BAE SECURA OPzV

Technical Specification for Stationary VRLA-GEL-Cells (DIN 40742)

1. Application

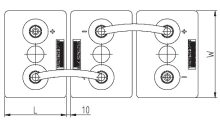
BAE OPzV batteries belong to the highest EUROBAT classification for maintenance-free lead-acid batteries: >12 years long life.
In applications with high requirements of operational safety and autonomy times of 1 h to more than 10 h, the BAE OPzV batteries are the right choice. They are used as stand-by power sources in telecommunications, in microwave radio systems, emergency lighting, power generation plants and other equipments.

2. Types, capacities, dimensions, weights

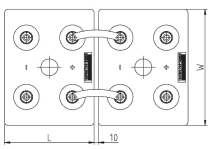
Type	$C_{10\,h}$ 20 °C Ah	$C_{5\,h}$ 20 °C Ah	$C_{3\,h}$ 20 °C Ah	$C_{1\,h}$ 20 °C Ah	$C_{8\,h}$ 25 °C Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight filled kg
U_e V/cell	1.80	1.77	1.75	1.67	1.75						
2 OPzV 100*	121	107	96	71	120	1.65	1.30	105	208	420	12.4
3 OPzV 150*	182	161	144	107	180	1.15	1.86	105	208	420	17.1
4 OPzV 200	243	214	192	143	240	0.89	2.40	105	208	420	19.4
5 OPzV 250	304	268	240	179	300	0.73	2.91	126	208	420	23.3
6 OPzV 300	364	322	288	215	360	0.63	3.39	147	208	420	27.4
5 OPzV 350	447	388	342	254	440	0.68	3.14	126	208	535	31.4
6 OPzV 420	529	459	405	302	521	0.58	3.64	147	208	535	36.9
7 OPzV 490	610	530	468	350	601	0.52	4.12	168	208	535	42.4
6 OPzV 600	729	630	564	417	718	0.46	4.63	147	208	710	51.0
7 OPzV 700*	858	740	663	492	840	0.36	5.81	215	193	710	61.9
8 OPzV 800	970	840	750	559	952	0.32	6.54	215	193	710	68.8
9 OPzV 900*	1,090	945	840	616	1,072	0.34	6.29	215	235	710	77.0
10 OPzV 1000	1,200	1,045	933	691	1,192	0.28	7.50	215	235	710	83.9
11 OPzV 1100*	1,320	1,145	1,020	748	1,304	0.28	7.56	215	277	710	92.2
12 OPzV 1200	1,440	1,245	1,113	822	1,416	0.24	8.63	215	277	710	99.2
11 OPzV 1375*	1,570	1,375	1,209	839	1,576	0.27	7.86	215	277	855	108.2
12 OPzV 1500	1,710	1,495	1,317	927	1,704	0.23	9.18	215	277	855	116.5
13 OPzV 1625*	1,890	1,660	1,461	1,040	1,880	0.18	11.91	215	400	815	131.4
14 OPzV 1750*	2,070	1,810	1,590	1,125	2,056	0.17	12.63	215	400	815	141.2
15 OPzV 1875*	2,170	1,900	1,677	1,191	2,160	0.16	13.25	215	400	815	147.9
16 OPzV 2000	2,300	2,015	1,779	1,265	2,288	0.15	13.94	215	400	815	156.2
17 OPzV 2125*	2,480	2,170	1,911	1,358	2,464	0.14	15.32	215	490	815	173.6
18 OPzV 2250*	2,610	2,290	2,016	1,433	2,600	0.13	16.03	215	490	815	181.4
19 OPzV 2375*	2,740	2,405	2,121	1,507	2,728	0.12	16.70	215	490	815	189.6
20 OPzV 2500	2,870	2,520	2,223	1,581	2,864	0.12	17.37	215	490	815	197.8
22 OPzV 2750*	3,210	2,805	2,466	1,740	3,192	0.11	18.43	215	580	815	205.7
24 OPzV 3000	3,470	3,035	2,670	1,887	3,456	0.10	19.76	215	580	815	222.0
26 OPzV 3250*	3,650	3,210	2,832	2,014	3,640	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
* Special type based on DIN 40742
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 6.

