VPN-12系列智能型固封式真空断路器
VPN-12 Series Intelligent Solid-Insulation-Embedded Pole Vacuum Circuit Breaker

产品特点

- 采用高强装甲结构，增强防震性能，同时具备一定的安全性能。
- 采用高精度的电子元件，提高电路的稳定性和可靠性。
- 采用高导电性的材料，降低功耗，提高效率。
- 采用高灵敏度的传感器，实时监测电路的状态，确保电路的正常运行。

Product Features

- Tyens-KLD online monitoring technology is used for online monitoring of the mechanical properties of the circuit breaker, so that automatic alarm is given when limit is exceeded.
- Tyens-KLD modular spring operating mechanism technology is used to realize maintenance-free of mechanism.
- Vacuum interrupter solid-insulation-embedded pole manufactured by joint venture is used to ensure stable quality and excellent performance.
- The pressure feedthrough treatment process of zinc-coated alloy hexavalent chromium in Malaysia shall be introduced, and the level of salt spray resistance test is up to 300 hrs.
- The German INA customized copper-based high-pressure alloy oil-free bearings are used to achieve self-lubrication of drive mechanism.
- Mechanical life of 30,000 cycles.

Overview

The VPN-12 vacuum circuit breaker is made up of research and development of imported technology from Tyens-KLD. The product is widely used in grid, power system, industry and other sectors.

The product can be used alone, or alternatively incorporated in the in-line switchgear and fixed switchgear. It can facilitate the handcart interchangeability with other circuit breakers, and have wide range of compatibility and interchangeability.

Structure Type

The VPN-12 intelligent vacuum circuit breaker is in overall structure of front-end arrangement of the circuit breaker and the primary conductive circuit. The main conductive section is in floor-standing structure of three-phase solid-insulation-embedded pole. The online monitoring monitors are normally mounted on the instrument panel of switchgear, and the data is transmitted through secondary plug-in components between circuit breakers and cubicles.

Operating Mechanism

The VPN-12 intelligent vacuum circuit breaker is entrenched with the modular spring-operated mechanism developed by Tyens-KLD, featuring compact size and high structural stiffness. The energy storage of the mechanism takes the form of gear transmission, and all metal parts of products are preserved using adjustment surface treatment process of zinc-coated alloy hexavalent chromium in Malaysia, and the level of salt spray resistance test is up to 300 hrs.

Solid-insulation-Embedded Pole

The VPN-12 intelligent vacuum circuit breaker is used with solid-insulation-embedded pole products, of which features are: high dielectric strength, little influence by environmental factors, smaller contact surface area between conductors, and lower resistance; at the same time, technical advantages and strict quality management system on products of joint venture. All these features support quality stability of the products and excellent performance of the vacuum interrupter.

Online Monitoring

The VPN-12 intelligent vacuum circuit breaker is applied with Tyens-KLD online monitoring technology to achieve real-time monitoring on the mechanical properties of the circuit breaker, which gives automatic alarm according to the relevant technical parameters monitored according to the parameters set to alert the maintenance personnel for timely maintenance and prevent the circuit breakers from faulty operation.

产品结构 Product Structure

- 结构形式
  - 采用高强装甲结构，增强防震性能，同时具备一定的安全性能。
  - 采用高精度的电子元件，提高电路的稳定性和可靠性。
  - 采用高导电性的材料，降低功耗，提高效率。
  - 采用高灵敏度的传感器，实时监测电路的状态，确保电路的正常运行。

- 操作机构
  - 采用高强装甲结构，增强防震性能，同时具备一定的安全性能。
  - 采用高精度的电子元件，提高电路的稳定性和可靠性。
  - 采用高导电性的材料，降低功耗，提高效率。
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- 固定螺栓
  - 采用高强装甲结构，增强防震性能，同时具备一定的安全性能。
  - 采用高精度的电子元件，提高电路的稳定性和可靠性。
  - 采用高导电性的材料，降低功耗，提高效率。
  - 采用高灵敏度的传感器，实时监测电路的状态，确保电路的正常运行。

