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## 企业简介



云南人民电力电气有限公司、云南江变电力电器成套设备有限公司是一家专业生产、销售 S11、S13 系列油浸式节能电力变压器、SH15 型非晶合金高效节能油浸式变压、SCBH15 型非晶合金干式变压器、美国杜邦绝缘技术 H 级 SGB10、11 型非密封干式变压器、SCB10、11 型环氧树脂浇注干式变压器、风力发电用组合式变电站、ZGSH15 系列非晶合金组合式变电站、ZGS11 系列美式箱变、高低压预装式变电站（欧式箱变）、户外高压开闭所、户外高压电缆分支箱、高低压开关柜等电器成套设备的高科技、节能环保型电力设备重点骨干企业，特别是电力互感器，填补了西南地区的空白，市场潜力巨大。

企业占地面积 66999 平方米，净用地面积 66000 平方米，建筑面积 62666 平方米。其中，厂房面积 26800 平方米，办公楼面积 17929 平方米，职工宿舍面积 17937 平方米。公司总投资 2.6 亿元人民币。公司现有员工近 260 人，其中高级技术职称 26 人，中级技术职称 36 人，其中总工程师曾参加国家电力设备行业标准起草工作。公司拥有主要生产、检测设备 126 台套。我公司投入国内外先进设备的同时，不断引进吸收多项变压器及高低压柜设计制造安装技术。拥有电力设备产品独立研发、制造、检测全程控制的成熟技术和工艺，具有年生产 35kV 及以下干式变压器 80 万 kVA、油浸式变压器 120 万 kVA、组合式变电站 1200 台，35kV 及以下高低压开关柜 9000 台，等电力成套设备，年销售额达 3.6 亿元人民币。

我公司坚持“人民电气为人民”的服务宗旨，以市场为导向，以客户为中心。大力实施“以质量创市场，以品牌求发展，以科技促进步”的品牌战略，运用现代化企业管理方法全面实施科学质量管理体系，不断完善售后服务体系，对客户的需求承诺随叫随到，取得了良好的社会效益与经济效益。坚持“质量立企、科技兴企”的发展方针和“顾客第一，服务至上”的原则，以优质的质量和服务，树立一流的企业形象。

在社会发展和市场体系的良好环境下，我公司愿与社会各界和广大客户精诚合作，开拓创新，与时俱进，共同发展，做到更大、更新、更强。

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## Company profile

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Yunnan Jiangbian Power Electrical Complete Plant Co. Ltd and Yunnan People' s Electrical Appliance Co. Ltd. (as one company) is a professional manufacturer and supplier of electrical appliance. Equipped with hi-technology, the facility is recognized as a backbone manufacturer of China who looks at energy efficiency and environment protection.

A wide range of products include:

- S11,S13 Low loss energy-efficient power transformer
- SH15 Amorphous alloy low-loss power transformer
- SCBH15 Amorphous alloy dry-type transformer
- SG(B)10,11 Winding unwrapped dry-type
- SCB10,11 Epoxy resin cast dry-type transformer
- Wind Power Box combined Transformer Substation
- ZGSH15 Amorphous alloy padmounted box transformer
- ZGS11 Padmounted transformer,
- Combined transformer substation (pre-installed cabinet type transformer substation)
- Outdoor HV Switchgear Station
- Outdoor HV cable branch box, and
- HV and LV Switchgear (cabinet)

In particular, mutual inductor is a gap-bridge product provided for the southwest China and is highly expected by the market.

The Company is set in 66,999 sq. m of land, with 62,666 sq. m for built-up area, among which 26,800 sq. m for production, 17,929 sq.m for office and 17,937 sq. m for staff dormitory. The company' s property is valued at 260 million RMB. Our mission is assisted by more than 260 highly skilled workforce, among them 26 engineers at senior level and 36 technicians at middle level. The chief engineer is proud to have contributed to the preparation of National Code of Practice for power sector in China. The company is equipped with state-of-art manufacturing and testing equipment 126 count. While investing in the upgrade of the equipment, we are devoting continuously to the upgrade of technology and expertise in all spheres of activities including design, manufacturing and installation. This leads to our excellent capability in independent innovation, design, manufacturing and test and state-of-art workmanship. Currently we are proud to have had a capacity to deliver 800 thousand KVA of dry-type transformer, 1.2million KVA of oil-immersed transformer, 1,200 combined transformer substations, 9,000 HV and LV 35Kv down switch cabinets on yearly basis, which bring us back an annual turn-over at 360 million yuan RMB.

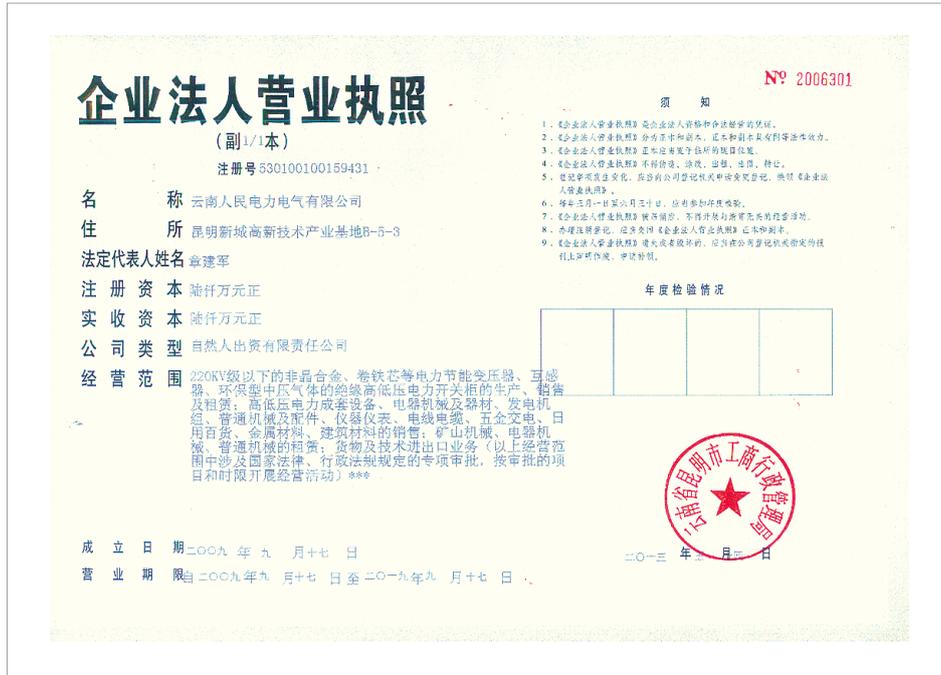
Our vision: In a persistent approach to "people' s electric serves people" and dedication to "customer first and service prioritized" , we shall consolidate our national presence as a leading manufacturer of brand product by establishing stringent quality norms in a vibrant environment that values quality, service and continuous technical improvement.

Our mission: To implement Brand Strategy and give a full play to "quality for market expectation, brand for growth and technology for progress" activities in adherence to modern corporate system to ensure quality control, continuous improvement of post sale service system and a good return of benefit.

In an environment that encourages social and marketing development we appreciate every opportunity to develop the best resource partners and be in partnership that will set us in a course of innovation, advancement and mutual growth.

# 相关证书

## Conformity certification





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### Conformity certification



## 相关证书

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**SIEMENS**

**云南江变电力电器成套设备有限公司**

**Yunnan Jiangbian Power & Electrical complete plant Co., Ltd.**

是西门子中压开关技术(无锡)有限公司之特约经销商(非独家),  
其经营范围是为中华人民共和国云南的供电局和终端用户项目,  
经销产品包括

is an Authorized Distributor( Non-exclusive) of Siemens Medium Voltage Switchgear  
Technologys (Wuxi) Ltd for PSB and Local End-user projects  
in Yunnan province, P.R. China of the following products

**8DJ/8DH 环网开关柜**  
**8DJ/8DH Ring Main Units**

Siegfried Ruhland  
11 MAR 12  
IC LMV MV  
  
**Dr. Siegfried Ruhland**  
General Manager 总经理  
SLC I C LMV MV  
西门子基础设施与城市业务领域中压部

Wang Yan Xiang  
  
**Mr. Wang Yanxiang**  
General Manager 总经理  
SLMVS 市场部  
西门子中压开关技术(无锡)有限公司

Zhaofei  
  
**Mr. Zhaofei**  
Sales General Manager 销售总经理  
SLC I C LMV MV  
西门子基础设施与城市业务领域中压部

有效期至 2014 年 2 月 6 日 Valid until Feb 6, 2013



# 相关证书

## Conformity certification



**認證證書**

认证编号: 117 13 QU 0230-04 R1M

兹证明 **云南江变电力电器成套设备有限公司**

地址 **云南省昆明新城高新技术产业开发区 B-5-3**

经现场评审满足: ISO9001: 2008 质量管理体系要求

认证范围 **干式、油浸式变压器, 电流电压互感器, 美式箱变(组合式变压器), 欧式箱变及高 (35kV~10 kV) 低压开关柜、配电柜的组装及销售**

批准:  发证日期: 2013年04月23日  
有效期至: 2016年04月22日

上海英格尔认证有限公司  
中国国家认证认可监督管理委员会批准号: CNCA-R-2005-117  
国家实验室认可委员会证书号: 260  
电话: +86 21-51114750  
传真: +86 21-54253541  
网址: www.icas90.com  
地址: 上海市静安区中山西路 2368 号伟德大厦 801 室 2000235

ISO9001 IAF 260

第一次评审 第二次评审 第三次评审

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**STATE OF REGISTRATION**

0230-04 R1M  
Quality management systems of  
an Electric Power Equipment Co., Ltd.  
High-Tech Industrial Base, Xincheng,  
Kunming, China  
Registered as meeting the requirements of  
of Dry & Oil-Immersed Transformer, Mutual Inductor, America Box Combined Transformers), European and High Voltage (35kV-10kV) & cabinet and Distribution Box

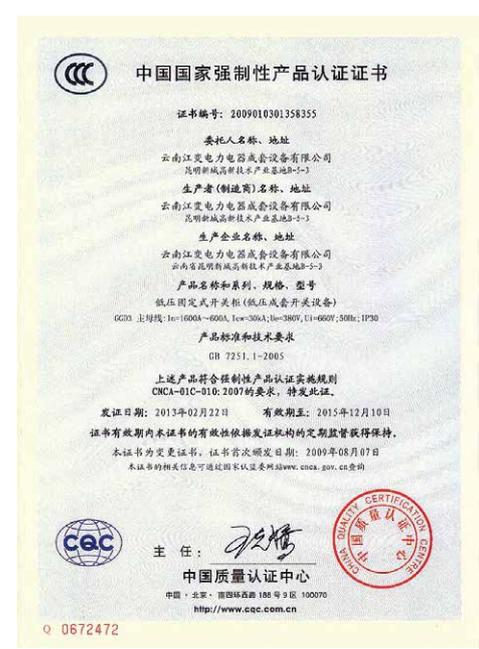
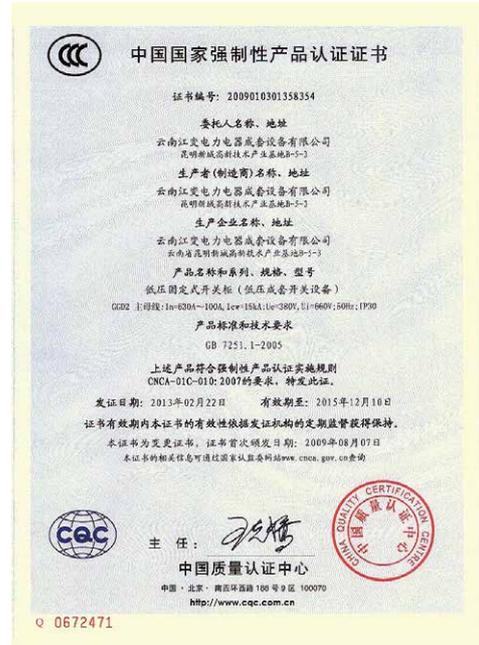
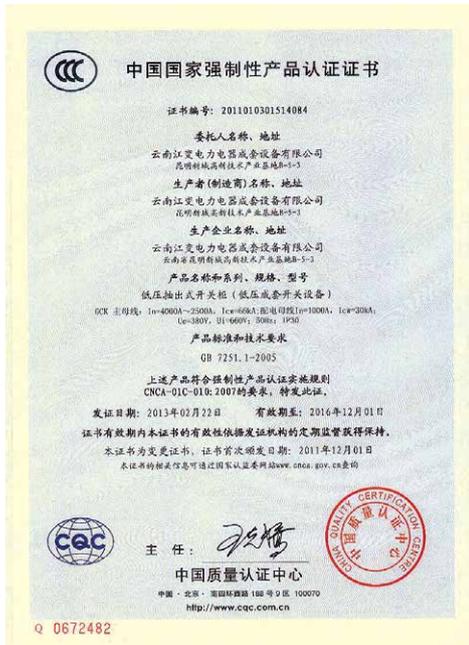
Approval Date: 23 Apr. 2013  
Expiry Date: 22 Apr. 2016

ISO9001 IAF 260

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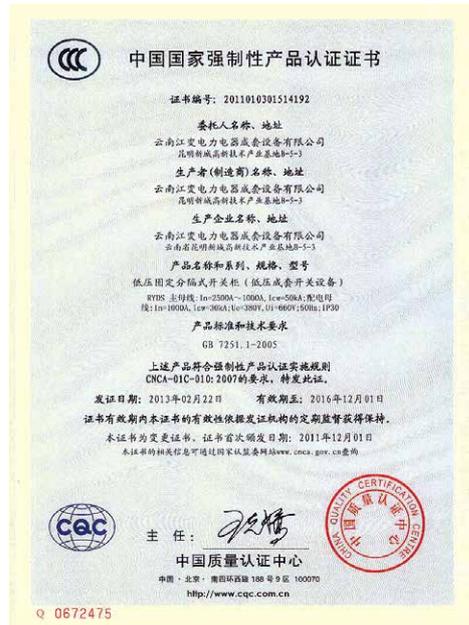
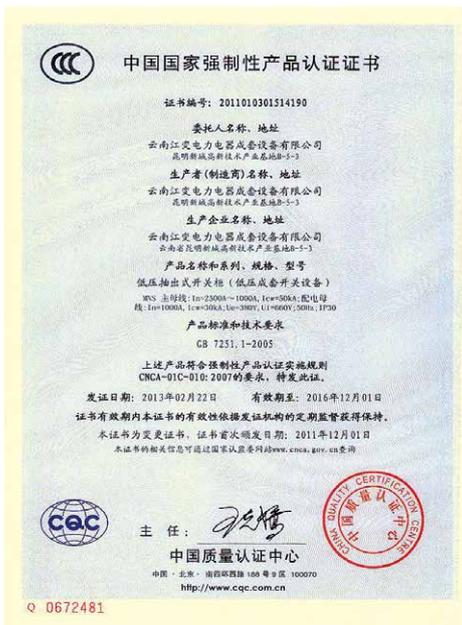
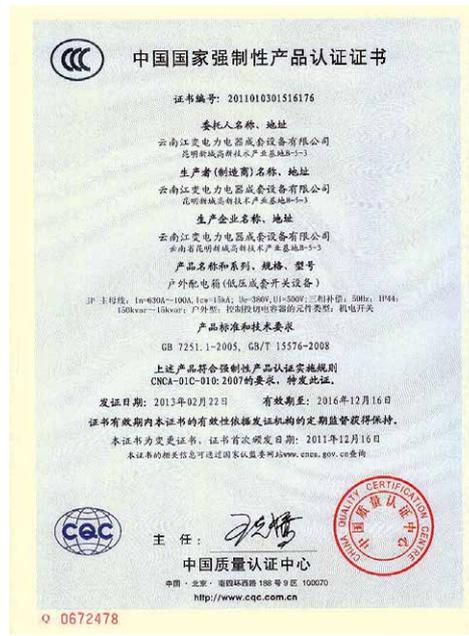
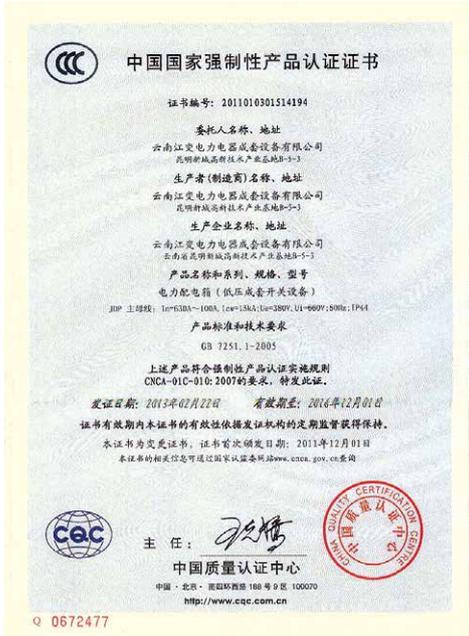
# 相关证书

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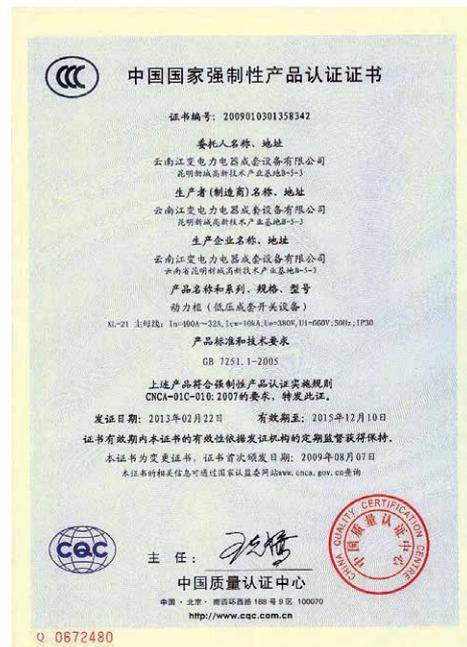
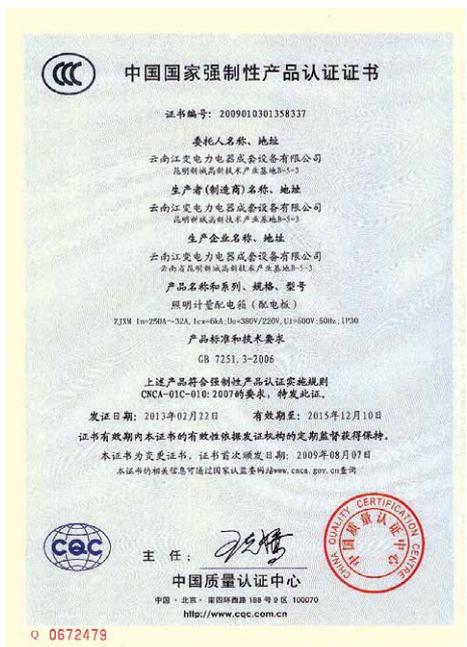
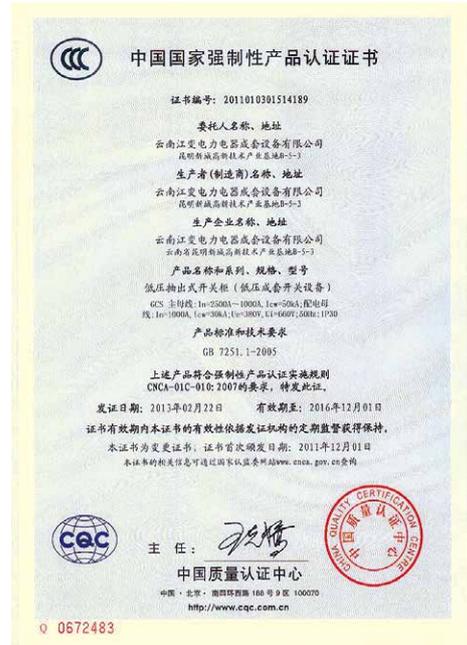
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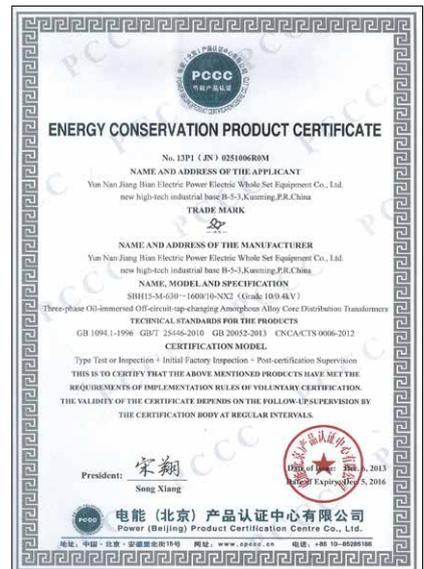
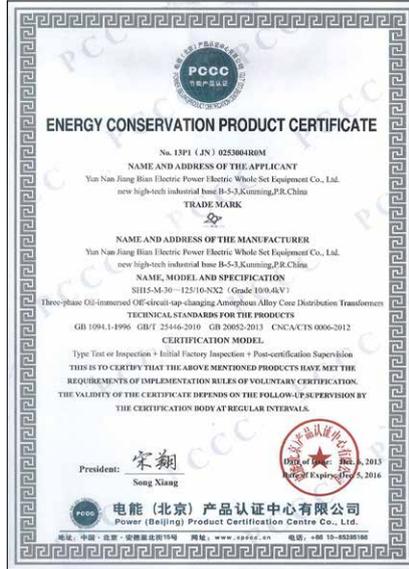


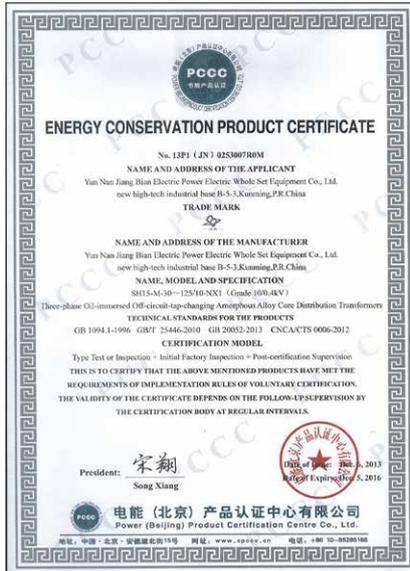












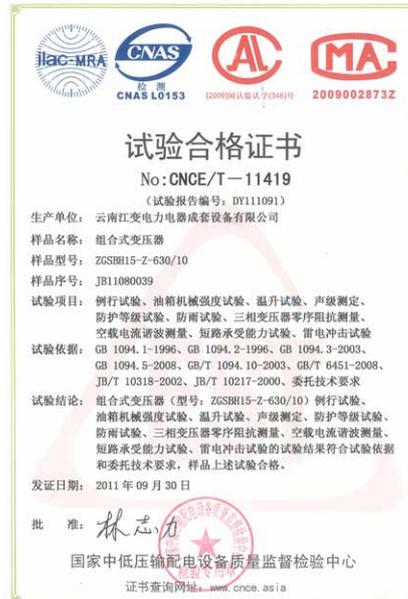
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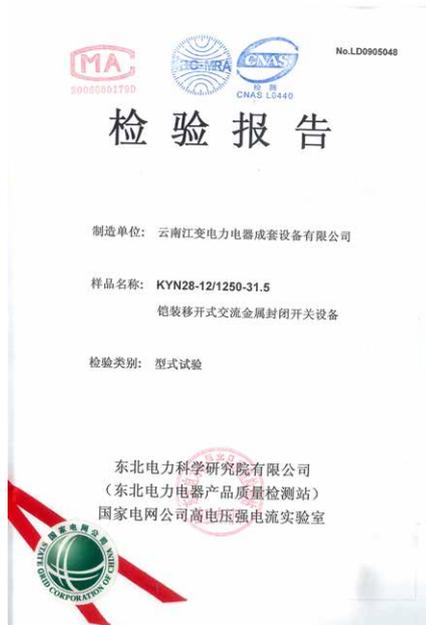
## Conformity certification



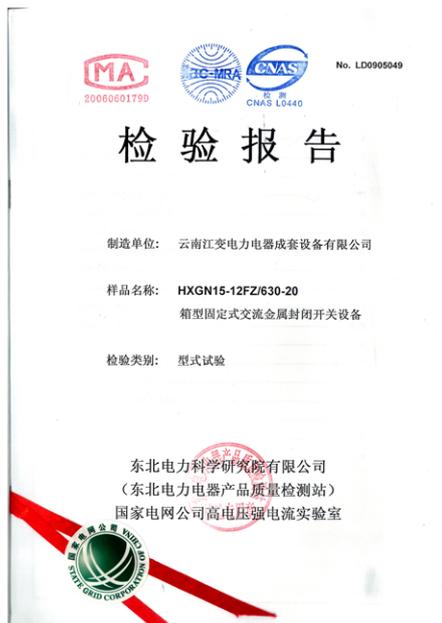


# 相关证书

## Conformity certification



东北电力电器产品 质量检测站		检验报告		No.LD0905048	
		共 22 页 第 1 页			
<b>概 述</b>					
委托单位	云南江变电力电器成套设备有限公司				
型号规格及产品名称	KYN28-12/1250-31.5 铠装移开式交流金属封闭开关设备				
制造单位	云南江变电力电器成套设备有限公司				
出厂日期	2009-03				
出厂编号	K0903001				
检验类别	型式试验				
检验日期	2009-05-22~2009-09-08				
委托方代表	李建军				
		<b>检 验 项 目</b>			
		<b>检 验 参 数</b>			
绝缘 1min 工频电压试验	相间, 相对地 42kV, 时间 1min				
绝缘 1.250μs 雷电冲击电压试验	相间, 相对地 75kV, 额定开断电流 31.5kA				
试 触点和控制回路的绝缘试验	工频电压 2000V, 1min				
绝缘电阻及金属门绝缘试验	工频电压 42kV, 1min; 雷电冲击电压 75kV				
回路电阻测量	≤150μΩ				
温升试验	1.1×1250A				
机械操作试验	符合标准要求				
防护等级验证	外壳 IP4X; 内部隔室之间及断路器室门打开时 IP2X				
基本回路试验方式 T100a 试验	试验电压 12kV, 额定短路开断电流 31.5kA, 额定短路开断电流 80kA				
基本回路试验方式 T100b 试验	试验电压 12kV, 开断电流 31.5kA, 短路容量 40%				
短时耐受和峰值耐受电流试验	主回路: 20kA (有效值), 4s; 80kA (峰值) 接地回路: 27.5kA (有效值), 2s; 43.3kA (峰值)				
检验依据	GB 3906-2006 (3.6kV~40.5kV 交流金属封闭开关设备和控制设备) JB/T 3855-2008 (高压交流真空断路器) GB/T 11022-1999 (高压开关设备和控制设备标准的共用技术要求) DL/T 404-2007 (3.6kV~40.5kV 交流金属封闭开关设备)				
检验结论	经过对云南江变电力电器成套设备有限公司生产的 KYN28-12/1250-31.5 铠装移开式交流金属封闭开关设备样品进行型式试验, 结果符合国家标准及技术要求, 样品检验结果合格。				
编制:	李建军	审核:	李志远	批准:	李冲
日期:	2009-06-23	日期:	2009-06-23	日期:	2009-06-24



东北电力电器产品 质量检测站		检验报告		No.LD0905049	
		共 22 页 第 1 页			
<b>概 述</b>					
委托单位	云南江变电力电器成套设备有限公司				
型号规格及产品名称	HXGN15-12FZ/630-20 箱型固定式交流金属封闭开关设备				
制造单位	云南江变电力电器成套设备有限公司				
出厂日期	2009-03				
出厂编号	H20903010				
检验类别	型式试验				
检验日期	2009-05-22~2009-09-10				
委托方代表	李建军				
		<b>检 验 项 目</b>			
		<b>检 验 参 数</b>			
绝缘 1min 工频电压试验	相间, 相对地及真空室侧口 42kV, 隔离开关侧口 48kV				
绝缘 1.250μs 雷电冲击电压试验	相间, 相对地及真空室侧口 75kV, 隔离开关侧口 85kV				
试 触点和控制回路的绝缘试验	工频电压 2000V, 1min				
绝缘电阻及金属门绝缘试验	工频电压 42kV, 1min; 雷电冲击电压 75kV				
回路电阻测量	≤300μΩ				
温升试验	1.1×630A				
机械操作试验	符合标准要求				
防护等级验证	外壳 IP3X				
关合和开断试验方式 1 (100%)	试验电压 12kV, 开断电流 0.83kA, 10 次				
关合和开断试验方式 5	试验电压 12kV, 关合电流 50kA, 2 次				
短时耐受和峰值耐受电流试验	主回路: 20kA (有效值), 4s; 50kA (峰值) 接地回路: 20kA (有效值), 2s; 50kA (峰值) 接地回路: 17.5kA (有效值), 2s; 43.3kA (峰值)				
检验依据	GB 3906-2006 (3.6kV~40.5kV 交流金属封闭开关设备和控制设备) GB 3804-2004 (3.6kV~40.5kV 高压真空断路器) GB/T 11022-1999 (高压开关设备和控制设备标准的共用技术要求) DL/T 404-2007 (3.6kV~40.5kV 交流金属封闭开关设备)				
检验结论	经过对云南江变电力电器成套设备有限公司生产的 HXGN15-12FZ/630-20 箱型固定式交流金属封闭开关设备样品进行型式试验, 结果符合国家标准及技术要求, 样品检验结果合格。				
编制:	李建军	审核:	李志远	批准:	李冲
日期:	2009-06-23	日期:	2009-06-23	日期:	2009-06-24

