



ELMARCO

GOOD FORM FOR LIGHTING

AMPER MASTER

INTRODUCTION

Nowadays most car manufacturers offer vehicles with hybrid or electric drive. Current regulations oblige local governments and investors (developers, etc.) to secure spots for charging electric cars in public car parks. Our stations charge the batteries quickly and safely, and the integrated light source provides user comfort and safety.

The charging time varies depending on capacity of the battery, power of the onboard charger and power of the charging station.

On the market, we have

AC chargers 1-phase with 3,7 - 7,4 kW power,
3-phase with 11 - 22 kW power

DC chargers with built-in rectifier with a high charging current of 100 - 300 A.

A medium-sized car has an average battery capacity of about 50 - 60 kWh. Driving 100 km consumes about 20 - 24 kWh. During normal use, the car battery is hardly ever completely empty.

EV power & charging speed comparison

Charging speed means how many km are added to range during charging per hour and can be calculated as:

$c = P / E$ c - charging speed (km per hour)
P - charging station power (kW)
E - energy consumption of the car (kWh / km)

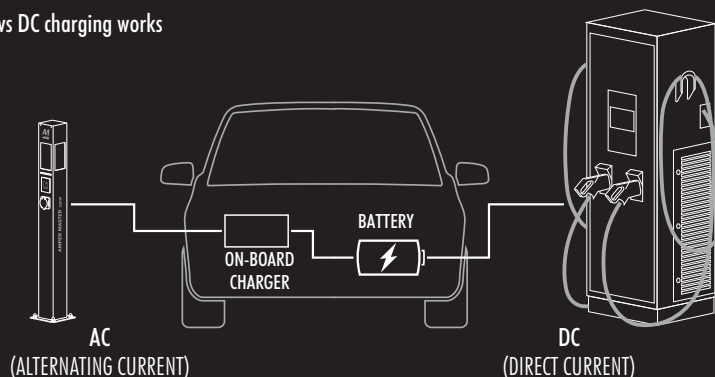
An electric car with energy consumption of 22 kWh/100 km (0,22 kWh / km) charging speeds with various charging station powers (range gain per hour):

$c = 3,7 \text{ kW} / 0,22 = 17 \text{ km}$
 $c = 22 \text{ kW} / 0,22 = 100 \text{ km}$
 $c = 70 \text{ kW} / 0,22 = 318 \text{ km}$

Connector type	Type 1/2 1-phase	Type 1/2 1-phase	Type 2 3-phase	Type 2 3-phase	CHAdeMO 3-phase	CCS2 3-phase
	16A 230V	32A 230V	16A 380V	32A 380V		
Power (kW)	3,7	7,4	11	22	50 - 100	150 - 300
Charge Time 10 - 80 % (h)	24	12	8	4	1	0,5
Charge Time for 100 km drive (h)	6	4	2	1,0	0,3	0,15
Range charging per hour (km)	17	34	50	100	320	—
Typical application	Home	Home, work place	Home, work place, shopping center, hotel	Work place, car parks, shopping center, hotel	Shopping center, car parks, highways	Shopping center, car parks, highways

The presented content is for information purposes only. Based on specialist literature and in-house expertise.

How AC vs DC charging works



An AC charger uses power from the grid which is supplied in AC (Alternating Current), which is then converted to DC by the vehicles on-board charger. Charging speeds can be limited due to size constraints.

A DC charger supplies power directly to the battery management system (BMS) inside the vehicle, with no on-board charging infrastructure needed inside the vehicle. Higher power can be supplied meaning charging time can be considerably faster.

Types of charging connectors



Type 1 - A five-pin plug, which is common for American and earlier Asian vehicles, it's a single-phase plug and can charge at a speed of up to 7,4 kW.



Type 2 - A seven-pin plug, typically found on most European and Asian vehicles from 2018 onwards, it's a triple-phase plug, enabling you to charge your car at a speed of up to 22 kW at home and up to 43 kW at public charging station.



CCS2 - This is an enhanced version of the Type 2 plug, with two additional power contacts for the purposes of rapid charging. It supports AC and DC charging. It allows up to 350 kW charging speed.



