Li-Ion PowerPack™ - Underwater power solutions

Highly reliable, efficient and safe Li-Ion batteries
Made for harsh offshore and subsea conditions such as offshore oil and gas, scientific and AUV or ROV equipment
Rechargeable Li-ion batteries are amongst the most efficient batteries and SubCtech even optimized them for the use in marine and offshore technology. They provide highest capacity while being lightweight and of small volume.

**Long-John**
- 14.4V – 46/60’ Ah
- 25.2V – 26/33’ Ah
- 46.8V – 16/20’ Ah
- 50.4V – 16/20’ Ah
- Other on request
- ‘with optional “A” cell
- UN T38.3 certificate

**Big-Jim**
- 14.4V – 140/180’ Ah
- 14.4V – 172 Ah
- 25.2V – 70/90’ Ah
- 46.8V – 33/43’ Ah
- 50.4V – 33/43’ Ah
- ‘with optional “A” cell
- UN T38.3 certificate

**Big-Jim XL**
- 14.4V – 280/361’ Ah
- 14.4V – 344 Ah
- 25.2V – 140/181’ Ah
- 46.8V – 70/90’ Ah
- 50.4V – 70/90’ Ah
- ‘with optional “A” cell
- UN T38.3 certificate

**Ø 90 mm**
- Li-ion rechargeable battery, 10 A max.
- Titanium housing Ø90 mm x 512 mm (without options)
- 8.5 kg in air, 5 kg in sea water (approx.)
- Operating depths 2000 m, 3000 m, 6000 m
- Optional: ROV switch, DC/DC outputs, data interface
  - NMEA-0183 or MODBUS, LED control lights, customizing

Note: length and weight increase when options such as BMS are installed.

**Ø 168/180 mm**
- Li-ion rechargeable battery, 10 A max., more on request
- Titanium housing - 300m: Ø168 mm x 350 mm (without options), 17 kg in air, 9 kg in sea water (approx.)
- Deepsea: Ø180 mm x 384 mm (without options), 25 kg in air, 15 kg in sea water (approx.)
- Operating depths 2000 m, 3000 m, 6000 m
- Optional: ROV switch, DC/DC outputs, data interface
  - NMEA-0183 or MODBUS, LED control lights, customizing

Note: length and weight increase when options such as BMS are installed.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Li-Ion rechargeable battery ● High-power, high safety, highly reliable industrial cells ● SubCtech’s electronic for high voltages, capacities and currents ● UL/UN certified cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Corrosion-free titanium ● 300 m – 6000 m operating depth ● Customizing on request</td>
</tr>
<tr>
<td>Connectors</td>
<td>SUBCONN® e.g. SeaBattery™ compatible ● High Power ● Data ● Others on request</td>
</tr>
<tr>
<td>Temperature</td>
<td>-20 ... +60°C operating ● 0 ... +45°C charging ● -20 ... +60°C (short time) storage</td>
</tr>
<tr>
<td>Self-discharge</td>
<td>&lt; 5% per year at +25°C ● Typ. &lt; 2% per year at +4°C</td>
</tr>
<tr>
<td>Charge cycles</td>
<td>&gt;300 cycles for 80% remaining capacity ● optional 3000+ cycles with special Conditioning BMS</td>
</tr>
<tr>
<td>Protection</td>
<td>Overcharge ● Deep discharge ● Current limit ● Overheating</td>
</tr>
<tr>
<td>Charging</td>
<td>Optional Standard Fully-automatic Li-Ion charger ● 100W, 300W, 750W – others on request ● Metal housing, IP65 water protected ● Input wide-range 90-264 VAC 50/60 Hz ● Just plug ‘n’ charge – no control elements, 3 signal LEDs ● PowerCharger™ 1kW to 10kW; see Vehicle batteries</td>
</tr>
</tbody>
</table>

ISO 9001

www.subctech.com ● info@subctech.com
High-Performance, high reliable and high-safety Li-Ion rechargeable batteries for the offshore subsea market. Design life up to 30 years, the electronic and Li-Ion cells are extreme reliable. Qualified according API 17F.

**Subsea battery 14V**
- ø 90 mm
- Li-Ion rechargeable battery
- 7 A max. continuous current
- Titanium housing ø90 mm
- weight 9 kg
- Operating depth: 2000 m
- Optional: ROV switch, DC/DC outputs, data interface
- LED control lights, customizing

**Subsea-UPS 24V**
- ø 184 mm
- Li-Ion rechargeable battery
- 3 - 4A input/output current,
- Automatic diagnostic test
- RS-485 MODBUS, isolated, Modicon PI-MBUS-300 / MODBUS RTU, Modicon PI-MBUS-300
- LED control lights, customizing

