

PRIMOVE Battery

Optimized battery system for urban mobility



Our comprehensive rail transit and e-mobility expertise lies behind our industry-leading battery systems, optimized for high power rail and road vehicles such as trams and buses.

WHY CHOOSE PRIMOVE BATTERY SYSTEMS?

Smaller and lighter

With their exceptionally compact and light packaging, our *BOMBARDIER* PRIMOVE** batteries are designed to meet public transport needs. Modular and scalable, they can be easily integrated into any suitable place on the vehicles, minimize our CO₂ footprint in production and recycling, and cut down the use of chemicals.

Latest technology

Our rechargeable *PRIMOVE* lithium-ion battery systems

provide optimal energy and power density, enabling high power recharging at the lowest weight and volume currently on the market. Intelligent battery management ensures an extended battery lifetime of minimum six to eight years and therefore, the requirement of fewer batteries during the product life cycle.

Safe under all operating conditions

An integrated safety concept monitoring voltage, currents and temperatures, along with a redundant battery management system, ensures the batteries' safety and reliability. By applying the highest automotive and rail safety standards, *PRIMOVE* batteries integrate the latest lessons learned in battery technology for maximum safety.

Optimized for public transport

Together *PRIMOVE* wireless charging and *PRIMOVE* batteries provide trams and electric buses with sufficient energy to operate for an entire day at minimum battery size.

PRIMOVE Battery for trams

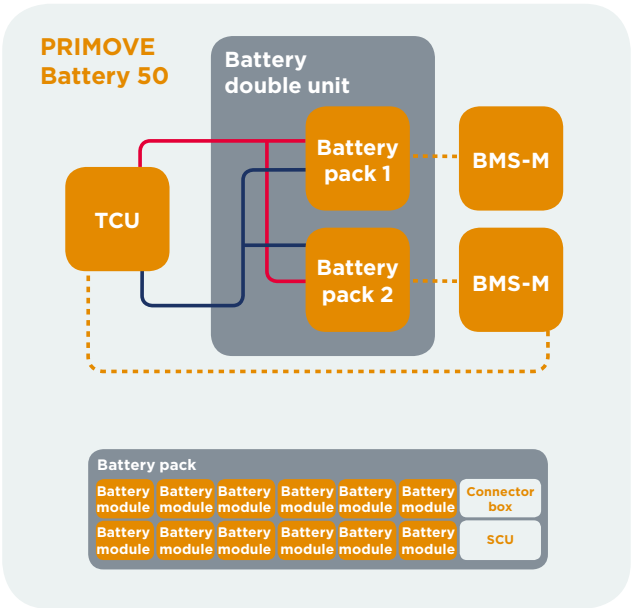
PRIMOVE batteries for tram and light rail applications can be combined with both inductive and conductive charging for catenary-free operation (CFO).

• **Premium PRIMOVE tram solution**

For 100% CFO lines, using PRIMOVE batteries and PRIMOVE wireless charging together ensures that the cityscape is not altered or spoiled by catenaries.

• **Standard PRIMOVE tram solution**

If overhead lines are acceptable at tram stops and subsequent metres, PRIMOVE batteries can be charged conductively via the pantograph. This solution is especially suitable for existing catenary systems where CFO is required only on specific sections.



PRIMOVE Battery 50

For a five-car tram, two batteries double units are installed.

Scope of delivery

- 2 battery double unit (fully assembled, including mounting frame), each consisting of:
 - 2 battery packs
 - 2 battery management system master (BMS-M)
- 2 thermal conditioning units (TCU)
- 2 wiring harnesses
- 2 hydraulic connection sets



TECHNICAL DATA	Unit	Battery 50
Number of battery packs (system)	Quantity	2
Nominal voltage (per pack)	V	532
Battery double unit energy content	kWh	49
Weight (per battery double unit) - excluding mounting	kg	ca. 667 (837 including TCU)
Dimensions (L/W/H)	mm	1780/450 (850 including TCU)/610

PRIMOVE Battery for e-buses

At Bombardier, we are extending vehicle electrification and its benefits beyond rail. With the *PRIMOVE* high power battery systems for e-buses, planned stops are turned into charging opportunities without requiring additional vehicles, interrupting service or affecting dwell times.

