



P.H.P.U.



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INDEX CARD

A series of flameproof lithium-ion batteries of the SBS-4Lion type

1. Application:

The SBS-4Lion series of flameproof lithium-ion batteries is intended for use as an energy source for battery locomotives type ELA-44 / 1,2,3, Lea BM-12 and other mining machines. SBS-4Lion batteries are made in two versions with stored energy 105kWh and 150kWh. SBS-4Lion batteries can be used and charged in workings classified as "a", "b" or "c" of methane explosion hazard and "A" or "B" class of coal dust explosion hazard. It is allowed to charge SBS-4Lion type batteries installed on the locomotive with reverse energy during braking. Charging and recharging the battery in any state of charge installed on the locomotive through a dedicated OPB-500 rectifier manufactured by P.H.P.U. "Izol-Plast" Sp. z o. o. at the rectifier installation points.

The flameproof lithium-ion battery of the SBS-4Lion type consists of the following components:

- Flameproof battery cover - 1 pc.,
- OGB-500 flameproof fuse sockets with EU type examination certificate no. : OBAC20ATEX0147X - 2 pcs. (optional 3 pcs.),
- GM-1A type monitoring socket with the EU-type examination certificate no. : KDB06ATEX318X - 1 pc.,
- Sight glass type W-1/1 with EU-type examination certificate no. : OBAC17ATEX0012U - 1 pc.,
- Battery cells with a capacity of 700Ah or 1000Ah - 47 pcs each,
- SBS-4Lion battery control system - CONTROLLER - 1 set.



Series of types of SBS-4Lion flameproof accumulator batteries

Type	Battery capacity	Main security	Control protection	The socket type	Insert type	Application example
SBS-4Lion/2G-150kWh	1000Ah	500A	-	OGB-500 A+, B-	BPS-500A	Locomotive type ELA-44/1,2,3
SBS-4Lion/3G-150kWh	1000Ah	500A	25A	OGB-500 A+, B-, B+	BPS-500A BPS-25A/II	Locomotive type LEA BM-12
SBS-4Lion/2G-105kWh	700Ah	350A	-	OGB-500 A+, B-	BPS-350A/II	Locomotive type ELA-44/1,2,3
SBS-4Lion/3G-105kWh	700Ah	350A	25A	OGB-500 A+, B-, B+	BPS-350A/II BPS-25A/II	Locomotive type LEA BM-12

2. Technical parameters:

Dimensions:	2590 x 1070 x 860 mm
Weight (without cells):	1740kg
Weight (with cells):	2900kg for 700Ah cells or 3860kg for 1000Ah cells
Ambient temperature:	-10°C to +40°C
Battery rated voltage	150 V DC
Cell capacity:	700Ah or 1000Ah
Work location:	horizontally
Maximum charging current:	300A DC
Maximum long-term discharge current:	250A DC
Short-time discharge current (60s):	500A DC



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3. Construction of the SBS-4Lion battery:

The flameproof lithium-ion battery of the SBS-4Lion type is made as a welded structure with a passive cooling system. The flameproof battery cover is made in the form of a cuboid with dimensions of 2590x1070x860 mm with chambers divided inside. Battery cells with a capacity of 700Ah or 1000Ah are built inside the chambers. In one of the battery compartments there is a controller, and on the cover there is a sight glass and control buttons. The OGB-500 type sockets and the GM-1A monitoring socket are mounted on the SBS-4Lion battery cover. The external surfaces of the SBS-4Lion batteries are covered with anti-corrosive yellow paint. Two types of lithium-ion cells with the following capacities: 700Ah and 1000Ah can be installed in the SBS-4Lion battery.



4. Charging the SBS-4Lion type battery:

For charging the SBS-4Lion type batteries, a dedicated OPB-500 rectifier with the EU-type examination certificate no. : OBAC20ATEX0309X by P.H.P.U. is intended. "Izol-Plast" Sp. z o. o.

5. Certificate:

The series of flameproof lithium-ion batteries of the SBS-4Lion type has an EU-type examination certificate no. : **OBAC20ATEX0308X** of **25.08.2020** in accordance with the requirements of the ATEX Directive 2014/34 / EU of 26.02.2014, which was issued by the OBAC Testing, Attestation and Certification Center Sp. z o. o. in Gliwice. The series of flameproof lithium-ion batteries of the SBS-4Lion type has the following marking:



OBAC 20 ATEX 0308X
I M2 (M1) Ex db [ia Ma] I Mb

SBS-4Lion batteries can be used in rooms (zones) endangered with explosion in accordance with the markings as specified above.

6. Project co-financed by European Funds:

The company P.H.P.U. "Izol-Plast" Sp. z o. o. implemented a project financed by European Funds under the name:

"Conducting research and development works to develop an innovative product - a series of flameproof Li-Ion batteries for powering locomotives in underground mining plants with stored energy 105kWh and 150kWh"

The result of research and development works is a series of types of flameproof locomotive batteries in underground mining plants with stored energy of 105kWh and 150kWh.

The new product was introduced to the offer of Izol-Plast.



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7. Additional benefits of the implemented project:

7.1. Avoidance of building battery holders at a given level of the mining plant:

- Avoidance of very large expenditures on the construction of the excavation for the battery holders,
- Avoiding the construction of battery compartment equipment.

7.2. Removal of very harmful workplaces - maintenance of cargo holds with classic cells (with electrolyte):

- No gas build-up when charging from the SBS-4Lion battery).

7.3. The SBS-4Lion battery installed on the locomotive does not require any maintenance, e.g. adding electrolyte or distilled water.

7.4. Charging the SBS-4Lion type battery on the locomotive takes:

- for 700Ah battery - 2h 20 minutes,
- for 1000Ah battery - 3h 30 minutes.

7.5. OPB-500 rectifiers can be installed in workings classified as grade "a", "b" or "c" of methane explosion hazard and "A" or "B" class of coal dust explosion hazard.

7.6. SBS-4Lion batteries are fully protected against:

- overheating,
- overcharging,
- too deep discharge.

7.7. SBS-4Lion batteries can be recharged in any state of charge.

7.8. The life of the SBS-4Lion type batteries is at least 5 times longer than that of classic or gel batteries working with an electrolyte.

7.9. The company P.H.P.U. "Izol-Plast" Sp. z o.o. has a technology for the disposal of used lithium-ion battery cells.



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