

BAE SECURA PVV solar

Technical Specification for Valve Regulated Lead-Acid Batteries (VRLA-GEL)

1. Application

BAE SECURA PVV solar batteries don't need to be refilled with water during the whole service life. Therefore, this battery type is maintenance-free. This eliminates checking of electrolyte level.

The batteries are used to store electric energy in medium and large solar photovoltaic installations.

Due to the robust tubular plated design BAE PVV Batteries are excellent suited for highest requirements regarding cycling ability and long lifetime.



2. Technical data (Reference temperature 20 °C)

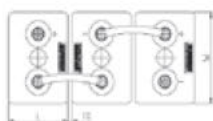
| Type | C_{1h} Ah | C_{10h} Ah | C_{20h} Ah | C_{72h} Ah | C_{100h} Ah | C_{120h} Ah | C_{240h} Ah | R_i 1) mV | I_k 2) kA | Length (L) mm | Width (W) mm | Height (H) mm | Weight kg |
|-------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|-------------------|-------------------|---------------------|--------------------|---------------------|--------------|
| 2 PVV 140 | 71 | 121 | 134 | 153 | 157 | 158 | 165 | 1.65 | 1.30 | 105 | 208 | 420 | 12.4 |
| 3 PVV 210 | 107 | 182 | 202 | 229 | 236 | 238 | 247 | 1.15 | 1.86 | 105 | 208 | 420 | 17.1 |
| 4 PVV 280 | 143 | 243 | 268 | 306 | 314 | 318 | 331 | 0.89 | 2.40 | 105 | 208 | 420 | 19.4 |
| 5 PVV 350 | 179 | 304 | 336 | 383 | 393 | 397 | 412 | 0.73 | 2.91 | 126 | 208 | 420 | 23.3 |
| 6 PVV 420 | 215 | 364 | 404 | 460 | 472 | 477 | 496 | 0.63 | 3.39 | 147 | 208 | 420 | 27.4 |
| 5 PVV 550 | 254 | 447 | 506 | 570 | 583 | 589 | 609 | 0.68 | 3.14 | 126 | 208 | 535 | 31.4 |
| 6 PVV 660 | 302 | 529 | 598 | 671 | 686 | 693 | 715 | 0.58 | 3.64 | 147 | 208 | 535 | 36.9 |
| 7 PVV 770 | 350 | 610 | 688 | 770 | 788 | 795 | 820 | 0.52 | 4.12 | 168 | 208 | 535 | 42.4 |
| 6 PVV 900 | 417 | 729 | 834 | 943 | 968 | 978 | 1,012 | 0.46 | 4.63 | 147 | 208 | 710 | 51.0 |
| 7 PVV 1050 | 492 | 858 | 980 | 1,116 | 1,140 | 1,154 | 1,195 | 0.36 | 5.81 | 215 | 193 | 710 | 61.9 |
| 8 PVV 1200 | 559 | 970 | 1,106 | 1,252 | 1,280 | 1,296 | 1,344 | 0.32 | 6.54 | 215 | 193 | 710 | 68.8 |
| 9 PVV 1350 | 616 | 1,090 | 1,252 | 1,418 | 1,450 | 1,464 | 1,524 | 0.34 | 6.29 | 215 | 235 | 710 | 77.0 |
| 10 PVV 1500 | 691 | 1,200 | 1,382 | 1,562 | 1,600 | 1,620 | 1,675 | 0.28 | 7.50 | 215 | 235 | 710 | 83.9 |
| 11 PVV 1650 | 748 | 1,320 | 1,512 | 1,713 | 1,750 | 1,764 | 1,836 | 0.28 | 7.56 | 215 | 277 | 710 | 92.2 |
| 12 PVV 1800 | 822 | 1,440 | 1,644 | 1,857 | 1,900 | 1,920 | 1,989 | 0.24 | 8.63 | 215 | 277 | 710 | 99.2 |
| 11 PVV 2090 | 839 | 1,570 | 1,772 | 2,023 | 2,070 | 2,088 | 2,169 | 0.27 | 7.86 | 215 | 277 | 855 | 108.2 |
| 12 PVV 2280 | 927 | 1,710 | 1,918 | 2,181 | 2,230 | 2,256 | 2,337 | 0.23 | 9.18 | 215 | 277 | 855 | 116.5 |
| 13 PVV 2470 | 1,040 | 1,890 | 2,120 | 2,426 | 2,490 | 2,508 | 2,592 | 0.18 | 11.91 | 215 | 400 | 815 | 131.4 |
| 14 PVV 2660 | 1,125 | 2,070 | 2,320 | 2,678 | 2,740 | 2,772 | 2,880 | 0.17 | 12.63 | 215 | 400 | 815 | 141.2 |
| 15 PVV 2850 | 1,191 | 2,170 | 2,420 | 2,772 | 2,840 | 2,868 | 2,976 | 0.16 | 13.25 | 215 | 400 | 815 | 147.9 |
| 16 PVV 3040 | 1,265 | 2,300 | 2,580 | 2,937 | 3,000 | 3,036 | 3,144 | 0.15 | 13.94 | 215 | 400 | 815 | 156.2 |
| 17 PVV 3230 | 1,358 | 2,480 | 2,780 | 3,182 | 3,260 | 3,300 | 3,408 | 0.14 | 15.32 | 215 | 490 | 815 | 173.6 |
| 18 PVV 3420 | 1,433 | 2,610 | 2,920 | 3,348 | 3,420 | 3,468 | 3,576 | 0.13 | 16.03 | 215 | 490 | 815 | 181.4 |
| 19 PVV 3610 | 1,507 | 2,740 | 3,080 | 3,506 | 3,590 | 3,624 | 3,744 | 0.12 | 16.70 | 215 | 490 | 815 | 189.6 |
| 20 PVV 3800 | 1,581 | 2,870 | 3,220 | 3,664 | 3,750 | 3,792 | 3,912 | 0.12 | 17.37 | 215 | 490 | 815 | 197.8 |
| 22 PVV 4180 | 1,740 | 3,210 | 3,600 | 4,118 | 4,220 | 4,272 | 4,416 | 0.11 | 18.43 | 215 | 580 | 815 | 205.7 |
| 24 PVV 4560 | 1,887 | 3,470 | 3,900 | 4,442 | 4,550 | 4,596 | 4,752 | 0.10 | 19.76 | 215 | 580 | 815 | 222.0 |
| 26 PVV 4940 | 2,014 | 3,650 | 4,060 | 4,608 | 4,710 | 4,764 | 4,920 | 0.10 | 21.02 | 215 | 580 | 815 | 235.1 |

