ATS CONTROL PANEL
SELECTION INSTRUCTION

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Smartgen — make your generator *smart*

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Version history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-11-11</td>
<td>1.0</td>
<td>Original release</td>
</tr>
<tr>
<td>2012-12-7</td>
<td>1.1</td>
<td>Add wiring diagram introductions; Modify the installation dimension.</td>
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</table>
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1 OVERVIEW

Two ways power ATS (Automatic Transfer Switch) Control Panel is used for two ways power change-over with load. The two ways power could be 2-way Mains (Grid), 1-way Mains with 1-way Gens (generator), or 2-way Gens. The panel’s appearance structure will remain same under the same power capacity. For different power capacity’s panel, the working theories are same but case dimensions are difference. Control capacity’s range is from 63A to 1250A (corresponding capacity under three phase is from 35kW to 700kW).

Each control panel is equipped with Smartgen Controller as main control unit, as well as other accessories are all come from famous company. The box adopts metal body; deals with electrostatic coating process, fully efficient for using under different environmental conditions. It is reliable and cost-effective with simple connection and easy operation. Control panel can also be customized according to the user’s requirements.

2 APPEARANCE AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Current (Power)</th>
<th>Appearance</th>
<th>Installation way</th>
<th>Overall Size(mm)</th>
<th>Installation Size(mm)</th>
<th>Installation Apertures(mm)</th>
<th>Outlet connection position</th>
</tr>
</thead>
<tbody>
<tr>
<td>63A<del>125A (35kW</del>70kW)</td>
<td><img src="image1.png" alt="Image" /></td>
<td>Wall-mounted</td>
<td>534X260 (height*length)</td>
<td>4xØ8</td>
<td>Bottom</td>
<td></td>
</tr>
<tr>
<td>125A<del>400A (70kW</del>220kW)</td>
<td><img src="image2.png" alt="Image" /></td>
<td>Wall-mounted</td>
<td>734X365 (height*length)</td>
<td>4xØ8</td>
<td>Bottom</td>
<td></td>
</tr>
<tr>
<td>400A<del>630A (220</del>350kW)</td>
<td><img src="image3.png" alt="Image" /></td>
<td>Vertical</td>
<td>440X410 (length*width)</td>
<td>4xØ10</td>
<td>Bottom and back</td>
<td></td>
</tr>
<tr>
<td>630A<del>1250A (220</del>700kW)</td>
<td><img src="image4.png" alt="Image" /></td>
<td>Vertical</td>
<td>640X490 (length*width)</td>
<td>4xØ10</td>
<td>Bottom and back</td>
<td></td>
</tr>
</tbody>
</table>
3 BASIC TECHNICAL PARAMETERS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working voltage range</td>
<td>(176~265)VAC</td>
</tr>
<tr>
<td>DC power voltage</td>
<td>(8~35)V(not necessary)</td>
</tr>
<tr>
<td>Body</td>
<td>Metal electrostatic coating, off-white</td>
</tr>
<tr>
<td>ATS Type</td>
<td>SMARTGEN SGQ series</td>
</tr>
<tr>
<td>Transfer time</td>
<td>Min. 3 Sec.</td>
</tr>
<tr>
<td>Control model</td>
<td>HAT220A, HAT600 series</td>
</tr>
<tr>
<td>Communication interface</td>
<td>RS485 Modbus-RTU (HAT600 only)</td>
</tr>
<tr>
<td>Language</td>
<td>Chinese /English (HAT600 only)</td>
</tr>
<tr>
<td>Installation way</td>
<td>Wall-mounted and vertical</td>
</tr>
<tr>
<td>Ambient</td>
<td>(-25~+70)ºC</td>
</tr>
<tr>
<td>Humidity</td>
<td>(20~90)%</td>
</tr>
<tr>
<td>Elevation</td>
<td>≤5000 M</td>
</tr>
<tr>
<td>Safety requirements</td>
<td>Object: among Input/output/Power</td>
</tr>
<tr>
<td></td>
<td>Test method: AC1.5KV/1min; Leakage current 3.5mA</td>
</tr>
</tbody>
</table>
4 THEORY AND APPLICATION

4.1. 2-WAYS MAINS (GIRD) AUTOMATIC CHANGE-OVER

Note: The above drawing is suitable for N type and T type switch (SGQ), please refer to SGQ instruction for more details about M type switch.

