



Berlin e-bus, Germany

- The world first capital to introduce wirelessly charged e-buses
- 4 *PRIMOVE* charging systems 200 - 12-metre e-buses
- 2 *PRIMOVE* charging stations on the line, one at the depot
- Start of passenger service: August 2015



Braunschweig e-bus, Germany

- First inductively charged e-bus for passenger operation
- 1 *PRIMOVE* charging system 200 - 12-metre e-bus
- 4 *PRIMOVE* charging systems 200 - 18-metre e-buses
- 4 *PRIMOVE* charging stations on the line, one at the depot
- Start of passenger service: March 2014



Bruges e-bus, Belgium

- E-mobility for UNESCO World Heritage city
- 3 *PRIMOVE* charging systems 200 - 9.7-metre e-bus
- *PRIMOVE* inductive charging 200 kW at depot
- Start of passenger service: Q4 2015



Mannheim e-bus, Germany

- 100% e-mobility on demanding city route
- 2 *PRIMOVE* charging systems 200 - 12 metre e-buses
- 6 *PRIMOVE* charging stations on the line, one in the depot
- Start of passenger service: June 2015

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TRAMS AND E-BUSES

PRIMOVE CHARGING 200

Change the way to charge



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***PRIMOVE* wireless charging builds on the vision of a city where all vehicles are electric, emission-free and quiet. Without catenaries, cables, wires or plugs - completely invisible and automatic.**

WHY CHOOSE PRIMOVE CHARGING?

Flexible and fast

The concept of fast opportunity charging at very high levels of efficiency allows seamless integration into existing operations and uninterrupted service.

Convenient and automatic

Intelligent vehicle detection makes the recharging process fully automatic, driver friendly and hassle free, with no specific qualifications or training necessary for use.

Invisible and clean

Contactless energy transfer between components installed under the road and under the floor of the vehicle enables *PRIMOVE* vehicles to operate without cluttering cities. Emissions and noise are also minimized.

Competitive and efficient

By maximizing the concept of high power opportunity charging, the *PRIMOVE* system reduces total cost of ownership (TCO). Vehicle availability remains unaffected thanks to the rapid charging process.

Reliable and easy

PRIMOVE wireless charging operates reliably even in the most adverse ground and weather conditions including sand, snow and ice. With prefabricated and tested modules, the system is quickly and easily installed on both new and existing rail and road infrastructure.

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the evolution of mobility

primove
true e-mobility

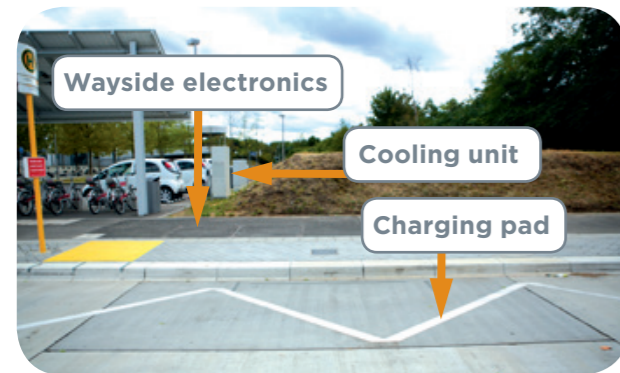
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the evolution of mobility

THE TECHNOLOGY BEHIND

PRIMOVE wireless charging is based on high power inductive energy transfer between components buried underground and receiving equipment installed beneath the vehicle. Wayside components 'communicate' with the vehicle to start the contactless charging process automatically as soon as the vehicle completely covers the charging segment.

The invisible system transfers energy without contact at very high levels of efficiency.