# 相关证书

## Conformity certification

2009002878Z

MA CMAA AL

实验室名称: 国家电器产品质量监督检验中心  
Lab Name: China National Center for Quality Supervision and Test of Electrical Apparatus Products

No 11Q0368-S

### 检验 (试验) 报告 Test Report

委托单位: 云南江变电力电器成套设备有限公司  
Client:

产品名称: 户内金属铠装抽出式开关设备  
Name of Product:

产品型号: KYN61-40.5 (Z) /T2000-31.5  
Product Type:

检验类别: 型式试验  
Test Category:

本实验室对出具的检验 (试验) 结果负责, 未经实验室书面同意, 不得部分地复制本报告。  
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报告编号: 11Q0368-S 第4页 共66页

国家电器产品质量监督检验中心

检验报告 KYN61-40.5 (Z) /T2000-31.5 户内金属铠装抽出式开关设备

### 检验结论

委托单位: 云南江变电力电器成套设备有限公司

样品型号: KYN61-40.5(Z)/T2000-31.5

样品名称: 户内金属铠装抽出式开关设备

制造单位: 云南江变电力电器成套设备有限公司

实施的检验项目:

- 防护等级检查 (外壳: IP4X; 隔室门: 开门 IP2X)
- 绝缘电阻测量 (主回路电阻 < 160 μΩ, 断路器电阻 < 45 μΩ)
- 温升试验 (1.1 \* 2000A)
- 机械操作和机械特性试验
- 联动机构和辅助机构的机械试验 (2000V/1min)
- 短时工频耐压试验 (对地和相间: 95kV/1min; 真空断口和隔离断口: 110kV/1min)
- 雷电冲击耐压试验 (对地和相间: 185kV; 真空断口和隔离断口: 215kV)
- 基本短路试验方式 T100a (电压: 40.5kV; 开断电流: 31.5kA; 峰值: 80kA)
- 基本短路试验方式 T100b (电压: 40.5kV; 开断电流: 31.5kA)
- 短时耐受电流和峰值耐受电流试验 (主回路: 4s; 31.5kA有效值; 80kA峰值)
- (接地开关: 4s; 31.5kA有效值; 80kA峰值)
- (接地开关: 2s; 27.4kA有效值; 69kA峰值)

检验依据:

- GB 3906-2009 3.6kV~40.5kV 交流金属封闭开关设备和控制设备
- GB/T 11022-1999 高压开关设备和控制设备标准的共用技术要求

检验结论:

经过对云南江变电力电器成套设备有限公司生产的 KYN61-40.5 (Z) /T2000-31.5 户内金属铠装抽出式开关设备进行型式试验, 结果符合标准及技术要求的规定, 样品合格。

编制: 曹琳 校核: 徐海红 审核: 孙志军 批准: 孙志军  
日期: 2011-06-08 日期: 2011-06-08 日期: 2011-06-08 日期: 2011-06-08

2009002878Z

MA CMAA AL

实验室名称: 国家电器产品质量监督检验中心  
Lab Name: China National Center for Quality Supervision and Test of Electrical Apparatus Products

No 11Q0018-S

### 检验 (试验) 报告 Test Report

委托单位: 云南江变电力电器成套设备有限公司  
Client:

产品名称: 户外高压环网开闭所  
Name of Product:

产品型号: RDFW-12/630-20  
Product Type:

检验类别: 型式试验  
Test Category:

本实验室对出具的检验 (试验) 结果负责, 未经实验室书面同意, 不得部分地复制本报告。  
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报告编号: 11Q0018-S 第4页 共51页

国家电器产品质量监督检验中心

检验报告 RDFW-12/630-20 户外高压环网开闭所

### 检验结论

委托单位: 云南江变电力电器成套设备有限公司

样品型号: RDFW-12/630-20

样品名称: 户外高压环网开闭所

制造单位: 云南江变电力电器成套设备有限公司

实施的检验项目:

- 主回路电阻测量 < 400 μΩ
- 温升试验 630A
- 机械操作和机械特性试验 按技术条件
- 机械寿命试验 负荷开关/接地开关: 2000/2000 次
- 防护等级检查 外壳 IP33
- 机械操作试验 操作倍率 1.2, 3 次
- 短时工频耐压试验 相间及对地: 42kV/1min; 断口: 48kV/1min
- 雷电冲击耐压试验 相间及对地: 75kV; 断口: 85kV
- 额定有功负载电流开断, 关合能力试验 12kV, 开断电流 630A, 10 次
- 额定电容负载电流开断, 关合能力试验 12kV, 开断电流 10A, 10 次
- 额定短路关合电流能力试验 12kV, 关合电流 (峰值) 50kA, 2 次
- 短时耐受电流和峰值耐受电流试验 主回路 有效值: 20kA, 4s; 峰值: 50kA, 0.3s
- 接地开关 有效值: 20kA, 4s; 峰值: 50kA, 0.3s
- 联锁试验 联锁率: 5mm/min, 作用时间: 5min

检验依据:

- GB 3906-2006 3.6kV~40.5kV 交流金属封闭开关设备和控制设备
- GB 3804-2004 3.6kV~40.5kV 高压交流负荷开关
- GB/T 11022-1999 高压开关设备和控制设备标准的共用技术要求

检验结论:

经过对云南江变电力电器成套设备有限公司生产的 RDFW-12/630-20 户外高压环网开闭所进行型式试验, 结果符合标准及技术要求的规定, 样品合格。

编制: 曹琳 校核: 徐海红 审核: 孙志军 批准: 孙志军  
日期: 2011-02-15 日期: 2011-02-15 日期: 2011-02-15 日期: 2011-02-15

# 相关证书

## Conformity certification

MA 2009002878Z  
CNAS C1020  
AL  
CNAS L0440

实验室名称: 国家电器产品质量监督检验中心  
Lab Name: China National Center for Quality Supervision and Test of Electrical Apparatus Products

No. 11Q0052-S

### 检验(试验)报告

Test Report

委托单位: 云南江变电力电器成套设备有限公司  
Client:

产品名称: 全密封全绝缘金属封闭开关设备  
Name of Product:

产品型号: RSP6-12(F)/VT125-31.5  
Product Type:

检验类别: 型式试验  
Test Category:

本实验室对出具的检验(试验)结果负责, 未经实验室书面同意, 不得部分地复制本报告。  
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报告编号: 11Q0052-S 第4页 共31页

国家电器产品质量监督检验中心

### 检验报告

RSP6-12(F)/VT125-31.5型全密封全绝缘金属封闭开关设备

检验结论

委托单位: 云南江变电力电器成套设备有限公司

试样型号: RSP6-12(F)/VT125-31.5型

试样名称: 全密封全绝缘金属封闭开关设备

制造单位: 云南江变电力电器成套设备有限公司

主回路电阻测量	< 800 μΩ
温升试验	125A
机械操作和机械特性试验	按技术条件
机械寿命试验	真空开关/接地开关: 3000/3000次
脱扣联锁试验	100次
机械寿命试验	90次
绝缘的检验项目:	
防护等级检验	外壳 IP3X 气室 IPX7
短时工频耐压试验	相间及相对地: 42kV 1min; 断口: 48kV 1min
雷电冲击耐压试验	相间及相对地: 75kV; 断口: 85kV
额定转移电流时开断能力的三相试验	12kV, 开断电流 1500A
额定短路电流时关合、开断能力的三相试验	12kV, 开断电流 31.5kA, 80kA(峰值)
密封试验	年漏率 < 0.02%

检验依据: GB 3906-2006 (3.6 kV—40.5 kV 交流金属封闭开关设备和控制设备)

检验结论: 经过对云南江变电力电器成套设备有限公司生产的 RSP6-12(F)/VT125-31.5 型全密封全绝缘金属封闭开关设备进行型式试验, 检验结果符合国家标准及技术要求的规定, 样品检验结果合格。  
**检验专用章**

编制: 丁明 审核: 徐爱红 审定: 彭峰 批准: 刘德林  
日期: 2011-03-11 日期: 2011-03-11 日期: 2011-03-12 日期: 2011-03-12

SJF-Q1004

MA 2006060179D  
CNAS L0440  
No. LD0905050

### 检验报告

制造单位: 云南江变电力电器成套设备有限公司

样品名称: HXGN15-12FZ(R)/125-31.5  
箱型固定式交流金属封闭开关设备

检验类别: 型式试验

东北电力科学研究院有限公司  
(东北电力电器产品质量检测站)  
国家电网公司高电压强电流实验室

编制: 李瑞 审核: 李致远 批准: 李坤  
日期: 2007-06-23 日期: 2007-06-23 日期: 2007-06-24

东北电力电器产品质量检测站

### 检验报告

No. LD0905050 共 18 页 第 1 页

概述

委托单位: 云南江变电力电器成套设备有限公司

型号规格及产品名称: HXGN15-12FZ(R)/125-31.5 箱型固定式交流金属封闭开关设备

制造单位: 云南江变电力电器成套设备有限公司

出厂日期: 2009-03

出厂编号: H20903011

检验类别: 型式试验

检验日期: 2009-05-22—2009-06-10

委托方代表: 陆建昌

检验项目	检验参数
地 1min 工频电压试验	相同、相对地及真空断路器 42kV; 隔离开关断口 48kV
地 1.250μs 雷电冲击电压试验	相同、相对地及真空断路器 75kV; 隔离开关断口 85kV
试验 辅助和控制回路的绝缘试验	工频电压 2000V, 1min
试验 观察接地回路的地线试验	工频 42kV, 1min; 雷电冲击 75kV
回路电阻测量	≤ 300μΩ (不含熔断器)
温升试验	125A
对机构的试验—脱扣联动和机械联动试验	联动可靠, 脱断无损伤, 触头无偏移
防护等级验证	外壳 IP3X
关合开断试验方式 1	试验电压 12kV, 开断电流 31.5kA
关合开断试验方式 5	试验电压 12kV, 额定交流电流 3.15kA
短时耐受和峰值耐受电流试验	接地短路: 17.3kA (有效值), 2s; 43.3kA (峰值)

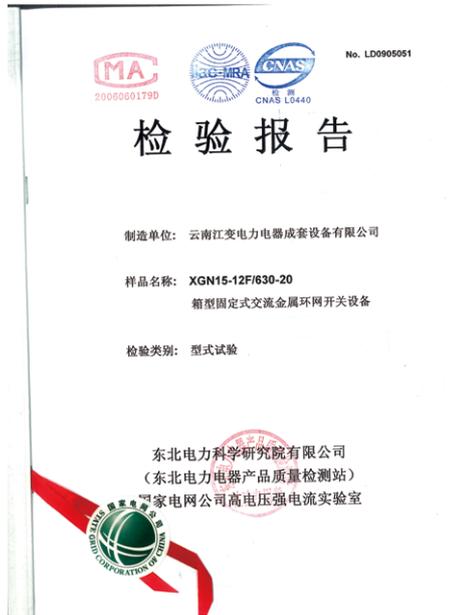
检验依据: GB 3906-2006 (3.6kV—40.5kV 交流金属封闭开关设备和控制设备)  
GB 19826-1997 《交流高压负荷开关—熔断器组合电器》  
GB/T 11022-1999 《高压开关设备和控制设备标准的共用技术要求》

检验结论: 经过对云南江变电力电器成套设备有限公司生产的 HXGN15-12FZ(R)/125-31.5 型箱型固定式交流金属封闭开关设备进行型式试验, 检验结果符合国家标准及技术要求的规定, 样品检验结果合格。  
**检验专用章**

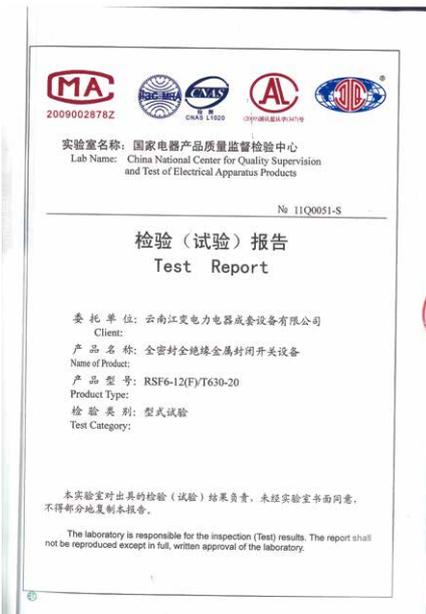
编制: 李瑞 审核: 李致远 批准: 李坤  
日期: 2007-06-23 日期: 2007-06-23 日期: 2007-06-24

# 相关证书

## Conformity certification



东北电力电器产品 质量检测报告		检验报告		No. LD0905051	
概述					
委托单位	云南江变电力电器成套设备有限公司				
型号规格及产品名称	XGN15-12F/630-20 箱型固定式交流金属环网开设备				
制造单位	云南江变电力电器成套设备有限公司				
出厂日期	2009-03				
出厂编号	L0903005				
检验类别	型式试验				
检验日期	2009-05-21~2009-06-03				
委托方代表	章建军				
检验项目		检验项目		检验参数	
绝缘	1min工频耐压试验	相同、相对、对地	42kV, 系统开关出口 48kV, 1min		
绝缘	1.250μs雷电流冲击电压试验	相同、对地	75kV, 系统开关出口 85kV		
试验	辅助和控制回路的绝缘试验	工频电压	2500V, 1min		
回路电阻测量			≤450μΩ		
温升试验			1.1×G30A		
机械操作试验			符合标准要求		
防护等级验证			符合IP3X		
关合和开断试验方式1(100%)		试验电压	12kV, 开断电流 630A, 10次		
关合和开断试验方式5		试验电压	12kV, 关合电流 50kA, 2次		
		主回路	20kA (有效值), 4s; 50kA (峰值)		
		接地工程	20kA (有效值), 2s; 50kA (峰值)		
		接地工程	17.3kA (有效值), 2s; 43.3kA (峰值)		
检验依据	GB 3905-2006 《3.6kV~40.5kV交流金属封闭开关设备和控制设备》 GB 3804-2004 《3.6kV~40.5kV高压交流负荷开关》 GB/T 11022-1999 《高压开关设备和控制设备标准的共用技术要求》 DL/T 404-2007 《3.6kV~40.5kV交流金属封闭开关设备使用说明书》				
检验结论	经过对云南江变电力电器成套设备有限公司生产的XGN15-12F/630-20型箱型固定式交流金属环网开设备样品进行型式试验, 结果符合国家标准及技术要求的规定, 样品检验结果合格。				
编制:	李达	审核:	李达	批准:	李达
日期:	2009-06-23	日期:	2009-06-23	日期:	2009-06-24



国家电器产品质量监督 检验中心		检验报告		第4页 共55页	
检验结论					
委托单位:	云南江变电力电器成套设备有限公司				
样品型号:	RSF6-12(F)/T630-20				
样品名称:	全密封全绝缘金属封闭开关设备				
制造单位:	云南江变电力电器成套设备有限公司				
	主回路电阻测量	< 150 μΩ			
	温升试验	1.1 × G30A			
	机械操作和机械特性试验	按技术条件			
	机械寿命试验	关合/开断/接地开关: 3000/3000次			
	防护等级验证	符合IP3X/气室IPX7			
实施的检验项目:	额定工频耐压试验	相同及相对开断:	42kV 1min; 开口: 48kV 1min		
	雷电冲击耐压试验	相同及相对开断:	75kV; 开口: 85kV		
	额定有功负载电流开断、关合能力试验	12kV, 开断电流	630A, 10次		
	额定电涌电流开断、关合能力试验	12kV, 开断电流	20kA, 10次		
	额定短路关合电流能力试验	12kV, 关合电流峰值	50kA, 2次		
	短时耐受电流和峰值耐受电流试验	主回路	有效值: 20kA, 4s; 峰值: 50kA, 0.3s		
	接地工程试验	接地开关	有效值: 20kA, 4s; 峰值: 50kA, 0.3s		
	密封试验	年漏气率	< 0.02%		
检验依据:	GB 3905-2006 《3.6kV~40.5kV交流金属封闭开关设备和控制设备》 GB 3804-2004 《3.6kV~40.5kV高压交流负荷开关》				
检验结论:	经过对云南江变电力电器成套设备有限公司生产的RSF6-12(F)/T630-20型全密封全绝缘金属封闭开关设备样品进行型式试验, 检验结果符合国家标准及文件的规定, 样品检验结果合格。				
编制:	丁娟	校对:	徐春红	审核:	李达
日期:	2011-03-11	日期:	2011-03-11	日期:	2011-03-12

# 相关证书

## Conformity certification

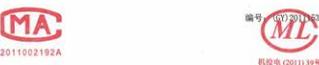

No. LD090602

## 检验报告

制造单位: 云南江变电力电器成套设备有限公司  
 样品名称: XGN15-12F (R) / 12S-31.5  
 箱型固定式交流金属环网开设备  
 检验类别: 型式试验

东北电力科学研究院有限公司  
 (东北电力电器产品质量检测站)  
 国家电网公司高压强电流实验室

检验报告		No. LD090602																						
检验项目		共 16 页 第 1 页																						
<p>委托单位: 云南江变电力电器成套设备有限公司</p> <p>型号规格及产品名称: XGN15-12F (R) / 12S-31.5 箱型固定式交流金属环网开设备</p> <p>制造单位: 云南江变电力电器成套设备有限公司</p> <p>出厂日期: 2009-03</p> <p>出厂编号: L0903005</p> <p>检验类别: 型式试验</p> <p>检验日期: 2009-05-21~2009-05-03</p> <p>委托方代表: 董建军</p>																								
<table border="1"> <thead> <tr> <th>检验项目</th> <th>检验参数</th> </tr> </thead> <tbody> <tr> <td>绝缘 1min 工频电压试验</td> <td>相间、对地 42kV, 负荷开关断口 48kV, 1min</td> </tr> <tr> <td>绝缘 1.250μs 雷电冲击电压试验</td> <td>相间、对地 75kV, 负荷开关断口 85kV</td> </tr> <tr> <td>辅助和控制回路的绝缘试验</td> <td>工频电压 2000V, 1min</td> </tr> <tr> <td>回路电阻测量</td> <td>≤400μΩ</td> </tr> <tr> <td>温升试验</td> <td>125A</td> </tr> <tr> <td>对机构的试验—联锁机构和机械联动试验</td> <td>联动可靠, 熔断器无损伤, 触头无偏移</td> </tr> <tr> <td>防护等级验证</td> <td>外壳 IP3X</td> </tr> <tr> <td>关合开断试验方式 1</td> <td>试验电压 12kV, 开断电流 31.5kA</td> </tr> <tr> <td>关合开断试验方式 4</td> <td>试验电压 12kV, 额定转移电流 1.5kA</td> </tr> <tr> <td>短时耐受和峰值耐受电流试验</td> <td>接地连接: 17.3kA (有效值), 2s; 43.3kA (峰值)</td> </tr> </tbody> </table>			检验项目	检验参数	绝缘 1min 工频电压试验	相间、对地 42kV, 负荷开关断口 48kV, 1min	绝缘 1.250μs 雷电冲击电压试验	相间、对地 75kV, 负荷开关断口 85kV	辅助和控制回路的绝缘试验	工频电压 2000V, 1min	回路电阻测量	≤400μΩ	温升试验	125A	对机构的试验—联锁机构和机械联动试验	联动可靠, 熔断器无损伤, 触头无偏移	防护等级验证	外壳 IP3X	关合开断试验方式 1	试验电压 12kV, 开断电流 31.5kA	关合开断试验方式 4	试验电压 12kV, 额定转移电流 1.5kA	短时耐受和峰值耐受电流试验	接地连接: 17.3kA (有效值), 2s; 43.3kA (峰值)
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检验依据	GB 3906-2006 3.6kV~40.5kV 交流金属封闭开关设备和控制设备 GB 19826-1997 《交流高压负荷开关—熔断器组合电器》 GB/T 11022-1999 《高压开关设备和控制设备标准的共用技术要求》 DL/T 404-2007 3.6kV~40.5kV 交流金属封闭开关设备和控制设备																							
检验结论	经过对云南江变电力电器成套设备有限公司生产的 XGN15-12F (R) / 12S-31.5 箱型固定式交流金属环网开设备样品进行型式试验, 结果符合国家标准 GB 3906-2006 及相关文件的规定, 样品检验结果合格。																							
编制: 李培冬 审核: 李志远 校核: 董建军 日期: 2009-06-23 日期: 2009-06-23 日期: 2009-06-24																								



## 检验报告

产品名称: 干式变压器  
 委托单位: 云南江变电力电器成套设备有限公司  
 检验类别: 委托检验

机械工业高原电器产品质量监督检测中心  
 检验报告专用章

机械工业高原电器产品质量监督检测中心

编号: (GY)201153 检验报告 第 1 页 共 7 页

产品名称	干式变压器	型号规格	SCB10-630/10
委托单位	云南江变电力电器成套设备有限公司	商标	云南人民电气
检验类别	委托检验	受托单位	云南江变电力电器成套设备有限公司
生产厂家	云南人民电气有限公司 云南江变电力电器成套设备有限公司	检测地点	电器试验室
样品数量	1台	抽样基数	/
抽样日期	/	到货日期	2011.12.08
产品编号	G11S10901	生产日期	2011.09
委托人	董建军	检验日期	2011.12.01~12.02
委托单位地址	云南省昆明市官渡区		
检验依据	1. GB/T 20928-2006 特殊环境条件 高压电工电子产品 第 1 部分: 通用技术要求; 2. GB 1094.1-1996 电力变压器 第 1 部分 总则; 3. GB 1094.11-2007 电力变压器 第 11 部分: 干式变压器。		
检验项目	1. 海拔 2000m 模拟环境条件下外施耐压试验; 2. 海拔 2000m 模拟环境条件下雷电冲击耐受电压试验; 3. 海拔 2000m 模拟环境条件下温升试验。		
检验结论	所检 3 项均符合标准要求。 签发日期: 2011.12.3 检验报告专用章		
备注	1. 附试验照片一张; 2. 雷电冲击耐受电压按组 1 进行。		

批准: 董建军 审核: 董建军 校核: 董建军 报告: 董建军

# 相关证书

## Conformity certification




编号: (GY)2011151  
机械电 (2011) 39号

### 检验报告

产品名称: 铠装移开式金属封闭开关设备  
委托单位: 云南江变电力电器成套设备有限公司  
检验类别: 委托检验

机械工业高原电器产品质量监督检测中心  
检验报告专用章

机械工业高原电器产品质量监督检测中心

编号: (GY)2011151

### 检验报告

第 1 页 共 7 页

产品名称	铠装移开式金属封闭开关设备	型号规格	KYN28A-12
委托单位	云南江变电力电器成套设备有限公司	商 标	云南人民电气
检验类别	委托检验	受托单位	云南江变电力电器成套设备有限公司
生产厂家	云南人民电气有限公司	检测地点	电器试验室
样品数量	1台	抽样基数	/
抽样日期	/	到样日期	2011.11.21
产品编号	1111099	生产日期	2011.11
委托人	李建军	检验日期	2011.12.07~12.08

委托单位地址: 云南省昆明市官渡区

检验依据: 1. GB/T 20626.1-2006 特殊环境条件 高原电子电子产品 第1部分: 通用技术要求;  
2. GB/T 11022-1999 高压开关设备和控制设备标准的共用技术要求;  
3. GB 3906-2006 3.6kV~40.5kV 交流金属封闭开关设备和控制设备。

检验项目: 1. 海拔 3000m 模拟环境条件下工频耐受电压检验(干态);  
2. 海拔 3000m 模拟环境条件下雷电冲击耐受电压检验(干态);  
3. 海拔 3000m 模拟环境条件下温升检验;  
4. 温升试验前及温升试验后主回路电阻测量。

检验结论: 所检 4 项均符合标准要求。

备注: 1. 附试品照片一张;  
2. 附温升考点图一张。

批准: 吴炳? 审核: 李? 校核: 李? 报告: 薛? 签发日期: 2011.12.26




编号: (GY)2011146  
机械电 (2011) 39号

### 检验报告

产品名称: 高压开关柜  
委托单位: 云南江变电力电器成套设备有限公司  
检验类别: 委托检验

机械工业高原电器产品质量监督检测中心  
检验报告专用章

机械工业高原电器产品质量监督检测中心

编号: (GY)2011146

### 检验报告

第 1 页 共 7 页

产品名称	高压开关柜	型号规格	KGN15-12
委托单位	云南江变电力电器成套设备有限公司	商 标	云南人民电气
检验类别	委托检验	受托单位	云南江变电力电器成套设备有限公司
生产厂家	云南人民电气有限公司	检测地点	电器试验室
样品数量	1台	抽样基数	/
抽样日期	/	到样日期	2011.11.21
产品编号	1111099-1-1	生产日期	2011.11
委托人	李建军	检验日期	2011.11.29~11.30

委托单位地址: 云南省昆明市官渡区

检验依据: 1. GB/T 20626.1-2006 特殊环境条件 高原电子电子产品 第1部分: 通用技术要求;  
2. GB/T 11022-1999 高压开关设备和控制设备标准的共用技术要求;  
3. GB 3906-2006 3.6kV~40.5kV 交流金属封闭开关设备和控制设备。

检验项目: 1. 海拔 3000m 模拟环境条件下工频耐受电压检验(干态);  
2. 海拔 3000m 模拟环境条件下雷电冲击耐受电压检验(干态);  
3. 海拔 3000m 模拟环境条件下温升检验;  
4. 温升试验前及温升试验后主回路电阻测量。

检验结论: 所检 4 项均符合标准要求。

备注: 1. 附试品照片一张。

批准: 吴炳? 审核: 李? 校核: 李? 报告: 薛? 签发日期: 2011.12.26

# 相关证书

## Conformity certification

MA 2011002192A 编号: (GY)2011152 ML 机电电 (2011)39号

### 检验报告

产品名称: 干式变压器  
委托单位: 云南江变电力电器成套设备有限公司  
检验类别: 委托检验

机械工业高原电器产品质量监督检测中心  
检验报告专用章

机械工业高原电器产品质量监督检测中心  
编号: (GY)2011152 检验报告 第1页 共7页

产品名称	干式变压器	型号规格	SCB11-2000/10GY
委托单位	云南江变电力电器成套设备有限公司	商 标	云南人民电气
检验类别	委托检验	受托单位	云南江变电力电器成套设备有限公司
生产厂家	云南江变电力电器成套设备有限公司	检测地点	电器实验室
样品数量	1台	抽样基数	/
抽样日期	/	到样日期	2011.12.12
产品编号	2011611	生产日期	2011.11
委托人	廖德军	检验日期	2011.12.12-12.14

委托单位地址: 云南省昆明市官渡区

检验依据: 1. GB/T 20626.1-2006 特殊环境条件 高原电子电子产品 第1部分: 通用技术要求;  
2. GB/T 14597-2010 电工产品 不同海拔的气候环境条件;  
3. GB 1094.11-2007 电力变压器 第11部分: 干式变压器;  
4. GB 1094.3-2003 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。

检验项目: 1. 海拔3000m 模拟环境条件下外施耐压试验;  
2. 海拔3000m 模拟环境条件下雷电冲击耐受电压试验;  
3. 海拔3000m 模拟环境条件下温升试验。  
**以下空白**

检验结论: 所检3项均符合标准要求。  
签发日期: 2011.12.14  
检验报告专用章

备注: 1. 附试品照片一张;  
2. 该变压器在高海拔环境条件下使用时必须加装风机。

批准: 廖德军 审核: 姜炳江 校核: 姜炳江 报告: 姜炳江

MA 2011002192A 编号: (GY)2011150 ML 机电电 (2011)39号

### 检验报告

产品名称: 油浸式变压器  
委托单位: 云南江变电力电器成套设备有限公司  
检验类别: 委托检验

机械工业高原电器产品质量监督检测中心  
检验报告专用章

机械工业高原电器产品质量监督检测中心  
编号: (GY)2011150 检验报告 第1页 共7页

产品名称	油浸式变压器	型号规格	S11-M-50-10GY
委托单位	云南江变电力电器成套设备有限公司	商 标	云南人民电气
检验类别	委托检验	受托单位	云南江变电力电器成套设备有限公司
生产厂家	云南人民电力电气有限公司	检测地点	电器实验室
样品数量	1台	抽样基数	/
抽样日期	/	到样日期	2011.12.12
产品编号	20111307	生产日期	2011.11
委托人	廖德军	检验日期	2011.12.12-12.13

委托单位地址: 云南省昆明市官渡区

检验依据: 1. GB/T 20626.1-2006 特殊环境条件 高原电子电子产品 第1部分: 通用技术要求;  
2. GB 1094.1-1996 电力变压器 第1部分 总则;  
3. GB 1094.2-1996 电力变压器 第2部分 温升;  
4. GB 1094.3-2003 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;  
5. GB/T 6451-2008 三相油浸式电力变压器技术参数和要求。

检验项目: 1. 海拔3000m 模拟环境条件下外施耐压试验;  
2. 海拔3000m 模拟环境条件下雷电冲击耐受电压试验;  
3. 海拔3000m 模拟环境条件下温升试验。  
**以下空白**

检验结论: 所检3项均符合标准要求。  
签发日期: 2011.12.13  
检验报告专用章

备注: 1. 附试品照片一张。

批准: 廖德军 审核: 姜炳江 校核: 姜炳江 报告: 姜炳江

## S11、S13 系列低损耗节能电力变压器

### S11, S13 Low loss energy-efficient power transformer

#### 概述 Introduction

S11、S13 变压器节能显著，磁路均匀，空载损耗低、噪声低、温升低、免维修、效率高、配电变压器节能效果显著，采用新型铁芯材料。磁路分布均匀，大大降低了空载激磁电流和空载损耗，由于铁芯为全斜三接缝结构，故运行可靠、体积小、重量轻、噪声低、工艺性好，散热好、温升低、不吊芯结构、不污染环境、免维修、效率高。可供居民区、商业街道、工矿企业和农村动力及照明之用。

S11 and S13 transformer is distinguished by its energy saving, magnetic continuity, low loss on non-load running, low noise, slow temperature rise, free of maintenance and efficiency while distribution transformer is made of newly developed wound core and competent for its energy efficiency. Magnetic continuity reduces dramatically non-load excited current loss and non-load loss. The product, as finished by good workmanship and reliable performance assured by sloping 3 seam structure for wound core, is additionally valued as small sized, light weighted, heat diffusive, and, as un-tanking structure adopted, free of pollution. It is meant for living quarter, high street, mine, industry and rural supply and illumination application.

