；
3、导热系数为80×10⁻²-100×10⁻²W/m.k，易于热量散发；
4、对各种物质均有很高的粘接力，分子结构紧密，机械强度高，对开关设备有很好的保护作用；
5、固化收缩率小，一般为1%-2%；线胀系数也很小，一般为6×10⁻⁵/℃。所以开关尺寸稳定，内应力小，任何时候不会开裂。
- 1. Able to endure a heat as high as above 200℃, and to keep a good insulation property even at a high level of temperature;
2. Stable chemical property, excellent resistance to alkali, acid and solvent, as well as good resistance to temperature aging and radiation aging;
3. With a coefficient of thermal conductivity of 80×10⁻²-100×10⁻²W/m.k, it contributes to heat dispersion;
4. Having strong cohesion for any substances, close molecular structure and high mechanical strength, it plays a protective role for switchgears.
5. With a curing shrinkage as low as 1%-2% generally and a coefficient of liner expansion as low as 6×10⁻⁵/℃ generally, it allows switches to have a stable dimension and a small internal stress for fear of a cleavage in any circumstances.

- 真正环保的绿色开关设备
Green Switchgears Beneficial to Environmental Protection

- 独特的开关结构
Unique Structure
- 1、不仅主开关可选配电动操作，隔离开关和接地开关也可选配电动操作，有力支持配网自动化和智能化；
2、带电部件全部密封设计，完整实现全绝缘、全密封结构，防护等级为IP67，短时浸泡在水中也能正常工作；
3、可以十分清晰地从观察窗分相观看开关的分合位置；
4、模块化设计和分相设计，使单元组合和回路扩展更加方便，绝缘性能更为优良；
5、无SF6气体绝缘，永无污染，完全彻底的环保结构；
6、巧妙的机械联锁和电气联锁，满足五防要求，确保人身安全设备安全；
7、精美的外形，柔和协调的色彩，给用户美的享受。

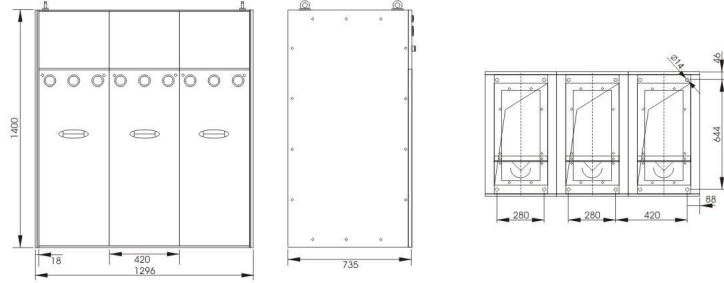
1. An electric operating mechanism is optional not only for the main switch but also for the isolating switch and ground switch, as is a profound backup for the automation and intelligization of the electric distribution network.
2. The totally sealed design of live parts allows an integral realization of the fully insulated and totally sealed structure, with a degree of protection of IP67, which means the unit can function normally for a short time even under water.
3. The open/close positions of switches can be seen clearly from the sight glass;
4. The modular design with segregated phases facilitates combination of units and expansion of loops, and enhances insulating property.
5. An absolute eco-friendly structure, with no SF6 being used for gas insulation and free from pollution forever;
6. The ingenious design of mechanical and electric interlocks can meet the requirements for the "five preventions", thus ensuring the safety of personnel and equipment; The delicate outline and pastel shades bring users a sensuous enjoyment.

- 完善的安全性
Perfect Safety Performance
- 1、固体绝缘开关设备完全取消SF6应用，避免了SF6环网柜因气体压力不足造成绝缘性能和灭弧能力下降所引发的爆炸事故。
2、采用具有防爆性能的真空灭弧室，固体绝缘层对开关具有进一步防护作用，确保设备和人员安全。
3、模块化的相间隔离结构，完全避免了相间短路或多回路短路而引起的事故。
4、回路主开关、隔离开关、接地开关柜门之间的“五防联锁”，保证了检修维护人员安全。
5、通过观察窗可十分清楚看到开关各相的分合位置，增强了运行和检修的安全。
6、环氧树脂的高玻璃化温度确保了环氧树脂与硅橡胶在高温下绝缘能力不会下降。
7、环氧水质绝缘层与开关一次导体间采用柔性填充物，消除热胀冷缩引起的应力，避免了产生裂缝。
8、在操作机构内采用全齿传动，提高了操作机构的可靠性。
9、固体绝缘开关的防护等级达到IP67，浸泡在水中也能正常运行。
10、开关位置指示安装于操作主轴上，增强了指示正确。

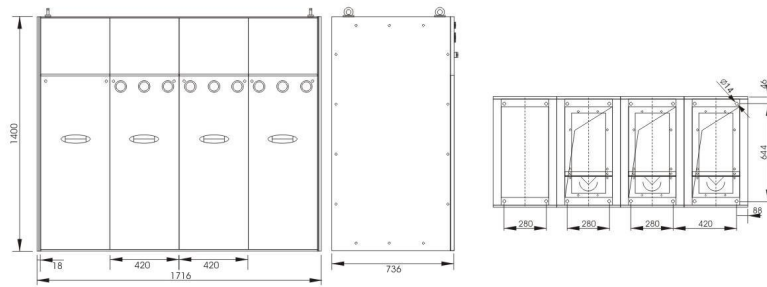
1. The disuse of SF6 in the solid-insulated switchgear avoids any explosive accidents arising from deterioration in insulating property and arc-extinguishing capability, which is attributable to insufficient gas pressure in the SF6 ring network cabinet.
2. The adoption of an explosion-proofing vacuum arc-extinguishing chamber, in which the solid insulating layer provides the switch with further protection, ensures the safety of equipment and personnel.
3. The modular design of the segregated structure between phases avoids any accidents arising from short circuit between phases or between multiple loops.
4. The "five-prevention interlock" between the main circuit switch, isolating switch, ground switch and cabinet door ensures the safety of repairmen and maintenance personnel.
5. The open/close positions of all phases of switches can be seen clearly from the sight glass, thus enhancing the safety of personnel during operation, examination and repair.
6. The high glass temperature of epoxy resin guarantees that the insulating property of epoxy resin and silicon rubber would not deteriorate when suffering a high temperature.
7. The adoption of flexible fillers between the epoxy resin insulating layer and the primary conductor of switches eliminates the stress caused by expansion with heat and contraction with cold, thus avoiding the occurrence of cracks.
8. The adoption of all-round reversing gear with the operating mechanism improves the reliability of the operating mechanism.
9. A degree of protection as high as IP67 allows the solid-insulated switch to function normally even under water.
10. The switch position indication is fixed to the main shaft, thus enhancing the correctness of the indication.

产品安装 Installation Foundation Dimension Drawing

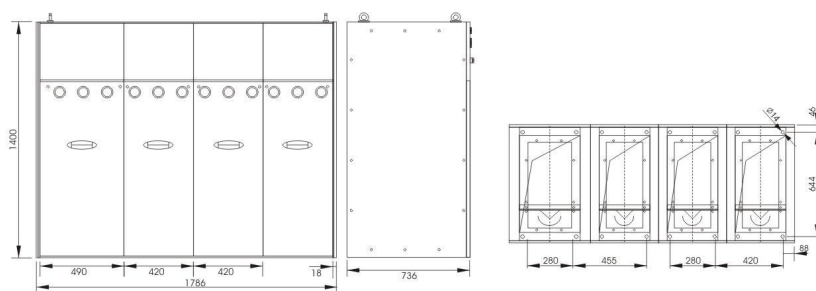
三单元 Unit III



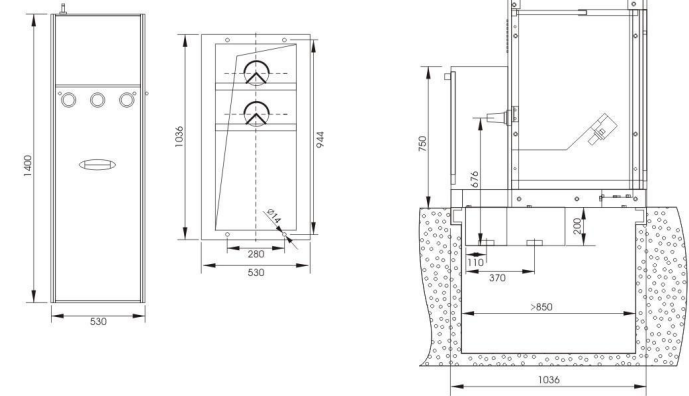
三单元+PT柜 Unit III+PT Cabinet



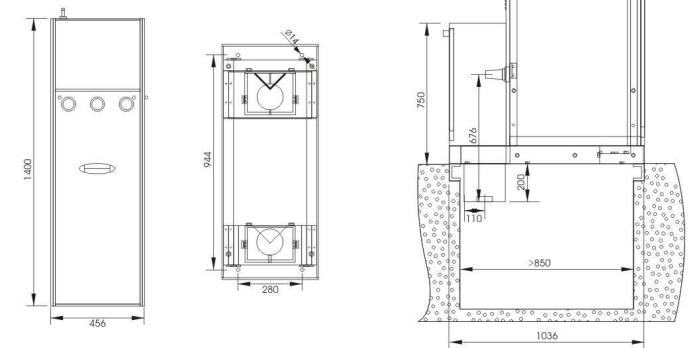
四单元FVCC Fvcc Unit IV



F单元单柜 Single Cabinet of Unit F



V单元单柜 Single Cabinet of Unit V



主要电路方案 Main Circuit Scheme

开关柜名称 Name of switch cabinet	进线/出线柜 Incoming/outgoing cabinet	出线柜 outgoing cabinet	联络柜 Liaison cabinet	
开关柜型号及代号 Model & code of switch cabinet	XGN-12(TT)/V	XGN-12(TT)/C	XGN-12(TT)/F	XGN-12(TT)/VL
开关柜一次接线图 Primary wiring diagram for switch cabinet				
隔离开关 630A/20KA Isolating switch	1组 Set	1组 Set	1组 Set	1组 Set
接地开关 630A/20KA Ground switch	1组 Set	1组 Set	1组 Set	1组 Set
断路器 630A/20KA Circuit breaker	1组 Set			1组 Set
负荷开关 630A/20KA Load switch		1组 Set	1组 Set	
高压熔断器 High-voltage fuse			1组 Set	
带电显示器 GXNK-10TH Live display	1组 Set	1组 Set	1组 Set	1组 Set
避雷器后插 HY5WZ-17/45 Arrester rear plug	1组 Set	1组 Set		
微机保护装置 CSR010 Microprocessor-based protection device	1组 Set			1组 Set
CT:LDZC-10 0.5/10P20,**/5	3只 Piece			3只 Piece
PT:JSZV18 10/0.1/0.22, 0.5/6P				
仪表箱: 420 × 300 × 200 Instrument box	1只 Piece	1只 Piece	1只 Piece	1只 Piece
欧式屏蔽电缆插接头 European type shielded cable connector	1组 Set	1组 Set	200A插接头一组 A set of 200A plugs and connectors	
外形尺寸: 宽 × 深 × 高 Exterior dimension: W × D × H	420 × 736 × 1600		490 × 736 × 1600	420 × 736 × 1600
用户提供电缆型号规格 Cable model & specs to be provided by customer				

开关柜名称 Name of switch cabinet	联络柜 Liaison cabinet	进线/出线柜 Incoming/outgoing cabinet	PT柜 PT cabinet	计量柜 Metering cabinet
开关柜型号及代号 Model & code of switch cabinet	XGN-12(TT)/CL	XGN-12(TT)/D	XGN-12(TT)/G	XGN-12(TT)/M
开关柜一次接线图 Primary wiring diagram for switch cabinet				
隔离开关 630A/20KA Isolating switch	1组 Set		1组 Set	
接地开关 630A/20KA Ground switch	1组 Set		1组 Set	
断路器 630A/20KA Circuit breaker				
负荷开关 630A/20KA Load switch	1组 Set			
高压熔断器 High-voltage fuse			XRNP-10/0.5A 3只 Piece	XRNP-10/0.5A 3只 Piece
带电显示器 GXNK-10TH Live display	1组 Set	1组 Set	1组 Set	1组 Set
避雷器后插 HY5WZ-17/45 Arrester rear plug		1组 Set	1组 Set	
微机保护装置 CSR010 Microprocessor-based protection device				
CT:LDZC-10 0.5/10P20,**/5				LZZBJ9-10Q 2只 Piece
PT:JSZV18 10/0.1/0.22, 0.5/6P			1只 Piece	JDZ-10Q 2只 Piece
仪表箱: 420 × 300 × 200 Instrument box	1只 Piece	1只 Piece	1只 Piece	
欧式屏蔽电缆插接头 European type shielded cable connector		1组 Set	1组 Set	
外形尺寸: 宽 × 深 × 高 Exterior dimension: W × D × H	420 × 736 × 1600		850 × 736 × 1600	
用户提供电缆型号规格 Cable model & specs to be provided by customer				

1、表中F单元出线柜如果在联络柜的提升侧，则联络柜要分解成两台420mm宽的柜体，才能实现并柜。

2、表中开关柜根据一次系统图并柜后，两侧面还须加装侧板各厚18mm。

3、如果单柜独立使用，因有进出线，除加装两侧板外，柜体深度须增加300mm。

4、表中外形尺寸的高度已包括柜顶的仪表箱高度。

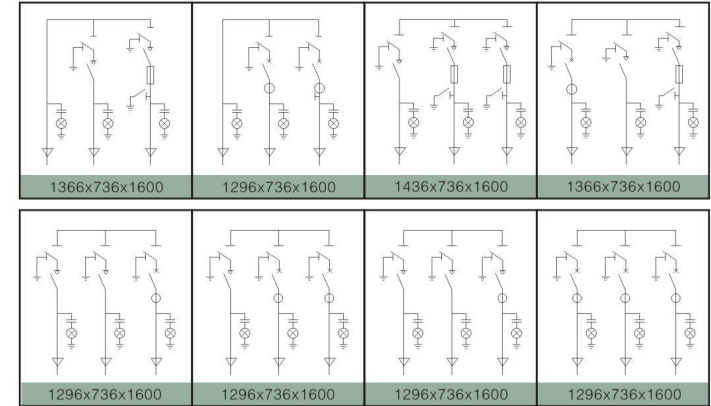
1. To combine the outgoing cabinet for unit F listed in the table with the tie cabinet together from the lifting side, the tie cabinet must be disassembled into two cabinets with a width of 420mm each.

2. After the combination of switch cabinets as listed in the table is completed, side plates must be additionally provided on both sides, with a thickness of 18mm each.

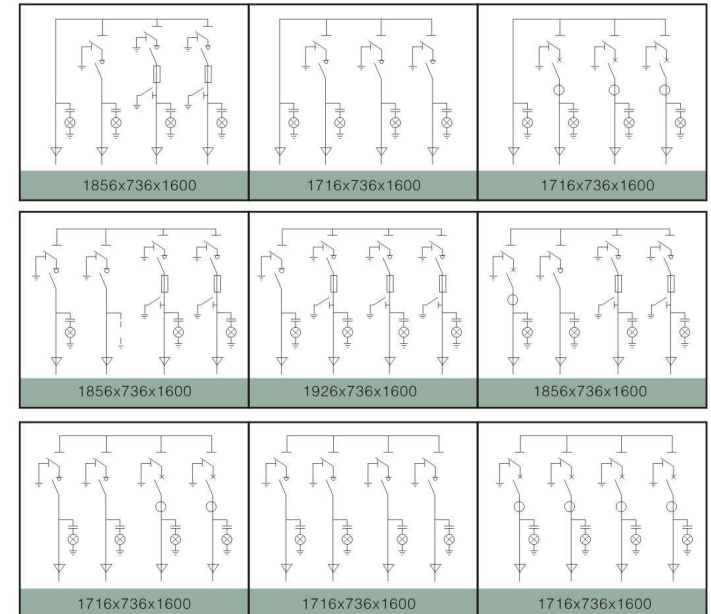
3. The depth of a single cabinet, if it is required to be used separately, must be increased by 300mm except two side plates is required additionally.

4. The height of the outline dimension as given in the table includes the height of the instrument box on top of the cabinet.

三单元组合举例 Examples of Three-Unit Combination



四单元组合举例 Examples of Four-Unit Combination



外形尺寸: 宽X深X高 单位: mm Exterior dimension: W × D × H Unit: mm

订货须知 Ordering Instructions

提供产品型号、规格

提供产品方案和一次接线图

提供熔断器的额定电流

提供进出线电缆截面面积

要求订购的备件和附件

特殊要求与制造商协商解决

Provide product model and specification

Provide the product scheme and primary wiring diagram

Provide the rated current of the fuse

Provide the cross-sectional area of the incoming and outgoing lines

Spare parts and accessories required in the order

If anything special is required, please consult the manufacturer.

产品·企业市场竞争力的体现

Product · Foundation Stone for Enterprise Impingement on Markets

低压成套开关设备

Low-Voltage Complete Switchgear

性能特点 Performance Features

低压开关柜适用于发电厂、石油、化工、冶金、纺织、高层建筑等行业，作为输电、配电及电能转换之用。

- 设计合理：根据进口、国产等各种开关电气的特点进行单元化设计，组合成功能单元。
- 结构通用，组装灵活：C型型材满足各种结构形式。保护等级及使用环境条件的要求。
- 标准模块：可以分别组成保护、操作、转换、控制等标准单元模块结构。
- 安全防护：采用区域之间的隔离以及功能单元进线和出线之间的相互隔离，有效地加强安全防护性能。

Low-voltage switch cabinet applies to industries such as power plant, petroleum, chemical, metallurgy, textile and high building, and is used for power transmission, power distribution and electric energy conversion.

- Reasonable design: unitization design is based on various switch electric characteristics such as escape hatch and schematic output, so as to form functional unit.
- General purpose structure and flexible assembling: type C profile material meets requirements of structure type I cable protection grade and usage surrounding conditions.
- Standard module: respective constitution of modular structure of standard units such as protection, operation, conversion and control, and any options.
- Safety protection: adoption of isolation between regions and mutual isolation between incoming and outgoing lines of functional units, so as to strengthen safety surplus protection performance effectively.

使用条件 Usage Conditions

- 周围空气温度不得超过+40℃，不低于-5℃，而且在24h内其平均温度不得超过+35℃。
- 空气清洁，在最高温度为+40℃时，其相对湿度不得超过50%，在较低温度时，允许有较大的相对湿度。
- 污染等级3级。
- 安装场地的海拔不得超过2000m。
- 特殊使用条件，订货时另行协商。

- Ambient air temperature no more than +40℃ and no less than -5℃, and average temperature within 24h no more than +35℃.
- Clean air, relative humidity should be no more than 50% under the highest temperature +40℃, and larger relative humidity is allowed under low temperature.
- Pollution grade: 3
- Altitude of installation site is no more than 2000m
- Special usage condition, to be negotiated upon ordering.

目录 Catalog

GGD型低压固定式成套开关设备	GGD model low-voltage stationary complete switchgear
GCS型低压抽出式成套开关设备	GCS model low-voltage withdrawable complete switchgear
GCK型低压抽出式成套开关设备	GCK model low-voltage withdrawable complete switchgear
MNS型低压抽出式成套开关设备	MNS low-voltage withdrawable-type complete switchgear
JP综合配电箱	JP integrated distribution box
计量箱	Metering box
XL-21型低压配电柜	XL-21 type low-voltage distribution cabinet
JXF配电箱	JXF distribution box



GGD型低压固定式成套开关设备

GGD Model Low-Voltage Stationary Complete Switchgear

GGD型低压固定式成套开关设备适用于发电厂、变电站、厂矿企业等电力用户，在频率为50Hz，额定工作电压380V，额定工作电流至3150A配电系统中，作为动力、照明及配电设备的电能转换、分配与控制之用。

GGD model low-voltage stationary complete switchgear applies to power users such as power plant, transformer substation and industrial and mining enterprises, and plays the role of power conversion, distribution and control of power equipment, illumination equipment and distribution equipment in power distribution system of frequency 50Hz, rated operating voltage 380V and rated operating current up to 3150A.

使用环境 Environmental Conditions for Product Use

- 周围空气温度不高于+40℃，不低于-5℃，24h内平均温度不得高于+35℃。
 - 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
 - 周围空气相对湿度在最高温度+40℃是不得超过50%，在较低温度时允许有较大的相对湿度。（例如+20℃时为90%）
 - 设备安装时与垂直面的倾斜度不超过5°。
 - 设备应安装在无剧烈震动和冲击的地方，以及不足以使电器元件受到腐蚀的场所。
 - 用户有特殊要求时可与制造厂协商解决。
- Ambient air temperature should be no more than +40℃ and no less than -5℃, and average temperature within 24h should be no more than +35℃.
 - Altitude should be 1000m, users of high altitude region should indicate altitude upon ordering, and the product can meet requirement of user for altitude below 4000m.
 - Relative humidity of ambient air should be no more than 50% under the highest temperature +40℃, and larger relative humidity is allowed under low temperature (for example: 90% under temperature +20℃).
 - he inclination from vertical plane should be no more than 5° upon installation of equipment.
 - Equipment should be installed at location free from violent shock and impact, and location free from corrosion of electric appliance component.
 - User can negotiate with manufacture to find out solution in case of special requirements.

产品特点 Product Characteristics

低压固定式成套开关设备的柜体采用通用柜形式，构架用8MF冷弯型钢局部焊接组装而成。通用柜的零部件按模块原理设计，并有20mm模数安装孔，通用系数高；充分考虑到柜体运行中的散热，在柜体上下两端均有不同数量的散热槽孔。按现代工业产品造型设计要求，采用黄金分割比的方法设计柜体外形和各部分的分割尺寸，使整柜美观大方。柜门用转轴式活动铰链与构架相连，安装、拆卸方便。门的折边处均嵌有一根山型橡胶条，关门时门与构架之间的嵌条有一定的压缩行程，能防止门与柜体直接碰撞，也提高了门的防护等级。装有电器元件的仪表门用多股软铜线与构架相连，柜内的安装件与构架间用滚花螺钉连接，整柜构成完整的接地保护电路。柜体顶盖在需要时可拆除，便于现场母线的装配和调整，柜顶的四角装有吊环，用于起吊和装运。柜体的防护等级为IP30，用户可根据环境的需要在IP20~IP40之间选择。

Cabinet body of low-voltage stationary complete switchgear adopts general purpose cabinet, and framework is assembled through partial welding of molded section. Component of general purpose cabinet is designed as per modular theory, and is configured with 20mm modulus installation hole, and the general purpose factor is high; with adequate consideration of heat radiation in cabinet during operation, different quantity of heat radiation holes are configured on both top/bottom side of cabinet body. In accordance with modern industrial product shape design requirement, golden section ratio is adopted for design of cabinet body exterior and section dimension of all parts, so that overall appearance of cabinet is pretty and elegant. Cabinet door is connected with framework by rotating shaft type of moveable hinge, featuring convenient installation and dismantling. A reverse T-shape rubber strip is embedded on edge of door, the embedded strip between door and framework has certain compression travel upon closing of door, and can prevent direct impact between door and cabinet body, enhancing degree of protection of door. The instrument door installed with electric component is connected to framework by multi-strand flexible copper wire, knurled screw is used for connection between parts mounted in cabinet and framework, so that the entire cabinet constitutes an integrated grounding protection circuit. Cabinet roof can be dismantled if necessary for the sake of assembling and adjustment of main busbar on site, hoisting rings are installed at all four corners of cabinet roof for hoisting and loading. Degree of protection of cabinet body is IP30 and user can select between IP20~IP40 as per demand of environment.

技术参数 Technical Parameters

型号 Model	额定电压 Rated voltage (V)	额定电流 Rated current (A)	额定短路开断电流 Rated short-circuit breaking current (kA)	额定短时耐受电流 Rated short-time withstand current (IS) (kA)	额定峰值耐受电流 Rated peak withstand current (kA)
GGD1	380	A	1000	15	15
		B	600 (630)		
		C	400		
GGD2	380	A	1500 (1600)	30	30
		B	1000		
		C	600		
GGD3	380	A	3150	50	50
		B	2500		
		C	2000		

主回路方案 Main Circuit Scheme

GGD柜的主电路设计了129个方案，共298个规格（不包括辅助电路的功能变化及控制电压变化而派生的方案和规格）。其中GGD1型，46个方案，123个规格；GGD2型，49个方案，107个规格；GGD3型，24个方案，68个规格。额定电流增加至3150A，适合2000kVA及以下的配电变压器选用。此外，为适应无功补偿的需要，设计了GGJ1、GGJ2电容补偿柜，其主电路方案4个，共12个规格。

The main circuit of GGD cabinet is designed with 129 programs, totaling 298 specifications (excluding functional change of auxiliary circuit and program and specification derived from change of control voltage).

In which there are 46 programs and 123 specifications for GGD type 1; 49 programs and 107 specifications for GGD type 2; 24 programs and 68 specifications for GGD type 3.

Rated current is increased to 3150A, and applies to power distribution transformer of 2000kVA and below.

Furthermore, in order to adapt to demand of reactive compensation, GGJ1 and GGJ2 capacitance compensation cabinets have been designed, including 4 main circuit programs and totaling 12 specifications.

辅助电路方案 Auxiliary Circuit Scheme

辅助电路的设计分供电方案和发电厂方案两部分。GGD柜内有足够的空间安装二次元件，同时开发研制了专用的LMZ3D型电流互感器以满足发电厂和特殊用户附设继电器保护时需要。

Design of auxiliary circuit is divided into two parts of power supply program and power plant program. There is sufficient space in GGD cabinet for installation of secondary component, meanwhile, special LMZ3D model current transformer has been developed and researched to meet requirements of power plant and special user on configuration of relay protection.


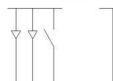



电器元件的选择 Selection of Electric Component

- GGD柜主要采用国内已能批量生产的较先进的电器元件，如ME、DZ20、TW30等。
- HD13BX和HS13BX型旋转操作式刀开关是为满足GGD柜独特结构需要而设计的专用元件，他改变了机构的操作方式，保留了老产品的优点，是一种实用新型的电器元件。
- 根据用户需要，选用性能更优良，技术更先进的新型电器元件时，因GGD柜具有良好的安装灵活性，一般不会因更新电器元件型号或厂家造成制造和安装方面的困难。
- 为进一步提高主电路的动稳定能力，设计了GGD柜专用ZMJ型组合式母线夹和绝缘支撑件。母线夹由高强度、高阻燃型PPO合金材料热塑成型，绝缘强度高，自熄性能好，结构独特，只需调整积木式模块即可方便地组合成单母线夹或双母线夹。绝缘支撑是套筒式模压结构，成本低、强度高，解决了老产品爬电距离不够的缺陷。


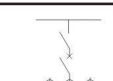



- GGD cabinet mainly adopts advanced electric components that have been regularly produced in China, such as ME, DZ20 and TW30, etc.
- HD13BX and HS13BX model rotating operation knife switch is special component designed to meet special structural demand of GGD cabinet, it changes operation mode of mechanism while keeping advantages of old product, and is a electric component of utility model.
- Where better performance and more advanced new type of electric components are selected as per user's demand, due to excellent installation flexibility of GGD cabinet, normally no trouble will be caused in term of manufacture and installation due to change of electric component model or manufacturer.
- In order to further enhance dynamic stability of main circuit, special ZMJ combined type busbar clamp and insulation supporting parts are designed for GGD cabinet. Made of thermoplastic moulding of PPO alloy material featuring high strength and high flame resistance, busbar clamp features high insulation strength, excellent self-extinguishing character and special structure, single-busbar clamp or double-busbar clamp can be combined conveniently through adjustment of building block module. With sleeve type of die stamping structure, insulation support features low cost and high strength, and has solved the defect of insufficient creepage of old product.

