Technical Specification

info@versol.lv +371 20 40 2372 Lielirbes iela 1, Rīga Latvija, LV-1046 www.versol.lv

Electric scooter charging station

Off-grid

1. Product designation

The solar scooter charging station has been designed to provide the possibility of charging electric scooters in public spaces. The station is equipped with 4 charging posts with a spiral charging cable. On the roof of the station there are photovoltaic panels supplying energy to the batteries placed in the frame.

Detailed description:

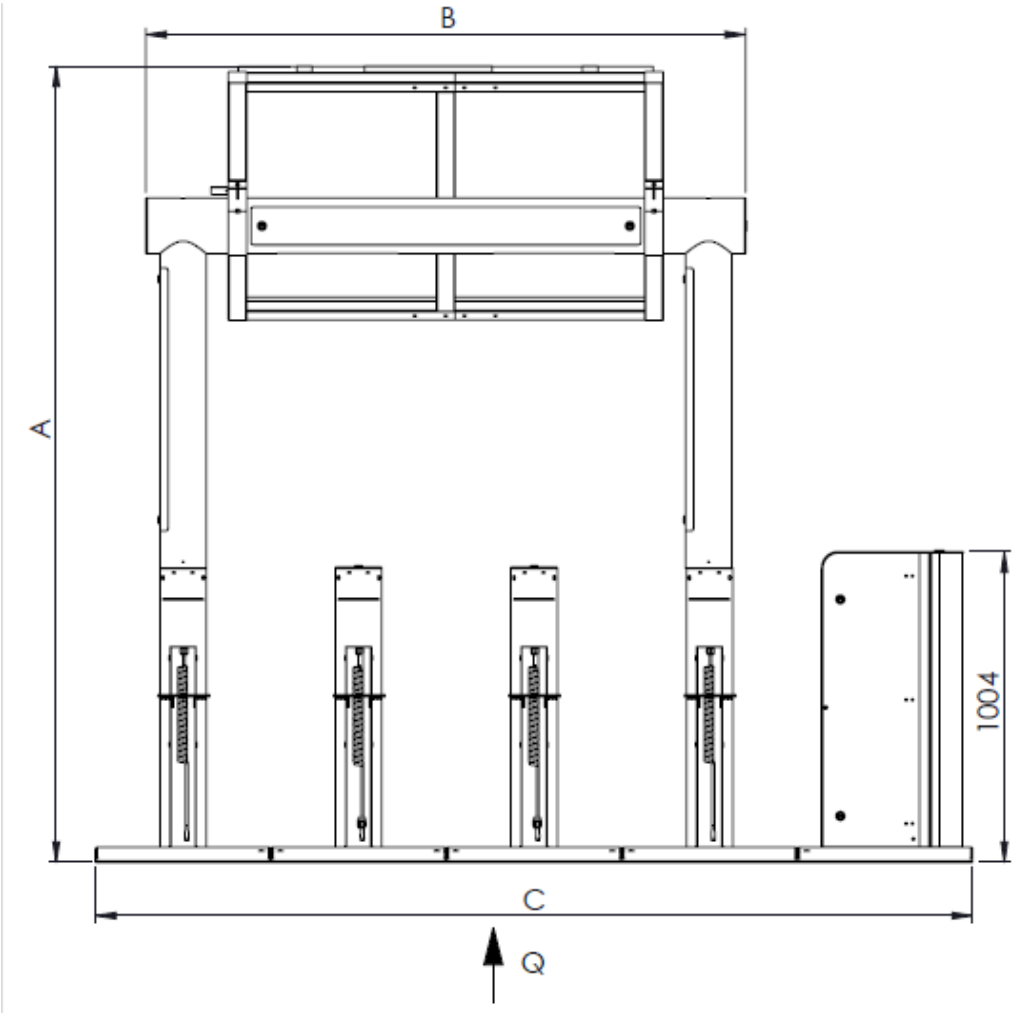
- 1 module, each with 4 charging posts;
- the module has a metal cable tray, which is also a connector for the modules;
- 4 pieces of charging outputs for scooters - 1 charging output per 1 bar;

