VB2-12
Assembly Pole Vacuum Circuit Breaker
Leading the future of electrification
GE

GE is a diversified organization covering a myriad of market segments, including infrastructure, finance and media. From energy, water, transportation and health to access to money and information, GE serves customers in more than 100 countries and employs more than 300,000 people worldwide.

The company traces its beginnings from Thomas A. Edison, who established the Edison Electric Light Company in 1878. In 1892, a merger of Edison General Electric Company and Thomson-Houston Electric Company created the General Electric Company. GE is the only company listed in the Dow Jones Industrial Index today that was also included in the original index in 1896.

Industrial Solutions

GE Industrial Solutions, a division of GE Energy Management, is a global leading provider in power distribution, offering a wide range of services and products which include medium and low voltage power distribution equipment and components, motor & control systems and service products that are safe, reliable and offer high performance.

Honour

2011 World's Most Admired Companies
2011 Best Global Brand
2008 World's Most Respected Companies
2009 World's Most Respected Companies
2010 World’s Most Innovative Companies
2007 World's Best R&D Companies
More Than 90 Years of Interrupter Experience

GE pioneered experimental vacuum interrupters in the 1920s. Refined it and introduced the world’s first 15kV Vacuum circuit breaker in the 1960s. To date, this interrupter design has been the world leader in vacuum technology and has accumulated over 55 years of reliable field service.

Universal Applications

SecoVac is designed, assembled and tested to meet or exceed applicable IEC, GB and DL standards. It is suitable for applications in all major industries including T&D, Oil & Gas, Automotive, Processing plants, Iron and Steel mills, Mining, Commercial buildings, etc.

World Class Quality

Manufactured, assembled and tested all in the same sophisticated facility, SecoVac is the product of state of the art manufacturing processes assured by ISO 9001:2000 and ISO 14001 certification.

Environment Conscious

Selecting low environmental impact technologies has become increasingly important to engineers tasked with choosing equipment for an application. With commitment to environment protection, the solid insulation of epoxy resin is used for SecoVac series MV embedded pole vacuum circuit breaker instead of SF6 gas.
Introduction

Shanghai GE breaker Co., Ltd. has launched a new SecoVac VB2 Type 12kV series vacuum circuit breakers (Briefed as VB2), which are pieces of apparatus for indoor installation. The products conform to the GB1984 standards (equivalent to IEC62271-100) as well as DL403 standards, and become the optimal choice for control and protection in HV Transmission and distribution system. In particular, the apparatus is applicable for places requiring frequent operation. The installation of VB2 breaker inside switchgear may be alternatively withdrawable type or fixed type.

Product Type

VB2-12 / T

Mounting mode: Z - withdrawable type; G - fixed type
Rated breaking current for short circuit (kA): 25, 31.5, 40
Rated current (A): 630, 1250, 1600, 2000, 2500, 3150, 4000
Spring-Operating Mechanism
Rated voltage (kV): 12
Vacuum circuit breaker

The breaker ready for placing in the cabinet
Testing position of the breaker in the cabinet
Working position of the breaker in the cabinet

Environmental data

- The ambient air temperature does not exceed 40°C and its average value, measured over a period of 24 h, does not exceed 35°C.
- The minimum ambient air temperature is -25°C (storage and transport is allow at 30°C).
- The altitude does not exceed 1000m.
- The conditions of humidity are as follow:
  - the average value of the relative humidity, measured over a period of 24 h, does not exceed 95%;
  - the average value of the water vapour pressure, over a period of 24 h, does not exceed 2.2 kPa;
  - the average value of the relative humidity, measured over a period of one month, does not exceed 90%;
  - the average value of the water vapour pressure, over a period of one month, does not exceed 1.8 kPa.
- During the period of high humidity, when the temperature drops sharply, pay attention to preventing condensation.
- Earthquake intensity is no more than 8 degree.
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.
- Storing place free from fire, explosion, chemical corrosion and heavy shakes.
Characteristics and Advantage

- High-end 3-D computer-aided design (Pro-Engvineer) and dynamic simulation optimal design (Pro-Mechanical)
- Lessening partial distribution and local overheat to minimum by optimizing electromagnetic field distribution.
- World leading-edge miniature interrupter chamber applying axial rotating magnetic field vacuum interrupting principle, with the extremely stable breaking performance.
- Perfect insulation performance, with more creeping distance and electrical clearance than requirements of IEC and GB standards, pass the condensation test successfully, which is applicable for operation under harsh environment.
- With reliable grounding mode, which ensures earthing continuity of breaker from working position to test position.
- Pass the temperature rise test under 110% rated current.