主电路方案图 Diagram Of Main Circuit Program

(1)GGD1型主电路方案 Program of GGD1 Main Circuit

主电路方案编号 Main Circuit Scheme number		01			02			03			04			05			
主 电 路 方 案	单线图 Single line diagram																
	用途 Usage	受电 Power receiving															
主 电 路 电 器 元 件	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
	HD13BX-1000/31				1			1			1			1			
	HD13BX-600/31					1			1			1			2	2	
	HD13BX-400/31						1				1			1			2
	TW30-1000/3											1					2
	TM30S-630W/3												1				
	TM30S-400W/3													1			
	CJ20-400/3														1		
	CJ20-250/3															2	
	CJ20-160/3																2
	LMZ1-0.66[]/5								1	1	1	3	3	3	2		
	LMZ3-0.66[]/5															2	2
LMZ3D-0.66[]/5																	
柜宽 (mm) Cabinet width	600	600	600	1000	800	800	600	600	600	800	800	800	800	800	800	800	
深 (mm) Cabinet depth	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	
电 路 图 号 Circuit diagram number		0101D,0102D,0109D															
		0110D,0115D,0116D															
		0118D,0119D,0127D															
		0128D,0201D,0202D 0204D,0205D,0207D															
备注 Remarks	B,C方案柜宽可为600mm Cabinet width=600mm																

GGD1型主电路方案 (续1) Program of GGD1 Main Circuit(I)

主电路方案编号 Main Circuit Scheme number		06			07			08			09			10			
主 电 路 方 案	单线图 Single line diagram																
	用途 Usage	受电 Power receiving															
主 电 路 电 器 元 件	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
	HD13BX-1000/31	1			1			1			2			2			
	HD13BX-600/31		1		1			1			2			2		2	
	HD13BX-400/31			1			1			1			2			2	
	TW30-1000/3				1			1			1			1		2	
	TM30S-630W/3					1			1		1			1			
	TM30S-400W/3						1			1			1			1	
	LMZ1-0.66[]/5				3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)
	LMZ3D-0.66[]/5																
	柜宽 (mm) Cabinet width	600	600	600	800	800	800	1000	800	800	1000	800	800	1000	800	800	
深 (mm) Cabinet depth	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600		
电 路 图 号 Circuit diagram number		0104D,0105D,0112D															
		0113D,0121D,0122D															
		0124D,0125D,0130D															
		0131D,0133D,0134D 0210D,0211D,0213D															
备注 Remarks																	

GGD1型主电路方案 (续2) Program of GGD1 Main Circuit (II)

主电路方案编号 Main Circuit Scheme number	11			12			13			14			15			
	单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			
用途 Usage	受电 联络 Power receiving+Liaison			受电 备用 Power receiving Standby									受电 Power receiving			
	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
HD13BX-1000/31	2															
HD13BX-600/31	2	2													1	
HD13BX-400/31			2													
HS13BX-1000/3(41)					1			1			1					
HS13BX-600/3(41)					1	1			1		1					
HS13BX-400/3(41)							1		1		1			1		
TM30-1000/3	1				1			1		1			1			
TM30S-630W/3		1				1			1			1				1
TM30S-400W/3			1			1			1			1				
LMZ1-0.66[]/5		3 (4)	3 (4)		3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)	3 (4)
LMZ3D-0.66[]/5																
柜宽 (mm) Cabinet width	1000	800	800	1000	800	800	1000	800	800	1000	800	800	1000	800	800	
深 (mm) Cabinet depth	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
电路图图号 Circuit diagram number	0104D,0105D,0112D			0107D,0108D			0107D,0108D			0107D,0108D			0101D,0102D,0109D			
	0113D,0121D,0122D												0110D,0115D,0116D			
	0124D,0125D,0130D												0118D,0119D,0127D			
	0131D,0133D,0134D												0128D,0201D,0202D			
	0210D,0211D,0213D												0204D,0205D,0207D			
备注 Remarks																

GGD1型主电路方案(续3) Program of GGD1 Main Circuit(III)

主电路方案编号 Main Circuit Scheme number	16			17			18			19			
	单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			
用途 Usage	联络 Liaison			联络 馈电 Interconnection Power feed			联络 Liaison			馈电 备用 Interconnection Power feed			
	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C
HD13BX-1000/31	2												
HD13BX-600/31		2			2								
HD13BX-400/31			2			2							
HS13BX-1000/3(41)											1		
HS13BX-600/3(41)												1	
DZ20-630P/3[]											1		
DZ20-250/3[]					2	2						1	
DZ20-100/3[]							2						
JDG-0.5 380/100V	2 (3)	2 (3)	2 (3)										
RTO-[]	3	3	3										
LMZ1-0.66[]/5					2	2						3	
LMZ3-0.66[]/5													3
柜宽 (mm) Cabinet width	1000	800	800	1000	800	800	600	600	600	600	600	600	600
深 (mm) Cabinet depth	600	600	600	600	600	600	600	600	600	600	600	600	600
电路图图号 Circuit diagram number	0403F,0406F,0407F			0512D,0519D						0508D,0511D			
备注 Remarks													

GGD1型主电路方案(续4) Program of GGD1 Main Circuit(IV)

主电路方案编号 Main Circuit Scheme number	20			21			22			23			24			
	单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			
用途 Usage	馈电 备用 Interconnection Standby									联络 馈电 备用 Interconnection Power feed Standby						
	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
HD13BX-1000/31											1			1		
HD13BX-600/31												1			1	
HD13BX-400/31													1			1
HS13BX-1000/3(41)									1					1		
HS13BX-600/3(41)	1							1			1			1		
HS13BX-400/3(41)		1							1				1			1
HS13BX-200/3(41)						1									1	
DZ20-250/3[]	2	1					4			4				2		2
DZ20-100/3[]					1	2		4	4		4	4		2	2	2
LMZ1-0.66[]/5										3	3	3				
LMZ3-0.66[]/5	2	2	2		4	4	4	4	4	4	4	4	2	2	2	2
柜宽 (mm) Cabinet width	600	600	600	800	800	800	800	800	800	800	800	800	1000	800	800	800
深 (mm) Cabinet depth	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
电路图图号 Circuit diagram number	0514D,0517D			0515D,0518D			0516D,0523D			0514D,0517D			1514D,0517D			
备注 Remarks																

GGD1型主电路方案(续5) Program of GGD1 Main Circuit(V)

主电路方案编号 Main Circuit Scheme number	25			26			27			28			
	单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			单线图 Single line diagram			
用途 Usage	馈电 Power feed												
	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C
HD13BX-1000/31													
HD13BX-600/31													
HD13BX-400/31													
HS13BX-1000/3(41)													
HS13BX-600/3(41)	1	1	1	1	1			1	1				
DZ20-630P/3[]	1												
DZ20-250/3[]	1	2			4			4					
DZ20-100/3[]										4	4		2
LMZ1-0.66[]/5	1									3	3		2
LMZ3-0.66[]/5	1	2	2		4	4							
LMZ3D-0.66[]/5										4	4		
柜宽 (mm) Cabinet width	600	600	600	800	800			800	800			800	
深 (mm) Cabinet depth	600	600	600	600	600			600	600			600	
电路图图号 Circuit diagram number	0512D,0519D,0525D			0513D,0520D			0509D,0521D			0524D			
	0505F,0506F												
备注 Remarks													

GGD1型主电路方案(续6)

主电路方案编号 Main Circuit Scheme number		29			30			31			32			33		
主电路方案 Main Circuit Scheme	单线图 Single line diagram															
	用途 Usage	馈电 Interconnection			联络 馈电 备用 Interconnection Power feed Standby											
主电路电器元件 Electric component of main circuit	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
	HD13BX-600/31							2			2			2		
	HD13BX-400/31	2			2			2			2			2		
	HS13BX-200/31		2			2			2			2			2	
	TM30S-630W/3													1		
	TM30S-400W/3														1	
	DZ20-250/3 []	2			2											
	DZ20-100/3 []		2			2										
	RTO-[]							6	6	6	12	12	12	3	3	
	LMZ3-0.66[]/5	2	2		6	6										
LMZ3D-0.66[]/5							2	2	2	4	4	4	4	4		
LJ-[]							2	2	2	4	4	4	2	2		
柜宽 (mm) Cabinet width	800	800		800	600		800	800	800	800	800	800	800	800		
深 (mm) Cabinet depth	600	600		600	600		600	600	600	600	600	600	600	600		
电路图图号 Circuit diagram number	0512D,0519D				0510D,0522D			0507F,0508F			0507F,0508F			0503F,0504F,0507F		
	0505D,0506D				0503F,0514F,0632F									0508F,0601F,0602F		
														0603F,0604F,0605F		
备注 Remarks																

GGD1型主电路方案(续7) Program of GGD1 Main Circuit(VII)

主电路方案编号 Main Circuit Scheme number		34			35			36			37			
主电路方案 Main Circuit Scheme	单线图 Single line diagram													
	用途 Usage	馈电 Interconnection			联络 馈电 备用 Interconnection Power feed Standby									
主电路电器元件 Electric component of main circuit	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	
	HD13BX-600/31	1						2						
	HD13BX-400/31		1											
	HD13BX-200/31	1	1		3						3			
	TM30S-630W/3	1												
	TM30S-400W/3		1											
	CJ20-630/3								1					
	CJ20-250/3								1					
	CJ20-63/3										6			
	RTO-[]	3	3		9			6			18			
JDG-0.5 380/100V	2 (3)	2 (3)		2 (3)										
LMZ3D-0.66[]/5	3	3		2			2							
LJ-[]	1	1		2			2							
柜宽 (mm) Cabinet width	800	800	800	800			800			800				
深 (mm) Cabinet depth	600	600	600	600			600			600				
电路图图号 Circuit diagram number	0401F,0404F,0407F				0401F,0404F,0407F			0638F,0369F,0640F			0648F,0649F,0650F			
	0503F,0504F,0601F				0507F,0508F						0641F,0642F,0643F			
	0602F,0603F,0604F							0644F,0645F,0646F						
	0605F,0606F,0634F													
备注 Remarks		主柜 main cabinet											辅柜 auxiliary cabinet	

GGD1型主电路方案(续8) Program of GGD1 Main Circuit(VII)

主电路方案编号 Main Circuit Scheme number		38			39			40			41			42		
主电路方案 Main Circuit Scheme	单线图 Single line diagram															
	用途 Usage	馈电 Interconnection			照明 Illumination											
主电路电器元件 Electric component of main circuit	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
	HD13BX-600/31				1			1								
	HD13BX-400/31	2				1			1							2
	HD13BX-200/31															
	HR5-630/3 []										1					
	HR5-400/3 []											1				
	HR5-200/3 []															
	HG2-160													1	12	
	CJ20-630/3	2														
	CJ20-63/3	4														
RTO-[]	18			12	12	12	18	18	18	18	18	18	18	18	18	
SG-[]										1	1	1				
LMZ3-0.66[]/5				4	4	4	6	6	6							
LMZ3D-0.66[]/5																
柜宽 (mm) Cabinet width	800			800	800	800	800	800	800	800	800	800	800	800	800	
深 (mm) Cabinet depth	600			600	600	600	600	600	600	600	600	600	600	600	600	
电路图图号 Circuit diagram number	0648F,0649F,0650F				0701D			0701D								
备注 Remarks																

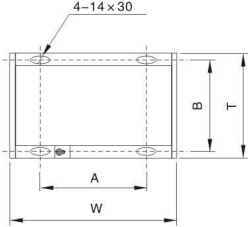
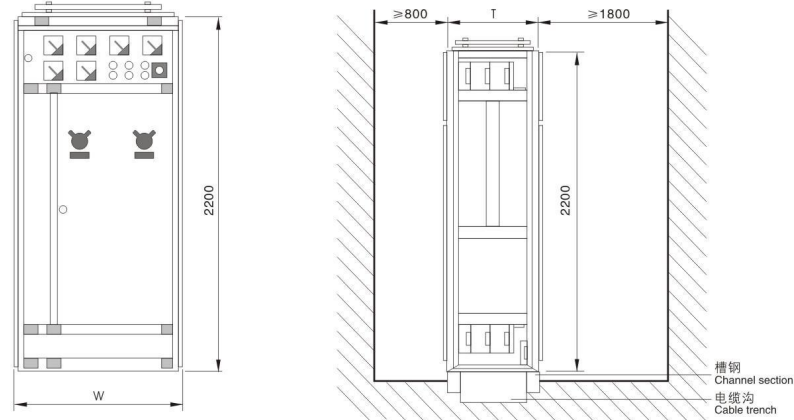
GGJ低压无功功率补偿主电路方案 Program of GGJ Low-Voltage Reactive Power Compensation Main Circuit

主电路方案编号 Main Circuit Scheme number		GGJ1-01			GGJ1-02			GGJ2-01			GGJ2-02		
主电路方案 Main Circuit Scheme	单线图 Single line diagram												
	用途 Usage	馈电 Interconnection											
主电路电器元件 Electric component of main circuit	型号规格 Model	A	B	C	A	B	C	A	B	C	A	B	C
	HR5-630/3 []	1	1	1	1	1	1	1	1	1	1	1	1
	HR5-400/3 []	3	3	3	3	3	3	3	3	3	3	3	3
	LMZ2-0.66[]/5	20	24	18	30	24	18	30	24	18	30	24	18
	aM3-32	3	3	3	3	3	3	3	3	3	3	3	3
	HY1.5WSZ-0.28	3	3	3	3	3	3	3	3	3	3	3	3
	CJ16-32/3	10	8	6	10	8	6	10	8	6	10	8	6
	JR16-60/32	10	8	6	10	8	6	10	8	6	10	8	6
	DWB-2N	1	1	1				1	1	1			
	BCMJO.4-16-3	10	8	6	10	8	6	10	8	6	10	8	6
(BW0.4-16-3)	(10)	(8)	(6)	(10)	(8)	(6)	(10)	(8)	(6)	(10)	(8)	(6)	
(BCMJO.4-20-3)													
柜宽 (mm) Cabinet width	1000	800	800	1000	800	800	1000	800	800	1000	800	800	
深 (mm) Cabinet depth	600	600	600	600	600	600	600	600	600	600	600	600	
电路图图号 Circuit diagram number	0801D				0802D			0801D			0802D		
备注 Remarks		主柜 main cabinet			辅柜 auxiliary cabinet			主柜 main cabinet			辅柜 auxiliary cabinet		

外形尺寸 Outline Dimensions

产品外形尺寸及安装基础见下图。基础槽钢和采用螺栓由用户自备。主母线连接时，若表面因运输、保管等原因造成的不平整时，需平整后再连接紧固。

See exterior dimension and installation foundation of product as per the following figure. Foundation channel steel and adopted bolt should be prepared by user. During connection of main busbar, in case of uneven surface caused due to reasons such as transportation and storage, it is necessary to connect and fasten after flattening.



外形尺寸mm Outline Dimension		
	A	B
宽W	600	450
	800	650
	1000	850
	1200	1050
宽W	600	556
	800	756

订货须知 Ordering Instructions

- 开关柜的排列图和配电室的平面布置图
- 主电路单线系统图及主母线规格
- 辅助回路原理图
- 柜内电器元件的型号、规格、数量。
- 柜外壳的防护等级IP30或柜体颜色。
- 母线槽相对于柜体（不包含门厚）和墙厚尺寸
- 其他与产品正常使用条件不符的特殊要求。

- Arrangement diagram of switch cabinet and floor plan of power distribution room
- Main circuit single wire system diagram and main busbar specification
- Schematic diagram of auxiliary circuit
- Model, specification and quantity of electric components in cabinet
- Degree of protection IP30 of cabinet enclosure or color of cabinet body
- Dimension of busbar duct in relation to cabinet body (excluding door thickness) and wall thickness
- Other special requirements that are not in compliance with normal usage conditions.



GCS型低压抽出式成套开关设备 GCS Model low-voltage withdrawable Complete Switchgear

GCS型低压抽出式成套开关设备是两部联合设计组根据行业主管部门、广大电力用户及设计单位的要求设计研制的，符合国情、具有较高技术性能指标、能够适应电力市场发展需要并可与现有引进产品竞争的低压抽出式开关柜。该装置适用于发电厂、石油、化工、冶金、纺织、高层建筑等行业的配电系统。在大型发电厂、石化系统等自动化程度高，要求与计算机接口的场所，作为三相交流频率为50（60）Hz，额定工作电压为380V（400V）、（660V），额定电流为4000A及以下的发、供电系统中的配电、电动机集中控制、无功功率补偿使用的低压成套配电装置。

Designed and researched by joint design group of two ministries in accordance with requirements of industrial authority, wide electric users and design organizations, GCS model low-voltage withdrawable complete switchgear is a low-voltage withdrawable-type switch cabinet that is in compliance with situations of China, features high technical performance index, can adapt to demand of electric market development and compete with existing imported product. The device applies to power distribution system of industries such as power plant, petroleum, chemical, metallurgy, textile and high building. It is used as low-voltage complete power distribution device for power distribution, concentrated motor control and reactive power compensation of power generation and power supply system of 3-phase AC frequency 50 (60) Hz, rated operating voltage 380V (400V)/(660V) and rated current 4000A and below in large-size power plant and petrochemical system where autorotation degree is high and interface with computer is required.

型号含义 Type Connotations

G C S -□-□
① ② ③ ④ ⑤

- | | |
|------------|-------------------------------------|
| ① 封闭式 | Enclosed-type |
| ② 抽出式 | Withdrawable-type |
| ③ 森源电气系统 | SenYuan electric system |
| ④ 主电路方案编号 | Number of electric circuit program |
| ⑤ 辅助电路方案编号 | Number of auxiliary circuit program |

使用环境 Environmental Conditions for Product Use

- 周围空气温度不高于+40℃，不低于-5℃，24h内的平均温度不得高于+35℃；
- 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
- 周围空气相对湿度在最高温度为+40℃时不得超过50%，在较低温度时允许有较大的相对湿度（例如+20℃时为90%）；
- 设备安装时与垂直面的倾斜度不超过5°；
- 设备安装在无剧烈震动和冲击的地方，以及不足以使电器元件受到腐蚀的场所；
- 用户有特殊要求时可与制造厂协商解决。

- Ambient air temperature should be no more than +40°C and no less than -5°C, and average temperature within 24h should be no more than +35°C.
- Altitude should be 1000m, users of high altitude region should indicate altitude upon ordering, and the product can meet requirement of user for altitude below 4000m.
- Relative humidity of ambient air should be no more than 50% under the highest temperature +40°C, and larger relative humidity is allowed under low temperature (for example: 90% under temperature of +20°C).
- The inclination from vertical plane should be no more than 5° upon installation of equipment.
- Equipment should be installed at location free from violent shock and impact, and location free from corrosion of electric appliance component.
- User can negotiate with manufacture to find out solution in case of special requirements.

技术参数 Product Parameters

名称 Descriptions	项目 Items	单位	参数 Parameters
主电路额定电压 Rated voltage of main circuit		V	交流AC380 (400)、660
辅助电路额定电压 Rated voltage of auxiliary circuit		V	交流AC220、380 (400)、直流DC110、220
额定频率 Rated frequency		Hz	50 (60)
额定绝缘电压 Rated insulation voltage		V	660 (1000)
额定电流 Rated current	水平母线 Horizontal busbar	A	≤4000
	垂直母线 Vertical busbar(MCC)		1000
母线额定短时耐受电流 Rated short-time withstand current of busbar		kA/1 S	50、80
母线额定峰值耐受电流 Rated peak withstand current of busbar		kA/0.1 S	105、176
工频试验电压 Power frequency test voltage	主电路 Main circuit	V/1min	2500
	辅助电路 Auxiliary circuit		1760
母线 Busbar	三相四线制 3-phase 4-wire system		A、B、C、PEN
	三相五线制 3-phase 5-wire system		A、B、C、N、PE
防护等级 Degree of protection			IP30、IP40

产品特点 Product Characteristics

- 框架采用8MF冷轧型材，其型材的二侧面分别有模数为20mm和100mm安装孔，使得框架组装灵活方便。
- 框架的侧框架配形式设计为两种，全组装配式结构和部分(侧框和横梁)焊接式结构，供用户选择。
- 开关柜的各功能室相互隔离，其隔室分为功能单元室、母线室和电缆室。各室的作用相对独立。电缆隔室的设计使电缆上、下进出均十分方便。
- 水平母线采用柜后平置式排列方式，以增强母线抗电动力的能力，是使主电路具备高短路强度能力的基本措施。
- 抽屉高度的模数为160mm。抽屉改变仅在高度尺寸上变化，其宽度、深度尺寸不变。相同功能单元的抽屉具有良好的互换性。单元回路额定电流630A及以下。
- 抽屉面板具有分、合、试验、抽出等位置的明显标志。抽屉单元有机械联锁装置。
- 抽屉进出线根据电流大小采用不同片数的同一规格片式结构的接插件。单元抽屉与电缆室的转接按电流分档采用相同尺寸棒式或管式结构ZJ-1型转接件。1/2单元抽屉与电缆室的转接采用背板式结构ZJ-2型转接件。

- Framework adopts 8MF cold rolled section, of which two sides are configured with installation holes of modulus 20mm and 100mm, so that framework assembling is flexible and convenient.
- Lateral frame assembling mode of framework is designed as two types, full assembling structure and partial (lateral frame and cross beam) welding structure for selection by user.
- All functional compartments of switch cabinet are separated from each other, and are divided into functional unit compartment, busbar compartment and cable compartment. Functions of all compartments are relatively independent. Design of cable compartment realizes very convenient upper/lower incoming and outgoing of cable.
- Horizontal busbar adopts near horizontal arrangement mode so as to enhance electrodynamic force resistance of busbar, which is a fundamental measure to realize high short-circuit strength of main circuit.
- Modulus of drawer height is 160mm. Drawer change is limited to change of height dimension only, while its width and depth dimension remain unchanged. Drawer of identical functional units features excellent interchangeability. Rated current of unit circuit is 630A and below.
- Drawer panel features prominent marking of open, close, test and drawn positions. Drawer unit features mechanical interlock unit.
- Incoming/outgoing line of drawer should adopt different number of plug-in components of slice architecture of the same specification as per electric current size. The switchover between unit drawer and cable compartment should adopt identical size of bar type or tubular type structure ZJ-1 switchover parts as per classification of current. The switchover between 1/2 unit drawer and cable compartment should adopt backboard structure ZJ-2 switchover parts

主电路方案 Main Circuit Program

装置主电路方案共33组118个规格(见下表)，不包括由辅助电路的控制与保护的变化而派生的方案和规格，包括了发电、供电和其它电力用户的需要，额定工作电流为4000A，适合2500kV及以下配变变压器选用。此外，为适应供电提高功率因数的需要而设计了电容器补偿柜；考虑综合投资的需要而设计了电抗器柜。

The main circuit program of device totals 33 groups and 118 specifications (see the following table), excluding program and specification derived from change of control and protection of auxiliary circuit, including demand of power generation, power supply/consumption and other power user, the rated operating current is 4000A and applies to power distribution transformer of 2500kV and below 2500kV. Furthermore, capacitor compensation cabinet has been designed to adapt to demand of power supply and consumption to enhance power factor, and reactor cabinet has been designed with consideration of demand of comprehensive investment.

辅助电路方案 Auxiliary Circuit Program

GCS辅助电路共分交流和直流两部分。

直流操作部分的辅助电路方案，主要用于发电厂变电站的低压厂(所)用系统及发电机组低压厂用系统，工作(备用)电源进线，电源馈线和电动机馈线的一般控制方式。交流操作部分的辅助方案主要用于厂矿企业及高层建筑的变电所的低压系统。辅助电路方案根据主电路方案分电源进线、馈线(PC)和电动机馈线(MCC)操作控制的功能单元进线设计。

Auxiliary circuit program of DC operation section is mainly used for normal control mode of low-voltage plant (station) service of power plant transformer substation and generator unit low-voltage station service, operating (backup) power supply incoming line, power supply feeder and motor feeder. Auxiliary program of AC operation section is mainly used for low-voltage system of substation of industrial and mining enterprises and high building. Auxiliary circuit program is designed on the basis of main circuit program branch power supply incoming line, feeder (PC) and functional unit incoming line of motor feeder (MCC) operation and control.

电器元件的选择 Selection of Electric Components

柜内的主要电器元件选用高分断力的国内先进产品，及引进技术的产品，满足了装置高性能的要求。如：断路器选用CM1、ME、AH、DZ20、TM30、ABB的F系列等；接触器选用CJ20、CJX、LC1等；热继电器选用JR16、3UA、LRA-D等。

这些元件具有性能好、结构紧凑、重量轻、短飞弧或无飞弧、技术性能指标高的特点，能满足本装置的要求。

Main electric components in cabinet adopt advanced products of China featuring high breaking capability, and imported technology products, and meet requirements on high performance of device. Such as: circuit breaker adopts F series of CM1, ME, AH, DZ20, TM30 and ABB; contactor adopts CJ20, CJX and LC1, etc; and thermal relay adopts JR16, 3UA and LRA-D, etc.

These components feature characteristics such as excellent performance, compact structure, light weight, short flashover or no flashover and high technical performance index, and meets requirements of this device.

主电路方案号 Main Circuit Scheme number		01						02						03						04													
主电路方案 Main Circuit Scheme	单线图 Single line diagram																																
	用途 Usage	受电(上进线) Power receiving(upper incoming line)						受电(下侧进线) Power receiving(lower incoming line)						受电(电缆进线) Power receiving(cable incoming line)						联络 Liaison													
规格序号 Specification serial number	A	B	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G					
短时耐受电流 Short-time withstand current	80/176						80/176						80/176						80/176														
瞬时耐受电流(kA) transient withstand current	50/105						50/105						50/105						50/105														
额定电流(A) Rated current (A)	30/63						30/63						30/63						30/63														
主电路电器元件 Electric component of main circuit	CW1-4000	1						1																			1						
	CW1-3200		1						1																			1					
	CW1-2500			1						1								1											1				
	CW1-2000				1						1								1											1			
	CW1-1600					1						1								1											1		
	CW1-1000						1						1								1											1	
	CW1-630							1							1																		1
	SDL-□																					(1)	(1)	(1)	(1)								
	BH-□□/5	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3(4)	3	3	3	3	3	3	3		
	柜宽mm Cabinet width	800(1000)						600						800(1000)						600													
柜深mm Cabinet depth	1000						800						1000						800														
占用小室高度mm Occupied compartment height																																	

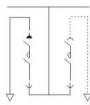
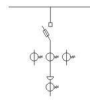
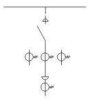
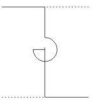
主电路方案号 Main Circuit Scheme number		05						06						07						08														
主电路方案 Main Circuit Scheme	单线图 Single line diagram																																	
	用途 Usage	母线转接 Busbar switchover						馈电 Power feeding						双电源手动切换 Double-power-source manual switching						双电源手动切换 Double-power-source manual switching														
规格序号 Specification serial number	A	B	C				A	B	C				A	B				A																
短时耐受电流 Short-time withstand current							50/105						50/105						50/105															
瞬时耐受电流(kA) transient withstand current							30/63						30/63						30/63															
额定电流(A) Rated current (A)	1600/1000/630						1600/1000/630						1000/630						1000/630															
主电路电器元件 Electric component of main circuit	CW1-1600	1					1																1											
	CW1-1000		1					1																				1						
	CW1-630			1					1																							1		
	QPS-1000																																	
	QPS-630																																	
	SDL-□																						1	1										
BH-□□/5	3(4)	3(4)	3(4)			3(4)	3(4)	3(4)			3(4)	3(4)			3(4)	3(4)			3(4)	3(4)			3(4)	3(4)			3(4)	3(4)			3(4)	3(4)		
柜宽mm Cabinet width	400(600)						1000						1000						1000															
柜深mm Cabinet depth	800(1000)						800(1000)						800						800															
占用小室高度mm Occupied compartment height	640																																	

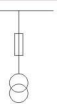
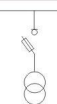

备注：1.01、02、04方案如PE+N线需进入电源柜时需用括号内尺寸。

Note: 2.SDL、SDH是GCS柜专用电流互感器。





1.for programs 01, 02 and 04, if line PE+N line needs to enter power supply cabinet, use dimension in bracket as width.





