

BAE *SECURA PVV BLOCK solar*

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

1. Application

BAE *SECURA PVV BLOCK 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 electrical energy in smaller solar photovoltaic installations.

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



2. Technical data (Reference temperature 20 °C)

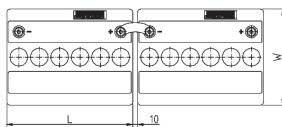
Type	C_{1h} Ah	C_{10h} Ah	C_{20h} Ah	C_{72h} Ah	C_{100h} Ah	C_{120h} Ah	C_{240h} Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight kg	
12 V 1 PVV	70	35	60	67	76	78	79	82	17.47	0.73	272	205	385	43.0
12 V 2 PVV	140	68	110	120	133	137	138	142	9.55	1.34	272	205	385	52.0
12 V 3 PVV	210	103	167	182	203	208	210	216	6.74	1.91	380	205	385	74.2
6 V 4 PVV	280	137	224	244	273	279	282	290	2.66	2.42	272	205	385	51.0
6 V 5 PVV	350	172	281	306	343	350	354	364	2.24	2.87	380	205	385	65.0
6 V 6 PVV	420	207	337	368	412	421	424	439	1.94	3.31	380	205	385	73.8
2 V 12 PVV	840	413	674	734	820	838	846	873	0.29	7.33	272	205	385	51.0
2 V 15 PVV	1050	517	844	920	1,029	1,050	1,062	1,094	0.24	8.81	380	205	385	65.0
2 V 18 PVV	1260	622	1,010	1,108	1,238	1,260	1,272	1,317	0.21	10.18	380	205	385	73.8

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

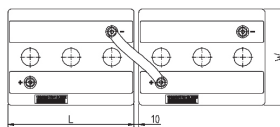
Height (H) is the maximum height between container bottom and top of the bolts in assembled condition.

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

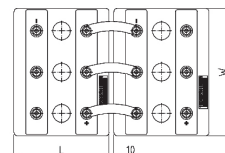
3. Terminal positions



12 V 1 PVV 70 to 12 V 3 PVV 210



6 V 4 PVV 280 to 6 V 6 PVV 420



2 V 12 PVV 840 to 2 V 18 PVV 1260

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.

Technical Specification for BAE *SECURA PVV BLOCK solar*



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 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	high impact SAN (Styrol-Acrylic-Nitrile), grey coloured (colour may vary slightly from given image), UL-94 rating: HB, on request also in UL-94 rating: V-0
Valve	one valve per cell 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 BLOCK solar* batteries are designed for indoor applications. For outdoor applications please contact BAE.

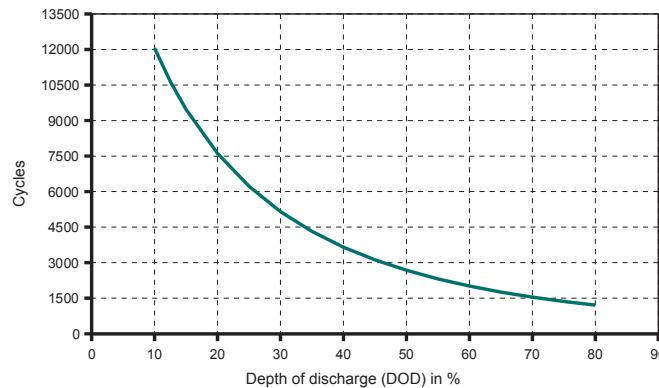
6. Maintenance

Every 6 months	check battery voltage, pilot block voltages, temperatures
Every 12 months	check connections, record battery voltage, block voltages and temperatures

7. Operational data

Depth of discharge (DOD)	max. 80 % ($U_e = 1.91$ V/cell for discharge times >10 h; 1.80 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
Floating voltage/non cyclic voltage	2.25 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
IEC 61427 cycles	2,100 (A+B) at 40 °C (104 °F)
Battery 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



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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 plate design BAE PVV Batteries are excellent suited for highest requirements regarding cycling ability and long lifetime.