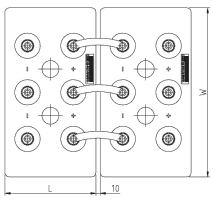
3. Terminal positions



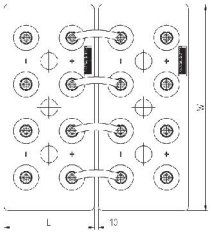
2 OPzV 100 to 6 OPzV 600



7 OPzV 700 to 12 OPzV 1500



13 OPzV 1625 to 16 OPzV 2000



17 OPzV 2125 to 26 OPzV 3250

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Technical Specification for BAE *SECURA OPzV*

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, 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 pole	M10 brass insertion
Connectors	flexible insulated copper cables with cross-section of 25, 35, 50, 70, 95 or 120 mm^2; on request: insulated solid copper connectors with cross-section 90, 150 or 300 mm^2
Connector screw	M10, steel, insulated, with measuring point
Kind of protection	IP 25 regarding EN 60529, touch protected according to VBG 4
Horizontal operation	Please use BAE special type OPzV “horizontal”. The construction and production of this type is adapted to the horizontal operation.

5. Charging

IU-characteristic	I_{max} without limitation U = 2.25 V/cell ± 1 %, 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)
Float current	20 - 30 mA/100 Ah C_{10}
Boost charge	U = 2.33 to 2.40 V/cell, time limited
Charging time up to 92 %	6 h with 1.5 x I_{10} initial current, 2.25 V/cell, 50 % C_{10} discharged

6. Discharge characteristics

Reference temperature	20 °C (68 °F)
Initial capacity	according to IEC 60896-21: 95 % at the 1st cycle, 100 % at the 5th cycle
Depth of discharge (DOD)	normally up to 80 %
Deep discharges	more than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

7. Maintenance

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

8. Operational data

Classification acc. to EUROBAT	12 years and longer - long life
Service life	20 years in stand-by operation, float at 20 °C to 25 °C (68 °F to 77 °F)
Maintenance-free	no topping up during life
IEC 60896-21 cycles	>1,500
Self-discharge	approx. 2 % per month at 20 °C (68 °F)
Battery temperature	-20 °C to 45 °C (-4 °F to 113 °F) recommended 10 °C to 30 °C (50 °F to 86 °F) short time 45 °C to 55 °C (113 °F to 131 °F)
Deep discharge recovery	very good
Standard	DIN 40742 (except * marked cells)
Tests according to	IEC 60896-21, -22
Safety standard, ventilation	EN 50272-2, Ventilation requirements are reduced to 20 % compared to those for vented batteries of the same capacity.
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.

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BAE *SECURA OPzV BLOCK*

Technical Specification for Stationary VRLA-GEL-Block Batteries

1. Application

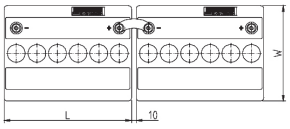
BAE *SECURA OPzV BLOCK* batteries belong to the highest EUROBAT classification for maintenance-free lead-acid batteries: >12 years long life.
In applications with high requirements of operational safety and autonomy times of 1 h to more than 10 h, the BAE *SECURA OPzV BLOCKs* are the right choice. They are used as stand-by power sources in telecommunications, in microwave radio systems, emergency lighting and other equipments.

2. Types, capacities, dimensions, weights

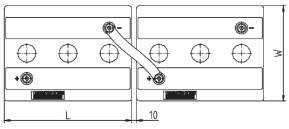
Type	$C_{10\,h}$ 20 °C Ah	$C_{5\,h}$ 20 °C Ah	$C_{3\,h}$ 20 °C Ah	$C_{1\,h}$ 20 °C Ah	$C_{8\,h}$ 25 °C Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight kg
U_e V/cell	1.80	1.77	1.75	1.67	1.75						
12 V 1 OPzV 50	60	53	48	35	60	17.47	0.73	272	205	385	43.0
12 V 2 OPzV 100	110	99	89	68	109	9.55	1.34	272	205	385	52.0
12 V 3 OPzV 150	167	149	135	103	166	6.74	1.91	380	205	385	74.2
6 V 4 OPzV 200	224	200	181	137	222	2.66	2.42	272	205	385	51.0
6 V 5 OPzV 250	281	251	227	172	279	2.24	2.87	380	205	385	65.0
6 V 6 OPzV 300	337	301	273	207	335	1.94	3.31	380	205	385	73.8
2 V 12 OPzV 600	674	600	543	413	668	0.29	7.33	205	272	385	51.0
2 V 15 OPzV 750	844	750	681	517	832	0.24	8.81	205	380	385	65.0
2 V 18 OPzV 900	1,010	905	819	622	1,000	0.21	10.18	205	380	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 6.

