

Technical specifications All In One Opportunity Charging Station (AIO)

150kW, 300kW, 450kW

23.06.2021



Charging station type

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

- Performance Class 1: AIO 150/2500, AIO 150/3500
- Performance Class 2: AIO 300/2500, AIO 300/3500
- Performance Class 2: AIO 450/2500, AIO 450/3500

Name plate

The name plate is located at the front of the lower structure door at eye level. It contains the following information:

1. Product:
2. Serial number:
3. Input:
4. Input current:
5. Output voltage:
6. Output power:
7. Class:
8. Type:
9. Construction year:
10. Input voltage:
11. Output current:
12. Protection class:

Furrer+Frey[®]
Opbrid Charging Systems

①	Product: OPPCharge DC Charger	Type: AIO 300/2500	⑧
②	Serial N°: 04280-001	Year: 2021	⑨
③	Input: 3 phase 50Hz AC + PE	Rated Input Voltage: 400V	⑩
④	Rated Input Current: 690A per phase		
⑤	Rated Output Voltage: 400Vdc - 750 Vdc	Rated Output Current: 600A-750A	⑪
⑥	Rated Output Power: 300kW	Degree of protection: IP54	⑫
⑦	Class: Equipment		

CE

Furrer+Frey AG
Postfach 182, 3000 Bern 6
Phone: +41 (0)31 357 61 11
Email: chargingsystems@furrerfrey.ch