2.SDL and SDH are special current transformer of GCS cabinet

主电路方案号 Main Circuit Scheme number		09	10	11	12
主电路方案 Main Circuit Scheme	单线图 Single line diagram				
	用途 Usage	双电源切换 Double-power-source switching		馈电 Power feeding	
规格序号 Specification serial number	A B	A B C D	A B C		
短时耐受电流 Short-time withstand current, 短时耐受电流	50/105 30/63	50/105 30/63		50/105 30/63	
主电路电器元件 Electric component of main circuit	瞬时耐受电流(kA) transient withstand current				
	额定电流 (A) Rated current (A)	400 250	630 400 250 160	400 200 100	600
	QSA-630		1		
	QSA-400		1		
	QSA-250		1		
	QSA-160			1	
	限流电抗器 Current-limiting reactor 600A 0.08Ω/Φ				3
	B370.LR1.CJ35	1			
	B250.LR1.CJ35	1			
	TG-400BD,CM1-400L,TM30	1 1			1
TG-225BD,CM1-225L,TM30				1 注	
TG-100BD,CM1-100L,TM30				1	
SDL-□		(1) (1) (1) (1)	(1) (1) (1)		
BH-□□/5		3 3 3 3	3 3 3		
柜宽mm Cabinet width	800 (1000)		1000		600
柜深mm Cabinet depth	600 (800)		800 (1000)		600 (800)
占用小室高度mm Occupied compartment height	480x2		480 320	(240)160	

主电路方案号 Main Circuit Scheme number		13	14	15
主电路方案 Main Circuit Scheme	单线图 Single line diagram			
	用途 Usage	电压互感器 Voltage transformer		
规格序号 Specification serial number				
主电路电器元件 Electric component of main circuit	额定电流 (A) Rated current (A)			
	QSA-63		1	1
	N100-□	3		
	JDG-0.5 380/100	2	2	
	JSGW-0.5			1
SDL-□□/5				
柜宽mm Cabinet width	(不占间隔, 装在受电柜内或05方案转接柜内, 接在分支母线上)			
柜深mm Cabinet depth	(Occupy no space, installed in power receiving cabinet or program 05 switchover cabinet, and connected on branch busbar)			
占用小室高度mm Occupied compartment height				

备注: 馈线方案可以加装零序保护、零序电流互感器装入电缆隔室。
 Remarks: feeding program can add zero sequence protection and install zero sequence current transformer into cable compartment.

主电路方案号 Main Circuit Scheme number		16	17	18	19
主电路方案 Main Circuit Scheme	单线图 Single line diagram				
	用途 Usage	电动机 (不可逆) Electric motor (irreversible)			
规格序号 Specification serial number	A B C	A B			A B C
最大控制电机功率 (KW) Maximum control motor power	100 75 55	37 15		7.5	100 75 55
主电路电器元件 Electric component of main circuit	QSA-250	1			1
	QSA-160		1		1
	QSA-125		1		1
	HH17-63		1		
	N100-□			3	
	B250, LC1, CJ35	1			2
	B170-105, LC1, CJ35	1 1			2 2
	B85或LC1-D80		1		
	B45或LC1-D32		1		
	B16或LC1-D18			1	
T85, LR1		1			
TSA45, LR1		1			
T16, LR1			1		
SDL-□	(1) (1) (1)	(1) (1)		(1)	(1) (1) (1)
BH-□□/5	3 3 3	1 1		1	3 3 3
占用小室高度mm Occupied compartment height	480 320 320		160	160	480

主电路方案号 Main Circuit Scheme number		20	21	22	23
主电路方案 Main Circuit Scheme	单线图 Single line diagram				
	用途 Usage	电动机 (不可逆) Electric motor (irreversible)			
规格序号 Specification serial number	A B C	A B			A B C
最大控制电机功率 (KW) Maximum control motor power	100 75 55	37 15		7.5	100 75 55
主电路电器元件 Electric component of main circuit	QSA-250	1			1
	QSA-160		1		1
	QSA-125		1		1
	HH17-63		1		
	N100-□			3	
	B250, LC1, CJ35	2			2
	B170-105, LC1, CJ35	2 2			2 2
	B85或LC1-D80		2		
	B45或LC1-D32		2		
	B16或LC1-D18			1	
T85, LR1		1			
TSA45, LR1		1			
T16, LR1	1 1 1			1	1 1 1
SDL-□	(1) (1) (1)	(1) (1)		(1)	(1) (1) (1)
BH-□□/5	1 1 1	1 1		1	3 3 3
占用小室高度mm Occupied compartment height	480 320 320		160	160	480

GCS系列柜单独或成列安装时，其垂直度以及柜面不平度和柜间接缝的偏差应符合下表规定。

For separated or in-row installation of GCS series of cabinet, deviation of its vertically, unevenness of cabinet surface and gap between cabinets should be in compliance with stipulations of the following table.

	项目 Project	允差 (mm) Tolerance
1	垂直度 (柜高2200mm时) Vertically (when cabinet is 2200mm in height)	3.3
2	水平度相邻二柜顶部 Levelness between tops of two adjacent cabinets 水平度成列柜顶部 Levelness between tops of a list cabinets	2
3	不平度 相邻二柜边 Unevenness between sides of two adjacent cabinets	5

产品安装后投运前的检查与试验

Inspection And Test After Installation of Product But Before Putting Product Into Service

- 检查柜面漆或其它覆盖材料 (如喷漆) 是否损坏, 柜内是否干燥清洁。
- 电器元件的操作机构是否灵活, 不应有卡涩或操作力过大现象。
- 主电器的主辅触头的通断是否可靠、准确。
- 抽屉或抽出式机构抽插应灵活、轻便, 无卡阻和碰撞现象。
- 抽屉或抽出式结构的动、静触头的中心线应一致, 触头接触应紧密, 主、辅触头的插入深度应符合要求, 机械联锁或电气联锁装置应动作正确, 闭锁或解除均应可靠。
- 仪表的刻度整定、互感器的变比极性正确无误。
- 熔断器的熔芯规格应符合工程设计的要求。
- 继电保护的定值及整定应正确, 动作可靠。
- 用1000兆欧表测量绝缘电阻值不得低于1MΩ。
- 各母线的连接应良好, 绝缘支撑件、安装件及其它附件安装应牢固可靠。

- Inspect whether cabinet surface paint or other coverage material (such as plastic spraying) is damaged, whether interior of cabinet is dry and clean.
- Whether operating mechanism of electric component is flexible, jamming or extremely large operating force is not allowed.
- Whether on/off of main/auxiliary contact of main electric appliance is reliable and accurate.
- Pulling/pushing of drawer or withdrawable-type mechanism should be flexible and easy and should be free from jamming and collision.
- The center line of moving/fixing contact of drawer or withdrawable-type mechanism should be consistent, contacting of contact should be tight, insertion depth of main/auxiliary contact should be in compliance with requirement, mechanical interlock or electric interlock device should act correctly, locking or releasing should be reliable.
- Scale setting of instrument and transformation ratio polarity of transformer should be correct.
- Core specification of fuse should be in compliance with requirements of engineering design.
- Fixed value and setting of relay protection should be correct, and activation should be reliable.
- Insulation resistance should be no less than 1MΩ when measured by using 1000 megohmmeter.
- Connection of all busbars should be good, installation of insulation support component, installation component and other accessories should be firm and reliable.

使用注意事项 Items To Be Noticed For Usage

- GCS系列柜为不靠墙安装, 正面操作, 双面维修的低压配电柜, 柜的维修通道及柜门, 必须是考核合格的专业人员方可进入或开启进行操作、检查和维修。
- 空气断路器、塑壳断路器经过多次分、合, 特别是经过短路分、合后, 会使触头局部烧伤和产生碳类物质, 使接触电阻增大, 应按断路器使用说明书进行维护和检修。
- 经过安装和维修后, 必须严格检查各隔室之间、功能单元之间的隔离状况确已恢复, 以确保本装置良好的功能分隔性, 防止出现故障扩大。
- GCS series of cabinet is low-voltage power distribution cabinet featuring free standing, frontal operation and double sides repair, only professionals who has been appraised as eligible can enter or open the access passage and door of cabinet for operation, inspection and repair.
- After air circuit breaker and plastic casing circuit breaker experience numerous times of make/break, especially short-circuit make/break, partial area of contact will be burnt and produce carbon related substance, thus increasing contact resistance, it is necessary to maintain, inspect and repair as per usage instruction manual of circuit breaker.
- After installation and repair, it is required to inspect strictly that the isolation conditions between all compartments and between functional units have been resumed, so as to assure functional compartmentation of the equipment and prevent expansion of malfunction.

产品成套性 Product Completeness

制造厂供货时应提供下列文件及附件:
 Manufacturer should provide the following documents and attachments upon product supply:

- | | |
|--------------------------|---|
| 1. 装箱清单 | 1. Packing list; |
| 2. 产品合格证 | 2. Certificate of conformity |
| 3. 使用说明书 | 3. Usage instruction manual; |
| 4. 出厂试验报告 | 4. Delivery inspection report; |
| 5. 有关电气图纸 | 5. Related electric drawing; |
| 6. 柜门钥匙, 操作手柄及合同单规定的备品备件 | 6. Key to cabinet door, operating handle and spare parts indicated in contract. |



GCK型低压抽出式成套开关设备

GCK Model low-Voltage Withdrawable Complete Switchgear

GCK型低压抽出式成套开关设备广泛应用于发电厂, 变电所, 厂矿企业和高层建筑的动力配电中心 (PC) 和电动机控制中心 (MCC), 作为交流50 (60) Hz, 额定工作电压为380V (660V)、额定电流为4000A及以下的发、供电系统中配电、电动机集中控制, 无功补偿使用的低压成套配电装置。

GCK model low-voltage withdrawable complete switchgear is widely used in power distribution center (PC) and motor control center (MCC) of power plant, transformer substation, industrial and mining enterprises and high building as low-voltage complete power distribution device for power distribution, motor concentrated control and reactive compensation of power generation/distribution system of AC 50 (60) Hz, rated operating voltage 380V (660V) and rated current 4000A and below.

型号含义 Type Connotations

G C K (L , J) 1 - □ - □
 ① ② ③ ④ ⑤ ⑥ ⑦

- | | | | |
|-------|-------------------|---------|-----------------------------|
| ①柜体结构 | Cabinet structure | ⑤无功功率补偿 | Reactive power compensation |
| ②抽屉式 | Drawer type | ⑥设计序号 | Design serial number |
| ③控制中心 | Control center | ⑦主电路方案 | Circuit program |
| ④动力中心 | Power center | | |

使用环境 Environmental Conditions for Product Use

- 周围空气温度不高于+40℃, 不低于-5℃, 24h内的平均温度不得高于+35℃;
- 海拔高度1000m, 高海拔地区用户, 请在订货中提出, 本产品可满足海拔高度4000m以下的用户要求;
- 周围空气相对湿度在最高温度为+40℃时不得超过50%, 在较低温度时允许有较大的相对湿度 (例如+20℃时为90%);
- 设备安装时与垂直面的倾斜度不超过5°;
- 设备应安装在无剧烈震动和冲击的地方, 以及不足以使电器元件受到腐蚀的场所;
- 用户有特殊要求是可与制造厂协商解决。

- Ambient air temperature should be no more than +40℃ and no less than -5℃, and average temperature within 24h should be no more than +35℃.
- Altitude should be 1000m, users of high altitude region should indicate altitude upon ordering, and the product can meet requirement of user for altitude below 4000m.
- Relative humidity of ambient air should be no more than 50% under the highest temperature +40℃, and larger relative humidity is allowed under low temperature (for example: 90% under temperature of +20℃).
- The inclination from vertical plane should be no more than 5° upon installation of equipment.
- Equipment should be installed at location free from violent shock and impact, and location free from corrosion of electric appliance component.
- User can negotiate with manufacture to find out solution in case of special requirements.

产品特点 Product Characteristics

GCK型低压抽出式成套开关设备是典型的隔离抽出式柜组设备, 柜体内部用电镀板隔成不同的功能小室, 各回路元件统一装在室内的抽屉中, 抽屉高度按功能需要以80mm的模数变化, 宽度, 高度和功能相同的抽屉可以互换使用。

本系列产品具有分断能力高, 动热稳定性好, 结构先进合理, 电气方案切合实际, 系列性、通用性强, 各种方案单元任意组合, 一台柜体所容纳的回路较多, 节省占地面积, 外形美观, 防护等级高, 安全可靠, 维护方便等优点, 是国内低压成套开关设备的普及产品。

GCK model low-voltage withdrawable-type complete switchgear is a typical isolation withdrawable-type cabinet equipment, the interior of cabinet is divided into different functional compartments by using electroplating partition plate, all circuit components are installed in drawer of compartment in a uniform manner, drawer height can be changed with modulus 80mm as per function demand, and drawers of identical width, height and function can be interchanged. Featuring advantages such as high breaking capacity, good dynamic thermal stability, advanced and reasonable structure, practical electric program, high seriality and commonality, combination of various program units at discretion, large number of circuits accommodated in one unit of cabinet, saving of land occupation area, good appearance, high degree of protection, safety and reliability and convenient repair, etc, the series of products is a popular product of low-voltage complete switchgear in China.

技术参数 Product Parameters

名称 Descriptions		单位 Unit	参数 Parameters
额定工作电压	Rated operating voltage	V	380, 660
额定频率	Rated frequency	Hz	50 (60)
额定绝缘电压	Rated insulation voltage	V	660, 1000
控制电动机最大容量	Maximum capacity of control motor	kW	320
水平母线耐受电流 (峰值)	Horizontal busbar withstand current (peak)	kA	105 (176)
水平母线短时耐受电流 (1S)	Horizontal busbar short-time withstand current (1S)	kA	50 (80)
垂直母线耐受电流 (峰值)	Vertical busbar withstand current (peak)	kA	63 (105)
垂直母线短时耐受电流 (1S)	Vertical busbar short-time withstand current (1S)	kA	50
抽屉回路最大电流	Maximum current of drawer circuit	A	500
主电路触头接插件	Contact plug-in components of main circuit		200, 400
辅助电路触头接插件	Contact plug-in components of auxiliary circuit		10, 20
额定电流 Rated current	水平母线 Horizontal busbar	A	630, 1250, 1600, 2000, 3150, 4000
	垂直母线 Vertical busbar		630, 1000
	馈电电路最大电流 Maximum current of feeding circuit		630
	受电电路 Receiving circuit		1000, 1600, 2000, 2500, 3150, 4000
工频耐压 (1min)	Power frequency withstand voltage (1min)	V	2500
防护等级	Degree of protection		IP40, IP30

主电路方案 (见下表) Main Circuit Program (see the following table)

辅助电路方案 Auxiliary Circuit Program

GCK辅助电路共分交流和直流两部分。

直流操作部分的辅助电路方案，主要用于发电厂变电站的低压场(所)用电系统及发电机组低压厂用系统，工作(备用)电源进线，电源馈线和电动机馈线的一般控制方式。交流操作部分的辅助方案主要用于厂矿企业及高层建筑的变电所的低压系统。辅助电路方案根据主电路方案分电源进线、馈线(PC)和电动机馈线(MCC)操作控制的功能单元进行设计。

GCK auxiliary circuit is totally divided into two parts of AC and DC.

Auxiliary circuit program of DC operation section is mainly used for normal control mode of low-voltage plant (station) service of power plant transformer substation and generator unit low-voltage station service, operating (backup) power supply incoming line, power supply feeder and motor feeder. Auxiliary program of AC operation section is mainly used for low-voltage system of substation of industrial and mining enterprises and high building. Auxiliary circuit program is designed on the basis of main circuit program branch power supply incoming line, feeder (PC) and functional unit of motor feeder (MCC) operation and control.

电器元件的选择 Selection of Electric Components

柜内的主要电器元件选用高分断能力的国内先进产品，及引进技术的产品，满足了装置高性能的要求。如：断路器选用DW15、ME、AH、DZ20、TM30、ABB的F系列等；接触器选用CJ20、3TB、LC1等；热继电器选用JR16、3UA、LR1-D等。

这些元件具有性能好、结构紧凑、重量轻、短飞弧或无飞弧、技术性能指标高的特点、能满足本装置的要求。

Main electric components in cabinet adopt advanced products of China featuring high breaking capability, and imported technology products, and meet requirements on high performance of device. Such as: circuit breaker adopts F series of DW15, ME, AH, DZ20, TM30 and ABB; contactor adopts CJ20, 3TE and LC1, etc; and thermal relay adopts JR16, 3UA and LR1-D, etc.

These components feature characteristics such as excellent performance, compact structure, light weight, short flashover or no flashover and high technical performance index, and meets requirements of this device.

主电路方案编号 Main Circuit Scheme number	01	02	03	04
主电路方案 Main Circuit Scheme				
用途 Usage	受电 Power receiving		联络 Liaison	受电 Power receiving
额定电流(A) Rated current (A)	630~4000			
分断能力(kA)(有效值) Breaking capacity (kA) (effective value)	50~100			
主电路主要设备 Main equipments of main circuit	ME630~4000			
占用间隙高度(mm) Occupancy clearance height	1800			
辅助电路编号 Auxiliary circuit number	10 01 F-04 07	10 02 F-05 08	03 F-06 09	F-10
备注 Remarks	F-10单独使用 F-01~03为有自投 F-04~06为无自投 F-07~09为有自投(预储能) F-10 is used alone F-01-03 features automatic switching. F-04-06 features no automatic switching F-07-09 features automatic switching (Pre-energy-storage)		同左 The same with the left	

主电路方案编号 Main Circuit Scheme number	05	06	07	08				
主电路方案 Main Circuit Scheme								
用途 Usage	受电 馈电 Power receiving Power feed		馈电 Power feed					
额定电流(A) Rated current (A)	630~1600	200~630	100	200	100	200		
分断能力(kA)(有效值) Breaking capacity (kA) (effective value)	50		30	75	40	75	40	75
主电路主要设备 Main equipments of main circuit	ME630~1600	200 DWX15C-400 630	DZ20-100	DZ20-200	DZ20-100	DZ20-200		
占用间隙高度(mm) Occupancy clearance height	900		400	600	200	300		
辅助电路编号 Auxiliary circuit number	F-10	F-11	F-12		F-13			
备注 Remarks	在同一台柜上可布置2台主开关 2 units of main switch can be arranged on one same cabinet							

主要电路方案编号 Main Circuit Scheme number	09						10						11		12	
主电路方案 Main Circuit Scheme																
用途 Usage	电源切换 Power supply Switchover						照明 Illumination				馈电 Power feeding					
额定电流 (A) Rated current (A)	40		100		200		40		100		200		16-100A		160 250	
分断能力(KA)(有效值) Breaking capacity (kA) (effective value)	30	75	30	75	40	75	30	75	30	75	40	75	30 75		100	
主电路主要设备 Main equipments of main circuit	DZ20-100 CJ20-40 (3TB44)		DZ20-100 CJ20-160 (3TB50)		DZ20-200 CJ20-250 (3TB54)		DZ20-100 CJ20-40 (3TB44)		DZ20-100 CJ20-160 (3TB50)		DZ20-200 CJ20-250 (3TB54)		HD11-200/31 DZ20-100		QSA-160 QSA-250	
占用间隙高度 (mm) Occupancy clearance height	200		400		600		200		400		600		900		400 600	
辅助电路编号 Auxiliary circuit number	F-14						F-15						F-16		F-17	
备注 Remarks															固定式 Stationary-type	

主要电路方案编号 Main Circuit Scheme number	13			14			15			16				
主电路方案 Main Circuit Scheme														
用途 Usage	馈电 Power feeding			电动机 Motor										
额定电流 (A) Rated current (A)	63	160	250	40		100		200		40		100	200	
分断能力(KA)(有效值) Breaking capacity (kA) (effective value)	50		100	30	75	30	75	40 75		100			50	100
主电路主要设备 Main equipments of main circuit	QSA-63 QSA-160 QSA-250			DZ20-100 CJ20-40 (3TB44) JR16 (3UA59)	DZ20-100 CJ20-160 (3TB50) JR16 (3UA62)	DZ20-100 CJ20-250 (3TB50) JR16 (3UA66)	NT00-160 CJ20-40 (3TB44) JR16 (3UA59)	NT1-250 CJ20-160 (3TB50) JR16 (3UA62)	NT2-400 CJ20-250 (3TB54) JR16 (3UA66)	QSA-63 CJ20-40 (3TB44) JR16 (3UA59)	QSA-160 CJ20-160 (3TB50) JR16 (3UA62)	QSA-250 CJ20-250 (3TB54) JR16 (3UA66)		
占用间隙高度(mm) Occupancy clearance height	200	400	600	200	400	600	200	400	600	200	400	600		
辅助电路编号 Auxiliary circuit number	F-18			F-19										
备注 Remarks				热继电器容量不够时, 改为与互感器串联 In case thermal relay capacity is insufficient, change as series connection with mutual induction.			热继电器容量不够时, 改为与互感器串联 In case thermal relay capacity is insufficient, change as series connection with mutual induction.			热继电器容量不够时, 改为与互感器串联 In case thermal relay capacity is insufficient, change as series connection with mutual induction.				

主要电路方案编号 Main Circuit Scheme number	17		18		19		20	
主电路方案 Main Circuit Scheme								
用途 Usage	电动机 (可逆) Electric motor (reversible)							
额定电流 (A) Rated current (A)	40		100		40		100	
分断能力 (KA) (有效值) Breaking capacity (kA) (effective value)	30	75	30	75	100		50	100
主电路主要设备 Main equipments of main circuit	DZ20-100 CJ20-40 x 2 (3TB44) JR16 (3UA59)		DZ20-100 CJ20-160 x 2 (3TB50) JR16 (3UA62)		NT00-160 CJ20-40 x 2 (3TB44) JR16 (3UA59)	NT1-250 CJ20-160 x 2 (3TB50) JR16 (3UA62)	QSA-63 CJ20-40 x 2 (3TB44) JR16 (3UA59)	QSA-160 CJ20-160 x 2 (3TB50) JR16 (3UA62)
占用间隙高度 (mm) Occupancy clearance height	200		400		200		400	
辅助电路编号 Auxiliary circuit number	F-20							
备注 Remarks	触头开关也可以改用 1.NT00-160 2.QSA-160 Tact switch can also be changed as 1.NT00-160 2.QSA-160							

主要电路方案编号 Main Circuit Scheme number	21			22			23			24		
主电路方案 Main Circuit Scheme												
用途 Usage	电动机 (Y-Δ 启动) Electric motor (Y-Δ start)			电动机 Motor								
额定电流 (A) Rated current (A)	160			300			400	100	200			
分断能力(KA)(有效值) Breaking capacity (kA) (effective value)	75						30	75	30	75	100	
主电路主要设备 Main equipments of main circuit	HD11-200/31 DZ20-200 CJ20-250 x 2 (3TB52) CJ20-100 x 1 (3TB48) JR16-150			HD11-600/31 DZ20-600 CJ20-630 x 2 (3TB58) CJ20-250 x 1 (3TB54) JR9-300			DZ20-100 CJ20-40 (3TB44) JR16 (3UA59)	DZ20-100 CJ20-160 (3TB50) JR16 (3UA62)	DZ20-200 CJ20-250 (3TB50) JR16 (3UA66)	NT2-160 CJ20-40 (3TB44) JR16 (3UA59)	NT2-400 CJ20-160 (3TB50) JR16 (3UA62)	NT2-400 CJ20-250 (3TB50) JR16 (3UA66)
占用间隙高度 (mm) Occupancy clearance height	900			1800			300	400	600		300	400
辅助电路编号 Auxiliary circuit number	F-21			F-22			F-23			F-24		
备注 Remarks	固定式: 自动开关也可以改用 1.NT1-250 2.QSA-250 (取消HD11) Stationary: automatic switch can also be changed as 1.NT1-250 2.QSA-250 (cancel HD11)			固定式: 自动开关也可以改用 1.NT1-630 2.QSA-630 (取消HD11) Stationary: automatic switch can also be changed as 1.NT1-630 2.QSA-630 (cancel HD11)			100 漏电继电器为JD1-200 100 Leakage relay is JD1-200					

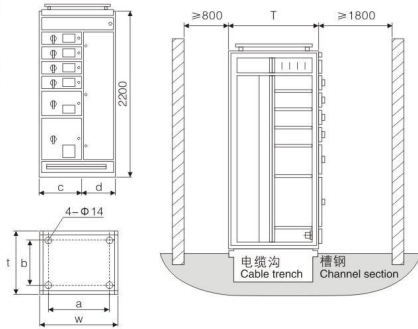
主要电路方案编号 Main Circuit Scheme number	25			26		27		28	
主电路方案 Main Circuit Scheme									
用途 Usage	电动机 Motor			电动机 (可逆) Electric motor (reversible)		辅助电路电源 Auxiliary circuit power supply		功率补偿V Power compensation V	
额定电流 (A) Rated current (A)	40	100	200	40	100			400	
分断能力(kA)(有效值) Breaking capacity (kA) (effective value)	50	100		30	75	30	75	30	75
主电路主要设备 Main equipments of main circuit	QSA-63 CJ20-40 (3TB44) JR16 (3UA59)	QSA-160 CJ20-160 (3TB50) JR16 (3UA62)	QSA-250 CJ20-250 (3TB50) JR16 (3UA66)	DZ20-100 CJ20-40 x 2 (3TB44) JR16 (3UA59)	DZ20-100 CJ20-160 x 2 (3TB50) JR16 (3UA62)	DZ20-100 Bk1000 1000VA 380/220V	DZ20-100 Bk1000 2000VA 380/220V	HR5-400/31 CJ16-40 JR16-60 AM3-40 CLMB23 GZK-10380	
占用间隙高度 (mm) Occupancy clearance height	300	400	600	300	400	200	400	1800	
辅助电路编号 Auxiliary circuit number	F-23			F-24		F-24		F-26	
备注 Remarks	漏继电器为JD1-200 Leakage relay is JD1-200			100 100 100		单相变压器 < 1000VA Single phase transformer < 1000VA		电容器CLMB23一个柜中最多装8个或10个见下表 At maximum, 8 or 10 capacitors CLMB23 can be installed in one cabinet, see the following table.	

外形尺寸及安装基础 Exterior Dimension and Installation Foundation

产品外形尺寸及安装基础见下图。基础槽钢和采用螺栓由用户自备。主母线连接时，若表面因运输、保管等原因造成的不平整时，需平整后再连接坚固。

See exterior dimension and installation foundation of product as per the following figure. Foundation channel steel and adopted bolt should be prepared by user. During connection of main busbar, in case of uneven surface caused due to reasons such as transportation and storage, it is necessary to connect and fasten after flattening.

外形尺寸mm Outline Dimension	a	b	c	d
宽W	600	480	600	0
	800	680	600	200
	1000	880	600	400
深T	600	480		
	800	680		
	1000	880		



订货须知 Ordering Instructions

订货时应提供以下资料：
It is necessary to provide following information upon ordering:

- 开关柜的排列图和配电室的平面布置图。
- 主电路单线系统图及主母线规格。
- 辅助回路原理图。
- 柜内电器元件的型号，规格，数量。
- 柜外壳的防护等级（IP30或IP40）及柜体颜色。
- 母线槽相对于柜体（不包括门厚）和墙厚尺寸。
- 其它与产品正常使用条件不符的特殊要求。

- Arrangement diagram of switch cabinet and floor plan of power distribution room
- Main circuit single wire system diagram and main busbar specification
- Schematic diagram of auxiliary circuit
- Model, specification and quantity of electric components in cabinet
- Degree of protection (IP30 or IP40) of cabinet enclosure or color of cabinet body
- Dimension of busbar duct in relation to cabinet body (excluding door thickness) and wall thickness
- Other special requirements that are not in compliance with normal usage conditions of product.