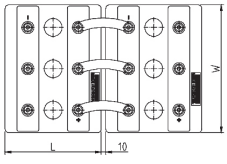
3. Terminal positions



12 V 1 OPzV 50 to 12 V 3 OPzV 150



6 V 4 OPzV 200 to 6 V 6 OPzV 300



2 V 12 OPzV 600 to 2 V 18 OPzV 900

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Technical Specification for BAE *SECURA OPzV BLOCK*

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, 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 ABS (Acrylonitrile-Butadiene-Styrene), UL-94 rating: V-0
Blocks with blind cells	4 V, 6 V, 8 V, 10 V
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 pole	M10 brass insertion
Connectors	flexible insulated copper cables with cross-section of 25, 35, 50, 70, 95 or 120 mm², on request: insulated solid copper connectors with cross-section 90, 150 or 300 mm²
Connector screw	M10, steel, insulated, with measuring point
Kind of protection	IP 25 regarding EN 60529, touch protected according to VBG 4
Horizontal operation	Please use BAE special type OPzV “horizontal”. The construction and production of this type is adapted to the horizontal operation.

5. Charging

IU-characteristic	I_{max} without limitation U = 2.25 V/cell ± 1 %, 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)
Float current	20 - 30 mA/100 Ah C_{10}
Boost charge	U = 2.33 to 2.40 V/cell, time limited
Charging time up to 92 %	6 h with 1.5 x I_{10} initial current, 2.25 V/cell, 50 % C_{10} discharged

6. Discharge characteristics

Reference temperature	20 °C (68 °F)
Initial capacity	according to IEC 60896-21: 95 % at the 1st cycle, 100 % at the 5th cycle
Depth of discharge (DOD)	normally up to 80 %
Deep discharges	more than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

7. Maintenance

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

8. Operational data

Classification according to EUROBAT	12 years and longer - long life
Service life	18 years in stand-by operation, float at 20 °C to 25 °C (68 °F to 77 °F)
Maintenance-free	no topping up during life
IEC 60896-21 cycles	>1,500
Self-discharge	approx. 2 % per month at 20 °C (68 °F)
Battery temperature	-20 °C to 45 °C (-4 °F to 113 °F) recommended 10 °C to 30 °C (50 °F to 86 °F) short time 45 °C to 55 °C (113 °F to 131 °F)
Deep discharge recovery	very good
Standard	DIN 40744
Tests according to	IEC 60896-21, -22
Safety standard, ventilation	EN 50272-2, Ventilation requirements are reduced to 20 % compared to those for vented batteries of the same capacity.
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.

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BAE *SECURA OPzS*

Technical Specification for Stationary VLA-Cells

1. Application

BAE *SECURA OPzS* batteries belong to the most enduring lead-acid batteries. They are suitable for stand-by operations as well as for capacitive loads. They perfectly meet requirements for autonomy times between 1 h and more than 10 h.

Fields:
Telecommunications
Emergency lighting
Microwave radio systems
Power generation plants