1, 2) Internal resistance R_i and short circuit current I_k according to IEC 60896-21

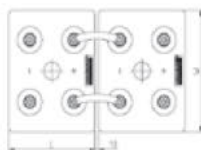
Height (H) is the maximum height between container bottom and top of the bolts in assembled condition.

All values given in the table correspond to 100% DOD without voltage drop of connectors. Please consider item 7.

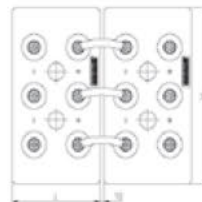
3. Terminal positions



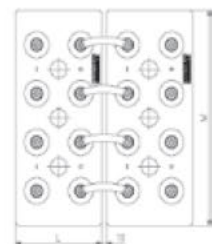
2 PVV 140 to 6 PVV 900



7 PVV 1050 to 12 PVV 2280



13 PVV 2470 to 16 PVV 3040



17 PVV 3230 to 26 PVV 4940

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.

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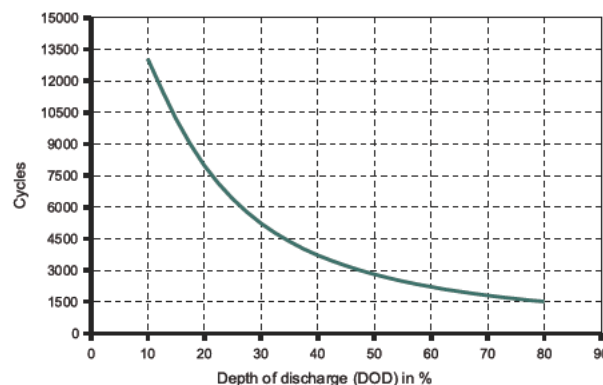
4. Design
- Positive electrode tubular-plate with woven polyester gauntlet and solid grids in a corrosion-resistant PbCaSn-alloy
 - Negative electrode grid-plate in PbCaSn-alloy with long-life expand material
 - Separation microporous separator
 - Electrolyte sulphuric acid with a density of 1.24 kg/l (20 °C), fixed as GEL by fumed silica
 - Container and lid high impact ABS (Acrylonitrile-Butadiene-Styrene), grey coloured (colour may vary slightly from given image), UL-94 rating: HB, on request also in UL-94 rating V-0
 - Valve valve with flame arrestor, opening pressure approx. 120 mbar
 - Pole bushing 100 % gas- and electrolyte-tight sliding, plastic coated "Panzerpol"
 - Kind of protection IP 25 regarding EN 60529, touch protected according to VBG 4
 - Horizontal operation Please use BAE special type PVV "horizontal". The construction and production of this type is adapted to the horizontal operation.

5. Installation
- BAE SECURA PVV solar batteries are designed for indoor applications. For outdoor applications please contact BAE.

6. Maintenance
- Every 6 months check battery voltage, pilot cell voltages and temperatures
 - Every 12 months check connections, record battery voltage, cell voltages and temperatures

7. Operational data
- Depth of discharge (DOD) max. 80 % ($U_e = 1.91$ V/cell for discharge times > 10 h; 1.74 V/cell for 1 h), deep discharges of more than 80 % DOD have to be avoided
 - Initial charge current (I or bulk phase) unlimited, the minimal charge current has to be 1.5 A/100 Ah C_{10}
 - Charge voltage at cyclic operation restricted from 2.30 V to 2.40 V per cell, operating instruction is to be observed
 - Float voltage / non cyclic operation 2.25 V/cell
 - Adjustment of charge voltage no adjustment necessary if battery temperature is between 10 °C and 45 °C (50 °F and 113 °F) in the monthly average, $DU/DT = -0.003$ V/cell per K below 10 °C (50 °F) within a period of 1 up to 4 weeks
 - Recharge to 100 % > 3,000 (A+B) at 40 °C (104 °F)
 - IEC 61427 cycles -20 °C to 45 °C (-4 °F to 113 °F), recommended temperature range 10 °C to 30 °C (50 °F to 86 °F)
 - Battery temperature approx. 2 % per month at 20 °C (68 °F)
 - Self-discharge

8. Number of cycles as function of Depth of discharge



9. Transport
- Batteries are not subject to ADR (road transport), if the conditions of Special Provisions 598 and 238 (Chapter 3.3) are observed. BAE cells/batteries conform to the IMDG-Code, therefore these products are no dangerous goods on sea transport.

10. Standards
- Test standards IEC 60896-21, IEC 61427
 - Safety standard, ventilation EN 50272-2