MNS型低压抽出式成套开关设备 MNS Low-Voltage Withdrawable-Type Complete Switchgear

MNS型低压抽出式成套开关设备（以下称开关柜）是目前国内较先进的低压抽出式开关设备，该产品用于三相交流频率为50Hz，额定绝缘电压和工作电压为380（400）V、660V，额定电流5000A及以下电力供电系统，可用于发电厂、变电所、工矿企业、大楼宾馆、机场、码头以及广播电视等通信中心，兼作为发电、输配电、电能转换及电能消耗设备的控制，并通过电容补偿柜对其主母线进行无功补偿。

MNS low-voltage withdrawable-type complete switchgear (hereunder referred to as switch cabinet) is an advanced low-voltage withdrawable-type switchgear in China at present, the product is used for power supply system of 3-phase AC frequency 50Hz, rated insulation voltage and operating voltage 380 (400) V, 660V, rated current 5000A and below, can be used for power plant, transformer substation, industrial and mining enterprises, building, hotel, airport, dock and communication center of Radio/TV as control of power generation, power transmission/power distribution, electric energy conversion and electric energy consumption equipment, and reactive compensation for its busbar through capacitor compensation cabinet.

型号含义 Type Connotations

M	N	S	①标准模块式	Standard module type
①	②	③	②低压	Low-voltage
			③开关配电设备	Switch power distribution equipment

使用环境 Environmental Conditions for Product Use

- 周围空气温度不高于+40℃，不低于-5℃，并且24h内其平均温度不高于+35℃。
- 大气条件，空气清洁，相对湿度在最高温度为+40℃时不超过50%，在较低温度时允许的有较高的相对湿度，例如+20℃时为90%，但应考虑到温度变化，有可能会偶然地产生适度的凝露。
- 本装置适应于以下温度的运输和储存过程：-25℃至+55℃的范围之间，在短时间内（不超过24h）可达+70℃，在这些极限温度下装置不应遭到任何不可恢复的损伤，而且在正常的条件下应能正常工作。
- 如果上述使用条件不能满足时，应由用户和制造厂协商解决。
- 当本装置用于海上石油钻采平台和核电站时，应另行签订技术协议。

- Ambient air temperature should be no more than +40℃ and no less than -5℃, and average temperature within 24h should be no more than +35℃.
- Atmospheric conditions: clean air, relative humidity should be no more than 50% under the highest temperature +40℃, and larger relative humidity is allowed under low temperature, for example: 90% under temperature +20℃, but it is necessary to take account of appropriate casual condensation due to temperature change.
- This device applies to transportation and storage under temperature as follows: between -25℃ and +55℃, and up to +70℃ in short time (no more than 24h), the device should not have non-recoverable damage under these limit temperatures, and should be capable of normal work under normal conditions.
- User can negotiate with manufacture to find out solution where above mentioned usage conditions are not met.
- When this device is used for offshore oil exploration platform and nuclear power station, it is necessary to sign technical agreement separately.

产品特点 Product Characteristics

MNS系统采用的框架结构设计先进，工艺成熟，结构紧凑，组装灵活，可组成保护、操作、转换、控制、调节、测定、指示等标准单元，具有高度灵活性，且抽屉亦可互为交换，其结构设计可满足多种进出线方案要求，上进上出、上进下出、下进下出、下进上出。柜体内可安装不同的标准元件，以满足各种使用要求，整个系统采用了组合式的优化设计，通用性强，标准化程度高，维修方便，运行安全可靠。

Framework structure adopted by MNS system features advanced design, mature technique, compact structure and flexible assembling, and constitution of standard units such as protection, operation, switchover, control, adjustment, measurement and indication, high flexibility, and interchange between drawers, its structural design can meet various incoming/outgoing line programs requirements, and features upper incoming/upper outgoing, upper incoming/lower outgoing, lower incoming/lower outgoing and lower incoming/upper outgoing. Different standard components can be installed inside cabinet, so as to meet various usage requirements, the entire system adopts combined optimization design, features high commonality, high standardization, convenient repair, safe and reliable operation.

技术参数 Product Parameters

名称 Descriptions	单位 Unit	参数 Parameters
额定频率 Rated frequency	Hz	50 (60)
额定工作电压 Rated operating voltage	V	380, 660
额定绝缘电压 Rated insulation voltage	V	660, 1000
辅助电路额定电压 Rated voltage of auxiliary circuit	V	AC380、220 / DC220、110
额定工作电流 Rated operating current	水平母线 Horizontal busbar	A 5000A, 4000A, 3150A, 2500A, 2000A, 630A
	垂直母线 Vertical busbar	A 1000, 1250
额定短时耐受电流 (1CW) Rated short-time withstand current (1CW)	kA	50, 65, 80 (1S有效值)
额定峰值耐受电流 Rated peak withstand current	A	105, 140, 176 (0.1S最大值)
外壳防护等级 Degree of protection of enclosure		IP30, IP40
外型尺寸高×宽×深 Exterior dimension: height x width x depth	mm	2200×400 (600、800、1000) ×600 (800、1000)

开关柜类型及结构 Switch Cabinet Type and Structure

本动力配电中心柜 (PC) This Power Distribution Central Cabinet (PC)

采用ME.F.M.AH系列等断路器。
adopts circuit breakers such as ME.F.M.AH series, etc.

电动机控制中心柜 (MCC) Motor Control Central Cabinet (MCC)

由大小抽屉组装而成，各回路主开关采用高分断型壳断路器或旋转式带熔断器的负荷开关。
Consists of large/small drawers, main switch of all circuits adopt high breaking capacity plastic casing circuit breaker or rotary load-breaking switch featuring fuse.

功率因数自动补偿柜 Power Factor Automatic Compensation Cabinet

开关柜柜体基本结构是由C型型材装配组成。C型型材是以E=25mm为模数安装孔的钢板弯制而成。全部框架及内层隔板都作镀锌钝化处理。四周门板、侧板则作油漆涂覆。

Basic structure of switch cabinet body is assembled with C type section material. C type section material is made by bending steel sheet with E=25mm modulus installation hole. All frameworks and interior partition plates feature galvanization passivating treatment. Surrounding door plate and side plate feature paint coating.

柜体的分区设计 Segmentation Design of Cabinet Body

动力配电中心 (PC)

Power distribution center (PC)

●PC柜内划分成四个隔室：

- 水平母线隔室：在柜的后部。
- 功能单元隔室：在柜前上部或柜前左边。
- 电缆隔室：在柜前下部或柜前右边。
- 控制回路隔室：左柜前上部。

●分隔措施：

- 水平母线隔室与功能单元隔室、电缆隔室之间用钢板分隔。
- 控制回路隔室与功能单元隔室之间用阻燃型聚苯醚塑料罩壳分隔。
- 左边的功能单元隔室与右边的电缆隔室之间用钢板分隔。
- 主电路与辅助电路之间设计成分隔结构，仪表、信号灯和按钮等组成的辅助电路单元，均安装于塑料板上。

- PC cabinet is divided into four compartments:

- Horizontal busbar compartment: on the rear of cabinet.
- Functional unit compartment: on the frontal upper section or frontal left-side of cabinet.
- Cable compartment: on the frontal lower section or frontal right-side of cabinet.
- Control circuit compartment: on the frontal upper section of left cabinet.

- Separation measure:

- Use steel plate for compartmentation between horizontal busbar compartment and functional unit compartment and cable compartment.
- Use flame resistance polyether ether plastic cover for compartmentation between control circuit compartment and functional unit compartment.
- Use steel plate for compartmentation between left functional unit compartment and right cable compartment.
- Design as compartmentation structure between main circuit and auxiliary circuit, and install auxiliary circuit units consisting of instrument, signal light and button on plastic plate.

抽出式电动机控制中心和小电流的动力配电中心 (MCC)

Withdrawable-Type Motor Control Center and Small Current Power Distribution Center (MCC)

抽出式MCC柜内分成三个隔室，即柜后部的水平母线隔室，柜前左边的功能单元隔室，柜前右边的电缆隔室。水平母线隔室与功能单元隔室之间用阻燃型MCC (电动机控制中心)的抽屉分为以下5种：

Withdrawable-type MCC cabinet is divided into three compartments, i.e. horizontal busbar compartment on the rear side of cabinet, functional unit compartment on the front left side of cabinet and cable compartment on the front right side of cabinet. Drawer of flame resistance type of MCC (motor control center) is used between horizontal busbar compartment and functional unit compartment, as divided into five types as follows:

8E/4: 高(H)200x宽(W)150x深(L)400mm

8E/2: 高(H)200x宽(W)300x深(L)400mm

8E: 高(H)200x宽(W)600x深(L)400mm

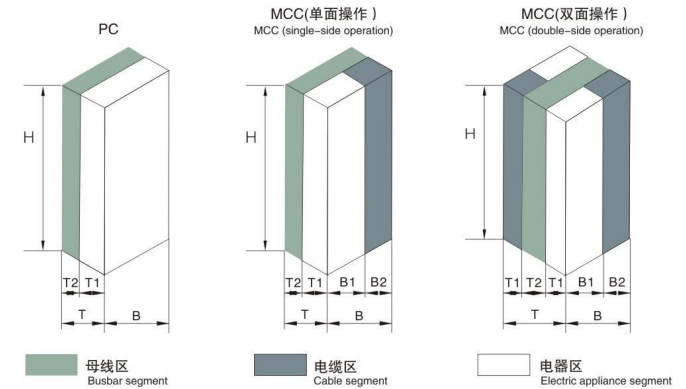
16E: 高(H)400x宽(W)600x深(L)400mm

24E: 高(H)600x宽(W)600x深(L)400mm

发泡塑料制成的功能版分隔，电缆隔室与水平母线隔室、功能单元隔室之间钢板分隔。

Functional plate compartmentation made of plastic foam, and steel plate is used for compartmentation between cable compartment, horizontal busbar compartment and functional unit compartment.

柜体示意图 Schematic Diagram of Cabinet Body



A. 电力配电中心 (PC) 柜 Power Distribution Center (PC) Cabinet

高H Mm	宽B Mm	深T			备注 Remarks
		Tmm	T1 mm	T2 mm	
2200	400	1000	800	200	
2200	400	1000	800	200	
2200	600	1000	800	200	
2200	800	1000	800	200	
2200	1000	1000	800	200	
2200	1200	1000	800	200	

B. 电动机控制中心 (MCC) 柜 Motor Control Center (MCC) Cabinet

高H Mm	宽B Mm	深T					备注 Remarks
		B1mm	B2mm	Tmm	T1 mm	T2 mm	
2200	1000	600	400	600	400	400	单面操作 Single-side operation
2200	1000	600	400	1000	400	200	双面操作 Double-side operation

母线系统 Busbar System

开关柜可配置二组主母线，安装在开关柜的后部母线室。二组母线可分辨安装在柜后上部或下部。根据进线需要，上下二组母线可分别采用不同或相同截面的材料。二者既可单独供电，也可并联供电，也可用做后备电源。

配电母线（垂直母线）组装在阻燃型塑料功能板中，既可防止电弧引起的放电，又能防止人体接触，通过特殊接件与主母线连接。

柜内设有独立的PE接地系统和N中性导体，二者贯穿整个装置，安装在柜前底部及右侧，各回路接地或接零都可就近连接。整个母线系统安装见图一所示。框架结构件全部采用自攻螺丝钉联接，具有较高的接地可靠性。中性母线和中性保护母线平行地安装在功能单元隔室的下部和垂直安装在电缆室中，N线与PE线之间如用绝缘子相隔，则N线与PE线分别使用，二者之间如用导体短接，即成PEN线。

Switch cabinet can be configured with two groups of main busbar, which are installed in rear busbar chamber of switch cabinet. Two groups of busbar are installed on rear upper or lower part of cabinet in an identifiable manner. In accordance with incoming line demand, two groups of upper/lower busbar can adopt material of different or identical section respectively. Both can be used for separated power supply or parallel power supply, or backup power supply.

Power distribution busbar (vertical busbar) is assembled in flame resistance plastic functional plate, so as to prevent discharge due to arc and physical contact, and connect with main busbar through special connector.

Independent PE earthing system and N neutral conductor are configured in cabinet, both go through the entire device and are installed on front bottom and right side of cabinet, all circuit earthings or neutral earthings can be spliced locally. See the entire busbar system installation as per figure 1. All framework structural components adopt self-tapping screw for splicing, and features high grounding reliability. Neutral busbar and neutral protection busbar are installed in parallel in lower section of functional unit compartment and vertically in cable compartment, if insulator is used for separation between N line and PE line, then N line and PE line are used separately, in case of shorting by conductor between them, then PEN line is formed.

保护接地系统 Protective Earthing System

装置的保护电路由单独装设的并贯穿于整个排列长度的PE线（或PEN线）和可导电的结构件两部分组成。

装置中金属结构件，除外表的门和封板外，其余都经过镀锌处理，在结构件的连接处，都经过精心设计，使其能通过一定的短路电流。

Protection circuit of device consists of two parts of PE line (or PEN line) that is installed separately and runs through the entire arrangement length and conductive structural components.

Metal structural components in device, with the exception of exterior door and enclosing plate, others feature galvanization treatment, connection position of structural component is designed carefully so that a certain short-circuit current can pass through.

安全保护系统 Safety Protection System

每柜设有一块或一组阻燃型塑料功能板，安装在主母线室与电器室之间，其作用为有效防止开关元件因故障引起的电弧与母线之间短路造成的事故，采取了严密的隔离措施。

上下层抽屉之间有带通风孔的镀锌金属底板相隔离，较小的8E/4、8E/2抽屉其周围均为阻燃型工程塑料件，故相邻回路之间有较强的绝缘隔离作用，柜内采用了多种塑料组件以支撑带电部分，这些组件要求是无卤素的，并具有CTI300等级以上的防漏电性能。

Each cabinet is configured with one piece or one group of flame resistance plastic functional plate, which is installed between main busbar compartment and electric compartment, and prevents arc caused due to malfunction of switching component and accident caused due to short-circuit between busbars, and strict isolation measure has been adopted.

Upper/lower layers of drawers are separated by galvanized metal base plate with ventilation hole, smaller 8E/4 and 8E/2 drawers are surrounded by flame resistance engineering plastic parts, therefore, there is strong insulation isolation between adjacent circuits, and multiple types of plastics are adopted in cabinet so as to support live parts, these assemblies are required to be free from halogen, and feature anti-creepage above grade CTI300.

辅助电路电缆槽 Auxiliary Circuit Cable Duct

在功能单元隔室的顶部有辅助电路电缆槽，槽内可安放柜间连接线和公用电源线。

Top of functional unit compartment is configured with auxiliary circuit cable duct, in which connection line between cabinets and public power supply line are laid.

抽屉类型 Drawer Type

五种标准尺寸，都是以8E（200mm）高度为基准：

Five types of standard dimension, all of which take 8E (200mm) height as reference:

- 8E/4:在8E高度空间组装4个抽屉单元。 - 8E/4: 4 drawer units are assembled in 8E height space.
- 8E/2:在8E高度空间组装2个抽屉单元。 - 8E/2: 2 drawer units are assembled in 8E height space.
- 8E:在8E高度空间组装1个抽屉单元。 - 8E: 1 drawer unit is assembled in 8E height space.
- 16E:在16E（400mm）高度空间组装1个抽屉单元。 - 16E: 1 drawer unit is assembled in 16E (400mm) height space.
- 24E:在24E（600mm）高度空间组装1个抽屉单元。 - 24E: 1 drawer unit is assembled in 24E (600mm) height space.

几种抽屉单元在一个柜体中作单一组装，也可作混合组装，一个柜体中作单一组装最多容纳抽屉单元数见表所示。

Several types of drawer unit can be assembled in single mode in one cabinet, or can be assembled in mixed mode, see the number of drawer units that can be assembled in one cabinet at maximum in single mode as per the figure.

抽屉形式 Drawer mode	8E/4	8E/2	8E	16E	24E
最多容纳单元数 Number of units that can be accommodated at maximum	36	18	9	4	3

抽屉的电气和机械连锁 Electric and Mechanical Interlock of Drawer

抽屉单元有可靠的机械连锁装置，通过操作手柄控制，具有的标准、合闸、实验、抽出和隔离位置。

Drawer unit features reliable mechanical interlock device, and standard, closing, test, draw-out and isolation positions through operation handle control.

一次方案的排列组合 Arrangement Combination of Primary Program

- 功能单元隔离室的总高度为72E。
- 在同一台装置中，功能单元的一般排列规律是，小功能单元在上，大功能单元在下。
- 8E/4抽屉为4个组成一个8E安装单元，8E/2抽屉为2个组成一个8E安装单元，或2个8E/4抽屉和1个8E/2抽屉组成一个8E安装单元。
- 方案中所画的电流互感器为本方案中最多安装数量，在实际使用中，可按系统需要而减少或不装。
- 为加强安全防范，操作手柄定位后可加上挂锁，最多可加三把锁。
- 装置的深度有600mm（MCC单面操作柜）和1000mm（PC和MCC双面操作柜）二种，推荐PC和MCC分开排列使用。当使用分段式功能板时，可允许PC和MCC混合装配在同一台中。
- 当PC和MCC二种装置相邻排列时，则：

- 1.当单面操作的加深到1000mm。如下图例二所示。
- 2.当MCC双面柜（或600深度的MCC单面柜）与PC柜相邻排列时，在二柜之间必须加转接柜（其宽度为400mm）如下图例一所示。

- Total height of functional unit compartment is 72E.

- In one same unit of device, the normal arrangement rules of functional units are: small functional units are on the top and large functional units are on the bottom.

- 8E/4 drawer is one 8E installation unit consisting of 4, 8E/2 drawer is one 8E installation unit consisting of 2, or 2 8E/4 drawers and 1 8E/2 drawer consist one 8E installation unit.

- The current transformer shown in program is the maximum installation quantity in this program, and it is allowed to reduce number of units or install no unit at all as per system demand in actual usage.

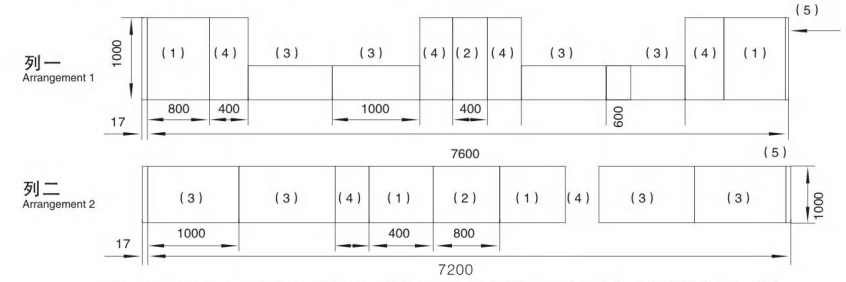
- In order to strengthen safety protection, it is allowed to add lock after positioning of operation handle, and add three locks at maximum.

- Depth of device includes two types of 600mm (MCC single-side operation cabinet) and 1000mm (PC and MCC double-side operation cabinet), it is recommended to arrange PC and MCC separately. When using segmented functional plate, it is allowed to assemble PC and MCC in one same cabinet.

- Where the two types of device of PC and MCC are arranged in adjacency, then:

1. When single-side operation to 1000mm. As shown in example II of the following diagram.

2. Where MCC double-side cabinet (or MCC single-side cabinet of depth 600) is arranged in adjacency to PC cabinet, it is required to add switchover cabinet between the two cabinets (its width is 400mm), as shown in example I of the following diagram.



注：（1）-受电柜（PC柜）（2）-联络柜（PC柜）（3）-电动机控制柜（MCC柜）（4）-主母线转接柜（5）-侧板

Note: (1)-power receiving cabinet (PC cabinet), (2)-liaison cabinet (PC cabinet), (3)-motor control cabinet (MCC cabinet),

(4)-main busbar switchover cabinet, (5)-side plate.

安装、使用、维修 Installation, Usage and Repair

- 装置的外形及安装尺寸见选型册。
- 当装置运抵目的地后，首先应检查包装箱是否完整，若装置不立即安装，应存放在干燥清洁之处。
- 装置推荐为离墙安装式，也可以靠墙安装，安装基础平面要求平整，基础槽钢的水平误差为1/1000，总长偏差3mm所有导电部分的螺栓固定方式推荐使用8.8级和张紧垫圈，其旋紧力矩推荐值见表：
- MCC方案附件供应二种规格的电缆头护套和一定数量的二次回路用钢接头（为适应铜接头的冷压接，二次电缆推荐使用多芯软线）。

●接好电缆后，装置底部应封闭，以防止小动物爬入柜内造成短路事故。

●装置在安装或调整后，在投入运行前，需进行下列各项检查和实验：

- 1.检查装置内，安装的电器设备和控制接线是否符合工厂的图纸要求。
- 2.用手动操作各种开关，应操动灵活，无异常和卡阻现象。
- 3.检查机械连锁机构，电气连锁装置的动作是否正确可靠，应符合系统要求。
- 4.检查主电路和控制回路的绝缘电阻是否符合规定要求。
- 5.检查装置内所安装的电气设备接触是否良好，是否符合该电器本身的技术条件。
- 6.检查装置内部有无异物及各部件的安装螺钉是否有松动现象。

螺栓规格 Bolt specification	旋紧力矩 Tightening torque (Nm)
M6	9.5
M8	25

●抽出式MCC操作须知：

- 1、抽屜底部应正确插入导向件后，才能向柜内推动，否则将会发生损坏抽屜或拉不出等不良现象。
- 2、8E/4和8E/2抽屜面板上的符号标志和作用见操作开关示意图1，图中从分断位置“O”到工作位置“1”的箭头表示为：先将操作手柄向里推进后再将手柄从“O”旋转到“1”即可，返回时不须推动，只要将手柄“1”旋向“O”，放手后，手柄自动弹出。
- 3、8E-24E抽屜面板上的符号标志和作用见操作开关功能示意图2.当手柄到达工作位置“1”时，机构对主开关解除机械闭锁，这时主开关可以合闸和分闸操作，但是，当主开关合闸后，联锁机构的手柄就不能操作。

●在符号标志的右下角门上有一塑料小盖，这是门的解锁机构，操作规程如下：

当抽屜在工作位置时，如果要开门，则先将小盖拔出。然后用螺丝刀插入孔内向下移动锁扣即可开门，开门后务必将塑料小盖盖上，否则将破坏原有的防护等级。

- See exterior and installation dimension of device as per model selection manual
- After arrival of device at destination, firstly it is necessary to inspect whether package is complete, and place products that will not be packed immediately at dry and clean location.
- It is recommended to install device as per free standing mode, and it is allowed to install on wall, installation foundation surface is required to be flat, horizontal error of foundation channel steel is 1/1000, total length deviation is 3mm, it is recommended to use grade 8.8 and tension gasket for bolt fixing mode of all conductive portions, see the recommended tightening torque as per table:
- Program accessories supply two specifications of cable head sleeve and a certain quantity of secondary circuit steel connectors (in order to adapt to cold compression connection of copper joint, it is recommended to use multi-core cord as secondary cable)
- After connection of cable, it is necessary to enclose bottom of device, so as to prevent pest from entering into cabinet and causing short-circuit accident.
- After installation or adjustment of device, it is necessary to perform following inspections and tests before putting device into service:
 1. Inspect whether the installed electric equipment and control wiring in device meet factory drawing requirements.
 2. Manual operation of all switches should be flexible, free from abnormal and jamming phenomenon.
 3. Inspect whether action of mechanical interlock mechanism and electric interlock device are correct and reliable, and system requirements should be met.
 4. Inspect whether insulation resistance of main circuit and control circuit meet stipulations and requirements.
 5. Inspect whether contacting of electric equipment installed in device is good, and meets technical conditions of the electric appliance itself.
 6. Inspect whether there is foreign matter in device and whether fixing screw of parts is loosened.
- Items to be noticed for withdrawable-type MCC
 1. Only after correct insertion of drawer bottom into guiding component, can drawer be pushed into cabinet, otherwise drawer will be damaged or cannot be drawn out.
 2. See symbol markings on 2.8E/4 and 8E/2 drawer panel and functions as per schematic diagram 1 of operation switch, the arrow from breaking position “O” to operating position “1” indicates that: after pushing operation handle inwards, then turn handle from “O” to “1”, rather than push to return, it is only necessary to turn handle from “1” to “O”, after releasing, handle pops up automatically.
 3. See symbol markings on 3.8E-24E drawer panel and functions as per functional schematic diagram 2 of operation switch. When the handle reaches operating position “1” the mechanism realizes main switch contact mechanical interlock, where open/close operation of main switch is allowed, but, after closing of main switch, it is impossible to operate handle of interlock mechanism.
- There is a plastic cap at right lower corner of symbol marking on door, it is unlocking mechanism of door, the operation rule is as follows:

When drawer is on operating position, pull out the small cap to open the door. Then use screw driver to insert into hole and move lock catch downwards to open the door, make sure to put on the small plastic cap after opening door, otherwise the original degree of protection will be damaged.

产品的成套性 Product Completeness

- 开关柜附有： 1、装箱单；
Switch cabinet is attached with: 2、产品合格证；
3、产品使用说明书；
4、电气图纸；
5、随机附件有门钥匙以及根据配套清单所提供的备品备件等。
1. Packing list;
 2. Certificate of conformity;
 3. Usage instruction manual of product;
 4. Electric drawing;
 5. Accessories provided with the unit include key to door and spare parts provided as per list.

订货须知 Items To Be Noticed For Ordering

- 用户应提供下列材料： 1、主电路方案单线图；
User should provide following information upon ordering: 2、原理图或原理接线图；
3、每柜所装电器设备的详细规格及数量，并填写订货规范书；
4、开关柜的排列及组合图，平面布置图。
1. Main circuit program single wire system diagram;
 2. Schematic diagram or schematic wiring diagram;
 3. Detailed specification and quantity of electric equipments installed in each cabinet, and fill out order specifications;
 4. Arrangement/combination diagram and floor plan of switch cabinet.

JP综合配电箱 JP integrated distribution box

JP综合配电箱是根据电力部门，广大电力用户及设计部门的要求，为满足不断发展的电力市场对增容、动力集中控制、方便安装维修、缩短事故处理时间等需要，本着安全、经济、合理、可靠的原则设计的。该产品具有信息化、智能化、操作简单、使用安全可靠、结构新颖、防护等级高等特点。适用于国网变台、变电所、工矿企业、住宅小区的低压配电系统作配电、无功功率补偿、电能转换、计量、分配与控制保护用。

符合标准：GB7251.12-2013、GB/T15576-2008

JP integrated distribution box is based on requirements of the power sector, the majority of power users and the design department. In order to meet the growing power market capacity need of centralized control, easy installation and maintenance, shorten the time, safety and other needs to design. The product is informationalized, intelligent, simple operation, safety use and reliable, novel structure and high level of protection. It is suitable for low-voltage distribution system, reactive power compensation, power conversion, measurement, distribution and control protection of state grid, substation, industrial and mining enterprises and residential area.

Meet the standard: GB7251.12-2013, GB / T15576-2008

型号含义 Type Connotations

- JP** - □
- ① ②
 - ① ②
- ①综合配电箱
 - ②主母线额定电流
 - ① Integrated distribution box
 - ② Main bus-bar rated current

使用环境 Environmental Conditions for Product Use

- 周围空气温度不高于+40℃，不低于-30℃，24小时内平均温度不高于+35℃，必要时需根据实际情况降容运行；
- 安装地点海拔高度不超过2000m；
- 周围空气相对湿度在最高温度+40℃时不超过50%，在较低温度时允许有较大的相应湿度，如+20℃时为90%，但应考虑由于湿度的变化可能会偶然产生凝露的情况；
- 产品安装时与垂直面的倾斜度不超过5°；
- 产品应安装在无剧烈震动和冲击以及不足以是元件受到不应有腐蚀的场所。
- The ambient air temperature should not be higher than +40℃, not less than -30℃, the average temperature in 24 hours should not be higher than +35℃. If necessary, it can run derating capacity according to the actual situation.
- Installation altitude should not be more than 2000m.
- The ambient air relative humidity should not exceed 50% at the maximum temperature of +40℃ and allows a greater corresponding humidity at lower temperatures, such as 90% at +20℃, but should be taken into account due to temperature changes may occur by chance. The situation of condensation.
- The vertical gradient should not be more than 5° when installing.
- The product should be installed in places where there is no violent vibration and shock and is protected from corrosion.