Wayside grid connection:



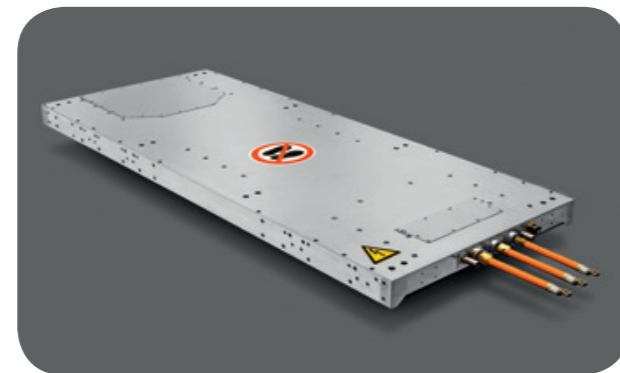
Max. input power	kW	$P_{in} = 225$
Nominal AC Input voltage:	V AC	$U_{in} = 400$
Max. AC apparent Power:	kVA	$S_{in} = 240$

Optional catenary connection

Nominal DC input voltage:	V DC	$U_{in} = 750 (500-900)$
Max. DC input current:	A	$I_{in} = 480$

E-vehicles can be charged rapidly and seamlessly either in motion (dynamic charging) or at rest (static charging) without the need for extra fleet vehicles or batteries. By eliminating the overhead cables and other wires previously needed to power electric vehicles, mass transit networks can now blend in with their surroundings. City landmarks, parks and heritage sites are left intact, minimizing visual pollution and enhancing the city's overall charm.

Onboard equipment:



DC output voltage:	V DC	$U_{out} = 530 - 750$
Max. output current:	A	$I_{out} = 280$
Max output power:	kW	$P_{out} = 200$

DESIGNED FOR OPTIMAL HEALTH AND SAFETY

The PRIMOVE charging system is designed to ensure full passenger, driver, operational staff and pedestrian health and safety. The charging segments are only switched on when the vehicle is positioned directly above them. In this way, electromagnetic fields are only created during charging and fully contained under the vehicle. Supported by TÜV SÜD for safe operation, PRIMOVE complies with all applicable requirements for electromagnetic field (EMF) emissions in public areas. The system also meets relevant electromagnetic compatibility (EMC) standards, ensuring no impact on modern heart pacemakers and electrical devices such as mobile phones.



FAST OPPORTUNITY CHARGING FOR ELECTRIC VEHICLES

The PRIMOVE charging system solves the issue of range and recharging constraints when it comes to e-mobility by combining opportunity charging with fast energy transfer at high power levels. Like that, regular stops are turned into charging opportunities.

Fast opportunity charging for trams and BRT

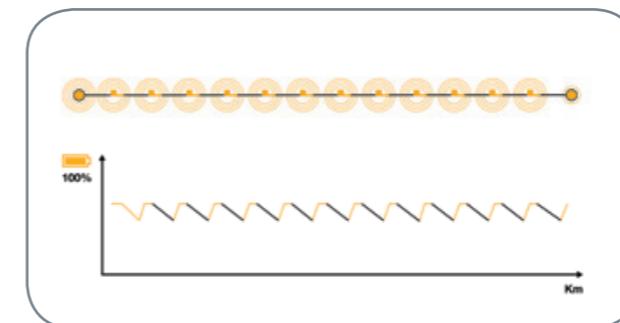
In many ways, trams and light rail vehicles are the ultimate form of e-mobility. Yet despite being clean and convenient, they have always been hampered by one disadvantage – catenaries.

With PRIMOVE inductive charging, light rail vehicles can now run without the need for unsightly poles and overhead lines. The energy source is moved underground which means trams can be integrated into urban areas where conventional catenary networks are prohibited or unwelcome.

Charging segments are installed at tram stops, further charging segments can be installed at additional positions along the route if necessary.

The combination of dynamic and static charging enables continuous operation and reduces infrastructure investments.

Bus rapid transit system (BRT) that were always running with diesel engines, creating noise and pollution, now can also benefit from the advantages of e-mobility thanks to the PRIMOVE charging system suitable for high capacity road vehicles. Charging segments are installed at regular stops.



Fast opportunity charging for e-buses

The revolutionary PRIMOVE charging system is making the electric bus market competitive and attractive, succeeding where others fail.

PRIMOVE wireless charging for e-buses is easy to install, convenient to use and competitive in price. It incorporates high power charging at the most convenient points along bus routes.

Equipped with lighter, smaller, long-life batteries, PRIMOVE e-buses provide reliable service at maximum passenger capacity while minimizing infrastructure.

Charging stations are strategically positioned in the depot, at end stops and en route at selected bus stops for recharging while letting passengers on and off without extended dwell times. The wireless charging process is seamlessly integrated into operations to allow uninterrupted service, optimum fleet availability and maximized efficiency.

