Technical attachment

GARDA UNO SPA via Barbieri 20
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tel 030 9995401 fax 030 9995460
www.gardauno.it

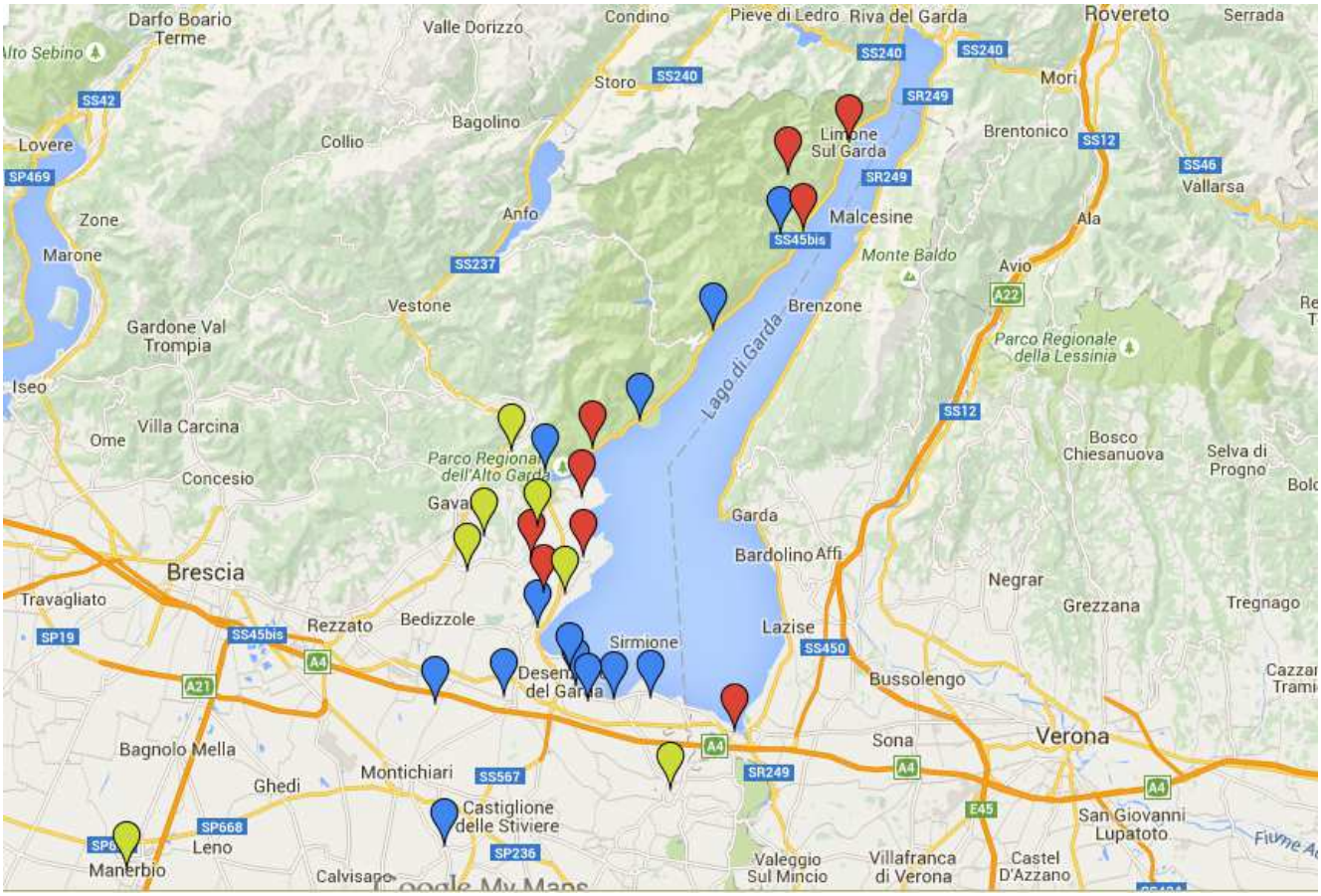
1. The project and its objectives

The developed infrastructure allows the diffused charging of batteries installed on electric vehicles (autovehicles and motorcycles) on the shore of the Garda lake belonging to the Province of Brescia. The charging process, in agreement with what is reported on the "National Plan for electric vehicles charging" will be "fast" for autovehicles (7 kW) and slow for motorcycles (3,5 kW).

All the charging stations installed on public land will be accessible through the use of a single card called "Mobility Card", sold by devoted distribution points chosen by the Company and indicated on the Internet website under the "Mobility" section. The card is personal and not transferable. The card will: authorize energy supply, manage the vehicle connection and disconnection to the energy supply socket and count the timing and the energy quantity supplied by the charging process.