CHAdeMO - This connector allows high charging capacities as well as bidirectional charging. Currently, Asian car manufacturers are offering EVs with a CHAdeMO plug, allowing charging speed up to 100 kW.

PRODUCT DESCRIPTION:

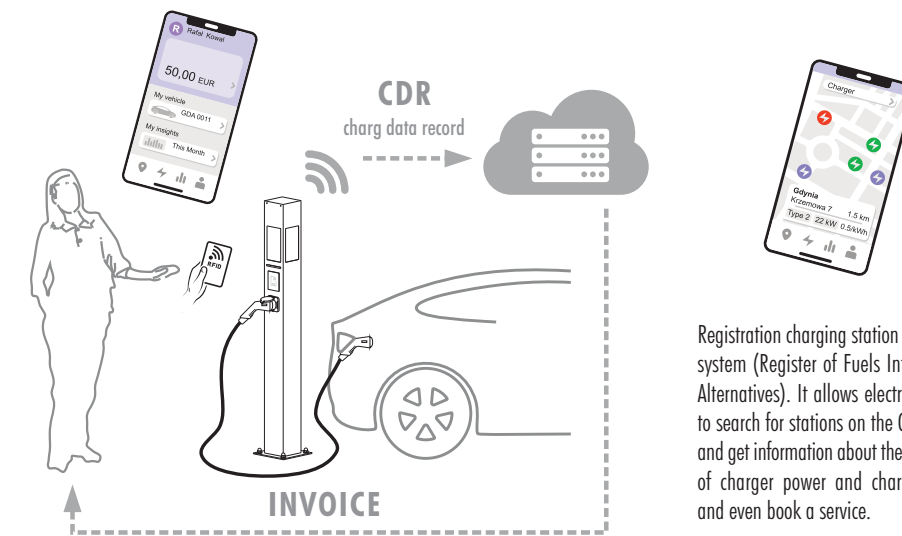
The option for private use are stations activated by plug in the charging cable or by key switch: the **AM B** version (BASIC).

Stations installed in public places require one of several configurations that differ in access and management.

Access via local **RFID** cards - billing by the premises manager/owner as an operator to a limited groups of users, using a server (e.g. hotel reception, office management) - the **AM P** version (PLUS).

Access and billing through the server of electricity provider, e.g. from Eo City, Green Line: the system allows access via the mobile application and **online payment** - the **AM S** version (SMART).

Server - the PC class computer working in a continuous mode connected to the In-ternet integrates the station with the vehicle, it also allows to read the energy consumed and calculate the fee.



Registration charging station in the **EIPA** system (Register of Fuels Infrastructure Alternatives). It allows electric car users to search for stations on the Google map and get information about the availability of charger power and charging price, and even book a service.

Public chargers require registration of the installation in **UDT** (Authority of Technical Inspection).

PRODUCT FEATURES:

Aluminium body 150 x 150 x 1500 mm or Ø 160 mm,
 Weight: 12 kg,
 Charging socket: IEC62196 type-2, 32 A,
 Over current protection 32 A,
 Residual - current protection 30 mA type A, 6 mA DC,
 Overvoltage protection type-2, 350V / 1500 V,
 Energy measurement: MID energy meter,
 Build-in LED charging status indicator,
 Cable lock system,
 The socket lock releasing in the event of a power failure,
 Certificates: CE, ROHS,
 Work temp.: - 30° - + 45°,
 Class: IP54, IK08, Insulation class: I,
 Network layout: TNC-S, TN-C, TT,
 Ground mounting to the foundation,
 Minimum required power supply cable cross section: 11 kW - 4 mm², 22 kW - 6 mm²,
 Dynamic Load Management: 11/15/18/22 kW (16/20/25/32 A), on request

Communication with the server is provided by: LAN cable (Ethernet), WIFI modules or GSM module (required SIM card from mobile phone systems).

OCP communication protocol: OCPP 1.6J (allows for intelligent operation and remote on/off switching), LED fixture 10-18 W, Controlled by twilight switch or astronomical timer.