- 在线监测
  - 采用高强装甲结构，增强防震性能，同时具备一定的安全性能。
  - 采用高精度的电子元件，提高电路的稳定性和可靠性。
  - 采用高导电性的材料，降低功耗，提高效率。
  - 采用高灵敏度的传感器，实时监测电路的状态，确保电路的正常运行。
VPN-12系列智能型固封式真空断路器
VPN-12 Series Intelligent Solid-Insulation-Embedded Pole Vacuum Circuit Breakers

产品特点
- 采用德森克罗德在线监测技术，对断路器机械特性进行在线监测，配置自动报警功能。
- 采用德森克罗德模块化弹簧操作机构技术，实现机构免维护。
- 采用配置真空灭弧室固封极柱，确保产品质量，性能优良。
- 引入马来西亚铝合金六面体铝制表面处理工艺，抗腐蚀试验水平达300小时。
- 采用英国RHA定制的铜高硬度合金油道轴承，实现传动自润滑。
- 极柱寿命30000次。

Product Features
- TySen-KLD online monitoring technology is used for online monitoring of the mechanical properties of the circuit breaker, so that automatic alarm is given when the limit is exceeded.
- TySen-KLD modular spring operating mechanism technology is used to realize maintenance-free of mechanism.
- Vacuum interrupter solid-insulation-embedded pole manufactured by joint venture is used to ensure stable quality and excellent performance.
- The passivation surface treatment process of zirconium-alloy hexavalent chromium in Malaysia shall be introduced, and the level of salt spray resistance test is up to 300 hrs.
- The German INA customized copper-based high pressure alloy oil-free bearings are used to achieve self-lubrication of drive mechanism.
- Mechanical life of 30,000 cycles.

产品结构

概述
VPN-12真空断路器是引进德森克罗德技术研发而成，产品广泛应用于电源、发电厂、变电站、工业及其他行业。

产品可以单独使用，也可用于装置式开关柜或固定式开关柜。并可方便与其他断路器联手合开，具有广泛的兼容性和互换性。

结构形式
VPN-12智能型真空断路器作为接触器与一次导电回路的紧密形式，主导电回路部分为三层固定极柱结构，在线监测显示器一般安装在开关柜或柜体，通过断路器与柜体一体化插件传递数据。

操作机构
VPN-12智能型真空断路器采用德森克罗德研发的模块化弹簧操作机构，具有体积小，结构简单的特点，机构由弹簧通过传动方式，使产品所有功能的性能均达到马来西亚铝合金六面体铝制表面处理工艺，抗腐蚀试验水平达300小时。

固封极柱
VPN-12智能型真空断路器采用合金极柱产品，其特点是：绝缘性能高，受环境因素影响小，导电性良好，绝缘性能好；同时由于合金产品的技术优势及严格的质量管理体系，确保了产品质量的稳定和真空灭弧室的优越性能。

在线监测
VPN-12智能型真空断路器采用德森克罗德在线监测技术，对断路器的机械特性进行实时监测，根据设定参数，在监测的参数变化速率时自动报警，提醒人员及时检修，防止断路器带故障运行。

概述
The VPN-12 vacuum circuit breaker is made up of research and development of imported technology from TySen-KLD. The product is widely used in power grids, power plants, substations and other sectors.

The product can be used alone, or alternatively incorporated in the mid-set switchgear and fixed switchgear. It can facilitate the handcart interchangeability with other circuit breakers, and have a wide range of compatibility and interchangeability.

Structure Type
The VPN-12 intelligent vacuum circuit breaker is in overall structure of front-end arrangement of the actuator and the primary conductive circuit. The main conductive circuit part is in floor-standing structure of three-phase solid-insulation-embedded pole. The online monitoring monitors are normally mounted on the instrument panel of switchgear, and transmit data through secondary plug-in component between circuit breakers and cubicle.

Operating Mechanism
The VPN-12 intelligent vacuum circuit breaker is installed with the modular spring-operated mechanism developed by TySen-KLD, featuring compact size and great composite stiffness. The energy storage of the mechanism takes the form of gear transmission, and all metal parts of products are preserved using passivation surface treatment process of zinc-alloy hexavalent chromium in Malaysia, and the level of salt spray resistance test is up to 300 hrs.

Solid-Insulation-Embedded Pole
The VPN-12 intelligent vacuum circuit breaker is used with solid-insulation-embedded pole products, of which features are: high dielectric strength, little influence by environmental factors, smaller contact surface area between conductors, and low loop resistance; at the same time technical advantages and strict quality management system on products of joint venture. All these features support quality stability of the products and excellent performance of the vacuum interrupter.