Dimensions and weights

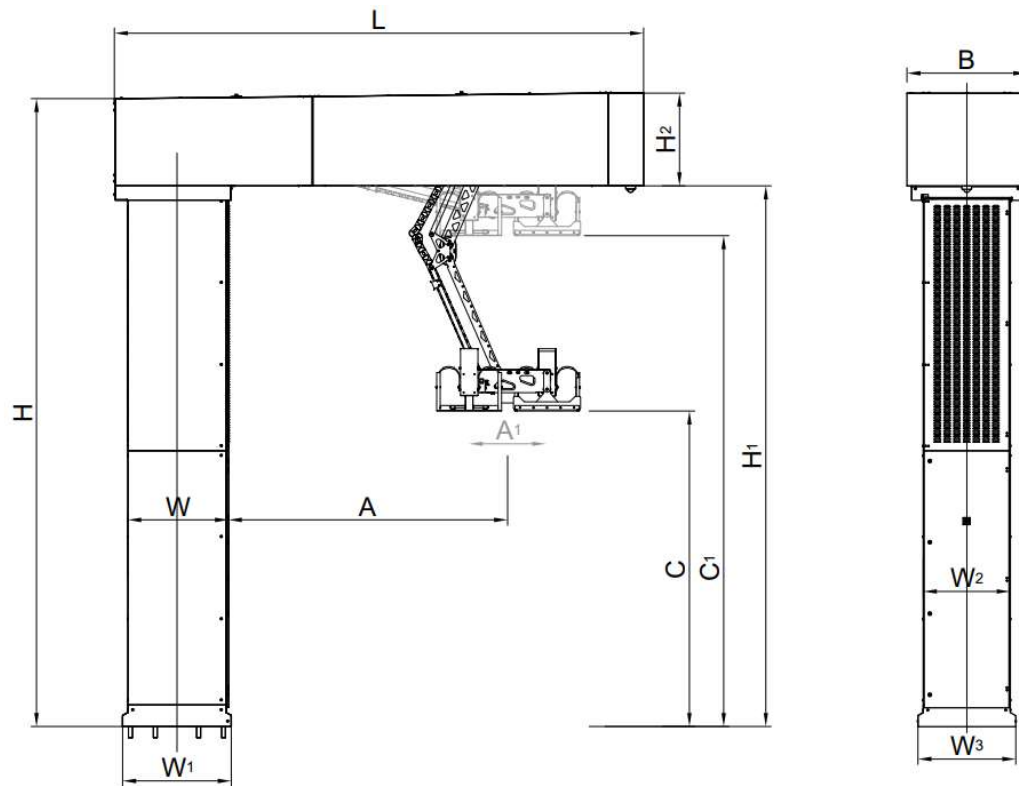


Fig. 1: Dimensions of the AIO Charging Station

Item	Designation	short	medium	long	Unit
L	Length of cantilever	4890	5390	5890	mm
W	Mast depth	930	930	930	mm
W ₁	Base depth	1004	1004	1004	mm
W ₂	Mast width	804	804	804	mm
W ₃	Base width	904	904	904	mm
B	Cantilever width	1110	1110	1110	mm
H	Overall height from ground level	5855	5855	5855	mm
H ₁	Cantilever height from ground level	5000	5000	5000	mm
H ₂	Cantilever height	855	855	855	mm
C	min. height of bus contact bars	2800	2800	2800	mm
C ₁	max. height of bus contact bars	4300	4300	4300	mm
A	Contact holder distance	2570	3070	3570	mm
A ₁	Pantograph adjustment range	±250	±250	±250	mm

Designation	Value	Unit
Charging station with short cantilever	3770 ¹⁾	kg
Charging station with medium cantilever	3885 ¹⁾	kg
Charging station with long cantilever	4000 ¹⁾	kg

¹⁾ w/o rectifier

Electrical power supply

Description	Value
Maximum Output power	150kW, 300kW, 450kW
Input	AC 3 Phase + PE
Input voltage	368 to 437 V
Frequency	45 to 65 Hz
Output	DC (isolated)
Output voltage	200 bis 750 V
Maximum Output current	250 A, 500 A, 700 A
Vehicle interface type:	OPPCharge (Inverted Pantograph)
Use	Outdoors
Efficiency	95 %
Power factor	>0.99
Harmonics input current (THD)	<5 %

Features

Designation	Explanation
Remote Monitoring and control	Realtime, cloud based with web interface and fault indication/notification and consumption statistical reporting Other interfaces supported via OCPP1.6
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
Vehicle Communication	OppCharge 1.3 (ISO 15118-2 with OppCharge Modifications) and Wifi 5GHz/Directed Antenna
Standby energy consumption	~ 380 W in standby; completely switched off ~ 20W
Current charging process	Depending on vehicle (master)

Sound Level	Distance	Idle or Charging	dB (A)
	3 m	Idle without E-Bus	< 35
	3 m	During Charging with E-Bus ¹⁾	54
	8 m ²⁾	During Charging with E-Bus ¹⁾	46
	20 m ²⁾	During Charging with E-Bus ¹⁾	38

1) Sound Optimized (quiet) E-Bus with A/C running

2) Typical bus stop situation with hard ground (asphalt, concrete)

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.
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 62262	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 62305 / EN 61643	Lightning protection
IEC 62477	The steel construction with mast and boom ensures a high level of fire protection.
Non-ionizing radiation level	Compliant with NISV and EN 62311

Additional Specifications

Designation	Explanation
Total deploy/setup/retract time per cycle (excluding vehicle delays)	< 25s
Parking Tolerance XY	+/-30cm
Electronics location	All electronics contained within mast and cantilever structure
Redundancy of power electronics	Modular, redundant design. If one power module fails, the others continue operating.
Charging Duty Cycle	Continuous cycles of 7.2 minutes charging, 2.8 minutes rest
Upgradability	150kW field upgradable to 300kW 300kW field upgradable to 450kW
Maximum 400VAC Input Cable cross section	1 cable of 240mm ² per phase plus PE
Maximum size of 400VAC Conduit	160mm diameter
Auxiliary outlets	1x 230VAC single phase socket with 6A breaker, RCD protection
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 counterweight. 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. If control circuit becomes non functional, charging is stopped and the pantograph is automatically raised.
Kneeling during charge	Yes
Operation Altitude	< 1000m
Operation Temperature	-25°C to 45°C
Operation Maximum Humidity	95% non condensing
Maximum Wind Speed	36m/s
Maximum Snow/Ice Load	0,4kN/m ²
Expexted Lifetime of Mechanical and Aesthetic Qualities including paint	10 years at 100 charging cycleses/day when observing proper maintenance
Enclosure Impact Withstand	IK08
Structure Impact Withstand	IK10
Free height over road (depends on foundation)	5m
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 pedestrians and for maintenance personnel.
Pedestrian protections	No sharp edges or point objects accessible to pedestrians
Designation	Explanation
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
Special Maintenance Feature	Pantograph can be moved manually by trained maintenance personnel, protected by a key lockable switch.
Emergency Switch	Emergency switch accessible from outside, switches off high power DC power circuit and raises the pantograph using mechanical counterweight.
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.