#### 特点 Product features:

- 1、节能，与原 S9 相比，空载损耗平均降低 29.25% 以上，空载电流降低 37.9% 以上，运行费用平均下降 18.9% 以上。
- 2、使用寿命长，变压器油箱采用全密封结构，油箱与箱沿可用螺栓联接或焊死，变压器油不与空气接触，延长了使用寿命。
- 3、运行可靠性高，油箱密封有关零部件进行改进，增加了可靠性，提高工艺水平以保证密封的可靠性。
- 4、占地面积小，全密封变压器油箱采用波纹散热器，当油温发生变化时波纹板热胀冷缩可取代储油柜的作用，波纹板式油箱外形美观，占地面积小。三相油浸式电力变压器，采用新型绝缘结构，提高了抗短路能力，铁芯由高质量冷轧晶粒取向硅钢片制成；高、低压绕组选用优质无氧铜线并采用多层圆筒式工艺结构；所有紧固件均采用特殊防松处理，机械强度高。波纹油箱壳体以自身弹性适应油的膨胀，是永久性密封的油箱，已被广泛地应用在各配电设备中。

1. Energy efficient: average reduction of no-load loss by 29.25% plus and no-load current loss by 18.9% plus compared with previous S9 series.

2. Longer durable life: oil tank is hermitically sealed by sticking gasket and lid together, or welded together to keep transformer oil from exposing to air. This ensures a longer life of service.

3. Operational reliability: efforts have been made to promote workmanship and renovation of sealing parts, which results in preciseness and reliability of the parts.

4. Space-saving: corrugated radiating fin is provided in place of oil conservator for oil tank of hermitically sealed transformer for heat radiating through its thermal expansion and contracting effect. Corrugated plate oil tank is not only good looking but also takes less space. Anti short-circuit capability of three phase oil immersed power transformer is enhanced by newly developed insulation structure, where wound core is made of premium cold rolled

## S11、S13 系列低损耗节能电力变压器

### S11, S13 Low loss energy-efficient power transformer

grain oriented silicon steel sheet. HV and LV windings are made of premium oxygen free copper wire and finished in multi-layer cylindrical pattern. Mechanical strength is boosted by special anti-loose control on fastener. As the elasticity allows for self thermal expansion, corrugated oil tank is accepted as a permanently sealed device and widely adopted in distribution equipment.

#### 使用环境条件

##### Ambient conditions:

- 1、海拔高度 ≤ 3000m ；
- 2、最高环境温度：+40℃ ；
- 3、最高年平均温度：+20℃ ；
- 4、最高日平均温度：+30℃ ；
- 5、户外最低气温：-45℃ ；

- 1、Altitude: ≤ 3,000meter
- 2、Temperature: max. +40℃ ,
- 3、Max annual average temperature: +20℃
- 4、Max. daily average temperature: 30℃
- 5、Lowest temperature outdoor: -45℃



# S11 低损耗节能电力变压器

## S11 Low loss energy efficient power transformer

### 绝缘水平 Insulation level

型号 model	电压等级 voltage grade	额定短时耐受电压(有效值) rated short-duration power-frequency withstand voltage (effective value)	额定雷电冲击耐受电压(峰值) rated lightning impulse withstand voltage (peak value)
S11,S13,SH15	6	25	60
	10	35	75
	35	85	200

### 10kV 级 S11 无励磁调压油浸式配电变压器技术参数 Technical parameters 10KV S11 No excitation regulating oil immersed distribution transformer

容量 (KVA) Rated capacity	电压组合 Voltage combination				空载损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short-circuit resistance	外形尺寸 (长*深*高) Size and shape (L * w * h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6.3 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	100	600	2.1	4.0	700*460*930	290	400*650
50					130	870	2.0		750*570*920	360	400*650
63					150	1040	1.9		770*570*930	410	550*650
80					180	1250	1.8		780*615*930	500	550*700
100					200	1500	1.6		975*635*970	565	550*700
125					240	1800	1.5		1040*670*990	660	550*700
160					290	2200	1.4		1040*685*1030	730	550*750
200					330	2600	1.3		1125*745*1040	845	550*750
250					400	3050	1.2		1130*750*1070	920	550*750
315					480	3650	1.1		1240*815*1080	1100	550*800
400					570	4300	1.0		1295*855*1150	1245	550*800
500					680	5150	1.0		1335*865*1160	1505	660*800
630					810	6200	0.9		1425*950*1220	1745	660*800
800					980	7500	0.8		1550*1030*1275	2100	660*850
1000					1150	10300	0.7		1620*1100*1345	2360	820*950
1250					1360	12000	0.6		1750*1260*1450	2755	820*920
1600					1640	14500	0.6		1840*1280*1810	3850	820*950

## S11 低损耗节能电力变压器

### S11 Low loss energy efficient power transformer

#### 35kV 级 S11 型双绕组无励磁调压配电变压器技术参数

Technical parameters 35 KV S11 Double windings no excitation regulating transformer

额定容量 (kVA) rated capacity	电压组合 Voltagecombination			联结组标 号 connection symbol	空载电 流,% no-load current	空载损 耗,% no-load loss	负载损 耗,% Loadloss	短路阻 抗,% shortcircuit resistance	轨距 AXB (mm) trackgauge
	高 压 (kV) high voltage	低压(kV) low voltage	高压分接范 围 high voltage tappingange						
50	35	0.4	± 5% 或 ± 2X2.5%	Yyn0 或 Dyn11	2.0	170	1150	6.5	660*660
63					1.8	190	1330		660*660
80					1.8	200	1620		660*660
100					1.6	230	1920		660*660
125					1.6	270	2260		660*660
160					1.6	290	2690		660*660
200					1.6	340	3160		660*660
250					1.6	410	3760		660*660
315					1.5	490	4530		660*660
400					1.5	585	5470		820*820
500					1.4	690	6580		820*820
630					1.4	830	7870		820*820
800					1.3	985	9400		820*820
1000					1.0	1150	11540		820*820
1250			0.9	1440	13870	1070*1070			
1600			0.85	1680	16620	1070*1070			
2000			0.75	2080	18050	7.0	1070*1070		
2500			0.75	2480	19950	7.0	1070*1070		



## S11 低损耗节能电力变压器

### S11 Low loss energy efficient power transformer

#### 35kV 级 S11 型双绕组无励磁调压电力变压器技术参数

Technical parameters 35KV S11 Double windings no excitation regulating power transformer

额定容量 (kVA) rated capacity)	电压组合 Voltagecombination			联结组标 号 connection symbol	空载电 流,% no-load current	空载损 耗,% no-load loss	负载损 耗,% Loadloss	短路阻 抗,% shortcircuit resistance	轨距 AXB (mm) trackgauge	
	高 压 (kV) high voltage	低 压(kV) low voltage	高压分接范 围 high voltage tappingange							
800	35	3.15	± 5% 或 ± 2X2.5%	Yd11	1.3	1040	9400	6.5	820*820	
1000					1.2	1200	11400		820*820	
1250					1.1	1440	13300		820*820	
1600					1.1	1680	16150		1070*1070	
2000					1.0	2080	18050		1070*1070	
2500					1.0	2480	19950		1070*1070	
3150					1.0	3040	23300		1070*1070	
4000					0.9	3680	27550		1070*1070	
5000					0.9	4400	31350		1070*1070	
6300				0.9	5200	35150	1475*1475			
8000				Yd11 YNd11	3.3	0.8	6800	39900	7.5	1475*1475
10000					3.15	0.8	8000	45900	1475*1475	
12500					6.3	0.8	9600	54400	1475*1475	
16000					6.6	0.7	11600	66500	1475*1475	
20000					10.5	0.7	12800	78800	8.0	2040*1475
25000					11	0.6	16000	97850	2040*1475	
31500					0.6	20320	118750	2040*1475		



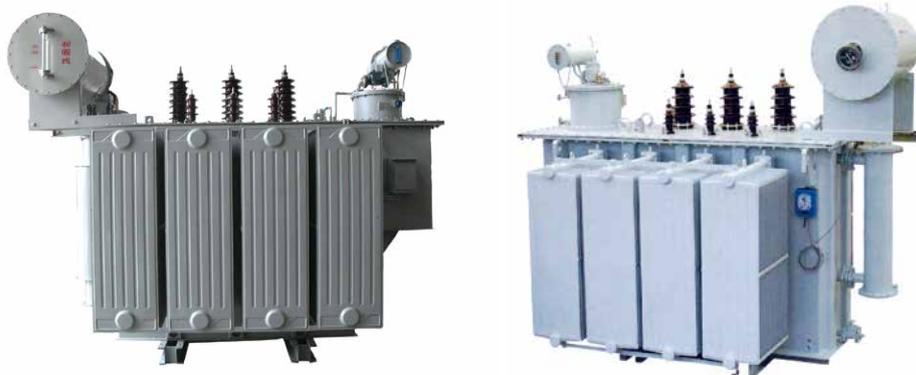
## S11 低损耗节能电力变压器

### S11 Low loss energy efficient power transformer

#### 35kV 级 SZ11 型双绕组有载调压电力变压器技术参数

Technical parameters 35 KV S11 Double windings no excitation regulating transformer

额定容量 (kVA) rated capacity	电压组合 Voltagecombination			联结组标 号 connection symbol	空载电 流,% no-load current	空载损 耗,% no-load loss	负载损 耗,% Loadloss	短路阻 抗,% shortcircuit resistance	轨距 AXB (mm) trackgauge
	高 压 (kV) high voltage	低 压(kV) low voltage	高 压分接范 围 highvoltage tappingange						
2000	35 ; 38.5 ;	6.3 6.6 10.5 11	± 3X2.5%	Yd11	1.0	2320	19000	6.5	1070*1070
2500					1.0	2640	20900		1070*1070
3150					0.9	3200	24700	7.0	1070*1070
4000					0.9	3920	28980		1070*1070
5000					0.85	4640	33250	7.5	1070*1070
6300					0.8	5600	37050		1475*1475
8000				0.8	7120	41800	1475*1475		
10000				0.75	8400	48450	YNd11	1475*1475	
12500				0.75	10080	57480		1475*1475	
16000				0.7	12160	65840	8.0	1475*1475	
20000				0.7	15600	84550		2040*1475	
25000				0.6	16800	99750	8.5	2040*1475	
31500				0.6	20560	11880		2040*1475	



# 110kV 级 SZ10 型有载调压电力变压器

## 110 kv level SZ10 type on-load voltage regulating power transformer

### S ( F ) Z10、S ( F ) SZ10 系列 110KV 级全密封式有载调压电力变压器技术参数

#### S Z10, S ( F ) SZ10 series 110 kv level full sealed power transformer on-load voltage regulating technology parameters

额定容量 capacity/kVA	电压组合及分接范围 voltage combination & tapping range			联结组 标号 Link set label	空载 电流 % no-load current%	空载 损耗 kW no-load loss/W	负载 损耗 kW on-load loss/W	短路 阻抗 % short circuit impedance	重量 kg Weight (kg)			外形尺寸 mm Outside Dimension (mm)			轮距 mm Gage	轮距 mm			
	高压 KV High voltage	中压 KV Medium voltage	低压 KV Low voltage						总重 Total	器身 Body	油重 Oil	长 L	宽 W	高 H					
SFZ10-M-6300	6300			6.3 *6.6 10.5 *11	YNd11	0.78	8.70	34.80	10.50	25000	11900	6230	4490	3980	4300	1070×1070			
SFZ10-M-8000	8000					0.78	10.40	42.50		26100	12450	6860	4920	4110	4600				
SFZ10-M-10000	10000					0.73	12.50	50.10		26455	13615	7347	5855	3870	5186		2000×1435		
SFZ10-M-12500	12500					0.73	14.50	58.50		33600	18150	8390	5795	3975	4670	1070×1070			
SFZ10-M-16000	16000					0.67	17.60	73.00		36200	18300	8650	6015	4160	5130	1435×1435			
SFZ10-M-20000	20000					0.67	20.80	88.40		39950	20216	10690	6070	4365	4550	2000×1070			
SFZ10-M-25000	25000					0.62	24.20	104.50		48310	23390	11100	5270	4395	4870				
SFZ10-M-31500	31500					0.62	29.20	125.80		51280	31800	11850	6280	4215	5160				
SFZ10-M-40000	40000					0.56	35.10	147.90		58628	35800	12230	6270	4383	5485				
SFZ10-M-50000	50000					0.56	41.50	183.60		59100	38300	13600	6510	4610	6105				
SFZ10-M-63000	63000					0.50	49.40	221.00		69900	40200	15100	7100	4710	6135				
SFSZ10-M-6300	6300	12±8× 1.25%				*6.6 10.5 *11	Yynod11	0.95		10.40	45.00	高-中 10.5 高-低 17-18 中-低 6.5 高-中 17-18 升压 10.5 中-低 6.5	33350	13150	8200	5870	4070	4380	1070×1070
SFSZ10-M-8000	8000	或 *110±8						0.95		12.50	53.50		36430	15800	10700	6785	4120	4620	
SFSZ10-M-10000	10000	×1.25%						0.90		14.80	62.90		38000	17390	11621	6435	4135	4660	
SFSZ10-M-12500	12500			0.90	17.00			73.90	41810	20300	11000		6580	4460	4690				
SFSZ10-M-16000	16000			0.84	21.00			90.10	46194	23874	14284		6900	3915	4710				
SFSZ10-M-20000	20000		38.5	0.84	24.80			106.20	42710	26390	13000		5610	4480	4893				
SFSZ10-M-25000	25000		±8×2.5%	0.78	29.30			125.80	53100	29345	13875		5980	4530	4995				
SFSZ10-M-31500	31500		或 38.5±5%	0.78	34.90			148.70	61250	34578	14398		6470	4680	5100				
SFSZ10-M-40000	40000			0.72	41.80			178.50	71190	41250	17320		7510	4700	5220				
SFSZ10-M-50000	50000			0.72	49.50			212.50	81100	43460	17800		7635	4890	5850				
SFSZ10-M-63000	63000			0.67	58.80			255.00	83750	50350	21300		7410	5220	6990				

注：表中带 \* 号标记的电压作为降压变压器 (以上尺寸如有变化，以实际产品为准)

(the product physical size shall prevail in case of any dimensions variation)



# 110kV 级 SZ11 型电力变压器

## 110 kv level SZ11 type power transformer

**SSZ11 系列 110kV 级三相三绕组有载调压电力变压器技术参数**  
110KV, SSZ11 series Three winding on-load regulating power transformer

额定容量 capacity/kVA	电压组合及分接范围 voltage combination & tapping range			联结组 标号 Link set label	空载 电流 % no-load current%	空载 损耗 KW no-loadloss/W	负载 损耗 KW on-load loss/W	短路 阻抗 % short circuit impedance	重量 kg Weight (kg)			外形尺寸 mm (Outside Dimension (mm))			轮距 mm Grip
	高压 KV High voltage	中压 KV Medium voltage	低压 KV Low voltage						总重 Total	器身 Body	油重 Oil	长 L	宽 W	高 H	
6300	110 ±ε × 25%	38.5 ±2 × 2.5%	6.30	Ynynod11	0.95	9.60	44.65	高-中 10.50 高-低 17-18 中-低 6.50	20805	10045	6350	4700	3500	5300	1475
8000					0.95	11.52	53.20		24890	12020	7595	4750	3600	5300	
10000					0.89	13.68	62.70		29420	14205	8980	4800	3600	5400	
12500					0.89	16.16	74.10		34780	16795	10615	4900	3660	5500	
16000					0.84	19.36	90.25		41855	20210	12775	5090	3760	5570	
20000					0.84	22.88	106.40		49480	23890	15100	6830	3540	5790	
25000					0.78	27.04	126.35		52300	25290	15250	6830	3540	5790	
31500					0.78	32.16	149.15		62200	30080	18140	7120	4300	5800	
40000					0.73	38.56	179.55		74405	35980	21695	7220	5150	5900	
50000					0.73	45.52	213.75		87960	42535	25660	7350	5250	6000	
63000					0.67	54.16	256.50		104605	50585	30505	7600	5500	6200	

注：①降压结构。②根据需要联结组标号可为 Ynd11y10。③高、中、低绕组的容量为 100%，④上述各系列中可根据用户要求提供特殊设计的产品。  
⑤变压器高低压可采用电缆进出线。（以上尺寸如有变化，以实际产品为准）  
Note: ① Buck structure. ② Link set table can be Ynd11y10 subject to need. ③ Capacity for H, M & L winding can be 100%. ④ Special order out of above series can be satisfied subject to customer's requirement.  
⑤ Cable available for HI-low voltage inlet & outlet. (the product physical size shall prevail in case of any dimensions variation)

**SZ11 系列 110kV 级三相双绕组有载调压电力变压器技术参数**  
110KV, SZ11 series Three level load power transformer has three winding technology parameters

额定容量 KVA capacity/kVA	电压组合 voltage combination			联结组 标号 Link set label	空载 电流 % no-load current%	空载 损耗 KW no-loadloss/W	负载 损耗 KW on-load loss/W	短路 阻抗 % short circuit impedance	重量 kg Weight (kg)			外形尺寸 mm (Outside Dimension (mm))			轮距 mm Grip
	高压 KV High voltage	高压分接 范围 High voltage	低压 KV Low voltage						总重 Total	器身 Body	油重 Oil	长 L	宽 W	高 H	
6300	110	±ε × 25%	6.30	Ynd11	0.80	8.00	34.20	10.50	20075	8896	6615	4850	3600	4900	1475
8000					0.80	9.60	42.75		54015	10645	7910	4900	3650	5000	
10000					0.74	11.36	50.35		28390	12580	9350	4950	3700	5300	
12500					0.74	13.44	59.85		33565	14875	11055	5000	3750	5400	
16000					0.69	16.16	73.15		40390	17900	13305	5090	3760	5570	
20000					0.69	19.2	88.35		38100	17810	10980	5300	3900	5590	
25000					0.64	22.72	104.5		45040	21055	12980	6200	4600	5650	
31500					0.64	27.04	126.35		53540	25700	13200	6670	4730	6100	
40000					0.58	32.32	148.20		59900	32450	15960	6800	4800	5900	
50000					0.58	38.24	184.30		70815	38365	18870	6950	4900	6200	
63000					0.52	45.44	222.30		84215	45625	22440	7100	5200	6500	

注：变压器降压结构（以上尺寸如有变化，以实际产品为准） Note: (the product physical size shall prevail in case of any dimensions variation)

**SSZ11 系列 110kV 级三相双绕组无励磁调压电力变压器技术参数**  
110KV, SSZ11 series Three level load power transformer has three winding technology parameters

额定容量 capacity/kVA	电压组合及分接范围 voltage combination & tapping range			联结组 标号 Link set label	空载 电流 % no-load current%	空载 损耗 KW no-loadloss/W	负载 损耗 KW on-load loss/W	短路 阻抗 % short circuit impedance	重量 kg Weight (kg)			外形尺寸 mm (Outside Dimension (mm))			轮距 mm Grip
	高压 KV High voltage	中压 KV Medium voltage	低压 KV Low voltage						总重 Total	器身 Body	油重 Oil	长 L	宽 W	高 H	
6300	*110 或 121	±2X 2.5%	6.3 *6.6 10.5 *11	Ynd11	0.77	7.44	34.20	10.50	12200	7470	2485	3000	2800	3800	1475
8000					0.77	8.96	42.75		14595	8940	2975	3100	2950	3900	
10000					0.72	10.56	50.35		17250	10565	3515	3400	3200	4000	
12500					0.72	12.48	59.85		17000	10565	3515	3500	3300	4100	
16000					0.67	15.04	73.15		24540	15030	5000	3750	3420	4040	
20000					0.67	17.60	88.35		29010	17770	5910	4500	3420	4900	
25000					0.62	20.80	104.50		34295	21010	6990	5600	3500	5000	
31500					0.60	24.64	126.35		45000	25440	9840	5850	3440	5000	
40000					0.56	29.44	148.20		49960	29980	9730	5900	4410	5110	
50000					0.52	35.20	184.30		57680	35330	11755	5950	4500	5300	
63000					0.48	41.60	222.30		68595	42015	13980	5950	4600	5840	

注：表中带 \* 号标记的电压作为降压变压器。（以上尺寸如有变化，以实际产品为准）  
Note: In the form "\*" symbol step down transformer. (the product physical size shall prevail in case of any dimensions variation)

**SS11 系列 110kV 级三相三绕组无励磁调压电力变压器技术参数**  
110KV, SS11 series Three winding on-load regulating power transformer

额定容量 capacity/kVA	电压组合及分接范围 voltage combination & tapping range			联结组 标号 Link set label	空载 电流 % no-load current%	空载 损耗 KW no-loadloss/W	负载 损耗 KW on-load loss/W	短路 阻抗 % short circuit impedance	重量 kg Weight (kg)			外形尺寸 mm (Outside Dimension (mm))			轮距 mm Grip
	高压 KV High voltage	中压 KV Medium voltage	低压 KV Low voltage						总重 Total	器身 Body	油重 Oil	长 L	宽 W	高 H	
6300	*110 或 121 ±2 X2.5%	3.5 38.5	*6.6 10.5 *11	Ynynod11	0.82	8.96	44.65	高-中 17-18 高-低 17-18 中-低 6.5	高-中 10.5 高-低 17-18 中-低 6.5	19140	9745	5717	4500	3200	4900
8000					0.78	10.64	53.20			22900	11660	6835	4700	3500	5000
10000					0.74	12.64	62.70			27070	13780	8085	4900	3750	5100
12500					0.70	14.72	74.10			32000	16295	9555	5100	3800	5200
16000					0.66	17.92	90.25			38510	19605	11500	5600	4000	5600
20000					0.65	21.12	106.40			44890	23170	11440	5870	4150	5880
25000					0.60	24.64	126.35			49685	24535	13725	6900	4300	5880
31500					0.60	29.44	149.15			59225	29180	16330	7200	4350	5700
40000					0.55	34.88	179.55			68445	34900	19525	7200	4410	5750
50000					0.55	41.60	213.75			80925	41260	23085	7300	4600	5800
63000					0.50	49.28	256.50			96240	49070	27455	7300	5100	5900

注：①表中带 \* 号标记的电压作为降压变压器。②高、中、低绕组的额定容量均为 100%。③根据需要连接标号可为 Ynd11y10。（以上尺寸如有变化，以实际产品为准）  
Note: ① In the form "\*" symbol step down transformer. ② Link set table can be Ynd11y10 subject to need. ③ Link label can be Ynd11y10 subject to need. (the product physical size shall prevail in case of any dimensions variation)

## S13 系列低损耗节能电力变压器

### S13 Low loss energy efficient power transformer

#### S13 无励磁调压油浸式配电变压器技术参数

Technical parameters S13 No excitation regulating oil immersed distribution transformer

容量 (kVA) Rated capacity	电压组合 Voltage combination				空载损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short- circuit resistance	外形尺寸 (长*深*高) Size and shape (L * w * h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6.3 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	80	600	2.1	4.0	700*460*930	305	400*400
50					100	870	2.0		750*570*920	375	400*400
63					110	1040	1.9		770*570*930	425	400*400
80					130	1250	1.8		780*615*930	515	500*500
100					150	1500	1.6		975*635*970	580	500*500
125					170	1800	1.5		1040*670*990	680	400*550
160					200	2200	1.4		1040*685*1030	750	500*500
200					240	2600	1.3		1125*745*1040	865	500*500
250					290	3050	1.2		1130*750*1070	940	500*500
315					340	3650	1.1		1240*815*1080	1130	660*660
400					410	4300	1.0		1295*855*1150	1280	660*660
500					480	5150	1.0		1335*865*1160	1540	660*660
630					570	6200	0.9		1425*950*1220	1780	820*820
800					700	7500	0.8		1550*1030*1275	2150	820*820
1000					830	10300	0.7		1620*1100*1345	2410	820*820
1250					970	12000	0.6		1750*1260*1450	2800	820*820
1600	1170	14500	0.6	1840*1280*1810	3910	820*820					

# SH15 非晶合金低损耗节能电力变压器

## SH15 Amorphous alloy low-loss power transformer

### 概述 Introduction

#### 一、非晶合金铁芯变压器的构成

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

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

(3) 箱体采用冷轧钢板制成的片状散热器，箱体全密封，20年内免维护。

#### 二、非晶合金铁芯变压器的节能效果

非晶合金铁芯变压器，具有低噪音、低损耗等特点，其空载损耗仅为常规 S11 系列产品的 1/5，且全密封免维护，运行费用投入低。

#### 三、非晶合金变压器的特点

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

#### 1. Structure of Amorphous alloy wound core transformer:

1) wound core is arranged in three phase five-pillar two rows pattern. Zero-sequence flux runs between two by-pillars, as flux does not pass cubicle, it does not generate heat. This maintains the transformer in low noise and low loss;

2) HV and LV winding are all rectangular copper windings which can resist to a certain level of mechanical stress damage when occasional short circuit occurs and protect the winding from deformation;

3) The cubicle is fin type radiator made of cold rolled steel sheet, hermitically sealed to ensure 20 years of free maintenance.

#### 2. Energy efficiency of Amorphous alloy wound core transformer

Amorphous alloy wound core transformer is competent for its low noise and low loss performance, where no-load loss is only measured at 1/5 of the ordinary S11 product. Hermitically sealed, it is free of maintenance and can reduce quite amount of operational cost.

#### 3. Product features

With low no-load loss and economic performance, it is meant for village, town and urban power consumption application.

Even in application of 3-shift mine and industry activity on 50%-80% load, a selection of proper amorphous is still significant to recover investment on schedule. Therefore the product's urban and rural application is not only well justified by reduction of transformer's loss, but also by power efficient factor which may result in less demand of power plant and add meanings to today's pursuant of energy efficient world.

## SH15 非晶合金低损耗节能电力变压器

### SH15 Amorphous alloy low-loss power transformer

#### 使用环境条件 Ambient conditions:

- 1、海拔高度 ≤ 3000m
- 2、最高环境温度：+40°C
- 3、最高年平均温度：+20°C
- 4、最高日平均温度：+30°C
- 5、户外最低气温：-45°C

- 1、Altitude: ≤ 3,000meter
- 2、Temperature: max. +40°C,
- 3、Max annual average temperature: +20°C
- 4、Max. daily average temperature: 30°C
- 5、Lowest temperature outdoor: -45°C



# SH15 非晶合金低损耗节能电力变压器

## SH15 Amorphous alloy low-loss power transformer

SH15 系列非晶合金无励磁调压地下式配电变压器技术参数  
 Technical parameters SH15 Amorphous alloy no excitation underground distribution transformer

容量 (kVA) Rated capacity	电压组合 Voltage combination				900 空载 损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short- circuit resistance	外形尺寸 (长*深*高) Size and shape (L*w*h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6 6.3 6.6 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	33	600	1.7	4	1000*780*810	440	550*550
50					43	870	1.3		960*620*1020	555	550*550
63									1000*900*845	610	550*550
80					60	1250	1.2		1060*900*865	675	550*550
100					75	1500	1.1		1110*910*920	770	550*550
125					85	1800	1.0		1170*910*950	880	550*550
160					100	2200	0.9		1220*910*985	990	550*550
200					120	2600	0.7		1290*920*1025	1150	660*660
250					140	3050	0.7		1380*700*1460	1310	660*660
315					170	3650	0.5		1380*860*1165	1515	660*660
400					200	4300	0.5		1510*900*1240	1870	660*660
500					240	5450	0.5		1640*900*1295	2185	660*660
630					320	6200	0.3		1580*1130*1310	2720	820*820
800					380	7500	0.3		2080*1230*1320	3200	1070*1070
1000					450	10300	0.3		2260*1350*1385	3640	1070*1070
1250					530	12000	0.2		2370*1360*1380	4215	1070*1070
1600	630	14500	0.2	2540*1400*1500	5000	1070*1070					

## S11 型立体卷铁芯低损耗节能电力变压器

### S11 Three-dimensional wound core transformer

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

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

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

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

油箱：以波纹油箱为主。亦可设计为长方形片式散热器油箱。

The capacity range of s11 three-dimensional wound core transformer is 30-2500kva. The core has a three-phase three-column structure with wrapped in ternal and external frames. The transformer has a high degree of mechanization and a large lamination factor. High and low voltage coils are continuously wound on core columns, so that the concentricity is good and the coils are tight. The main technical and economic indicators have reached the international advanced level of similar products.