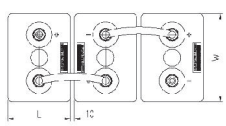
Similar to the illustration

2. Types, capacities, dimensions, weights

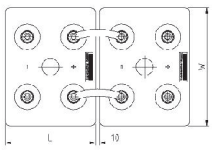
Type	$C_{10\,h}$ 20 °C Ah	$C_{5\,h}$ 20 °C Ah	$C_{3\,h}$ 20 °C Ah	$C_{1\,h}$ 20 °C Ah	$C_{8\,h}$ 25 °C Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
U_e V/cell	1.80	1.77	1.75	1.67	1.75							
2 OPzS 100	111	97	86	63	110	1.52	1.37	105	208	420	9.1	14.5
3 OPzS 150	167	145	129	95	165	1.06	1.96	105	208	420	11.2	16.4
4 OPzS 200	223	193	171	127	220	0.84	2.46	105	208	420	12.8	18.0
5 OPzS 250	279	242	214	159	276	0.70	2.98	126	208	420	15.3	21.7
6 OPzS 300	334	290	257	191	332	0.60	3.47	147	208	420	18.1	25.7
5 OPzS 350	389	346	306	223	392	0.57	3.61	126	208	535	20.0	28.8
6 OPzS 420	467	414	366	267	470	0.49	4.18	147	208	535	23.5	34.0
7 OPzS 490	544	483	429	310	548	0.44	4.69	168	208	535	26.8	39.1
6 OPzS 600	665	580	504	352	670	0.47	4.41	147	208	710	33.0	47.4
7 OPzS 700*	777	675	594	415	781	0.36	5.66	215	193	710	42.1	61.5
8 OPzS 800	886	770	675	473	888	0.32	6.36	215	193	710	46.6	65.4
9 OPzS 900*	992	860	753	522	1,000	0.33	6.20	215	235	710	51.4	75.4
10 OPzS 1000	1,100	960	840	585	1,112	0.28	7.25	215	235	710	56.0	79.4
11 OPzS 1100*	1,210	1,050	918	635	1,216	0.28	7.36	215	277	710	61.0	89.6
12 OPzS 1200	1,320	1,150	1,005	698	1,328	0.24	8.41	215	277	710	65.4	93.4
11 OPzS 1375*	1,470	1,295	1,137	790	1,496	0.24	8.38	215	277	855	72.7	105.9
12 OPzS 1500	1,600	1,415	1,245	869	1,632	0.22	9.48	215	277	855	77.4	110.4
13 OPzS 1625*	1,740	1,550	1,371	978	1,768	0.16	13.03	215	400	815	90.8	137.8
14 OPzS 1750	1,880	1,665	1,473	1,051	1,904	0.15	13.82	215	400	815	95.3	142.4
15 OPzS 1875*	2,010	1,780	1,578	1,123	2,032	0.14	14.43	215	400	815	100.2	146.9
16 OPzS 2000	2,140	1,900	1,680	1,195	2,168	0.13	15.20	215	400	815	105.4	151.6
17 OPzS 2125*	2,290	2,030	1,797	1,280	2,320	0.12	16.91	215	490	815	117.7	175.1
18 OPzS 2250	2,420	2,150	1,899	1,352	2,456	0.11	17.55	215	490	815	121.9	179.1
19 OPzS 2375*	2,560	2,265	2,004	1,425	2,592	0.11	18.36	215	490	815	126.8	183.6
20 OPzS 2500	2,690	2,380	2,106	1,496	2,728	0.11	18.92	215	490	815	132.0	188.3
22 OPzS 2750	2,950	2,615	2,307	1,635	2,992	0.10	19.92	215	580	815	145.4	213.9
24 OPzS 3000	3,220	2,845	2,514	1,777	3,264	0.09	21.26	215	580	815	155.2	223.0
26 OPzS 3250	3,480	3,080	2,715	1,917	3,536	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 * Special type based on DIN 40736-1
Height (H) is the maximum height between container bottom and top of the bolts in assembled condition.
All values published in the table correspond to 100 % discharge of current depending capacity without voltage drop of connectors.

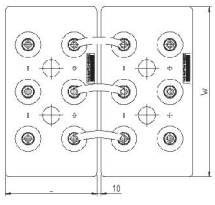
3. Terminal positions



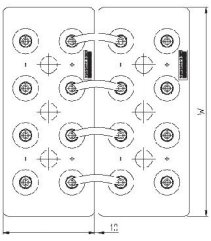
2 OPzS 100 to 6 OPzS 600



7 OPzS 700 to 12 OPzS 1500



13 OPzS 1625 to 16 OPzS 2000



17 OPzS 2125 to 26 OPzS 3250

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Technical Specification for BAE *SECURA OPzS*

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 low antimony alloy with long-life expander material
Separation	microporous separator
Electrolyte	sulphuric acid with a density of 1.24 kg/l (20 °C / 68 °F)
Container	high impact, transparent SAN (styrene-acrylonitrile resin), UL-94 rating: HB
Lid	high impact plastic lid in grey colour, UL-94 rating: HB, on request also in ABS (Acrylonitrile-Butadiene-Styrene), UL-94 rating: V-0
Plugs	labyrinth plugs for arresting aerosols, recommended BAE ceramic funnel plugs according to DIN 40740 or BAE ceramic plugs
Pole-bushing	100 % gas- and electrolyte-tight, sliding, plastic coated “Panzerpol”
Kind of pole	M10 brass insertion
Connectors	flexible insulated copper cables with cross-section of 25, 35, 50, 70, 95 or 120 mm^2; on request: insulated solid copper connectors with cross-section 90, 150 or 300 mm^2
Connector screw	M10, steel, insulated, with measuring point
Kind of protection	IP 25 regarding EN 60529, touch protected according to BGV A3

BAE *SECURA OPzS* cells are also available as dry, pre-charged version. They are specifically marked with „TG“, e.g. 12 OPzS 1500 TG.