技术参数 Product Parameters

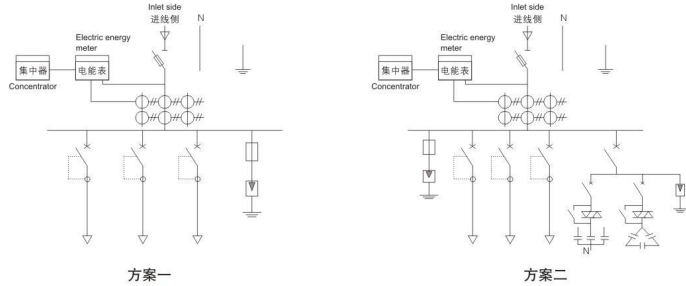
额定绝缘电压 Nominal insulation voltage	主回路额定电压 Main circuit nominal voltage	辅助回路额定电压 Auxiliary circuit nominal voltage	额定电流 Rated current	补偿容量 Compensation capacity	工频耐压 Power frequency withstand voltage	额定频率 Rated frequency	防护等级 Level of Protection	变压器容量 Transformer capacity
AC660V	AC380V/220V	AC380V/220V	10A-630A	5kvar~200kvar	2500V/1min	50Hz	IP44	50kVA~400kVA

结构特点 Structural features

- 综合配电箱的主构架采用1.5mm及以上冷轧钢板或不锈钢板折弯而成，构架采用部分焊接的结构形式，也可以采用磨砂不锈钢双层隔热结构。根据用户要求可选SMC材质；
- 户外型配电箱的门框设有翻边防水倒流槽，上部设防水顶盖，顶盖下檐、箱体两侧设通风散热孔；
- 增设计量及各种配电保护功能的配电箱，可根据用户要求设置多个独立的隔室（即计量室、进线室、馈线室、补偿室），具有防窃电同时保证动作可靠操作安全方便等优点；
- 综合配电箱的进出线孔分别或同时设在箱体的左右侧面、顶部、底部，也可根据用户要求采用其它方式；



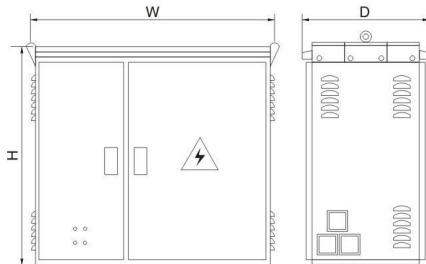
- The integrated distribution box is made of 1.5mm or more cold-rolled steel plate or stainless steel plate. The framework could use the partial welding the frosted stainless steel double-layer insulation structure. We choose SMC materials according to user requirements.
- The door frame of outdoor distribution box has a flanging waterproof backflow tank. There is a waterproof lid on the top and cooling holes at the lid eaves and both sides of the box body.
- Increase the design and a variety of distribution protection function of the distribution box. According to user requirements set up a number of independent compartment (that is, measuring room, inlet line room, feeder room, compensation room), with anti-tampering while ensuring reliable action Safe operation and other advantages.
- The inlet-outlet holes of integrated distribution box are set on the left and right sides, the top, the bottom of box body separately or same; they can also be set in other ways according to user requirements.



- 进线刀熔开关采用HR系列，也可根据用户要求采用隔离开关；
- 断路器可选电子式、热磁式、漏电重合闸式，满足国网招标要求；
- 补偿投切方式可采用机电开关、复合开关、智能电容器；
- 计量CT根据用户要求可预留位置或自行安装；

- Inlet knife fissure switch use HR series; it can also be used isolation switch according to user requirements.
- Circuit breaker could be electronic, thermal magnetic and leakage reclosing type to meet the national grid tender requirements.
- Compensation switch can be used mechanical and electrical switches, composite switches, smart capacitors.
- Metering CT can be reserved a place or self-installed according to user requirements.

产品外型及安装尺寸 Appearance and Installation Dimension of Product



高(H)	宽(W)	深(D)
700\800\850	600\650\700	350\400\450
900\950\1000	750\800\850	500\550\600
1200\1250	900\950\1000	650\700\700
1300\1350	1050\1200	750\800\850
1400\1450	1250\1300	
1500	1350\1400	
	1450\1500	
	1550\1600	
	1650\1700	
	1750	

注：1. 以上尺寸可以任意组合；
2. 箱体尺寸也可以根据客户图纸要求制作。
Note: 1. All the above dimensions can be any combination.
2. Box size can also be produced according to customer drawings requirements.

订货须知 Items To Be Noticed For Ordering

- 产品型号；
- 主电路图；
- 外形尺寸；
- 箱内元器件清单（主母线规格）
- 箱体材料和颜色要求；
- 其它与产品正常使用条件不符的特殊技术要求。

- Product model;
- Main circuit diagram;
- Dimensions;
- Components list in box (main bus-bar specifications);
- Box body material and color requirements;
- Other special technical requirements which are not comply with the normal conditions of use.

计量箱 Metering box

MJJG计量箱用户交流50Hz、额定电压220V或380V，负载总电流不大于225A的三相五线的末端电路中，作为电能计量、用电设备进行控制，对过载、短路、过电压和漏电起保护作用的成套设备。MJGG计量箱安装有断路器、电能表等电气设备。它的主要特点是：外形美观、使用安全、在国内外应用广泛。

符合标准：GB7251.12-2013

MJJG measurement box is used in end of three-phase five-wire circuit of the total load current no more than 225A. The alternating current is 50Hz, nominal voltage is 220V or 380V. As an electric energy measurement and electrical equipment to control for protecting overload, short circuit, over voltage and leakage. MJGG measuring box is consist of circuit breakers, electric energy meters and other electrical equipments. Its main features are: beautiful appearance, safety in use, widely used at home and abroad. Meet the standard: GB7251.12-2013



型号含义 Type Connotations

MJJG - □
① 计量箱 ① Metering box
② 户数 ② Number of households

使用环境 Environmental Conditions for Product Use

环境温度 Ambient humidity	+20℃时空气相对湿度月平均值不大于90%； Monthly average does not exceed 90% at 20℃	污秽等级 Pollution grade	Level II Ⅱ级
环境温度 Ambient temperature	周围空气温度不超过+40℃，而且在24h内其平均温度不超过+35℃.周围空气温度下限为-25℃； The ambient air temperature does not exceed +40℃, and within 24 hours the average temperature does not exceed +35℃. The lower limit of ambient air temperature is -25℃.		
海拔高度 Altitude	≤2000m		
地震裂度 Seismic intensity	无剧烈震动和冲击的场合，安装时与垂直的倾斜度不超过5° No severe vibration and shock location, the vertical gradient should not be more than 5°		

注：用户对上述条件不能满足时应与制造厂家协商。Users should consult with the manufacturer when the above conditions can not be met.

技术参数 Product Parameters

额定绝缘电压 Nominal insulation voltage	额定工作电压 Rated operating voltage	额定电流 Rated current	分断能力 Breaking capacity		过电压类别 Overvoltage category	电气间隙 Electric clearance	爬电距离 Creepage distance	出线回路数 Circuit number of outgoing line	防护等级 Level of Protection
			极限断路器 Limit breaker	运行短路 Running short circuit					
AC500V	AC38V/220V	225A	35kA	17.5kA	III	≥3mm	≥5mm	6、9、12	IP30

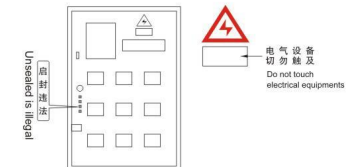
结构特点 Structural features

MJJG计量箱结构部件有箱门、箱体、安装轨道、导电排、接线座和电气元件等。内装电气元件主要由塑壳断路器、小型断路器、电能表等。断路器在同一个隔室，并安装在标准安装轨道上，可根据需要进行任意组合，拆装迅速方便。电能表集中安装在一个隔室内。整个计量箱结构紧凑、布局合理。箱体结构为暗箱嵌入式或明箱壁挂式，上下端设置进出线敲落孔，便于接线。

MJJG measuring box is consist of box door, box body, installing track, conductive bar, terminal blocks and electrical components. The electrical components are mainly molded case circuit breakers, small circuit breakers, and electric energy meters and so on. Circuit breakers in the same compartment, and installed in the standard installing track. It could be any combination according to the need, easy assemble and disassemble. The energy meter electric energy meters are centrally installed in a compartment. The measuring box has a compact structure and a reasonable layout. Box structure has embedded and wall-mounted types. Inlet-outlet line knocking holes on up and down are easy for wiring.

产品外型尺寸 Product dimensions

序号 Number	名称 Name	安装方式 Way to install	规格型号 Specifications Model	长(L)×高(H)×厚(T) mm
1	计量箱 Metering box	暗箱 Embedded box	MJJG-6H	640×970×150
2			MJJG-9H	640×1270×150
3			MJJG-12H	780×1270×150
4		明箱 Wall-mounted box	MJJG-6H	655×985×135
5			MJJG-9H	655×1285×135
6			MJJG-12H	795×1285×135



订货须知 Items To Be Noticed For Ordering

- 计量箱型号和规格；
- 箱体颜色及特殊要求；
- 箱内配套的元件型号规格和电气原理图。

- Metering box model and specification;
- Box color and special requirements;
- Components model specifications and electrical schematic diagram of metering box.



XL-21型低压配电柜

XL-21 type low-voltage distribution cabinet

产品用途

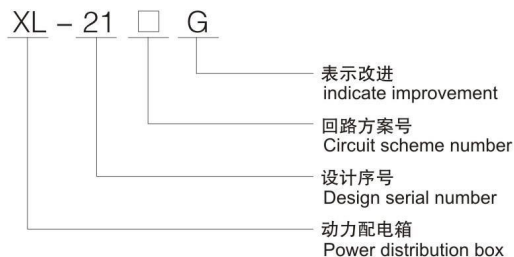
Product use

XL-21型动力柜广泛适用于各工矿企业，高层建筑，民用建筑等，50HZ，380V/220V电力系统的动力配电与各种控制之用。对所控制的线路具有过载和短路保护的作用。XL-21型配电柜户内安装，挂墙安装，柜前检修方便。

XL-21 type power cabinet is widely used in various industrial and mining enterprises, high-rise buildings, civil buildings, etc., for 50, 380V/220V power system power distribution and various controls. It has the function of overload and short circuit protection for the controlled lines XL-21 type distribution cabinet is installed indoors, hung on the wall, and is convenient for maintenance in front of the cabinet.

型号意义

Model significance



产品特点

Product features

- 1、本产品结构轻盈紧凑，采用优质钢板弯制焊接而成，单扇门，门上装有运行仪表及指示灯。
- 2、配电柜打开后，内部电器元件敞露，后侧做成活门，便于日常检修和维护；柜体上部装有吊环便于吊运，亦可增加防水顶盖。
- 3、柜内隔离开关安装在40*40横梁上，断路器固定在1.5mm钢板制成的元件梁上，内装断路器、接触器和中间继电器可灵活组合。
- 4、本产品一次方案有48种规格供用户选用，二次方案有17种规格供用户选用。可制作成双电源互投柜，也可制作成电机控制柜及其他动力控。

1. This product has a lightweight and compact structure, made of high-quality steel plates bent and welded, with a single door, and equipped operation instruments and indicator lights on the door.
2. When the distribution cabinet is opened, the internal electrical components are exposed, and the back is made into a movable for easy daily maintenance and inspection; the upper part of the cabinet is equipped with lifting rings for easy lifting, and a waterproof top cover can also be added.
- 3 The disconnect switch inside the cabinet is installed on the 40*40 horizontal beam, and the circuit breaker is fixed on the component beam made of 15mm steel plate, which can be flexibly combined with the installed circuit breaker, contactor, and intermediate relay.
4. This product has 48 specifications primary scheme for users to choose from, and 17 specifications of secondary scheme for users to choose from. It can be made into a dual-power automatic transfer cabinet and it can also be made into a motor control cabinet and other power control cabinets.

使用条件

Terms of use

周围空气温度不高于+40℃。不低于-5℃。且24小时内其平均温度不高于+35℃，周围空气温度不低于-10℃。空气清洁，相对湿度在最高温度为+40℃时不超过50%。在较低温度时允许有较高的湿度；海拔高度不超过2000m。没有火灾，爆炸危险，严重污秽，化学腐蚀及剧烈震动的场所。

The ambient air temperature shall not exceed 40℃. Not less than -5℃. And its average temperature in 24 hours shall exceed 35℃, the ambient air temperature shall not be lower than -10℃. The air is clean, and the relative humidity shall not exceed 50% at the highest temperature of 40℃. Higher humidity is allowed at lower temperatures; the altitude shall not exceed 2000m. There is fire, explosion hazard, severe pollution, chemical corrosion and severe vibration.



JXF配电箱

JXF distribution box



产品介绍

Product introduction

本公司生产的JXF配电箱结构紧凑、检修方便、一次方案组合灵活等特点，故广泛适用于各工矿企业中，作为交流50Hz、500V以下三相电力系统照明及动力配电之用，对所控制的线路有过载及短路保护作用。

本JXF配电箱系户内装置，靠墙安装，屏前操作及检修。箱门及底板可拆卸，可分体安装，为工程建筑提供方便、节省时间。

The JXF distribution box produced by our company has the advantages of compact structure, convenient maintenance, and flexible combination of primary scheme, so it is widely in various industrial and mining enterprises, as a lighting and power distribution for three-phase power system of AC 50Hz and below 500V, and has the function of overloading and short circuit protection for the controlled lines.

This JXF distribution box is an indoor device, which is installed against the wall, and the and maintenance are in front of the screen. The box door and bottom plate can be disassembled, and can be installed separately, which provides convenience for engineering construction saves time.

使用条件

Terms of use

- 海拔高度不超过2000m;
- 周围空气温度不高于+40℃，不低于-20℃;
- 周围空气中无足以能腐蚀金属和破坏绝缘的气体;
- 没有爆炸危险的场所。
- Altitude not exceeding 2000m;
- Ambient air temperature not higher than 40℃, not lower than -2℃;
- Ambient air contains no gases that can corrode metals and damage insulation;
- No place with explosion hazard.

技术参数

Technical parameters

项目	Project	参数 parameters
防护等级	Protection level	IP30
额定工作电压	Rated working voltage	AC380
频率	Frequency	50
额定绝缘电压	Rated insulation voltage	500
极限分断能力	Ultimate breaking capacity	2500

产品·企业市场竞争力的体现

Product · Foundation Stone for Enterprise Impingement on Markets

高、低压成套设备

High/Low Voltage Complete Equipment

适用范围 Scope of Application

预装式变电站可作为环网型和终端型变配电装置。广泛应用于住宅小区、工矿企业、宾馆、医院、商场、机场、公园、铁路等户外场所。

Prefabricated transformer substation can be used as ring main type and terminal type of power transformation/power distribution device. It is widely used in outdoor locations such as residential district, industrial and mining enterprises, hotel, hospital, department store, airport, park and railway.

使用条件 Usage Conditions

- 1) 海拔高度不超过1000m;
- 2) 环境温度：最高温度40℃，最低温度-25℃，最高日平均温度不超过35℃；
- 3) 相对湿度：日平均值不超过90% (+25℃)；
- 4) 户外风速不超过35m/s；
- 5) 地面倾斜度不大于3°；
- 6) 阳光辐射不得超过1000W/m；
- 7) 安装地点无爆炸危险、火灾、化学腐蚀及剧烈振动；当与上述正常使用条件不同时，由用户和制造厂协商解决。
- 8) 地震烈度8度
 - 1) Altitude should be no more than 1000m;
 - 2) Ambient temperature: maximum temperature should be 40℃ and minimum temperature should be -25℃, and maximum daily average temperature should be no more than 35℃;
 - 3) Relative humidity: daily average value should be no more than 90% (+25℃);
 - 4) Outdoor wind speed should be no more than 35m/s;
 - 5) ground surface inclination should be no more than 3°;
 - 6) Sunlight radiation should be no more than 1000W/m;
 - 7) Equipment should be installed at location free from explosion hazard, fire disaster, chemical corrosion and violent vibration; user can negotiate with manufacture to find out solution in case of difference from the above mentioned usage conditions.
 - 8) Seismic intensity: grade 8

目录 Catalog

预装式变电站	Pre-installed Power Transformers Substation
开闭站	Switching Station
美式箱变系列	American Type of Cubicle Transformer Substation Series
景观式箱变	Scenic Type Cubicle Transformer Substation
地理式变电站	Embedded Transformer Substation
12KV电缆分支箱	12KV Cable Distribution Cabinet
10KV柱上变压器	10KV pole-mounted transformer



预装式变电站

Pre-installed Power Transformers Substation

本产品完全符合GB/T17467-2010《高压/低压预装式变电站》标准。适用于城市公共配电、路灯用电、工矿企业、市区建筑、住宅、山区、宾馆、公园及工地施工等，可实现环网型和终端型供电方式。

The product is completely in compliance with standard GB/T17467-2010 (high-voltage/low-voltage Pre-installed Power Transformer Substation). It applies to urban public power distribution, road lamp power consumption, industrial and mining enterprises, urban building, residential building, mountainous area, hotel, park and construction site, and can realize ring main type and terminal type of power supply mode.

型号含义 Type Connotations

① 预装式变电站	Pre-installed Power Transformer Substation
② 布置方式：M表示“目”字型 P表示“品”字型	Arrangement mode: M stands for “rectangle” type P stands for “triangle” type
③ 设计序号	Design serial number
④ 高压侧额定电压 (kV)	High-voltage side rated voltage (kV)
⑤ 低压侧额定电压 (kV)	Low-voltage side rated voltage (kV)
⑥ 变压器额定容量 (kVA)	Transformer rated capacity (kVA)

使用环境 Environmental Conditions for Product Use

- 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
 - 环境温度：-30℃~+40℃；
 - 温度：最高月平均气温+30℃，最高年平均气温+20℃；
 - 相对湿度：日平均≤95%，月平均≤90%；
 - 防震水平：水平加速度0.4m/s²，垂直加速度0.15m/s²；
 - 安装地点：无剧烈冲击、无严重污染和化学腐蚀、无导电尘埃及爆炸危险；
 - 当不能满足正常使用条件要求时，请用户与我公司协商。
- Altitude should be 1000m, users of high altitude region should indicate altitude upon ordering, and the product can meet requirement of user for altitude below 4000m.
- Ambient temperature: -30℃~+40℃
- Temperature: maximum monthly average temperature should be +30℃ and maximum annual average temperature should be +20℃.
- Relative humidity: daily average ≤95% and monthly average ≤90%;
- Anti-seismic level: horizontal acceleration 0.4m/s² and vertical acceleration 0.15m/s²
- Installation site: free from violent impact, serious pollution and chemical corrosion, conductive dust and explosion hazard.
- Where the normal usage conditions/requirements are not met, please negotiate with our company.

采用标准 Significant Implementation Standards

- GB/T17467-2010/eqVIEC1300: 1995 高压/低压预装式变电站
- GB1094-1996/eqVIEC 76: 1993 电力变压器
- GB6450-1998/eqVIEC 726: 1982 干式电力变压器
- GB11022-1999/eqVIEC 60694: 1996 高压开关设备和控制设备标准的共同技术条件
- GB3906-2006/eqIEC398: 1990 3.6-40.5kV 交流金属封闭开关设备和控制设备
- GB/T17467-2010/eqVIEC1300: 1995 High-voltage/low-voltage Pre-installed Power Transformer Substation
- GB1094-1996/eqVIEC 76: 1993 Power transformer
- GB6450-1998/eqVIEC 726: 1982 Dry type power transformer
- GB11022-1999/eqVIEC 60694: 1996 Common technical conditions of high-voltage switchgear and control gear standard
- GB3906-2006/eqIEC398: 1990 3.6-40.5kV AC metal-enclosed switchgear and control gear

产品特点 Product Characteristics

- 箱变的基本结构分为“目”字形和“品”字形两种，箱式骨架采用优质槽钢和角钢焊接而成，具有较高的机械强度；箱体采用铝合金型材制作，具有较好的防腐能力，整体美观的外形经喷漆着色可与周围环境相协调，精心设计的底部起吊装置，给安装运输移动提供了极大的方便。
- 箱变内有独立的高压室、变压器室和低压室，各室照明随门的开启自动打开。高压室内装有高压环网开关设备，可根据用户需要选用压气式、真空式负荷开关，且具有“五防”功能，当采用限流型高压熔断器时，当其相熔断器熔断时，负荷开关自动分闸，避免因缺相运行而引起故障。
- 变压器室采用自然通风和自动控制的强迫散热风冷装置，具有随温度变化而自动控制的排风系统，能有效控制降低箱内温度，满足运行要求。根据用户要求还可采用防凝露的装置，还可设有轨道，能方便地从变压器室两侧大门进出。箱体材料能防止雨水和污物进入，具备长期户外使用的条件，具有防腐防水，防尘性能，使用寿命长，维护简单，外形美观等功能。
- 变压器可采用干式或油浸变压器，油浸式变压器可选用有油枕和无油枕全密封的两种。
- 低压室具有成套开关设备的总体功能，供用户挑选，任意组合。
- 外壳材料：外壳材料有复合板、不锈钢、镀锌锌板、不锈钢板、金属雕花板。环保木等。
- 结构特点：高压结构合理紧凑，可选用SF6、FZN57、VHC环网柜，具有五防联锁功能。变压器自然通风和自动风冷系统可适用干式和油浸变压器。
- 低压室：可根据用户要求采用多种结构的配电方案，有动力配电，照明配电，无功自动补偿，电能计量等各种功能，装有自动照明系统，防尘性能高，使用寿命长，维护简单，外形美观。

- Basic structure of cubicle transformer substation falls into two categories of rectangular or triangular arrangement, cubicle-type skeleton adopts welding of high quality channel steel and angle steel, and features high mechanical strength, cubicle body adopts aluminum alloy section material, features good corrosion resistance, painting color of exterior is harmonized with ambient environment, and carefully designed bottom hoisting device provides extreme convenience for installation, transportation and movement.
- Cubicle transformer substation features independent high-voltage chamber, transformer chamber and low-voltage chamber, of which illumination is automatically turned on with opening of door. High-voltage chamber is installed with high-voltage ring main switchgear, it is possible to select air compression type and vacuum type load-breaking switch, and "five-proof" function is available, in case of adoption of current limiting high-voltage fuse, load-breaking switch is automatically opened upon breaking of fuse of a certain phase, so as to avoid malfunction caused due to phase-deficient operation.
- Transformer chamber adopts natural ventilation and automatically controlled forced heat radiation air cooling device, features exhaust system automatically controlled as per change of temperature, effective control and reduction of temperature inside cabinet, and meets operation requirements. In accordance with user's requirement, it is also possible to adopt anti-condensation device, and configure track to facilitate entry/exit from gate at both sides of transformer chamber. Cubicle material can prevent ingress of rain water and filthy, meet conditions for long-term outdoor usage, feature corrosion resistance, water proof, dust proof, long usage life, simple maintenance and pretty appearance, etc.
- Transformer can adopt dry type or oil immersion transformer, and oil immersion transformer can adopt two types with oil conservator or without oil conservator fully-sealed.
- Low-voltage features overall function of complete switchgear for selection by user and any combination.
- Enclosure material: enclosure material includes composite plate, aluminized zinc sheet, stainless steel plate, metal carving plate and environmental protection timber, etc.
- Structural features: high-voltage structure is reasonable and compact, can select SF6, FZN57 and VHC ring main cabinet, and features five-proof interlock function. Natural ventilation and automatic air cooling system of transformer applies to dry type and oil immersion transformer.
- Low-voltage chamber: power distribution program of multiple structures can be adopted as per user's requirement, and features various functions such as power distribution, illumination power distribution, automatic reactive compensation and electric energy metering, automatic illumination system, high dust proof performance, long usage life, simple maintenance and beautiful appearance.

技术参数 Product Parameters


名称 Descriptions		单位 Unit	参数 Parameters
高压单元 HV unit	额定频率 Rated frequency	Hz	50
	额定电压 Rated voltage	kV	6, 10, 35
	最高工作电压 电压Maximum operating voltage	kV	6.9, 11.5, 40.5
	工频耐受电压 对地和相前/隔离断口 Power frequency withstand voltage Phase-to-ground and phase-to-phase/isolating distance	kV	32/36, 42/48, 95/118
	雷电冲击耐受电压 对地和相前/隔离断口 Lightning impulse withstand voltage Phase-to-ground and phase-to-phase/isolating distance	kV	60/70, 75/85, 185/215
	额定电流 Rated current	A	400, 630, 1250
	转移电流 Transfer current	A	1200-3150
	额定短时耐受电流 Rated short-time withstand current	kA	12.5 (2s), 16 (2s), 20 (2s)
	额定峰值耐受电流 Rated peak withstand current	kA	32.5, 40, 50
	额定短路开断电流 (限流熔断器) Rated short-circuit breaking current (current-limiting fuse)	kA	31.5
低压单元 LV unit	额定电压 Rated voltage	V	220, 380, 690, 800
	主回路额定电流 Rated current of main circuit	A	50-4000
	额定短时耐受电流 Rated short-time withstand current	kA	15, 30, 50
	额定峰值耐受电流 Rated peak withstand current	kA	30, 63, 110
	支路电流 Branch current	A	5-800
分支回路数 Number of branch circuits	路	1-12	
变压器单元 Transformer unit	额定电压 Rated voltage	KV	6, 10, 35
	额定容量 Rate capacity	kVA	30-2000
	阻抗电压 Impedance voltage	%	4, 4.5, 6, 8
	分接范围 Tapping range	%	±2.5%, ±5%
	联接组别 Splicing group		Yyn0, Dyn11
外壳 Enclosure	防护等级 (常规产品) Degree of protection (conventional product)		高压室(High-voltage room) IP33 变压器室(Transformer room) IP23 低压室(Low-voltage room) IP33
	噪声水平 Noise level	DB	≤50

产品结构图 Product Structural Diagram



结构1 Structure 1

型号 Model	结构1 Structure 1	欧变外形尺寸 Exterior dimension of European transformer (宽×深) (width × depth)	变压器容量 Transformer capacity (KVA)	低压室 Low-voltage chamber		高压室 High-voltage chamber	
				低压柜 Low-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 低压标准方案 Applicable low-voltage standard program	高压柜 High-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 高压标准方案 Applicable high-voltage standard program
YBP1		3000 × 2000	200 - 315	3000 × 600 × 1800	DZ1.DZ2	1000 × 940 × 1600	GZ1.GZ4
		3200 × 2300	400 - 630				
YBP2		3200 × 2300	200 - 630	2800 × 600 × 1800	DZ3.DZ4	1500 × 940 × 1600	GZ3
YBP3		4000 × 2300	400 - 630	3600 × 600 × 1800	DZ3.DZ4	2300 × 940 × 1600	GZ3.GZ4
YBP4		4900 × 2300	400 - 630	4400 × 600 × 1800	DZ3.DZ4	2300 × 940 × 1600	GZ3.GZ4



结构2 Structure 2

型号 Model	结构2 Structure 2	欧变外形尺寸 Exterior dimension of European transformer (宽×深) (width × depth)	变压器容量 Transformer capacity (KVA)	低压室 Low-voltage chamber		高压室 High-voltage chamber	
				低压柜 Low-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 低压标准方案 Applicable low-voltage standard program	高压柜 High-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 高压标准方案 Applicable high-voltage standard program
YBP5		3900 × 2000	800	2000 × 600 × 1800	DZ1.DZ2	1800 × 940 × 1600	GZ2.GZ3.GZ4
		4700 × 2000		2800 × 600 × 1800	DZ3.DZ4	2300 × 940 × 1600	GZ5.GZ6
YBP6		4000 × 2400	1000	2000 × 600 × 1800	DZ1.DZ2	1800 × 940 × 1600	GZ2.GZ3.GZ4
		4700 × 2500		2800 × 600 × 1800	DZ3.DZ4	2300 × 940 × 1600	GZ5.GZ6
YBP7		4000 × 2500	1250	2000 × 600 × 1800	DZ1.DZ2	1800 × 940 × 1600	GZ2.GZ3.GZ4
		4700 × 2500		2800 × 600 × 1800	DZ3.DZ4	2300 × 940 × 1600	GZ5.GZ6

