BAE *SECURA PVVM solar*

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

1. Application

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

The batteries are used to store electric energy in small solar photovoltaic installations.

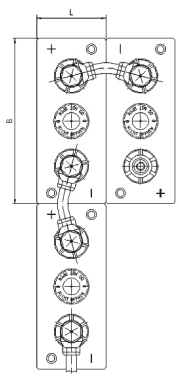
Due to the robust tubular plate design BAE PVVM batteries are excellent suited for highest requirements regarding cycling ability and long lifetime.

2. Technical data (Reference temperature 20 °C)

Type	$C_{1\,h}$ Ah	$C_{10\,h}$ Ah	$C_{20\,h}$ Ah	$C_{72\,h}$ Ah	$C_{100\,h}$ Ah	$C_{120\,h}$ Ah	$C_{240\,h}$ Ah	R_i 1)	I_k 2)	Length (L)	Width (W)	Height (H)	Weight
U_e V/cell	1.67	1.78	1.80	1.80	1.80	1.80	1.80	mΩ	kA	mm	mm	mm	kg
2 PVVM 140	70	112	121	134	137	138	143	1.57	1.37	47	198	370	8.8
3 PVVM 210	106	170	184	205	209	211	217	1.10	1.96	65	198	370	12.5
4 PVVM 280	142	227	246	275	280	283	290	0.86	2.52	83	198	370	16.2
5 PVVM 350	178	285	310	344	352	355	364	0.71	3.05	101	198	370	19.9
6 PVVM 420	214	342	372	415	423	427	439	0.61	3.54	119	198	370	23.6
7 PVVM 490	250	400	436	485	495	499	513	0.54	4.00	137	198	370	27.3
8 PVVM 560	285	458	498	555	566	571	588	0.47	4.53	155	198	370	31.2
9 PVVM 630	321	515	560	624	638	643	662	0.43	4.96	173	198	370	34.9
10 PVVM 700	357	573	624	695	709	716	736	0.40	5.36	191	198	370	38.6

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.
Please observe needed headroom for installation and maintenance.
All values given in the table correspond to 100 % DOD without voltage drop of connectors. Please consider item 7.

3. Terminal positions



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.

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4. Design

Positive electrode	tubular-plate with woven polyester gauntlet and solid grid in a corrosion-resistant PbCaSn-alloy
Negative electrode	grid-plate in PbCaSn-alloy with long-life expander 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	impact-resistant polypropylene, UL-94 rating: HB
Valve	with flame arrestor, opening pressure approx. 120 mbar
Pole-bushing	100 % gas- and electrolyte-tight
Kind of protection	IP 25 regarding EN 60529, touch protected according to VBG 4

5. Installation

BAE PVVM cells have to be installed in racks or trays with lateral force on the sidewalls in order to avoid an excessive bulging of the battery cell containers.

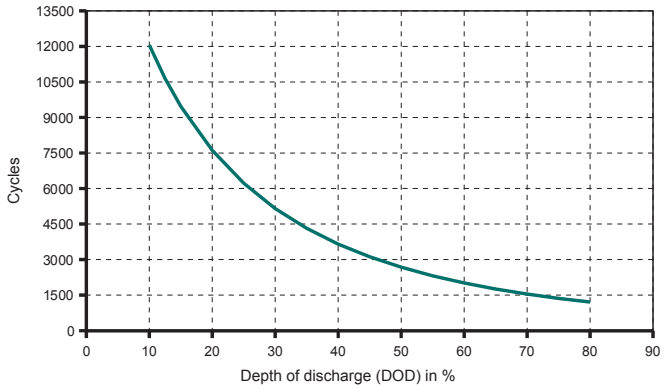
6. Maintenance

Every 6 months	check battery voltage, pilot cell voltages and temperatures
Every 12 months	check of mechanical and electrical connections, record battery voltage, cell voltages and temperatures Please refer to the operational instruction for details.

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
Initial charge current (I or bulk phase)	unlimited, the minimal charge current has to be 1.5 A/100 Ah C_{10} (until voltage limit is reached)
Charge voltage	restricted from 2.30 V to 2.40 V per cell, operating instruction is to be observed
• DOD per day < 40 % C_{10}	2.30 V – 2.35 V per cell
• DOD per day 40 % - 60 % C_{10}	2.35 V – 2.40 V per 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, $\Delta U/\Delta T$ = -0.003 V/cell per K below 10 °C (50 °F)
Recharge to 100 %	within a period of 1 up to 4 weeks
Operational temperature	-20 °C to 45 °C (-4 °F to 113 °F), recommended temperature range 10 °C to 30 °C (50 °F to 86 °F)
Self-discharge	approx. 2 % per month at 20 °C (68 °F)

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 are 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

12/2012 4805122 Technical details may be subject to alterations.

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