5. Charging

IU-characteristic	I_{max} without limitation U = 2.23 V/cell ± 1 %, between 10 °C and 30 °C (50 °F and 86 °F) in the monthly average, otherwise $\Delta U/\Delta T$ = -0.003 V/K
Boost charge	U = 2.33 to 2.40 V/cell, time limited

6. Discharge characteristics

Reference temperature	20 °C (68 °F)
Initial capacity	according to IEC 60896-11: 95 % at the 1st cycle, 100 % at the 5th cycle

7. Operational data

Service life	20+ years in stand-by operation, float at 20 °C to 25 °C (68 °F to 77 °F)
Water-refilling-interval	>3 years, float at 20 °C to 25 °C (68 °F to 77 °F)
IEC 60896-11 cycles	>1,500
Self-discharge	approx. 3 % per month at 20 °C (68 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F), recommended 10 °C to 30 °C (50 °F to 86 °F)
Standard	DIN 40736-1 (except * marked cells)
Tests according to	IEC 60896-11
Safety standard, ventilation	EN 50272-2

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BAE Energy from Batteries

BAE *SECURA OPzS BLOCK*

Technical Specification for Stationary VLA-Block Batteries

1. Application

BAE *SECURA OPzS BLOCK* batteries belong to the most enduring lead-acid batteries. They are suitable for stand-by operations as well as for capacitive loads. They perfectly meet requirements for autonomy times between 30 min and more than 10 h.

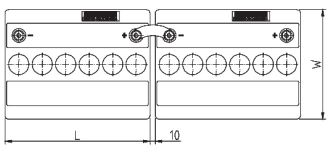
Fields:
Telecommunications
Emergency lighting
Microwave radio systems
Power generation plants

2. Types, capacities, dimensions, weights

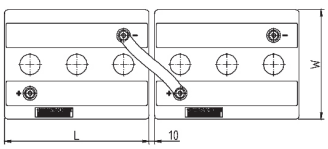
Type	$C_{10\,h}$ 20 °C Ah	$C_{5\,h}$ 20 °C Ah	$C_{3\,h}$ 20 °C Ah	$C_{1\,h}$ 20 °C Ah	$C_{8\,h}$ 25 °C Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
U_e V/cell	1.80	1.77	1.75	1.67	1.75							
12 V 1 OPzS 50	56	48	42	31	55	16.62	0.75	272	205	385	29.5	41.0
12 V 2 OPzS 100	109	95	84	63	108	8.91	1.40	272	205	385	38.0	47.6
12 V 3 OPzS 150	167	145	129	95	165	6.27	1.99	380	205	385	51.0	69.4
6 V 4 OPzS 200	223	194	171	127	220	2.47	2.52	272	205	385	33.0	46.5
6 V 5 OPzS 250	279	242	214	159	276	2.09	2.98	380	205	385	41.7	60.4
6 V 6 OPzS 300	334	290	257	191	332	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 OPzS* blocks are also available as dry pre-charged version. They are titled with additional "TG", e.g. 12 V 3 OPzS 150 TG.
All values given in the table correspond to 100 % DOD without voltage drop of connectors. Please consider item 6.

3. Terminal positions



12 V 1 OPzS 50 to 12 V 3 OPzS 150



6 V 4 OPzS 200 to 6 V 6 OPzS 300

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Technical Specification for BAE *SECURA OPzS BLOCK*

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 low antimony alloy with long-life expander material
Separation	microporous separator
Electrolyte	sulphuric acid with a density of 1.24 kg/l
Container	high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid	high impact SAN in grey colour (colour may vary slightly from given image), UL-94 rating: HB
Blocks with blind cells	4 V, 6 V, 8 V, 10 V
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 pole	M10 brass insertion
Connectors	flexible insulated copper cables with cross-section of 25, 35, 50, 70, 95 or 120 mm^2; on request: insulated solid copper connectors with cross-section 90, 150 or 300 mm^2
Connector screw	M10, steel, insulated, with measuring point
Kind of protection	IP 25 regarding EN 60529, touch protected according to VBG 4

5. Charging

IU-characteristic	I_{max} without limitation U = 2.23 V/cell ± 1 %, 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
Float current	approx. 15 mA/100 Ah C_{10}, increasing to approx. 30 mA/100 Ah C_{10} at the end of service life
Boost charge	U = 2.33 to 2.40 V/cell, time limited
Charging time up to 90 %	6 h with 1.5 x I_{10} initial current, 2.23 V/cell, 50 % C_{10} discharged

6. Discharge characteristics

Reference temperature	20 °C (68 °F)
Initial capacity	according to IEC 60896-11: 95 % at the 1st cycle, 100 % at the 5th cycle
Depth of discharge (DOD)	normally up to 80 %
Deep discharges	more than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

7. Maintenance

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

8. Operational data

Service life	18 years in stand-by operation, float at 20 °C to 25 °C (68 °F to 77 °F)
Water-refilling-interval	>3 years, float at 20 °C to 25 °C (68 °F to 77 °F)
IEC 60896-11 cycles	>1,200
Self-discharge	approx. 3 % per month at 20 °C (68 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F) recommended 10 °C to 30 °C (50 °F to 86 °F)
Standard	DIN 40737-3
Tests according to	IEC 60896-11
Safety standard, ventilation	EN 50272-2
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.