The project foresees three development stages as reported in the following map:

Phase I – under development
Phase II – under development
Phase III – beginning of construction works foreseen in Spring 2016



The Company objectives and aims are the following:

- **Foster**, in a structural and capillary way, the use of electric vehicles as daily experience based on the concept of normal and continuous use of "green" vehicles;
- **Develop** a 100% green network of charging columns with the aim of diffusing the sustainable electric

mobility on the shore of the Garda lake belonging to the Province of Brescia;

- **Provide** a network of charging columns on the Garda territory that can be well connected to the stations of near future development on the major road axes (A4 and A22);
- **Incentive** new forms of tourism, with particular reference to those Countries where this mobility mode is already diffused, guaranteeing access to the service through easily consulting websites (apps) where itineraries and travels can be programmed;
- **Diffuse**, in an economic way, access modalities to the service simple and easily available, even involving tourist offices, local receptive structures and public exercises;
- **Allow** the whole charging columns network control and consultation by remote in order to generate user reports and develop new incentive ways for the initiative;
- **Program** the initiative diffusion thinking about a starting path developed in three realization steps of 14, 10 and 7 charging columns, equal to an overall amount of 62 charging points for autovehicles and 32 for light vehicles (motorcycles and quadricycles);
- Constantly **Inform** the local administrations and citizens on the fulfilment of the project objectives.

2. Electric charging column

There are two types of charging columns uniformly diffused on the Garda territory and belonging to Garda Uno Spa infrastructure:

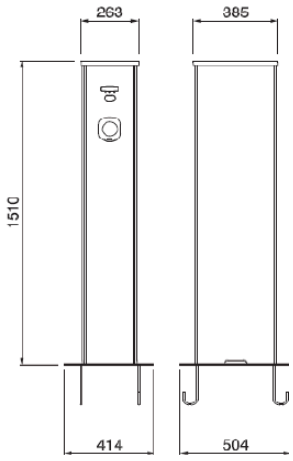
- **Charging column for autovehicles**

  It is a bifacial charging station with two type 2 sockets, one for each side, with a nominal power of 7 kW each. Whenever the autovehicle is able to receive a lower input of electric energy the charging column-autovehicle system will be able to automatically define the energy delivery and assure a completely safe charging.

Reference regulations

EN 61851-1 (2011)
Electric vehicle conductive charging system.
Part 1: General requirement.
EN 61439-1 (2011)
Low-voltage switchgear and control gear assemblies.
Part 1: General requirement.

Dimensions



Technical features

Nominal current	32A
Nominal Voltage	400Vac
Frequency	50-60Hz
Insulation voltage	500V
Protection level	IP54
Working temperature range	-25°C +40°C
Material: Steel sheet	Lamiera d'acciaio
Glow wire test	-
IK level at 20°C	IK10
Colour: grey	Grigio
Assembly: with basement	A basamento
Saline solution: resistant	Resistente
UV rays: resistant	Resistente

- **Charging column for autovehicles and motorcycles**

It is a bifacial charging station with 4 sockets: two of type 2 (higher sockets) and two of type 3A (lower sockets), one for each side. The type 2 sockets are able to supply 7 kW each while the type 3A sockets deliver a maximum power of 3,5 kW. Whenever the autovehicle is able to receive a lower input of electric energy the system charging column -autovehicle will be able to automatically set up the energy supply and assure a completely safe charging phase.

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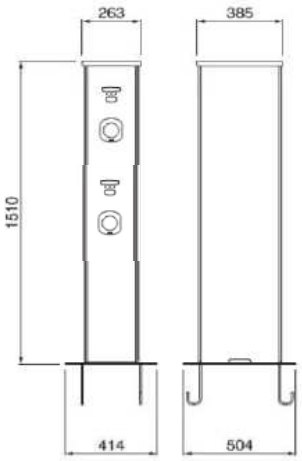

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Saline solution: resistant	**Resistente**
UV rays: resistant	**Resistente**

In the higher part all the columns present a luminous terminal divided into two sections: one devoted to the right plug group and the other one for the left plug group.

ILLUMINATED TERMINAL

The terminal can show three different colours:

- Green = charging column available
- Light blue = charging in progress
- Red = charging column not available

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Each display can interact with the user through 4 different languages (English, German, French, Spanish plus Italian) thanks to a manual selection that can be activated using the green button located under each RFID reader.

Furthermore, on each column the reference numbers to receive assistance and warn Garda Uno SpA for a failure or sudden stop of the charging station are indicated.

3. Connectors

	
TYPE 2	**TYPE 3A**

- **TYPE 2**

The connector, even called Mennekes, can be single phase (16A - 3,5 kW) or 3 phase (64A - 42 kW) and is devoted to electric vehicles of more than 3 kW, like autovehicles. It shows a CP contact for the pilot circuit and a PP for the identification of the cable dimension, info needed for a quick charging solution.