<table>
<thead>
<tr>
<th>Application Situation</th>
<th>Module Selection</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only need basically automatic changeover function.</td>
<td>HAT220A</td>
<td>LED display</td>
</tr>
<tr>
<td>DC power supply and no necessary to detect power/current status.</td>
<td>HAT600</td>
<td>LCD display; Voltage abnormal signal output in both 2-way</td>
</tr>
<tr>
<td>No necessary to detect power/current status.</td>
<td>HAT600B</td>
<td></td>
</tr>
<tr>
<td>DC power supply and need to detect power/current status.</td>
<td>HAT600I</td>
<td></td>
</tr>
<tr>
<td>Need to detect power/current status.</td>
<td>HAT600BI</td>
<td></td>
</tr>
</tbody>
</table>

Note: HAT600 series has RS485 standard communication interface. When need to communicate uninterruptedly, the control module MUST requires DC power supply.
4.2. 1-WAY MAINS (GIRD) AND 1-WAY GENSET (GENERATOR)

AUTOMATIC CHANGEOVER

Note: The above drawing is suitable for N type and T type switch (SGQ), please refer to SGQ instruction for more details about M type switch.

<table>
<thead>
<tr>
<th>Application Situation</th>
<th>Module Selection</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only need basically automatic changeover function.</td>
<td>HAT220A</td>
<td>LED display</td>
</tr>
<tr>
<td>DC power supply and no necessary to detect power/current status.</td>
<td>HAT600</td>
<td></td>
</tr>
<tr>
<td>No necessary to detect power/current status.</td>
<td>HAT600B</td>
<td>LCD display; Timing commissioning</td>
</tr>
<tr>
<td>DC power supply and need to detect power/current status.</td>
<td>HAT600I</td>
<td></td>
</tr>
<tr>
<td>Need to detect power/current status.</td>
<td>HAT600BI</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. Both HAT220A and HAT600 series can start Genset automatically when Mains is failed.
2. HAT600 series has RS485 standard communication interface. When need to communicate uninterruptedly, the control module MUST requires DC supply.
4.3. 2-WAYS GENSETS (GENERATOR) AUTOMATIC CHANGEOVER

Note: The above drawing is suitable for N type and T type switch (SGQ), please refer to SGQ instruction for more details about M type switch.

<table>
<thead>
<tr>
<th>Application Situation</th>
<th>Module Selection</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only need basically automatic changeover function.</td>
<td>HAT220A</td>
<td>LED display</td>
</tr>
<tr>
<td>DC power supply and no necessary to detect power/current status.</td>
<td>HAT600</td>
<td></td>
</tr>
<tr>
<td>No necessary to detect power/current status.</td>
<td>HAT600B</td>
<td>LCD display; Cyclic start the Genset.</td>
</tr>
<tr>
<td>DC power supply and need to detect power/current status.</td>
<td>HAT600I</td>
<td></td>
</tr>
<tr>
<td>Need to detect power/current status.</td>
<td>HAT600BI</td>
<td></td>
</tr>
</tbody>
</table>

Note: HAT600 series has RS485 standard communication interface. When need to communicate uninterruptedly, the control module MUST requires DC supply.
## 5 CONTROL MODULE’S PARAMETER LIST

<table>
<thead>
<tr>
<th>Items</th>
<th>HAT220A</th>
<th>HAT600</th>
<th>HAT600B</th>
<th>HAT600I</th>
<th>HAT600BI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td><img src="image1" alt="Appearance" /></td>
<td><img src="image2" alt="Appearance" /></td>
<td><img src="image3" alt="Appearance" /></td>
<td><img src="image4" alt="Appearance" /></td>
<td><img src="image5" alt="Appearance" /></td>
</tr>
<tr>
<td>DC power range</td>
<td>8V~35V DC</td>
<td>8V~35V DC</td>
<td>8V~35V DC</td>
<td>8V~35V DC</td>
<td>8V~35V DC</td>
</tr>
<tr>
<td>Nominal AC voltage input range</td>
<td>160V~300V</td>
<td>50V~360V (phase-N)</td>
<td>50V~280V (phase-N)</td>
<td>50V~360V (phase-N)</td>
<td>50V~280V (phase-N)</td>
</tr>
<tr>
<td>AC sensing system</td>
<td>1P-2Wire, 3P-4Wire</td>
<td>1P-2Wire, 2P-3Wire, 3P-3Wire, 3P-4Wire</td>
<td>1P-2Wire, 2P-3Wire, 3P-3Wire, 3P-4Wire</td>
<td>1P-2Wire, 2P-3Wire, 3P-3Wire, 3P-4Wire</td>
<td>1P-2Wire, 2P-3Wire, 3P-4Wire</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60Hz</td>
<td>50/60Hz</td>
<td>50/60Hz</td>
<td>50/60Hz</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>LED indicators</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Auto start genset when mains failed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Voltage detecting protection</td>
<td>Over or under voltage, No power</td>
<td>Over or under voltage, lost phase, anti-phase, over or under frequency</td>
<td>Over or under voltage, lost phase, anti-phase, over or under frequency</td>
<td>Over or under voltage, lost phase, anti-phase, over or under frequency</td>
<td>Over or under voltage, lost phase, anti-phase, over or under frequency</td>
</tr>
<tr>
<td>Current detecting protection</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Fault alarm</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Communication</td>
<td>No</td>
<td>Standard RS485, Modbus-RTU communication protocol</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Configurable digital input</td>
<td>No</td>
<td>4</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Configurable relay output</td>
<td>No</td>
<td>5</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Commissioning</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Schedule start genset</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cyclic starting of one of two Gensets</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Overall size (mm)</td>
<td>138x119x66</td>
<td>209x153x55</td>
<td>138x119x66</td>
<td>209x153x55</td>
<td>138x119x66</td>
</tr>
<tr>
<td>Cutout (mm)</td>
<td>130x111</td>
<td>186x141</td>
<td>130x111</td>
<td>186x141</td>
<td>130x111</td>
</tr>
</tbody>
</table>
6 AUTOMATIC TRANSFER SWITCH PARAMETER LIST