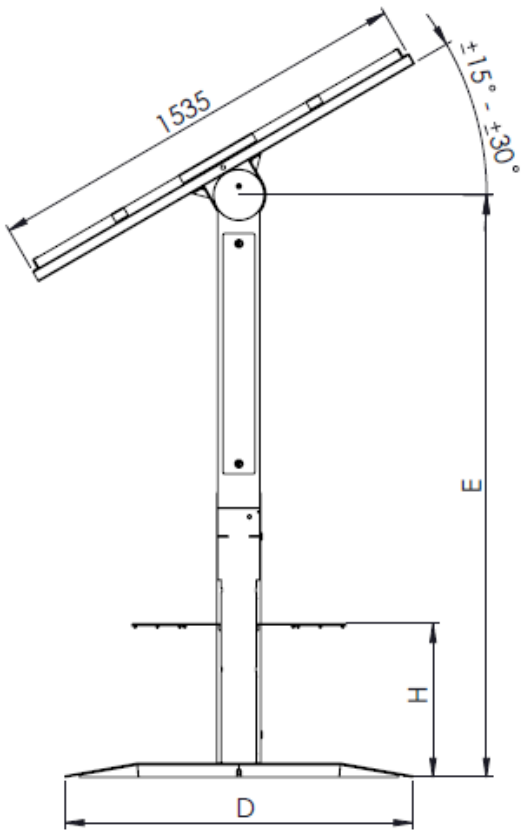
- each post has a scooter parking holder with a minimum width of 50 mm and a maximum width of 80 mm;
- the station is equipped with a service door providing separate access to each of the bollards and control electronics, secured with a lock with a unique key.
- the station has an adaptive system for mounting photovoltaic panels, allowing them to be oriented towards the sun with the possibility of adjustment every 15 degrees;
- each exit is terminated with a spiral cable of minimum 70 cm in total length, terminated with a DC 2.1 / 5.5 mm male connector. The braid of the cable is resistant to weather conditions, made of polymer.