2. Technical data (Reference temperature 20 °C)

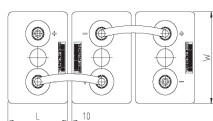
Type	C_{1h} Ah	C_{10h} Ah	C_{20h} Ah	C_{72h} Ah	C_{100h} Ah	C_{120h} Ah	C_{240h} Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight kg
U_g V/cell	1.67	1.80	1.80	1.80	1.80	1.80	1.80						
2 PVV 140	71	121	134	153	157	158	165	1.65	1.30	105	208	420	12.4
3 PVV 210	107	182	202	229	236	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

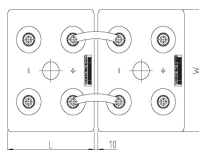
Height (H) is the maximum height between container bottom and top of the bolts in assembled condition.

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

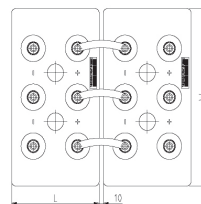
3. Terminal positions



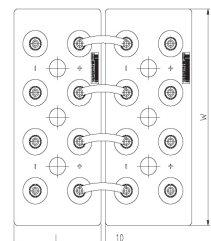
2 PVV 140 to 6 PVV 900



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.

Technical Specification for BAE *SECURA PVV solar*



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 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	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.

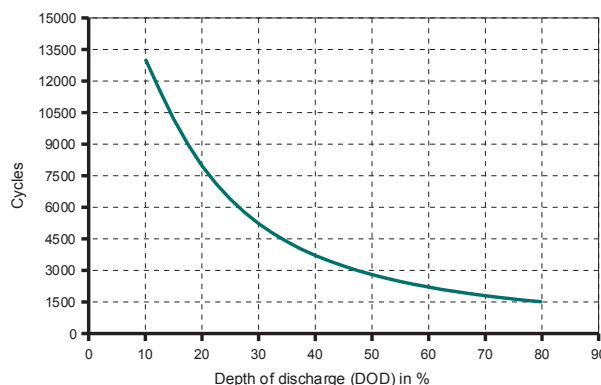
6. Maintenance

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, $\Delta U/\Delta T = -0.003$ V/cell per K below 10 °C (50 °F)
Recharge to 100 %	within a period of 1 up to 4 weeks
IEC 61427 cycles	>3,000 (A+B) at 40 °C (104 °F)
Battery 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



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BAE *SECURA PVS BLOCK solar*

Technical Specification for Vented Lead-Acid Batteries (VLA)

1. Application

BAE *SECURA PVS BLOCK solar* batteries need only low maintenance and are used to store electrical energy in smaller solar photovoltaic installations. Due to the robust tubular plate design BAE PVS 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) mΩ	I _k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
12 V 1 PVS 70	31	56	64	70	71	72	74	16.62	0.75	272	205	385	29.5	41.0
12 V 2 PVS 140	63	109	125	137	140	140	144	8.91	1.40	272	205	385	38.0	47.6
12 V 3 PVS 210	95	167	192	211	215	217	222	6.27	1.99	380	205	385	51.0	69.4
6 V 4 PVS 280	127	223	254	282	287	289	295	2.47	2.52	272	205	385	33.0	46.5
6 V 5 PVS 350	159	279	318	352	359	361	369	2.09	2.98	380	205	385	41.7	60.4
6 V 6 PVS 420	191	334	382	424	431	434	444	1.82	3.42	380	205	385	48.5	66.5

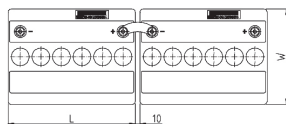
1, 2) Internal resistance R_i and short circuit current I_k according to IEC 60896-11

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

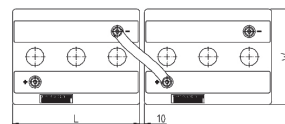
BAE *SECURA PVS BLOCK solar* batteries are also available as dry pre-charged version. They are titled with additional "TG", e.g. 12 V 3 PVS 210 TG.

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

3. Terminal positions



12 V 1 PVS 70 to 12 V 3 PVS 210



6 V 4 PVS 280 to 6 V 6 PVS 420

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.

Technical Specification for BAE *SECURA PVS BLOCK solar*



4. Design

Positive electrode	tubular-plate with 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 (68 °F)
Container	high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid	high impact, grey coloured SAN (colour may vary slightly from given image), UL-94 rating: HB
Plugs	labyrinth plugs for arresting aerosols, 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 EN 60529, touch protected according to VBG 4

5. Installation

BAE *SECURA PVS BLOCK solar* batteries are designed for indoor applications. For outdoor applications please contact BAE.

