ABB E-MOBILITY

EV Charging Infrastructure
Product portfolio
ABB is leading the e-mobility revolution by offering a complete solution to enhance your business: connected charging infrastructure for any location and with connected service. ABB EV chargers work seamlessly with all services or payment application, and supports all EV charging standards.

ABB is a global leader in power and automation technologies. Based in Zurich, Switzerland, The ABB Group of companies operates in roughly 100 countries and employs about 130,000 people.

Benefit from ABB’s experience and expertise installing and servicing 5000+ DC fast chargers worldwide.
Global leader in EV charging infrastructure
North American Center of Excellence in E-Mobility

ABB has years of experience in designing, manufacturing, installing and maintaining electric vehicle charging infrastructure, including several nationwide charger networks.

ABB in Canada
ABB has been serving Canadian customers for over a century with reliable energy efficient solutions for utilities, industry, infrastructure and transport. Reinforcing ABB’s commitment to local markets and maintaining best-in-class facilities in Canada, our new high-tech corporate headquarters is located in Montréal, Québec. The facility is ABB’s Center of Excellence in E-Mobility for North America.

It is ISO 9001 certified for design, project management, manufacturing, testing and servicing, ISO 14001 certified for environmental standards and OHSAS 18001 certified for Health and Safety standards and has been for over 20 years.

With a dedicated and local team of sales, service sales, application engineering, and fully-trained service personnel, the Center of Excellence will put Canada on the map of emerging technologies that will power the change and help make the nation a global hub for smarter, sustainable transport systems.

Main features of all ABB chargers
ABB chargers are designed to be durable, reliable and easy to service. Main advantages include:

- Modular and redundant construction to ensure continuous operation
- Industry-grade components to ensure long lifetime and robust operation
- Future-proof, easily upgradable technology
- Remote maintenance and support for an effective, timely response to any irregularity in the network
- Supports open charging communication protocol: OCPP
- Stainless steel powder coated cabinets for durability, even in cold or humid climates
- User centered design validated by user tests
- Remote charger’s power management

Key advantages of connected chargers
ABB’s connected chargers enable fast global service and proactive maintenance. ABB Connected Services offer four key advantages:

- Flexibility: connect to any charging network, back-office, payment platform or energy management solution
- Upgradability: benefit from the latest industry standards
- High availability of the service: based on Microsoft Azure’s robust platform
- Cost efficiency: avoid development and maintenance costs of proprietary software solutions
Manufacturing and quality system
Key components in ABB DC fast chargers are designed and manufactured by ABB. This ensures full control over hardware and firmware. ABB chargers are manufactured in factories with strict quality systems in place. These factories undergo rigorous quality audits by independent external parties, as well as by automotive OEM clients.

Partnerships with car OEMs
ABB EVCI has R&D partnerships with many automotive OEMs to support joint development and testing as well as to ensure optimal compatibility between DC fast charger and electric vehicle.

Supporting all EV charging standards
ABB supports all currently available open charging standards, which enables providing charging services to widely available electric vehicles. All chargers can be combined with comprehensive solutions for user authorization, payment and network connectivity.

Connected Services
ABB’s Connected Services offering is based on a 24/7/365 monitored platform, which ensures the highest availability. A network operator can select from a modular offering supporting a smooth and seamless integration to back-office processes via APIs, and giving access to value adding Web tools for configuration, advanced monitoring and notification.
The key elements
to run an EV charging operation

ABB provides all elements to run a successful charging operation. One stop for hardware, software, connectivity and services.

HARDWARE:
DC fast chargers
Reliable, robust, modular hardware.

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>FEATURES</th>
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<tbody>
<tr>
<td>Personal vehicle fast chargers</td>
<td>from 24 kW to 350 kW +</td>
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<tr>
<td>Bus chargers</td>
<td>Opportunity charging from 150 kW to 450 kW</td>
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<tr>
<td></td>
<td>Depot/overnight charging from 50 kW to 150 kW</td>
</tr>
</tbody>
</table>

SOFTWARE AND CONNECTIVITY:
Web tools and APIs
Integrate with back-offices and added value systems.

