ENERGY STORAGE SYSTEM

BORDLINE® Battery Module
For high performance applications

BORDLINE® BPW (battery power water-cooled) is a high-power Lithium-ion battery module designed for reliable operation in harsh environments. It is suitable for use as a traction or as an auxiliary battery and designed for use in road and railway vehicles.

Key characteristics
• High level of inherent safety
• Very high cycle life
• High power density
• High energy efficiency
• Excellent fast charging capability
• Precise and stable cell connection with low contact resistance (laser welding)
• Efficient liquid cooling

Applications
• Railway rolling stock
• Electrically propelled road vehicles
  - eBus
  - eTrucks
• Off-road vehicles
  - Mining trucks
  - Utility vehicles

Modularity and scalability
The modular battery design allows easy scalability in terms of installed energy and allows mechanical integration either on the roof, in the machine room or underfloor of the vehicle.
Module characteristics

System arrangement
Up to sixteen battery modules can be connected in series to form a battery string and multiple strings can be connected in parallel. The series connection of modules are realized with insulated quick coupling power connectors and with a wired serial bus between the modules and the master control unit.

Simplified block diagram of BORDLINE® ESS

Technical data
- Cell technology: Lithium-ion (LTO)
- Cell format: prismatic metal can
- Nominal voltage: 55 V
- Configuration: 24S2P
- Typical energy: 2.6 kWh
- Charging current, 25°C: avg 184 A (4C), max 368 A (8C) for 30s
- Discharging current, 25°C: avg 184 A (4C), max 368 A (8C) for 30s
- Cell monitoring and balancing: integrated
- Master BMS: external
- Typical cycle life (80% DoD), 25°C: > 20'000 cycles
- Specific energy: 104 Wh/l
- Energy density: 79 Wh/kg
- Power interface: BCC-S10
- Test voltage: 2.8 kVac / 10s
- Thermal management: liquid cooled
- Operating temperature range: -30°C to +45°C
- Conformity: UN 38.3, IEC 62928, ISO 12405

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