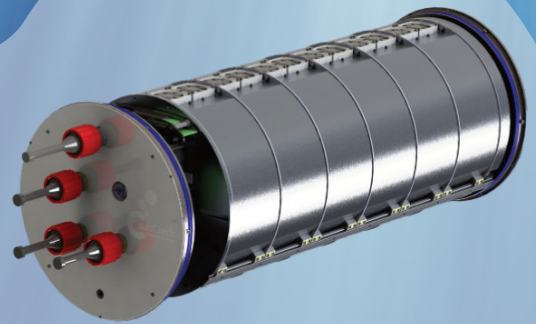
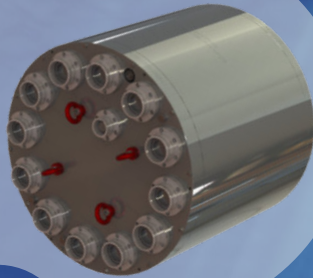


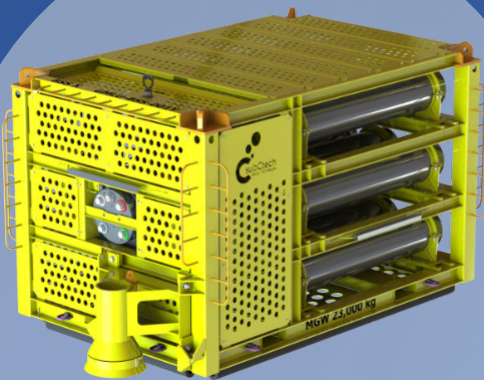
Ocean Power



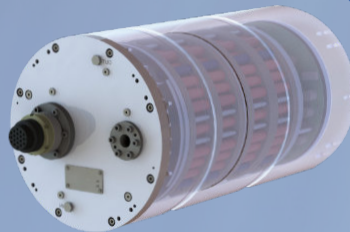
Standard



Vehicle



Subsea



Li-Ion PowerPack™ - Underwater power solutions

Highly reliable, efficient and safe Li-Ion batteries
Made for harsh offshore and subsea conditions such as
Offshore energy, scientific and AUV or ROV equipment
Long track record, qualified to int. standards



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

14.4 V – 46 Ah / 60° Ah
25.2 V – 26 Ah / 33° Ah
46.8 V – 16 Ah / 20° Ah
50.4 V – 16 Ah / 20° Ah
Other on request

*with optional "A" cell
UN T38.3 certificate



ø 90 mm

- Li-Ion rechargeable battery, 16 A max.
- Titanium housing ø90 mm x 512 mm (without options)
- 8,5 kg in air, 5 kg in sea water (approx.)
- Operating depths 300 m to full ocean depth
- Optional: ROV switch, DC/DC outputs, data interface
- NMEA-0183 or MODBUS RTU, LED control lights, customizing

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

Big-Jim

14.4 V – 140 Ah / 180° Ah
14.4 V – 172 Ah
25.2 V – 70 Ah / 90° Ah
46.8 V – 33 Ah / 43° Ah
50.4 V – 33 Ah / 43° Ah

*with optional "A" cell
UN T38.3 certificate



ø 168 / 180 mm

- Li-Ion rechargeable battery, 16 A, up to 50 A (more upon 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 300 m to full ocean depth
- Optional: ROV switch, DC/DC outputs, data interface
- NMEA-0183 or MODBUS RTU, LED control lights, customizing

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

Big-Jim XL

14.4 V – 280 Ah / 361° Ah
14.4 V – 344 Ah
25.2 V – 140 Ah / 181° Ah
46.8 V – 70 Ah / 90° Ah
50.4 V – 70 Ah / 90° Ah

*with optional "A" cell
UN T38.3 certificate



ø 168 / 180 mm

- Li-Ion rechargeable battery, 16 A, up to 50 A (more upon request)
- Titanium housing - 300m: ø168 mm x 612 mm (without options), 30 kg in air, 15 kg in sea water (approx.)
- Deepsea: ø180 mm x 634 mm (without options), 42 kg in air, 25 kg in sea water (approx.)
- Operating depths 300 m to full ocean depth
- Optional: ROV switch, DC/DC outputs, data interface
- NMEA-0183 or MODBUS RTU, LED control lights, customizing

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

Technology	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
Housing	Corrosion-free titanium • 300 m – full ocean depth • Customizing on request
Connectors	Standard SUBCONN® • High Power • Data • More upon request
Temperature	-20 °C... +60 °C operating • 0 °C... +45 °C charging • -20 °C ... +60 °C (short time) storage
Self-discharge	< 5% per year at +25 °C • Typ. < 2% per year at +4 °C
Charge cycles	>300 cycles for 80% remaining capacity • optional 3000+ cycles with special conditioning BMS
Protection	Overcharge • Deep discharge • Current limit • Overheating
Charging	Fully-automatic Li-Ion charger • 100 W, 300 W, 750 W • Metal housing, IP65 water protected • Input wide-range 90-264 VAC 50/60 Hz • Just plug 'n' charge - no control elements, 3 signal LEDs





High-Performance, high reliable and high-safety Li-Ion rechargeable batteries for the subsea energy market. Design life up to 25 years, the electronic and Li-Ion cells are extreme reliable. Qualified according API17F. Track record since 2006