<table>
<thead>
<tr>
<th>WEB TOOLS</th>
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</thead>
<tbody>
<tr>
<td>ABB Driver Care</td>
<td>Status, statistics, access management, etc.</td>
</tr>
<tr>
<td>ABB Charger Care</td>
<td>Troubleshooting resource</td>
</tr>
<tr>
<td>Payment management</td>
<td>Configure and support payment terminals</td>
</tr>
</tbody>
</table>

APIs

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCPP API</td>
<td>Connect to back-office systems</td>
</tr>
<tr>
<td>Service API</td>
<td>Support your call center to help EV drivers</td>
</tr>
<tr>
<td>Demand/Response API</td>
<td>Manage input power of a charger dynamically</td>
</tr>
</tbody>
</table>

Payment and Authentication
Global platform to support local payment and authentication solutions:
- RFID
- Smart phone
- PIN code
- Credit card payment module

SERVICES:
Service Level Agreement
Configure a service agreement to match the needs of your organization.
- Proactive monitoring and remote diagnosis
- Certified service teams
- Preventive and corrective maintenance
- Over-the-air software updates and upgrades
- Training programs
- Clear communication and overview via ABB Web tools
Personal vehicle infrastructure products
Terra 53 CJ - 50 kW

The Terra 53 CJ DC fast charging station is a dual outlet 50 kW (CHAdeMO and CCS) fast charging station that can be configured to support the charging needs of every customer. The Terra 53 CJ is ideal for use at highway rest stops, gas stations, car dealerships and busy urban areas.

Technical specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Multi-standard DC charging station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Indoor / Outdoor</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-35 °C to +55 °C (de-rating characteristic applies)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °C to +70 °C</td>
</tr>
<tr>
<td>Compliance and Safety</td>
<td>cUL us</td>
</tr>
</tbody>
</table>

**Input**

| AC Power connection            | 3P + PE                           |
| Input voltage range            | 480/600* VAC +/-10% (60 Hz)       |
| Max rated input current and power | 100 A, 75 kVA (Power limiting options available) |
| Power factor (full load)       | > 0.96                            |
| Efficiency                     | 94 % at nominal output power      |

**DC output**

| Maximum output power           | 50 kW                             |
| Output voltage range           | 200 – 500 VDC (Combo-1) 50 – 500 VDC (CHAdeMO) |
| Maximum output current         | 125 ADC (Combo-1) 120 ADC (CHAdeMO) |

**General**

| DC connection standard         | EN61851-23 / DIN 70121 Combo-1 and CHAdeMO 1.0 |
| DC cable length                | 12 feet (optional: 20 feet)             |
| DC plug type                   | Combo-1 / CHAdeMO                      |
| RFID system                    | ISO/IEC14443A/B, ISO/IEC15693 FeliCa™1, NFC reader mode |
| Network connection             | GSM modem (2G/3G) 10/100 base-T Ethernet |
| Protection                     | Type 3R                               |
| Dimensions (D x W x H)         | 30” x 21” x 75” (760 mm x 525 mm x 1900 mm) |
| Weight                         | 775 lbs (350 kg)                      |
| Shipping dimensions (D x W x H)| 48” x 32” x 75” (1200 mm x 800 mm x 2150 mm) |
| Shipping weight                | 830 lbs (375 kg)                      |

* when combined with a step-down transformer

Possible configurations

The Terra 53 CJ is available in several configurations. Optional input power limiting software is available to avoid expensive grid upgrades.

Main features and key benefits

- Robust all weather stainless steel enclosure
- Quick and easy installation
- Low operational noise
- 50 kW DC fast charger supporting CCS and CHAdeMO
- Designed to deliver full output power continuously
- IEC 61000 EMC certified for industrial and residential areas (including gas stations, retail outlets, offices, etc.)
- Future-proof connection via open industry standards
  - Flexible interfacing with added value systems
  - Remote uptime monitoring and assistance
  - Remote updates and upgrades

- Easy to use:
  - Daylight readable touch screen display
  - Graphic visualization of charging progress
  - RFID authorization
DC wallbox - 24 kW

ABB’s DC wallbox is a compact charger for car dealerships, offices, shopping areas and home.

**Main features and key benefits**
+ 24 kW DC fast charging
+ 60 A high output current
+ Single or dual outlet: CCS-1 and CHAdeMO
+ Daylight readable 7” full color touch screen display

Future-proof connectivity:
- OCPP 1.6
- Capability for remote services
- Compact design

Easy to install: 208 - 240 VAC single phase input
Max. input current: 100 A with current limiting option available

Robust, all-weather enclosure for indoor and outdoor use
cUL and FCC certified
RFID card reader available as an option

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Terra HP - 175 kW to 350 kW

Fast charging just got faster.
High power for next gen EVs.

Several EV models with larger batteries and longer range are coming, while infrastructure needs are growing. More fast charging points with higher power demands will be needed for drivers to adopt the next generation of electric transportation. ABB has solutions today that will enable this future.

