公司简介

Company Profile

厦门顺德福电器有限公司（www.gudep.com）成立于2008年6月，属民营高科技企业，注册资金3000万元人民币，厂房面积17000平方米，我司专业生产中高压绝缘电气产品，专业专注为电力开关服务。目前开关元器件拥有固体绝缘系列、陶瓷绝缘系列、充气柜系列、SF6开关系列以及真空绝缘系列等六大系列。最新产品技术开发，能满足加工、生产、技术等服务于一体的科技型企业，是一家技术、高品质电气产品的制造商及服务商。

厦门顺德福的使命：缔造绿色电网，保障开关安全，为促进电气事业的快速发展而努力奋斗！

厦门顺德福的愿景：成为世界一流的绝缘元件制造商，成为世界一流的电行业服务者！

厦门顺德福以“创新科技、以人为本”为经营理念，汇集并培养了一批从事电力产品研发的专业团队，为客户提供质优价廉的电气产品。以客户为核心，以技术创新社会、以创新开拓市场，以品质服务赢得客户信赖和尊重。

厦门顺德福成立于1995年，主要从事电力电器行业，研发团队在电力电器行业长期专注技术创新开发，探索世界先进水平并与国际电力市场接轨。目前，管理团队经验丰富，制造团队精锐领先，销售团队业已强大。始终坚持现代化的管理，制造出优质的产品，用心打造“创新科技、智能领先”的“GOODEP”工程电气品牌，为国家、为民族、为世界电力事业的发展做出更多，更大的贡献。

Xiamen Good EP Electrical Co., Ltd. (www.gudep.com) was founded in June 2008. It is a high technology privately operated company, with a registered capital of 30 million yuan and factory area of 17,000 square meters. We are specialized in producing middle-high voltage intelligent electrical products and serving the electric switchgear companies. At present, we have six series of products of switch components, namely solid insulated series, engraved pole series, GIS series, SF6 switch shell series, and other insulated component series. Good EP is not only a technology company integrating technological development of new products, processing based on customers' samples and drawings, production, technical training and sales service, but also a manufacturer and service provider of high-tech and high-quality electrical products.

Our mission is to develop and produce environmentally-friendly insulated products, to guarantee the safety of switch products and dedicated in promoting the fast development of electric industry.

Our vision is to be the first-class insulated components manufacturer and a world-leading electric service provider.

We always uphold the concept of people-oriented and technological innovation-driving management. We gathered and trained a team of professionals who have long been working on research and development of electrical products, so we can provide our customers high-quality electrical products with reasonable price. We earned our customers' trust and respect by consistently adhering to the development principle of market-oriented, customer-centered, serving the community with technologies, exploring market with innovation and by providing high-quality products and services.

The founder of GOOD EP has been engaged in electricity and power industry since 1995 while our R&D team have long devoted themselves in technological development. We are reaching for advanced world levels and trying to integrate with overseas electric market. In addition, our management team is full of rich experience, our manufacturing team cautious and conscientious and our sales team devoted and powerful. Always insisting on modernized management, we produce high-quality products, deliberately establish "GOODEP" as an electrical brand featuring technological innovation, leading products and services, and trying to make great contributions to the development of electric industry in China and abroad.
Product Features

- **Multi-functional & Integrated Product**
  The inflatable shell of switchgear is made of high quality 2.5mm-thick stainless steel plate by laser welding. To ensure its airtight reliability, high mechanical strength, good corrosion resistance and the grade of inflatable shell protection to achieve IP67, the gas box is equipped with explosion-proof diaphragm, which can effectively prevent the damage to people and equipment when internal pressure is too high. All conductive parts are enclosed in the air tank, which can not only avoid the impact of external environmental factors, but also improve the operational reliability, so that it can be maintenance-free or less maintenance and can meet the requirements of small size at the same time.
  The main circuit is combined with a three-position switch (connecting + disconnecting + grounding) and the vacuum interrupter. This structure is perfectly suitable for the operation and maintenance needs of current power grid because its structure is configured with the most mature technologies.