- The closing spring charging mechanism with excellent performance is applied in the VB2 breaker. Modular design for multi-uses and the main parts are reasonable arranged, which make the operating mechanism simpler and performance more stable.
- The whole mechanism consist of three modules: energy-charging module, closing module and tripping module. Each module can be assembled respectively and mounted on to the mechanism together with bolts.
- The energy-charging module is composed of two-level worm gears, super clutch and closing spring, which be more compact and delicate.
- Besides power operating energy-charging device, the manual operating device is provided. Auto-reclosing can be realized for all VB2 breakers.
## Technical data for breaker

<table>
<thead>
<tr>
<th>Product type</th>
<th>VB2-12/T630-25</th>
<th>VB2-12/T630-31.5</th>
<th>VB2-12/T1250-25</th>
<th>VB2-12/T1250-31.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>kV</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated normal current</td>
<td>A</td>
<td>630</td>
<td>1250</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>Hz</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated power-frequency withstand voltage (1 minute)</td>
<td>kV</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage (peak)</td>
<td>kV</td>
<td>75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated short-circuit breaking current</td>
<td>kA</td>
<td>25</td>
<td>31.5</td>
<td>25</td>
</tr>
<tr>
<td>Rated short-circuit making current (peak)</td>
<td>kA</td>
<td>63</td>
<td>80</td>
<td>63</td>
</tr>
<tr>
<td>Rated short-time withstand-current (4 sec.)</td>
<td>kA</td>
<td>25</td>
<td>31.5</td>
<td>25</td>
</tr>
<tr>
<td>Rated peak withstand-current</td>
<td>kA</td>
<td>63</td>
<td>80</td>
<td>63</td>
</tr>
<tr>
<td>Rated short-circuit current breaking times</td>
<td>times</td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Short circuit/breaking endurance times</td>
<td>times</td>
<td></td>
<td>274</td>
<td></td>
</tr>
<tr>
<td>Operating sequence</td>
<td></td>
<td></td>
<td>O-0.3s-CO-180s-CO</td>
<td></td>
</tr>
<tr>
<td>Mechanical life</td>
<td>times</td>
<td></td>
<td>30000</td>
<td></td>
</tr>
<tr>
<td>Clearance between Contact</td>
<td>mm</td>
<td>9 ± 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overtravel</td>
<td>mm</td>
<td>5 ± 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average closing speed</td>
<td>m/s</td>
<td>0.5–1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average opening speed</td>
<td>m/s</td>
<td>1–1.3</td>
<td></td>
<td></td>
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<tr>
<td>Contact closing tripping time</td>
<td>ms</td>
<td>≤2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synchronization of 3-phase contact closing and opening</td>
<td>ms</td>
<td>≤2</td>
<td></td>
<td></td>
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<tr>
<td>Pole center distance</td>
<td>mm</td>
<td>210 (or 170)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable maximum contact erosion</td>
<td>mm</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>Breaker grade</td>
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Breaking current 25–31.5kA

Breaking current 40kA
<table>
<thead>
<tr>
<th>VB2-12/T1250-40</th>
<th>VB2-12/T1600-40</th>
<th>VB2-12/T2000-40</th>
<th>VB2-12/T1600-40</th>
<th>VB2-12/T2000-40</th>
<th>VB2-12/T2500-40</th>
<th>VB2-12/T3150-40</th>
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<tr>
<td>12</td>
<td>1250</td>
<td>1600</td>
<td>2000</td>
<td>1600</td>
<td>2000</td>
<td>2500</td>
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<td>50</td>
<td>42</td>
<td>75</td>
<td>40</td>
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<td>100</td>
<td>30</td>
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<tr>
<td></td>
<td>O-0.3s-CO-180s-CO</td>
<td>30000</td>
<td>8 ± 1</td>
<td>5 ± 1</td>
<td>0.5–1</td>
<td>1–1.3</td>
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<td>≤2</td>
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<td>≤2</td>
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<td></td>
<td>230</td>
<td>275</td>
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<td>3</td>
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<td></td>
<td></td>
<td></td>
<td>C2-E2-M2</td>
</tr>
</tbody>
</table>

- Truck
- Rocking handle of chassis
- Energy-storing handle
Technical data for energy storing motor

<table>
<thead>
<tr>
<th>Name</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operation voltage (V)</td>
<td>AC, DC110</td>
</tr>
<tr>
<td>Rated input power for motor (W)</td>
<td>300</td>
</tr>
<tr>
<td>Normal operation voltage scope</td>
<td>85%–110% rated operation voltage</td>
</tr>
<tr>
<td>Energy storing period under rated voltage</td>
<td>≤10</td>
</tr>
</tbody>
</table>