The capacity range of s11 three-dimensional wound core transformer is 30-2500kva. The core has a three-phase three-column structure with wrapped internal and external frames, the transformer has a high degree of mechanization and a large lamination factor. High and low voltage coils are continuously wound on core columns, so that the concentricity is good and the coils are tight. The main technical and economic indicators have reached the international advanced level of similar products.

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

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

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

Tank: mainly refers to a corrugated tank, it can also be designed into a rectangular finned radiator tank.

## S11 型立体卷铁芯低损耗节能电力变压器

### S11 Three-dimensional wound core transtomer

S11 型立体卷铁芯油浸式变压器技术参数  
Technical parameters of S11 three-dimensional wound core oil-immersed transtomer

额定容量 (KVA) rated Capacity	电压组合 Voltage combination				空载 损耗 (w) no- load current	负载 损耗 (w) load loss	空载 电流 (%) no- load loss	短路 阻抗 (%) short- circuit resistance	器身重 量 (kg) tare weight	重量 (kg) 绝缘 油重 tare weight	总重 total weight	轨距 A×B (mm) trackqauge	外形尺寸 (mm) L×W×H overall dimensions
	高压 (KV) high Voltage	高压分接 范围 high voltage tapping range	低压 (KV) low voltage	联结组 标号 connection symbol									
30	11: 10.5: 10: 6.6: 6.3: 6:	±5%: 或 ±2%: ×2.5%:	0.4	Dyn11: Yzn11: Yyn0:	100	630/600	0.33	4.0	167	107	358	380×50	1010×67×159
50					130	910/870	0.30		222	113	423	380×50	1025×83×224
80					180	1310/1250	0.27		278	153	525	380×50	1114×27×314
100					200	1580/1500	0.26		278	149	554	380×50	1045×95×314
160					280	2310/2200	0.24		439	168	746	400×60	1045×05×376
200					340	2730/2600	0.23		509	197	856	400×60	1091×44×394
250					400	3200/3050	0.22		591	228	986	400×60	1114×65×397
315					480	3830/3650	0.21		679	252	1124	550×20	1190×031×422
400					570	4520/4300	0.21		818	303	1340	550×20	1225×060×477
500					680	5140/5100	0.20		964	375	1618	550×20	1394×207×562
630					810	6200	0.20		1128	417	1939	550×20	1467×270×594
800					980	7500	0.19		1424	526	2417	550×20	1570×360×636
1000					1150	10300	0.18		1660	645	2955	550×070	1731×510×656
1250					1360	12000	0.17		1802	630	3135	550×070	1761×525×768
1600					1640	14500	0.16		2255	781	3784	550×070	1740×510×928
2000					2250	18500	0.15		3166	1239	5637	660×300	1836×699×863
2500					2400	24000	0.15		3158	1541	6089	660×300	1856×762×088



# SC(B)10、11 干式电力变压器

## SC(B)10,11 Dry-type power transformer

### 概述 Introduction

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

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

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

SCB10、11 树脂浇注薄绝缘干变产品制造技术的独特之处，独成一格的创造点是：

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

The product is structurally distinguished by subsection cylindrical windings cast into formation by chopped glass fiber with axial air passage provided inside to permit heat diffusion. An appropriate cast technology helps resin penetrate to every clearance of winding, layer-to-layer and subsection-to subsection to give a maximum insulation strength and to reduce partial discharge value to a minimum ( $\leq 5\text{pc}$ ).

Prevention of fracturing on castings, restraint of bubble in the casting and reduction of partial discharge value to a minimum, these appear to be a great challenge to all transformer manufacturers and solution of it, be it a critical technology, is required and highly valued.

However, we are proud to have successfully solved the problem after practiced a numerous research, test and trial production. The technology we have developed and been awarded helps to upgrade the overall mechanical performance of resin solid and set our product - chopped glass fiber filled vacuum cast thin layered insulation windings - in new parameter: tensile strength at  $170\text{N}/\text{mm}^2$  and bending strength at  $200\text{N}/\text{mm}^2$ .

The unique technology makes SCB10 and SCB11 resin cast thin insulated dry-type transformer different with the following factors:

1. Skin-off insulation layer to allow more heat diffusion;
2. When fractures on castings can be successfully prevented, windings are consolidated by glass fiber cloth to increase its mechanical strength and capability to resist emergent short circuit.
3. Adoption of unique workmanship on windings helps to reduce partial discharge dramatically and increase electric strength of windings.
4. Foil structure for LV windings helps to reduce brow leakage and increase resistance to emergent short circuit.

## SC(B)10、11 干式电力变压器

### SC(B)10,11 Dry-type power transformer

#### 使用环境条件 Ambient conditions:

- 1、海拔高度 ≤ 3000m
- 2、最高气温：+50° C
- 3、最低气温：-10° C(最低贮存温度 -30° C)
- 4、最高日平均气温：+30° C 最高年平均气温 +20° C
- 5、根据用户需要,可提供超出上述范围使用条件的变压器

- 1、Altitude: ≤ 3,000meter
- 2、Temperature: max. +40,
- 3、Lowest temperature: -10°C (lowest storage temperature: -30°C)
- 4、Max annual average temperature: +20°C Max. daily average temperature: +30°C
- 5、Special order can be made after mutual discussion.



## SC(B)10、11 干式电力变压器

### SC(B)10,11 Dry-type power transformer

10kV 级 SC(B)10 系列无励磁调压干式配电变压器技术参数  
Technical parameters 10KV SC(B)10 No excitation regulating dry-type distribution transformer

容量 (KVA) Rated capacity	电压组合 Voltage combination				空载损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short- circuit resistance	外形尺寸 (长*深*高) Size and shape (L * w * h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6 6.3 6.6 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	190	710	2.4	4	690*700*787	250	400*650
50					270	1000	2.4		790*700*862	350	400*650
80					370	1380	1.8		870*700*947	450	550*650
100					400	1570	1.8		910*750*937	550	550*700
125					470	1850	1.6		910*750*982	650	550*700
160					540	2130	1.6		910*750*1032	750	550*700
200					620	2530	1.4		1000*800*1037	850	550*750
250					720	2760	1.4		1000*800*1177	1050	550*750
315					880	3470	1.2		1080*800*1165	1210	550*750
400					980	3990	1.2		1100*850*1193	1410	550*800
500					1160	4880	1.2	1110*850*1240	1600	550*800	
630					1340	5880	1.0	1320*850*1248	1820	660*800	
630					1300	5960	1.0	1320*850*1248	1820	660*800	
800					1520	6960	1.0	1340*900*1313	2140	660*850	
1000					1770	8130	1.0	1420*1000*1453	2520	820*950	
1250					2090	9690	1.0	1480*970*1548	2950	820*920	
1600					2450	11730	1.0	1560*1000*1783	3750	820*950	
2000					3050	15960	0.8	1630*1000*1845	4400	820*950	
2500					3600	18890	0.8	1720*1100*1915	5000	820*1050	

## SC(B)10、11 干式电力变压器

### SC(B)10,11 Dry-type power transformer

10kV 级 SC(B)11 系列无励磁调压干式配电变压器技术参数  
 Technical parameters 10KV SC(B) 11 No excitation regulating dry-type distribution transformer

容量 (kVA) Rated capacity	电压组合 Voltage combination				空载损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short- circuit resistance	外形尺寸 (长*深*高) Size and shape (L * w * h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6 6.3 6.6 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	165	710	2.2	4	690*700*787	250	400*650
50					235	1000	1.9		790*700*862	350	400*650
80					320	1380	1.8		870*700*947	450	550*650
100					350	1570	1.6		910*750*937	550	550*700
125					410	1850	1.5		910*750*982	650	550*700
160					475	2130	1.4		910*750*1032	750	550*700
200					545	2530	1.4		1000*800*1037	850	550*750
250					630	2760	1.4		1000*800*1177	1050	550*750
315					770	3470	1.2		1080*800*1165	1210	550*750
400					850	3990	1.2		1100*850*1193	1410	550*800
500					1015	4880	1.2	1110*850*1240	1600	550*800	
630					1200	5880	1.0	1320*850*1248	1820	660*800	
630					1130	5960	1.0	1320*850*1248	1820	660*800	
800					1330	6960	1.0	1340*900*1313	2140	660*850	
1000					1540	8130	0.8	1420*1000*1453	2520	820*950	
1250					1825	9690	0.8	1480*970*1548	2950	820*920	
1600					2140	11730	0.8	1560*1000*1783	3750	820*950	
2000					2700	15960	0.6	1630*1000*1845	4400	820*950	
2500					3200	18890	0.6	1720*1100*1915	5000	820*1050	

## SC(B)10、11 干式电力变压器

### SC(B)10,11 Dry-type power transformer

35kV 级 SC(B)11 系列无励磁调压干式配电变压器技术参数  
Technical parameters 35kV SC(B)11 No excitation regulating dry-type distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination				空载损耗 (W) no-load loss	负载损耗 (W) load loss	空载电流 (%) no-load current	短路阻抗 (%) short- circuit resistance	轨距A*B (mm) track gauge	噪声水平 dB noise level
	高压 (kV) high voltage	高压分接 范围 high voltage tapping range	低压 (kV) low voltage	联结组 标号 connection symbol						
50	35~38.5	±2*2.5% 或±5%	0.4	Dyn11 或 Yyn0	405	1425	2.4	6	550*550	43
100					560	2090	2.2		660*660	43
160					710	2812	1.8		660*660	44
200					790	3325	1.8		660*660	45
250					890	3800	1.6		660*660	45
315					1060	4510	1.6		820*820	47
400					1240	5415	1.4		820*820	47
500					1640	6650	1.4		820*820	48
630					1680	7695	1.2		820*820	48
800					1950	9120	1.2		820*820	49
1000					2190	10450	1.0		820*820	50
1250					2550	12730	1.0		1070*1070	50
1600					2920	15485	1.0		1070*1070	51
2000					3440	18240	0.8		1070*1070	53
2500					4010	21850	0.8		1070*1070	54

# SC(B)10、11 干式电力变压器

## SC(B)10,11 Dry-type power transformer

35kV 级 SCB10 系列无励磁调压干式电力变压器技术参数  
 Technical parameters 35KV SCB11 No excitation regulating dry-type distribution transformer

额定容量 (kVA) rated capacity	电压组合 voltage combination			联结组 标号 connection symbol	空载电流 (%) no-load current	空载损耗 (W) no-load loss	负载损耗 (W) load loss	短路阻抗 (%) short- circuit resistance	轨距A*B (mm) track gauge	噪声水平 dB noise level			
	高压 (kV) high voltage	低压 (kV) low voltage	高压分接 范围 high voltage tapping range										
800	35; 38.5;	3.15 6 6.3 10 10.5 11	±5% 或 ±2X2.5%	Yd11	1.2	2250	9400	6.0	820X820	50			
1000					1.2	2670	10900		820X820	50			
1250					1.1	3130	12920		1070X1070	51			
1600					1.1	3690	15500		1070X1070	51			
2000					1.0	4230	18200	7.0	1070X1070	52			
2500					1.0	4860	21850		1070X1070	53			
3150					0.9	6030	24500	8.0	1475X1475	57			
4000					0.9	7020	29400		1475X1475	57			
5000					0.7	8420	35000		1475X1475	57			
6300					0.7	9900	40800		1475X1475	59			
8000					Yd11 或 YNd11			0.6	11340	46100	9.0	1475X1475	59
10000								0.6	12960	55600		1475X1475	61
12500								0.5	15800	64600		1475X1475	61
16000								0.5	19300	76000		1475X1475	61



# SCBH15 型非晶合金干式变压器

## SCBH15 Amorphous alloy dry-type transformer

### 概述 Introduction

SCBH15 型非晶合金干式变压器适当成分的液体金属,以大约每秒摄氏一百万度的冷却速率,急速凝固所获得的合金,因其原子在结晶化之前即已凝固,结果使合金具有类似玻璃的非结晶原子结构及优点的软磁性质。

Amorphous alloy is a kind of alloy derived through rapid solidification of a proportioned liquid metal freezing at one million degrees centigrade per second, as its atom has been solidified prior to crystallization, the alloy is derived of amorphous atomic structure and advantage similar to glass and soft magnetic property.

### 特点 Features

- 1、超低损耗特性,省能源、用电效率高;
- 2、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SO<sub>2</sub>、CO<sub>2</sub>废气的排放,降低对环境污染及温室效应,免保养,无污染;
- 3、运转温度低、绝缘老化慢、变压器使用寿命长;
- 4、高过载能力,高机械强度;
- 5、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心饱和的问题,故以非晶铁芯制成的SCBH15型非晶合金干式变压器具有较好的耐谐波能力;
- 6、投资回收效益快。

1. Super low loss, energy efficient and high efficiency on reticulation;
2. Manufacturing of amorphous alloy requires less energy, and added by its extremely low loss nature, it helps to reduce power consumption and increase generating amount which may lead to less emission of SO<sub>2</sub> and CO<sub>2</sub>, less pollution of environment and less greenhouse effect.
3. Long durable life guaranteed by low operational temperature and slow aging of insulation material.
4. Highly capable of overload and high mechanical strength.
5. When amorphous wound core passes high frequency flux, it can still maintain low iron loss and low excitation current to restrain wound core form saturation, this empowers SCBH15 amorphous alloy dry-type transformer, as made of amorphous wound core, a good capability to withstand Harmonic wave.
6. Quick return of investment.

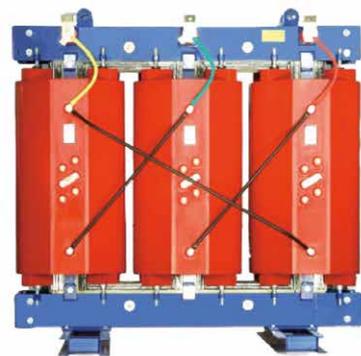
## SCBH15 型非晶合金干式变压器

### SCBH15 Amorphous alloy dry-type transformer

#### 用环境条件 Ambient conditions:

- 1、海拔高度 ≤ 3000m
- 2、最高气温：+50° C
- 3、最低气温：-10° C(最低贮存温度 -30° C)
- 4、最高日平均气温：+30° C 最高年平均气温 +20° C
- 5、根据用户需要,可提供超出上述范围使用条件的变压器

- 1、Altitude: ≤ 3,000meter
- 2、Temperature: max. +40,
- 3、Lowest temperature: -10°C (lowest storage temperature: -30°C )
- 4、Max annual average temperature: +20°C Max. daily average temperature: +30°C
- 5、Special order can be made after mutual discussion.



## SCBH15 型非晶合金干式变压器

### SCBH15 Amorphous alloy dry-type transformer

SC(B)H15 系列无励磁调压干式配电变压器技术参数  
Technical parameters SC (B) H15 No excitation regulating dry-type power transformer

额定容量 kVA	空载损耗 W	负载损耗 W	空载电流 (%)	短路阻抗 (%)
30	70	710	1.6	4.0
50	90	1000	1.4	
80	120	1380	1.3	
100	130	1570	1.2	
125	150	1850	1.1	
160	170	2130	1.1	
200	200	2530	1.0	
250	230	2760	1.0	
315	280	3470	0.9	
400	310	3990	0.8	
500	360	4880	0.8	
630	420	5880	0.7	
630	410	5960	0.7	6.0
800	480	6960	0.7	
1000	550	8130	0.6	
1250	650	9690	0.6	
1600	760	11730	0.6	
2000	1000	14450	0.5	
2500	1200	17170	0.5	8.0
1600	760	12960	0.6	
2000	1000	15960	0.5	
2500	1200	18890	0.5	

## SG(B)10、11 非包封 H 级干式电力变压器

### SG(B)10, 11 Winding unwrapped dry-type power transformer H class

#### 概述

#### Introduction

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

The product is a high performing, safest and environment-friendly dry type transformer we have independently innovated based on Mora technology by means of incorporating NOMEX paper as fundamental factor. It is intended for application in places potential with fire risk, high fluctuation of load and environment heavily polluted, applications include: airport, power plant, metallurgical activity, hospital, high building, shopping centre, densely populated district and special applications like oil chemical activity, nuclear power plant and nuclear submarine.

#### 性能特点

#### Features

- 1、散热条件好，热寿命长，过负荷能力极强，在 120% 长期过负荷、IP45 条件下无强迫风冷，可长期满负荷运行。
- 2、极高的安全及阻燃性能，在 800° C 高温长时燃烧下无烟雾产生。
- 3、极强的抗热击能力（-50° C 下立即加满负荷）
- 4、百分百防水密封性，优异的憎水性、防潮性。
- 5、独特的线圈结构和强场计算，使产品几乎无局放产生。
- 6、损耗低，节能效果显著，与 SC9 系列干式变压器相比空载损耗平均下降 20%，负载损耗下降 5%。
- 7、寿命期后可轻易将绝缘材料和铜线分离回收利用，不污染环境。

1. Heat diffusive, long heat life, capable of over loaded which ensures a longer time withstanding of 120% load; no need for forced wind cooling under IP45 condition to ensure a long service of full load.

2. Excellent safety performance and fire-resistance, which can ensure non incidence of smoke even flamed at 800°C for a long time.

3. Excellent heat resistance (instantly charged to full load under -50°C).

4. 100% water tight and excellent hydrophobicity and anti-humidity.

5. Almost no partial discharge guaranteed by unique winding structure and computation of high electric field.

6. Low loss and energy efficient. Non-load loss is averagely reduced by 20% and load loss by 5% compared with SC9 dry-type transformer.

7. Insulation material and copper wire can be readily recovered after retirement to ensure no pollution is made.

## SG(B)10、11 非包封 H 级干式电力变压器

### SG(B)10, 11 Winding unwrapped dry-type power transformer H class

#### 结构特点 Structure

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

1. Unique porcelain insulating structure by using of insulating cylinder, Mora and high frequency ceramic bricks to ensure no deformation.

2. Processing technology on HV and LV windings: MORA insulating material is selected, dipped frequently in special formula liquid for H class insulating coating in VPI vacuum pressure equipment, baked for several times, then sealed by high strength insulation material and ultimately solidified under high temperature. HV windings are arranged in continuous structure for high mechanical strength and heat diffusion.

3. Wound core is made of premium conductive silicone steel sheet, bedded, and in stepping 45° slope structure. Elastic fastening device is used to fix wound core and windings to maintain transformer in low non-load loss and low noise. Surface of wound core is specially processed. Wound core is properly fastened by tensile rod while upper and down clamp are connected by plate, and then fixed together with chassis and windings. Windings are fixed by elastic bush.

4. Leading out terminal is fixed on top of windings, branch terminal on the middle of windings. LV terminal is plate conductive strip and cold pressure welded.



## SG(B)10 非包封 H 级干式电力变压器

### SG(B) 10 Winding unwrapped H class dry-type power transformer

#### 10kV 级 SG(B)10 系列无励磁调压干式配电变压器技术参数

Technical parameters 10KV SG(B)10 No excitation regulating dry-type power transformer

容量 (kVA) Rated capacity	电压组合 Voltage combination				空载损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short- circuit resistance	外形尺寸 (长*深*高) Size and shape (L * w * h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6 6.3 6.6 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	190	760	1.8	4	920*720*830	385	550*550
50					270	1070	1.7		930*720*850	485	550*550
80					370	1480	1.6		980*720*880	605	550*550
100					410	1780	1.5		1080*720*1120	745	550*550
125					470	2100	1.5		1100*720*1120	790	550*550
160					550	2390	1.3		1180*720*1240	850	550*550
200					650	2850	1.3		1210*720*1240	975	660*660
250					740	3100	1.3		1250*720*1250	1165	660*660
315					880	3950	1.1		1310*720*1260	1385	660*660
400					1000	4500	1.1		1370*880*1280	1655	660*660
500					1180	5500	1.1	1275*1050*1310	1950	660*660	
630					1350	6650	0.9	1290*1050*1330	2330	660*660	
630					1300	6800	0.9	1375*1050*1345	2265	660*660	
800					1540	7900	0.9	1450*1050*1405	2825	820*820	
1000					1780	9200	0.9	1500*1050*1440	3225	820*820	
1250					2100	11000	0.9	1500*1050*1530	3640	820*820	
1600					2550	13400	0.9	1560*1050*1705	4390	820*820	
2000					3050	16600	0.7	1650*1200*1790	5180	1070*1070	
2500					3600	19600	0.7	1670*1200*1910	6135	1070*1070	

## SG(B)11 非包封 H 级干式电力变压器

### SG(B)11 Winding unwrapped H class dry-type power transformer

#### 10kV 级 SG(B)11 系列无励磁调压干式配电变压器技术参数

Technical parameters 10KV SG(B)11 No excitation regulating dry-type power transformer

容量 (kVA) Rated capacity	电压组合 Voltage combination				空载损耗 (W) No-load loss	负载损耗 (W) Load loss	空载电流 (%) No-load current	短路阻抗 (%) Short- circuit resistance	外形尺寸 (长*深*高) Size and shape (L * w * h)	总量 (kg) The total	轨距 Gauge
	高压 (KV) High voltage	高压分接 范围 High voltage tapping range	低压 (KV) Low voltage	联结组标号 Connection symbol							
30	6 6.3 6.6 10 10.5 11	±2*2.5% 或 ±5%	0.4	Dyn11 或 Yyn0	160	760	1.8	4	920*720*830	385	550*550
50					230	1070	1.7		930*720*850	485	550*550
80					320	1480	1.6		980*720*880	605	550*550
100					370	1780	1.5		1080*720*1120	745	550*550
125					425	2100	1.5		1100*720*1120	790	550*550
160					495	2390	1.3		1180*720*1240	850	550*550
200					585	2850	1.3		1210*720*1240	975	660*660
250					670	3100	1.3		1250*720*1250	1165	660*660
315					790	3950	1.1		1310*720*1260	1385	660*660
400					900	4500	1.1		1370*880*1280	1655	660*660
500					1060	5500	1.1		1275*1050*1310	1950	660*660
630					1215	6650	0.9		1290*1050*1330	2330	660*660
630					1170	6800	0.9		1375*1050*1345	2265	660*660
800					1385	7900	0.9		1450*1050*1405	2825	820*820
1000					1575	9200	0.9		1500*1050*1440	3225	820*820
1250					1890	11000	0.9		1500*1050*1530	3640	820*820
1600					2300	13400	0.9		1560*1050*1705	4390	820*820
2000					2800	16600	0.7		1650*1200*1790	5180	1070*1070
2500	3300	19600	0.7	1670*1200*1910	6135	1070*1070					

# ZGS11-Z · F-40.5kV 风力发电箱式变电站

## ZGS11-Z·F-40.5kV Wind Power Box Transformer Substation

### 概述 Introduction

ZGS11-Z.F40.5kV/0.69kV 系列风力变电站是将风电机组发出的 0.6-0.69kV 电压提升到 35kV 或 10kV 后，并网输出的专用变电设备，是我公司根据国内风力发电市场需求而量身定做的专供风力发电的新产品。它的出现适应了全国范围建立风力发电场的趋势，是集可靠性、安全性、实用性、经济性于一体的风力发电系统的配套产品。

Wind power transformer substations in series of ZGS11-Z·F-40.5kV/0.69kV are able to step up voltage generated by wind generating unit from 0.6-0.69kV to 35kV or 10kV and then outlet to the reticulation, a new product developed to meet the need of the customer of wind power generating. As a facility tailored for wind power generating and promised by growing trend of the wind power application across China, the series are competent by its reliability, safety, adoptability and cost-effectiveness.

### 使用环境条件 Ambient conditions:

环境温度：最高 +40℃，最低 -40℃  
海拔高度：≤ 3000m  
湿度：日平均 ≤ 100% 月平均 ≤ 90%  
地震裂度：8 度（中国 12 级度标准）  
户外风速：不大于 50m/s 风压 100kgf/m<sup>2</sup>  
耐污等级：III 级污秽地区  
安装场所：户外，安装在无火灾、爆炸危险、无导电埃、化学腐蚀性气体的场所  
覆冰厚度：10mm

Temperature: max. +40°C, min. -40°C  
Altitude: ≤ 3,000meter  
Humidity: daily average ≤ 100%, monthly average ≤ 90%  
Seismic intensity: 8 degrees (Chinese standard ranging from 1 to 12 degrees)  
Outdoor wind velocity: not more than 50m/sec. wind pressure 100kgf/m<sup>2</sup>  
Pollution level: III  
Place of installation: outdoor, free from fire, explosive, conductive dust and chemical corrosive.  
Thickness of ice capping: 10mm

### 产品特点 Product features:

1、本产品的变压器采用优质硅钢片材料，经电磁优化设计后，其空载损耗和负载损耗均比同类产品低，最大限度地保证了风能的充分利用；

## ZGS11-Z · F-40.5kV 风力发电箱式变电站 ZGS11-Z·F-40.5kV Wind Power Box Transformer Substation

- 2、安全：高压部分采用负荷开关 + 熔断器组合电器，可以快速可靠地保护变压器，低压部分可采用断路器或刀熔开关作为主开关，配置小容量变压器提供箱变和风塔的 0.4kV 照明及检修用电；
- 3、耐高温、过负荷运行能力强；
- 4、寿命长：使用寿命超过 20 年；
- 5、免维护：寿命期内无需滤油、换油，变压器的密封件与变压器同寿命；
- 6、防护等级高：风力变的箱体采用双层门密封结构，所有门的闭合处都采用密封胶条密封，通风口设有防尘装置，能有效防止沙尘、雨雪对风力变的侵扰，防护等级达到 IP54。

1. Super quality silicon steel sheet is used for transformer making. With electro-magnetic optimum design, the product is distinguished by its less non-load and load loss than the like product and can ensure a maximum use of wind power.

2. Safety: to maintain safe operation of high voltage, load switch + fuse combination unit are used to protect the transformer in a quick and reliable way, and circuit breaker or fuse-bloc as main control of low voltage circuit while small capacity transformer is provided to ensure 0.4kv power to illuminate on box transformer and wind tower when service is made.

3. Resistent to high temperature and capable of over load performance.

4. Durability: life more than 20 years.

5. High level of hermit: transformer's cubicle consists of double-layer door well sealed against pollution. Sealing rubber strip applies to every joint of the door to ensure dust-tight. Anti-dust device is fixed on ventilation opening to keep away dust, rain or snow. All these help to upgrade the enclosure level to IP 54.

### 风力变壳体结构 Frame structure, wind power transformer

- a、总体布置：品字型；
- b、底座结构：底座由标准槽钢焊接；焊接成型后将底座整体放入表面处理池中进行前期预处理，工序包括四部分：酸洗、磷化、底漆、面漆（烘烤）；面漆选用进口优质户外漆，漆膜厚度为 0.3mm；



## ZGS11-Z · F-40.5kV 风力发电箱式变电站

### ZGS11-Z·F-40.5kV Wind Power Box Transformer Substation

c. 箱体结构：变压器油箱为 6.0 厚热轧钢焊接而成，采用全自动 CO<sub>2</sub> 气体保护焊接工艺，散热片为 1.0mm 优质低碳冷制作，采用等离子焊接工艺而成，严格保证焊接质量，确保油箱永无渗透油之忧，前箱体由 2.5mm 厚冷轧钢板弯制而成，门板由 30mm 厚夹层复合钢板（夹层填充材料聚丙烯泡沫聚氨酯，厚度为 30mm），具有抗辐射、隔热、隔音、防凝露等优点；箱体门锁材料为铸铝型专用锁，带把手和锁盒盖，表面镀锌处理；门框内侧镶有高弹性、耐老化的密封胶条，门下侧设有缓冲风钩。

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

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

f. 箱体防护等级：变压器：IP68；考虑到箱变的安装地环境恶劣，高低压箱体均用冷轧钢板迷官式折边，配以高强度耐老化的密封件，可是高低压箱体的防护等级达到 IP54；

#### 1、箱式变电站接地系统

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

#### 2、箱式变电站使用寿命：

箱变的整体寿命按 30 年设计（高低压熔丝等易损件更新除外）；

a. General arrangement: “^” pattern is taken;

b. Chassis structure: standard each-bitted steel is chosen and welded together. Then the entire chassis will be pre-treated in process cell though four steps: acid wash, phosphorization, primary coat and varnishing (baking). Imported quality varnish is selected and coating film thickness is maintained at 0.3mm.

c. Frame structure: 6.0 thick hot rolled steel is chosen for oil tank of transformer and then welded into the fabrication by automatic carbon dioxide gas shielded welding process. Premium low-carbon steel sheet 1.0mm is used to make cooling pin, configured by cold smith and fabricated by plasma welding to ensure non oil leak at all. The front frame is made by 2.5mm thick cold rolled steel sheet after bending, and the door plank by 30mm thick clad steel sheet with polypropylene foam and polyurethane 30mm thick as sandwich, which makes it resistant to radiation and frost, insulative of heat and noise. The door is equipped with aluminum cast lock complete with galvanized handle and lock box. Inner joint of door frame is well closed by aging-resistance and elastic rubber strip and buffer wind catch is equipped on lower part of the door.

d. Top structure of the cubicle: cold rolled steel sheet is filled with foam layer thick at 30mm, 100mm vent pipe laid between foamed layer and top insulation plate. After fabrication, the entire frame has high strength, being insulative of heat, anti-radiation and frost resistant, and able to withstand the weight of 300mm thick snow or 10mm thick ice cap.

e. Cubicle surface treatment: frame surface is coated by plastic (outdoor type), which ensures the surface 10years free from colour fading and 30years free from corrosion. Colour is subject to decision of the manufacturer.

f. Shield level of the cubicle: transformer: IP 68. Considering the tough environment where box transformer is to be placed, cold rolled steel sheet is selected for fabrication of high and low voltage frame, with edge labyrinth ruffled and complete with aging sealing component. All these ensure the shield level of frame at IP54.