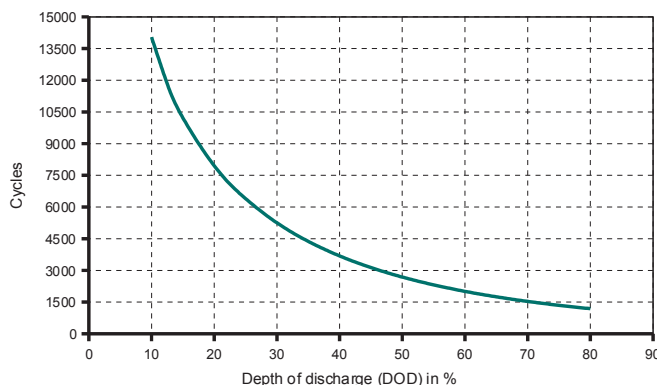
6. Maintenance

Every 6 months	check battery voltage, pilot block voltages, temperatures
Every 12 months	check connections, record battery voltage, block voltages and temperatures

7. Operational data

Depth of discharge (DOD)	max. 80 % ($U_e = 1.91$ V/cell for discharge times >10 h; 1.80 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 5 A/100 Ah C_{10}
Charge voltage at cyclic operation	restricted from 2.30 V to 2.40 V per cell, operation instruction is to be observed
Floating voltage/non cycle voltage	2.23 V per cell
Adjustment of charge voltage	no adjustment necessary if battery temperature is between 10 °C and 30 °C (50 °F and 86 °F) in the monthly average, otherwise $\Delta U/\Delta T = -0.003$ V/cell per K
Recharge to 100 %	within a period of 1 up to 4 weeks
IEC 61427 cycles	2,700 (A+B) at 40 °C (104 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F), recommended temperature range 10 °C to 30 °C (50 °F to 86 °F)
Self-discharge	approx. 3 % 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 Provision 598 (Chapter 3.3) are observed.

These cells/batteries are dangerous goods on sea transport. Declaration and packaging must comply with the requirements of IMDG-Codes.

10. Standards

Test standards	IEC 60896-11, IEC 61427
Safety standard, ventilation	EN 50272-2

BAE *SECURA PVS solar*

Technical Specification for Vented Lead-Acid Batteries (VLA)

1. Application

BAE *SECURA PVS solar* batteries need only low maintenance and are 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 requirements regarding cycling ability and long life-time.



