1. Controlled Switching System

The controlled switching system of gas circuit breakers (GCB) is an economical and effective solution to eliminate harmful transients in networks and to reduce the cost of maintaining equipment. Table 1 summarizes the advantages of the controlled switching system for each type of switching purpose.

<table>
<thead>
<tr>
<th>Load type</th>
<th>Transients</th>
<th>Merit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformer energization</td>
<td>Inrush current</td>
<td>Elimination of closing resistor, Improvement of power quality, Prevention of mal-operation of secondary system</td>
</tr>
<tr>
<td>Shunt reactor energization</td>
<td>Inrush current</td>
<td>Reduction of GCB contact wearing</td>
</tr>
<tr>
<td>Capacitor bank energization</td>
<td>Over-voltage</td>
<td>Reduction of insulation level</td>
</tr>
<tr>
<td>Line energization</td>
<td>Over-voltage</td>
<td>Elimination of closing resistor, Reduction of insulation level</td>
</tr>
<tr>
<td>Shunt reactor de-energization</td>
<td>Over-voltage</td>
<td>Reduction of insulation level, Reduction of GCB contact wearing</td>
</tr>
<tr>
<td>Line/capacitor bank de-energization</td>
<td>Over-voltage</td>
<td>Improvement of re-ignition free reliability</td>
</tr>
</tbody>
</table>

2. Mitsubishi’s Controlled Switching System

The controlled switching system using Mitsubishi’s synchronous switching controller (SSC) has high accuracy and reliability backed by a solid track record in the field around the world. The main ratings of the SSC are summarized in Table 2.

<table>
<thead>
<tr>
<th>Item</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control voltage</td>
<td>DC 100/125 V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Consumption</td>
<td>35 W or less</td>
</tr>
<tr>
<td>Control output</td>
<td>3 close and 3 open signals</td>
</tr>
<tr>
<td>Reference voltage</td>
<td>57/100/110 V</td>
</tr>
<tr>
<td>Reference current</td>
<td>1/5 A</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-30 to +60°C (&lt;95% RH)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W: 220 x H: 260 x D: 260 (mm)</td>
</tr>
</tbody>
</table>

(1) Compensation of GCB operation

The operating time variation of GCB can be compensated to maintain accurate control according to operating conditions, past operation results, idle time, ambient temperature, control voltage and operating pressure.

(2) Measurement and recording of GCB operation

The SSC can store the operation times and conditions of the past 200 operations, thus allowing GCB conditions to be monitored.

(3) High reliability

The SSC is designed using advanced technology supported by experience in relay and monitoring systems, and has excellent reliability and robustness.