#### 1. Earthing system of box transformer

## ZGS11-Z · F-40.5kV 风力发电箱式变电站

### ZGS11-Z·F-40.5kV Wind Power Box Transformer Substation

Copper earthing busbar is provided for box transformer. The busbar runs through each compartment and connects properly with non-load metal component and metal structure component and anchored at chassis copper earthing terminal (M12). In addition, another 4 earthing terminals are provided at the outside of chassis connecting with earthing busbar (M12), these allow customer to connect terminals with foundation earthing network.

#### 2. durable life of box transformer

The box transformer is designed to have a durable life of 30years (except the replacement of consumable component such as fuses).

### 主要技术参数 Technical parameters

高压负荷开关性能表  
Specifications for HV load switch

序号 S/N	项目 Item	保证值 Guaranteed value
1	型式 Type	ZGS-Z.F40.5/0.69
2	电压等级 Voltage class	40.5(kV)
3	最大相对电压 Max.phase-to-phase voltage	40.5(kV)
4	最大相对地电压 Max.phase-to-earth voltage	40.5(kV)
5	额定短时工频耐受电压 Rated short duration power frequency withstand voltage	95kV/1min
6	雷电冲击耐受电压峰值 Peak lightning impulse withstand voltage	200(kV)
7	额定电流 Rated current	630(A)
8	短时耐受电流 Short time withstand current	20kA/2s
9	额定开断能力 Rated breaking capacity	630(A)
10	主回路电阻 Main circuit resistance	不大于150(uΩ)
11	机械寿命 Mechanical life	不小于2000次 Not less than2000times

# ZGS11-Z · F-40.5kV 风力发电箱式变电站

## ZGS11-Z-F-40.5kV Wind Power Box Transformer Substation

变压器特性及性能表  
 Transformer property and specifications

序号 S/N	项目 Item	保证值 Guaranteed value
1	型式 Type	三相\双绕组\油浸自冷\低损耗\全密封免维护 3-phase,dual windings,oil-immersed and self-cooling, low loss,fully-sealed,andmaintenance-free
2	最高工作电压 Max.working voltage	40.5(kV)
3	额定频率 Rated frequency	50(Hz)
4	额定容量 Rated capacity	800-1600(kVA)
5	电压比 Voltage ratio	
6	联接组别 Connection groups	D,yn11 38.5±2*2.5%/0.69(kV)
7	阻抗电压 Impedance voltage	4.5%-6.5%
8	调压方式 Voltage regulation mode	无励磁分接开关 off circuit tap changer
9	变压器油 Transformer oil	克接玛依45#绝缘油 Kelamayi45#insulating oil
10	额定短时工频耐受电压 Rated short duration power frequency withstand voltage	95kV/1min(kV)
11	雷电冲击耐受电压峰值 Peak lightning impulse withstand voltage	215(kV)
12	冷却方式 Cooling type	ONAN
13	外壳防护等级 Enclosure protection class	油箱IP68, 箱体IP54 Oil tank:IP68;box:IP54
14	温升 Temperature rise	线圈:63k, 顶层油:53k Coil:63k;top level oil:53k
15	空载电流 No load current	0.6%
16	噪音水平 Noise level	不大于50db No larger than 50db

## ZGS11、ZGS13 型美式箱变

### ZGS11,ZGS13 Padmounted transformer

#### 概述 Introduction

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

Combined transformer, also known as Padmounted transformer, is widely used in industrial zone, living quarter, business centre, urban road and tall buildings because of its reliable power supply, appropriate configuration, easy mounting, flexibility, easy operation and compacted space. However, our product is different from the like padmounted transformer currently available in China, and such differences are marked by our integrity design which incorporates transformer wound core, high-voltage load switch and protection fuse into same oil tank, hence only a small size is required.

#### 使用环境条件 Ambient conditions:

- 1 环境温度：最高温度 +40 摄氏度，最低温度 -30 摄氏度
- 2 周围湿度：日平均值不大于 95%，月平均值不大于 95%
- 3 海拔高度 ≤ 3000m
- 4 抗地震度：地震烈度不超过 8 度
- 5 周围空气应不受腐蚀性，无可燃性气体 水蒸气明显污污染
- 6 无经常性的剧烈震动的场所
- 7 安装地点倾斜度不大于 3 度
- 8 在超过 GB3906 规定的正常的环境条件下使用时，由用户和我公司协商

1. Temperature: max. +40°C , min. -30°C
2. Humidity: daily average ≤ 95% , monthly average ≤ 95%



## ZGS11、ZGS13 型美式箱变

### ZGS11,ZGS13 Padmounted transformer

3. Altitude:  $\leq 3,000$  meter
4. Seismic intensity: not more than 8 degrees
5. Ambient air: free from corrosive, flammable and steam disturbance
6. Place: free from frequent quake
7. Mounting place: decline not more than three degrees
8. Consultations should be made with manufacturer if conditions of mounting place does not conform to conditions set in GB3906 standard.

#### 产品特点 Product features:

体积小，结构紧凑，仅为同容量欧式箱变的三分之一左右。

全密封，全绝缘结构，无需绝缘距离，可确保人身安全。

既可用于环网，又可用于终端，转换十分方便，提高了供电的可靠性。

变压器性能卓越：低损耗，低噪音、低温升、过载能力强、抗短路、耐冲击能力强。

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

采用双熔丝保护，降低了运行成本，插入式熔断器为双敏熔丝（温度、电流）

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

采用 DYN11 接法及三相五柱式结构，优点是电压质量高，中性点不飘移、噪音低、防雷性好。

- small size, well compacted, size measured only as one third of the like padmouted transformer;
- tight enclosed, total insulation configuration. Safety is ensured as no insulation space is needed.
- flexible adoption, either to grid or terminal, makes power supply reliable.
- excellent performance: low loss, low noise, limited temperature rise, eligible to overload and resistent to short circuit and impact.
- cable joint is able to operate on 200A load current and can work as load switch in case of emergency, or isolation switch.
- double fuse is provided for circuit protection with UNIKA fuse as plug fuse. This reduces the operational cost.
- High ignition point oil (R-TEMP oil, ignition point high at 312 °C) is used against any fire possibility in the building.
- DYN11 connection is used in three-phase five-pole construction. This helps to ensure a quality voltage, no drift of neutral point and maintain operation in low noise and resistent to lightning.

## ZGS11、ZGS13 型美式箱变

### ZGS11,ZGS13 Padmounted transformer

#### 主要技术参数 Technical parameters

序号 No.	项目 Item	单位 unit	技术参数 Technical parameters
1	额定电压 Rated voltage	一次侧 primary side	6~10
2		二次侧 secondary side	0.4
3	额定工作电压 Rated working voltage	kV	12
4	额定频率 Rated frequency	Hz	50
5	额定容量 Rated capacity	kVA	100~1250
6	1分钟工频耐受电压 1-Minute power frequency withstand voltage	kV	35
7	雷电冲耐受电压 Lightning withstand voltage	kV	(6~10)±2.5%
8	2秒短时耐受电流 2-second withstand current	kV	12
9	高压后备限流熔断器遮断容量 Reserve high-voltage current-limiting fuse breaking	kV	50
10	无载调压 non-load voltage regulation		
11	环境温度 Ambient temperature	°C	-20~40
12	允许温升 Allowed temperature rise	K	55

# ZGSH15 型非晶合金美式箱变

## ZGSH15 Amorphous alloy padmounted box transformer

### 概述 Introduction

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

Amorphous alloy combined transformer, also known as Amorphous alloy padmounted transformer, is widely used in industrial zone, living quarter, business centre, urban road and tall buildings because of its reliable power supply, appropriate configuration, easy mounting, flexibility, easy operation and compacted space. However, our product is different from the like padmounted transformer currently available in China, and such differences are marked by our integrity design which incorporates transformer wound core, high-voltage load switch and protection fuse into same oil tank, hence only a small size is required.

### 使用环境条件 Ambient conditions:

- 1 环境温度：最高温度 +40 摄氏度，最低温度 -30 摄氏度
- 2 周围湿度：日平均值不大于 95%，月平均值不大于 95%
- 3 海拔高度 ≤ 3000m
- 4 抗地震：地震烈度不超过 8 度
- 5 周围空气应不受腐蚀性，无可燃性气体、无水蒸气明显污染
- 6 无正常性的剧烈震动的场所
- 7 安装地点倾斜不大于 3 度
- 8 在超过 GB3906 规定的正常的环境条件下使用时，由用户和我公司协商

1. Temperature: max. +40°C, min. -30°C
2. Humidity: daily average ≤ 95%, monthly average ≤ 95%
3. Altitude: ≤ 3,000meter
4. Seismic intensity: not more than 8 degrees
5. Ambient air: free from corrosive, flammable and steam disturbance
6. Place: free from frequent quake
7. Mounting place: slope decline not more than three degrees
8. Consultations should be made with manufacturer if conditions of mounting place does not conform with conditions set in GB3906 standard.

## ZGSH15 型非晶合金美式箱变

### ZGSH15 Amorphous alloy padmounted box transformer

#### 产品特点

#### Product features:

体积小，结构紧凑，仅为同容量欧式箱变的三分之一左右。

全密封，全绝缘结构，无需绝缘距离，可确保人身安全。

既可用于环网，又可用于终端，转换十分方便，提高了供电的可靠性。

变压器性能卓越：低损耗，低噪声，低温升，过载能力强，抗短路、耐冲击能力强。

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

采用双熔丝保护，降低了运行成本，插入式熔断器为双敏熔丝（温度、电流）

选用高燃点油（R-TEMP 油，燃点高达 312 摄氏度），可置于建筑内除火灾隐患。

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

- small size, well compacted, size measured only as one third of the like padmounted transformer;
- tight enclosed, total insulation configuration. Safety is ensured as no insulation space is needed.
- flexible adoption, either to grid or terminal, makes power supply reliable.
- excellent performance: low loss, low noise, limited temperature rise, eligible to overload and resistant to short circuit and impact.
- cable joint is able to operate on 200A load current and can work as load switch in case of emergency, or isolation switch.
- double fuse is provided for circuit protection with UNIKA fuse as plug fuse. This reduces the operational cost.
- High ignition point oil (R-TEMP oil, ignition point high at 312 °C) is used against any fire possibility in the building.
- DYn11 connection is used in three-phase five-pole construction, helping to ensure a quality voltage, no drift of neutral point and maintain operation in low noise and resistant to lightning.

## ZGSH15 型非晶合金美式箱变

### ZGSH15 Amorphous alloy padmounted box transformer

#### 主要技术参数 Transformer Specifications

No.	Item 项目	单位 Unit	技术参数 Technical parameter
1	Rated voltage 额定电压	一次侧 Primary side	
2		二次侧 Secondary side	
3	额定工作电压 Rated operation voltage	kv	
4	额定频率 Rated frequency	Hz	
5	额定容量 Rated capacity	kVA	
6	1 分钟工频耐受电压 1-Minute power frequency withstand voltage	kv	
7	雷电冲耐受电压 Lightning withstand voltage	kv	
8	2 秒短时耐受电流 2-second withstand current	kv	
9	高压后备限流熔断器遮断容量 Reserve high-voltage current-limiting fuse breaking capacity	kv	
10	无载调压 non-load voltage regulation		
11	环境温度 Ambient temperature	°C	
12	允许升温 Allowed temperature rise	k	



## YB 系列组合变电站 ( 欧式箱变 )

### YB Combined transformer substation in YB series (pre-installed cabinet type transformer substation)

#### 概述 Introduction

YB 系列式变电站, 俗称欧式箱变, 是将高压电器设备, 变压器、低压电器设备组合面紧凑型成套配电装置, 用于城市高层建筑、城乡建筑、居民小区、高新技术开发区、中小型工厂、矿厂油田以及施工用电等场所, 作配电系统中接受和分配电能之用。

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

The substation in series YB, also known as pre-installed cabinet type transformer substation, incorporates high voltage electric equipment, transformer and low voltage electric equipment together to form a complete facility. As a power feed-in and distributor, it has a range of application from tall building in the city, urban and rural facilities, hi-tech development zone, medium and large-scale plant, mines, oil field to on-going construction works.

YB combined transformer substation is competent for its self-integrity, small size, compaction, reliable and safe operation, easy service and floatability. As it only occupies 1/10 - 1/5 space that like capacity substation often requires, installation of such substation will dramatically reduce design and construction work, which consequently leads to lower cost. New and credited to its adaptable both to ring network distribution system and to double power distribution system or radiation terminal power distribution system, the substation is often chosen for urban or rural substation construction or as a substitute in substation renovation works.

## YB 系列组合变电站 (欧式箱变)

YB Combined transformer substation in YB series (pre-installed cabinet type transformer substation)

### 平面布置及外形尺寸 Layout and outer measurement

YB 系列箱式变电站分 "目" 字型排列 (图 1-1\图 1-2) 和 "品" 字型排列 (图 1-3\图 1-4)。

Layout for YB combined transformer substation is shown as "II" (figure 1-1, 1-2) or "T" (figure 1-3, 1-4) pattern.

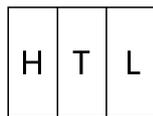


图1-1  
Fig. 1-1

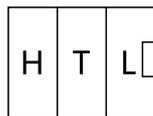


图1-2  
Fig. 1-2

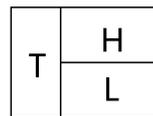


图1-3  
Fig. 1-3

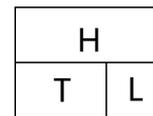


图1-4  
Fig. 1-4

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

Layout for BY series cabinet substation. H-high voltage chamber, T-transformer chamber, L-low voltage chamber

外形尺寸见图 2、图 3、表 1

See figure2 , 3 and table 1 for exterior measurement

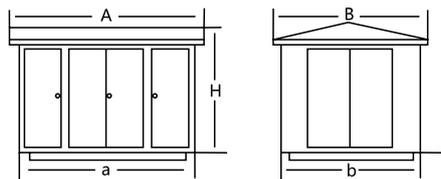


图 2 YB 系列箱式变电站外形图 ("目" 字型排列)  
Fig.2 appearance of YB substation (II)pattern

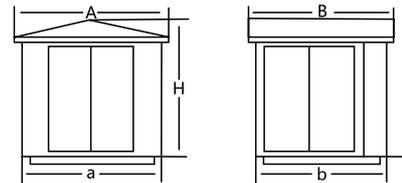


图 2 YB 系列箱式变电站外形图 ("品" 字型排列)  
Fig.2 appearance of YB substation (T)pattern



## YB 系列组合变电站 ( 欧式箱变 )

YB Combined transformer substation in YB series (pre-installed cabinet type transformer substation)

### 主要技术参数 Technical parameters

序号 No	项目 Item	单位 Unit	高压电器 HV appliance	变压器 Transformer	低压电器 LV appliance
1	额定电压Ue Rated voltage Ue	kV	7.2、12	6/0.4、10/0.4	0.4
2	额定容量Se Rated capacity Se	kVA		目型：200-1250	
3	额定电流Le Rated current Le	A	200-600		100-3000
4	额定开断电流 Rated breakoff current	A	负荷开关400-630A Load switch		15-63
		kA	组合电器取决于熔断器 GIS subject to fuse breaker		
5	额定短时 耐受电流 Rated short-time with stand current	kA	20(2S)	200-400kVA	15(1S)
			12.5(4S)	400kVA、	30(1S)
6	额定峰值 耐受电流 Rated peak withstand current	kA	31.5、50	200-400kVA	30
				400kVA	63
7	额定关合电流 rated short-circuit breaking current	kV	31.5、50		
8	工频耐受 电压1min 1Min. power equency withstand voltage	kV	相对地及相间42、30 Phase to earth & phase-to-phase 42, 30	油变：35/5min	不大于300时2kV
			隔离断口48、34 Isolating distance	干变：28/5min	300, 660V时2.5kV
9	雷电冲击 Lightning impact	kV	相对地及相间75、60 Phase to earth & phase-to-phase 75, 60	75	
			隔离断口85、75 Isolating distance		
10	噪声水平 Noise level	dB		油变：小于55	
				干变：小于65	
11	防护等级 Protection degree		Ip33	Ip23	Ip33
12	外形尺寸 Exterior measurement	根据所选变压器和形式，选定不同的外形尺寸 Exterior measurement subject to transformer and pattern			

## GGD 型交流低压配电柜

### GGD AC low voltage distribution cabinet

#### 概述 Introduction

GGD 型交流低压配电柜适用于发电厂、变电所、工业企业等电力用户作为交流 50Hz、额定工作电压 380V 额定电流至 3150A 的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。该产品分断能力高，额定短时耐受电流达 50kA。线路方案灵活、组合方便、实用性强、结构新颖等特点。该产品是我国组装式、固定面板开关柜的代表产品之一。该产品符合 IEC439《低压成套开关设备和控制设备》，GB7251《低压成套开关设备中》等标准。

AC low voltage distribution cabinet is designed for illumination, power supply, switch-over, distribution and management in 380V 3150A distribution system and meant for application in power plant, transformer station, mine and industry. Having a new structure equipped with sound breaking capacity and up to 50kA short-time current withstand, the product offers a wide range of wiring diagram and combination to permit it in various need and is acknowledged as a symbol of assembled stationary panel cabinet.

The product conforms to <LV Complete Switchgear and Control Equipment> set IEC439 standard and <LV Complete Switchgear> standard set in GB7251.

#### 使用环境条件 Ambient conditions:

周围空气温度：不高于 +40°C，不低于 -5°C。24h 内的平均温度不得超过 +35°C。

适用类型：户内

海拔高度：2000m。

周围空气相对湿度：最高温度为 +40°C 时不超过 50%，在较低温度时允许有较大的相对湿度：（例如 +20°C 时为 90%）。应考虑到由于温度的变化可能会偶然产生凝露的影响。

垂直面倾斜度：不超过 5%。

用户有特殊要求时可与本公司协商解决。

1. Temperature: max. +40°C, min. -5°C, average temperature not more than +35°C
  2. Place: indoor
  3. Altitude: 2,000meter
  4. Relative humidity: not more than 50% at + 40°C, allowable of bigger Humidity at lower temperature: (i.e 90% at+20°C)Cautious of condensation when temperature changes.
  5. Gradient: not more than 5%
- Consultations should be made with manufacturer if placing a special order .

## GGD 型交流低压配电柜 GGD AC low voltage distribution cabinet

### 主要技术参数 Technical parameters

型号 Model	额定电压 (V) Rated voltage	额定电流 (A) Rated current(A)		额定短路开关电流 (kA) Rated short-circuit breaking current (kA)	额定短时耐受电流 (IS) (kA) Rated short-time withstand current (IS) (kA)	额定峰值耐受电流 (kA) rated peak withstand current (kA)
GGD1	380	A	1000	30	30	50
		B	600(630)			
		C	400			
GGD2	380	A	1500 ( 1600)	42	42	63
		B	1000			
		C	600			
GGD3	380	A	3150	100	85	105
		B	2500			
		C	2000			



## GGD 型交流低压配电柜

### GGD AC low voltage distribution cabinet

#### 2. 辅助电路方案

辅助电路的设计分供电方案和发电方案两部分。

#### 3. 主母线

额定电流在 1500A 及以下时采用单铜排母线。额定电流大于 1500A 时采用双铜排母线。母线的搭接面均采用搪锡工艺处理。

#### 4. 电器元件选择

a. GGD 柜主要采用国内已能批量生产的较先进的电器元件。

b. HD13BX 和 HS13BX 型旋转操作式刀开关是 NLS 为满足 GGD 柜独特结构的需要而设计的专用元件，它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。

c. 如设计部门根据用户需要，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造成制造和安装方面的困难。

d. 为进一步提高电路的动稳定能力，GGD 柜的母线支撑采用专用的 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 复合材料热塑成型，绝缘强度高、自熄性能好，结构独特，只需调整积木式间块即可方便地组合成单母线或双母线夹。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。

#### 2. Ancillary circuit scheme

Ancillary circuit design includes power supply scheme and power generating scheme.

#### 3. Busbar

Copper busbar single row will be selected if rated current is below 1500A, and double row if rated current is above 1500A. Busbar's overlapping will be soldered.

#### 4. Selection of electric appliance

A. State-of-art electric appliance in massive production by Chinese manufacturers will be chosen and installed in GGD cabinet.

B. HD13BX and HS13BX rotating knife switch are specially designed by NLS to fit the unique configuration of GGD cabinet, a new and applicable appliance that has changed the operation method of the mechanism while keeping the advantage of the old product.

C. GGD cabinet has a good flexibility to allow adoptions of other updated and better appliances as may decided by customer, and can eliminate any barrier in terms of appliance manufacturing or installation.

D. To give a dynamic stability of the circuit, GGD cabinet is equipped with ZMJ combination generatrix clamp and insulation bracket for busbar support. The clamp is made of inflaming and high strength PPO composite material fabricated by thermal forming, which ensure it of high insulation and self-extinguish. The unique structure can readily help to re-organize inter blocks into single row generatrix clamp or double row. Bushed moulding structure is adopted for insulation bracket, providing a good solution for creepage distance problem in a cost saving way.

## 结构特点

### Structure

1. GGD 型交流低压配电柜的柜体采用通用柜的形式，框架用 8MF 冷弯型钢局部焊接或组装而成，框架零件及专用配套零件

## GGD 型交流低压配电柜

### GGD AC low voltage distribution cabinet

由本公司生产配套供货，经保证柜体精度和质量。通用柜的零部件按模块原理设计，并有 20 模的安装孔，通用系数高。可以使工厂实现预生产。既缩短了生产制造周期，也提高了工作效率。

- 2、GGD 柜设计时充分考虑到柜体运行中的散热问题。在柜体上下两端均有不同数量的散热槽孔，当柜内电器元件发热时，热量上升，通过上端槽孔排出，而冷风不断地由下端槽孔补充进柜，使密封的柜体自下而上的形成一个自然通风道，达到散热的目的。
- 3、GGD 柜按照现代工业产品造型设计的要求，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。
- 4、柜门用转轴式活动铰链与构架相连、安装拆卸方便。门的拆边处均嵌有一根山型橡塑条，关门时门与框架之间的嵌条有一定的压缩行程，能防止门与柜体之间直接碰撞，也提高了门的防护等级。
- 5、装有电器元件的仪表门用多股软铜线与框架相连。柜内的安装件与框架间用滚花垫圈连接，整柜构成完整的接地保护系统。
- 6、柜体面漆可选用聚脂桔形烘漆，亦可选用喷塑粉工艺处理。均具有附着力、质感好的特点。整柜呈亚光色调，避免了眩光效应，给值班人员创造了较舒适视觉环境。
- 7、柜体的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。
- 8、柜体的防护等级为 IP30，用户也可根据使用环境的要求在 IP20-IP40 之间选择。

1. The cabinet of GDD AC low voltage distribution cabinet is fabricated for universal type. Cubicle is made of 8MF shaped steel, bended and locally welded or assembled into form. The cabinet, frame accessories and complete accessories are manufactured and delivered by our high skilled and experienced team of production personnel who consistently ensure that each and every production activity factors in an adherence to accuracy and high quality benchmarks established by the organization. The accessories of universal cabinet, designed on module principle and equipped with 20mm mounting hole, are universal, too. Pre-fabrication of cabinet and accessories shortens the production cycle and make the production efficient.

2. GDD design provides a solution to heat generated form cabinet during performance. For the purpose, a number of heat diffusive holes or openings are available on both top and bottom of the cabinet. When electric components inside cabinet warms up and gain more heat, the hear will go up and get out through top holes while cold air is continuously blown in through bottom holes to form a natural ventilation to help cool the cabinet.

3. In pursuit of design value appreciated by contemporary industry, Golden ratio is employed to arrange space of the cabinet and size of each cell while aesthetic value is well represented.

4. The door panel is fixed by axial hinge on the frame, easy for mantle or dismantle where every joint is sealed by "A" type rubber trip to give a compression absorb to prevent direct smash between panel and door frame. This ensures the door of higher protection.

5. Instrument mounted panel connects with frame by soft copper lines and components inside are fixed on the line by serrated washers to ensure the entire cabinet in earthing system.

6. Cabinet surface is finished by polyester orange-peel baking paint or plastic spraying powder in its subtle and elegant varnish and avoidance of dazzling brightness, all can give an ease and relaxing sense to secure a comfortable environment for man to work.

7. The top lid of the cabinet can be removed wherever necessary to permit site installation and adjustment of busbar, with four lifting lugs available for crane load and unload.

8. The cabinet has a protection degree of IP30, however, special order can be made between IP20 to IP40.

## GCK、GCL 系列低压抽出式开关柜

### GCK, GCL Low-voltage Withdrawable Switchgear Assembly

#### 概述

#### Introduction

GCK、GCL 系列低压抽出式开关柜是我公司根据广大用户的需求而设计的，具有结构先进，外形美观，电气性能高。防护等级高，安全可靠，维护方便等优点，是冶金、石油、化工、电力、机械、轻纺等行业低压供电系统理想的配电装置。被国家列为两网改造推荐产品和第九批节能产品。

LV withdrawable switchgear is another product we are proud to have executed design, manufacturing and delivery to meet the various need of customers with advanced configuration, aesthetics value, electric performance, reliability, safety and easy maintenance. Meant for power distribution in LV power system for its application in metallurgical, oil, chemical, power, textile industries, the product is recognized as priority product for urban and rural power grid renovation and energy-efficient product on 9th recommendation list by authority.

#### 结构特点

#### Structure Features

GCK、GCL 的基本框架为组合装配式结构，框架的全部结构件都经过镀锌、喷塑处理，通过螺钉紧固互相连接成基本框架，再按需要加上门，挡板、隔板、抽屉、安全支架以及母线和电器组件等零件，组装成一台完整的控制中心柜，本柜结构有下列特点。

- 1、框架采用异形钢材，利用角板定位，螺栓连接的无焊接结构。
  - a、零部件的成型尺寸，开孔尺寸，设备间隔实行模数化。（模数 E=20mm, 下同）
  - b、内部结构件采用镀锌处理。
  - c、外部经磷化处理；然后采用静电环氧粉末喷涂。
  - d、柜架分成母线室、功能单元、电缆室三个相互隔离的区间，可防止事故扩散和便于带电维修。
- 2、功能单元
  - a、功能单元：馈电单元、电动机单元、公用电源单元。
  - b、抽屉层高度模数为 200mm，分为 1/2 单元、1 单元、3/2 单元、2 单元、5/2 单元、3 单元六尺寸系列。单元回路额定电流 630A 及以下。
    - c、每台 MCC 柜最多能安装 9 个一单元的抽屉或 18 个 1/2 单元的抽屉。
    - d、隔室的门板由主开关的操作机构与抽屉进行机械连锁，主开关在合闸位置时，门板打不开。
    - e、主开关的操作机构可用一把撬锁定在合闸或分闸位置，可安全的进行电器设备的维修。
    - f、功能单元隔室采用金属隔板隔开。
    - g、隔室中的活门，随着抽屉的推进和拉出自动打开和封闭，使之在隔室中不能触及垂直母线。
    - h、功能单元背面具有主电路进出线插头，辅助电路二次插头及插头。
    - i、接地插头使抽屉在分离试验连接位置时，保证了保护电路的连续性。
- 3、母线系统
  - a、GCK、GCL 母线系统采用三相四线制、三相五线制，水平母线装于柜顶，N 线、PE 线既可以装于柜顶，也可以装于柜体下部。
  - b、三相水平母线采用铜母线，机械强度高、散热性好。
  - c、垂直母线采用碳酸酯工程塑料外壳封闭。

The GCK and GCL switchgear takes an assemble frame, of which every component is galvanized, plastic coated, and fastened by screw nut into the fabrication and is finished with door, baffle, partition, drawer, safety support, busbar and electric component in appropriate size. Thus the readily-made cabinet has the following configuration features:

1. Frame: non-welding structure. Dimensional steel is used for frame, angle plate positioned and bolt/nut

## GCK、GCL 系列低压抽出式开关柜

### GCK, GCL Low-voltage Withdrawable Switchgear Assembly

fastened.

- a. Specifications of component, opening and clearance of equipment are all modularized; ( modular E = 20mm, ditto hereinafter)
- b. Inner component is galvanized;
- c. Exterior is processed by phosphurization and then spray-coated by static epoxy powder;
- d. The frames consists of busbar compartment, function unit and cable compartment isolated from each other, which will stop the disturbance of accident and help for live maintenance.