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) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
U_e V/cell	1.67	1.80	1.80	1.80	1.80	1.80	1.80							
2 PVS 140	63	111	127	141	143	144	148	1.52	1.37	105	208	420	9.1	14.5
3 PVS 210	95	167	191	211	215	217	222	1.06	1.96	105	208	420	11.2	16.4
4 PVS 280	127	223	254	282	287	289	295	0.84	2.46	105	208	420	12.8	18.0
5 PVS 350	159	279	318	352	359	361	369	0.70	2.98	126	208	420	15.3	21.7
6 PVS 420	191	334	382	424	431	434	444	0.60	3.47	147	208	420	18.1	25.7
5 PVS 550	223	389	432	486	496	500	513	0.57	3.61	126	208	535	20.0	28.8
6 PVS 660	267	467	518	583	595	601	616	0.49	4.18	147	208	535	23.5	34.0
7 PVS 770	310	544	604	681	694	700	720	0.44	4.69	168	208	535	26.8	39.1
6 PVS 900	352	665	748	856	877	888	916	0.47	4.41	147	208	710	33.0	47.4
7 PVS 1050	415	777	872	993	1,020	1,033	1,065	0.36	5.66	215	193	710	42.1	61.5
8 PVS 1200	473	886	996	1,137	1,160	1,178	1,216	0.32	6.36	215	193	710	46.6	65.4
9 PVS 1350	522	992	1,116	1,274	1,300	1,320	1,365	0.33	6.20	215	235	710	51.4	75.4
10 PVS 1500	585	1,100	1,240	1,418	1,450	1,464	1,516	0.28	7.25	215	235	710	56.0	79.4
11 PVS 1650	635	1,210	1,362	1,555	1,590	1,608	1,665	0.28	7.36	215	277	710	61.0	89.6
12 PVS 1800	698	1,320	1,486	1,699	1,740	1,752	1,816	0.24	8.41	215	277	710	65.4	93.4
11 PVS 2090	790	1,470	1,636	1,836	1,870	1,884	1,941	0.24	8.38	215	277	855	72.7	105.9
12 PVS 2280	869	1,600	1,784	2,001	2,040	2,052	2,116	0.22	9.48	215	277	855	77.4	110.4
13 PVS 2470	978	1,740	1,938	2,174	2,210	2,232	2,292	0.16	13.03	215	400	815	90.8	137.8
14 PVS 2660	1,051	1,880	2,080	2,332	2,380	2,400	2,448	0.15	13.82	215	400	815	95.3	142.4
15 PVS 2850	1,123	2,010	2,220	2,498	2,550	2,568	2,640	0.14	14.43	215	400	815	100.2	146.9
16 PVS 3040	1,195	2,140	2,380	2,664	2,710	2,736	2,808	0.13	15.20	215	400	815	105.4	151.6
17 PVS 3230	1,280	2,290	2,540	2,858	2,910	2,940	3,000	0.12	16.91	215	490	815	117.7	175.1
18 PVS 3420	1,352	2,420	2,680	3,024	3,080	3,108	3,192	0.11	17.55	215	490	815	121.9	179.1
19 PVS 3610	1,425	2,560	2,840	3,189	3,250	3,276	3,360	0.11	18.36	215	490	815	126.8	183.6
20 PVS 3800	1,496	2,690	2,980	3,355	3,420	3,444	3,528	0.11	18.92	215	490	815	132.0	188.3
22 PVS 4180	1,635	2,950	3,280	3,686	3,750	3,780	3,888	0.10	19.92	215	580	815	145.4	213.9
24 PVS 4560	1,777	3,220	3,560	4,010	4,090	4,128	4,224	0.09	21.26	215	580	815	155.2	223.0
26 PVS 4940	1,917	3,480	3,860	4,341	4,420	4,464	4,584	0.09	22.49	215	580	815	165.0	232.0

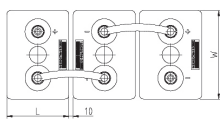
1, 2) Internal resistance R_i and short circuit current I_k according to IEC 60896-11

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

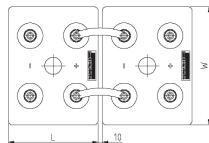
BAE *SECURA PVS solar* batteries are also available as dry pre-charged version. They are titled with additional "TG", e.g. 4 PVS 280 TG.

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

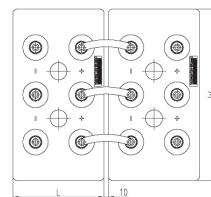
3. Terminal positions



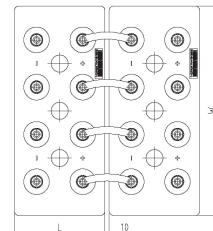
2 PVS 140 to 6 PVS 900



7 PVS 1050 to 12 PVS 2280



13 PVS 2470 to 16 PVS 3040



17 PVS 3230 to 26 PVS 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.

Technical Specification for BAE *SECURA PVS solar*



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 (68 °F)
Container	high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid	high impact SAN in dark grey colour (colour may vary slightly from given image), UL-94 rating: HB
Plugs	labyrinth plugs for arresting aerosols, 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 EN 60529, touch protected according to VBG 4