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Energy from Batteries

BAE *SECURA OGi*

Technical Specification for Stationary VLA-Cells

Similar to the illustration

1. Application

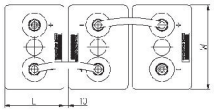
BAE *SECURA OGi* cells are designed for reliable operation, long service life, high discharge currents during short discharge times and capacitive loads over longer discharge times.
They are used as stand-by source in power supply stations, transforming stations, UPS-stations and emergency light equipment.
Due to the used grid plate design with high mass of lead and circular bars a long operational life and a very good high-current-performance can be assured. The slick-walled containers and the vertical arranged plates offer a high power density related to a small foot-print. The transparent container allows an easy visual access and simplifies service and maintenance significantly.

2. Types, capacities, dimensions, weights

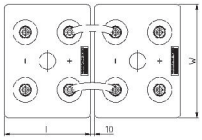
Type	$C_{10\,h}$ 20 °C Ah	$C_{5\,h}$ 20 °C Ah	$C_{3\,h}$ 20 °C Ah	$C_{1\,h}$ 20 °C Ah	$C_{30\,min}$ 20 °C Ah	$C_{10\,min}$ 20 °C Ah	$C_{8\,h}$ 25 °C Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
U_e V/cell	1.80	1.80	1.79	1.75	1.72	1.65	1.75							
8 OGi 200	234	206	183	140	115	79	236	0.45	4.58	103	206	420	14.4	18.8
10 OGi 250	289	255	226	173	143	97	292	0.38	5.47	124	206	420	17.2	22.6
12 OGi 300	345	304	270	207	170	115	348	0.33	6.28	145	206	420	19.9	26.5
14 OGi 350	397	350	312	239	197	132	400	0.29	7.02	145	206	420	22.4	28.7
16 OGi 400	455	402	357	276	229	158	459	0.23	9.25	187	206	420	25.3	34.0
18 OGi 450	510	451	402	310	257	177	515	0.20	10.21	187	206	420	27.8	36.2
5 OGi 400	422	352	306	222	172	100	415	0.44	4.71	145	206	700	27.5	41.0
6 OGi 480	506	423	366	266	205	119	498	0.37	5.53	145	206	700	31.3	44.6
7 OGi 560	590	493	429	310	239	138	581	0.32	6.34	145	206	700	34.9	47.8
8 OGi 640	675	560	489	353	271	156	664	0.29	7.08	145	206	700	38.6	51.3
9 OGi 720	710	595	525	385	299	173	701	0.26	7.84	145	206	700	42.3	54.6
10 OGi 800	843	705	612	444	343	199	824	0.22	9.23	210	191	700	50.9	67.7
11 OGi 880	910	760	666	483	374	218	896	0.20	10.07	210	191	700	54.6	71.2
12 OGi 960	942	795	699	515	402	235	928	0.19	10.88	210	191	700	58.2	74.5
13 OGi 1040	1,090	910	792	568	431	243	1,080	0.19	10.66	210	233	700	62.7	83.5
14 OGi 1120	1,140	960	837	608	467	267	1,128	0.17	12.00	210	233	700	66.6	87.2
15 OGi 1200	1,170	990	870	635	488	278	1,160	0.17	12.28	210	233	700	70.2	90.5
16 OGi 1280	1,340	1,115	972	695	526	295	1,320	0.16	12.83	210	275	700	75.1	100.0
17 OGi 1360	1,370	1,155	1,011	734	563	321	1,360	0.14	14.31	210	275	700	78.8	103.5
18 OGi 1440	1,410	1,190	1,047	768	596	344	1,392	0.13	15.59	210	275	700	82.4	106.8
19 OGi 1520	1,590	1,330	1,164	846	659	387	1,568	0.11	18.45	210	360	675	88.7	122.0
20 OGi 1600	1,670	1,400	1,224	889	691	406	1,648	0.10	19.19	210	360	675	92.3	125.2
21 OGi 1680	1,750	1,470	1,284	932	725	425	1,728	0.10	20.08	210	360	675	95.9	128.6
22 OGi 1760	1,800	1,510	1,323	966	753	442	1,768	0.10	20.82	210	360	675	99.7	132.0
23 OGi 1840	1,820	1,540	1,353	996	780	460	1,792	0.09	21.69	210	360	675	103.5	135.3
24 OGi 1920	1,860	1,575	1,389	1,028	807	476	1,832	0.09	22.35	210	360	675	106.9	138.7
25 OGi 2000	2,080	1,745	1,521	1,104	855	497	2,048	0.09	23.05	210	440	675	112.8	154.1
26 OGi 2080	2,160	1,810	1,581	1,146	886	514	2,128	0.08	23.67	210	440	675	116.5	157.5
27 OGi 2160	2,230	1,870	1,632	1,186	918	533	2,192	0.08	24.58	210	440	675	120.2	160.8
28 OGi 2240	2,260	1,900	1,665	1,216	944	548	2,224	0.08	25.20	210	440	675	123.9	164.1
29 OGi 2320	2,290	1,935	1,701	1,248	972	567	2,264	0.08	26.10	210	440	675	127.6	167.6
30 OGi 2400	2,320	1,965	1,731	1,277	996	580	2,296	0.07	26.61	210	440	675	131.3	170.9

