

Batteries in the OPzS Perfect range has the highest levels of reliability and has been used in all stand-by critical application.

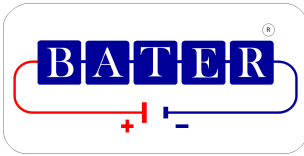
OPzS Perfect are quasi-VRLA cell due to use pole with outer labyrinths thread and plastic sheathing, and bi-directional recombination plug with flame arrestor – RegPlug2.

In addition to the long service life in stand-by parallel operation the OPzS Perfect range also offers high cycle consistency. Our batteries has increased capacity compared to the requirements of the DIN standard

Due to high reliability the main usage areas are telecommunication equipment, power station and power distribution, airport, railway, control systems, emergency lighting, UPS with long back-up.

MAIN FEATURES

- capacity range C_{10} , $U_{END}=1.80V/cell @ +20^{\circ}C$:
cell 2V: 107Ah ÷ 3340Ah,
is higher than DIN standard capacity,
- dimensions accordance to DIN 40736-1 standard,
- service life: over 20 years @ +20°C,
- high reliability,
- low maintenance,
- cells equipped with patented BATER recombination plug RecPlug2 results in:
 - low explosion risk,
 - no need for refilling water loses.



TECHNICAL DATA

- operating mode: stand-by parallel and floating, switch or battery (charge/discharge),
- recommended charging characteristic IU acc. to EN 50272-2 and DIN 41773,
- stand-by parallel mode recommended float charge voltage: 2.23 V/cell ± 1% @ +20°C,
- boost charging: 2.40V/cell for max. charging current 4 x I₁₀, time 24h and t < +30 °C,






Charging characteristic "IU" 2.4 V/cell										
State of charge	Charging current I ₁₀ (10A/100Ah)					Charging current I ₂₀ (20A/100Ah)				
	60%	80%	95%	100%	Full of charge	60%	80%	95%	100%	Full of charge
DOD	Charging time [h]					Charging time [h]				
20%	< 0.5	0.5	1.5	2,6	16	< 0.5	<0.5	1	2.5	14
40%	< 0.5	2	3.5	4,6	17	<0.5	1	2	3.3	15
60%	2	4	5.5	6,6	18	1	2	3	4.3	16
80%	4	6	8	8,6	20	2	3	4	5.3	17
100%	6	8	10	10,6	24	3	4	5	6,3	18

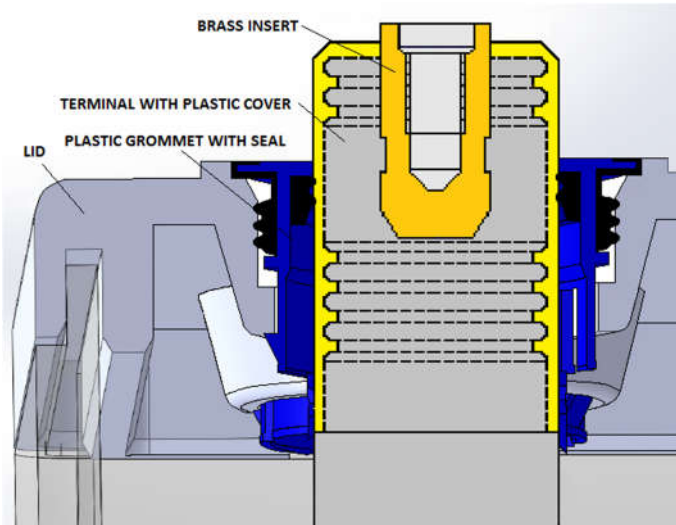
- maximum charging current:
 - t < +25°C unlimited,
 - t > +25 °C max. 4xI₁₀,
- float voltage compensation in function of temperature: -2 mV/°C ÷ -4mV/°C,
- ventilation requirements: acc. to EN 50272-2
- operating temperature range:
 - recommended: +15°C ÷ +25°C,
 - maximum long term operating temperature: +30°C (with ventilation assured - reduced service life),
 - maximum short term operating temperature (for hours): +50°C (with ventilation assured - reduced service life),
 - minimum long term operating temperature: +5°C (operating in lower temperature is not preferred according to possibility battery freezing in discharge case)
- self-discharge <3%/month @ +20 °C acc to EN 60896-21,
- bi-directional recombination plug RecPlu2 eliminates of necessity of water refilling,
- stands and racks: special BATER racking and bases. Bases are made of steel (square tubes) coated with polyethylene fluidization method. Resistance to electrostatic short circuit above 7kV. We project and produce structures according to customer documentation, or perform individual project for the special rooms or spaces.