**Main features and key benefits**
+ 175 - 350 kW
+ Liquid-cooled charging cables
+ Ultra-high output current capability, 350 - 500 A
+ Wide voltage range: 150 - 920 VDC
+ Flexible charging cables, advanced liquid-cooling system
+ CCS and CHAdeMO available
+ Robust, all-weather enclosure for indoor and outdoor use
cUL and FCC certified
Heavy vehicle charging infrastructure
Zero-emission bus transit

ABB Heavy Vehicle Charger (HVC) solutions offer high power fast charging systems that allow electric transit buses to charge on-route and at the bus depot, with minimal impact on operation; enabling true zero-emission public transit.

Enable zero emission bus transit in your city
With increasing air pollution levels and a stronger public commitment to clean transportation, electric city buses offer a great opportunity to improve life in cities, while also reducing operational costs. ABB’s high power fast charging system solves the key problems for large scale adoption of zero emission electric buses: long charging times and short driving range belong to the past.

Depot Charging
Save energy without requiring depot staff to monitor the charging procedure with ABB’s depot charging solution. This system allows up to three electric buses to be connected and charged sequentially while parked at the bus depot. The logic programmed into the depot feeding station “wakes up” each bus in turn for charging, and then puts them back into “sleep mode” once the charge is complete.

Opportunity Charging
ABB’s opportunity charging solution allows electric buses to have short charging times along their routes; thus enabling true zero-emission public transportation in cities. With its automated rooftop connection and typical charge time of 3–6 minutes, the system can easily be integrated in existing bus routes by installing chargers at endpoints, terminals and/or intermediate stops.

Main features and key benefits
+ Sequential charging (up to three buses)
+ Small infrastructure footprint
+ Easy to upgrade power capacity on-site
+ OCPP compliant for remote management
+ CCS protocol compliant
+ Safe and reliable connection
+ Remote diagnostics and service

Main features and key benefits
+ Charge electric bus in 3-6 minutes
+ Easy integration into existing bus lines
+ Automated 4-pole rooftop connection
+ OCPP compliant for remote management
+ Based on international IEC 61851-23 standard
+ Safe and reliable connection
+ Remote diagnostics and service
ABB connectivity and services put you in control
All ABB chargers come with an extensive suite of connectivity features including remote monitoring, remote management and smart software upgradeability. These advanced services enable high uptime of the equipment, a fast response to problems and provide owners of chargers with powerful insight into statistics of their charging operation. Combined with ABB’s global presence of service teams we can provide a reliable overall charging solution, anywhere in the world.

Future-proof solutions for interoperability
ABB’s high power fast chargers are designed to the highest international electrical, quality and safety standards, including IEC 61851-23, guaranteeing safe and reliable operation. ABB has invested heavily into standardization and is a leading authority in all key standardization developments with respect to fast charging. This provides you with the confidence that long term support and industry-wide understanding of the solution is secured.

ABB is your experienced partner
The new fast charging solution for e-bus charging is based on ABB’s solid experience in charging solutions for electric vehicles. For almost a decade, ABB has installed over 5000 fast charging systems for electric vehicles around the world and is the globally leading supplier in this market. This unique position and experience is leveraged to provide the best value to our customers.

<table>
<thead>
<tr>
<th>Technical specifications</th>
<th>Depot Charging</th>
<th>Opportunity Charging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Modular: 50 kW, 100 kW, 150 kW</td>
<td>Modular: 150 kW, 300 kW, 450 kW</td>
</tr>
<tr>
<td>Input AC connection</td>
<td>3P + PE</td>
<td></td>
</tr>
<tr>
<td>Rated input current and power</td>
<td>3 x 230 A, 173 kVA (per 50 kW module)</td>
<td>3 x 230 A, 173 kVA (per 150 kW module)</td>
</tr>
<tr>
<td>Input voltage range</td>
<td>480 V_{dc} +/-10% (60 Hz)</td>
<td></td>
</tr>
<tr>
<td>Maximum output current</td>
<td>200 A</td>
<td>225 A (per 150 kW module)</td>
</tr>
<tr>
<td>Output voltage range</td>
<td>200 – 920 V_{dc}</td>
<td>200 – 920 V_{dc}</td>
</tr>
<tr>
<td>DC connection standard</td>
<td>IEC 61851-23 / DIN 70121</td>
<td></td>
</tr>
<tr>
<td>Connection method between charger and bus</td>
<td>CSS-1 or CSS-2 connector</td>
<td>4-pole automatic connection system</td>
</tr>
<tr>
<td>Environment</td>
<td>Indoor/Outdoor</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Standard: -10 °C to +50 °C (de-rating characteristic applies); Optional: -35 °C to +50 °C</td>
<td></td>
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<td>Compliance and Safety</td>
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</tr>
<tr>
<td>Network connection</td>
<td>GSM/3G modem</td>
<td>10/100 base-T Ethernet</td>
</tr>
<tr>
<td>Protection</td>
<td>IP54 – IK10 - NEMA 3R</td>
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ABB Connected Services
APIs and Web tools