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.
All values published in the table correspond to 100 % discharge of current depending capacity without voltage drop of connectors.

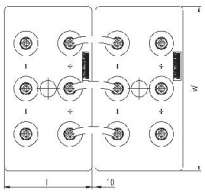
3. Terminal positions



8 OGi 200 to 9 OGi 720



10 OGi 800 to 18 OGi 1440



19 OGi 1520 to 30 OGi 2400

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Technical Specification for BAE *SECURA OGi*

4. Design

Positive electrode	grid-plate with circular bars in a corrosion-resistant low antimony alloy
Negative electrode	grid-plate in low antimony alloy with long-life expander material
Separation	microporous separator
Electrolyte	sulphuric acid with a density of 1.24 kg/l
Container	high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid	high impact SAN in grey colour, UL-94 rating: HB, on request also in ABS (Acrylonitrile-Butadiene-Styrene), UL-94 rating: V-0
Plugs	labyrinth plugs for arresting aerosols, recommended BAE ceramic funnel plugs according to DIN 40740 or BAE ceramic plugs
Pole-bushing	100 % gas- and electrolyte-tight, sliding, plastic coated “Panzerpol”
Kind of pole	M10 copper insertion
Connectors	flexible insulated copper cables with cross-section of 25, 35, 50, 70, 95 or 120 mm^2; on request: insulated solid copper connectors with cross-section 90, 150 or 300 mm^2
Connector screw	M10, steel, insulated, with measuring point
Kind of protection	IP 25 regarding EN 60529, touch protected according to BGV A3

BAE *SECURA* OGi cells are also available as dry, pre-charged version. They are specifically marked with “TG”, e.g. 30 OGi 2400 TG.

5. Charging

IU-characteristic	I_{max} without limitation U = 2.23 V/cell ± 1 %, 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
Boost charge	U = 2.33 to 2.40 V/cell, time limited

6. Discharge characteristics

Reference temperature	20 °C (68 °F)
Initial capacity	according to IEC 60896-11: 95 % at the 1st cycle, 100 % at the 5th cycle

7. Operational data

Service life	20 years in stand-by operation, float at 20 °C to 25 °C (68 °F to 77 °F)
Water-refilling-interval	>3 years, float at 20 °C to 25 °C (68 °F to 77 °F)
IEC 60896-11 cycles	>1,200
Self-discharge	approx. 3 % per month at 20 °C (68 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F) recommended 10 °C to 30 °C (50 °F to 86 °F)
Standard	dimensions according to DIN 40736-1
Tests according to	IEC 60896-11
Safety standard, ventilation	EN 50272-2

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BAE
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BAE *SECURA OGi BLOCK*

Technical Specification for Stationary VLA-Block Batteries

1. Application

BAE *SECURA OGi BLOCK* batteries are robust and for high discharge-performances optimised lead-acid batteries. They are particularly suitable for autonomy times of a few minutes to one hour.

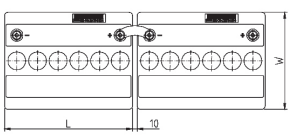
BAE OGi batteries are used for uninterrupted power supplies (UPS), to start diesel engines and for emergency power supplies in switch stations of utilities, in signal systems of railway applications or in other stations.