5. Installation

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

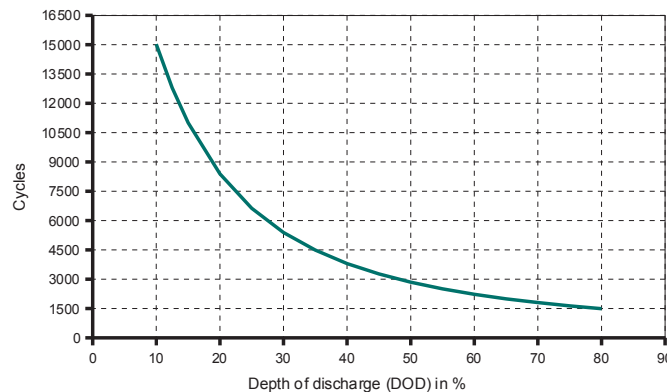
6. Maintenance

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

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 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 voltage	2.23 V/cell
Adjustment of charge voltage	no adjustment necessary if battery temperature is between 10 °C and 30 °C (50 °F and 86 °F) in the monthly average, otherwise $\Delta U/\Delta T = -0.003$ V/cell per K
Recharge to 100 %	within a period of 1 up to 4 weeks
IEC 61427 cycles	3,150 (A+B) at 40 °C (104 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F), recommended temperature range 10 °C to 30 °C (50 °F to 86 °F)
Self-discharge	approx. 3 % 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 Provision 598 (Chapter 3.3) are observed. These cells/batteries are dangerous goods on sea transport. Declaration and packaging must comply with the requirements of IMDG-Codes.

10. Standards

Test standards	IEC 60896-11, IEC 61427
Safety standard, ventilation	EN 50272-2



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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_{1h} Ah	C_{10h} Ah	C_{20h} Ah	C_{72h} Ah	C_{100h} Ah	C_{120h} Ah	C_{240h} Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight 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

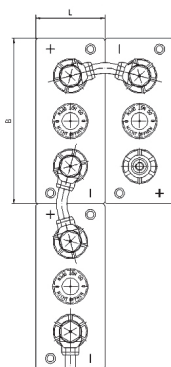
1, 2) Internal resistance R_i and short circuit current I_k according to IEC 60896-21

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.

Technical Specification for BAE *SECURA PVVM solar*



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.

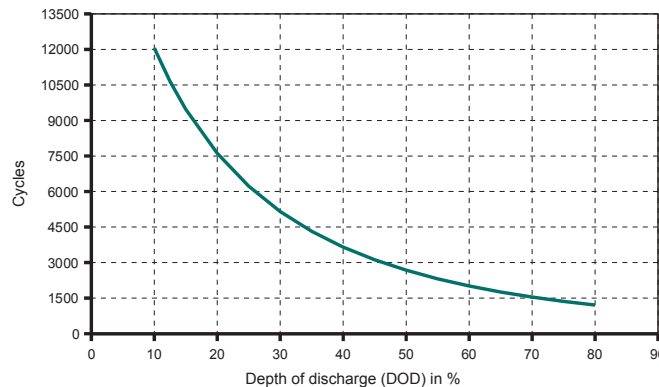
6. Maintenance

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



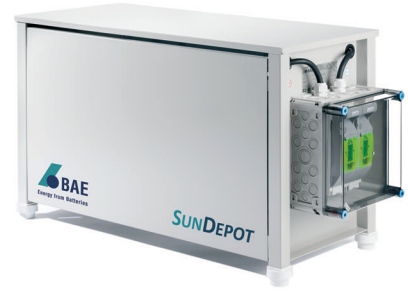
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Efficient consumption of PV-energy where it is generated

The BAE *SUNDEPOT* stores the generated PV energy locally and increases the degree of self consumed energy significantly.

It is designed especially for use in small industrial, commercial and private applications. The compact and modular design enables fast and easy assembling on site. The BAE *SUNDEPOT* comprises of a robust fully insulated battery rack with front cover and lid, a modern maintenance free solar battery of 6 or 12 V blocks in tubular plate design, the junction box with fuse switch disconnecter for NH-1 fuses and all components to connect the system up to the fuse terminal output.



1. BAE *SUNDEPOT* 24 & BAE *SUNDEPOT* 48 (Reference temperature 20 °C)

Type	Battery	Energy kWh C ₁₀₀	Energy kWh C ₁₀	Nominal voltage V	Tiers	Length mm	Width mm	Height mm	Weight incl. battery kg
SUNDEPOT 24 -280	4 x 6V 4PVV280	6.7	5.3	24	1	1129	465	631	256
SUNDEPOT 24 -350	4 x 6V 5PVV350	8.4	6.6	24	1	1129	465	631	312
SUNDEPOT 24 -420	4 x 6V 6PVV420	10.0	7.8	24	1	1129	465	631	347
SUNDEPOT 48 -210	4 x 12V 3PVV210	10.1	7.9	48	1	1129	465	631	348
SUNDEPOT 48 -280	8 x 6V 4PVV280	13.4	10.5	48	2	1129	465	1210	492
SUNDEPOT 48 -350	8 x 6V 5PVV350	16.8	13.2	48	2	1129	465	1210	604
SUNDEPOT 48 -420	8 x 6V 6PVV420	20.2	15.9	48	2	1129	465	1210	675