#### 2. Function unit

- a. Function unit includes: feedback unit, motor unit and public power unit;
- b. Height modular for drawer is 200mm, available with 6 sizes: 1/2 unit, 1 unit, 3/2 unit, 5/2 unit and 3 units. Unit return current is rated 630A down.
- c. Each MCC cabinet is able to house max. 9 one-unit drawers or 18 1/2 unit drawers.
- d. Door panel of the compartment is interlocked by operating device on main switch with drawer, which will keep the door closed when main switch is on.
- e. The operating device on main switch can be set on off or on position by padlock, allowing safe access to maintenance.
- f. Each compartment of function unit is divided by metal partition;
- g. Valve in compartment can be closed or opened with draw-in or draw-out, which will keep the drawer from touching vertical busbar;
- h. Main inlet plug, secondary plug of ancillary circuit and other plugs are provided on back of function unit;
- i. Earthing plug, on connection position when drawer in separation test, can ensure the continuous running of the circuit.

#### 3. Busbar system

- a. Busbar system for GCK and GCL switchgear is 3-phase 5-wire or 3-phase 4-wire system. Horizontal busbar is fixed on cabinet top, N wire, PE wire can either be on cabinet top or bottom.
- b. 3-phase horizontal busbar is copper busbar, high mechanical strength and heat diffusive.
- c. Vertical busbar is sealed by polycarbonate (PC) engineering plastic tube.

### 使用环境条件

#### Ambient conditions:

周围空气温度：不高于 +40°C，不低于 -5°C。24h 内的平均温度不得超过 +35°C。

适用类型：户内

海拔高度：2000m

周围空气相对湿度：最高温度为 +40°C 时不超过 50%，在较低温度时允许有较大的相对湿度：（例如 +20°C 时为 90%）  
允许在 -25°C~+50°C 温度条件下运输和存储，在短时间内（不超过 24h）温度不超过 +70°C。

Temperature: max. +40°C, min. -5°C, daily average temperature not More than +35°C

Place: indoor

Altitude: 2,000meter

Relative humidity: not more than 50% at + 40 °C, allowable of bigger Humidity at lower temperature: (i.e 90% at+20°C)

Transport and storage under temperature range -25°C - +50°C, and only +70°C for short time (not more than 24 hours)

## GCK、GCL 系列低压抽出式开关柜

### GCK, GCL Low-voltage Withdrawable Switchgear Assembly

#### 主要技术参数 Technical parameters

项目 Item		参数 Parameters
额定工作电压 (V) Rated working voltage (V)		380
额定绝缘电压(V) Rated insulation voltage (V)		660
辅助电路额定工作电压 (V) rated working voltage (V) for ancillary circuit	AC	220、380
	DC	110、220
使用频率 (Hz) Frequency (Hz)		50~60
额定电流 (A) Rated current (A)	水平母线 horizontal bus	630—6300
	垂直母线 Vertical bus	800—2000
额定短时耐受电流 (kA/1S)	主母线 Busbar main	105
	中性母线 Neutral bus	30
额定峰值电流 (kA/0.1S) Rated peak current (kA/0.1S)		105、50
功能单元 (抽屉) 分段能力 (kA) Function unit (drawer) isolating capacity (kA)		50 (有效值) effective value
外壳防护等级 Cubicle protection degree		IP30、IP40
母线设置 Busbar arrangement		三相四线制、三相五线制 three phase four wire, three phase five wire
符合标准 Standard conformity		IEC-439、BS5486、VDE0660、GB7251、NEMA12-322、JJB/T9661
操作方式 Operating method		就地、远方、自动 in-site, remote, automatic



## MNS 型低压成套开关设备 MNS LV complete switchgear

### 概述 Introduction

MNS 型低压成套开关设备（以下简称低压开关柜）是我公司结合我国低压成套开关设备的发展趋势，在其电器元件的选用和柜体结构方面进行改进，并重新注册的产品。该产品的电器性能和机械性能完全满足原 MNS 产品技术要求。

本低压开关柜适用于交流 50-60Hz, 额定工作电压 660V 及以下的电力系统，作为发电、输电、配电、本低压开关柜除一般陆地使用外，经过特殊处理后还可用于海上石油钻采平台和核电站中。本低压开关柜符合 IEC439、VDE0660 第 5 部分、GB7251-87《低压成套开关设备》标准和 JB/T9661《低压抽出式成套开关设备》行业标准。

LV complete switchgear is a new product we are proud to have developed on the basis of technology level Chinese manufacturers have reached, renovated on electric component and cabinet structure and technical know-how registered. This product's electric and mechanical performance conform to all technical specifications set in standard for MNS product.

The product is meant for power generating, transmission and distribution in AC 50-60Hz 660V down power system for its application not only on land but also in offshore oil drilling platform or nuclear power station after some treatment. The cabinet conforms to part five in VDE0660, IEC439, standard set in GB7251-87 for <LV Complete Switchgear Equipment> and codes set in JB/T9661 for <LV Withdrawable Complete Switchgear Equipment>.

### 使用环境 Ambient conditions:

周围空气：温度不高于 +40°C，不低于 -5°C。24h 内的平均温度不得超过 +35°C。

适用类型：户内

海拔高度：2000m

周围空气相对湿度：最高温度为 +40°C 时不超过 50%，在较低温度时允许有较大的相对湿度：（例如 +20°C 时为 90%）允许在 -25°C ~ +50°C 温度条件下运输和存储，并允许在 24h 温度不超过 +70°C；

地震烈度：9 度。

Temperature: max. +40°C, min. -5°C, daily average temperature not More than +35°C

Place: indoor

Altitude: 2,000meter

Relative humidity: not more than 50% at + 40 °C, allowable of bigger Humidity at lower temperature: (i.e 90% at +20°C)

Transport and storage under temperature range -25°C - +50°C, and only +70°C for short time (not more than 24 hours)

Seismic intensity: not more than 9 degrees

## MNS 型低压成套开关设备

### MNS LV complete switchgear

#### 结构特点 Structure Features

抽出式 MCC 有五种标准尺寸的抽屉，它们分别是 8E/4、8E/2、8E、16E、和 24E。其中 8E/4 和 8E/2 两种抽屉的结构是用模制的阻燃型塑料件和铝合金型材组成（4 个 8E/4 或 2 个 8E/2 组成一个 8E 高度间隔）。功能单元隔室的总高度为 72E。

五种标准尺寸的抽屉，一般有 16 个二次隔离触头引出。如果需要，除 8E/4 抽屉外，其它四种抽屉可增加到 32 个。每个静触头的接线端同时可接 3 根导线。上述端头由制造厂随产品提供适量的附件和冷轧钳。

通过机械连锁装置的操作程序，只有当主回路辅助回路全部断开的状态下才能移动抽屉，机械连锁装置使抽屉具有移动位置、分断位置和分离位置，并用相应的符号标志出来。机械连锁装置上的操作手柄和主断路器的操作手柄能同时被三把挂锁锁住。

可移式电动机控制中心和小电流动力配电中心（以下简称可移式 MCC）

可移式 MCC 的柜体结构特征同工同 4.2 条款中（a）和（b）

功能单元设计成可移式结构，功能单元与垂直母线的连接采用一次隔离触头，即使与其连接的电路是带电的，也可以从设备中完整地取出和放回功能单元。另一端为固定式结构。

可移式 MCC 的功能单元为 3E、6E、8E、16E、24E、32E 和 40E 功能单元隔室，总高度也是 72E。

Withdrawable MCC has five standard sized drawers, i.e 8E/4, 8E/2, 16E and 24E, of which 8E/4, 8E/2 drawers are made of mould-making inflammable plastic and dimensional aluminum alloy (four 8E/4 or two 8E/2 makes one 8E height clearance). Total height for function unit compartment is 72E.

Each of the drawer has 16 secondary isolation contact and can be increased to 32 if necessary (except 8E/4). Crimp terminal of each static contact is available for 3 wires tapping at all and the contact is often supplied with proper accessories and cold rolled pliers.

Operation is controlled by mechanical interlock system. The drawer can only move when main circuit and ancillary circuit break off. The interlock device will set drawer in moving, break-off or separation position and each position is marked by colour symbol. Three padlocks are provided to lock manual handle on mechanical interlock device and on main circuit breaker simultaneously.

Movable motor control centre and small current power distribution centre (hereinafter called MCC):

MCC cabinet's configuration is the same as (a) and (b) in 4.2 clause.

Function unit is designed as movable type. The function unit is tapped by primary insulation contact with vertical busbar, which allows place-in or taking-out of function unit on active line, while the other terminal is stationed.

Movable MCC consists of 3E, 6E, 8E, 16E, 24E, 32E and 40E function unit compartment, with total height of compartment at 72E.

## MNS 型低压成套开关设备 MNS LV complete switchgear

### 母线系统

水平母线 ( L1、 L2、 L3), 水平母线安装于柜后独立的母线隔室中, 它有两个可选择的安装位置, 即柜高 1/3 或 2/3 处。母线可按需要装于上部或下部, 也可以上下两组同时安装, 两组母线可以单独使用, 也可以并联使用。每相母线由 2 根、 4 根或 8 根母排并联, 母排截面有 10\*30\*2, 10\*60\*2, 10\*80\*2, 10\*60\*4, 10\*80\*2\* 和 10\*60\*4\*2 六种。

垂直母线为 50\*30\*5 的 L 型铜母线, 它被嵌装修于用阻燃型塑料制造的功能壁中, 带电部分的防护等级达 IP20。

中性线 ( N 线 ) 和保护接地线 ( PE 线 )。中性线母线和保护接地线母线平行地安装在功能单元隔室的下垂直安装在电缆室中。N 线和 PE 之间如用绝缘子相隔, 则 N 线与 PE 线分别使用, 两者之间如用导体短接, 即成 PENXG 线。

Busbar system : Horizontal busbar ( L1, L2 and L3) is installed in independent busbar compartment positioned in the back of the cabinet, with two optional tapping position, one at 1/3 cabinet height and the other 2/3, or fixed on top or bottom of the cabinet subject to actual needs, or two busbars fixed at the same time. Two busbar systems can be used independently or together. Busbar for each phrase consists of 2, 4 or 8 busbar row in parallel. Six cross sections are available for busbar row: 10\*30\*2, 10\*60\*2, 10\*80\*2, 10\*60\*4, 10\*80\*2 and 10\*60\*4\*2.

Vertical bus is 50\*30\*5 L shape copper wire, laid in inflammable plastic wall and live part is secured by IP 20 protection degree.

### 保护接地系统

本开关柜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 ) 和可导电的金属结构件两部分组成。金属结构件除外表的门和封板外, 其余都经过镀锌处理。在结构的连接处都经过精心设计, 使其能通过一定的短路电流。

Neutral line ( N line) and protection earthing line ( PE): N bus and PE bus are laid in parallel on the bottom of function unit compartment and vertically arranged in cable compartment. When insulator applies for separation of these two, N line and PE line is supposed to be used separately, or PENXG if these two lines are connected by short circuit conductor.

### 辅助电路电缆槽

在功能单元隔室的顶部装有辅助电路电缆槽, 槽内可安放柜间连接线和公用电源线。

Protection earthing system: protection wire of the cabinet consists of conductive metal accessory and full length PE line ( or PEN line) that is specially designed and installed. All metal accessories, except door and shrouding plate, are galvanized where every joint of the structure is carefully designed and can conduct some level of short circuit current.

## MNS 型低压成套开关设备

### MNS LV complete switchgear

#### 辅助电路的隔离措施

在抽出式 MCC 方案的每一回路中，按系列需要可装设一只隔离变压器，变压器容量交流接触器，规格确定。

Cable channel of ancillary circuit: cable channel of ancillary circuit is fixed on the top of function unit compartment, and in the channel cabinet connection line and public power line are arranged.

Insulation of ancillary circuit: one insulation transformer with capacity rated and AC contactor with certain specification are optional to be provided for each loop based on withdrawable MCC scheme.

#### 主要技术参数

#### Technical parameters

额定工作电压 ( V ) Rated working voltage (V)		380、660
额定绝缘电压(V) Rated insulating voltage (V)		660
额定工作电流 ( A ) Rated working current (A)	水平母线 Horizontal bus	630-5000
	垂直母线 Vertical bus	800-2000
额定短时耐受电流有效值 ( 1S ) /峰值(kA) Rated short-time withstand current, effective value (1S)/peak value (kA)	水平母线 Horizontal bus	50-100/105-250
	垂直母线 Vertical bus	60/130-150
外壳防护等级 Cubicle protection degree		IP30、IP40、IP54
外形尺寸(宽*深*高,mm) Exterior measurement (W*D*H, mm)		600、800、1000*1000*2200



## GCS 低压抽出开关柜 GCS LV withdrawable switchgear

### 概述 Introduction

GCS 型低压抽出式开关柜（以下简称装置）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出的符合国情、具有较高技术性能指标、能够适应电力市场发展需要并可以与现有引进产品竞争的低压抽出式开关柜。该装置目前已被电力用户广泛选用。

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。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(400)、(600) 额定电流为 4000A 及以下的发电厂、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。

GCS low voltage withdrawable switchgear (hereinafter referred to as Equipment) is an equipment designed, manufactured and delivered by joint design team sponsored by two ministries to fit the actual conditions of China in parallel with expanding market requirement from power sector. With high technical parameters and performance, it has been proved to be more competitive than imported like product and therefore overwhelmingly accepted by customers in power sector for applications in power plant, oil and chemical plant, textile, metallurgy and high buildings to support distribution system; also meant for LV power distribution in power plant and power supply system rated at 380V (400), (600) 4000A down, 3 phase and 50(60)Hz, in central control system of motors and in no-power compensation. The compatible computer plug-in is provided and allows it to be used by large-scale power plant or fully automatic oil chemical plant who often intended it.

### 结构特点 Structure Features

周围空气温度：不高于 +40° C，不低于 -5° C。24 小时内平均温度不得高于 +35° C。

使用环境：室内

海拔高度：2000m

周围空气相对湿度：最高温度为 +40° C 时不超过 50%，在低温度时允许有较大的相对湿度：如 +20° C 时为 90%，应考虑由于温度的变化可能会偶然产生凝露的影响。

垂直面倾斜度：不超过 5%

Temperature: max. +40°C, min. -5°C, daily average temperature not More than +35°C

Place: indoor

Altitude: 2,000meter

Relative humidity: not more than 50% at + 40°C, allowable of bigger Humidity at lower temperature: (i.e 90% at+20°C) Be cautious of occasional frost due to temperature change

Gradient: not more than 5%

## GCS 低压抽出开关柜

### GCS LV withdrawable switchgear

#### 主要技术参数 Technical parameters

主电路额定电压(V) Rated voltage (V), main circuit		交流380 ( 400)、( 660 ) AC 380 ( 400 )、( 660 )	母线额定短时耐受电流(kA/1s) Rated shor-time withstand current (kA/1S)	50 , 80	
辅助电路额定电压(V) Rated voltage (V), ancillary circuit		交流220、380 ( 400 ) AC 220、380 ( 400 )	母线额定峰值耐受电流(kA/0.1s) Rated shor-time withstand peak current (kA/1S)	105,176	
额定频率(Hz) Rated frequency (Hz)		50(60)	工频试验电压 Frequency test voltage (V1min)	主电路 Main circuit	2500
额定绝缘电压(V) Rated insulating voltage (V)		660(1000)		辅助电路 Ancillary circuit	2000
额定电流(A) Rated current (A)	水平接线 Horizontal	不大于4000 not more than 4000	母线 busbar	三相四线制 3-phase 4 wire	A.B.C.PEN
	垂直母线 Vertical bus	600—2000		三相五线制 3-phase 5 wire	A.B.C.PE.N



## RYDS 低压固定分隔式开关柜 RYDS LV fixed-separation switchgear cabinet

### 特点 Introduction

RYDS 型低压固定分隔式开关柜适用于发电厂、石油化工、冶金、纺织、高层建筑供电等行业，在大型发电厂、石油化工等自动化程度高，要求与计算机接口的场所，作为三相交流频率 50Hz，额定工作电压为交流 380V，额定电流至 4000A 及以下的配电系统中作为电能分配、转换和控制电机之用。

RYDS LV fixed-separation switchgear cabinet is meant for applications in power plant, oil and chemical plant, textile, metallurgy and high buildings to support distribution system; LV power distribution in power plant and power supply system rated at 380V (400), (600) 4000A down on 3 phase 50(60)Hz, in central control system of motors and in no-power compensation.

### 结构特点 Structure Features

固定分隔式柜体采用通用柜的形式，主要构架采用 8MF 型钢，局部焊接组装而成，并有模数为 20 mm 的  $\Phi 9.2$  安装孔。通用柜的零部均按模块原理设计，在柜体上下两端均有不同数量的散热槽孔。柜体用转轴式活动铰链与构架相连，门的折边外均嵌有一根橡胶条。金属结构件外部，门，封板及骨架采用喷粉处理，内部件镀锌处理；柜体的防护等级为 IP30。

- a、按使用类别可分为：进线柜、馈电柜（PC）、电动机控制柜（MCC）和无功功率补偿柜。
- b、根据系统容量和开关大小，柜体基本尺寸：宽度有 300mm、400mm、600mm、800mm 四种；深度有 800mm、1000mm 二种；高度为 2200mm。
- c、水平母线为柜顶布置，本系列额定电流等级有：1000A、1250A、1600A、2000A 和 2500A。
- d、馈电柜或电动机控制柜垂直母线额定电流等级有：630A、1000A 和 1250A。
- e、本系列产品母线容量及相应规格：电流等级 630A、800A、1000A、1250A、1600A、2000A、2500A
- f、水平母排额定短时耐受电流能力：50kA。
- g、馈电柜及控制柜垂直母线短时耐受电流能力：50kA。
- h、进线柜中主开关的分断能力：50kA。
- i、馈电柜及控制柜中保护开关的分断能力：50kA。。
- j、馈电柜及控制柜回路数：1 ~ 24 个。
- k、功能单元类型：插拔式、可移式、抽屉式。
- l、功能单元规格：高度有 240mm、400mm、420mm、900mm、960mm、1200mm。
- m、外壳防护等级：IP3X。
- n、产品使用环境：污染等级 3。

Fixed-separation cabinet is a universal cabinet, made of 8MF each-bitted steel sheet with local welded and available with modular 20mm and  $\Phi 9.2$  mounting hole. All accessories of the universal cabinet is designed on modular principle. A number of vent holes are provided on the top and bottom of the cabinet. The door panel is fixed by axial

## **RYDS** 低压固定分隔式开关柜

### RYDS LV fixed-separation switchgear cabinet

hinge on the frame, where every joint is sealed by rubber trip to give a compression absorb. Exterior of the door, shrouding plate and frame are all spray coated while interior support zinc plated. This ensures the cubicle protection at IP30 degree.

- a. Category in application: feed cabinet, feed-back cabinet, MCC and no-power compensation cabinet;
- b. Category in size, decided by system capacity and size of switch: available width: 300mm, 400mm, 600mm and 800mm; depth: 800mm and 1000mm; height: 2200mm;
- c. Horizontal bus is placed on the top of cabinet with rated current as: 1000A, 1250A, 1600A, 2000A and 2500A;
- d. Rated current for feed-back cabinet or vertical bus for MCC is available at: 630A, 1000A and 1250A;
- e. Bus capacity and specification: current class: 630A, 800A, 1000A, 1250A, 1600A, 2000A and 2500A.
- f. Short-time withstand current on horizontal bus row is rated at: 50KA;
- g. Short-time withstand current on vertical bus of feedback cabinet and control cabinet: 50KA;
- h. Switch-off capacity of main switch in feed cabinet: 50KA
- i. Switch-off capacity of protection switch in feedback cabinet and control cabinet: 50KA;
- j. Count of return circuit in feed-back cabinet and control cabinet: 1-24;
- k. Type of function unit: insert/pull-out, movable and withdrawable;
- l. Specification for function unit: height: 240mm, 400mm, 420mm, 900mm, 960mm and 1200mm;
- m. protection degree for cubicle: IP3X;
- n. Ambient condition: 3 grade of pollution.

#### 使用环境及条件 Ambient conditions

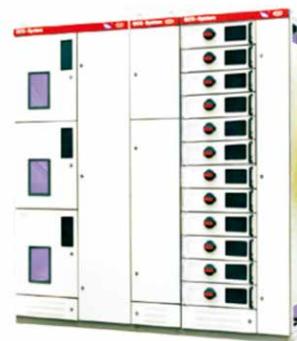
海拔高度：2000m  
环境温度：-25 摄氏度 - +40 摄氏度  
周围湿度：日平均值不大于 95%，月平均值不大于 90%  
周围空气应不受腐蚀性 可燃性气体 水蒸气明显污染  
无经常性的剧烈震动的场所

Altitude: 2,000meter  
Temperature: max. +40°C , min. -25°C  
Humidity: daily average not more than 95% and monthly average not more than 95%.  
Place: free of corrosion, flammable gas, steam or other pollution;  
Free from frequent quake.

## RYDS 低压固定分隔式开关柜 RYDS LV fixed-separation switchgear cabinet

### 主要技术参数 Technical parameter

项目 Item		参数 Parameters
额定工作电压 (V) Rated working voltage		AC380
额定绝缘电压(V) Rated insulating voltage (v)		AC690
过电压类别 Overvoltage category		IV
材料组别 Material grouping		IIIa
污染等级 Pollution level		3
额定电流 (A) Rated current (A)	水平母线 Horizontal bus	400—3200
	垂直母线 Vertical bus	1000
额定短时耐受电流 (kA/1S) kA/1S)	主母线 Main busbar	50
	中性母线 Neutral busbar	30
额定峰值电流 (kA/0.1S) Rated peak current (kA/0.1S)		105、63
主开关分断能力 (kA) Isolating capacity on main switch (kA)		50
外壳防护等级 Cubicle protection degree		IP30
电气间隙(mm) Electric clearance (mm)		≥5.5
爬电距离(mm) Creepage distance		≥10
触电保护类别 Shock protection level		I 类



## JDP 电缆分支箱

### JDP Cable branch box

#### 概述 Summary

JDP 电缆分支箱是我公司根据广大用户的需求设计的,该柜体采用优质不锈钢铸造广泛用于工业园区、居民小区、商业中心、城市道路以及高层建筑等各种场所。具有结构先进供电可靠、结构合理、安装迅速、灵活、操作方便、体积小等卓越性。

JDP cable branch box is a product we are proud to have manufactured and supplied to meet the need of customers. Made of cast stainless steel, it is meant for industry zone, living quarter, business centre, urban road and high building application. The product is distinguished by advanced and smart-space structure, easy installation, flexibility, easy operation and small size.

#### 结构特点 Structure

柜体为封闭式结构,采用 1.5mm 不锈钢板或冷轧钢板制成。机构设计为单开门或前后开门两种,具有重量轻、强度高的特点。框门、侧板、顶盖等外观可见部件均采用防锈表面处理及电镀后用粉末静电喷涂,涂层均匀美观耐腐蚀。

The cubicle is a total-sealed type and fabricated by 1.5mm stainless steel sheet or cold rolled sheet. Single door opening or double opening is provided, light weighted and high strength. Door frame, lateral plate and top lid are all processed for dust proof, electroplated, static powder spray coated, smooth, anti-corrosion and aesthetic.

#### 使用环境 Ambient conditions:

环境温度:最高气温 +40°C,最低气温 -30°C

海拔高度:2000m

风速:相当 34m/s (不大于 700Pa)

湿度:日相对湿度平均值不大于 95%,月相对湿度平均值不大于 95%

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

安装地点倾斜度:不大于 3°

安装环境:无爆炸性、腐蚀性气体、安装场所无剧烈震动冲击,订购本产品超出上述条件规定时,可与本公司协商。

Temperature: max. +40°C, min. -30°C

Altitude: 2,000meter

Wind velocity: equivalent to 34m/s (not more than 700Pa)

Humidity: daily average ≤ 95%, monthly average ≤ 95%

Seismic: horizontal acceleration speed ≤ 0.4m/s<sup>2</sup>, vertical acceleration speed ≤ 0.5m/s<sup>2</sup>

Gradient: not more than 3 degrees

Place: free from explosive, corrosive gas and frequent quake. Consultations should be made with manufacturer when special order is made.

## JDP 电缆分支箱

### JDP Cable branch box

#### 主要技术参数 Technical parameter

项目 Item	参数 Parameters
额定工作电压 ( V ) rated working voltage (V)	380
额定绝缘电压(V) Rated insulating voltage (V)	660
过电压类别 Over-voltage category	Ⅲ
材料组别 Material grouping	Ⅲa
污染等级 Pollution level	3
主电路额定电流 ( A ) Rated current (A) on main circuit	630
额定限制短时耐受电流 ( kA ) Rated limited short-time withstand current (kA)	15、30
主电开关分断能力 ( kA ) Isolating capacity on main switch (kA)	15
主开关额定电流 ( A ) Rated current on main switch (A)	630
短路分断能力 ( kA ) Short-circuit isolating apacity (kA)	50
额定峰值电流 ( kA/0.1S ) Rated peak current (kA/0.1S)	105、63
主开关分断能力 ( kA ) Isolating capacity on main switch (kA)	15
外壳防护等级 Cubicle protection level	Ip 44
电气间隙(mm) Electric clearance (mm)	≥5.5
爬电距离(mm) Creepage distance (mm)	≥10
触电保护类别 Shock protection category	I 类



## JP 户外配电箱

### JP outdoor distribution cabinet

#### 概述

##### Introduction

JP 户外配电箱，该柜体采用优质不锈钢铸造而成。广泛用于工业园区、居民小区、商业中心、城市道路等各种场所。电力用户作为交流 50Hz，额定工作电压 380V，额定电流至 1500A 的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。该产品分断能力高，额定短时耐受电流达到 50kA。具有供电可靠、结构合理、安装迅速、灵活、操作方便、体积小等卓越性。

JP outdoor distribution cabinet is made of cast stainless steel and meant for industry zone, living quarter, business centre and urban road application. The product is often used for power supply and illumination purpose when adopted in 50Hz, 380V and 1500A power distribution system and for power switchover, distribution and control when incorporated in power distribution equipment.

#### 结构特点

##### Structure

主要组成部件：箱体、断路器、电能表、接触器、熔断器、绝缘支撑件、铜母排、绝缘导线等。柜体采用不锈钢或普通钢板，板材厚度 $\geq 1.5\text{mm}$ ，整箱采用焊接式（或组合式）组装而成，箱盖是尖顶式，利于泄水，箱盖底边有透气孔，可保证箱内元器件不凝露，箱门有双折边可防喷水。

样机操作方式：手动 / 自动

样机安装方式：固定安装

样机接线方式：固定接线

Components includes: cubicle, circuit breaker, watt-hour meter, contactor, fuse, copper busbar row and insulated conducting wire. Cubicle is made of stainless steel sheet or ordinary sheet more than 1.5mm thick, welded and assembled. Cabinet cover, ogival, and good for drainage. Vent holes are provided at the cabinet bottom to prevent components inside from frost. Cubicle door is double sealed by rubber strip against flooding.

For Prototype:

Operation method: manual/automatic

Installation method: stationary

Tapping method: fixed tapping

## 使用环境

### Ambient conditions:

环境温度：最高气温 +40°C，最低气温：-30°C

海拔高度：2000m

风速：相当 34m/s (不大于 700Pa)

湿度：日相对湿度平均值不大于 95%，月相对湿度平均值不大于 95%

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

安装地点倾斜度：不大于 3°

安装环境：无爆炸性、腐蚀性气体、安装场所无剧烈震动冲击，订购本产品超出上述条件规定时，可与本公司协商。

Temperature: max. +40°C, min. -30°C

Altitude: 2,000meter

Wind velocity: equivalent to 34m/s (not more than 700Pa)

Humidity: daily average ≤ 95%, monthly average ≤ 95%

Seismic: horizontal acceleration speed ≤ 0.4m/s<sup>2</sup>, vertical acceleration speed ≤ 0.5m/s<sup>2</sup>

Gradient: not more than 3 degrees

Place: free from explosive, corrosive gas and frequent quake. Consultations should be made with manufacturer when special order is made.



## JP 户外配电箱

### JP outdoor distribution cabinet

#### 主要技术参数 Technical parameter

项目 Item	参数 Parameters
额定工作电压 (KV) Rated working voltage (kV)	AC380
额定绝缘电压 (V) Rated insulating voltage (V)	AC660
额定冲击耐受电压 (kV) Rated impact withstand voltage (kV)	8
额定容量 (kVA) Rated capacity (kVA)	30—630
过电压类别 Over voltage category	Ⅲ
材料组别 Material grouping	Ⅲa
电气间隙 (mm) Electric clearance (mm)	≥10
爬电距离 (mm) Creepage distance (mm)	≥14
动态响应时间 (s) Dynamic responding time (s)	25
电容器容量 (kvar) Condenser capacity (kvar)	30—210
短时耐受电流能力 (kA) Short-time withstand capacity of current	30
主开关额定电流 (A) Rated current on main switch (A)	100—1500
极限短路分断能力 (kA) Isolating capacity of limit short-circuit (kA)	50
运行短路分断能力 (kA) Isolating capacity on operating short-circuit (kA)	25
外壳防护等级 Cubicle protection level	IP44

# KYN61-40.5 型铠装移开式高压成套开关设备

## KYN61-40.5 (Armoured) Removable high voltage complete switchgear

### 概述

#### Introduction

KYN61-40.5 铠装移开式交流金属封闭开关设备（以下简称开关柜）适用于三相交流 50Hz、40.5kV 单母线及单母线分断电力系统，主要应用于发电厂、变电所及工矿企业、高层建筑的变配电中作为接受和分配电能之用，并对电路实行控制、保护和检测，满足 IEC60298、GB3906、DL404 等标准的要求，并具备完善的“五防”功能。

KYN61-40.5 Type (armoured) removable high voltage complete switch gear (hereinafter called as Switch cabinet) is suitable for three-phase AC 50Hz 40.5kV single busbar system and single busbar fault power system for its sound performance on power receiving and distribution with function to maintain circuit in control, protected and measured. Being equipped with “five protection” functions and quality consistent with IEC60298, GB3906 and DL404 standards, the product is credited for its service in power plant, transformer substation, mining activities and power supply for tall buildings.