2. Types, capacities, dimensions, weights

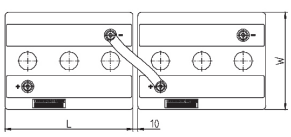
Type	$C_{10\,h}$ 20 °C Ah	$C_{3\,h}$ 20 °C Ah	$C_{1\,h}$ 20 °C Ah	$C_{30\,min}$ 20 °C Ah	$C_{10\,min}$ 20 °C Ah	$C_{5\,min}$ 20 °C Ah	$C_{8\,h}$ 25 °C Ah	R_i 1) mΩ	I_k 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
U_e V/cell	1.80	1.75	1.70	1.65	1.65	1.65	1.75							
12 V 1 OGi 25	30	23	18	15	10	7	30	16.78	0.74	272	205	385	22.0	35.0
12 V 2 OGi 50	60	47	36	30	20	14	61	9.11	1.37	272	205	385	30.0	42.0
12 V 3 OGi 75	91	71	54	45	31	20	91	6.39	1.95	272	205	385	37.2	47.5
12 V 4 OGi 100	112	90	69	58	40	27	113	5.00	2.50	272	205	385	44.5	54.2
12 V 5 OGi 125	151	118	90	75	50	33	152	4.19	2.99	380	205	385	54.5	71.5
12 V 6 OGi 150	166	133	103	86	59	39	167	3.60	3.47	380	205	385	60.7	74.7
6 V 7 OGi 175	206	163	124	103	69	44	208	1.61	3.89	272	205	385	34.8	48.0
6 V 8 OGi 200	234	185	141	118	78	50	236	1.44	4.32	272	205	385	40.0	51.0
6 V 9 OGi 225	262	207	159	132	86	55	264	1.33	4.68	380	205	385	46.0	63.3
6 V 10 OGi 250	289	230	176	147	95	60	292	1.23	5.05	380	205	385	50.0	67.0
6 V 11 OGi 275	317	252	193	162	103	65	320	1.15	5.40	380	205	385	54.0	71.0
6 V 12 OGi 300	344	274	210	176	111	69	348	1.09	5.73	380	205	385	57.6	72.5
2 V 24 OGi 600	703	555	425	355	234	150	708	0.16	12.95	205	272	385	40.0	51.0
2 V 30 OGi 750	869	690	528	442	286	182	872	0.13	15.29	205	380	385	50.0	67.0
2 V 36 OGi 900	1,030	822	631	529	335	211	1,040	0.12	17.38	205	380	385	57.6	72.5

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 OGi* blocks are also available as dry pre-charged version. They are titled with additional "TG", e.g. 12 V 6 OGi 150 TG.
All values given in the table correspond to 100 % DOD without voltage drop of connectors. Please consider item 6.

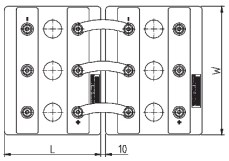
3. Terminal positions



12 V 1 OGi 25 to 12 V 6 OGi 150



6 V 7 OGi 175 to 6 V 12 OGi 300



2 V 24 OGi 600 to 2 V 36 OGi 900

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Technical Specification for BAE *SECURA OGi BLOCK*

4. Design

Positive electrode	grid-plate with circular bars in a corrosion-resistant low antimony alloy
Negative electrode	grid-plate in low antimony alloy with long-life expander material
Separation	microporous separator
Electrolyte	sulphuric acid with a density of 1.24 kg/l
Container	high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid	high impact SAN in grey colour (colour may vary slightly from given image), UL-94 rating: HB
Blocks with blind cells	4 V, 6 V, 8 V, 10 V
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 pole	M10 brass insertion
Connectors	flexible insulated copper cables with cross-section of 25, 35, 50, 70, 95 or 120 mm^2, as option: insulated solid copper connectors with cross-section 90, 150 or 300 mm^2
Connector screw	M10, steel, insulated, with measuring point
Kind of protection	IP 25 regarding EN 60529, touch protected according to VBG 4

5. Charging

IU-characteristic	I_{max} without limitation U = 2.23 V/cell ± 1 %, 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
Float current	approx. 20 mA/100 Ah C_{10}, increasing to approx. 60 mA/100 Ah C_{10} at the end of service life
Boost charge	U = 2.33 to 2.40 V/cell, time limited
Charging time up to 90 %	6 h with 1.5 x I_{10} initial current, 2.23 V/cell, 50 % C_{10} discharged

6. Discharge characteristics

Reference temperature	20 °C (68 °F)
Initial capacity	according to IEC 60896-11: 95 % at the 1st cycle, 100 % at the 5th cycle
Depth of discharge (DOD)	normally up to 80 %
Deep discharges	more than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

7. Maintenance

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

8. Operational data

Service life	16 years in stand-by operation, float at 20 °C to 25 °C (68 °F to 77 °F)
Water-refilling-interval	>3 years, float at 20 °C to 25 °C (68 °F to 77 °F)
IEC 60896-11 cycles	>1,000
Self-discharge	approx. 3 % per month at 20 °C (68 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F) recommended 10 °C to 30 °C (50 °F to 86 °F)
Standard	dimensions according to DIN 40737-3
Tests according to	IEC 60896-11
Safety standard, ventilation	EN 50272-2
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.

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Energy from Batteries