Grid-eMotion™ Fleet
Charging more with less

INTEGRATING SEAMLESS INTO YOUR LOCAL POWER GRID

Grid-eMotion™ Fleet is designed to facilitate the grid connection and in compliance with the most stringent power quality requirements.

COMPATIBLE WITH ALL TYPES OF CHARGERS

Charging points are configured to ensure full interoperability with the EV fleet:
- Combined Charging System (CCS) plug pedestals
- Sequential or parallel charging
- PantoUP, PantoDOWN (OppCharge)
- Cable reels or stinger systems
- Fleet positioning systems

MAIN ADVANTAGES

- Reduced space requirements and cabling
- Simplified interfaces
- Lower harmonic distortion
- Lighter installation at parking places
- Improved reliability, availability and maintainability
- Less site activities, shorter delivery time and lower risk of project delay
- Containerized, fully assembled, tested, ready to install
- Integrated with SCADA, energy management system (Open Charge Point Protocol - OCPP)
- Battery energy storage systems or photovoltaic/solar plant integration
- Connection to existing DC grid for customers already operating tram, metro or trolleybus networks

COMPACT CENTRALIZED CHARGING EQUIPMENT

Available from 50 to 600kW power, mounted on withdrawable racks to facilitate maintenance.

Grid-eMotion™ Fleet is a scalable, modular and fully customizable solution for charging large fleets of electric vehicles in public and commercial transport. By concentrating most of the charging equipment at a central location, Hitachi ABB Power Grids is offering this pioneering technology to reduce the space requirement by up to 60% in confined depot environments.
Landscape
e-mobility in public and commercial transport

DIGITAL ENTERPRISE FLEET MANAGEMENT
- Vehicle Dispatch
- Traffic Control
- Infrastructure Management
- Maintenance
- Analysis
- Predictive and prognostic asset maintenance, defect and service inspection data analysis and reporting

ENERGY MANAGEMENT SYSTEM (EMS) DIGITAL PORTFOLIO
Fleet and Infrastructure Energy Management System™ is a scalable vertically integrated digital ecosystem which can:
- Run asynchronous optimization
- Sequence and control the charging of the EV fleet
- Prioritise the fleet charging based on the time schedule
- Limit the overall power demand

CHARGING POINTS AND SYSTEMS
Selected to ensure full interoperability with the EV fleet:
- CCS plug pedestals
- Sequential or parallel charging
- PantoUP
- PantoDOWN (OppCharge)
- Cable management
- Fleet positioning systems

CONTAINERIZED CHARGER & SUBSTATION
1.5MW Grid-eMotion™ Fleet for high power charging
20ft container including:
- 1.6MVA grid connection
- Twelve 150kW charging modules
- Energy Management System
Tackling large scale EV fleet deployments

The charging infrastructure for large fleets must provide efficient operation in confined spaces, smartly deliver and optimize energy consumption.

With extensive power transmission and DC grid integration experience coupled with a wide portfolio of products and services, Hitachi ABB Power Grids is well positioned to tackle the transport industry’s biggest challenges.
Tackling large scale EV fleet deployments

We need a system to charge all our vehicles that fits in the limited space available in our depots.

TECHNICAL MANAGER
Public transport operator

- Optimized footprint for EV Depots
- Prefabricated walk-in modular outdoor enclosures
- Robust and lightweight design
- Wide range of power rating capacities

We need to offer a flexible charging for different EV standards around the world.

CHIEF TECHNOLOGY OFFICER
EV Vehicle manufacturer

- Optimized grid integration and use of renewables

We need to offer broadest range of services

NEED TO OFFER BROADEST RANGE OF SERVICES
- Depot, terminal, opportunity and flash charging options available
- Grid to plug solution

MEET REGULATORY STANDARDS
- Support the use of clean, renewable power
- Utility grid compliance, e.g. power quality

I need a smart system that will allow me to maximize the operation time of each vehicle.

PLANNING & OPERATIONS MANAGER
Public transport operator

- Cloud enabled remote monitoring and control
- Sequence and parallel charging control
- Lower overall power demand
- Prioritize charging on timetable

DIGITAL ENERGY MANAGEMENT SYSTEM

I need a reliable global partner who can support my customers’ infrastructure needs while I focus on delivery of the buses.

