

Technical Specifications Zero Foot-Print™ (ZFP) Depot charging system

60 – 120 kW / 150 - 240 kW

22.06.2021



Charging station type

We distinguish two performance classes of our fully automatic charging system for heavy commercial battery vehicles:

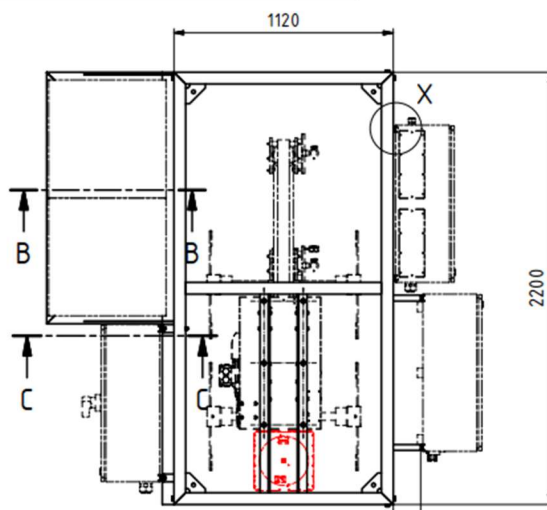
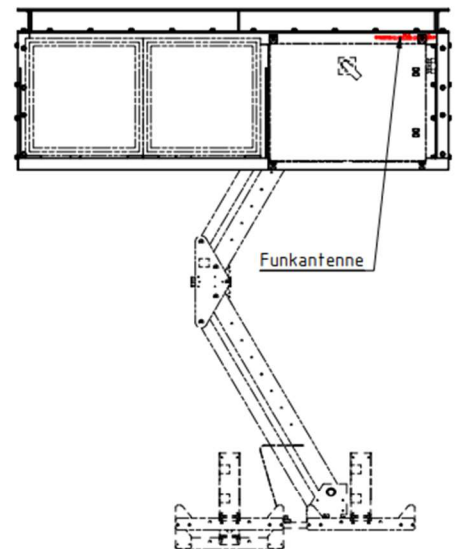
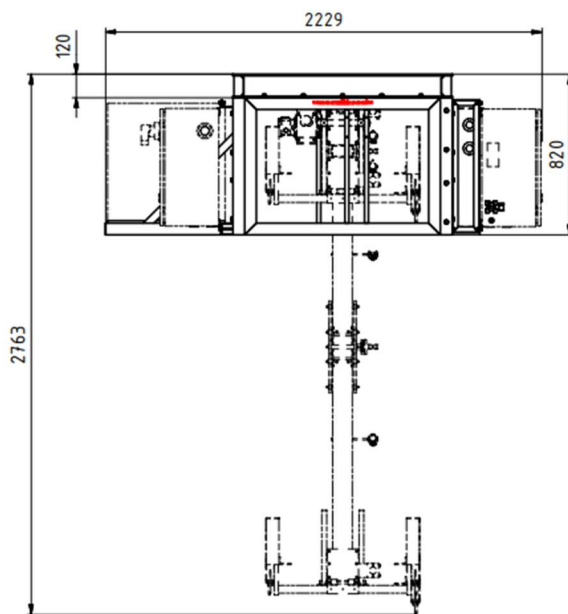
- Performance Class 1: ZFP 60 – 120kW
- Performance Class 2: ZFP 150 – 240kW

Name plate

The name plate is located on the front of each unit. It contains the following information:

1. Product and Type
2. Serial Number and Year Manufactured
3. Input Voltage and Frequency
4. Rated Input Current
5. Rated Output Voltage and Current
6. Rated Output Power
7. Degree of Ingress Protection
8. Electrical Equipment Class

Dimensions



Weights

Designation	Value	Unit
ZFP Performance Class 1 * (2 – 4 power converters possible)	685	kg
ZFP Performance Class 2 * (5 – 8 power converters possible)	750	kg
30kW Power Converter	25	kg

*without power converters.