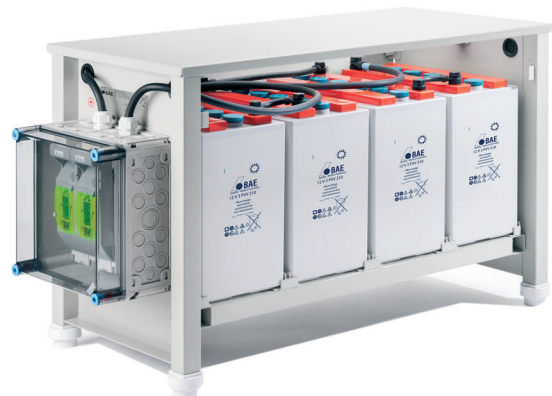
2. Easy assembling

The modular design makes it easy to assemble the BAE *SUNDEPOT* quickly. Only three parts are to be connected by screws.

Front side



Back side



Additionally a cover for back side is available as option.

Technical Specification of BAE *SUNDEPOT*

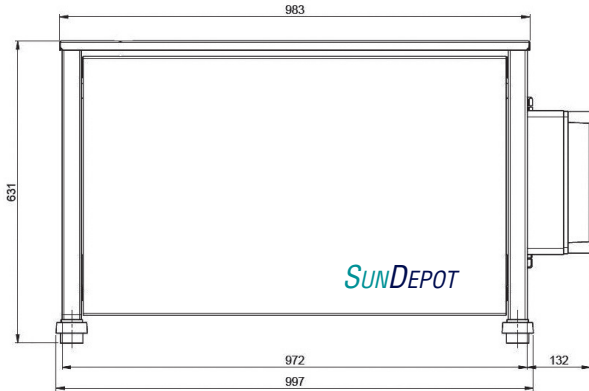


3. Design

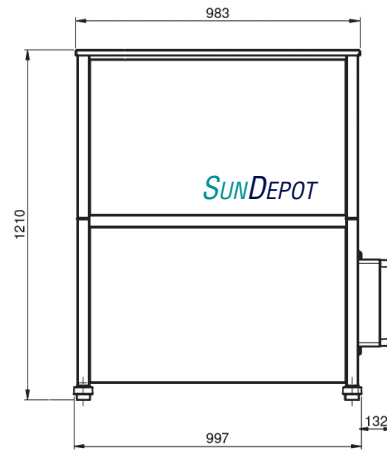
Rack	Coated steel rack, floor unit and side walls screwed; lid and front cover hooked in
Battery	Maintenance free solar battery with highest cyclic ability via tubular plate technology; electrolyte fixed as GEL
Connector	Fully insulated block connectors, pre assembled end terminal cables for junction box (included)
Junction box	Fuse switch disconnecter inside the junction box with flip cover suited for NH-1 fuse (not included)

4. Dimension

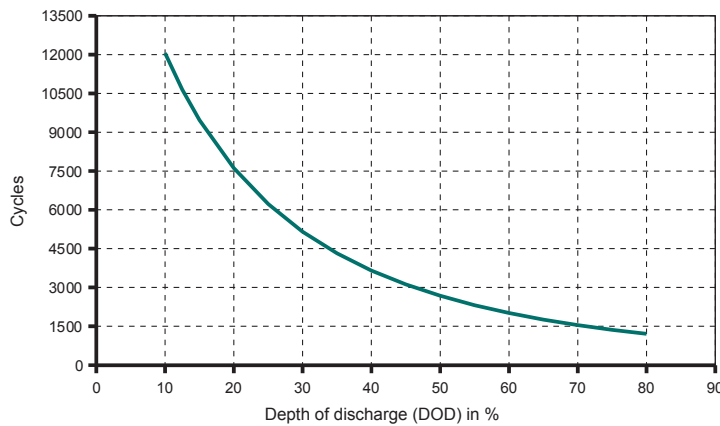
1-tier:



2-tier:



5. Number of cycles as function of Depth of discharge



6. Transport

As standard packaging the BAE *SUNDEPOT* will be shipped as one system per pallet.

7. Standards

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

09/2013 4804697 Technical details may be subject to alterations.