STANDARDS

- EN 60896
- DIN 40736, DIN 41773, DIN 41774, DIN 41775
- EN 50272-2:2003
- ISO 9001 i ISO 14001

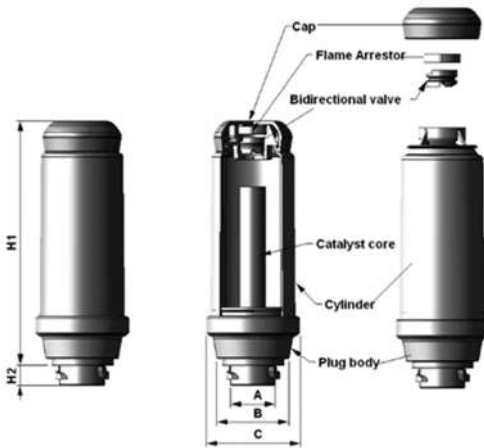
CONSTRUCTION

<p>➤ positive plate –the grid of the tubular positive plate consists of several lead spines which are joined together by the upper frame. Spines are being die-casted. These thin lead spines, which are equipped with small concentric vanes, are covered with acid permeable tubes. Between the lead spines and tubes is the active positive material. Tubes are being wet-filled. A special lead alloy which is used for positive plate has an Sb portion 1,7%,</p>	
<p>➤ negative plate – a lead grid pasted with active material forms the negative plate. Grids are being die-casted. A special lead alloy which is used for negative grid has an Sb portion 1,7%. Negative plates are wrapped Sireg net prevented loss active mass,</p> <p>➤ separators - Daramic polyethylen, low resistance, high acid proof, microporus material,</p> <p>➤ container – the cell container is made of transparent SAN,</p> <p>➤ lid – is made of grey ABS and equipped with well proven seal for leakage-proof insulation of the terminal construction. Lid and container are being glued and is proof against the escape of gas or leakage of electrolyte,</p>	
<p>➤ terminals – with outer labyrinths thread and plastic sheathing are being made from corrosion resistant lead alloy with brass inserted designed to give minimum resistance and maximum hermetic.,</p>	
<p>➤ connection –fully insulated solid copper with full insulated screw with measurements hole,</p>	
<p>➤ bi-directional recombination plug RecPlug3 / 2</p> <ul style="list-style-type: none"> • eliminates of necessity of electrolyte refilling, • increased work safety of cells with liquid electrolyte (electrolyte fumes and gas poisoning compounds are not released to environment), • preventing explosions there is no possibility of effusion of gases, that would cause explosion, the construction makes impossible also penetration of fire from outside, • limiting of ventilation, battery rooms provided with cells with recombination plugs have smaller ventilation requirements, 	
<p>➤ electrolyte– sulphuric acid with a density 1,24 kg/dm³ @+20°C/max level/full charged cell.</p>	



Terminal sealing

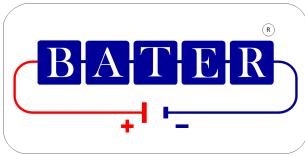
with outer labyrinths thread and plastic sheathing are being made from corrosion resistant lead alloy with brass inserted designed to give minimum resistance and maximum hermetic. The design of terminals ensures the cell is sealed in accordance to the requirements for VRLA batteries.



Bi-directional recombination plug RecPlug2

When using lead acid battery as a result of electrolysis of an aqueous electrolyte solution are separated hydrogen and oxygen. These gases in air may form explosive mixtures. Additionally the electrolysis reduces the amount of water in the electrolyte, which must be relatively frequently replenish in the battery. The conversion of hydrogen and oxygen in steam is an exothermic process. The heat emitted during the recombination process inside the sealed battery significantly accelerates the degradation of the lead electrodes immersed in an electrolyte. Therefore, the process is preferably carried away from the recombination with the electrodes, thus increasing the life of the entire battery. The innovative design of the gases generated during the electrolysis of water from the electrolyte when it reaches the plug in a controlled manner are converted into steam. Water vapor then condenses on the walls of plug. After cooling, as the water flows

back into the battery. In order to achieve the most efficient gas recombination plug except the construction of a special catalyst system was also used bidirectional valves which automatically regulate the pressure inside the unit to achieve the best value. In order to maintain safe operation of the system pressure regulator over is mounted flame arrestor in the plug in addition to the single fuse hydrogen, in the form of a ceramic flame screen. In such designed plug gas emissions is minimal and safe for the surrounding environment. New recombination plug with two-way valve system, while maintaining the proper operation, maintenance reduces the frequency of replenishing the electrolyte level in the battery. New design of recombination plug increases the safety of the battery in areas with limited ventilation while maintaining the level of gas recombination at the highest possible level.