### 特点

#### Product features

采用热缩绝缘材料及环氧涂覆绝缘工艺，优化电极形状，柜体结构紧凑，缩小占地面积；  
开关柜柜体选用优质冷轧钢板经数控钣金加工成形后，通过高强度螺栓螺母和铆螺母连接而成，构件表面采用喷塑或镀锌工艺；  
可配国产 ZN85-40.5(3AV3) 真空断路器和法国施耐德 SF1、SF2 型及阿尔斯通 FP 系列六氟化硫断路器，以满足不同客户需要；  
开关柜各功能小室均采用金属板封隔，并设有独立的压力释放通道；  
断路器、接地开关等操作均可在开关柜门关闭情况下进行，即可实现关门操作；  
开关柜的结构适应性强，主接线方案可以达到 198 种以上，能满足不同用户的需要；  
手车，断路器，接地开关和后柜门之间设有防止错误操作的机械联锁装置，“五防”功能齐全，安全可靠。

Heat insulation material is selected and finished by epoxy coated process. Shielding is optimized. Having compact construction, the switch cabinet takes less space.

For frame making, premium cold rolled steel sheet is selected, fabricated by CNC metal sheet process and fastened by high strength bolt-nut and riveting nut. The component surface is finished by plastic or zinc coating.

The cabinet is adaptable to a wide range of circuit breaker, which includes vacuum circuit breaker model ZN85-40.5(3AV3), Chinese product, or Schneider SF1 or SF2, or SF6 in FP series by Alstom, as may need decide.

Each compartment inside the cabinet is isolated by metal partition and available with independent pressure release channel.

Circuit breaker and earth switch can be operated under the condition that the door is closed, which means closed operation is possible.

The configuration of the cabinet allows it to be adaptable to various wire connecting ways, offering more than 198

## KYN61-40.5 型铠装移开式高压成套开关设备

### KYN61-40.5 (Armoured) Removable high voltage complete switchgear

options to our customer.

Mechanical interlocking device is provided inter hand cart, circuit breaker, earthing switch and rear door to prevent error operation. Safety and reliability is ensured by "five protections" .

#### 使用环境条件

##### Ambient conditions:

海拔高度：2000m

环境湿度：上限为 +40° C，下限为 -15° C;

相对湿度：日平均不大于 95%，月平均值不大于 90%

地震烈度：不超过 8 度

没有火灾爆炸危险，没有剧烈震动及化学腐蚀等严重污秽的场所。

1. Altitude: 2,000meter
2. Temperature: max. +40°C , min. -15°C
3. Relative Humidity: daily average  $\leq 95\%$  , monthly average  $\leq 95\%$
4. Seismic intensity: not more than 8 degrees

The place should be free from hazards of fire, explosion, strong quake or chemical corrosion.



## KYN61-40.5 型铠装移开式高压成套开关设备

### KYN61-40.5 (Armoured) Removable high voltage complete switchgear

#### 主要技术参数 Technical parameter

序号 NO.	项目 Item	单位 unit	参数 Parameters	
1	额定电压 Rated voltage	kV	40.5	
2	额定频率 Rated frequency	Hz	50	
3	主母线额定电流 Rated current on main bus	A	1250, 1600, 2000	
4	分支母线额定电流 Rated current on branch bus	A	630, 1250, 1600	
5	额定绝缘水平 Rated insulating level	1min工频耐受电压 (有效值) 雷电冲击耐受电压 (峰值)	相间、相对地 Phase-to-phase Phase-to-earth	一次隔离断口 Primary isolating distance
			95	115
	辅助控制回路1min工频耐受电压	V	2000	
6	额定短路开断电流 Rated short-circuit isolating current	kA	25, 31.5	
7	额定短路关合电流 (峰值) Rated making current on short-circuit (peak)	kA	63, 80	
8	额定短时耐受电流 (4s) Rated short-time withstand current	kA	25, 31.5	
9	额定峰值耐受电流 Rated peak withstand current	kA	63, 80	
10	辅助控制回路额定电压 Rated voltage on ancillary control loop	V	-100, -220, -220	
11	防护等级 Protection level		外壳IP4X, 隔室间, 断路器室门打开时IP2X IP4X for cubicle, IP2X for compartment & on door opening of circuit breaker compartment	
12	外形尺寸 (宽×深×高) Exterior measurement (WxDxH)	mm	1400×2800 (3000) ×2800 (*括号内数字为SF6手车方案) (* number in bracket is for hand cart option)	
13	重量 Weight	kg	约2300 Around 2,300	

## KYN28-12 型铠装移开式高压成套开关设备

### KYN28-12 (Armoured) Removable high voltage complete switchgear

#### 概述

#### Introduction

KYN28A-12(Z) 铠装移开式交流金属封闭开关设备 ( 又称 GZS1 开关设备 ) , 是由西安森源公司开发和提供技术转让的先进开关设备。它适用于三相交流 50HZ 电力系统, 用于接受和分配电能并对电路实行控制, 保护及监测。

GB3906-91 《3~35kV 交流金属封闭开关设备》

GB11022-89 《高压开关设备通用技术条件》

IEC298(1990) 《额定电压 1kV 以上 50kV 及以下交流金属封闭开关设备和控制设备》

DL404-91 《户内交流高压开关柜订货技术条件》

KYN28-12(Z) armoured removable hermitically sealed AC switchgear, also known as GZS1 switchgear, is an advanced product developed by Xi-an Senyuan company and produced after transfer of technology. It is suitable for three-phase AC power system for its sound performance on power receiving and distribution with function to maintain circuit in control, protected and measured.

The product conforms to the following codes and standards:

- GB 3906-91 < Hermitically Sealed 3-35Kv AC Switchgear >
- GB11022-89 <General Technical Specifications for High Voltage Switchgear >
- IEC298(1990) <Hermitically Sealed 1kv up and 50Kv down AC Switchgear and Control Unit >
- DL404-91 <Technical Specifications for Order of Indoor AC High Voltage Switchgear >.

#### 使用环境条件

#### Ambient conditions:

环境温度：最高温度 +40 摄氏度，最低温度 -10 摄氏度

周围湿度：日平均值不大于 95%，月平均值不大于 90%

海拔高度：3000m

抗地震度：地震烈度不超过 8 度

周围空气应不受腐蚀性 可燃性气体 水蒸气污染

无经常性的剧烈震动的场所

在超过 GB3906 规定的正常的环境条件下使用时，由用户和我公司协商。

1. Temperature: max. +40°C, min. -10°C
2. Humidity: daily average ≤ 95%, monthly average ≤ 95%
3. Altitude: 3,000meter

## KYN28-12 型铠装移开式高压成套开关设备

### KYN28-12 (Armoured) Removable high voltage complete switchgear

4. Seismic intensity: not more than 8 degrees
5. Ambient air: free from corrosive, flammable and steam disturbance
6. Place: free from frequent quake
7. Consultations should be made with manufacturer if conditions of mounting place do not conform to conditions set in GB3906 standard.

#### 结构特点

#### Product features

开关设备按 GB3906-91 中的铠装式金属封闭开关设备而设计。整体是由柜体和中置式可抽出部件（即手车）两大部分组成。柜体分四个单独的隔室，外壳防护等级为 IP4X，各小室间和断路器室门打开时防护等级为 IP2X。具有架空进出线、电缆进出线及其它功能方案，经排列、组合后能成为各种方案形式的配电装置。本开关设备可以从正面进行安装调试和维护，因此它可以背靠背组成双重排列和靠墙安装，提高了开关设备的安全性、灵活性，减少了占地面积。

开关设备的外壳是选用进口敷铝锌薄钢板，经 CNC 机床加工，并采取多重折边工艺。这样使整个柜体不仅具有精度高、抗腐蚀与抗氧化强作用，而且由于采用多层折边工艺，使柜体比其他同类设备柜体整体重量轻、机械强度高、外形美观。柜体采用组装式结构，用拉铆螺丝和高强度的螺栓联接而成。这样使加工生产周期短、零部件通用性强、占地面积少、便于组织生产。

Switchgear is designed based on standard for Armoured Hermitically Sealed Switchgear set in GB3906-91. The construction consists of frame and removeable component (hand cart). Four independent compartments are provided inside cabinet. Protection degree for each compartment frame is IP4X and IP2X for door opening of each compartment and circuit breaker. Options are available for overhead line out, cable inlet and outlet or others, this allows a wide range of wiring scheme when serving for power distribution purpose. As all operations like installation, test-run and service can be done through front door of the switchgear, two switchgears can be placed back-to-back or placed against the wall, this, by reduction of space need, upgrades the safety and flexibility of the facility.

The aluminum-zinc coated thin steel sheet is selected and imported to make the frame of switchgear, then processed by CNC machine tool and fabricated after multiple folding. This ensures preciseness of the frame and make it resistant to corrosion and oxidation. Multiple folding process helps to reduce the weight of the cabinet (lighter than the like cabinet) while increasing its strength and aesthetics. As assemble-type configuration applies, the cabinet assembled and fastened by riveting nut and high strength bolt, which makes the production easy and dramatically shortens the production time. The cabinet is also competent for its universal accessories and low requirement for space.

## KYN28-12 型铠装移开式高压成套开关设备

### KYN28-12 (Armoured) Removable high voltage complete switchgear

#### 主要技术参数 Technical parameter

项目 Item	单位 Unit	参数 Parameters
额定电压 Rated voltage	kV	3、6、10
最高工作电压 Max. working voltage	kV	3.6, 7.2, 12
额定频率 Rated frequency	kV	50
断路器额定电流 Rated current for circuit breaker	kV	630、1250、1600、2000、2500、3150
开关柜额定电流 Rated current for switch cabinet	kV	630、1250、1600、2000、2500、3150
额定热稳定电流 (4s) Rated thermal stability current	kV	25、31.5、40
额定动稳定电流 (峰值) Rated dynamic stability current (peak value)	kV	80
额定短路开断电流 Rated short-circuit breaking current	kV	16、20、25、31.5、40、50
额定短路关合电流 (峰值) Rated short-circuit making current	kV	40、50、63、80、100、125
额定绝缘水平 Rated insulating level	1min工频耐受电压 1min frequency withstand voltage	kV 对地相接42, 断口48 earth to phase 42, isolating distance 48
	雷电冲击耐受电压 Lightning impact withstand voltage	kV 对地相接75, 断口85 earth to phase 42, isolating distance 85
防护等级 Protection level	外壳为IP4X, 隔室间, 断路器室门打开时为IP2X IP4X for cubicle, IP2X for compartment & on door opening of circuit breaker compartment	



# XGN15-12 固定式交流金属封闭开关设备

## XGN15-12 Stationary hermitically sealed AC switchgear

### 概述 Introduction

XGN15-12(L)/T630-25 及 XGN15-12(L-R)/T100-31.5 箱型固定式交流金属封闭开关设备主要用于三相交流 50Hz, 额定电压 10kV 的电力系统的环网供电或双辐射供电, 也可用于终端供电设备的保护装置, 它也适用于箱式变电站, 尤其是紧凑型箱变中。

XGN15-12(L)/T630-25 and XGN15-12(L-R)/T100-31.5 cabinet-type stationary hermitically sealed AC switchgear is primarily used for three-phase 50Hz AC 10Kv power supply of ring network and double radiation, it can also be used as protection device for terminal power equipment, or box transformer substation, particularly for compact box transformer substation.

### 开关柜的主要结构 Structure

由母线室, 三工位负荷开关室(或断路器室)。电缆室。操动机构, 联锁机构和低压控制以及测量回路等部分组成。各隔室用钢板分隔, 可避免故障部位影响到邻室。符合 GB3926, IEC298 等标准。

The switchgear consists of busbar, 3-position load switch, cable, each in proper compartment, and interlock device plus low voltage control and circuit measurement. Each compartment is isolated by steel sheet in order to stop any disturbance from problem compartment to neighbouring one. The product conforms to GB3926 and IEC298 standard.

### 使用环境及条件 Ambient conditions:

- 1 海拔高度: 3000m
  - 2 环境温度: -25 摄氏度 -+40 摄氏度
  - 3 周围湿度: 日平均值不大于 95%, 月平均值不大于 90%
  - 4 周围空气应不受腐蚀性 可燃性气体 水蒸气污染
  - 5 无经常性的剧烈震动的场所
1. Temperature: max. +40°C, min. -10°C
  2. Humidity: daily average  $\leq$  95%, monthly average  $\leq$  90%
  3. Altitude: 3,000meter
  4. Seismic intensity: not more than 8 degrees
  5. Ambient air: free from corrosive, flammable and steam disturbance
  6. Place: free from frequent quake

# XGN15-12 固定式交流金属封闭开关设备

## XGN15-12 Stationary hermetically sealed AC switchgear

### 主要技术参数 Technical parameter

序号 No.	项目 item	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	额定绝缘水平 Rated insulating level	1min工频耐压 1min frequency withstand voltage	对地及相间42,隔离断口48 to earth & phase-to-phase42, isolating distance 48
		雷电冲击耐压 Lightning impact voltage	对地及相间75,隔离断口85 to earth & phase-to-phase75, isolating distance 85
4	主母线额定电流 Rated current on main bus	A	630
5	额定电流 Rated current	A	630
6	额定闭环开断电流 Rated closed loop breaking current	A	630
7	额定有功负载开断电流 Rated breaking current on active load	A	630
8	额定电缆充电开断电流 Rated line- charging breaking current	A	10
9	额定转移电流 Rated transfer current	A	1700
10	开断空载容量 No-load breaking capacity	kVA	1250
11	额定关合电流(峰值) Rated making current(peak value)	kA	63
12	额定短时耐受电流 (2s) rated short-time withstand current (2S)	kA	25
13	额定峰值耐受电流 Rated peak withstand current	kA	63
14	额定短路开断电流 Rated short circuit breaking current	kA	31.5
15	接地回路峰值耐受电流 peak withstand current on ground loop	kA	63
16	接地回路短时耐受电流 Short-time withstand current on ground loop	kA	25
17	配用熔断器型号 Matching fuser model		S□LAJ
18	辅助回路额定电压 Rated voltage on ancillary loop	V	≅220,110,48,42
19	防护等级 Protection level		IPX3X
20	机械寿命 Mechanical life	负荷开关 Load switch	次 5000
		接地开关 Earthing switch	次 2000



## RSF6-12 PTVCCC 系列充气柜

### RSF6-12 PTVCCC GIS Switchgear

#### 概述

#### Introduction

RSF6-PTVCCC 系列充气柜是云南江变电力电器成套设备有限公司开发的新一代小尺寸模块式开关设备，RSF6-PTVCCC 系列充气柜的具有单元型及其箱体等模块式结构。每个模块都具有其各自的功能及金属外壳，并且可以在左右侧任意扩展，根据不同的设计方案任意排列，完成不同的配电任务，当配置模块大于 6 个模块时要采用扩展母线的形式将柜子连起来，实现半模块化结构；气箱全部采用 3.0mm 进口不锈钢板材，通过自动焊接旋转平台及日本松下 Panasonic 焊接机械手动焊接而成，以保证气箱的密闭性；气箱内充以 SF6 气体，并经过同步抽真空氦检漏，负荷开关、接地开关、熔断器绝缘筒等开关活动部件及母线均密封在不锈钢气箱内，极大的提高了电气产品的安全性能，并使充气柜壳体的防护等级达到了 IP67；气箱在底部装有防爆膜片，能有效防止对人；电缆及开关站内其他开关设备的破坏。

RSF6-PTVCCC 系列充气柜定位为国产高端充气环网柜，其在原材料的选择及生产过程都进行严格的监控。所需要的主要环氧件、塑料件及硅胶件全部采购国际知名品牌原材料自行生产，所有元件必须经过严格的氮质谱检漏仪检测和 X 光无损探伤仪检验并进行相关的局部放电测试及电压测试，以确保所有元件的质量可靠；在装配过程中采用德国进口的机械特性测试仪器对充气柜分、合闸的周期性、行程、速度等电气及机械性能进行精确的测试，最大限度的保证产品的生产质量。

RSF6-PTVCCC 系列充气柜具有结构紧凑、全封闭、全绝缘、长寿命、免维护、占用空间小、安全可靠、不受工作环境影响等优点，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、机场、铁路、商业区、高层建筑、高速公路、地铁、隧道及自然条件极其恶劣的场所等领域。

Gas Insulated Switchgear (GIS) in RSF6-12 PTVCCC series is a new generation of small sized modular switchgear innovated and developed by Yunnan Jiangbian Power & Electrical Complete Plant Co. Ltd.. The product consists of modular cell and cell frame which are well configured. Each cell has its own metal frame and is assigned for function. The metal frame provides extension access both from left and right side to permit intended arrangement and organization as the distribution task may decide. Busbar extension will be needed to join two cabinets to form a semi-modular configuration when more than 6 modulars are placed together. The material for gas cabinet is 3.00 mm thick stainless steel specially imported for the purpose. To ensure the tightness, cabinet is automatically welded by Panasonic welding manipulator on automatic turning table. The cabinet is equipped with activate components including load switch, earthing switch, fuse and busbar, all are sealed inside, with space filled with SF6 gas for insulation. Leakage test is done by simultaneous vacuum helium detection. These help to ensure the safety operation of the cabinet and raise its protection degree to IP67. Pressure brusting disc fixed at the ground floor of the cabinet shall effectively prevent man, cable and other components from any damage.

Gas Insulated Switchgear (GIS) in RSF6-12 PTVCCC series is rated as a high-level GIS ring main unit that China has made. To ensure quality control over the cycle of the product manufacturing, from material selection, every production activity factors to assembly. All epoxy, plastic and silicone rubber components are processed and fabricated from material supplied by world known supplier. Upon delivery, every component is checked for its leakage by helium mass spectrometer leak detector and partial discharge and voltage by X ray flaw detector. During assembly stage, an accuracy test is conducted for cabinet's switch on/off period, stroke and speed by mechanical performance detector from Germany.

## RSF6-12 PTVCCC 系列充气柜

### RSF6-12 PTVCCC GIS Switchgear

Gas Insulated Switchgear (GIS) in RSF6-12 PTVCCC series is competent for its compaction, total sealing, total insulation, long durable life, free of maintenance, small size, safety, reliability and free from environment disturbance and can find a wide application in a great diversity of purpose, which may include: industrial and civilian cable ring and supply terminal, particularly in small-scale secondary substation, switch station, plant, mining activity, air port, railway, business centre, tall building, high way, subway, tunnel and other places heavily polluted.

#### 特点 Product features

RSF6-PTVCCC-12/24 系列充气柜以 SF6 气体作为灭弧及绝缘介质；

开关柜为全密封、全绝缘结构；母线、开关及带电部件完全封闭在不锈钢壳体中。腔体充以 1.4bar 的 SF6 气体，防护等级达到 IP67；整个开关装置完全不受外部环境条件影响，即使在短时水浸等级情况下也能保证开关正常运行，产品终身免维护。

开关柜具有完善的“五防”连锁装置，彻底杜绝人为误操作可能引起的人员及设备运行故障；

所有开关柜具有可靠的安全泄压通道，即使在极端情况下也能保障操作人员人身安全。

开关柜分为固定单元组合和可扩展单元组合两类；

开关柜通常由正面出线，也可以按不同的安装位置实现侧出线或侧扩展；

柜体尺寸小安装方便，并能够适合空间狭小及环境条件不良的地方；

开关可根据用户的不同需求配电、远控及监测装置；

不受恶劣环境及场所影响，抗凝露、凝霜、盐雾等；所有高压带电部位以及开关元件全部密封在充油 SF6 气体的箱

内结构紧凑，体积小，重量轻、全绝缘，设计模块化，不同模块组合可实现各种主接线的组合方式，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与柜体的任意扩展全屏蔽电缆进出线、可配用断路器柜、可配用高压监视元件、综合数字式断路器；可配用断路器柜、可加装遥控和监控单元、可加装过流断电保护设备；防洪功能强，长寿命，免维护，降低运行成本满足配网自动化升级要求。

Contained in GIS RSF6-12 PTVCCC series, SF6 gas works as arc extinguisher and insulation media.

The cabinet is totally sealed and insulated, where busbar, switch and load component are all sealed in stainless steel frame and insulated by 1.4bar SF6 gas. All these rise the protection level to IP67 and ensures the cabinet free of environment disturbance, and maintains it in normal operation even it is flooded. The product is free of service for the whole life.

The cabinet is equipped with “five protection” interlock system, which eliminates any possibility of malfunctions or body injury due to wrong operation.

Pressure discharge channel is provided for each cabinet to safeguard operator even under emergent circumstances.

Cabinet is available in two types, one for fixed unit arrangement and the other for unit extension.

In normal circumstances, the cabinet provides a front outlet, but side outlet or side extension is possible subject to placement positions.

Small size and easy installation, accessible to small space or space polluted.

Switchgear can be used for distribution, remote control or monitoring subject to customer's need.

## RSF6-12 PTVCCC 系列充气柜

### RSF6-12 PTVCCC GIS Switchgear

Free from any environment disturbance, resistant to frost, mist and salt mist. Every high voltage position and on load switch component is sealed in SF6 gas filled cabinet.

Compact, small size, light weight, totally insulated and modular cell design which permits integration of various modular for different wiring diagrams. Silicone rubber connector used in circuit switch system allows plug-in of high voltage component and shielded cable inlet and outlet when desired for extension. The cabinet is adaptable to circuit breaker cabinet, high voltage monitoring component, integrated digital circuit breaker; or remote control component or overload protection device. Resistant to flood, free of service and cost effective, the cabinet has long durable life and can satisfy automatic upgrading requirement when intended for network connection.

#### 使用工作环境和工作条件 Ambient conditions:

环境温度：-35°C +40°C

相对湿度；日平均值≤ 95%，月平均值≤ 90%

抗震能力：8 度，水平加速度≤ 0.4g，垂直加速度≤ 0.2g

海拔高度：2000m

无火灾，爆炸危险及剧烈震动场所，当有特殊要求时可与本公司联系协商解决。

1. Temperature: max. +40°C, min. -35°C
2. Humidity: daily average ≤ 95%, monthly average ≤ 90%
3. Altitude: 2,000meter
4. Seismic intensity: not more than 8 degrees,  
horizontal acceleration speed ≤ 0.4g,  
vertical acceleration speed ≤ 0.2g
5. Place: free from fire, explosive and frequent quake. Consultations should be made with manufacturer when special order is made.



# RSF6-12 PTVCCC 系列充气柜

## RSF6-12 PTVCCC GIS Switchgear

### 主要技术参数 Technical parameter

项目 Item	单位 unit	C模块 C modular block	F模块 F modular block	V模块 V modular block		CB模块 CB modular block	
		负荷开关 Load switch	组合电器 GIS	真空开关 Vacuum switch	隔离/接地开关 Isolat/earthing switch	真空断路器 Vacuum circuit breaker	隔离/接地开关 Isolat/earthing switch
额定电压 Rated voltage	KV	12/24	12/24	12/24	12/24	12/24	12/24
工频耐受电压 frequency withstand voltage	KV	42/65	42/65	42/65	42/65	42/65	42/65
雷电冲击耐受电压 Lightning impact withstand voltage	KV	95/125	95/125	95/125	95/125	95/125	95/125
额定电流 Rated current	A	630/630		630/630		1250/800	
额定转移电流 Rated transfer current	A		1700/1400				
分断能力 Isolating capacity	kA	25		25			
闭环开断电流 Closed loop breaking current	A	630/630					
电缆充电开断电流 Line-charging breaking current	A	135/135					
5%额定有功负载 开断电流 5% rated active load breaking current	kA	31.5/31.5					
接地故障开断电流 Earthing failure breaking current	kA	50		50			
接地故障时电缆充 电的开断电流 Line-charging breaking current when earthing fails	A	158/87					
短路开断电流 Short-circuit breaking current	KA	50		50		25(20)	
关合能力 Switch-on capacity	KA	63/52.5		50/40	50/40	63(50)	63/50
短时耐受电流2秒 2 second withstand current	KA	25/25		25			
短时耐受电流3秒 3 second withstand current	KA	20/20	6	20/16	20/16	25(20)	25/20
机械寿命 Mechanical life	次	5000	3000	10000	2000	10000	2000
气箱不锈钢厚度 Wall thickness of gas conservator	mm						

## RDFW 系列户外高压开闭所

### RDFW Outdoor high voltage sub-section post

#### 概述 Introduction

壳体材料全部采用不锈钢或冷轧板。钢板表面喷塑，厚度在 2mm，具有较强的抗腐蚀能力和机械强度，顶盖为空气夹层结构，并设有通风孔，进风口设在箱体下部，出风口设在箱体顶部，隐藏于顶檐下面，可形成自下而上的对流空气，箱体底部设有可拆卸隔板，有电缆进出孔，可防止小动物进入，并使箱体具有良好的隔热通风效果。

The frame is made of stainless steel or cold rolled steel sheet, 2mm plastic coated, corrosion resistant and consolidated for strength. Top lid is air sandwiched with ventilation hole placed. Air intake is placed on the bottom of the cabinet while outlet on the top and hidden under roof. The construction gives a circulation of air. Removable plate is placed on the bottom of the cabinet for heat insulation and ventilation, and available with cable inlet and outlet opening and grid to keep any small animal from entering.

#### 结构特点 Structure

开关柜箱体内为原装进口或国产的 SF6 绝缘三工位负荷开关，开关气体全密封结构，不需加热器，无凝露问题，免维护，箱体内无外露带电体，负荷开关机械寿命达 5000 次；高压进出线通过环氧树脂套管连接。电缆室的每个间隔都配有一组三相带电显示器。挂锁装置，可以将开关锁定在任一状态。

The switch cabinet houses 3 position load switch insulated by SF6 gas and is totally sealed. The cabinet is free from heating, maintenance and frost. Load component inside the cabinet is insulated and load switch is ensured of a mechanical life more than 5,000 on/off times. High voltage inlet/outlet wire is connected by epoxy bushing. Each cell in the cable compartment is equipped with a 3-phase HV live display. Mode setter is provided to set switch mode as intended.

#### 使用环境条件 Ambient conditions:

海拔高度：2000m  
周围空气温度：上限 +55°C，下限 -45°C  
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或可燃气体，水蒸汽等明显污染  
无经常性的剧烈振动，地震强度不超过 8 度。

1. Temperature: max. +40°C, min. -35°C
2. Humidity: daily average  $\leq 95\%$ , monthly average  $\leq 90\%$
3. Altitude: 2,000meter
4. Seismic intensity: not more than 8 degrees,  
Place: free from fire, explosive and frequent quake.

## RDFW 系列户外高压开闭所

### RDFW Outdoor high voltage sub-section post

#### 主要技术参数 Technical parameter

项目 Item	参数 Parameters
额定电压 (KV) Rated voltage (KV)	12
额定电流 (A) Rated current (A)	630
额定频率(Hz) Rated frequency (Hz)	50
局部放电(pc/13kV) Partial discharge (pc/13kV)	≤10
额定热稳电流(kA/2s) Rated thermal stability current (kA/2s)	20
额定峰值电流(kA) Rated peak value current (kA)	50
工频耐压(kV/1min) Power frequency withstand voltage (kV/1min)	48
雷电冲击耐压kV Lightning impact withstand voltage kV	105
回路电阻(uΩ) Loop resistance	≤60
导体工作温度 (°C) Conductor's working temperature	≤95
直流耐压(kV/15min) DC withstand voltage (kv/15min)	55
防护等级 Protection level	Ip 3 3
适用电缆类型 Adaptable cable	交流聚乙烯电缆 AC polyethylene cable
负荷开关机械寿命 (次) Mechanical life for load switch (time)	5000



## RDFW 系列高压电缆分支箱

### RDFW HV Cable branch box

#### 概述 Introduction

RDFW 系列电缆分支箱是额定电压为 12KV/50Hz，额定电流为 630A 的户外高压电器设备，用于电力和电缆及城市供电系统种的联接和分接。该产品具备了安全系数高，组合多元化，利用范围广的特点，能满足不同用户的设计要求及客户设计方案输入的解决，提供令客户满意的技术解决方案。

RDFW cable branch box is an outdoor HV electric facility designed for connection between power and cable and branching connection of power system for the city on 12KV/50Hz and 630A rated current. With high safety coefficient, multiple combination and wide application, the product is able to provide tailored technical solutions to customers as design or inlet scheme may decide.