6.1. 63A ATS (N TYPE)

<table>
<thead>
<tr>
<th>Item</th>
<th>2P</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Weight</td>
<td>4kg</td>
<td>4.5kg</td>
<td>4.7kg</td>
</tr>
<tr>
<td>Overall size(mm)</td>
<td>172x186x155</td>
<td>200x186x155</td>
<td>228x186x155</td>
</tr>
<tr>
<td>Width of outlet cooper bar</td>
<td>12mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aperture of bar</td>
<td>Ø5mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2. 125A (N TYPE)

<table>
<thead>
<tr>
<th>Item</th>
<th>2P</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>Weight</td>
<td>4.5kg</td>
<td>5kg</td>
<td>5.65kg</td>
</tr>
<tr>
<td>Overall size(mm)</td>
<td>193x186x155</td>
<td>228x186x155</td>
<td>265x186x155</td>
</tr>
<tr>
<td>Width of outlet cooper bar</td>
<td>20mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aperture of bar</td>
<td>Ø7mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 6.3. 160A/200A/250A (T TYPE)

<table>
<thead>
<tr>
<th>Item</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Weight</td>
<td>16.5kg</td>
<td>18.5kg</td>
</tr>
<tr>
<td>Overall size (mm)</td>
<td>326x292x150</td>
<td>375x292x150</td>
</tr>
<tr>
<td>Width of outlet cooper bar</td>
<td>20mm</td>
<td></td>
</tr>
<tr>
<td>Aperture of bar</td>
<td>Ø9mm</td>
<td></td>
</tr>
</tbody>
</table>

### 6.4. 400A (T TYPE)

<table>
<thead>
<tr>
<th>Item</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Weight</td>
<td>18kg</td>
<td>20kg</td>
</tr>
<tr>
<td>Overall size (mm)</td>
<td>355x292x150</td>
<td>406x292x150</td>
</tr>
<tr>
<td>Width of outlet cooper bar</td>
<td>L line: 30mm N line: 20mm</td>
<td></td>
</tr>
<tr>
<td>Aperture of bar</td>
<td>L line: Ø11mm N line: Ø 9mm</td>
<td></td>
</tr>
</tbody>
</table>
### 6.5. 630A (T TYPE)

<table>
<thead>
<tr>
<th>Item</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td>Weight</td>
<td>20kg</td>
<td>22kg</td>
</tr>
<tr>
<td>Overall size (mm)</td>
<td>364x310x150</td>
<td>424x310x150</td>
</tr>
<tr>
<td>Width of outlet cooper bar</td>
<td>L line: 40mm N line: 30mm</td>
<td></td>
</tr>
<tr>
<td>Aperture of bar</td>
<td>L line: Ø15mm N line: Ø15mm</td>
<td></td>
</tr>
</tbody>
</table>

### 6.6. 630A/800A/1000A/1250A (M TYPE)

<table>
<thead>
<tr>
<th>Item</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
</tr>
<tr>
<td>Overall size (mm)</td>
<td>510x260x340</td>
<td>600x260x340</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>630A</td>
<td>42.3kg</td>
<td>49.7kg</td>
</tr>
<tr>
<td>800A</td>
<td>45.3 kg</td>
<td>54.4 kg</td>
</tr>
<tr>
<td>1000A</td>
<td>48.3 kg</td>
<td>59.4 kg</td>
</tr>
<tr>
<td>1250A</td>
<td>51.3 kg</td>
<td>64.5 kg</td>
</tr>
<tr>
<td>Width of outlet cooper bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>630A</td>
<td>30mm</td>
<td></td>
</tr>
<tr>
<td>800A</td>
<td>40mm</td>
<td></td>
</tr>
<tr>
<td>1000A</td>
<td>45mm</td>
<td></td>
</tr>
<tr>
<td>1250A</td>
<td>55mm</td>
<td></td>
</tr>
<tr>
<td>Aperture of bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>630A</td>
<td>Ø12mm</td>
<td></td>
</tr>
<tr>
<td>800A</td>
<td>Ø15mm</td>
<td></td>
</tr>
<tr>
<td>1000A</td>
<td>Ø15mm</td>
<td></td>
</tr>
<tr>
<td>1250A</td>
<td>Ø15mm</td>
<td></td>
</tr>
</tbody>
</table>