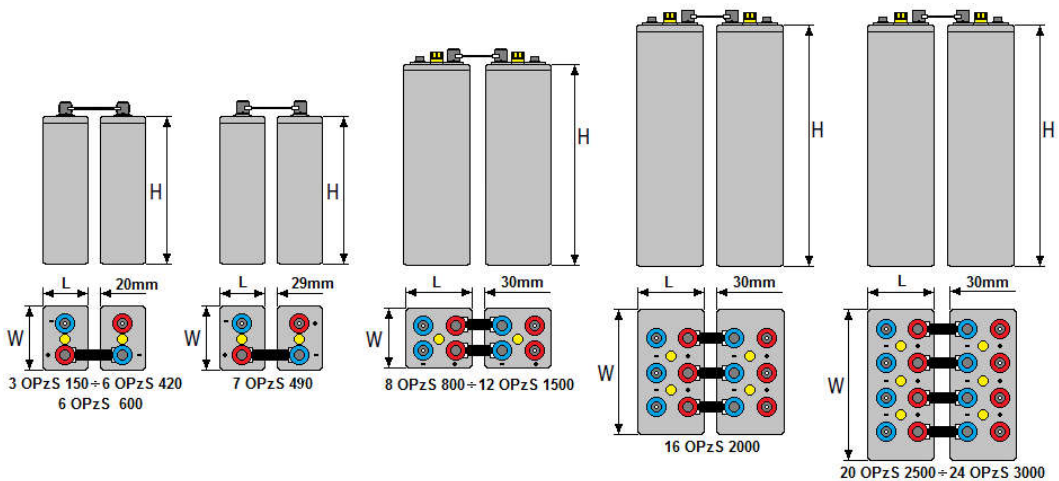


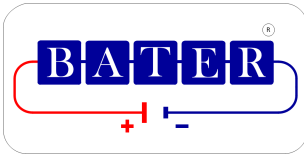
DIMENSIONS AND TECHNICAL DATA OF CELLS

@ +20°C

No	Cell type	Nom volt.	Capacity					Charging current $I_{nom}^{(1)}$	Length L	Width W	Height H	Weight	
			$C_{10}^{(2)}$ Uend =1.80 V/cell	C_5 Uend =1.75 V/cell	C_3 Uend =1.75 V/cell	C_1 Uend =1.67 V/cell	$C_{nom}^{(1)}$ Uend =1.80 V/cell					dry +/-5%	wet +/-5%
			[V]	[Ah]								[A]	[mm]
1	2 OPzS 100	2	107	92	79	60	100	10	103	206	369	6	11
2	3 OPzS 150	2	161	138	118	90	150	15	103	206	369	11	16
3	4 OPzS 200	2	215	183	157	119	200	20	103	206	369	13	18
4	5 OPzS 250	2	268	230	197	148	250	25	124	206	369	16	22
5	6 OPzS 300	2	322	275	236	178	300	30	145	206	369	18	26
6	5 OPzS 350	2	388	333	286	218	350	35	124	206	485	20	29
7	6 OPzS 420	2	465	400	343	263	420	42	145	206	485	24	34
8	7 OPzS 490	2	543	466	400	307	490	49	166	206	485	28	39
9	6 OPzS 600	2	656	566	492	355	600	60	145	206	660	35	50
10	8 OPzS 800	2	875	756	659	473	800	80	210	191	660	46	65
11	10 OPzS 1000	2	1093	945	824	590	1000	100	210	233	660	57	80
12	12 OPzS 1200	2	1312	1134	988	709	1200	120	210	275	660	66	93
13	12 OPzS 1500	2	1670	1457	1235	787	1500	150	210	275	810	88	119
14	16 OPzS 2000	2	2227	1943	1647	1050	2000	200	212	397	792	106	152
15	20 OPzS 2500	2	2783	2431	2068	1313	2500	250	212	487	792	145	200
16	24 OPzS 3000	2	3340	2918	2474	1572	3000	300	212	576	792	170	240

- (1) Nominal parameters according to DIN 40736
- (2) Capacity C_{10} after 10 cycles