S



VACANT



OCCUPIED



S



SMART mobile APP
 RFID card
 OCPP
 Cable Lock system

ACCESSORIES



IMPACT PROTECTION



FMK



FMO

FBK 90/18 or FMK 90/18 foundations applicable for all models.



index	product	dimensions		power kW	terminal S/mm ²	power supply	LED lamp W	energy meter	RFID / billing	UDT Tech. Inspection Authority
		H/cm	S/cm							
193-1111-000008	AMPER MASTER B K 3,7	150	15	3,7	≥ 4	1 ph	15	no	no	no
193-1111-000009	AMPER MASTER B K 7/11*	150	15	7,4/11	≥ 4/6	2/3 ph	15	no	no	yes / no
193-1111-000010	AMPER MASTER B K 11/22	150	15	11/22	≥ 4/6	3 ph	15	no	no	yes / no
193-1111-000011	AMPER MASTER B O 3,7	150	16	3,7	≥ 4	1 ph	15	no	no	no
193-1111-000012	AMPER MASTER B O 7/11*	150	16	7,4/11	≥ 4/6	2/3 ph	15	no	no	yes / no
193-1111-000013	AMPER MASTER B O 11/22	150	16	11/22	≥ 4/6	3 ph	15	no	no	yes / no
193-1111-000014	AMPER MASTER P K 11/22	150	15	11/22	≥ 4/6	3 ph	15	MID	RFID	yes
193-1111-000015	AMPER MASTER P O 11/22	150	16	11/22	≥ 4/6	3 ph	15	MID	RFID	yes
193-1111-000016	AMPER MASTER S K 11/22	150	15	11/22	≥ 4/6	3 ph	15	ME	online	yes
193-1111-000017	AMPER MASTER S O 11/22	150	16	11/22	≥ 4/6	3 ph	15	ME	online	yes

* B 7/11: P- 7,4kW, 2 ph; 11kW - 3 ph supply. Approximate data in the tables for 2024. Additional data available in the specification.

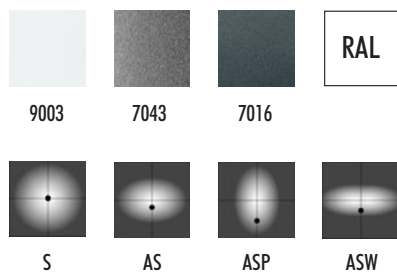


AM O



AM K

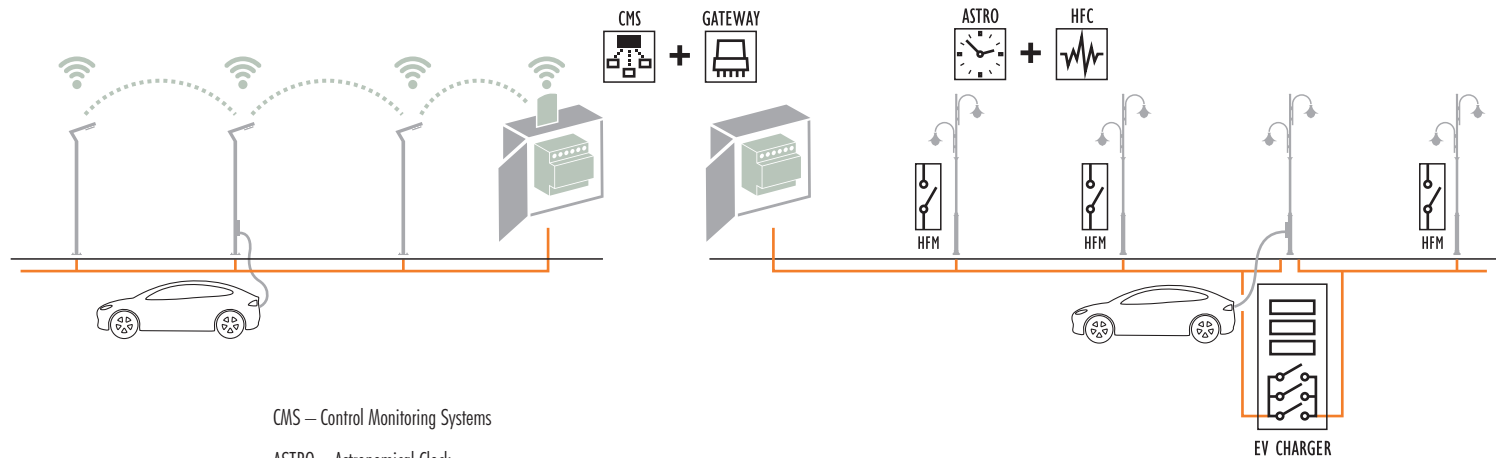
Amper Master is a durable and modern solution for charging electric cars integrated with a lighting lantern.