- **Environmental Friendly & Pollution Free**
  The insulation medium of GDSQR-12 series gas filled tank is zero-level dry air (outgassing) or 99.99% pure N2 that is in line with GB/T 6979-2006. The gas leakage will not cause any impact to external environment, therefore no recycling work is needed.

- **Complete Mechanical Interlock**
  The operation panel of GDSQR-12 series gas filled tank has a perfect mechanical interlock function that is weather-proof, oil-proof, lightning-proof, snow-proof and against small animals which have been well configured in the internal system. Therefore, you can use the product smoothly if only the instructions are followed.

- **Flexible & Suitable Design**
  The design of GDSQR-12 series environment-friendly gas filled tank adopted modular design which is to connect a variety of modules through a dedicated bus to achieve diversified unit combinations, thus to meet the most complex and diverse distribution design schemes in various parts of China.

GDSQR-12 series of environmental-friendly gas insulated RMU | General Introduction
产品结构 Product Structure

1. 电流表
2. 微机综合保护装置
3. 主开关触头指示
4. 储能开关操作指示
5. 开关操作联锁装置
6. 气压表
7. 模数转换器
8. 操作把手
9. 接地刀闸
10. 电气开关

1. Ammeter
2. Micro-computer integrated protection device
3. Main switch energy-storage indicator
4. Energy-storage operation handle
5. Disconnecting switch energy-storage operation handle
6. Pressure gauge
7. Digital-to-analog converter
8. Operation handle
9. Grounding blade
10. Electric switch
型号说明 Model Designation

图示说明 Diagram Explanation

使用环境 Working Environment

2.4.1 安装高度：≤2000m（安装海拔高度超过2000m，请联系制造商）。
2.4.2 环境温度：最高温度：40℃；最低温度：-40℃；24h 内平均气温不超过35℃。
2.4.3 环境湿度：24h 相对湿度平均不超过95%；月相对湿度平均不超过80%。
2.4.4 安装环境：周围空气没有爆炸性或腐蚀性气体，安装场所无强烈振动冲击。
2.4.5 使用条件：8 度。

依据标准 According to Standards

GB/T 11022-2011 高压开关设备和控制设备标准的共用技术要求
GB 3906-2006 3.6kV～40.5kV 交流金属封闭开关设备和控制设备
GB 1984-2014 高压交流断路器
GB 3804-2004 3.6kV～40.5kV 高压交流负荷开关
GB 16926-2009 高压交流负荷开关-熔断器组合电器
GB 3309-1989 高压开关设备的机械试验
DL/T 1404-2007 交流金属封闭开关设备和控制设备
JB/T 3855-2008 3.6kV～40.5kV 户外交流真空断路器
GB 4208-2008 外壳防护等级（IP 代码）
GB/T 4205-2010 人机界面（MMI）-操作规程
GB/T 6388-1986 运输包装收发货标志
GB 9869-2008 工业产品用说明总则
GB/T 13384-2008 机电产品包装通用技术条件
GB/T 14436-1993 工业产品保证文件总则
GB/T 191-2008 包装储运图示标志

Note: Enterprise Model Definition as follows:
GDSGR-E: Extensible Circuit Breaker Solution
GDSGR-C: Extensible Load Switch Solution
GDSGR-T: Extensible Load Switch/Fuse Combined Electrical Apparatus Solution
GDSGR-V/C: Non-extensible Circuit Breaker & Load Switch trio unit in one-box Solution
### GDSGR-12 增列环保气体绝缘环网开关设备主要技术参数表

<table>
<thead>
<tr>
<th>项目</th>
<th>单位</th>
<th>某某</th>
<th>负荷开关</th>
<th>某某开关 - 某某模块组合电器</th>
</tr>
</thead>
<tbody>
<tr>
<td>额定电压</td>
<td>kV</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>额定电流</td>
<td>A</td>
<td>630/1250</td>
<td>630</td>
<td>1250</td>
</tr>
<tr>
<td>额定频率</td>
<td>Hz</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