Electrical power supply

Description	Value
Maximum Output power	Performance Class 1: 60kW, 90kW, 120kW Performance Class 2: 150kW, 180kW, 210kW, 240kW
Input	High Power Input: AC 3 Phase + PE Control Power Input AC 3 Phase + N + PE
Input voltage	320 to 530 V
Frequency	45 to 65 Hz
Output	DC (isolated)
Output voltage	150 to 1000 V
Maximum Output current	50A per power module
Vehicle interface type:	OPPCharge v1.3 (Inverted Pantograph)
Use	Indoor/Outdoor
Efficiency	95 %
Power factor	>0.99
Harmonics input current (THD)	<5 %

Features

Designation	Explanation
Remote Monitoring and control	OCPP 1.6
Charging process	Fully Automatic with Driver Start/Stop Control
IP rating	IP54
Electrical Safety	According to CE Regulations
Electrical Isolation Type	DC IT (Isolated Terra)
Status Indicator	Green/Red/Blue Indicator Light
Optional High Voltage Indication on pantograph	HV warning light flashes when voltage > 45VDC
Pantograph Voltage	No voltage on pantograph when not connected

Standards Compliance

Designation	Explanation
CE	Overall Standard Compliance
EN 1090-1	Execution of steel structures and aluminium structures. Requirements for conformity assessment of structural components.

Designation	Explanation
EN 1090-2	Execution of steel structures and aluminium structures. Technical requirements for steel structures
IEC 61851-21-2	Electric vehicle conductive charging system - Part 21-2: EMC requirements for off-board electric vehicle charging systems. Table 4 (Immunity) and Class B (Radiated Emissions)
IEC 61851-23-1 when released, until then the corresponding OppCharge standards.	Electric vehicle conductive charging system - Part 23-1: DC electric vehicle charging station DC charging with an automatic connection system
2013/35/EU	European EMC Directive. Related to human exposure to electromagnetic fields
2014/35/EU	European Low Voltage Directive
EN 1991. Eurocode 1	Actions on structures
EN 60529	Degrees of Protection Provided by enclosures (IP Code)
EN 62305 / EN 61643	Lightning Protection
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems
IEC 62477	Fire Safety
Non-ionizing radiation level	Compliant with NISV and EN 62311

Additional Specifications

Designation	Explanation
Pantograph deployment and retraction time	< 20s
Parking Tolerance XY	+/-30cm
Redundancy of power electronics	Modular, redundant design. If one power module fails, the others continue operating.
Charging Duty Cycle	Continuous
Upgradability	Performance Class 1: 60kW to 90kW/120kW Performance Class 2: 150kW to 180kW/210kW/240kW
Earthing	All accessible conductive parts connected to earth. Earth clamping bar accessible for maintenance personnel.
Response to grid failure	Orderly electrical shutdown and mechanical retraction of pantograph by hand crank and/or battery backup. Automatic restart upon restoration of grid power.
Separation of control and power circuits	Control circuits physically separated from AC input and DC output circuits.
Control Circuit Function	Control Circuit remains functional when AC/DC conversion circuits are shut down.
Kneeling during charge	Yes
Operation Altitude	< 2000m
Operation Temperature	-25°C to 45°C
Operation Maximum Humidity	95% non condensing
Expected Lifetime	10 years at 1-4 charging cycles/day when observing proper maintenance
Pantograph safety	Interlock of pantograph deployment coupled to bus parking location. Signal sent to bus to immobilize when pantograph is not in the full up position.
Contact sequence	Earth, power, pilot on connection. Pilot, power, earth on disconnection.
Electrical Checks before charging	Isolation check, short circuit check, voltage check.

Electrical Danger Protection Signage	Warning signs for maintenance personnel.
Maintenance personnel protections	No accessible live parts with access doors open.
Power control	Main switch to cut off power to system
Isolation of DC power circuit	DC IT isolated system > 1MΩ
Dielectric withstand of AC circuit	Leakage current < 2mA @ 1000V
Emergency Switch	Emergency switch accessible from outside, switches off high power DC power circuit and raises the pantograph.
HV Indicator	Redundant flashing light shows when high voltage is present on the pantograph. (Optional)
Over extension protection	Pantograph will not extend over its maximum working range.
External coating	Powder coated painting available to customer RAL color requirements that ensure mechanical and aesthetic stability against solar radiation, humidity or corrosion along the expect life cycle of the system.
Locking during Maintenance Labors	The main switch can be locked in the open position by a customer provided padlock for safety during maintenance procedures.