#### 结构特点 Structure

RDFW 系列分支箱采用内充 SF6 绝缘气体的高性能负荷开关和可接触屏蔽硅胶橡胶电缆接头，具有较强的有功负载及空载电缆电流的开断能力和短路电流的关合能力，并根据用户要求配置相应的避雷器及接地故障指示器。该系列产品中每条环网线上都装有负荷开关或真空断路器。任何一条分支回路都可以自由的退出和投入运行，其他环网回路不受影响。负荷开关上还可以附装熔断器，当某分支回路发生短路故障时，该支回路上的熔断器快速断开故障回路，并撞击负荷开关的脱扣器使之分闸，故障回路被隔离，这样便保证分支回路的供电连续性。

Equipped with high mechanical load switch insulated by SF6 gas and touchable shielded silicone rubber joint, RDFW cable branch box is able to work on high active load and has on/off performance on non load cable current and closing performance on failure circuit. Lightning arrester and earthing failure indicator can be provided subject to order of the customer. Load switch or vacuum circuit breaker have been provided on each ring in the cabinet to allow it free step out or in without affecting other ring's performance. Load switch can be added by fuse breaker, when short circuit occurs, the fuse breaker shall immediately break off the failure branch circuit and impact on load switch's detacher to activate switch off. By separate the failure return, it ensures the continuity of power supply on other return.

#### 使用环境条件 Ambient conditions:

海拔高度：2000m  
周围空气温度：上限 +55°C，下限 -45°C  
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或可燃气体，水蒸汽等明显污染  
无经常性的剧烈振动，地震强度不超过 8 度

1. Temperature: max. +40°C, min. -35°C
2. Humidity: daily average  $\leq$  95%, monthly average  $\leq$  90%
3. Altitude: 2,000meter
4. Seismic intensity: not more than 8 degrees,  
Place: free from fire, explosive and frequent quake.

## RDFW 系列高压电缆分支箱

### RDFW HV Cable branch box

#### 主要技术参数 Technical parameter

项目 Item	参数 Parameters
额定电压 (KV) Rated voltage (KV)	12
额定电流 (A) Rated current (A)	630
额定短时耐受电流 (KA/3s) Rated short-time withstand current (KA/3s)	20
额定峰值耐受电流 (KA) Rated peak value withstand current (KA)	50
工频耐压 (KV/1min) Power frequency withstand voltage (kV/1min)	42 (有效值) (effective value)
雷电冲击耐受电压 (KV) Lightning impact withstand voltage (kv)	75
局部放电 Partial discharge	Pc < 10
额定电缆充电开断电流 (A) Rated line-charging breaking current (A)	10
额定闭环回路开断电流 (A) Rated closed loop breaking current (A)	630
机械寿命 (次) Mechanical life (time)	5000/2000
Sf6气体压力 (Bar) SF6 gas pressure (bar)	0.45
外壳防护等级 Cubicle protection level	Ip 3 3
气体泄漏率 (%/年) Gas leakage rate (%/year)	< 0.1
电缆最大截面积 (mm) Max. cross section of cable (mm)	240



# 10kV 环氧浇注干式铁心串联电抗器

## 10KV Epoxy cast dry core series reactor

### 概述 Introduction

串联电抗器主要与并联电容器相串联用于限制电容器投、切过程中的合闸涌流，抑制电网电压波形畸变和控制流过电容器的谐波分量，消除谐波和过电流对电容器的损伤。此外，一些电网或用电设备为了限制电流的突变也串入串联电抗器起限流保护。

随着电网的不断发展，作为无功补偿装置中不可缺少的设备，串联电抗器被越来越广泛地使用。

Serial reactor is often serial-connected with parallel capacitor in order to restrain inrush transient current occurred during capacitor switching process, inhibit power grid waveform distortion and regulate harmonic component that runs through the capacitor, thus protecting capacitor from damage caused by harmonic component and overloaded current. Also, serial reactor is serial-connected into local power grid or power equipment to restrain current mutation.

As the power grid continuously grows and develops, serial reactor, as a critical component in reactive power compensation device, is more and more used.

### 特点 Product features

该电抗器采用环氧浇注绝缘系统，无油介质、安全性好。

铁芯采用低损耗优质硅钢片，芯柱由多个气隙分为均匀小段，气隙采用环氧层压玻璃板做间隔，以保证电抗器气隙在运行过程中不发生变化。

线圈采用优质导线绕制，排列紧密且均匀，外表不包绝缘层，具有极佳的美感，且有较好的散热性能。

铁芯柱经整体浇注成型，成为坚固钢体运行时振动小，噪声低。

电抗器芯柱部分紧固件采用无磁性材料，确保电抗器具有较高的品质因数和较低的升温，确保具有较好的滤波效果。

外露部件均采用了腐蚀处理，引出端子采用镀锡铜管端子。

该电抗器与国内同类产品相比具有体积小、重量轻、外观美等优点，可与国外知名品牌相媲美。

Safety is assured by epoxy cast insulation system, free of oil media.

Wound core is made of low loss premium silicone steel sheet, with core column divided into homogeneous segments by multiple air gap partitioned by epoxy laminated glass panel in an attempt to maintain air gap works during operation.

Winding is made of premium conducting line, tightly and homogeneously finished with its surface free from insulation coating which ensures of it not only aesthetic but also heat diffusive.

Core column made by cast molding and formed into a robust steel body which can reduce vibration and noise.

Non-magnetic material is chosen for the making of fastener of reactor's core to ensure reactor of higher quality factor, low temperature rise and satisfactory filtering effect.

Exposed parts are finished by anti dust treatment and outlet terminal is tin coated copper tube.

The product is competent for small size, light weight and aesthetic compared with like product by other domestic manufacturers and still stands up to any world branded product.

## 10kV 环氧浇注干式铁心串联电抗器

### 10KV Epoxy cast dry core series reactor

#### 适用范围 Ambient condition

海拔高度：2000 米  
运行环境温度：-25℃ ~ +45℃；  
周围无有害气体，无易燃易爆物品；  
周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

Altitude: 2000 m  
Ambient temperature: -25°C - + 45°C  
Place: free of hazardous gas or any flammable or explosive substance  
Requirement for ventilation. Ventilation device is needed to be affixed if placed in cabinet.



# 10kV 环氧浇注干式铁心串联电抗器

## 10KV Epoxy cast dry core series reactor

### 主要技术参数 Technical parameter

型号 Model	并联电容器组容量 (kvar) Capacity of parallelled condenser unit	电容器额定电压 (kV) Rated voltage of condenser	额定电抗率 (%) Rated reactance rate	额定电抗 (Ω) Rated reactance	额定电流 (A) Rated current	额定端电压 (V) rated terminal voltage	额定容量 (kvar) Rated capacity	损耗 (120°C) (kM) Loss	外形尺寸 L×W×H (mm) Exterior measurement	安装尺寸 A×B (mm) Mounting size	总重 (kg) Total weight
CKSC-54/10-4.5	1200	11√3	4.5	4.54	63	286	54	0.7	940×500×990	400×400	510
CKSC-72/10-6		11√3	6	6.05	63	381	72	0.97	940×500×1010	400×400	565
CKSC-144/10-12		12√3	12	14.4	57.8	831	144	1.55	1180×650×910	500×550	750
CKSC-68/10-4.5	1500	11√3	4.5	3.63	78.7	286	68	0.9	940×500×1060	400×400	530
CKSC-90/10-6		11√3	6	4.84	78.7	381	90	1.18	970×500×980	400×400	610
CKSC-180/10-12		12√3	12	11.5	72.2	831	180	1.9	1180×650×1040	500×550	860
CKSC-81/10-4.5	1800	11√3	4.5	3.03	94.5	286	81	1.08	980×500×1070	400×400	560
CKSC-108/10-6		11√3	6	4.03	94.5	381	108	1.25	980×500×1100	400×400	710
CKSC-216/10-12		12√3	12	9.6	86.6	831	216	2.1	1220×650×1030	500×550	960
CKSC-108/10-4.5	2400	11√3	4.5	2.27	126	286	108	1.27	1010×500×1070	400×400	680
CKSC-144/10-6		11√3	6	3.02	126	381	144	1.5	1145×660×975	500×550	750
CKSC-288/10-12		12√3	12	7.2	115.5	831	288	2.5	1250×650×1160	550×550	1180
CKSC-121/10-4.5	2700	11√3	4.5	2.02	141.7	286	121	1.4	1150×500×880	400×400	650
CKSC-162-/10-6		11√3	6	2.69	141.7	381	162	1.65	1160×650×970	500×550	790
CKSC-324/10-12		12√3	12	6.4	130	831	324	2.6	1240×650×1320	550×550	1280
CKSC-135/10-4.5	3000	11√3	4.5	1.82	157.5	286	135	1.5	1150×650×960	500×500	710
CKSC-180/10-6		11√3	6	2.42	157.5	381	130	1.8	1250×650×930	500×550	900
CKSC-360/10-12		12√3	12	5.76	144.3	831	360	2.9	1330×650×1160	550×550	1400
CKSC-148/10-4.5	3300	11√3	4.5	1.65	173.2	286	148	1.6	1160×650×950	500×550	740
CKSC-198/10-6		11√3	6	2.2	173.2	381	198	1.9	1210×650×1030	500×550	940
CKSC-396/10-12		12√3	12	5.23	158.8	831	396	3.0	1370×650×1130	550×550	1490
CKSC-162/10-4.5	3600	11√3	4.5	1.51	189	286	162	1.65	1190×650×950	500×550	820
CKSC-216-/10-6		11√3	6	2.02	189	381	216	1.92	1240×650×1020	500×550	980
CKSC-432/10-12		12√3	12	4.8	173.3	831	432	3.1	1360×760×1200	660×660	1600
CKSC-180/10-4.5	3000	11√3	4.5	1.36	210	286	180	1.8	1210×650×1020	500×550	900
CKSC-240/10-6		11√3	6	1.81	210	381	240	2.2	1300×650×980	500×550	1035
CKSC-480/10-12		12√3	12	4.32	192.5	831	480	3.2	1400×760×1210	660×660	1740

# 10kV 环氧浇注干式铁心串联电抗器

## 10KV Epoxy cast dry core series reactor

### 主要技术参数 Technical parameter

型号 Model	并联电容器组容量 (kvar) Capacity of parallelled condenser unit	电容器额定电压 (kV) Rated voltage of condenser	额定电抗率 (%) Rated reactance rate	额定电抗 (Ω) Rated reactance	额定电流 (A) Rated current	额定电压 (V) rated terminal voltage	额定容量 (kvar) Rated capacity	损耗 (120℃) (kM) Loss	外形尺寸 L×W×H (mm) Exterior measurement	安装尺寸 A×B (mm) Mounting size	总重 (kg) Total weight
CKSC-189/10-4.5	4200	11√3	4.5	1.3	220.5	286	189	1.86	1200×650×1000	500×550	900
CKSC-252/10-6		11√3	6	1.73	220.5	381	252	2.21	1250×650×1110	550×550	1110
CKSC-504/10-12		12√3	12	4.11	202.2	831	504	3.33	1360×760×1350	660×660	1760
CKSC-203/10-4.5	4500	11√3	4.5	1.21	236	286	203	1.95	1210×650×1060	500×550	960
CKSC-270/10-6		11√3	6	1.61	236.2	381	270	2.3	1280×650×1090	550×550	1200
CKSC-540/10-12		12√3	12	3.84	216.6	831	540	3.6	1450×760×1230	660×660	1900
CKSC-216/10-4.5	4800	11√3	4.5	1.13	252	286	216	2.0	1210×650×1120	550×550	1000
CKSC-288/10-6		11√3	6	1.51	252	381	288	2.23	1280×650×1080	550×550	1190
CKSC-576/10-12		12√3	12	3.6	231	831	576	3.63	1430×920×1300	820×820	1940
CKSC-225/10-4.5	5000	11√3	4.5	1.09	262.5	286	225	2.1	1220×650×1050	550×550	1040
CKSC-300/10-6		11√3	6	1.45	262.5	381	300	2.35	1300×650×1100	550×550	1230
CKSC-600/10-12		12√3	12	3.45	240.7	831	600	3.8	1460×920×1270	820×820	2060
CKSC-243/10-4.5	5400	11√3	4.5	1.01	283.5	286	243	2.2	1220×650×1130	550×550	1070
CKSC-324/10-6		11√3	6	1.34	283.5	381	324	2.48	1310×760×1130	660×660	1310
CKSC-648/10-12		12√3	12	3.2	260	831	648	4.1	1430×920×1270	820×820	2140
CKSC-270/10-4.5	6000	11√3	4.5	0.92	315	286	270	2.2	1250×650×1170	550×550	1150
CKSC-360/10-12		11√3	6	1.21	315	381	360	2.7	1310×760×1180	660×660	1380
CKSC-720/10-12		12√3	12	2.88	289	831	720	4.55	1490×920×1390	820×820	2370
CKSC-297/10-4.5	6600	11√3	4.5	0.83	346.5	286	297	2.43	1270×650×1140	550×550	1210
CKSC-396/10-6		11√3	6	1.1	346.5	381	396	2.8	1340×760×1200	660×660	1520
CKSC-792/10-12		12√3	12	2.62	317.7	831	792	5.1	1570×920×1350	820×820	2600
CKSC-315/10-4.5	7000	11√3	4.5	0.78	367.5	286	315	2.44	1310×650×1140	550×550	1320
CKSC-420-/10-6		11√3	6	1.04	367.5	381	420	2.9	1400×760×1130	660×660	1580
CKSC-840/10-12		12√3	12	2.47	337	831	840	5.2	1570×920×1420	820×820	2780
CKSC-324/10-4.5	7200	11√3	4.5	0.76	378	286	324	2.53	1310×650×1130	550×550	1310
CKSC-432/10-6		11√3	6	1.01	378	381	432	3.1	1390×760×1160	660×660	1600
CKSC-864/10-12		12√3	12	2.4	346.6	831	864	5.5	1580×920×1410	820×820	2870

## 互感器 Mutual inductor

### 概述 Introduction

本系列电流互感器为环氧树脂浇注全封闭支柱式产品，适用于额定频率 50Hz 或 60Hz、额定电压 10kV 的电力系统中，作电能计量、电流测量和继电保护用。

本产品符合 IEC60044-1 及 GB1208《电流互感器》标准。

Current mutual inductor is an epoxy resin cast totally sealed pillar type designed for power and current measurement and relay protection in 10KV 50Hz or 60Hz power system.

The product conforms to IEC60044-1 standard and <AC Mutual Inductor> standard set in GB1208.

### 结构简介 Structure

本系列电流互感器为环氧树脂浇注绝缘全封闭结构，耐污染及潮湿。安装时将一次出线螺钉压紧，保证接触可靠。母线窗孔内有电屏，带有等位线，安装时将等位线与一次母线连接，浇注体固定在安装板上。

Current mutual inductor is an epoxy resin cast totally sealed pillar type, anti-pollution and humidity. To start installation, primary outlet line should be screwed tightly to ensure reliable tap. Electronic screen is available in the busbar window and equipotential line equipped. To start installation, equipotential line should be connected with primary busbar, cast and fixed on the mounting board.



高压电流互感器  
HV current inductor

低压互感器  
LV inductor

## 互感器

## Mutual inductor

### 技术参数

#### Technical parameters:

额定绝缘水平：12/42/75kV

额定二次电流：5A，1A

额定一次电流、准确级组合、额定输出及动、热稳定电流见表 1-9

局部放电水平符合 GB1208《电流互感器》标准。

污秽等级：II级。

若用户有要求，测量级可为 0.2S、0.5S 级。

Rated insulation level: 12/42/75Kv

Rated secondary current: 5A, 1A

Please refer to table 1-9 for rated primary current, accuracy combination, rated outlet and dynamic-heat stability current.

Partial discharge level conform to standard set in GB1208 <Current Mutual Inductor>

Pollution level: II level

Measurement level cab be 0.2S or 0.5S in case of customer order.

## 互感器

## Mutual inductor

### 主要技术参数 Technical parameter

型号 Model	额定一次电流(A) Rated primary current	准确级组合 Accuracy combination	额定输出(VA) Rated output					短时热电流 (I <sub>th</sub> )(kA)	额定动稳定 电流 (I <sub>dyn</sub> ) (kA)
			0.2S 0.2	0.5	5P10 10P10	5P15 10P10	5P20 10P20		
LZZBJ9-10A1 LZZBJ9-10B1 LZZBJ9-10C1 LZZBJ9-10D1 LZZBJ9-10A1G	5	0.2S/10P10 0.2/10P10 0.5/10P10 0.2S/10P15 0.5/10P15 0.2S/10P20 0.2/10P20 0.5/10P20	10	15	15	15	15	0.5	1.25
	10							1	2.5
	15							1.5	3.75
	20							3	7.5
	30、40、50							6	15
	60、75							11	27.5
	100							21	52.5
	150							31.5	80
	200、300							45	112.5
	400、600							63	130
	800、1000 1200、1250		80	160					
LZZBJ9-10A1 LZZBJ9-10C	1500		15	20	20	30	100	80	160
	2000							100	160
	2500								

### 二绕组技术参数

Parameters for secondary windings

额定一次电流(A) Rated primary current	准确级次组合 Accuracy combination	额定输出(VA) rated output			
		0.2	0.5	5P10	5P15
1000	0.2/0.2	20	30	50	30
1200	0.2/0.5				
1500	0.2/5P10	20	50		
200	0.2/5P10				
2500	0.5/5P15				
3000	5P10/5P10				
4000	5P15/5P15				

### 三绕组技术参数

Parameters for tertiary windings

额定一次电流(A) Rated primary current	准确级次组合 Accuracy combination	额定输出(VA) rated output		
		0.2	0.5	5P10
1000	0.2/0.5/5P10 0.2/5P10/5P10 0.5/5P10/5P10	20	30	30
1200				
1500		20	50	
200				
2500				
3000				
4000				

工程案例  
Customer list



俊发中心  
Junfa Center



奥辰地产 (财富中心)  
Aocheng Real Estate (Fortune Center)



星耀水乡  
Xinyao Living Complex



郑和商业广场  
Zhenghe Commercial Plaza



云南日报社记者村  
Journalist Living Complex, Yunnan Daily



鼎杰地产  
Dingjie Real Estate



昆明长水机场  
Kunming Changshui International Airport



新螺丝湾  
Kunming Changshui International Airport

工程案例  
Customer list



(石林) 巴江明珠岭城  
Bajiang River -Minzhu Mountain Peral city (Stone Forest)



(红河) 创泰房产“创泰御境”  
Chuangtai Palace Complex,Chuangtai Real Estate Co. (Honghe)



保利房地产  
Baoli Real Estate



昆明理工大学  
Kunming University of Science & Technology



昆明市北部汽车客运站  
Kunming North Bus Terminal



云南新立有色金属  
Yunnan Xinli Non-ferrous Co.

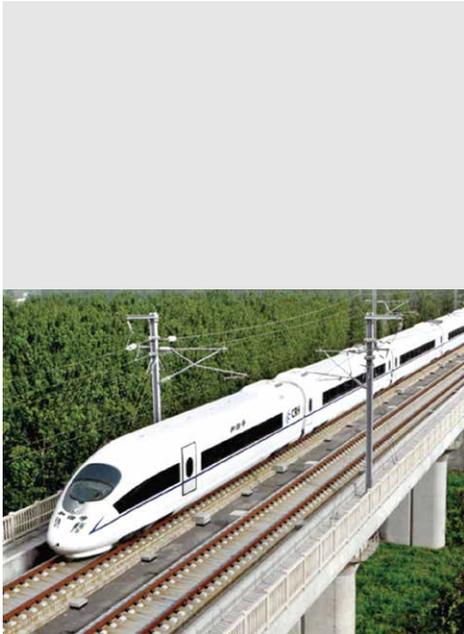


云南省第一人民医院  
Yunnan Provincial No.1 People's Hospital



云南中医学院  
Yunnan Provincial No.1 People's Hospital

## 工程案例 Customer list



沪昆高铁  
Shanghai - Kunming High Speed Railway



昆明二环三环  
2nd and 3rd Ring Road of Kunming



机场项目  
Air Port Project

### 电力系统 Meant for power sector application

南方电网公司云南省电网公司  
Yunnan Provincial Power Grid Co. Ltd., China Southern Power Grid Company Limited  
南方电网公司云南省电力设计院  
Yunnan provincial Power Deign Institute, China Southern Power Grid Company Limited  
南方电网公司昆明供电局  
Kunming Power Supply Bureau, China Southern Power Grid Company Limited  
云南保山电力股份有限公司  
Yunnan Baoshan Power Holding Co. Ltd.  
石林电力工程发展有限公司  
Shilin Power Engineering Development Co.  
禄劝德泰电力工程有限责任公司  
Luquan De-tai power Engineering Co. Ltd.  
石林县供电有限责任公司  
Shilin County Power Supply Co. Ltd.  
云南电网公司昆明供电局 110KV 郑家营输变电工程项目  
Zhengjiaying 110kv Power Transmission and Transforming Project, Kunming Power Supply bureau, Yunnan Power grid Co.

云南电网公司昆明供电局【2008 年大修专项中支出工程项目】  
<Major Maintenance Engineering Program-2008>, Kunming Power Supply bureau, Yunnan Power grid Co.  
云南建源电力工程有限公司  
Yunnan Jianyuan Power Engineering Co. Ltd  
云南正达电力工程有限公司  
Yunnan Zhengda Power Engineering Co. Ltd  
南恒兴电力工程有限公司  
Nanhenxing Power Engineering Co. Ltd  
云南耀洲电力工程有限公司  
Yunnan yaozhou Power Engineering Co. Ltd  
云南滇源电力安装有限公司  
Yunnan Dianyuan Power Installation Co. Ltd.  
德宏电力有限公司  
De-hong Power Co. Ltd.

### 政府系统 Meant for governmental application

昆明新机场 Kunming New Airport  
云南海埂会议中心项目 Yunnan Haigen Conference Centre Project  
云南省国家安全厅 10KV 配电工程  
10Kv Power Distribution Project, Yunnan Provincial Bureau of National Security  
云南省安宁监狱 An-ning Prison, Yunnan Province  
昆明高新技术产业开发区建设局  
Construction Bureau, Kunming High-tech Industry development Zone  
昆明市公安局西山分局配电工程  
Power distribution Project, Xishan Police Station, Kunming Municipal Police Bureau  
昆明市盘龙区人民政府大楼配电工程项目  
Power Distribution Part, Office Building Project for Panlong District Government, Kunming  
昆明高新技术产业开发区建设局建设项目  
Construction Project, Construction Bureau, Kunming High-tech Industry Development Zone

### 市政、城市开发 Meant for urban construction/development application

新螺蛳湾小商品加工基地  
Small Item Processing Base, New Luosiwn Big Whole Sal Market  
新亚州体育城 New Asia Sport Arena  
中铁 16 局隧道工程  
Tunnel Works undertaken by 16th Construction Bureau China Railway Construction Head Bureau  
二环改造项目  
2nd Ring Road Renovation Project

## 工程案例 Customer list



河南南阳农运会场馆  
Nanyang Farmer's Gymnasium, Henan Province



海南文昌卫星发射  
Satellite Launch at Wenchang, Hainan



昆明世纪广场  
Kunming Era Plaza

昆明地铁轨道交通建设项目  
Kunming Subway Construction Project  
昆明市西山区城市建设投资开发有限责任公司  
Urban Construction and investment Co. Ltd. Xishan District, Kunming Municipality  
沪昆客专云南段项目部  
Yunnan Section Sub-contractor, Shanghai - Kunming Passenger Railway  
Construction Project  
云桂铁路云南段  
Yunnan Section Sub-contractor, Yunnan - Guilin Railway Construction Project  
昆明市禄大二级公路  
Luquan - Dali 2nd Grade Road, Kunming Municipality  
五华区“沙沟壩、莲园村”城中村改造重建工程  
City Slum Renovation and Re-construction Project - Shagougen and Lianyuan  
Villages, Wuhua District  
昆明市西段 10KV 以下电力线路迁改工程  
Relocation Project of 10KV Down Transmission Line - West Section of Kunming  
昆明市五华区北仓村“城中村”改造项目  
“City Slum” Renovation Project - Beicang Village, Wuhua District, Kunming  
Municipality

### 军工系统 Meant for military application

中国人民解放军 78300 部队  
78300 Army, PLA  
云南省公安边防总队后勤部  
Logistics Department, Headquarter of Yunnan Frontier Police  
中国人民解放军 77200 部队后勤部  
Logistics Department of Army 77200, PLA

### 房地产 Meant for Real Estate Application

云南俊发房地产开发有限公司  
Yunnan Junfa Real Estate Development Co. Ltd.  
昆明星耀体育运动城有限公司  
Kunming Xinyao Sport Arena Co. Ltd.  
云南奥宸房地产开发有限公司  
Yunnan Aochen Real Estate Development Co. Ltd.  
昆明百大集团房地产开发有限公司  
Real Estate Development Co. Ltd., Kunming Department Store Group Co.  
云南实力房地产开发经营有限公司  
Yunnan Strength Real Estate Development and Dealing Co. Ltd.  
云南东银房地产开发有限公司  
Yunnan Dong Yin Real Estate Development Co. Ltd.  
云南保山子元房地产开发有限公司  
Yunnan Baoshan Ziyuan Real Estate Development Co. Ltd.  
云南海诚房地产开发有限公司  
Yunnan Haicheng Real Estate Development Co. Ltd.  
云南名鼎集团房地产开发有限公司  
Real Estate Development Co. Ltd., Yunnan Minding Group Co.  
昆明神州天宇  
China Skyland  
昆明鼎易房地产开发有限公司  
Kunming Dingyi Real Estate Development Co. Ltd.  
西双版纳正元房地产开发有限公司  
Zhengyuan Real Estate Development Co. Ltd., Xishuangbanna  
昆明国福房地产开发有限公司  
Kunming Guofu Real Estate Development Co. Ltd.  
  
云南云景房地产开发有限公司  
Yunnan Yunjin Real Estate Development Co. Ltd.  
昆明拓东房地产开发有限公司  
Kunming Tuodong Real Estate Development Co. Ltd.

### 文教卫体 Meant for school and hospital application

昆明市盘龙职业高级中学  
Kunming Municipal Panlong Vocational School

## 工程案例 Customer list



云南民族大学  
Yunnan Ethnic University



昆十一中学  
Kunming No. 11 Middle School



红河卷烟厂  
Honghe Cigarette Factory

昆明市扬帆学院 10KV 配电工程  
10kv Power Distribution Project undertaken by Kunming Municipal Yangfan College  
云南省技师学院  
Yunnan Provincial Skill Training College  
云南省卫生厅  
Yunnan Provincial Public Health Bureau  
云南省第一人民医院  
Yunnan Provincial No.1 People' s Hospital  
昆明市第一人民医院  
Kunming Municipal No.1 People' s Hospital  
云南省交通中心医院 10KV 配电室改造  
10kv Distribution Cabinet Renovation undertaken by Yunnan Provincial Traffic Headquarter  
Hospital  
昆明市盘龙区园博小学  
Yuanbo Primary School, Panlong District, Kunming Municipality  
云南机电职业技术学院  
Yunnan Mechanical & Electric Technology and Vocational Institute  
昆明鼎立医院有限公司 10KV 配电工程  
10kv Distribution Project undertaken by Kunming Dingli Hospital Co. Ltd.

### 工矿企业 Meant for mine & industry application

红河卷烟厂 Honghe Cigarette Factory  
昆明钢铁厂 Kunming Steel Works  
中石化股份云南红河石油分公司  
Yunnan Honghe Oil Branch, Sinopec Corp.  
麻栗坡县润弘水电有限公司 那往河二级水电站建设工程  
Two Stage Hydropower Station undertaken by Runhong Hydropower Co. Ltd., Malipo  
County  
螺蛳湾国际商贸城小商品加工基地 10KV 电缆安装工程  
10kv Cable Installation Project for Small Item Processing Base, Luosiwan International  
Trading Fair  
云南省光明园艺场 10KV 配电工程  
10kv Power Distribution Project undertaken by Yunnan provincial Bright Horticulture Farm  
云南三明鑫疆矿业有限公司 10KV 线路架设及变压器配电安装工程  
10kv Transmission Line Erection and Transformer Distribution Installation Project  
undertaken by yunnan Sanming Xinjiang Mining Co. Ltd.  
昆明统一食品企业有限公司 10KV 配电工程  
10kv Power Distribution Project undertaken by Kunming Uni-President Foodstuff Co. Ltd.  
昆明宝远汽车销售服务有限公司 500KVA 用电工程  
500KVA Power supply Project undertaken by Kunming Baoyuan Auto Dealing Co.  
昆明方舟大酒店有限公司  
Kunming Ark Hotel Co. Ltd.  
云南龙图阁商贸有限公司  
Yunnan Longtuge Trading Co. Ltd  
石林圆通运动场管理服务服务有限公司  
Shilin yuantong Gym Management and Service Co. Ltd.  
中国水利水电第十四工程局有限公司牛栏江 - 滇池补水工程项目  
Niulan River - Dianchi Lake Water Replenish Project, 14th Engineering Co. Ltd., China  
Water Conservancy and Hydro Construction Headquarter Co.  
昆明国际珠宝城  
Kunming International Jewelry City  
车行天下国际车城  
International Auto Fair, Driving Worldwide



云南雅迪汽车  
Yunnan Yadi Auto Dealer' s Gallery