Subsea battery 14/25/50 V

674 Wh (up to 4.5 kWh)
UN T38.3 (14v)
API 17F on request

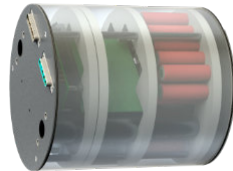


ø 90 mm

- Li-Ion rechargeable battery
- 16 A max. continuous current
- Titanium housing ø90 mm
- weight 9 kg
- Operating depth 300 m to full ocean depth
- Optional: ROV switch, DC/DC outputs, data interface
- LED control lights, customizing

Subsea-UPS 24 V

63.3 - 300 Wh
API 17F



ø 184 mm

- Li-Ion rechargeable battery
- 3 - 4 A input/output current,
- Optional automatic diagnostic test
- RS-485 MODBUS RTU, isolated
- LED control lights, customizing

Subsea-UPS 400 V

1 - 3.4 kWh HP
- 15 kW LFP
UN T38.3
API 17F



ø 298 mm

- Li-Ion or LFP rechargeable battery
- LFP: up to 15000 W 45s, 3cycles, every 4h @EOL subsea
- Li-Ion: Buffer time 1 hour @1kw @EOL subsea
- OEM or SEM housing, optional full ocean depth
- RS-485 galvanic isolated MODBUS RTU, CAN/SiS L2
- LED control lights, customizing

Energy Storage System ESS

1 MWh Skids
UN T38.3
API17F



Subsea Energy Storage and Backup System

- Up to 12 batteries in one skid - high redundancy 1oo12
- 1 MWh per skid @BOL, 5.5 kW cont. output
- Super duplex: 22 t, 3 x 4 x 2.5 m, titanium optional
- Flexible battery control module BCM installed
- Output Power Module OPM, scaled up to 7 skids
- Fast charging top-side up to 160 kW by skid or subsea
- Full API17F qualification, UN T38.3 certificate

Lifetime	10 years minimum, 25 or 30 years design life
Temperature	Li-Ion: -20 °C... +60 °C operating • 0 °C... +45 °C charging • -20 °C... +60 °C (short time) storage LFP: -30 °C... +60 °C operating • -40 °C... +60 °C (short time) storage
Self-discharge	< 5% per year at +25 °C , lower subsea
Charge cycles	300 up to 3000+ cycles with special adaptations
Protection	Overcharge • Deep discharge • Current limit • Overheating • Hot-spots
Certification	Qualified to international standards • ISO 13628-6 and API17F • DNV and UN T38.3 on request



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 vehicle host system.

PowerPack™ Series 260

1.5 - 20 kWh



ø 260 mm

- Li-Ion rechargeable Battery, divided into SmartPowerBlocks™ (SPB) connected via internal power and BMS bus
- Scalable in voltage, capacity, power
- Up to 600 V (battery)
- 2 x 50 A max. cont. current
- Single or redundant dual channel support
- 1.5 kWh per SPB module OD 310 mm x 150 mm
- Options and customizing on request

PowerPack™ Series 310

10 - 50 kWh

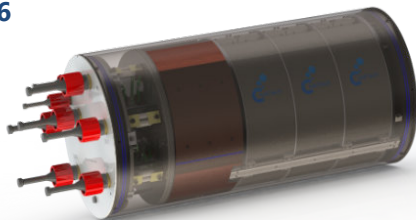


ø 310 mm

- Li-Ion rechargeable Battery, divided into SmartPowerBlocks™ (SPB) connected via internal power and BMS bus
- Scalable in voltage, capacity, power
- Up to 600 V (battery)
- 2 x 50 A max. cont. current
- Single or redundant dual channel support
- 3.5 kWh per SPB module OD 310 mm x 150 mm
- Optional PDU Power Distribution and CIM high-level controller with data logger, to connect 12 batteries

PowerPack™ Series 416

10 - 100 kWh



ø 416 mm

- Li-Ion rechargeable Battery, divided into SmartPowerBlocks™ (SPB) connected via internal power and BMS bus
- Scalable in voltage, capacity, power
- Up to 600 V (battery)
- 2 x 75 A max. cont. current
- Single or redundant dual channel support
- 7 kWh per SPB module OD 416 mm x 150 mm
- Optional PDU Power Distribution and CIM high-level controller with data logger, to connect 12 batteries

Technology	Reliable high-capacity Li-Ion rechargeable batteries with highest energy density, high safety by proven technology • Redundant design • UL & UN certified cells • Qualifications to international standards
BMS	Highly sophisticated Battery Management System SmartBMS™ • Monitoring and control over all battery parameters • Configurable functions • Fail-safe
Data Interface	User friendly interface to host system with standardized data format for easy integration • MODBUS RTU • CAN, CANopen • NMEA-0183 (ASCII) RS-485 or RS-232 • Ethernet • Fully isolated
Handling	Easy handling by single protected blocks SmartPowerBlocks™ (SPB) of 30 kg and max. 60 V each for personal maintenance • Simply plug together on rails in the pressure housing
Vehicle Safety	Optional redundant battery concept guarantees 50% remaining capacity per battery in case of any fatal failure for emergency procedures • Mechanical & electrical protections
Certification	Type approval examples: MIL-STD 810G (Shock & Vibration) • MIL-STD 461F for EMC • API17F • NATO Codes • DNV VI-7 • UN T38.3
Housing	Pressure housing full ocean depth • Standard titanium, optional others • Connectors SubConn, Glenair, GISMA etc.