**额定绝缘水平**

- 1min 工频耐压（对地及相间）
  - kV：42
  - kV：42

- 1min 工频耐压（相间###
  - kV：48
  - kV：48

- 1min 工频耐压（对地及相间）
  - kV：2
  - kV：2

- 环路冲击耐压（相间及相对地）
  - kV：75
  - kV：75

- 环路冲击耐压（对地及相间）
  - kV：85
  - kV：85

<table>
<thead>
<tr>
<th>噪声等级耐压值</th>
<th>kA</th>
<th>20/25</th>
<th>20</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>噪声等级耐压值</td>
<td>kA</td>
<td>50/63</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>噪声等级耐压值</td>
<td>kA</td>
<td>20/25</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

### Main technical parameter list of GDSGR - 12 series of environmental-friendly gas insulated RMU

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Circuit Breaker</th>
<th>Load switch</th>
<th>fuse combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>kV</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Rated current</td>
<td>A</td>
<td>630/1250</td>
<td>630</td>
<td>1250</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>Hz</td>
<td>50</td>
<td>50</td>
<td>50</td>
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<tr>
<td><strong>Rated insulation level</strong></td>
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<tr>
<td>min Power frequency withstand voltage</td>
<td>Hz</td>
<td>42</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Min Power frequency withstand voltage</td>
<td>Hz</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Power frequency withstand voltage (control and auxiliary circuit)</td>
<td>Hz</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lightning impulse withstand voltage</td>
<td>Hz</td>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Lightning impulse withstand voltage (isolating distance)</td>
<td>Hz</td>
<td>85</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Rated short-circuit breaking current</td>
<td>kA</td>
<td>20/25</td>
<td>20</td>
<td>31.5</td>
</tr>
<tr>
<td>Rated short-circuit making current</td>
<td>kA</td>
<td>50/63</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>Rated short-time withstand current</td>
<td>kA</td>
<td>20/25</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Rated duration of short-circuit</td>
<td>s</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Rated peak withstand current</td>
<td>kA</td>
<td>50/63</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Take-over current/transfer current</td>
<td>A</td>
<td>50/63</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Rated operating sequence</td>
<td></td>
<td>0-0.3s<del>0-180s</del>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated filling pressure (gas pressure when temperature is 20°C)</td>
<td>Mpa</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Minimum functional pressure (gas pressure when temperature is 20°C)</td>
<td>Mpa</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yearly Gas Leakage Rate</td>
<td>Mpa</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Technical Notes**

- All the above parameters have met the technical specifications of Type-1 grounding system for the 12kV ring main switchgear by the State Grid, China Southern Power Grid and Jiangsu Electric Power Company and are fully compatible with different neutral grounding modes.
- The combination of three-way cable or two-way cable plus one arrester combination can be realized with combination of the GDSGR-12 series 12kV cable accessory.
- **Note:** Type-1: grounding system of neutral point through little resistance; Type-2: grounding of neutral point through arc suppression coil or ungrounded system.
3.1 Vacuum circuit breaker unit V

Standard Configuration and Characteristics:
- 630A/1250A Busbar
- Vacuum circuit breaker
- Vacuum switch electric operation mechanism
- Three-position disconnecter
- Vacuum switch and three-position disconnecter switch
- Position indicator
- Cable connecting bushing
- Capacitive voltage indicator display bushing charged
- The pressure gauge
- Padlock device
- Cabinet
- Ground bus
- Operating handle
- Current transformer (for protection)
- Digital relay protection device

Optional configuration and characteristics:
- Short-circuit and ground fault indicator
- Separable connector (cable joint)
- Arrester
- Locking device of grounding / charging incoming line
- Interlock device of key machinery
- Ring current transformer and meters
3.2 Load Switch Unit C

Standard Configuration and Characteristics:

- 630A busbar
- Vacuum load switch
- Vacuum load switch manual operation mechanism
- Three-position disconnector switch
- Three-position disconnector switch manual operation mechanism
- Load switch and three-position disconnector switch position indicator
- Cable connecting bushing
- Capacitive voltage indicator display bushing charged
- The pressure gauge
- Padlock device
- Cabinet
- Ground busbar
- Operating handle

Optional configuration and characteristics:

- Vacuum load switch electric operation mechanism
- Short-circuit and ground fault indicator
- Separable connector (cable joint)
- Arrester
- Locking device of grounding charging income line
- Interlock device of key machinery
- Circular current transformer
3.3 组合电器单元 T

标准配置与特性:
125A 母线
真空负荷开关
真空负荷开关手动操作机构
三工位隔离开关 / 储能器装置与未储能接地开关
三工位隔离开关 / 储能器装置与未储能接地开关手动操作机构
负荷开关和接地开关位置指示器
电缆连接装置
显示管带电的容性电压指示器
气压表
悬挂装置
柜体
接地装置
操作手柄
熔管筒

可选配置与特性:
真空负荷开关电动操作机构
储能及接地故障指示器
可分离接地装置（电缆接地）
避雷器
钥匙机械互锁装置
高压限流熔断器
环形电抗互感器及表计

3.3 Switch-fuse Combinations unit T

Standard Configuration and Characteristics:
125A Busbar
Vacuum load switch
Vacuum load switch manual operation mechanism
Three-position disconnector switch/fuse terminal grounding switch
Three-position disconnector switch/fuse terminal grounding switch manual operation mechanism
Load switch and grounding switch position indicator
Cable connecting bushing
Capacitive voltage indicator display bushing charged
The pressure gauge
Padlock device
Cabinet
Ground bus
Operating handle
Fuse tube

Optional configuration and characteristics:
Vacuum load switch electric operation mechanism
Short-circuit and ground fault indicator
Separable connector (cable joint)
Arrester
Interlock device of key machinery
Current limiting fuses
Ring current transformer and meters
3.4 Voltage Transformer Unit PT

Standard Configuration and Characteristics:
2 current transformer
Fuse for protecting unit PT
1 voltmeter with transfer switch
Capacitive voltage indicator display bushing charged
Cabinet
The pressure gauge

Optional configuration and characteristics:
3 voltage transformer
Arraper
Three-position disconnector
Three-position disconnector switch manual operation
mechanism position indicator
3.5 Sectional Switch Unit (Vacuum Circuit Breaker) SV of Busbar

Standard Configuration and Characteristics:
630A/1250A Busbar
Vacuum switch
Vacuum switch manual operation mechanism
Two-position disconnector switch
Two-position disconnector switch manual operation mechanism
Vacuum switch and two-position disconnector switch position indicator
The pressure gauge
Padlock device
Cabinet
Operating lever
Breaking coil
Digital relay protection device

Optional configuration and characteristics:
Vacuum load switch electric operation mechanism
Separable connector (cable joint)
Interlock device of key machinery
3.6 Metering Module M

Standard Configuration and Characteristics:
- 630A/1250A Busbar
- Voltage transformer (2)
- Current transformer (2)
- Fuse for protecting unit PT
- Capacitive voltage indicator display bushing charged
- Cabinet

Optional configuration and characteristics:
- 1 transfer switch
- 1 voltmeter
- 1/2/3 ammeter
- 1 watt-hour meter
- 1 wattless component meter
**Disconnector Switch Design**

a. The disconnector switch adopted three-position design, which theoretically avoid the maloperation completely.
b. Using the contact design which is advantageous to the grounding connection, so that the grounding closing speed reached >4.2m/s.
c. High-performance disc spring from Mubea Germany guarantee the stability of contact pressure.
d. The transmission gap of Spindle driven rotation isolation is small, which ensures reliable ground distance and isolating distance.