结构3 Structure 3

型号 Model	结构3 Structure 3	欧变外形尺寸 Exterior dimension of European transformer (宽×深) (width × depth)	变压器容量 Transformer capacity (KVA)	低压室 Low-voltage chamber		高压室 High-voltage chamber	
				低压柜 Low-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 低压标准方案 Applicable low-voltage standard program	高压柜 High-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 高压标准方案 Applicable high-voltage standard program
YBM1		3300 × 2300	200 - 250	2000 × 600 × 1800	DZ1.DZ2	1800 × 600 × 1800	GZ1.GZ2 GZ3.GZ4
YBM2		3400 × 2300	315 - 400	2000 × 600 × 1800	DZ1.DZ2	1800 × 600 × 1800	GZ1.GZ2 GZ3.GZ4
YBM3		3500 × 2300	500 - 630	2000 × 600 × 1800	DZ1.DZ2	1800 × 940 × 1600	GZ1.GZ2 GZ3.GZ4

结构4 Structure 4

型号 Model	结构4 Structure 4	欧变外形尺寸 Exterior dimension of European transformer (宽×深) (width × depth)	变压器容量 Transformer capacity (KVA)	低压室 Low-voltage chamber		高压室 High-voltage chamber	
				低压柜 Low-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 低压标准方案 Applicable low-voltage standard program	高压柜 High-voltage cabinet (宽×深×高) (width × depth × height)	可应用的 高压标准方案 Applicable high-voltage standard program
YBM4		6700 × 2800	100 - 315	3300 × 1800 × 1800	GZ5.GZ6	2300 × 940 × 1600	DZ5.DZ6
YBM5		7000 × 3000	400 - 630	3300 × 1800 × 1800	GZ5.GZ6	2300 × 940 × 1600	DZ5.DZ6
YBM6		7400 × 3400	800 - 1250	3300 × 1800 × 1800	GZ5.GZ6	2300 × 940 × 1600	DZ5.DZ6

主回路方案图 Main Circuit Program Diagram
高压标准单元编号说明 Description of High-Voltage Standard Unit Number

型号 Model	单元 Unit	下标 Subscript	1 (无开关) 1 (Without switch)	2 (负荷开关) 2 (Load-breaking switch)	3 (断路器) 3 (Circuit breaker)	4 (隔离开关) 4 (Disconnecting switch)
进线 Incoming line	1		●	●		●
计量 Metering	2		●			
出线 Outgoing line	3			●	●	●

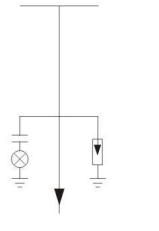
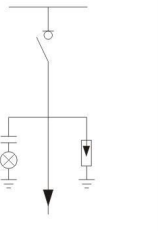
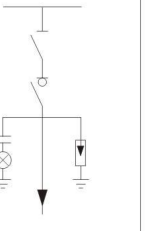
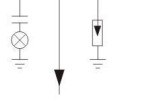
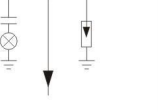
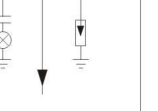
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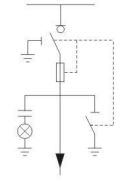
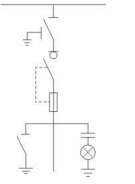
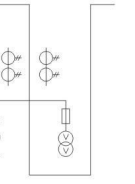

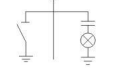
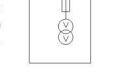
● represents that the function is available

2. 例: 32代表出线带负荷开关;

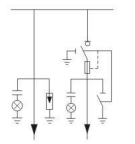
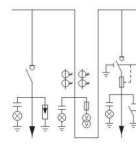
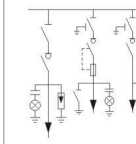
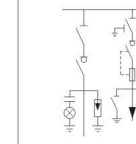

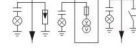
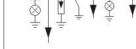

Example: 32 represents that outgoing line with load-breaking switch;

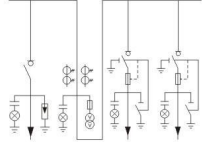
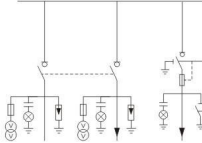
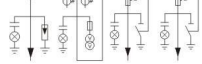
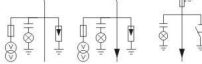
主回路单元编号 (高压单元) Main Circuit Unit Number (High-Voltage Unit)

一次线路单元编号 Primary circuit unit number	11	12	124
一次系统图 Primary system diagram			
主要设备 Main equipment			
开关柜用途 Usage of switch cabinet	进线 Incoming line		
隔离开关 Disconnecting switch			1
负荷开关 Load-breaking switch		FLN36、FZN25	FZN25
高压带电显示器DXN6-10 High-voltage live display DXN6-10	1	1	1
避雷器HY5W-17/50 Lightning arrester HY5W-17/50	3	3	3
柜体尺寸 (宽×深×高) Cabinet body dimension (width × depth × height)	500 × 940 × 1600(1900)	500(650) × 940 × 1600(1900)	500 × 940 × 1600(1900)

一次线路单元编号 Primary circuit unit number	32	324	21
一次系统图 Primary system diagram			
主要设备 Main equipment			
开关柜用途 Usage of switch cabinet	出线 Outgoing line		
隔离开关 Disconnecting switch		1	
负荷开关 Load-breaking switch	FLRN36、FZRN25	FLRN36	
高压带电显示器DXN6-10 High-voltage live display DXN6-10	1	1	1
电流互感器LZZBJ9 Current transformer LZZBJ9			2
电压互感器JDZ-10 Voltage transformer JDZ-10			2
熔断器XRNT-10 Fuse XRNT-10	3	3	
柜体尺寸 (宽×深×高) Cabinet body dimension (width × depth × height)	500(650) × 940 × 1600(1900)	500 × 940 × 1600(1900)	800 × 940 × 1600(1900)

主回路组合编号 (高压单元) Main Loop Combination No. (High-Voltage Unit)

一次线路单元编号 Primary circuit unit number	GZ1	GZ2	GZ3	GZ4
一次系统图 Primary system diagram				
主要设备 Main equipment				
开关柜单元组合号 Combination number of switch cabinet unit	11+32	12+21+32	124+324+124	124+324

一次线路单元编号 Primary circuit unit number	GZ5	GZ6
一次系统图 Primary system diagram		
主要设备 Main equipment		
开关柜单元组合号 Combination number of switch cabinet unit	12+21+32+32	12+12+32

低压标准单元编号说明 Instructions To The Numbering Of Standard Low-Voltage Units

型号 Model	单元 Unit	下标 Subscript	1 (无隔离) (Without isolation)	2 (隔离开关) (Isolating switch)	3 (计量) (Metering)	4 (有触点) (With contact)	5 (共补偿复合开关) (Common compensation composite switch)	6 (混补偿复合开关) (Mixed compensation composite switch)
进线 Incoming line	1		●	●	●			
出线 Outgoing line	2		●	●	●			
补偿 Compensation	3					●	●	●
联络 Liaison	4		●	●				

说明(Description): 1. ●代表具有此功能;
 ● represents that the function is available
 2. 例: 21代表出线无隔离
 2.E.g. 21 implies non-isolated outgoing line

主回路单元编号 (低压单元) Main Circuit Unit Number (Low-Voltage Unit)

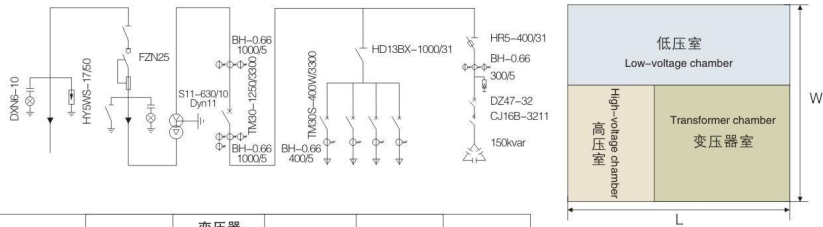
一次线路单元编号 Primary circuit unit number	11	12	113	123
一次系统图 Primary system diagram				
主要设备 Main equipment				
开关柜用途 Switch cabinet usage	进线 Incoming line		进线兼计量 Incoming line and metering	
主开关TW30、TM30 branch switch	400-1600A 1个 Unit	400-1600A 1个 Unit	400-1600A 1个 Unit	400-1600A 1个 Unit
隔离开关GL、HD11F Disconnecting switch GL and HD11F		400-1600A 1个 Unit		400-1600A 1个 Unit
电度表DT862、DX862 Kilowatt hour meter DT862、DX862			220V/380V 1.5(6)A 3(6)A 各一个 per each	220V/380V 1.5(6)A 3(6)A 各一个 per each
电流互感器BH-0.66 Current transformer BH-0.66	400-1500/5 4个 Unit	400-1500/5 4个 Unit	400-1500/5 7个 Unit	400-1500/5 7个 Unit
柜体尺寸(宽×深×高) Cabinet body dimension (width x depth x height)	800×600(500)×1650(1800)	800×600(500)×1650(1800)	800×600(500)×1650(1800)	800×600(500)×1650(1800)

一次线路单元编号 Primary circuit unit number	21	22	23
一次系统图 Primary system diagram			
主要设备 Main equipment			
开关柜用途 Switch cabinet usage	出线 Outgoing line		
支路开关TM30、TM30 branch switch	225-400A 6/4个 Unit	225-400A 6/4个 Unit	225-400A 6/4个 Unit
隔离开关GL、HD13BX Disconnecting switch GL and HD13BX		400-1600A 1个 Unit	400-1600A 1个 Unit
电流表6L2-A Kilowatt hour meter 6L2-A	100-400/5 6/4个 Unit	100-400/5 6/4个 Unit	100-400/5 6/4个 Unit
电流互感器BH-0.66 Current transformer BH-0.66	100-400/5 6/4个 Unit	400-1500/5 6/4个 Unit	400-1500/5 3个 Unit
柜体尺寸(宽×深×高) Cabinet body dimension (width x depth x height)	800×600(500)×1650(1800)	800×600(500)×1650(1800)	800×600(500)×1650(1800)

一次线路单元编号 Primary circuit unit number	34	35	36	一次线路单元编号 Primary circuit unit number	422	41
一次系统图 Primary system diagram				一次系统图 Primary system diagram		
主要设备 Main equipment				主要设备 Main equipment		
开关柜用途 Usage of switch cabinet	补偿 Compensation			开关柜用途 Usage of switch cabinet	联络 Liaison	
刀熔开关HR5 Fuse isolating switch HR5	100-630A 1个 Unit	100-630A 1个 Unit	100-630A 1个 Unit	主开关TW30、TM30 Main switch TW30/TM30		100-1600A 1个 Unit
微型断路器 C65N、DZ47-C Mini-circuit breaker 微断断路器	25-63A 4-12个 Unit	25-63A 4-12个 Unit	25-63A 4-10个 Unit	隔离开关GL、HD11F Disconnecting switch GL、HD11F	100-1600A 2个 Unit	
接触器 CJ16B、CJX4 Contact CJ16B、CJX4	32-63A 4-12个 Unit			电流互感器BH-0.66 Current transformer BH-0.66	400-1500/5 3个 Unit	400-1500/5 3个 Unit
共补偿复合开关 CASW Common-complement compound switch CASW		40-60A 4-12个 Unit	40-55A 4-12个 Unit	柜体尺寸(宽×深×高) Cabinet body dimension (width x depth x height)	600×500(600)×1650(1800)	600×500(600)×1650(1800)
分补偿复合开关SLFK-Y Separated-complement compound switch SLFK-Y						
电容器BSMJ Capacitor BSMJ	12-30kvar 4-12个 Unit	12-30kvar 4-12个 Unit	12-30kvar 4-12个 Unit			
电流互感器BH-0.66 Current transformer BH-0.66	100-600A 3个 Unit	100-600A 3个 Unit	100-600A 3个 Unit			
柜体尺寸(宽×深×高) Cabinet body dimension (width x depth x height)	600×500(600)×1650(1800)	600×500(600)×1650(1800)	600×500(600)×1650(1800)			

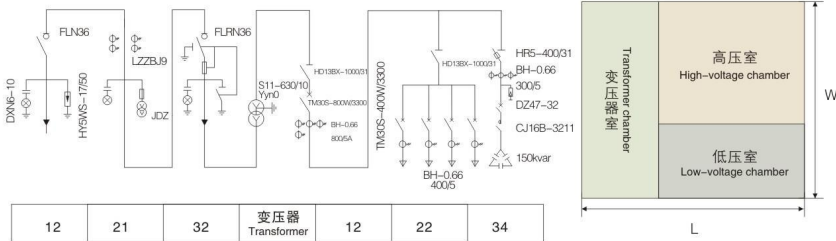
主回路组合编号 (低压单元) Main Circuit Unit Number (Low-Voltage Unit)

一次线路组合编号 Primary circuit unit number	DZ1	DZ2
一次系统图 Primary system diagram		
主要设备 Main equipment		
开关柜单元组合号 Combination number of switch cabinet unit	113+21+34	12+21+35
一次线路组合编号 Primary circuit unit number	DZ3	DZ4
一次系统图 Primary system diagram		
主要设备 Main equipment		
开关柜单元组合号 Combination number of switch cabinet unit	113+27+22+34	11+21+31+35

1号典型方案 No. 1 Typical Program
平面排布方案 Plane arrangement program


11	324	变压器 Transformer	113	22	34
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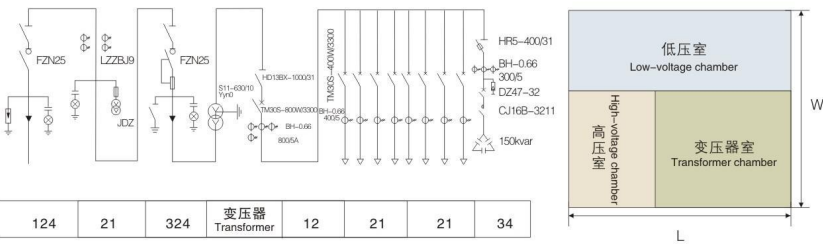
编号 S/N	长L (mm)	宽W (mm)	高H (mm)	变压器容量 (KVA) Transformer capacity (KVA)	高压柜数量 (台) Number of high-voltage cabinets (units)	低压柜数量 (台) Number of low-voltage cabinets (units)
1	3300	2200	2200	630以下	2	3

2号典型方案 No. 2 Typical Program
平面排布方案 Plane arrangement program


12	21	32	变压器 Transformer	12	22	34
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注：方案适合S11-630/10/0.4及以下。SG10与SC系列干式变压器400/10/0.4及以下容量
 Note: the program applies to S11-630/10/0.4 and below. SG10 and SC series dry transformer 400/10/0.4 and below.

编号 S/N	长L (mm)	宽W (mm)	高H (mm)	变压器容量 (KVA) Transformer capacity (KVA)	高压柜数量 (台) Number of high-voltage cabinets (units)	低压柜数量 (台) Number of low-voltage cabinets (units)
2	4000	2000	2200	630以下	3	3

3号典型方案 No. 3 Typical Program
平面排布方案 Plane arrangement program


124	21	324	变压器 Transformer	12	21	34
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编号 S/N	长L (mm)	宽W (mm)	高H (mm)	变压器容量 (KVA) Transformer capacity (KVA)	高压柜数量 (台) Number of high-voltage cabinets (units)	低压柜数量 (台) Number of low-voltage cabinets (units)
3	4000	2200	2200	630以下	3	3

35KV变电站的结构特点

Structural Characteristics Of 35KV Power Transformer Substation

智能组合变电站/开闭站是我公司为了满足市场的需要，并结合在配电领域的科研成果和工程实践经验，自主研发的新产品，它提供了110KV、72KV、40.5KV新建变电站最佳的解决方案，本产品具有可靠性高、小型化、无污染、运行费用低、组合灵活、安装方便、自动化、免维护、操作简单、无人值守等优点。取代了土建变电所的传统工程方案。可极大减少变电站的投资、占地和建设周期，推动了变电站运行水平的全面提高。变电站综合自动化系统在设计上采用分散分布式结构，将大部分保护、控制功能下放至开关间隔内，把一次设备的紧凑性和二次设备的分散性进行了完美的结合。以计算机网络实现信息共享，消除所有冗余硬件，实现了产品设计的智能化、一体化、生产过程的工厂化和现场安装的简单化。同时将变电站的技术水平和安全稳定运行水平提高到新的层次。

As a new product independently researched and developed by our company to meet market demand and in combination with scientific research achievements and engineering practice experience of power distribution field, intelligent combined transformer substation/switching station provide the best solution for new transformer substation of 110KV, 72KV and 40.5KV, and features advantages such as high reliability, small size, no pollution, low operation cost, flexible combination, convenient installation, automation, free from service, simple operation and unattended operation. It replaces traditional engineering program of civil work substation. It can substantially reduce investment of transformer substation, land occupation and construction period, and has propelled overall enhancement of operation level of transformer substation. Comprehensive automation system of transformer substation adopts scattered/distributed structure in term of design, allocates most of protection and control functions in switch compartment, and realizes perfect combination of compact primary equipment and scattered secondary equipment. It realizes share of information through computer network, eliminates all redundant hardware, and realizes intelligence and integration of product design, factory-based production process and simplicity of onsite installation. Meanwhile, technical level and safe/stable operation level of transformer substation have been enhanced to new level.

一、二次设备一体化 Integration Of primary/Secondary Equipments

10KV的一、二次设备按单元配套，组装于开关柜内。35KV侧保护装置集中组屏，将高压开关柜、综合自动化装置组合在一起放置在同一箱体，成为一体化的成套供配电装置。变电站内无需建筑物，占地面积大大缩小。可实现无人值守的要求，初期投资合理。

10KV primary/secondary equipments are configured as per unit, and are assembled in switch cabinet. 35KV side protection device adopts centralized screen configuration, and combines high-voltage switch cabinet and comprehensive automation device together in one same cubicle as an integrated complete power supply/power distribution device. No building is required in transformer substation, and land occupation area is substantially reduced. Requirement of unattended operation can be realized, and initial investment is reasonable.

建设过程工厂化 Factory-Based Construction

变电站的10KV设备和变电站综合自动化系统均在公司内部完成设计、制造、安装及内部电气接线。出厂前整组调试合格。整体运输，运抵现场。从而实现了变电站的工厂化建设。

Design, manufacture, installation and internal electric wiring of 10KV equipment of transformer substation and comprehensive automation system of transformer substation are completed inside the company. Complete group is commissioned as eligible before delivery from factory. Equipments are shipped to site through integrated transportation, realizing factory-based construction of transformer substation.

现场安装简单化 Simple Onsite Installation

体积小、安装施工方便。现场工作只需完成变电站箱体水泥基础建设，箱体就位后，将10KV一次电缆和35KV侧二次信号接入相应设备即可，大大减少了现场施工的工作量。

Small volume and convenient installation construction. Onsite work only requires completion of cement foundation construction of transformer substation cubicle, after cubicle gets ready, connect 10KV primary cable and 35KV side secondary signal, work volume on construction site has been substantially reduced.

外形美观 Beautiful Appearance

外形美观大方，可以与周边环境协调，可起到美化城市的作用。
 Appearance is beautiful, can be harmonized with surrounding environment, and plays a role of beautification of city.

占地面积小 Small Land Occupation Area

建设一座常规35KV变电所，大约占地800m²左右，而选用箱式变电站占地面积最小可至100m²，仅为同规模变电所占地面积的1/10，符合国家节约土地的政策。

Construction of a conventional 35KV substation approximately occupies land area of 800m², while cubicle-type transformer substation occupies land area as small as 100m² which is only 1/10 of land area of substation of the same scale, and is in compliance with national land-saving policy

可靠性强 High Reliability

“五防”功能齐全，维护方便，运行安全可靠。
 综合自动化系统为分层分布式结构，分成变电站层和间隔层，层间用通信网相接，间隔层保护测控装置分散安装于一次设备，35KV等级以上的监控系统部分采用集中组屏式结构，整套装置一般由变压器测控保护屏、线路测控保护屏、计量屏及直流屏等组成。

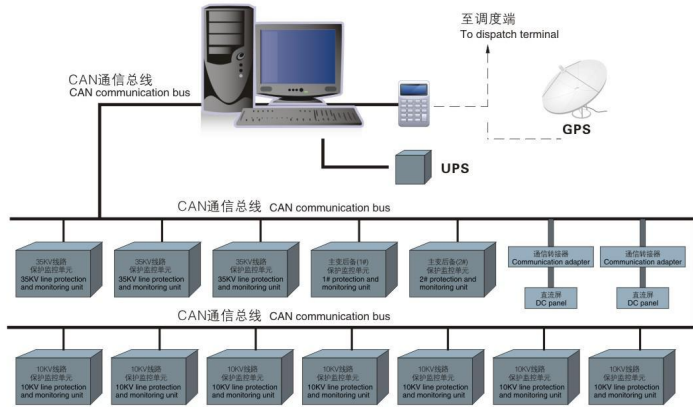
“Five-proof” functions are complete, maintenance is convenient and operation is safe and reliable.
 Comprehensive automation system is of layered distributive structure, and is divided into transformer substation layer and compartment layer, which are connected through communication network, compartment layer protection/measurement devices are installed in primary equipment in a scattered manner, monitor system over 35KV grade adopts centralized configuration structure, complete set of device normally consists of transformer measurement/control protection panel, circuit measurement/control protection panel, metering panel and DC panel, etc.

变电站的综合自动化系统 Comprehensive Automation System Of Power Transformer Substation

智能组合变电站采用了系列微机保护装置。它集保护、测量、控制、检测、通讯等多种功能于一体，适用于各种电压等级的变电站，终端站和城乡电网系统。

Intelligent combination transformer substation adopts serial PC protection device. It integrates multiple functions such as protection, measurement, control, detection and communication, and applies to transformer substation, terminal station and urban/rural power grid system of various voltage grades.

35KV变电站综合自动化系统通讯网络结构示意图 Schematic Diagram Of Comprehensive Automation Communication Network Structure Of 35KV Power Transformer Substation



系统特点 System Features

- 分层、分布式系统。减少了控制电缆，简化了系统，缩小了控制室面积，节省了综合造价。
- 保护定值可由面板、后台机或远方实现在线修改，多整定方式，维护方便。
- 多种形式可选用的备用电源自投方式，最大限度地满足用户需要。
- 可与五防系统联接，完成五防及记录功能。
- 具有完备的自检和报警功能。
- 提供多种组态功能，便于系统配置和功能扩充。
- 多接口模式，可与微机保护、数字式电表等其它装置通讯，可采用多种远程通讯规约与调度中心通讯。
- 采用高可靠CAN总线工业控制现场网络，彻底克服了主从式网络结构的瓶颈现象。
- 基于CAN总线的网络型保护技术，可以不增加投资的情况下，实现站内任一设备处的快速保护，特别是母线的快速保护大大减小了故障对设备的冲击，提高了供电可靠性和设备的可靠性。
- 硬件标准化、模块化，根据需要可灵活组合。
- 各监控单元使用统一硬件平台。
- 超低功耗设计。
- 高可靠性。所有元件均采用CMOS工业级芯片，抗干扰能力强，故障率极低，独特的布线设计、电磁屏蔽、软硬件冗余、瞬态抑制使装置具有高抗干扰能力，任意元件损坏均保证自动进行及时有效的处理，任何情况下不影响正常工作。

- Layered distributive structure. Reduction of control cable, simplification of system, reduction of control room area, and saving of comprehensive cost.
- Protection setting value modified online through panel, background computer or remotely, multiple setting modes, and convenient maintenance.
- Multiple options of standby power supply automatic switching mode, and compliance with user's demand to the maximum extent.
- Splicing with five-proof system for realization of five-proof and recording function.
- Complete self-inspection and alarm function.
- Multiple configuration functions, convenience for system setup and function expansion.
- Multiple interface modes, communication with other devices such as PC protection and digital kilowatt hour meter, and adoption of multiple remote communication protocols for communication with dispatch center.
- Adoption of highly reliable CAN bus industrial control onsite network, thorough elimination of bottle-neck of master/slave network structure.
- Network type of protection technology based on CAN bus, which can realize quick protection of any equipment in station without increase of investment, especially quick protection of bus substantially reduces impact upon equipment due to malfunction, and enhances power supply and equipment reliability.
- Standardization and modularization of hardware, and flexible combination as per demand.
- Uniform hardware platform for all monitor units.
- Ultra-low power consumption design.
- High reliability. All components adopt CMOS industrial grade chip featuring high anti-interference and extremely low malfunction rate, high anti-interference capability is realized through special wiring design, electromagnetic shielding, software/hardware redundancy and transient restriction, damage of any components can be handled automatically, timely and effectively, and will not affect normal work under any circumstances.

后台监控软件 Background Monitor Software

数据采集和处理 Data collection and processing

- 1、数据来源：RTU、智能设备、人工置入、标准时钟数据及频率值、主站系统通信数据；数据类型：模拟量、数字量、状态量、非电量及综合自动化信息等；
- 2、系统按标准时钟对时，支持数字和模拟通道。支持双通道切换，具有对通道监视诊断和运行统计功能，支持单机、双机方式。
- 3、系统提供数据的条件归零、零源处理、死区检查、人工置数合封锁、告警、公式计算等。

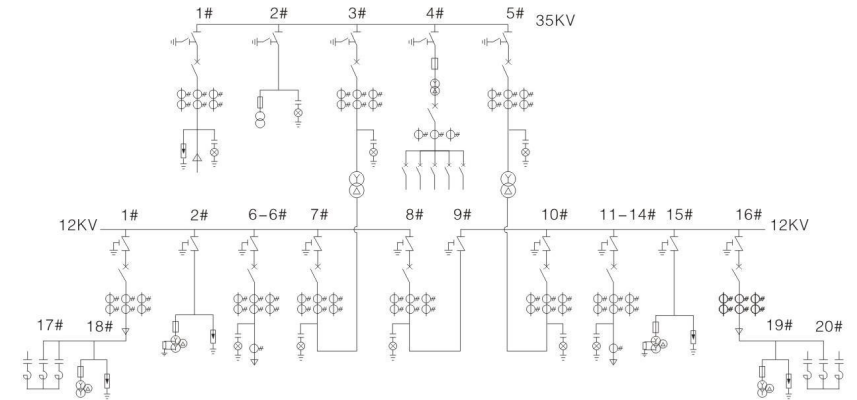
1. Data source: RTU, intelligent equipment, manual import, standard clock data and frequency value, master station system communication data; data type: analog quantity, digital quantity, quantity of state, non-electrical quantity and comprehensive automation information, etc.
2. The system compares the time as per standard clock, and supports digital and analog channel. Supports dual-channel switchover, features channel monitor diagnose and operation statistics function, and supports single/dual-system mode.
3. The system provides data condition zero adjustment, zero source handling, dead zone inspection, manual setting value blocking, warning and formula calculation, etc.