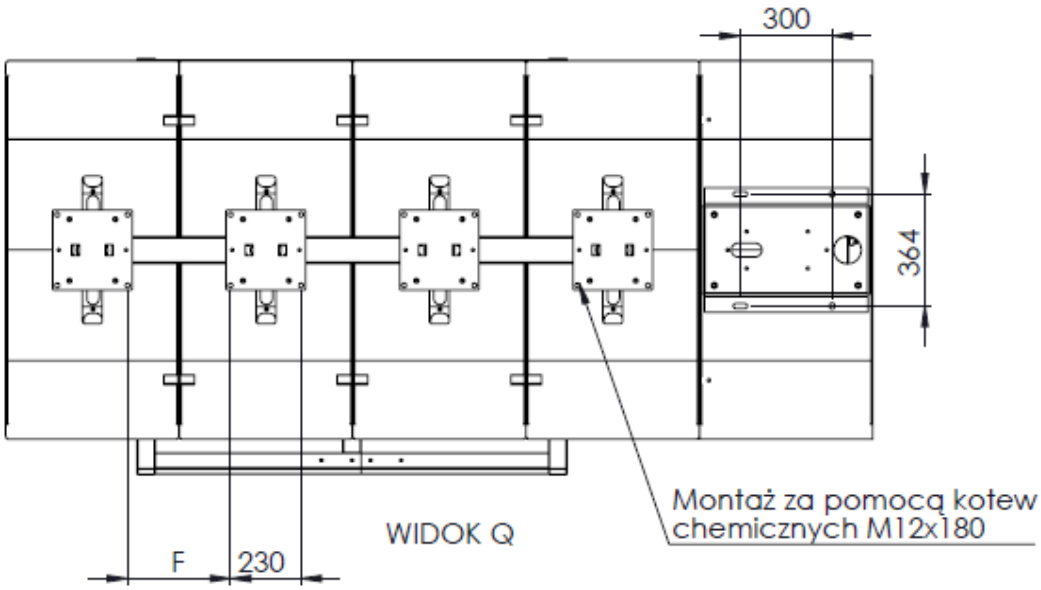
2. Technical specifications

1. Mechanical specifications

a) Dimensions




1535
±15° - ±30°
E
H
D


300
364
F
230
WIDOK Q
Montaż za pomocą kotew
chemicznych M12x180

Safety belts around the station

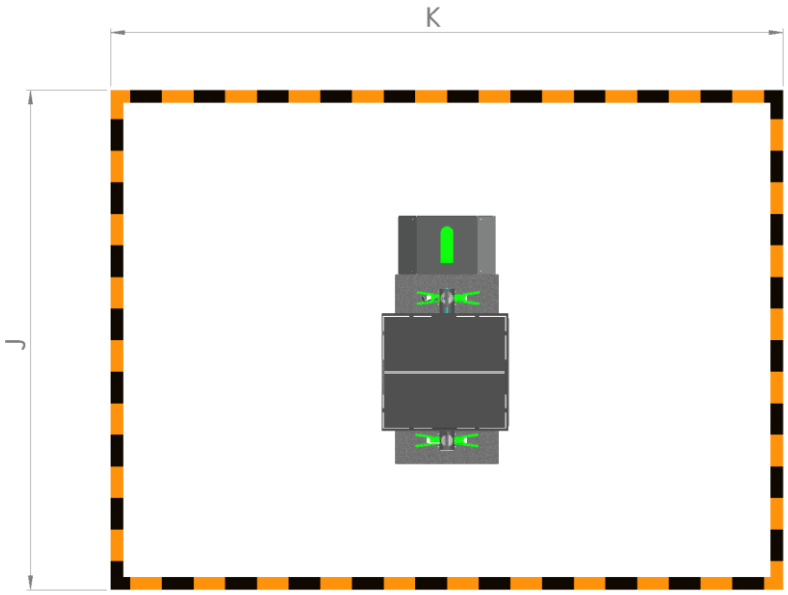


Table 1. Dimensions

Parameter	Value [mm]
A	2574
B	1938
C	2834
D	1232
E	2057
F	336
G	230
H	542
J	5967
K	8000

b) Material

The station should be made of materials resistant to weather conditions, additionally it is powder coated in RAL 7016. The main structural elements are made of galvanized steel and powder coated, which ensures appropriate strength properties, durability and aesthetics. The material specification is given in table 2.

Table 2. List of materials from which the device elements are made

Station elements	Material
Station enclosure	PA11- EN AW-5754 Aluminum
LED cover	30% opal polycarbonate / acrylic glass
LOGO cover	Milled polycarbonate th. 4 [mm]
Solar panel Z-profile	AISI 304 stainless steel
PC scooter holder	PE High density
Electronics board	PA11- EN AW-5754 Aluminum

The station is made entirely of non-flammable or flame retardant materials. It is resistant to both fire and high temperatures.

c) Station endurance
The maximum permissible static load of the station is: 500 kg.
The construction of the station ensures resistance to dynamic loads of natural origin (wind, snow).
The manufacturer is not responsible for any damage to the station resulting from vandalism.

2. **Electric specification**

The station is an electrical device, therefore, despite the low voltages in the system, it should be handled in a manner appropriate for this type of device.

Table 3. Electrical specifications

Component	Tension [V]	Prąd [A]	Description
LED lighting	12 DC	0,4/m	IP65, 60 Led/m
Battery	12 DC	60 Ah	Lead batteries should be matched to fit in the housing frame.
Electronic internal system	12 DC	Max. 20	It communicates with the management board using the built-in 2G SIM card module
Photovoltaic panel - system	12 V	Max. 20	Nominal power - 340 W
Output voltage	42 - 48V	Max 1 A	Voltage depends on the scooter system

Detailed description

- Lead batteries, each with a minimum capacity of 15Ah, operate at the rated voltage of 12V. The batteries are matched to fit in the housing frame.
- Photovoltaic panels - minimum 340 W of total power per module, rated voltage 12 V, divided into 2 panel modules per 1 charging station module.
- Energy management system and battery charging inside the station. This system measures the voltage and current of the photovoltaic panels as well as the voltage and current of the battery charging. It is equipped with the ability to handle 2 photovoltaic panels per 1 module and the ability to measure each battery separately. The system has 4 managed 12 V outputs with the ability to measure voltage and current at the output. The system has the ability to remotely manage the output current.
- Voltage conversion system from 12 V to 48 V. This system has a minimum of 4 outputs with a voltage of 48V with the possibility of adjusting the charging current. Adjustment should be done remotely.
- An anchoring system ensuring stability and safe operation. Anchoring should take place at least 8 spaced M12 anchors.
- Connection to the remote work measurement analysis system - sent to the remote management system of parameters on battery current and voltages, current and voltages on photovoltaic panels as well as current and voltages at the outputs for scooters.
- The electronics communicate via a SIM card operating in the 2G communication standard. Data sent should be in json format.
- The device measures temperature, humidity, and LED lighting inside the station. Temperature measurement will turn on / off the batteries at a temperature of -15 and + 50 degrees C in order to prevent their damage. LED lighting is controlled by a twilight sensor and a motion sensor (PIR).
- The device has a GPS module that sends the device position to the administrator.