BUSINESS DEVELOPMENT MANAGER
EV Vehicle manufacturer

- DC charge improves reliability and availability
- Web based management for predictive maintenance
- Standardized containerized solution for easy maintenance

RELIABILITY AND PERFORMANCE

NEED SMALL FOOTPRINT CHARGING SOLUTION
- Light installation requirement at parking
- Compact DC system – saves up to 40%

COMPATIBLE WITH GLOBAL STANDARDS
- Designed to meet the highest HSE standards
- High protection degree: IP 43/23D (MV SWG/Trafo)
- Applicable standards: IEC, GB, AS, GOST, ANSI, CSA

LIMITED ENVIRONMENTAL IMPACT

- Optimized grid integration and use of renewables

NEED TO OFFER BROADEST RANGE OF SERVICES
- Depot, terminal, opportunity and flash charging options available
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Charging points and systems

**Grid-eMotion™ Fleet starts with 1MW depot power**

Scalable, modular, fully customizable charging system

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**RECTIFIER CUBICLE**

<table>
<thead>
<tr>
<th>Technical specification</th>
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<tbody>
<tr>
<td>Typical Power</td>
<td>from 1000kW up to 3000kW</td>
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<tr>
<td>Type</td>
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<td>Standard configuration</td>
<td>3 phase bridge 6 or 12 pulse</td>
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<td>Maximum Permanent Voltage</td>
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<td>Insulation Voltage</td>
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<td>Overvoltage Category</td>
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<td>Operating Temperature</td>
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<td>Altitude</td>
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**DC-DC CHARGERS’ CABINET**

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<tbody>
<tr>
<td>Typical Power</td>
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<td>Standards</td>
<td>EN 50328, IEC 60146</td>
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<tr>
<td>Features</td>
<td>• Touch screen</td>
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<td></td>
<td>• 2-poles DC Breaker</td>
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<td>• Power section with drawable</td>
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<td>• Galvanic isolation</td>
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**CHARGING POINT**

<table>
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<th>Technical specification</th>
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<tr>
<td>Features</td>
<td>• Touch-screen display/buttons</td>
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<td></td>
<td>• CAN-bus/Ethernet connection</td>
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<td></td>
<td>• CCS-Combo 2 plug, 4.5m cable</td>
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<td></td>
<td>• Single plug, double plug with sequential or parallel charging</td>
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<td>Plug ratings</td>
<td>125A, 250A</td>
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<tr>
<td>Standards</td>
<td>ISO 15118, DIN 70121, IEC 61851-23/24</td>
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The cabinet is designed and manufactured to facilitate maintenance
Charging points and systems, containerized chargers and digital solutions

Grid-eMotion™ Fleet charging systems

- **1MW grid connection**
  - Ten EV chargers up to 100kW each

- **1.25MW grid connection**
  - Eight EV chargers 150kW each

- **1.5MW grid connection**
  - Twelve EV chargers 150kW each

- **2.5MW grid connection**
  - Twenty EV chargers 150kW each

- **Single plug charging point**
  - Up to 250A

- **Double plug charging point**
  - Up to 250A
  - Sequential or parallel charging

- **PantoUP**
  - Up to 600kW
  - Integration of mast in cityscape

- **PantoDOWN (OppCharge)**
  - Up to 600kW
  - Integration of inverted pantograph and mast in cityscape

Containerized charger and substation

- Your solution for fast energization

- **Prefabricated walk-in, modular outdoor enclosure**
- **Thermally insulated for increased equipment lifetime**
- **Robust and light weight design**
- **Wide range of ratings & capacities as well as layouts in steel, concrete and GRP**
- **Protection degree: IP 43/23D (MV switchgear/transformer)**
- **Applicable standards: IEC, GB, AS, GOST, ANSI, CSA, and more**

Battery Energy Storage System (BESS)

- **Stationary BESS for small depots or city terminals**

- **Up to 500kW power**
- **Grid-forming power converter**
- **Battery racks and battery management system**
- **Designed for grid integration of EV charging infrastructure depots and terminals**
- **For power requirement up to 500kW and energy storage of 670kWh**
- **Remote monitoring and control system**
- **Standardised enclosure for fast delivery at site**