

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.

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BORDLINE®
Battery Module BPW

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.

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

Module characteristics

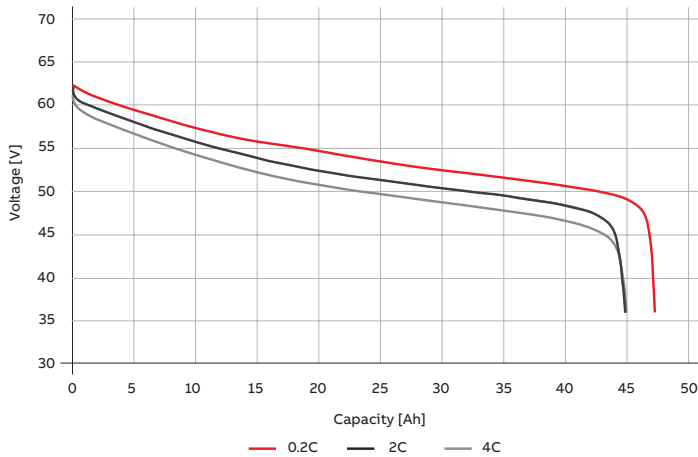


Figure 1 Discharge characteristics at 25°C

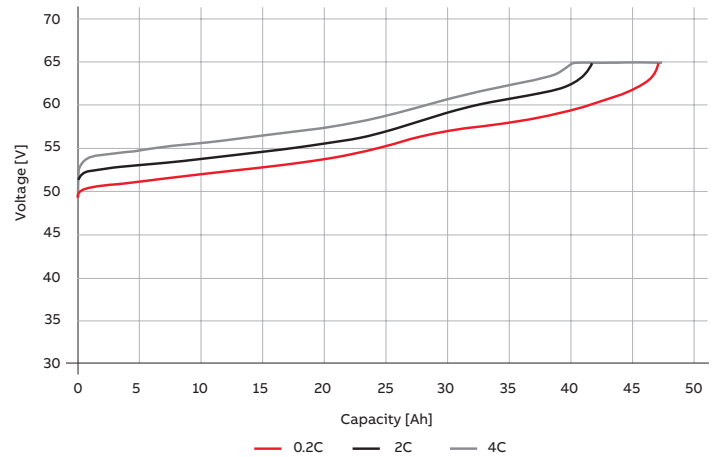
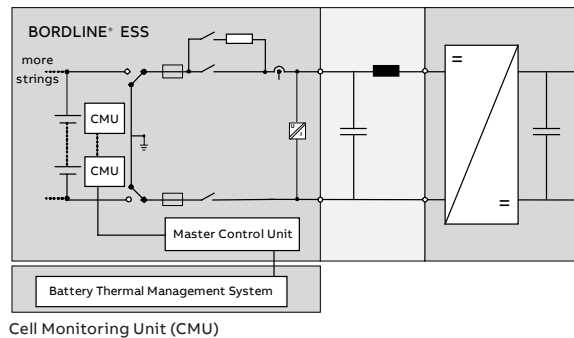


Figure 2 Charge characteristics at 25°C

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	55.2 V	
Configuration	2p24s	
Typical energy	2.54 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	127 Wh/l	
Energy density	77 Wh/kg	
Power interface	BCC-S10	
Test voltage	2.8 kVac / 10s	
Thermal management	liquid cooled	
Operating temperature range	-30°C to +45°C	
Transport regulation	UN 38.3	
Drop test	IEC 62619	
Onboard Lithium-ion traction batteries	IEC 62928	
Shock and vibration	IEC 61373	
Electrically propelled road vehicles	ISO 12405	
Wheeled vehicles applications	ECE R100	