通读管理机 Communication Manager

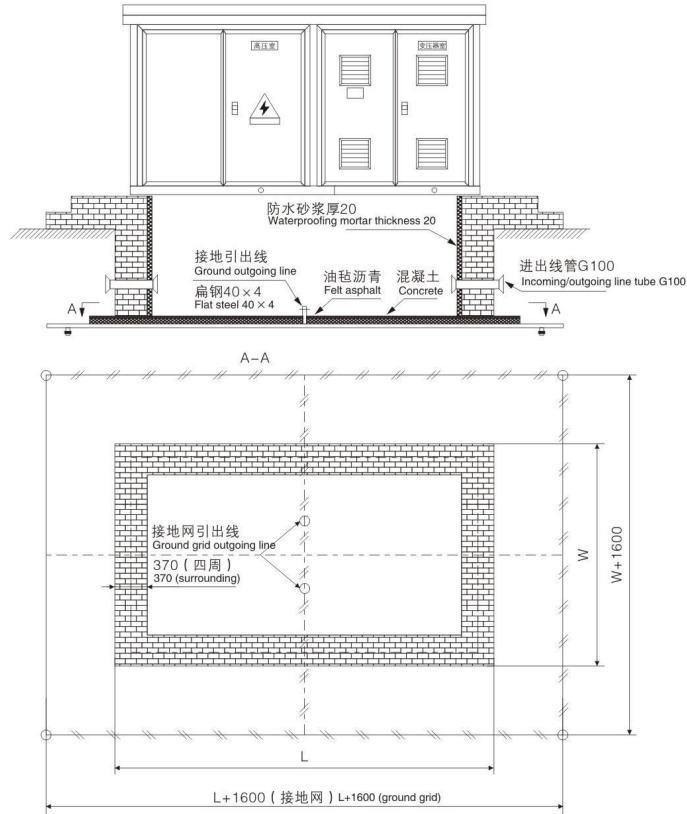
- 1、通讯管理机具有多种接口，可以集成各种自动化装置。
- 2、具有标准RS232和RS485接口，可以与智能电表等各种智能电子装置通讯连接，收集它们的数据向监控后台和上级高度自动化系统转发数据。
- 3、提供CAN总线接口，与间隔单元构成总线网络。
- 4、提供以太网接口，与后台系统构成局域网。
- 5、支持各种运动通讯规约，如IEC870-5-101、IEC870-5-102、IEC80-5-103等，并可根据需要提供新的通讯规约。

1. Communication manager features multiple interfaces, and can be integrated into various automation devices.
2. Features standard RS232 and RS485 interfaces, can be connected for communication with various intelligent electronic devices such as intelligent kilowatt hour meter, collects their data and transmits data to monitor background and superior high automation system.
3. Provides CAN bus interface, and constitutes bus network with compartment unit.
4. Provides Ethernet interface and constitutes LAN with background system.
5. Supports various communication protocols, such as IEC870-5-101, IEC870-5-102 and IEC80-5-103, and can provide new communication protocol as per demand.

变电站一次方案图 Primary Program Diagram Of Transformer Substation



基础图 Foundation Drawing



- 基础平面应找平;
- 基础内预埋钢管根数及方位由用户根据进出电缆的根数及方位确定;
- 基础内的电缆应由支架固定, 所以预埋铁件及支撑件应接地;
- 接地棒根数由土壤情况确定, 一定要保证接地电阻小于4欧姆;
- 接地极与接地线连接处焊接且刷沥青防腐;
- 踏步台阶的位置请用户根据箱变开门的位置自定 (参照平面布置);
- 地坑深度及其它尺寸可视安装条件确定;
- 基础图仅供参考, 用户可根据实际情况修改。

- Foundation plane should be leveled;
- User should determine number and position of steel pipes to be embedded in foundation as per number and position of incoming/outgoing cables.
- Cable in foundation should be fixed by bracket, therefore, embedded iron parts and supporting parts should be grounded;
- Number of grounding bars should be determined as per soil conditions, it is required to ensure that grounding resistance is less than 4ohms.
- It is necessary to weld connection between grounding pole and grounding wire and apply asphalt for corrosion resistance;
- User should determine position of step as per position of cubicle transformer substation door opening (by making reference to plane layout);
- Site depth and dimension should be determined as per installation condition.
- Foundation drawing is for reference only, user can modify it as per actual situations.



开闭站 Switching Station

带多开关的电缆分接箱 (以下简称多开关分接箱, 别名: 户外开闭所) 用于10kV电缆环网供电或终端供电系统中, 用作接受和分配电能之用。该产品配置本公司生产的TT-12系列全封闭全绝缘环网开关柜和防洪性可分离式电缆终端, 具有全绝缘、全封闭、防尘、耐腐蚀、免维修等功能, 可实现不同方案组合, 满足各种接线方式。其简单、方便、灵活的连接方式, 经济、可靠而用的结构特点, 成为配网电缆化工程的首选设备。

多开关分接箱适用于交流50HZ、10KV的电力系统, 广泛应用于工业及民用电缆环网及供电末端。特别适用于以下场所, 城市工业园区、城市住宅小区、城市商业中心、矿区和钢铁、汽车、石油、化工、水泥等大型企业以及其他场合的10kV电缆配网系统中环网连接配电网, 是城网改造的理想设备。

也可根据用户要求配置本公司生产的XGN15-12系列环网开关柜。

Cable tapping cubicle with multiple switches (hereunder abbreviated as multi-switch tapping cubicle, also known as: outdoor switching station) is used for power receiving and power distribution in 10kV cable ring main power supply or terminal power supply system. The product is configured with TT-12 series of fully-enclosed full insulation ring main switch cabinet manufactured by our company and anti-flooding separable cable terminal, and features functions such as full-insulation, full-enclosure, dust-proof, corrosion resistance and free-from-maintenance, realization of combination of different programs, and compliance with various wiring modes. With simple, convenient and flexible connection mode, and economic, reliable and durable structural characteristics, it has become the first choice for distribution network cabling project.

Multi-switch tapping cubicle applies to AC 50HZ/10kV power system, and widely applies to industrial and civil cable ring main and power supply terminal. Especially applies to ring main connection power distribution network of 10kV cable distribution network system in following locations such as urban industrial park, urban residential district, urban commercial center, mining area and large enterprises of steel, automobile, petroleum, chemical and cement and other occasions, and is ideal equipment of urban network reconstruction.

XGN15-12 series of ring main switch cabinet manufactured by our company can be configured as per user's requirements.

型号含义 Type Connotations

KBZ-12 - 1 A K K 2
① ② ③ ④ ⑤ ⑥ ⑦

- | | | | |
|--------|-------------------------|--------|-------------------------|
| ① 开闭站 | Switching station | ⑤ 负荷开关 | Load-breaking switch |
| ② 额定电压 | Rated voltage | ⑥ 负荷开关 | Load-breaking switch |
| ③ 一路进线 | One-route incoming line | ⑦ 二路出线 | Two-route outgoing line |
| ④ 避雷器 | Lightning arrester | | |

使用环境 Environmental Conditions for Product Use

海拔高度 Altitude	≤3500m
环境温度 Environmental temperature	-35℃~+40℃
相对湿度 Relative humidity	日平均值≤95%, 月平均值≤90% Daily average value ≤95% and monthly average value ≤90%
抗震能力 Aseismic performance	8度, 地面水平加速度≤0.4g, 地面垂直加速度≤0.2g Grade 8, horizontal acceleration ≤0.4g and vertical acceleration ≤0.2g
无剧烈震动和冲击以及无火灾、爆炸危险的场所 Location free from violent shock and impact, fire disaster and explosion hazard.	

符合标准 Significant Implementation Standards

国际标准 International standard	IEC60265, IEC60298, IEC60694, IEC60056, DIN47636
国家标准 National standard	GBT/11022-1999、GB3906-2006、GB3804-2004、GB16926-2009、GB/T11023-1999、GB1984-2003、GB1985-2004、DL/T404-2007

产品特点 Product Characteristics

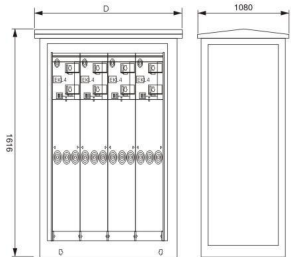
- 不受环境影响，抗凝露、凝霜、盐雾、污秽、抗腐蚀、耐紫外线及化学物质等；
 - 所有高压带电部位及开关元件全部密封在充有SF6气体的不锈钢箱体内部，结构紧凑，体积小，重量轻，全绝缘；
 - 模块化设计，有不同模块组合实现各种主接线，形成回路开关系统；
 - 采用硅橡胶连接器，实现高压部件的插接于柜体的任意扩展；
 - 全屏蔽电缆进出线；
 - 可配用真空断路器模块；
 - 可配用高压监控元件、综合数字式继电器；
 - 可配高压计量模块；
 - 可加装遥调和监控单元；
 - 可加装过流继电保护装置；
 - 防洪能力强，长寿命，免维护，降低运行成本；
 - 满足配网自动化升级要求。
- Free from environmental effect, and resistance of condensation, frosting, salt mist, filthy, corrosion, ultraviolet radiation and chemical substances, etc;
 - All high-voltage live parts and switching elements are sealed in stainless steel cubicle charged with SF6 gas, featuring compact structure, small volume, light weight and full insulation;
 - Modularization design, different modules are combined to realize various main wirings, and form circuit switching system;
 - Adoption of silicon rubber connector, and realization of any expansion of high-voltage parts plugged in cabinet;
 - Full-shielding cable incoming/outgoing line;
 - Can be used with vacuum circuit breaker module;
 - Can be used with high-voltage monitor component and comprehensive digital relay;
 - Can be used with high-voltage metering module;
 - Can be added with remote control and monitor unit;
 - Can be added with over-current relay protection device;
 - High anti-flooding capability, long life, maintenance-free and reduction of operation cost;
 - Compliance with distribution network automation upgrade requirements.

技术参数 Product Parameters

项目 Project	单位 Unit	C模块 Module C	F模块 Module F	V模块 Module V	隔离/接地开关 Isolation/earthing switch
		负荷开关 Load-breaking switch	组合电器 Composite electric apparatus	真空开关 Vacuum switch	
额定电压 Rated voltage	KV	12/24	12/24	12/24	12/24
工频耐受电压 Power frequency withstand voltage	KV	42/50	42/50	42/50	42/50
雷电冲击耐受电压 Lightning impulse withstand voltage	KV	95/125	95/125	95/125	95/125
额定电流 Rated current	A	630/630	注Note (1)	630/630	
分断能力 Breaking capacity	A				
闭环开断电流 Closed-loop breaking current	A	630/630			
电缆充电开断电流 Cable charging breaking current	A	135/135			
5%额定有功负载开断电流 5% rated real load breaking current	A	31.5/			
接地故障开断电流 Grounding malfunction breaking current	A	200/150			
接地故障时电缆充电的开断电流 Cable charging breaking current in case of grounding malfunction	A	115/87			
短路开断电流 Short-circuit breaking current	KA		注Note (2)	20/16	
关合能力 Making capability	KA	63/52.5	注Note (2)	50/40	50/40
短时耐受电流2s Short-time withstand current 2s	KA	25/-			
短时耐受电流3s Short-time withstand current 3s	KA	-/21		20/16	20/16
机械寿命 Mechanical life	次	5000	3000	5000	2000

说明：以上参数根据配置不同的开关而异。
 Description: the above parameters will vary as per switch of different configurations.

产品外型及安装尺寸 Appearance and Installation Dimension of Product



序号 Number	分支数 Number of branches	宽 W	深 D	高 H
1	二个单元 Two units	1000	1080	1616
2	三个单元 Three units	1330	1080	1616
3	四个单元 Four units	1650	1080	1616
4	五个单元 Five units	1980	1080	1616
5	六个单元 Six units	2300	1080	1616

可选户外箱体 Optional outdoor cubicle body

- 不锈钢外壳 ● Stainless steel enclosure
- 景观性外壳 ● Scenic enclosure
- SMC外壳 ● SMC enclosure
- 嵌木条式景观外壳 ● Crate type of scenic enclosure

美式箱变系列

American Type of Cubicle Transformer Substation Series

美式箱变是一种新型的配电设备，是将高压负荷开关、高压熔断器置于变压器油中进行绝缘和冷却。该产品作为电缆化配电网中重要供电单元，集高压控制、保护、变电，以及配电设备于一体的成套预装产品，特别适用于城市电网的负荷中心，降低损耗，提高供电质量。该系列产品已在全国各地广泛应用于居民小区、公共场所、工矿企业等配电站所。



As a new type of power distribution equipment, American type of cubicle transformer substation is to place high-voltage load-breaking switch and high-voltage fuse in transformer oil for insulation and cooling. As an important power supply unit in cabling power distribution network, and a complete pre-assembled product integrating high-voltage control, protection and transformation and power distribution equipment, the product especially applies to load center of urban power grid, reduction of loss and enhancement of power supply quality. The series of products have been widely used in power distribution locations such as residential district, public location and industrial and mining enterprises nationwide.

型号含义 Type Connotations

- | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z | G | S | □ | - | □ | - | □ | / | □ | - | □ |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | | | | |
- ① 组合式 Combined type
 - ② 共箱 Common cubicle
 - ③ 三相 3-phase
 - ④ 节能水平代号 Energy-saving level code
 - ⑤ 环网型H、终端型Z Ring main model H and terminal model Z
 - ⑥ 额定容量kVA Rated capacity kVA
 - ⑦ 电压等级kV Voltage grade kV
 - ⑧ 特殊使用环境代号 Special usage environment code

产品特点 Product Characteristics

- 结构紧凑，体积小，仅为同容量国产欧式箱变的1/3-1/5左右，大大减少了占地面积；
 - 全密封、全绝缘结构，无需绝缘距离，可靠保护人身安全；
 - 高压采用负荷开关熔断器组合电器保护；
 - 高压接线既可用于环网，又可用于终端，供电方式灵活，可靠性高；
 - 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；
 - 满足各种低压馈出要求，可按方案选择，亦可自行设计；
 - 电缆头有200A肘型电缆接头及600A欧式前接头两种，肘型电缆接头适用于电缆截面积为35-120mm²，欧式前接头适用于电缆截面积为35-500mm²，电缆头的材质分为铜芯和铝芯，两者均可配置全绝缘氧化锌避雷器，200A肘型电缆头可以带负荷插拔，又可以起到隔离开关的作用。
- Compact structure and small volume, only account for approximately 1/3-1/5 of homemade European type of cubicle transformer substation of the same capacity, and substantially reduce land occupation area;
 - Full-insulation and full-sealing structure, no insulation distance required, reliable assurance of physical safety.
 - High-voltage adopts load-breaking switch fuse composite electric apparatus protection.
 - High-voltage wiring can be used for both ring main and terminal, flexible power supply mode and high reliability;
 - Excellent transformer performance: low loss, low noise and low temperature rise; high overload capacity, short-circuit resistance and high shock resistance;
 - Comply with various requirements on low-voltage feeding, selectable as per program, or can be designed independently;
 - Cable head falls into two categories of 200A elbow cable connector and 600A European type of front connector, elbow cable connector applies to cable section area of 35-120mm²; European type of front connector applies to cable section area of 35-500mm²; cable head material is divided into copper core and aluminum core, both can be configured with full-insulation zinc oxide arrester, 200A elbow cable connector features under-load inserting and pulling-out, and function of disconnecting switch.

使用环境 Environmental Conditions for Product Use

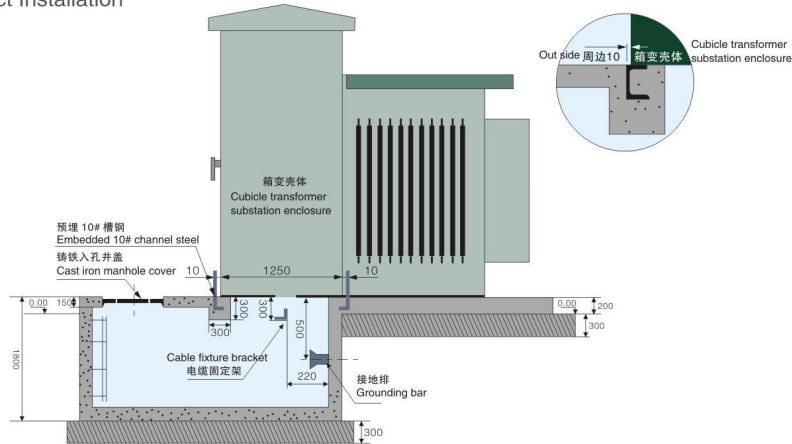
- 环境温度：最高气温+40℃，最低气温-30℃
 - 海拔高度：≤1000m
 - 风速：相当34m/s (不大于700Pa)
 - 相对湿度：日相对湿度平均值不大于95% 月相对湿度平均值不大于95%
 - 防震水平：水平加速不大于0.4m/S²，垂直加速度不大于0.15m/S²
 - 安装地点：倾斜度不大于3°
 - 安装环境：周围空气不受腐蚀性，可燃性气体等明显污染，安装地点无剧烈震动。
- Ambient temperature: maximum air temperature +40℃ and minimum air temperature -30℃;
 - Altitude: ≤1000m
 - Wind speed: equivalent to 34m/s (no more than 700Pa);
 - Relative humidity: daily average relative humidity should be no more than 95%; Monthly average relative humidity should be no more than 95%;
 - Antiseismic level: horizontal acceleration no more than 0.4m/s² and vertical acceleration no more than 0.15m/s²
 - installation location inclination: no more than 3°
 - Installation environment: ambient air should be free from prominent pollutions such as corrosive/combustible gas, and installation location should be free from violent shock;

备注：订购本产品超出上述条件的规定时，可与本公司协商。
 Note: Where the product ordered exceeds stipulations on above conditions, please negotiate with our company.

技术参数 Product Parameters

额定容量 Rated Capacity (KVA)	电压组合 Voltage Combination			联接组 标号 Conn- ection Label	空载电流% No-Load Current (A)			空载损耗W Load Loss-es (W)			负载损耗W No-Load Loss (W)	阻抗 电压 Short Circuit Impe- dance (%)	噪音 Noise (dB)	温升 Temper- ature rise (K)	长×宽×高 L×W×H (mm)		
	高压 H.V. (KV)	高压分 接范围 High Voltage Tap Range	低压 L.V. (KV)		S9	S10	S11	S9	S10	S11						S9/S10/S11	
100	6	2×2.5%	0.4	Yyn0 或 Dyn11	1.6	1.1	290	230	200	1580/1500	4	55	顶层油温 55℃, 线圈 65℃	1830×1355×1735			
125					1.5	1.0	340	270	240	1890/1800				1830×1365×1735			
160					1.4	1.0	400	310	270	2310/2200				1830×1375×1735			
200					1.4	0.8	480	380	330	2730/2600				1830×1375×1735			
250					1.2	0.8	560	460	400	3200/3050				1830×1405×1735			
315					6.3	±5%	0.69	1.1	0.7	670				540	480	3830/3650	1830×1425×1735
400					1.0			0.7	800	650				570	4520/4300	1830×1435×1805	
500					1.0			0.6	960	780				680	5410/5150	1830×1445×1805	
630					0.9			0.6	1200	920				810	6200	1830×1455×1860	
800					0.8			0.6	1400	1120				980	7500	1830×1490×1860	
1000	0.7	0.5	1700	1320	1150			10300	1830×1675×2005								
1250	0.6	0.5	1950	1560	1360			12000	2100×1845×2035								
1600	0.6	0.5	2400	1880	1640			14500	2100×1885×2135								

安装示意图 Product Installation



- 注: 1.台阶观层铺地砖, 面层加设φ6×150钢筋网, 双向布置;
 2.爬梯构件C1, 角钢均为∠50×4;
 3.土建施工时, 基础开挖应达到设计深度并达到原土层, 超挖部分可回填8:2级配砂石;
 4.基础开挖后应做好电气接地网, 再做回填或垫层;
 5.预埋穿电缆钢管根数及方向按实际情况确定;
 6.预埋槽钢周围外露10mm(见图), 以便箱变底座与其焊接连接;
 7.本图仅供参考, 可因地制宜, 或参照国家有关规范。

- Note: 1.Pave step with tile and lay φ6×150 bar mat reinforcement on surface, two-way arrangement;
 2.Climbing structural component C1, all angle steel ∠50×4
 3.During civil work construction, foundation excavation should reach design depth and original soil layer, over-break portion can be filled with 8:2 graded sand;
 4.After foundation ditch excavation, it is necessary to complete electric grounding grid, then complete backfill or bedding;
 5.Determining number and direction of embedded cable conduits as per actual situations;
 6.Embedded channel steel should be exposed by 10mm (see figure), so that cubicle transformer substation base is welded with it;
 7.The figure is only for reference, it is allowed to adjust as per local conditions or make reference to relevant national norms.



景观式箱变

Scenic Type Cubicle Transformer Substation

主要由地下式变压器和预制式地坑箱组成的“地下部份”以及户外高、低压开关柜和景观式外壳组成的“地上部份”, 安装组合而成的一种预装式变电站, 占地面积不到6m²。其中户外高、低压开关柜由高压开关设备、低压开关设备(6-8路低压出线)、电能计量装置、无功补偿装置等元件组成。景观式外壳用保护高、低压开关柜的箱式壳体, 通过与周边环境相协调的广告灯箱、艺术造型等多种景观式实现。景观式外壳有两层防盗门, 内装有防盗报警器。景观式外壳内的广告画可以方便更换, 配有长寿命的LED发光板, 可做商业广告之用。

地下式变压器及预制式地坑箱, 均采用全面密封设计, 变压器具有可浸水运行(防护等级达到IP68)无须停电的特点, 箱体内还具备有自动排水系统、自动排风散热系统及温度监测系统, 完全可满足不同环境下的使用要求。

景观式地埋箱变产品已形成系列化, 地下式变压器容量覆盖30-2500KVA。

As a prefabricated transformer substation mainly consisting of "underground portion" of underground transformer and pre-fabricated silo cubicle, and "above-ground portion" of outdoor high-voltage switch cabinet and scenic enclosure, it occupies land area less than 6m². In which, outdoor high/low-voltage switch cabinet consists of components such as high-voltage switchgear, low-voltage switchgear (6-8 routes of low-voltage outgoing line), electric energy metering device and reactive compensation device. Scenic type of enclosure adopts cubicle-type enclosure of high/low-voltage switch cabinet, and is realized through multiple scenic advertising lamp-boxes and artistic shapes harmonized with surrounding environment. Scenic enclosure has two layers of anti-theft door, in which anti-theft alarm is installed. Advertisement posters in scenic enclosure can be replaced conveniently, is configured with long-life LED light emitting screen for commercial advertisement.

Underground transformer and prefabricated silo cubicle adopt full-seal design, transformer features water-immersion operation (degree of protection is up to IP68) without shutdown of power, cubicle also features automatic water drainage system, automatic ventilation head radiation system and temperature monitor system, and can meet usage requirements under different environments.

Scenic embedded cubicle transformer substation products have realized seriation, and underground transformer capacity covers 30-2500KVA.

使用环境 Environmental Conditions for Product Use

海拔高度 Altitude	常规产品不超过1000m, 特殊产品≥1000m, ≤3000m。 No more than 1000m for conventional products and ≥1000m and ≤3000m for special products.	
环境温度 Environmental temperature	最高日平均气温 Maximum daily average air temperature	+40℃
	最低气温 Minimum air temperature	-45℃
	最高月平均温度 Maximum monthly average temperature	+35℃
	最高年平均温度 Maximum annual average temperature	+25℃
地震引发的地面加速度ag Ground acceleration ag caused due to earthquake	水平方向低于3m/s ² ; 垂直方向低于1.5m/s ² 。 Less than 3m/s ² in horizontal direction and less than 1.5m/s ² in vertical direction.	
电源电压的波形 Waveform of power voltage	近似于正弦波。Approximately sine wave	
三相电源对称性 Symmetry of 3-phase power supply.	对于三相地下式变压器, 其三相电源电压应大致对称。 For 3-phase underground transformer, its 3-phase power voltage should be approximately symmetrical.	

注: 如实际使用环境条件超出上述条件时, 可根据客户要求进行特殊设计。

Note: Where the actual usage environment condition exceeds the above conditions, special design can be performed as per customer's requirements.

产品特点 Product Characteristics

天通企业研发、生产的景观式地埋箱变, 以其独特的设计及制造工艺, 具有防爆炸及可完全浸水运行的特点, 其防护等级更高达IP68(即可完全防水)。另外, 由于其占地面积小, 对安装环境要求低, 施工简单方便, 在多种场合下可接近负荷中心安装, 分散供电, 从而大幅减少低压电缆的投入和长期降低线路损耗, 节约电费。因此, 在旧城改造、商业路段改造、路灯工程等市政建设, 以及房地产开发、工厂商厦等多方面有着无可替代的优势, 更是响应我国创建和谐节约型、创新型社会的一种新型配电网产品。

Scenic embedded cubicle transformer substation researched and developed by Tiantong Electric realizes explosion proof and complete water immersion operation through special design and manufacture technique, its degree of protection is up to IP68 (i.e. complete water proof). Furthermore, due to small land occupation area, its requirements on installation environment are low, construction is simple and convenient, and it is permissible to access load center for installation under multiple occasions, power supply is scattered, therefore, investment for low-voltage cable has been substantially reduced and long-term circuit loss has been reduced, saving power cost. Therefore, it has peerless advantages in numerous aspects such as municipal construction of old city reconstruction, commercial road section reconstruction and road lamp project, real estate development, factory and commercial building, and is also a new type of power distribution product responsive to creation of harmonized, saving and creative society of China.

经济效益 Economic Benefit

从经济效益方面分析, 景观式地埋箱变主要有三方面优势

From the point of view of economic benefit analysis, scenic embedded cubicle transformer substation mainly features three advantages:

1. 占地面积少, 无需建造电房
2. 减少低压电缆的投入及线损
3. 集成功能多、运行经济性高

1. Small land area, no need to build power house;
2. Reduction of investment of low-voltage cable and line loss
3. Integration of multiple functions, and high operation economy;

地埋式变电站

Embedded Transformer Substation



随着城乡现代化建设进程的加快，城市的建设已步入旨在改善街景市貌的都市美容阶段。传统的箱式变电站大小不一且挤占闹市的黄金地段，与优美的城市环境显得格格不入。随着生态城市理念的不断普及，将变压器埋入地下安装且将户外开关设备做成广告灯箱式的地埋式箱变就应运而生。由于它占地面积小且能与周围环境协调一致，因而被广泛的用于城市交通主干道、住宅小区、机场、车站、高速公路等场所中的额定电压为380V，频率为50Hz的三相四线制或三相五线制的交流电力系统中，作为电能的接受，传输和控制保护用的电力设备。

地埋式箱变就是为了满足上述领域的要求而设计开发的全新的一种电力成套设备，它是由地埋式变压器和广告灯箱形式的户外成套开关设备两部分组成的。地埋式变压器是由变压器、高压负荷开关、熔断器等组合在一起的一种新型的紧凑型的电力设备，它安装在地坑中，不占用地表空间，而且能在一段时间内浸没在水中运行。广告灯箱式的户外开关设备是集广告牌及户外开关设备于一体的成套设备，它安装在地面上，箱体内部为户外高低压配电柜，两侧为广告灯箱，具有极佳的视觉效果。

With acceleration of urban/rural modernization construction, construction of city has entered the phase of urban beautification aimed to improve street scene. Traditional cubicle transformer substation is of different sizes and occupies prime locations of downtown area, and is incompatible with beautiful urban environment. With continuous promotion of ecological urban philosophy, embedded cubicle transformer substation featuring underground embedding of transformer and advertising lamp-box type of outdoor switchgear emerge as the times require. Due to small land area and harmonization with ambient environment, it is widely used for AC power system of rated voltage 380V/frequency 50Hz 3-phase 4-wire system or 3-phase 5-wire system in locations such as urban traffic trunk road, residential district, airport, station and highway as power equipment for power receiving, transmission, control and protection.

As a brand new complete power equipment designed and developed to meet requirements of above mentioned fields, embedded cubicle transformer substation consists of embedded transformer and outdoor complete switchgear in the form of advertising lamp-box. As a new type of compact power equipment combining transformer, high-voltage load-breaking switch and fuse, embedded transformer is installed in silo, occupies no ground surface space, and can operate when immersed in water for a certain period of time. As a complete equipment integrating advertisement billboard and outdoor switchgear, advertising lamp-box type of outdoor switchgear is installed on ground surface, interior of cubicle is outdoor high/low-voltage power distribution cabinet, and both sides are advertising lamp-box, featuring excellent visual effect.

产品特点 Product Characteristics

一、高可靠性 High Reliability

地埋式箱变所选用的地埋式变压器箱体全密封，高低压进出线采用防水全密封、全绝缘、全屏蔽的接线方式。

变压器地坑基础设计和制作时进行了防水及排水考虑，顶部通风孔具备有效的防雨防水功能，侧部及底部用特种防水材料处理，渗水不能侵入，在底部安装有受自动排水系统控制的潜水泵。

Body of embedded cubicle transformer substation is fully sealed, high/low-voltage incoming/outgoing lines adopt water-proof, full-sealing, full-insulation and full-shielding wiring mode.