3. Installation

In order for the installer to be able to properly carry out the installation, the relevant requirements on the part of the Employer must be met. Their fulfillment determines the correct operation of the device, and at the same time its maximum efficiency and meeting the assumptions and manufacturer's declaration.
Failure to meet the requirements described in point 3 may result in the inability to achieve the parameters declared by the manufacturer.
After the mechanical installation, the station function is activated. The activation is made by the company's service. All functionalities are activated during activation.

a) Location requirements

The requirements in Table 4 are the requirements for the general siting of the equipment. Their fulfillment is important primarily due to the appropriate operation of the system's electricity source - the photovoltaic panel.

Table 4. Location requirements for the device

Parameter name	Indication	Range
Station orientation	Stations should be able to be mounted so that the panel faces south	- 20 degrees / 45 degrees
Shadow	The station should be located in an area that is not shaded	Shading max. 20% of the panel area during the day
Terrain	Stations should be installed on a paved area that provides a stable position and allows for anchoring	-----
Proximity to water	As stations are electrical devices, they should be installed away from bodies of water and watercourses	>15 m from sea shore
Pollution	The device is equipped with the highest quality components, but excessive dust may hinder its operation. If it is necessary to install the device in a dusty place, inform the Manufacturer about it.	----

Temperature	The stations are designed for operation in the Eastern European zone, so the operating temperature range is also limited. If you anticipate going outside the operating range, please contact the manufacturer to adapt the product accordingly	- 20 st. C to 50 st. C

b) Direct installation requirements

In order to meet the anti-theft requirements, and at the same time ensure the long-term operation of the station at the customer's location, the Installer will anchor the station, unless the customer clearly indicates otherwise.

In the event that the station is not anchored, at the express request of the customer (or due to the impossibility to perform such an operation, e.g. in the event of unstable surface such as gravel, sand), it is recommended to additionally insure the station against theft / damage on its own, as well as purchase of additional monitoring systems (the manufacturer's system provides for internal monitoring, but it is not a specialized anti-theft system).

Direct installation requirements:
- Leveled terrain (unevenness deviation at the level of max 2 cm)
- The area is additionally hardened at the corners, preferably with a concrete screed, to which the anchors will be attached (the location of the corners is consistent with the dimensions of the station)
- Lack of installations, pipelines, etc. under the station installation site;
- In the absence of an additional screed, an on-site visit by the installer is required to assess the conditions and their suitability for installation
- Level area (to ensure proper operation of the device). The permissible deviation from the level is a maximum of 15 degrees)
- The installer, after prior on-site inspection, may perform these works on behalf of the contracting authority, but an additional fee will be charged, in accordance with the installer's price list - depending on the results of the on-site inspection.

The device should be installed so as not to disturb communication routes. It is recommended to leave a margin of at least 1.5 meters for pedestrians or follow the relevant regulations. It is recommended to install the station along the communication routes so that the user has the freedom to drive up with a scooter / bicycle.

c) Maintenance

Seasonal maintenance / technical inspection is performed by the Manufacturer's service at least once a year at the customer's request. The ongoing maintenance is the responsibility of the customer. It should consist in keeping the station clean and preventing excessive dust.
Any doubts noticed during the current maintenance should be reported to the manufacturer's service.

4. Contact

If you have any questions or concerns, please contact the Manufacturer via the website or by phone:
www.versol.lv
Tel. +371 20402372

5. Standards, regulations and certificates

The products comply with the following international regulations:
DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 2014/30 / EU (on electromagnetic compatibility)
DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 2011/65 / EU (on the restriction of the use of certain hazardous substances in electrical and electronic equipment)

List of standards and certificates for station components:
- Paints: Qualicoat class 1 P-0570 (KABE)
- Steel: manufactured in a plant with the ISO 9001: 2008 system implemented
- Electronics: DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 2014/30 / EU
- Batteries: EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 2013/56 / EU on batteries and accumulators;
- PV panels: PN-EN 60904: 2008 Photovoltaic elements
- LED light: PN-EN 62031: 2010, LED modules for general lighting purposes