BATTERY STANDS

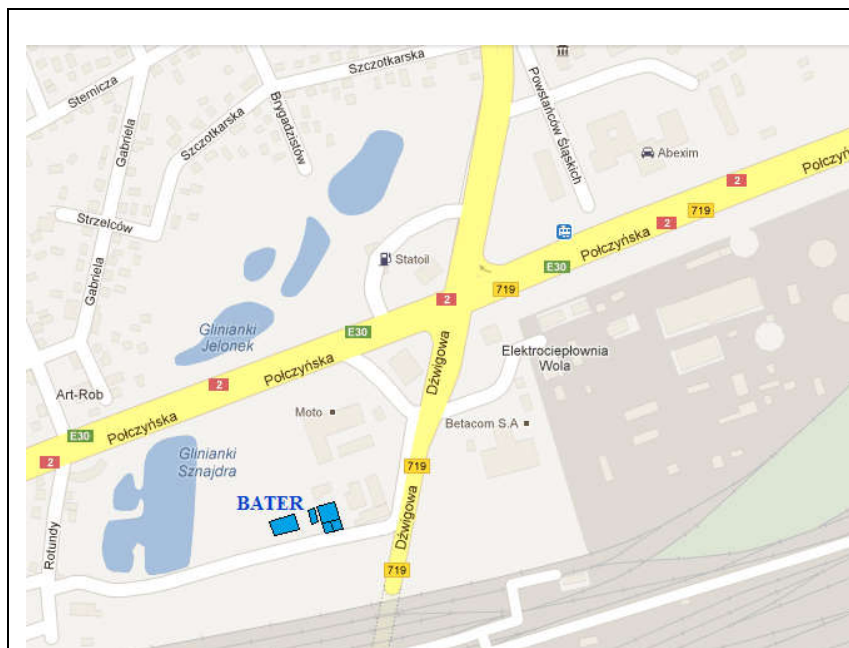
Bater is a manufacturer of all types of corrosion resistant stands for OPzS Perfect batteries. The stands are made of square tube and covered with polyethylene by fluidization. We design housing in accordance with customer’s documentation or carry out our own project individually according to the target room dimension.

CONSTRUCTION

- purpose: to put together any type of battery cells on one or more levels,
- construction: made of closed metal profiles. Produced sets are fully welded,
- corrosion protection: protected against electrolyte by a coating made of high quality polyethylene thicker than 1 mm, immersed in fluidized bed reactor on our modern technological line,
- resistance to electrostatic short circuit above 7kV,
- separation from the ground: insulators made of ABS plastic with adjustable height,
- location of cells: on carrier brackets, which spacing can be adjusted to their width. Versatile design of stands enables the use of additional stands brackets for cells of more than 200kg.

DIMENSIONS AND TECHNICAL DATA OF BATTERY STANDS

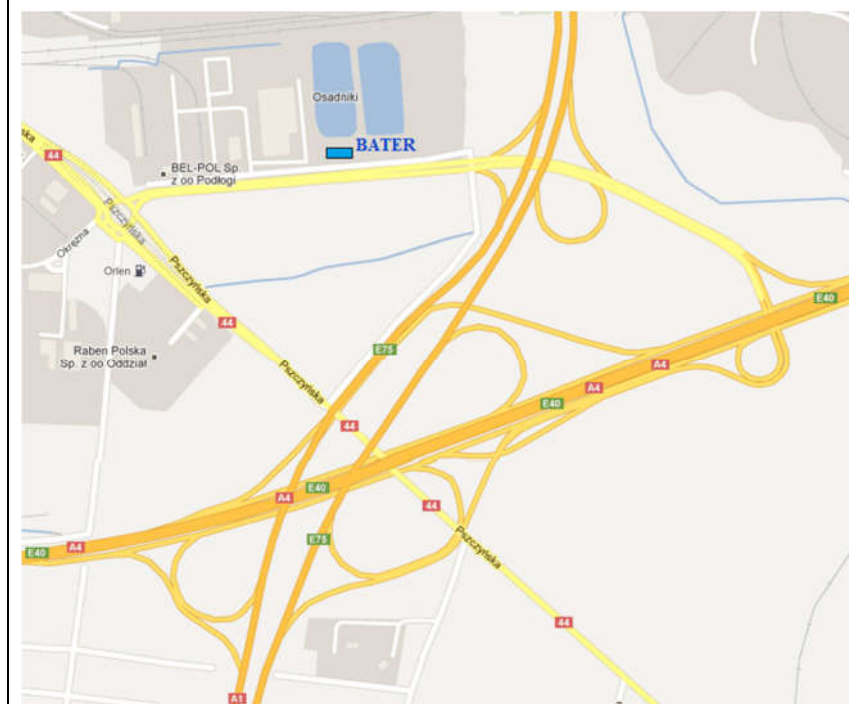
No	Cell type	B1	B2	h1	t	
1	2 OPzS 100	250	500	610	20	<div style="text-align: center;"> $I = N \times (L + t)$ (N – cells number) </div> <p>Single-row stands</p> <p>Double-row stands</p>

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