Technical Specification for Vented Lead-Acid Batteries (VLA)

1. Application

BAE Secura PVS solar batteries are low maintenance and used to store electric energy in medium and large solar photovoltaic installations. Due to the robust tubular plate design BAE PVS batteries are excellent suited for highest requirement regarding cycling ability and long lifetime.

2. Technical data (Reference temperature 20 °C)

<table>
<thead>
<tr>
<th>Type</th>
<th>C1h Ah</th>
<th>C10h Ah</th>
<th>C20h Ah</th>
<th>C72h Ah</th>
<th>C120h Ah</th>
<th>C240h Ah</th>
<th>Ri1) mΩ</th>
<th>I2) 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 PVS 140</td>
<td>54</td>
<td>111</td>
<td>128</td>
<td>156</td>
<td>160</td>
<td>162</td>
<td>166</td>
<td>1.90</td>
<td>1.27</td>
<td>105</td>
<td>208</td>
<td>420</td>
<td>9.3</td>
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<tr>
<td>3 PVS 210</td>
<td>79</td>
<td>162</td>
<td>187</td>
<td>226</td>
<td>231</td>
<td>234</td>
<td>240</td>
<td>1.27</td>
<td>1.62</td>
<td>105</td>
<td>208</td>
<td>420</td>
<td>11.3</td>
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<td>201</td>
<td>232</td>
<td>278</td>
<td>285</td>
<td>286</td>
<td>295</td>
<td>0.95</td>
<td>2.16</td>
<td>105</td>
<td>208</td>
<td>420</td>
<td>12.5</td>
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<tr>
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<td>257</td>
<td>298</td>
<td>358</td>
<td>366</td>
<td>369</td>
<td>379</td>
<td>0.76</td>
<td>2.70</td>
<td>126</td>
<td>208</td>
<td>420</td>
<td>15.2</td>
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<td>6 PVS 420</td>
<td>156</td>
<td>317</td>
<td>368</td>
<td>444</td>
<td>454</td>
<td>458</td>
<td>470</td>
<td>0.63</td>
<td>3.24</td>
<td>147</td>
<td>208</td>
<td>420</td>
<td>17.8</td>
</tr>
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<td>371</td>
<td>414</td>
<td>475</td>
<td>488</td>
<td>496</td>
<td>528</td>
<td>0.70</td>
<td>2.90</td>
<td>126</td>
<td>208</td>
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<td>20.0</td>
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<td>6 PVS 660</td>
<td>263</td>
<td>468</td>
<td>522</td>
<td>604</td>
<td>620</td>
<td>628</td>
<td>669</td>
<td>0.58</td>
<td>3.48</td>
<td>147</td>
<td>208</td>
<td>535</td>
<td>22.8</td>
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<tr>
<td>7 PVS 770</td>
<td>306</td>
<td>543</td>
<td>606</td>
<td>700</td>
<td>718</td>
<td>729</td>
<td>777</td>
<td>0.50</td>
<td>4.06</td>
<td>168</td>
<td>208</td>
<td>535</td>
<td>26.4</td>
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<tr>
<td>6 PVS 900</td>
<td>359</td>
<td>670</td>
<td>752</td>
<td>900</td>
<td>933</td>
<td>944</td>
<td>976</td>
<td>0.47</td>
<td>4.32</td>
<td>147</td>
<td>208</td>
<td>710</td>
<td>32.7</td>
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<tr>
<td>8 PVS 1200</td>
<td>494</td>
<td>932</td>
<td>1,044</td>
<td>1,260</td>
<td>1,300</td>
<td>1,308</td>
<td>1,365</td>
<td>0.35</td>
<td>5.76</td>
<td>215</td>
<td>193</td>
<td>710</td>
<td>44.6</td>
</tr>
<tr>
<td>10 PVS 1500</td>
<td>589</td>
<td>1,090</td>
<td>1,226</td>
<td>1,468</td>
<td>1,510</td>
<td>1,536</td>
<td>1,588</td>
<td>0.28</td>
<td>7.20</td>
<td>215</td>
<td>235</td>
<td>710</td>
<td>54.3</td>
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<tr>
<td>12 PVS 1800</td>
<td>714</td>
<td>1,320</td>
<td>1,490</td>
<td>1,792</td>
<td>1,840</td>
<td>1,860</td>
<td>1,934</td>
<td>0.23</td>
<td>8.64</td>
<td>215</td>
<td>277</td>
<td>710</td>
<td>63.4</td>
</tr>
<tr>
<td>12 PVS 2280</td>
<td>882</td>
<td>1,670</td>
<td>1,866</td>
<td>2,181</td>
<td>2,250</td>
<td>2,280</td>
<td>2,397</td>
<td>0.22</td>
<td>9.18</td>
<td>215</td>
<td>277</td>
<td>855</td>
<td>75.4</td>
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<tr>
<td>16 PVS 3040</td>
<td>1,139</td>
<td>2,130</td>
<td>2,380</td>
<td>2,779</td>
<td>2,860</td>
<td>2,904</td>
<td>3,024</td>
<td>0.17</td>
<td>12.24</td>
<td>215</td>
<td>400</td>
<td>815</td>
<td>117.9</td>
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<tr>
<td>20 PVS 3800</td>
<td>1,470</td>
<td>2,780</td>
<td>3,100</td>
<td>3,643</td>
<td>3,750</td>
<td>3,804</td>
<td>3,984</td>
<td>0.14</td>
<td>15.30</td>
<td>215</td>
<td>490</td>
<td>815</td>
<td>127.0</td>
</tr>
<tr>
<td>22 PVS 4180</td>
<td>1,617</td>
<td>3,060</td>
<td>3,420</td>
<td>4,003</td>
<td>4,130</td>
<td>4,188</td>
<td>4,392</td>
<td>0.12</td>
<td>16.83</td>
<td>215</td>
<td>580</td>
<td>815</td>
<td>141.0</td>
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<tr>
<td>24 PVS 4560</td>
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<td>3,470</td>
<td>3,880</td>
<td>4,564</td>
<td>4,710</td>
<td>4,776</td>
<td>5,016</td>
<td>0.11</td>
<td>18.36</td>
<td>215</td>
<td>580</td>
<td>815</td>
<td>146.0</td>
</tr>
<tr>
<td>26 PVS 4940</td>
<td>1,911</td>
<td>3,620</td>
<td>4,040</td>
<td>4,737</td>
<td>4,880</td>
<td>4,956</td>
<td>5,184</td>
<td>0.10</td>
<td>19.97</td>
<td>215</td>
<td>580</td>
<td>815</td>
<td>156.0</td>
</tr>
</tbody>
</table>

