Technical Specification for Vented Lead-Acid Batteries (VLA)

1. Application
BAE PVSM cell solar batteries are low maintenance and used to store electric energy in small solar photovoltaic installations.

2. Technical data (Reference temperature 20°C)

<table>
<thead>
<tr>
<th>Type</th>
<th>( C_{1, h} ) Ah</th>
<th>( C_{10, h} ) Ah</th>
<th>( C_{20, h} ) Ah</th>
<th>( C_{72, h} ) Ah</th>
<th>( C_{100, h} ) Ah</th>
<th>( C_{120, h} ) Ah</th>
<th>( C_{240, h} ) Ah</th>
<th>( R_1 ) mΩ</th>
<th>( I_2 ) kA</th>
<th>Length mm</th>
<th>Width mm</th>
<th>Height mm</th>
<th>Weight (dry) kg</th>
<th>Weight (filled) kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 PVSM 220</td>
<td>82.0</td>
<td>162</td>
<td>185</td>
<td>217</td>
<td>224</td>
<td>226</td>
<td>235</td>
<td>1.75</td>
<td>1.16</td>
<td>47</td>
<td>198</td>
<td>486</td>
<td>7.5</td>
<td>9.6</td>
</tr>
<tr>
<td>3 PVSM 330</td>
<td>123</td>
<td>243</td>
<td>277</td>
<td>326</td>
<td>335</td>
<td>339</td>
<td>350</td>
<td>1.17</td>
<td>1.74</td>
<td>65</td>
<td>198</td>
<td>486</td>
<td>11.0</td>
<td>14.0</td>
</tr>
<tr>
<td>4 PVSM 440</td>
<td>163</td>
<td>324</td>
<td>370</td>
<td>434</td>
<td>447</td>
<td>452</td>
<td>467</td>
<td>0.88</td>
<td>2.32</td>
<td>83</td>
<td>198</td>
<td>486</td>
<td>14.2</td>
<td>18.1</td>
</tr>
<tr>
<td>5 PVSM 550</td>
<td>205</td>
<td>400</td>
<td>456</td>
<td>536</td>
<td>552</td>
<td>558</td>
<td>578</td>
<td>0.70</td>
<td>2.90</td>
<td>101</td>
<td>198</td>
<td>486</td>
<td>18.5</td>
<td>22.6</td>
</tr>
<tr>
<td>6 PVSM 660</td>
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<td>490</td>
<td>559</td>
<td>656</td>
<td>676</td>
<td>684</td>
<td>710</td>
<td>0.58</td>
<td>3.48</td>
<td>119</td>
<td>198</td>
<td>486</td>
<td>21.4</td>
<td>26.6</td>
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<td>570</td>
<td>650</td>
<td>763</td>
<td>786</td>
<td>795</td>
<td>826</td>
<td>0.50</td>
<td>4.06</td>
<td>137</td>
<td>198</td>
<td>486</td>
<td>24.8</td>
<td>31.1</td>
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<td>8 PVSM 880</td>
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<td>648</td>
<td>739</td>
<td>868</td>
<td>894</td>
<td>905</td>
<td>938</td>
<td>0.44</td>
<td>4.64</td>
<td>155</td>
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<td>9 PVSM 990</td>
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<td>729</td>
<td>832</td>
<td>977</td>
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<td>1,017</td>
<td>1,052</td>
<td>0.39</td>
<td>5.22</td>
<td>173</td>
<td>198</td>
<td>486</td>
<td>31.0</td>
<td>39.6</td>
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<td>10 PVSM 1100</td>
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<td>810</td>
<td>924</td>
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<td>1,131</td>
<td>1,172</td>
<td>0.35</td>
<td>5.80</td>
<td>192</td>
<td>198</td>
<td>486</td>
<td>33.8</td>
<td>43.8</td>
</tr>
</tbody>
</table>

BAE SECURA PVSM CELL solar batteries as dry charged version are marked with “TG”. E.g. 2 PVSM 220 TG
1) \( R_1 \) and 2) \( I_2 \) values according to IEC 60896-11

3. Terminal position
Terminals are designed as female poles with brass inlay M10 for flexible insulated copper cables with cross-section 25, 35, 50, 70, 95 or 120 mm².
Technical Specification of BAE Secura PVSM CELL solar

4. Design
positive electrode: tubular - plate with a polyester gauntlet and solid grids in a corrosion-resistant PbSb1.6SnSe - alloy
negative electrode: grid - plate in a low antimony alloy with long life expander material
separation: microporous separator
electrolyte: sulphuric acid with a density of 1.24 kg/l at 20 °C
container and lid: impact-resistant polypropylene, UL-94 rating: HB
plugs: with integrated min and max level of electrolyte
pole-bushing: 100% electrolyte-tight
kind of protection: IP 25 regarding DIN EN 60529, touch protected according to VBG 4

5. Installation
BAE PVSM solar battery cells have to be installed either in steel, wooden or plastic battery trays in order to avoid an excessive bulging of the side walls of the battery cell containers.

6. Maintenance
- every 6 months: check battery voltage as well as temperature,
  average water-refilling interval (depending on utilization and ambient temperature)
- every 12 months: check of mechanical and electrical connections, record battery cell voltage as well as temperature

7. Operational data
  depth of discharge (DOD) restricted to 80 % according to final voltage per cell and discharge time as per Item 2,
  deep discharges of more than 80 % DOD have to be avoided
  charge current: may vary from $5 \times \text{i}_{10}$ down to $0.01 \times \text{i}_{10}$
  charge voltage: restricted from 2.30 V to 2.40 V per cell
  - DOD per day < 20 % $\text{C}_{10}$: 2.30 V – 2.35 V per cell
  - DOD per day > 20 % - 30 % $\text{C}_{10}$: 2.35 V – 2.40 V per cell
  - DOD per day > 30 % $\text{C}_{10}$: to prevent electrolyte stratification, a gassing recharge must be carried out according to BAE operating instructions
  adjustment of charge voltage: no adjustment necessary if battery temperature is between 10 °C and 30 °C in the monthly average, otherwise $\Delta U/\Delta T = -0.003 \text{ Vpc/K}$
  recharge to 100 %:
    - within a period of one up to 4 weeks
  operational temperature: -20 °C to 55 °C, recommended temperature range 10 °C to 30 °C
  self-discharge: approx. 3 % per month at 20°C

8. Number of cycles as function of DOD (Depth of discharge)

9. Transport
Batteries are not subject to ADR (road transport), if the conditions of special rule 598 (chapter 3.3) are observed.

10. Standards
Test standard: IEC 60896-11, IEC 61427
Safety standard, ventilation: EN 50272-2

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