**Subsea-UPS 400V**
- ø 298 mm
- Li-Ion or LFP rechargeable battery
- LFP: up to 15000W 45s, 3cycles, every 4h
- Buffer time 1 hour @1kw
- OEM or SEM housing
- GISMA penetrator, other on request
- RS-485 galvanic isolated MODBUS RTU,
- LED control lights, customizing

**Energy Storage System**
- 100+ kWh
- 14.4 V - 400 V

**Power Switch & Distribution Unit**
- Protection, Switch & Fuse for high voltages (max. 600V) and high power (max. 100A) output controls
- Bi-directional switching, optional melting fuse
- MODBUS RTU, galvanic isolated interface

**Lifetime**
- 10 years minimum, 30 years design life

**Temperature**
- Li-Ion: -20 ... +60°C operating ● 0 ... +45°C charging ● -20 ... +60°C (short time) storage
- LFP: -30 ... +60°C operating ● -40 ... +60°C (short time) storage

**Self-discharge**
- < 5% per year at +25°C , lower subsea

**Charge cycles**
- 300 up to 3000+ cycles

**Protection**
- Overcharge ● Deep discharge ● Current limit ● Overheating

**Certification**
- Type approval examples: MIL-STD 810G (Shock & Vibration)
- MIL-STD 461F for EMC ● ISO 13628-6 and API 17F Offshore Oil+Gas ● NATO AECTP-400 and AQAP ● DNV-GL VI-7
Proven and rechargeable Li-ion batteries are built in the Li-Ion PowerPack™ for AUVs and other vehicles. SmartBMS™ observes the battery + delivers data to the AUV host system.

**AUV PowerPack™ 260**

<table>
<thead>
<tr>
<th>Ø 260 mm</th>
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<tbody>
<tr>
<td>Cost-effective solution</td>
</tr>
<tr>
<td>Li-ion rechargeable Battery</td>
</tr>
<tr>
<td>50 - 150 V – others on request</td>
</tr>
<tr>
<td>50 A max. current – others on request</td>
</tr>
<tr>
<td>Pressure housings for depths up to 6000 m</td>
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<tr>
<td>SmartBMS™ with optional logging to 32 GB SD card</td>
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**AUV PowerPack™ 310**

<table>
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<tr>
<th>Ø 310 mm</th>
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<tbody>
<tr>
<td>Li-ion rechargeable Battery, divided into SmartPowerBlocks™ (SPB) connected via internal power and BMS bus</td>
</tr>
<tr>
<td>Master-BMS module on the top side</td>
</tr>
<tr>
<td>14.4 V, 25.2 V, 46.8 V, 50.4 V up to 600 V</td>
</tr>
<tr>
<td>50 A max. current – others on request</td>
</tr>
<tr>
<td>Pressure housings up to 6000 m available (titanium)</td>
</tr>
<tr>
<td>SmartBMS™ with logging to 32 GB SD card</td>
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<tr>
<td>Redundant design for highest safety and reliability</td>
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**AUV PowerPack™ 416**

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<td>Li-ion rechargeable Battery, divided into SmartPowerBlocks™ (SPB) connected via internal power and BMS bus</td>
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<td>Master-BMS module on the top side</td>
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<td>50 A max. current – others on request</td>
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<tr>
<td>Pressure housings up to 6000 m available (titanium)</td>
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<tr>
<td>Optional embedded Li-Ion PowerCharger™</td>
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<td>Redundant design for highest safety and reliability</td>
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</tbody>
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<tr>
<th>Technology</th>
<th>Reliable high-capacity Li-ion rechargeable batteries with highest energy density, high safety by proven technology ● Collaboration with battery cell manufacturer ● UL &amp; UN certified cells</th>
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<tbody>
<tr>
<td>BMS</td>
<td>Highly sophisticated Battery Management System SmartBMS™ ● Redundant safety design ● Full monitoring and control over all battery parameters ● Configurable functions ● Fail-safe</td>
</tr>
<tr>
<td>Data Interface</td>
<td>User friendly interface to host system with RS-485 or RS-232 ● Fully isolated ● NMEA-0183 (ASCII) or MODBUS RTU data format for easy integration into your system ● CAN bus on request</td>
</tr>
<tr>
<td>Handling</td>
<td>Easy handling by single blocks SmartPowerBlocks™ (SPB) of max. 30 kg and max. 60V each for personal maintenance ● Mechanical support for installation ● Standard industrial connectors</td>
</tr>
<tr>
<td>Vehicle Safety</td>
<td>Optional redundant battery concept guarantees 50% remaining capacity per battery in case of any fatal failure for emergency procedures ● Mechanical &amp; electrical protections</td>
</tr>
<tr>
<td>Certification</td>
<td>Type approval examples: MIL-STD 810G (Shock &amp; Vibration) ● MIL-STD 461F for EMC ● ISO 13628-6 and API17f Offshore Oil+Gas ● NATO AECTP-400 and AQAP ● DNV-GL VI-7 ● UN T38.3 on request</td>
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