Silo foundation of transformer is designed and fabricated with consideration of water-proof and water drainage, top ventilation hole features effective rain-proof and water-proof function, side and bottom are treated with special water-proof material, seepage water cannot ingress, bottom is installed with submersible pump under control of automatic water drainage system.

二、节能降耗 Energy-Saving And Consumption Reduction

节能降耗已成为全社会的共识，地埋式箱变选用S11系列低损耗的地埋式变压器产品，与普通变压器相比，空载损耗低30%，负载损耗低15%。如果采用非晶合金铁心的地埋式变压器，其空载损耗下降了80%。

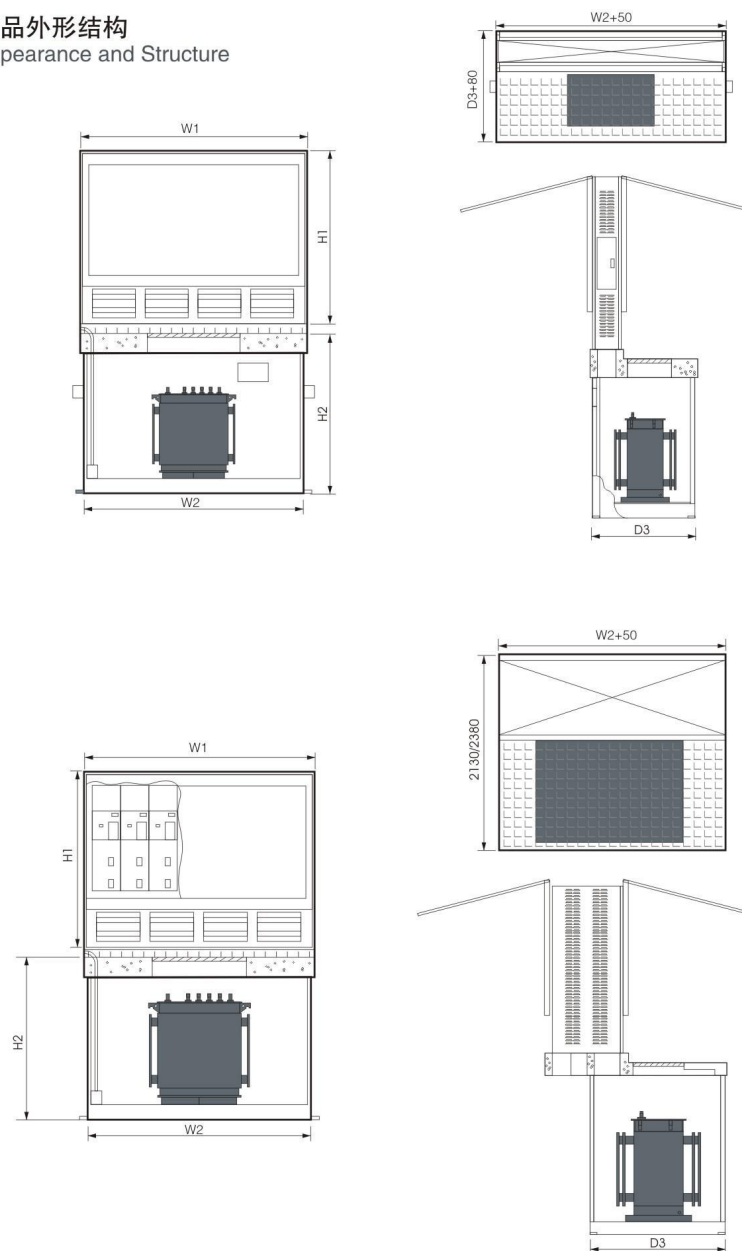
Energy-saving and consumption reduction have become a common understanding of the whole society, embedded cubicle transformer substation adopts S11 series of low loss embedded transformer product, and features 30% reduction of no-load loss and 15% reduction of under-load loss. In case of adoption of embedded transformer of amorphous alloy core, its no-load loss is reduced by 80%.

三、降低噪声 Reduction of Noise

四、美观，与环境协调 Beautify Appearance and Harmonization With Environment.

五、为客户创造价值 Creation of Value For Customer

产品外形结构 Appearance and Structure



高、低压成套设备
High/Low Voltage Complete Equipment

使用环境 Environmental Conditions for Product Use

- 环境温度：最高气温+40℃，最低气温-30℃；
- 海拔高度1000m，高海拔地区用户，请在订货中提出，本产品可满足海拔高度4000m以下的用户要求；
- 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：水平加速度不大于0.4m/s²，垂直加速度不大于0.15m/s²；
- 安装地点倾斜度：不大于3°；
- 安装环境：周围空气应不受腐蚀性、可燃性、水蒸气等明显污染，安装地点无剧烈震动；
- 订购本产品超出上述条件的规定时，可与本公司协商。

- Ambient temperature: maximum air temperature +40°C and minimum air temperature -30°C;
- Altitude should be 1000m, users of high altitude region should indicate altitude upon ordering, and the product can meet requirement of user for altitude below 4000m.
- Wind speed: equivalent to 34m/s (no more than 700pa);
- Humidity: daily average relative humidity should be no more than 95%;
- Monthly average relative humidity should be no more than 95%;
- Antiseismic level: horizontal acceleration no more than 0.4m/s² and vertical acceleration no more than 0.15m/s²
- Installation location inclination: no more than 3°
- Installation environment: ambient air should be free from prominent pollutions such as corrosive, combustible and water steam, and installation location should be free from violent shock;
- Where the product exceeds stipulations on above conditions, please negotiate with our company.

技术参数 Product Parameters

美式、欧式分支箱技术参数 Technical Parameters Of American and European Type Of Cable Distribution Cabinet

序号 Number	名称 Name	单位 Unit	参数 Parameters
1	额定电压 Rated voltage	KV	12
2	额定频率 Rated frequency	Hz	50
3	额定电流 Rated current	A	630(200)
4	1min工频耐受电流 1min power frequency withstand current	KV	42
5	雷电冲击耐受电压 Lightning impulse withstand voltage	KV	75
6	15min直流耐压 15min DC withstand voltage	KA	52
7	局部放电（15KV以下） Partial discharge (below 15KV)	KA	< 10PC

带开关的分支箱技术参数 Technical Parameters of Cable Distribution Cabinet With Cabinet

序号 Number	名称 Name	单位 Unit	参数 Parameters
1	额定电压 Rated voltage	KV	12
2	额定频率 Rated frequency	Hz	50
3	额定电流 Rated current	A	630
4	额定有功负载开断电流 Rated real load breaking current	A	630
5	额定闭环开断电流 Rated closed-loop breaking current	A	630
6	额定电缆充电开断电流 Cable charging breaking current	A	10
7	1min工频耐受电流 1min power frequency withstand current	KV	相对地：42 断口：48 Phase to ground: 42 Isolating distance: 48
8	雷电冲击耐受电压 Lightning impulse withstand voltage	KV	相对地：75 断口：85 Phase to ground: 75 Isolating distance: 85
9	额定短时耐受电流（热稳定） Rated short-time withstand current (thermal stability)	KA/a	20/3
10	额定峰值耐受电流（动稳定） Rated peak withstand current (dynamic stability)	KA	50
11	额定短路关合电流 Rated short-circuit making current	KA	50
12	机械寿命 Mechanical life	次	≥2000
13	回路电阻 Circuit resistance	uΩ	≤100

典型电气方案 Typical Electric Program

电缆分支箱标准方案（美式） Standard Program of Cable Distribution Cabinet (American Type)

型号 Model	接线方案 Wiring program	方案配制 Program formulation	外形尺寸 Outline Dimension
DF02-200		二通母排（200A），肘型头 2-way busbar (200A), elbow head.	1000×480×900
DF03-200		三通母排（200A），肘型头 3-way busbar (200A), elbow head.	
DF04-200		四通母排（200A），肘型头 4-way busbar (200A), elbow head.	1250×480×900
DF12-600/200		二通混合母排（600/200A），T II头、肘型头200 2-way mixed busbar (600/200A), T II head and elbow head 200.	
DF22-600/200		二通母排（600A），T II头、肘型头 2-way busbar (600A), T II head and elbow head.	1000×600×900
DF11-600/200		二通母排（600A），T型头、T II头、肘型头 2-way busbar (600A), T head, T II head and elbow head.	
DF20-600		二通母排（600A），T型头 2-way busbar (600A), T head	
DF13-600/200		三通混合母排（600A/200A），T II头、肘型头 3-way mixed busbar (600A/200A), T II head and elbow head.	
DF23-600/200		三通混合母排（600/200A），T II头、肘型头 3-way mixed busbar (600/200A), T II head and elbow head.	
DF33-600/200		三通母排（600A），T II头、肘型头 3-way busbar (600A), T II head and elbow head.	1250×600×900
DF32-600/200		三通母排（600A），T型头、T II头、肘型头 3-way busbar (600A), T head, T II head and elbow head.	
DF31-600/200		三通母排（600A），T型头、T II头、肘型头 3-way busbar (600A), T head, T II head and elbow head.	
DF30-600		三通母排（600A），T型头 3-way busbar (600A), T head.	
DF14-600/200		四通混合母排（600A/200A），T II头、肘型头 4-way mixed busbar (600A/200A), T II head and elbow head.	
DF24-600/200		四通混合母排（600A/200A），T II头、肘型头 4-way mixed busbar (600A/200A), T II head and elbow head.	
DF44-600/200		四通母排（600A），T II头、肘型头 4-way busbar (600A), T II head and elbow head.	1500×600×900
DF43-600/200		四通母排（600A），T型头、T II头、肘型头 4-way busbar (600A), T head, T II head and elbow head.	
DF42-600/200		四通母排（600A），T型头、T II头、肘型头 4-way busbar (600A), T head, T II head and elbow head.	
DF41-600/200		四通母排（600A），T型头、T II头、肘型头 4-way busbar (600A), T head, T II head and elbow head.	
DF40-600		四通母排（600A），T型头 4-way busbar (600A), T head.	

电缆分支箱标准方案 (欧式) Cable Distribution Cabinet Standard Program (European Type)

型号 Model	接线方案 Wiring program	方案配制 Program formulation	外形尺寸 Outline dimension
DF10-03		对接套管、前接头、后接头 Mating bushing, front connector and rear connector	650 × 850 × 950
DF10-03A		对接套管、前接头、后接头、后接头避雷器 Mating bushing, front connector, rear connector and rear connector lightning arrester	
DF10-04		对接套管、前接头、后接头 Mating bushing, front connector and rear connector	
DF10-04A		对接套管、前接头、后接头、后接头避雷器 Mating bushing, front connector, rear connector and rear connector lightning arrester	
DF10-05		对接套管、前接头、后接头 Mating bushing, front connector and rear connector	650 × 1100 × 950
DF10-05A		对接套管、前接头、后接头、后接头避雷器 Mating bushing, front connector, rear connector and rear connector lightning arrester	
DF10-06		对接套管、前接头、后接头 Mating bushing, front connector and rear connector	
DF10-06A		对接套管、前接头、后接头、后接头避雷器 Mating bushing, front connector, rear connector and rear connector lightning arrester	
DF10-07		对接套管、前接头、后接头 Mating bushing, front connector and rear connector	650 × 1350 × 950
DF10-07A		对接套管、前接头、后接头、后接头避雷器 Mating bushing, front connector, rear connector and rear connector lightning arrester	
DF10-08		对接套管、前接头、后接头 Mating bushing, front connector and rear connector	

电缆分支箱标准方案 (带开关) Cable Distribution Cabinet Standard Program (With Switch)

型号 Model	接线方案 Wiring program	进线侧方案配制 Incoming line side program formulation	外形尺寸 Outline dimension	出线侧方案配制 Out line side program formulation	外形尺寸 Outline dimension
DF10-1K2		一体式加长套管、前接头 Integrated lengthened bushing, front connector.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一体式加长套管、前接头、后接头 Integrated lengthened bushing, front connector and rear connector.	1400 × 1200 × 1600
DF10-1K3		一体式加长套管、前接头 Integrated lengthened bushing, front connector.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	
DF10-1K4		一体式加长套管、前接头 Integrated lengthened bushing, front connector.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	

DF10-1AK2		一体式加长套管、前接头后接式避雷器 Integrated lengthened bushing, front connector and rear connected lightning arrester.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一体式加长套管、前接头、后接头 Integrated lengthened bushing, front connector and rear connector.	1600 × 1200 × 1600
DF10-1AK3		一体式加长套管、前接头后接式避雷器 Integrated lengthened bushing, front connector and rear connected lightning arrester.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	
DF10-1AK4		一体式加长套管、前接头后接式避雷器 Integrated lengthened bushing, front connector and rear connected lightning arrester.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	
DF10-2K2		一体式加长套管、前接头后接头 Integrated lengthened bushing, front connector, behind connector.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一体式加长套管、前接头、后接头 Integrated lengthened bushing, front connector and rear connector.	
DF10-2K3		一体式加长套管、前接头后接头 Integrated lengthened bushing, front connector, behind connector.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	
DF10-2K4		一体式加长套管、前接头后接头 Integrated lengthened bushing, front connector, behind connector.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	
DF10-2AK2		一分二异型母排、前接头后接式避雷器 Integrated lengthened bushing, front connector and rear connected lightning arrester.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一体式加长套管、前接头、后接头 Integrated lengthened bushing, front connector and rear connector.	
DF10-2AK3		一分二异型母排、前接头后接式避雷器 Integrated lengthened bushing, front connector and rear connected lightning arrester.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	
DF10-2AK4		一分二异型母排、前接头后接式避雷器 Integrated lengthened bushing, front connector and rear connected lightning arrester.	SF6负荷开关 (FLN36-12D/T630) 小型真空负荷开关 (FZN25-12D/T630) Small-size vacuum load-breaking switch (FZN25-12D/T630)	一分二异型母排、前接头、后接头 Break-in-two non-conventional type busbar, front connector and rear connector.	

订货须知 Ordering Instructions

- 请注明所选用电缆分支箱的型号，进出线数目，备用回路数目，电缆的标称截面，电缆线芯材质（铜芯或铝芯）。
- 保护装置及备品备件要求（如无要求则按本公司标准供给）。
- 箱体外壳要求及外壳颜色（如无要求则按本公司标准供给）。
- 如您有其它要求在订货时面洽，我们可以为您设计电缆分支箱的最佳方案。

- Please indicate model of selected cable distribution cabinet, number of incoming/outgoing lines, number of standby circuits, nominal section of cable and cable core material (copper core or aluminum core).
- Requirements on protection device and spare parts (if there is no requirement, comply with standard of our company).
- Requirements on cabinet enclosure and enclosure color (if there is no requirement, comply with standard of our company).
- If you have other requirements, please discuss with us face to face upon ordering, we will design the best program of cable distribution cabinet for you.

10KV柱上变压器

10KV pole-mounted transformer

常规10KV柱上变压器物料多、安装时间长、精度不高、检修工作量大。实施成套化供货后，显著提高了工作效率，但也存在不同的物料匹配度不高。为响应国家电网公司要求，我公司研发出一种10KV一体化柱上变压器台，在10KV一体化柱上变压器台设计方面，将高压模块、变压器模块、低压配电模块及附件组合为一体式结构的柱上变压器台，综合考虑一体化变压器台成套设备的可靠性、建设成本及检修习惯等。本产品适用于国网变台、变电所、工矿企业、住宅小区、路灯用电、市区建筑、山区、宾馆、公园及工地施工等场所。



Conventional 10kV pole-mounted transformer platform has more material, longer installation time, low accuracy and great maintenance workload. After gang production, the efficiency was improved significantly. But there was also low matching of different materials. In response to the requirements of the State Grid Corporation, our company has developed a kind of 10kV integrated pole-mounted transformer platform. In the design, to make the high-voltage module, transformer module, low-voltage distribution module and accessories combine as a one-piece structure for overall considering the equipment reliability, construction costs and maintenance habits. This product is suitable for national grid, substation, industrial and mining enterprises, residential quarters, street lamps, urban construction, mountain, hotels, parks and site construction and other places.

型号含义 Type Connotations

YZ □ - □ - 10/0.4 - □ - □
 ① ② ③ ④ ⑤ ⑥

- | | |
|-------------------------------------|--|
| ① 一体化柱上变压器台 | ① Integration pole-mounted transformer platform |
| ② 结构类型: ZX(纵向), HX(横向) | ② Structure type: ZX (Vertical), HX (Horizontal) |
| ③ 变压器类型: S13\SH15\S13R | ③ Transformer Model: S13 \ SH15 \ S13R |
| ④ 额定电压: 高压侧(10kV), 低压侧(0.4kV) | ④ Nominal voltage: high voltage side (10kV), low voltage side (0.4kV) |
| ⑤ 变压器容量: 50kVA\100kVA\200kVA\400kVA | ⑤ Transformer capacity: 50kVA \ 100kVA \ 200kVA \ 400kVA |
| ⑥ 安装方式: ZL(正装电缆)CL(侧装电缆)ZX(正装绝缘线) | ⑥ Way to install: ZL (Horizontal) CL (Vertical) ZX (Horizontal insulated wire) |

使用环境 Environmental Conditions for Product Use

海拔高度 Altitude	≤1000m			
年最高气温 Maximum working temperature	+40℃ (24h平均值不超过35℃) +40℃ (average value of 24 hours does not exceed 35℃)		年最低气温 Minimum working temperature	-25℃
环境湿度 Ambient humidity	25℃时, 空气相对湿度不超过95%, 月平均不超过90% The relative humidity should not be more than 95%, and monthly average does not exceed 90% at 25℃.			
污秽等级 Contamination level	IV级	爬电比距 Creepage distance	≥31mm/kV	
地震烈度 Seismic intensity	≤8度, 水平加速度0.15g ≤ 8 degrees, and the horizontal acceleration is 0.15g			
安装地点 Installation location	户外; 风速不超过34m/s; 倾斜度不大于3°; 日照强度0.1W/cm² Outdoor; wind speed does not exceed 34m/s; gradient is not greater than 3°; sunshine intensity is 0.1W/cm².			

技术参数 Product Parameters

变压器模块技术参数

形式 Form	Form	不低于GB20052-2013中二级能效等级、全密封、全绝缘油浸式变压器 Not less than the second energy efficiency grade in GB20052-2013, fully sealed, all-insulated oil-immersed transformers.
容量 Capacity	Capacity	50kVA、100kVA、200kVA、400kVA
阻抗电压 Impedance voltage	Impedance voltage	Uk%=4
额定电压 Nominal voltage	Nominal voltage	10 (10.5) ± 2*2.5%/0.4kV或(σr) 10 (10.5) ± 5%/0.4kV
连接组别 Connection group	Connection group	Dyn11、Yyn0
冷却方式 Cooling type	Cooling type	自冷式 Self-cooled

低压配电模块技术参数 Technical parameters of low - voltage distribution module

额定绝缘电压 Nominal insulation voltage	AC660V	工频耐压 Power frequency withstand voltage	2500V/1min
主回路额定电压 Main circuit nominal voltage	AC380V/220V	额定频率 Rated frequency	50Hz
辅助回路额定电压 Auxiliary circuit nominal voltage	AC380V/220V	防护等级 Level of Protection	IP44
额定电流 Rated current	10A-630A	适于变压器容量 Suitable for transformer capacity	50kVA-400kVA
补偿容量 Compensation capacity	5kvar-200kvar		

符合标准 Significant Implementation Standards

- GB1094.2-2013电力变压器第2部分: 液浸式变压器的温升
- GB1094.3-2013电力变压器第3部分: 绝缘水平绝缘试验和外绝缘空气间隙
- GB7251.12-2013 低压成套开关设备和控制设备第2部分: 成套电力开关和控制设备
- GB17467-2010 高压/低压预装式变电站
- GB/T15576-2008 低压成套无功功率补偿装置
- GB4208-2008 外壳防护等级 (IP代码)
- GB/T29312-2012 低压无功功率补偿投切装置

- GB1094.2-2013 Power transformers - Part 2: Temperature rise of liquid immersion transformers
- GB1094.3-2013 Power transformers - Part 3: Insulation level, insulation test and external insulation air gap
- GB7251.12-2013 Low - voltage switchgear and control gear - Part 2: Power switchgear and control gear
- GB17467-2010 High/Low voltage preparatory transformer substation
- GB/T15576-2008 Low voltage complete set of reactive power compensation device
- GB4208-2008 Enclosure protection class (IP code)
- GB/T29312-2012 Low voltage reactive power compensation switching device

术语和定义 Terms and definitions

10kV一体化柱上变压器台: 10kV integrated pole-mounted transformer platform:

10kV一体化柱上变压器台是指将高压模块、变压器模块、低压配电模块及附件组合为一体式结构的柱上变压器台。10kV integrated pole-mounted transformer platform refers to the high-voltage modules, transformer modules, low-voltage power distribution modules and accessories combined as a one-piece structure of pole-mounted transformer platform.

纵向一体化柱上变压器台: Vertical integrated pole-mounted transformer platform:

纵向一体化柱上变压器台是指将低压配电模块通过悬挂方式垂直固定在变压器模块下方, 组合为一体式结构的柱上变压器台。Vertical integration pole-mounted transformer platform refers to a one-piece structure of pole-mounted transformer platform with the low-voltage power distribution module hanging under the transformer module by vertical fixed.

横向一体化柱上变压器台: Horizontal integration pole-mounted transformer platform low - voltage distribution module:

横向一体化柱上变压器台是指将低压配电模块与变压器模块前后固定为一体式结构的柱上变压器台。低压配电模块与变压器模块之间留有散热通道。Horizontal integration pole-mounted transformer platform refers to pole-mounted transformer platform fixed the low-voltage distribution module and the transformer module together. There are thermal vias between the low-voltage distribution module and the transformer module.

纵向一体化柱上变压器台成套装置:

Set of devices of Vertical integration pole-mounted transformer platform:

纵向一体化柱上变压器台成套装置是指由变压器、预制式连接母线及通过悬挂方式固定在变压器模块下方的低压配电模块组合为一体式结构的单元。

Set of devices of vertical integration pole-mounted transformer platform refers to a one-piece structure unit composed of the transformer, prefabricated connection bus and the low - voltage distribution module by hanging under the transformer module.

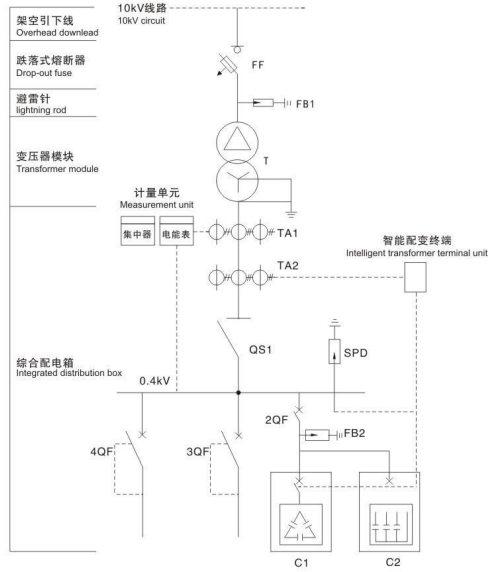
横向一体化柱上变压器台成套装置:

Set of devices of Horizontal integration pole-mounted transformer platform:

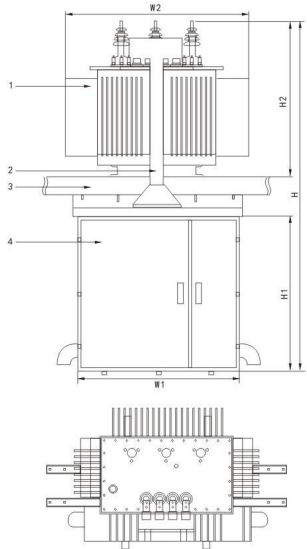
横向一体化柱上变压器台成套装置是指由变压器模块及固定在变压器模块正前方的低压配电模块组合为一体式结构的单元。

Set of devices of horizontal integration pole-mounted transformer platform refers to a one-piece structure unit composed of the transformer mould and the low - voltage distribution module before it.

电气主接线方案 Electrical main wiring scheme



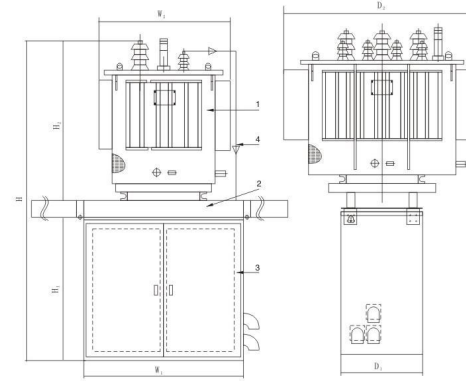
纵向正装一体化变台外形图 Longitudinal horizontal integration transformer platform outside drawing



1. 变压器模块
 2. 低压预制母线
 3. 变压器安装横担
 4. 综合配电箱
1. Transformer module
2. Low-voltage prefabricated bus
3. Transformer installation cross arm
4. Integrated distribution box

规格 specification	外形尺寸 (单位mm)								
	W1(宽)	D1(深)	H1(高)	W2(宽)	D2(深)	H2(高)	W(宽)	D(深)	H(高)
50kVA	1000	650	700	< 1250	< 1100	< 1000	< 1250	< 1250	< 2100
100kVA	1000	650	700	< 1250	< 1100	< 1000	< 1250	< 1250	< 2100
200kVA	1350	700	1200	< 1400	< 1300	< 1300	< 1400	< 1450	< 2900
400kVA	1350	700	1200	< 1600	< 1300	< 1300	< 1600	< 1450	< 2900

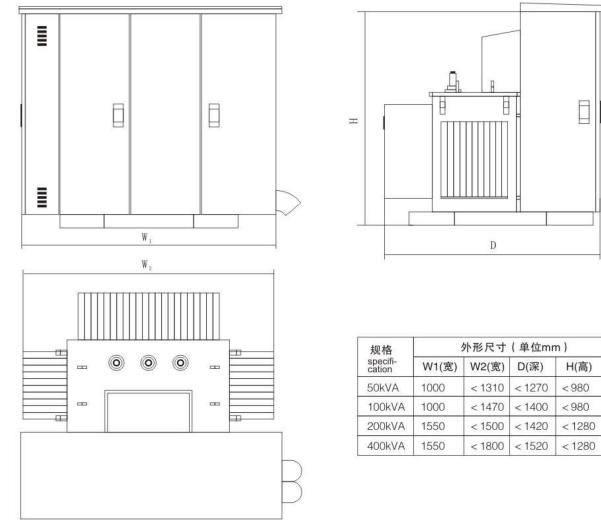
纵向侧装一体化变台外形图 Longitudinal vertical integration transformer platform outside drawing



1. 变压器模块
 2. 安装横担
 3. 综合配电箱
 4. 低压软电缆
1. Transformer module
2. Install the cross arm
3. Integrated distribution box
4. Low voltage flexible cable

规格 specification	外形尺寸 (单位mm)					
	W1(宽)	D1(深)	H1(高)	W2(宽)	D2(深)	H2(高)
50kVA	1000	650	700	< 1100	< 1250	< 1000
100kVA	1000	650	700	< 1100	< 1250	< 1000
200kVA	1350	700	1200	< 1300	< 1400	< 1300
400kVA	1350	700	1200	< 1300	< 1600	< 1300

横向一体化变台外形图 Horizontal integration transformer platform outside drawing



规格 specification	外形尺寸 (单位mm)			
	W1(宽)	W2(宽)	D(深)	H(高)
50kVA	1000	< 1310	< 1270	< 980
100kVA	1000	< 1470	< 1400	< 980
200kVA	1550	< 1500	< 1420	< 1280
400kVA	1550	< 1800	< 1520	< 1280

订货须知 Items To Be Noticed For Ordering

- 产品型号; Product model:
主电路图; Main circuit diagram:
变压器容量; Transformer capacity:
箱内元器件清单 (主母线规格); Components list in box (main bus-bar specifications)
颜色要求; Color requirements:
其它与产品正常使用条件不符的特殊技术要求; Other special technical requirements which are not comply with the normal conditions of use.