Monitoring
The VPN-12 intelligent vacuum circuit breaker is applied with TySen-KLD online monitoring technology to achieve real-time monitoring on the mechanical properties of the circuit breaker, which gives automatic alarm according to the relevant technical parameters monitored according to the parameters set, to alert the maintenance personnel for timely maintenance and prevent the circuit breakers from faulty operation.
### Environmental Conditions for Use

- Ambient temperature:
  - Maximum temperature: +45℃
  - Minimum temperature: -25℃ (allowable for storage and transportation at -30℃)
- Environmental Humidity:
  - Daily average relative humidity: ≤ 95%
  - Monthly average relative humidity: ≤ 90%
  - Daily average air pressure: 2.2 x 10^3 MPa
  - Monthly average air pressure: 1.8 x 10^3 MPa
- Altitude: 1,000 m (1,000-4,000 m can be customized)
- Earthquake intensity not more than 8度
- The place of use must not have any dripping, combustion and explosive hazards, severe contamination, chemical corrosive gases and severe vibration.

### Main Specifications and Technical Parameters of Circuit Breaker

<table>
<thead>
<tr>
<th>序号</th>
<th>名称</th>
<th>Description</th>
<th>单位</th>
<th>参数</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>额定电压</td>
<td>Rated voltage</td>
<td>kV</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>额定短路开断电</td>
<td>Rated short-circuit breaking current</td>
<td>kA</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>额定短路关合电</td>
<td>Rated short-circuit making current</td>
<td>kA</td>
<td>63</td>
</tr>
<tr>
<td>4</td>
<td>额定峰值耐受电</td>
<td>Rated peak withstand current</td>
<td>kA</td>
<td>63</td>
</tr>
<tr>
<td>5</td>
<td>额定热恢复电（有效值）</td>
<td>Rated thermal stability current (effective value)</td>
<td>kA</td>
<td>63</td>
</tr>
<tr>
<td>6</td>
<td>额定短路持续时间</td>
<td>Rated short-circuit duration</td>
<td>s</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>框架寿命</td>
<td>Mechanical life</td>
<td>Number of cycles</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>防尘保护箱</td>
<td>Rated single/both back capacitor bank breaking current</td>
<td>A</td>
<td>630/400 (800/400 for 40kA)</td>
</tr>
<tr>
<td>9</td>
<td>相间距离</td>
<td>Phase-to-phase spacing</td>
<td>mm</td>
<td>Below 1600A, 210 x 1.5 Above 2000A, 275 x 1.5</td>
</tr>
<tr>
<td>10</td>
<td>防尘保护箱</td>
<td>Rated short-circuit breaking current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>框架寿命</td>
<td>Mechanical life</td>
<td>Number of cycles</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>框架寿命</td>
<td>Mechanical life</td>
<td>Number of cycles</td>
<td>30000</td>
</tr>
<tr>
<td>13</td>
<td>框架寿命</td>
<td>Mechanical life</td>
<td>Number of cycles</td>
<td>30000</td>
</tr>
<tr>
<td>14</td>
<td>相间距离</td>
<td>Phase-to-phase spacing</td>
<td>mm</td>
<td>Below 1600A, 210 x 1.5 Above 2000A, 275 x 1.5</td>
</tr>
</tbody>
</table>

**Note:**
- 3000A requires forced air cooling. Data shall be prevail by the final manufactured products.
- 4000A requires forced air cooling. Data shall be prevail by the final manufactured products.

**Note:**
### Environmental Conditions for Use

- Ambient temperature:
  - Maximum temperature: +45°C
  - Minimum temperature: -25°C (allowable for storage and transportation at -30°C)

- Environmental Humidity:
  - Daily average relative humidity: ≤95%
  - Monthly average relative humidity: ≤90%
  - Daily average air pressure: ≤2.2 x 10^3 MPa
  - Monthly average air pressure: ≤1.8 x 10^3 MPa

- Altitude: 1,000 m (1,000-4,000 m can be customized)

- Earthquake intensity not more than 8 degree

- The place of use must not have any dripping, combustion and explosive hazards, severe contamination, chemical corrosive gases and severe vibration.