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**Main Switch Design**

a. Simple circuit design, uniform electric field distribution structure, no need for more complex insulation, spacious gas box space which meets the good heat convection.

b. Use recyclable and reusable environmental thermoplastic materials with high mechanical strength and good heat-resistance. Replace epoxy casting vacuum interrupter skeleton with one-injection molding three-phase integral vacuum interrupter frame. The design is featuring simple structure, uniform electric field strength, outstanding insulation performance, high production efficiency, less adjustment, easy assembly and many other advantages.
**Main Switch Mechanism Design**

a. The motor, auxiliary switch, release, travel switch of main switch mechanism can be replaced at any time, so that the products are convenient to be repaired.
b. Double spring precision transmission design with function of reclosing.
c. In order to meet the latest procurement standards of State Grid, the main switching mechanism is equipped with automatic counting function.
d. All transmission parts are made of high-quality steel and quenched steels.
e. The core transmission adopted needle roller bearing design which featuring strong impact resistance, heavy load and small friction resistance.

**Disconnector Switch Mechanism Design**

a. The isolation mechanism is designed with three-position single spring and two independent operation shafts, which theoretically avoid the maloperation completely.
b. The rigid limit design of the isolation position prevents the mechanism from rebounding, and effectively prevents the instantaneous break of insulation from breaking through.
c. The grounding closing speed reached ≥4.2m/s.
d. Isolation mechanism "five - guard" linkage rigid connection, reliable to prevent wrong operation.
观察窗设计 Observation Window Design

a. The grounding observation window adopted the principle of optical imaging which is to realize large observation range through the smaller observation window.
b. The grounding observation window is designed with its own light source, which is convenient and clear.
c. The illumination light source adopted the LED lamp design which guarantees the design life of lighting lamp.

泄压设计 Pressure-relief Design

a. Special pressure relief device
b. Cable room can release pressure backward, so that the back-end of cabinet need not to increase pressure relief channel.
**Operation Panel Design**

1. Analog busbar clarity
2. There are two separate operation holes for both disconnector switch and grounding switch.
3. Operation hole can be locked.
4. Grounding switch can be mounted with an electromagnetic lock device to prevent wrongly charging and closing the grounding switch.

**Operation Button Design**

1. The main switch manual operation is designed to be simple and convenient.
2. The button design is fitted with a tamper-resistant lid and can be locked.

a. 主开关手动操作采用按钮设计，操作简单方便
b. 按钮设计有防误合操作罩，并可锁扣
**Energy Storage Electric Machine Design**

Planetary deceleration dc permanent magnet motor is small and stable which has an excellent transmission efficiency with its energy efficiency loss as low as about 3%.

**Environmental Protection**

Recyclable materials are selected. Production design matches environmental protection according to ISO14001 environment management system. We are obliged to recycle our product when its lifetime is over.
外形及相关尺寸
Appearance and related dimension

GDSGR-12-CVW 外形尺寸
Appearance and dimension of GDSGR-12-CVW

<table>
<thead>
<tr>
<th>尺寸 A</th>
<th></th>
<th>尺寸 B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>A</td>
<td>Unit</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>900</td>
<td></td>
<td>730</td>
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<tr>
<td></td>
<td>640</td>
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<td>590</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td></td>
<td>1130</td>
</tr>
</tbody>
</table>

Note: A depends on the type and number of units.

Note: B depends on the type and number of units.
GDSGR-12-T 外形尺寸
Appearance and dimension of GDSGR-12-T cabinet

GDSGR-12-M 外形尺寸
Appearance and dimension of GDSGR-12-M cabinet
安装相关尺寸
Relevant dimension of installation

底座安装孔位相关尺寸
Relevant dimension of mounting hole on the base

<table>
<thead>
<tr>
<th>Unit</th>
<th>W1</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>1台  1-circuit</td>
<td>380</td>
<td>420</td>
</tr>
<tr>
<td>2路  2-circuit</td>
<td>600</td>
<td>640</td>
</tr>
<tr>
<td>3路  3-circuit</td>
<td>1220</td>
<td>1260</td>
</tr>
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</table>
Sales distribution network diagram