Internet connectivity is fundamental to the successful operation of a network of EV chargers. It is a flexible, reliable and cost effective solution and by choosing ABB as supplier for charging infrastructure means having access to best-in-class connected services.

**Connected Services Platform**
ABB chargers are connected via a mobile network to the Connected Services Platform – the basis for all APIs and Web tools. The connection to the chargers and the platform is monitored 24/7/365 by the Network Operation Center (NOC).

This platform approach means that ABB DC fast chargers are future-proof; that is, they are accessible in real time and can receive remote software updates as they are launched.

The connection to the platform is not a standalone service but an integrated part of the offering. Building on that, two models are available to interact with the charger: either via APIs or via Web tools. Both approaches can be combined in a modular way depending on customer needs.

**APIs for back-office integration**
ABB offers standards based APIs supporting smooth integration with back-office systems, energy management solutions, and payment services.

Available APIs:
- Open Charge Point Protocol (OCPP) API to integrate with back-office systems
- Service API with technical status data from the charger for simpler remote diagnostics, helping to improve availability of a charger and to better support EV drivers
- Basic Demand/Response API to dynamically manage the input power of a charger

ABB APIs are based on OCPP – the industry-wide accepted communication protocol – and therefore ensure seamless integration to customers’ back-office systems. All ABB APIs have openly available specifications.

**Web tools**
ABB offers advanced Web tools to operate and monitor chargers. Web tools allow to see the real-time status of a charger, to configure settings related to authentication, notification and case management and to obtain valuable insights into usage statistics. All data is available directly via an Internet browser and can be exported for further processing.

For chargers equipped with a credit card payment terminal, a web module is available to configure the payment device including pricing per session, currency and language.
ABB Charger Care
Optimize charger availability

Secure the availability, performance and safety of your EV chargers with an ABB Charger Care service agreement, according to the needs of your organization. Avoid leaving drivers stranded.

**ABB Charger Care**
With an ABB Charger Care service agreement matching the customer’s needs, ABB can reduce the risk of unplanned downtime and rapidly respond if problems do occur.

ABB Charger Care is available for all ABB EV charging products: Terra 53 C3, Terra HP, DC Wallbox, and HVC bus charger.

Together with your local ABB service organization, you can tailor a Service Level Agreement (SLA) matching your organizations wishes. Several modules are available, including proactive monitoring, preventive and corrective maintenance, training programs, spare parts, and software updates and upgrades.

**Proactive monitoring and remote diagnosis**
Remote condition monitoring and remote troubleshooting are important advantages of ABB chargers. ABB is constantly monitoring over 100 parameters of every charger. We have a geographically-separated, redundant server setup with a team of experts in our Network Operations Center (NOC) watching over availability of the server network.

If a charger or the server network signals a problem, either an ABB or a third party service team automatically receives a trigger. Some issues can be resolved automatically by the charger without any service intervening. Other issues may require a remote or on-site repair. If a repair is required, remote diagnosis enables doing it first-time-right.

**Certified service teams**
Repairs are exclusively performed by ABB certified personnel. This may be ABB’s service organization, or your own service organization after training and certification by ABB.

ABB service teams are ready to offer support 24/7/365 according to your needs and/or your Service Level Agreement.

**Preventive maintenance**
ABB provides a complete maintenance schedule to keep your chargers in good health.

**Corrective maintenance**
Remote diagnosis, modular design and clear procedures ensure quick repairs, reducing inconvenience at your location. Spare parts are available from a central warehouse, minimizing lead time.

**Software updates and upgrades**
Software updates and upgrades will be installed on all chargers covered by an SLA.

**Training programs**
Training modules are available for end-users, customer care personnel and service engineers. Trainings can take place at your location, on request.

**Clear communication**
Via ABB Web tools you can quickly track service interventions, spare parts orders, and create cases to be handled by ABB.