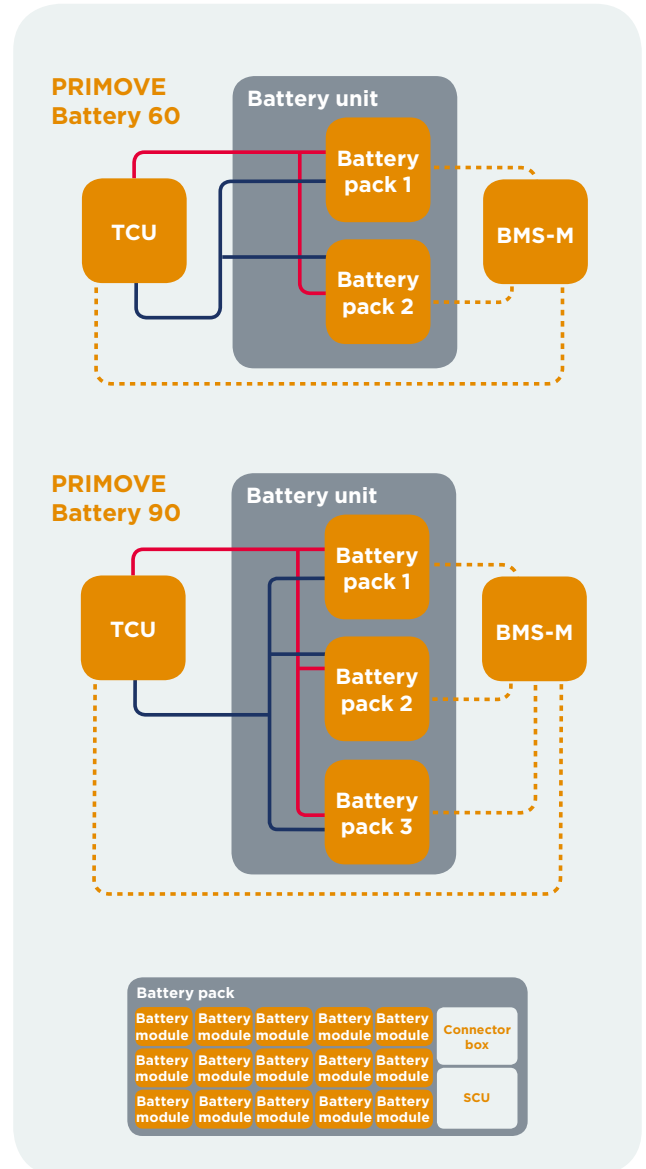
PRIMOVE Battery 60 and 90

The *PRIMOVE* Battery 60 and 90 are lithium-ion traction battery systems designed to minimize integration efforts on any type and size of electric bus while providing high durability and safety, operational stability, and low component cost.

Using *PRIMOVE* inductive charging, the battery size can be kept to a minimum while allowing the e-bus for a full day of service.

Scope of delivery

- 1 battery unit with 2 or 3 battery packs (30 kWh capacity each)
- 1 battery management system master (BMS-M)
- 1 thermal conditioning unit (TCU)



TECHNICAL DATA	Unit	Battery 60	Battery 90
Number of battery packs (system)	Quantity	2	3
Nominal voltage (per pack)	V	330	220
Nominal voltage (system)	V	660	660
Installed energy content	kWh	60 (2x30 kWh)	90 (3x30 kWh)
Weight			
- excluding mounting	kg	ca. 720	ca. 1100
Dimensions (L/W/H)	mm	2 x 1545/750/216	3 x 1545/750/216
Nominal power consumption 24 VDC	W	50	75

TRAMS AND E-BUSES



Nanjing, China

- 30 *PRIMOVE* battery systems
- Each 5-car tram equipped with 2 modular battery systems of 49 kWh each
- 90 % CFO – charging via pantograph during acceleration and during normal dwell times at tram stops while passengers get on and off
- Start of passenger service: August 2014



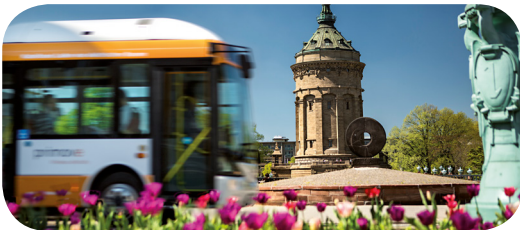
Mannheim, Germany (pilot project)

- 2 *PRIMOVE* battery systems of 49 kWh on 5-car tram
- Charging tests via pantograph at dynamic and static mode
- Start of tests: spring 2014



Braunschweig, Germany

- 1 *PRIMOVE* battery system 60 on one 12-metre e-bus
- 4 *PRIMOVE* battery systems 90 on four 18-metre e-buses
- *PRIMOVE* inductive charging with 200 kW at depot, end stop and 1 intermediate bus stop
- Start of passenger service: March 2014



Mannheim, Germany

- 2 *PRIMOVE* battery systems 60 on two 12-metre e-buses
- *PRIMOVE* inductive charging with 200 kW at depot, end stops and 4 intermediate bus stops
- e-buses are also equipped with *PRIMOVE* propulsion 140
- Start of passenger service: 2015



Berlin, Germany

- 4 *PRIMOVE* battery systems 90 on four 12-metre e-buses
- *PRIMOVE* inductive charging with 200 kW at depot
- Start of passenger service: 2015

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BOMBARDIER
the evolution of mobility