### Main Specifications and Technical Parameters

#### Main Specifications and Technical Parameters of Circuit Breaker

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<tr>
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<th>Description</th>
<th>单位</th>
<th>参数</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>额定电压</td>
<td>Rated voltage</td>
<td>kV</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>额定短路开断电流（1 min）</td>
<td>Rated short-circuit breaking current</td>
<td>kA</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>额定短路关合电流</td>
<td>Rated short-circuit making current</td>
<td>kA</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>额定分断耐受电压</td>
<td>Rated peak withstand voltage</td>
<td>kA</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>额定热稳定电流（有效值）</td>
<td>Rated thermal stability current (effective value)</td>
<td>kA</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>额定短路持续时间</td>
<td>Rated short-circuit duration</td>
<td>s</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>额定短路关合次数</td>
<td>Rated operations of short-circuit breaking current</td>
<td>次/Number of cycles</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>机械寿命</td>
<td>Mechanical life</td>
<td></td>
<td>30000</td>
</tr>
<tr>
<td>9</td>
<td>额定分断开合闸操作</td>
<td>Rated single-break to break capacitor bank breaking current</td>
<td>A</td>
<td>Below 600A, 210A ≤ 40KA</td>
</tr>
<tr>
<td>10</td>
<td>非线性</td>
<td>Phase-to-phase spacing</td>
<td>mm</td>
<td>Below 1600A, 210A ≤ 1.5</td>
</tr>
<tr>
<td>11</td>
<td>非线性</td>
<td>Arc-to-cone thinning thickness</td>
<td>mm</td>
<td>Below 2000A, 275 ≤ 1.5</td>
</tr>
<tr>
<td>12</td>
<td>非线性</td>
<td>Arc-to-cone thinning thickness</td>
<td>mm</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>时间间隔</td>
<td>Time interval between opening of first and last phase of three-phase circuit-breaker</td>
<td>ms</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>14</td>
<td>时间间隔</td>
<td>Bouncing time of contactor closed</td>
<td>ms</td>
<td>&lt; 2 (40KA或&lt;3)</td>
</tr>
<tr>
<td>15</td>
<td>时间间隔</td>
<td>Opening time</td>
<td>ms</td>
<td>25-50</td>
</tr>
<tr>
<td>16</td>
<td>时间间隔</td>
<td>Closing time</td>
<td>ms</td>
<td>25-70</td>
</tr>
<tr>
<td>17</td>
<td>时间间隔</td>
<td>Rated operating sequence</td>
<td></td>
<td>0.3s, 180s, 0, 180s, 0, 180s, 0</td>
</tr>
<tr>
<td>18</td>
<td>时间间隔</td>
<td>Actuator corrosion resistance (salt spray test)</td>
<td>h</td>
<td>300</td>
</tr>
</tbody>
</table>

注：40KA需要强制风冷，数据以最终出厂产品为准
Note: 40KA requires forced air cooling. Data shall prevail by the final manufactured products.
**VPN-12系列智能型固封式真空断路器**
**VPN-12 Series Intelligent Solid-Insulation-Embedded Pole Vacuum Circuit Breaker**

- **产品型号说明 Model Description**
  - 户内智能型真空断路器 (帝森南自品牌)
  - Indoor intelligent vacuum circuit breaker (TYSEN-SAE brand)

- **常用规格说明 Common Specifications**
  - 额定电流: 630A, 1250A, 1600A, 2000A, 3150A, 4000A
  - 额定短路开断电流: 20kA, 25kA, 31.5kA, 40kA

**ZN139-12/G系列固封式真空断路器**
**ZN139-12/G Series Solid-Insulation-Embedded Pole Vacuum Circuit Breaker**

- **产品型号说明 Model Description**
  - 户内真空电路断路器
  - Vacuum circuit breaker

- **常用规格说明 Common Specifications**
  - 额定电流: 630A, 1250A, 1600A, 2000A, 3150A, 4000A
  - 额定短路开断电流: 20kA, 25kA, 31.5kA, 40kA

注: *4000A需强制风冷，具体技术参数及详细选型请参见产品介绍。
Note: *4000A requires forced air cooling. For specific technical parameters and detailed selection, refer to Part I: Products Introduction.