Technical data for opening and closing electromagnetic coils

<table>
<thead>
<tr>
<th>Name</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operation voltage (V)</td>
<td>DC110 DC220</td>
</tr>
<tr>
<td>Rated operation current (A)</td>
<td>1.9 1</td>
</tr>
<tr>
<td>Resistance value of 20°C electromagnetic coil (Ohm)</td>
<td>57 ± 10% 220 ± 5%</td>
</tr>
</tbody>
</table>
| Scope of normal operation voltage         | Closing: 85%–110% rated voltage
|                                           | Opening: 65%–120% rated voltage. In case the voltage is lower than 30% rated voltage, opening operation is not allowed. |

Overall Size

Installation dimensions of Breaker body bottom

<table>
<thead>
<tr>
<th>Specifications</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>630-1250A Pole centre distance 170mm</td>
<td>460</td>
<td>325</td>
<td>50</td>
<td>520</td>
</tr>
<tr>
<td>630-1250A Pole centre distance 210mm</td>
<td>515</td>
<td>325</td>
<td>50</td>
<td>600</td>
</tr>
<tr>
<td>1250-2000A Pole centre distance 230mm</td>
<td>580</td>
<td>325</td>
<td>85</td>
<td>640</td>
</tr>
<tr>
<td>1600-4000A Pole centre distance 275mm</td>
<td>700</td>
<td>325</td>
<td>85</td>
<td>760</td>
</tr>
</tbody>
</table>
Overall Dimensions

25~31.5kA/Pole centre distance 170mm, Withdrawable

25~31.5kA/Pole centre distance 210mm, Fixed

25~31.5kA/Pole centre distance 210mm, Withdrawable
Overall Dimensions

40kA/1250A, Pole centre distance 230mm, Withdrawable

40kA/1600~2000A, Pole centre distance 230mm, Withdrawable
40kA/Pole centre distance 275mm, Fixed

40kA/Pole centre distance 275mm, Withdrawable

Truck Size and Track For Withdrawable Type Circuit Breaker

<table>
<thead>
<tr>
<th>Pole centre distance</th>
<th>A (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>170 mm (630-1250A)</td>
<td>530</td>
</tr>
<tr>
<td>210 mm (630-1250A)</td>
<td>620</td>
</tr>
<tr>
<td>230 mm (1250-2000A)</td>
<td>660</td>
</tr>
<tr>
<td>275 mm (1600-4000A)</td>
<td>820</td>
</tr>
<tr>
<td>Secondary components of breaker</td>
<td>Secondary components of the truck</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>HK</td>
<td>58-pin aviation plug</td>
</tr>
<tr>
<td>M</td>
<td>Energy storage motor</td>
</tr>
<tr>
<td>S10,S11,S12</td>
<td>Energy storage position switch</td>
</tr>
<tr>
<td>S21,S22</td>
<td>Energy storage position switch</td>
</tr>
<tr>
<td>S41,S42</td>
<td>Energy storage position switch</td>
</tr>
<tr>
<td>HQ</td>
<td>Closing coil</td>
</tr>
<tr>
<td>TQ</td>
<td>Opening coil</td>
</tr>
<tr>
<td>GT1</td>
<td>Over current trip coil</td>
</tr>
<tr>
<td>GT2</td>
<td>Over current trip coil</td>
</tr>
<tr>
<td>GT3</td>
<td>Over current trip coil</td>
</tr>
<tr>
<td>DL</td>
<td>Auxiliary switch</td>
</tr>
</tbody>
</table>
Weight

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (Kg)</td>
<td>165</td>
<td>196</td>
<td>263</td>
<td>280</td>
<td>211</td>
<td>295</td>
<td>315</td>
</tr>
</tbody>
</table>

Storage

Products should be stored in a indoor, dry, well-ventilated, non-serious polluted, non-chemical-corrosive and non-severe-vibrating place.

Accessories

Withdrawable type: energy-storing handle, rocking handle of truck
Fixed type: energy-storing handle.

Order Sheet Format

1. Purchaser  
2. Project Name  
3. Quantity Ordered  
4. Unit

<table>
<thead>
<tr>
<th>1. Purchaser</th>
<th>Project Name</th>
<th>Quantity Ordered</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Product type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Rated Current (A):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Technical data for spring-operated mechanism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Accessories for Withdrawable type (Note 2):</td>
<td>energy-storing handle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Accessories for fixed type:</td>
<td></td>
<td>energy-storing handle</td>
<td></td>
</tr>
<tr>
<td>7. Remark:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: 400 stand for no overcurrent release, 104 stand for 1 overcurrent release, 114 stand for 2 overcurrent release, 1114 stand for 3 overcurrent release.
Note 2: For every 5 breakers, a set of accessories will be available as giveaway (each breaker has a set of secondary socket and plug-in unit). The secondary wiring plastil pipe 650mm in length is provided for cabinet. And in case of special needs, please specify them at the time of ordering.
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