1) Ri and 2) I2 values according to IEC 60896-11

BAE Secura PVS solar batteries as dry charged version are marked with “TG”. e.g. 4 PVS 280 TG.

All values given in the table correspond to 100 % DOD. Please consider item 7.

3. Terminal position

2 PVS 140 to 6 PVS 900
8 PVS 1200 to 12 PVS 2280
16 PVS 3040
20 PVS 3800 to 26 PVS 4940

ENERGY FROM BATTERIES
Technical Specification of BAE Secura PVS solar

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 or insulated solid copper connectors with cross-section 90, 150 or 300 mm².

4. Design

Positive electrode: tubular-plate with a woven polyester gauntlet and solid grids in a corrosion-resistant PbSbSnSe-low antimony 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: high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid: high impact, SAN in dark grey colour, UL-94 rating: HB
Plugs: labyrinth plugs for arresting aerosol, optional ceramic plugs or ceramic funnel plugs according to DIN 40740
Pole-bushing: 100 % gas- and electrolyte-tight, sliding, plastic-coated “Panzerpol”
Kind of protection: IP 25 regarding DIN 40050, touch protected according to VBG 4

5. Installation

BAE Secura PVS solar batteries are designed for indoor applications. For outdoor applications please contact BAE.

6. Maintenance

Every 6 months: check battery voltage as well as temperature
Every 12 months: check connections, record battery cell voltage as well as temperature
Every 3 years: average water-refilling interval (depending on utilization and ambient temperature)

7. Operational data

Depth of discharge (DOD): max. 80 % (Uₘₐₙₐₓ = 1.91 V/cell for discharge times >10 h; 1.74 V/cell for 1 h)
Charge current: unlimited, the minimal charge current has to be I₁₀
Charge voltage at cyclic operation: restricted from 2.30 V to 2.40 V per cell, operating instruction is to be observed
Floating voltage/non cyclic voltage: 2.23 V/cell
Adjustment of charge voltage: no adjustment necessary if battery temperature is between 10 °C and 30 °C in the monthly average, otherwise ΔU/ΔT = -0.003 V/cell per K
Recharge to 100 %: within a period of 1 up to 4 weeks
IEC 61427 cycles: 3150 (A+B)
Battery 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)

![Graph showing 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