- **TYPE 3A**

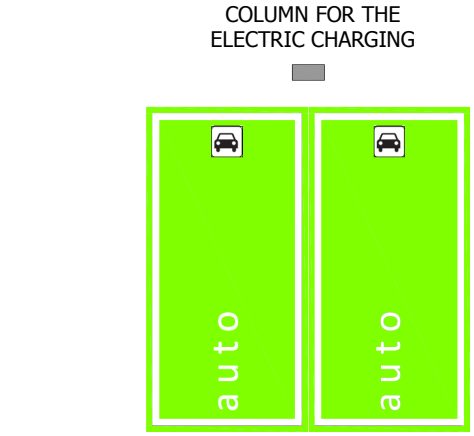
The connector shape derives from the Scame IEC309 plugs with a quick Snap-on closure device with the presence of an additional CP contact for the pilot circuit to test the continuity of the protection conductor in compliance with standard CEI 69-6. It can be used only for single phase applications (16A - 3,5 kW) so that it is usually mounted on small size vehicles like scooters and motorcycles.

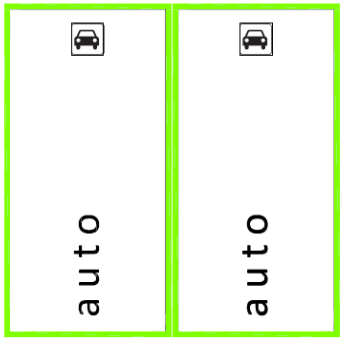
4. Parking areas

Two main column typologies will be foreseen:

- **Columns for autovehicles**

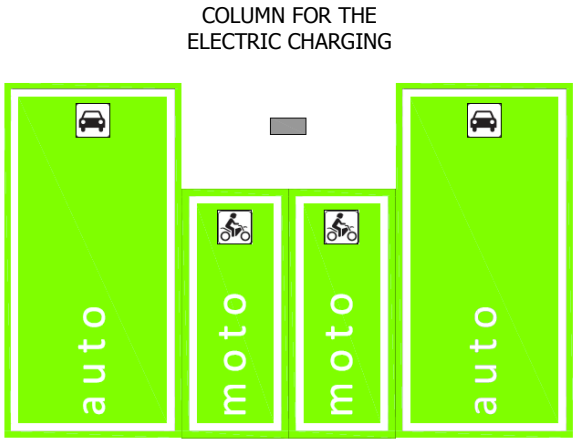
The charging column is centrally located with respect to two parking lots at a maximum distance of about 1 m from the car hood.





- **Columns for autovehicles and motorcycles**

The charging column is centrally located with respect to 4 parking lots divided into 2 parking places for autovehicles and 2 for motorcycles. In the case of a quadricycle, the user will park on the 2 parking lots devoted to light vehicles.



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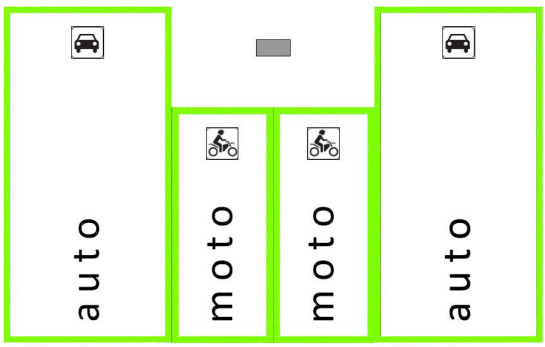
COLUMN FOR THE
ELECTRIC CHARGING



All stations present devoted informative panels for the users illustrating the charging process. Furthermore, where it has been possible, in agreement with the project choices and completely respecting landscape criteria characterizing the lake areas where the project has been developed, areas have been painted green as reported in the image here below:

The horizontal signposting will be developed with materials and qualitative features in compliance with the technical requirements foreseen by ANAS specifications.

The no parking vertical signposting for non electric vehicles will be installed in compliance with art. 39 of the Street Regulation.

5. Informative panels

At each station, beside each charging column some informative panels will be located to support the user in the vehicles charging process.

Panels will be composed of:

- Frontal side: description of the charging process step by step;
- Back side: map with the available electric charging columns.

On the side of the column itself the contacts needed to receive further assistance or give warnings of service failures will be available.

6. Best practices and actions that foresee penalties

The parking lots associated to each column are reserved to the owners of autovehicles/motorcycles under charging process. On the devoted areas a no parking ordinance is addressed to all non electric vehicles that can be sanctioned by the competent authorities. Each vehicle type must occupy its specific lot. In the case of a quadricycle the user is obliged to park the vehicle in the areas devoted to motorcycles.

At the end of the charging process the user receives a text message and it is compulsory to move the autovehicle within 30 minutes in order to leave the area free and available for a new charging process.

In case of failures or technical problems the user must warn the Company about the service anomaly using the devoted green number, reported in the following chapter. It is strictly forbidden to force the system and activate personal procedures.

7. Contacts

For more info and assistance consider the following contacts:

- Garda Uno SpA Research and Development Office
  Via I. Barbieri 20
  25080 Padenghe s/G

- Garda Uno SpA website: **www.gardauno.it**

- Garda Uno SpA Green number: