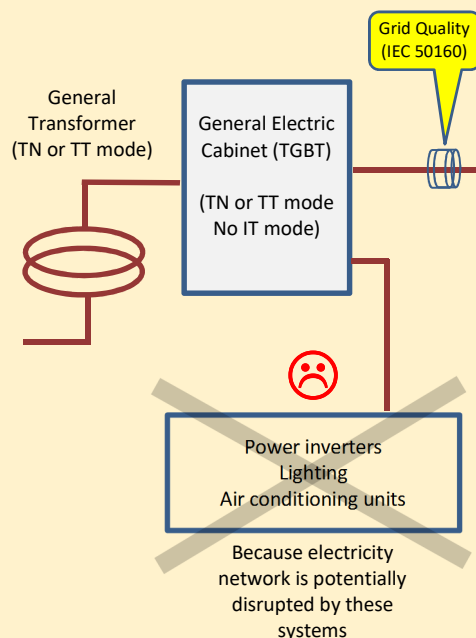


CAR SHARING – Charge Infrastructure Requirements for EV Renault

EV Renault Car Sharing project must respect all EV standards, especially charge infrastructure.
Below the most important requirements, all driven by **ZE Ready 1.4D** compliance for hardware, installer and installation.

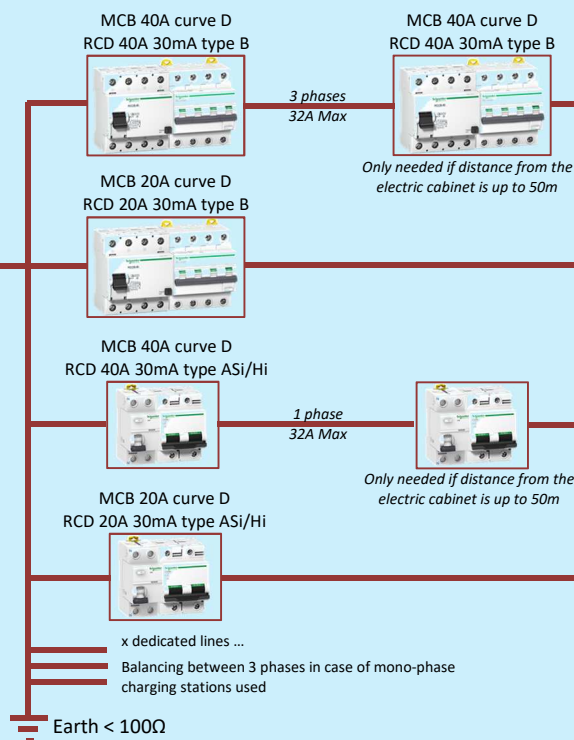
ELECTRIC DISTRIBUTION



ZE Ready 1.4D

- A TN or TT ground system (**not IT**), with a value of ground less than 100 Ohms.
- A dedicated wire between the transformer and the dedicated electrical cabinet (used for charging stations electric protections)
- Avoid using an electricity network potentially disrupted by power inverters, lighting, air conditioning units, ... because ZOE refuses to load on an electric grid that do not respect the European standard IEC 50160 (harmonic perturbations)

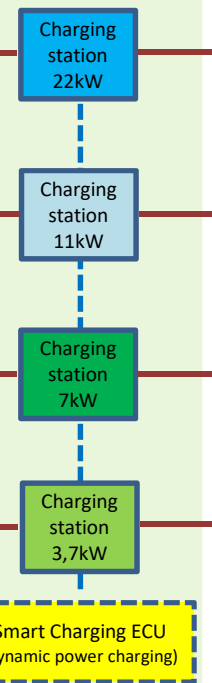
ELECTRIC PROTECTIONS



ZE Ready 1.4D

- **Earth ground < 100Ω**
- A dedicated wire between electrical cabinet and the terminal, with electric set protections.
 - If wire between electrical cabinet is longer than 50m, another protection set is needed just before the charging station.
 - If double plug charging station is using, it's not possible to mix the input electric line and the security.
- Electric Protections specifications :
 - Setting +20% for the maximum current
 - Thermic protection Curve D
 - **Differential tripping** with DC leakage detection
 - **Type B for three-phases (11 & 22kW)** (or Type A with DC leakage module)
 - **Type A Si or Hi for one-phase (3,7 & 7kW)**
- No differential switch type AC ahead (due to problem of selectivity)

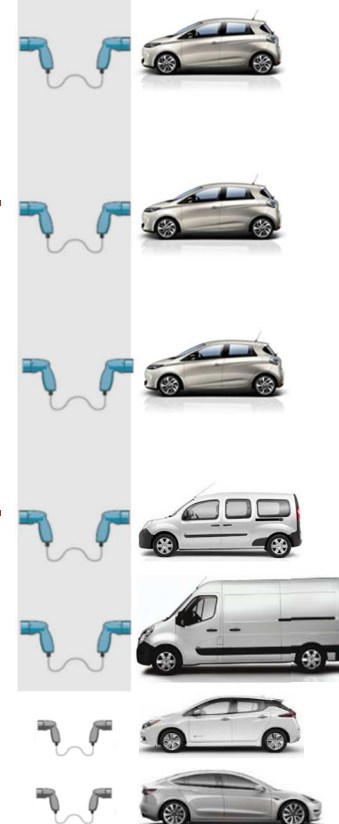
CHARGING STATIONS



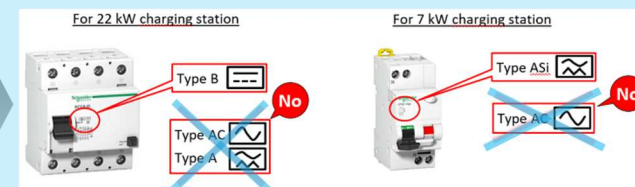
ZE Ready 1.4D

- Charging stations are referenced by LCIE (**specific list**)
- Else, contact Renault
- In case of Smart Charging System, contact Renault

CABLE



- Charge cables must be Renault Approved
- Else, contact Renault



EV Renault Car Sharing project must respect all EV standards, especially charge infrastructure. Below the most important requirements, all driven by ZE Ready 1.4D compliance for hardware, installer and installation.

1. **Charge Cable**

The charge cable must be the one sold by Renault : cable Mode 3 Type 2 (32A-three-phases) ref 82 01 415 224 / Cable Mode 2 Type F (10-14A-mono-phase) ref 82 01 489 213
In other case, contact Renault.

2. **Charging Station**

To ensure personal safety, performance and interoperability with all electric vehicles, the charging station must be compliant with the current **EV Ready 1.4D** standard. This standard now consists of 53 technical requirements, which are a synthesis of all existing standards on charging electric vehicles.

http://www.asefa-cert.com/marque_EV_READY

The **ZE Ready 1.4D** standard adds 9 technical requirements to the EV Ready 1.4D standard, in order to guarantee 100% charging of Renault vehicles. This is the reference for Renault.

http://www.lcie.fr/990/infrastructures_de_charge/z.e._ready/

On this internet site, all ZE Ready 1.4D certified charging stations are listed by reference, by supplier and by country.

http://www.lcie.fr/999/ze_ready/base_des_licenci%C3%A9s_produits_et_installateurs_associ%C3%A9s/

In case of using a non-certified ZE Ready charging terminal, it is imperative that Renault obtains the following items in order to apprehend future difficulties when charging :

- Technical differences on each technical requirement.
- The internal wiring diagram of the charging station.

3. **Installer**

Like the charging station, it is strongly recommended that charging station installers themselves be EV Ready 1.4D certified. In France, this certification is issued by ASEFA. This is the essential guarantee for a charging infrastructure that respects personal safety, be efficient and 100% available.

4. **L'installation (infrastructure)**

Just like charging station and installer, installation (infrastructure) must also be ZE Ready 1.4D compliant. This means respecting all existing standards for EV Renault :

- a. Charging station : certified ZE Ready 1.4D
- b. Installer : certified EV Ready 1.4D
- c. Electric network : complies the IEC 50160 (harmonics specifically)
- d. Electric installation : complies of the ZE Ready 1.4D standard ... mean all standards like IEC 60364 (NFC 15-100 in France)
- e. Management of the allocated power (smart charging, dynamic charging, ...) : complies with the applicated standards

Note : Renault must be informed of the allocated power strategy used/wished.

Two cases :

1°) The infrastructure is existing and the charging stations are already installed (private or public)

In this case, it is necessary to obtain the contact of the operator (including the electrician dedicated to the site) and the provider. Renault will contact them to ask all the necessary technical details and thus issue an interoperability opinion. On-site visit and interoperability tests by Renault are also possible to build this final opinion.

2°) The infrastructure is to be created (private or public)

In this case, Renault can provide technical support from the beginning of the project.