Lantern types integrated with the AM charging station.

SMART NETWORK CONTROL

STANDARD NETWORK CONTROL



CMS – Control Monitoring Systems
 ASTRO – Astronomical Clock
 HFC – High Frequency Control
 HFM – High Frequency Module

6.0 m
5.0 m
4.0 m
3.0 m
2.0 m

7.0 m
6.0 m
5.0 m
4.0 m
3.0 m
2.0 m



ELEW

GARNIZON

BOVER

BOKARD

AM K

AM O

BOLARD

PALIO

SEVILA

AREM

(two charging spots option)

(two charging spots option)



INFO

Charging point – a device enabling charging a single plug-in electric vehicle.

Charging point with normal power - charging point with a power of $3.7\text{kW} < P < 22\text{kW}$.

Charging station - a device with at least one charging point with normal or high power, i.e. $> 22\text{kW}$, used for providing charging services, equipped with software and a parking space.

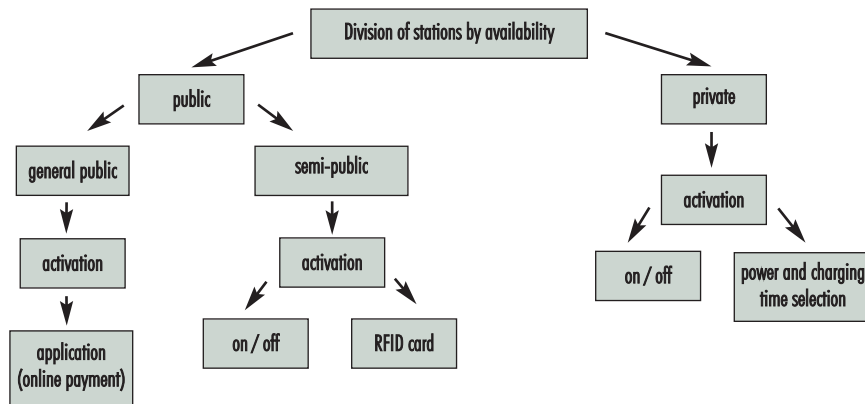
Semi-public charging station - if the station is available only to a group of users, e.g. hotel guests, community residents.

General public charging station – a charging station available on the basis of equal treatment for every user.

If the owner of the charging point and the electric vehicle is the same person/entity, there is no charging service and it is not subject to the Technical Inspection Authority tests.

In the case of a device installed e.g. by a community and the device is available to its residents, this case of semi-public charging stations are subject to UDT tests.

Each public charging station is subject to technical inspections. If the operator wants to use the station or charging point, is obliged to submit application for a technical inspection to the Technical Inspection Authority. The exception are devices with a power of up to 3,7 kW installed in non-public places.



Dear Customers,

As a manufacturer, we closely monitor the trends and requirements of the changing market, constantly expanding our offer and the standards of our work.

Our regularly developing offer keeps up with global trends and is a strength of our company. Due to unique technologies and technical background, we not only produce catalog products, but also carry out individual projects.

Taking care of the natural environment, we work within **the idea of sustainable development**.

Aluminum, as the basic material for Elmarco products, meets all utility and pro-ecological expectations (85% energy savings through recycling).

The products are manufactured in our plant with a cubic capacity of 12,000 m³ in the environment and employees friendly conditions, in accordance with implemented system of Factory Production Control (FPC) based on Polish and European standards and directives.

We carry out production processes in our own locksmith, welding, carpentry, painting and assembly departments. Consequently, we have a full control over the production process and quality as well deliveries on time.

The high quality of our products and their safety is confirmed by the external accredited laboratories (including Zetom, ViTom) in photobiology, energy efficiency, photometry and compliance with the Elmarco PBS requirements.

The certification process includes regular inspections at the production plant. It authorizes Elmarco to mark its products with the European **CE** mark.



