ARCHITECTURES FOR E-MOBILITY ROADSIDE / HIGHWAY APPLICATIONS

All-in-one solution limits site works & ensures smooth startup

IEC Skidded CSS w/ Integrated Chargers 8x175 kW

EM13 EM_eCar_Roadside/Highway_IEC_Skid + CSS_1MW_MV
### Electrification for roadside/highway rest areas

**Skid-mounted HP chargers and CSS**

ABB’s all-in-one plug-and-play solution meets the demands of roadside charging facilities

- Integrated solution with chargers, electrical infrastructure and digital communication for control and optimization
- Ability to charge multiple cars within minutes
- Quickly establish electrical charging points with minimal site and civil works
- Lower risk, ensure a smooth startup and immediate return on investment with pre-engineered, pre-fabricated and pre-tested solution

**Solution architecture**

ABB’s pre-engineered solutions meet the speed and reliability requirements demanded by roadside charging facilities

- Repeatable building block designs provide the standardization for multi-site roadside facilities
- Pre-engineered digital packages for a variety of monitoring, control and optimization options
- Modular architecture enables easy expansion and ability to add Energy Storage Modules (ESM)
- Eliminate fencing and security with a completely internal arc tested solution ideal for public applications

**Example**

![Example](image_url)
Solving today’s e-mobility roadside challenges

Architecture composition

Skid mounted CSS w/HP chargers

- This skidded solution features all the power and control connections, from medium voltage grid connection to the power cabinets, already routed in the base frame
- Site works are minimized thanks to the pre-wired solution
- Solution available from 2 to 8 x 175kW chargers, and scalable for future expansion
- Just connect the MV grid and the charge post and start operation

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Solution</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration</td>
<td>Electrical infrastructure and charger package</td>
<td>Assures interoperability with integrated communication for optimized operation</td>
</tr>
<tr>
<td>Scalability</td>
<td>Modular design</td>
<td>Provides for a scalable solution that can be expanded as capacity changes</td>
</tr>
<tr>
<td>Risk</td>
<td>Factory assembled, pre-wired and pre-tested</td>
<td>Assures smooth startup and reduces schedule risk and maximizes reliability</td>
</tr>
<tr>
<td>Asset monitoring</td>
<td>Digital options</td>
<td>Digital solutions available for energy mgt., asset health and utilization information</td>
</tr>
<tr>
<td>Speed</td>
<td>Plug-and-play solution</td>
<td>Allows for quick connection to the grid – up to 60% faster installation and startup time with minimal site and civil works</td>
</tr>
<tr>
<td>Safety</td>
<td>Internally arc tested to IEC 62271-202</td>
<td>Safe to install in public areas – no fencing or security required saving 30% on installation costs</td>
</tr>
</tbody>
</table>
Roadside solution

Architecture composition

Single line diagram

Features of architecture

- Scalable architecture with option to add Terra HP EV chargers
- Integrated solution of power, communication and EV chargers, assures coordinated operation and fast start-up
- Robust equipment provides reliable operation
  - ABB SafeRing MV gear with VD4 vacuum circuit breakers
  - Relion REF-615 relays
- Low voltage Emax 2 and Tmax XT circuit breakers with Ekip trip units to reliably protect and monitor
- Optional InLine II fuse disconnectors
- Internally arc tested design assures high safety standards for service personnel and public
- Compact design to reduce footprint
Roadside solution
Architecture composition

Digital single line diagram

Features of architecture

- Integrated chargers, equipment and communication provide monitoring, control and energy optimization
- Relion REF-615 relays provide reliable protection, control and monitoring of vacuum circuit breakers
- LV Emax 2 and Tmax XT breakers with Ekip trip units provide data that is seamlessly integrated with the control and monitoring systems
- High power ABB Terra EV charger stations communicate with monitoring and billing systems
- ZEE-600 or Optimax energy mgt. system provides monitoring and control of the electrical system
- ABB Ability asset health monitoring with CMES and MRC and energy mgt. with EDCS can help reduce energy bills, lengthen equipment life and reduce maintenance expenditures
Depot solution
The equipment

**Typical Equipment**
- Compact secondary substation (CSS) enclosure
- MV SafeRing equipment with Relion REF-615 relays
- Transformer (oil or dry type)
- LVS3 Low voltage switchboard with Emax 2 and Tmax XT circuit breakers with Ekip trip units and/or fused disconnectors
- Skid mounted Terra high-power chargers

**Options**
- ABB Ability and Energy and asset management options with ZEE-600, Electrical Distribution Control System (EDCS), Condition Monitoring for Electrical Systems (CMES), My Remote Care (MRC)
- Seismic certifications
- IP35 or IP45 protection for demanding locations
- Added ventilation for hot climates