

SAFE ELECTRIFICATION CHECK LIST

ENERGY STORAGE SYSTEM

INTRODUCTION

The safe electrification check lists initiated by the Forum for European Electrical Safety (FEEDS, www.feedsnet.org) aim to provide the installer and the user with essential information regarding the electrical safety of the installation.



DESCRIPTION

An energy storage system, often abbreviated as ESS, is a device or group of devices assembled together, capable of storing energy in order to supply electrical energy at a later time. Batteries are the most common type of new ESS installation that enable energy from renewables, like solar, to be stored and then released when the power is needed most. Battery storage systems will play an increasingly pivotal role, including into a domestic environment, between green energy supplies and responding to electricity demands.

← BEFORE INSTALLATION

CLIENT

- Make sure to ask for a qualified and, where relevant, certified installer.
- Check the existence of an electrical inspection report. The report can assess the safety, the readiness to accept new equipment. If no report is available, or if the existing report doesn't give the useful information, it is recommended to ask one if the electrical installation has more than 5 years.
- Check with the installer the place where batteries are likely to be installed: a clear space, ventilation, distances regarding heat sources are key elements.
- Check if and which subsidies are available, and if electrical upgrades are covered.

✂ INSTALLER

- If client has a photovoltaic system, propose implementation of smart control of loads via an energy management system (In this case the battery will be better optimized, and perform fewer cycles, thus extending its lifespan).
- Control earthing system.
- Plan cables paths and ensure all cables have the appropriate cross-section (See annex) and that all necessary electrical protection devices will be installed.

↓ DURING INSTALLATION

✂ INSTALLER

- Follow the recommendations given by the manufacturer, they can differ from one to another.
- Follow the relevant standards and legal requirements for installation available at national level.
- Use the cables size and specification in accordance with relevant standards (see annex) and legislation.
- Pay particular attention to:
 - mechanical protection of the terminals
 - protection against overcurrent for:
 - the battery cable
 - the cable powering the regulator
 - the DC cable
 - the cables (converter) inverter DC/AC
 - the cable of the termination DC box
 - emergency battery cut-off for:
 - the battery
 - the DC part of the installation
 - the other DC & AC sources in the battery room
 - sectioning DC and AC sides of the installations
 - identification of DC & AC parts

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AFTER INSTALLATION

CLIENT

- Declare the installation to all relevant counterparties (landlord, condo administrator, the local fire brigade, the insurance company, Distribution System Operator - DSO).
- Keep carefully the documentation provided, related to the equipment and its installation and follow the maintenance plan.

INSTALLER

- Test and control of the new installation, this final check can be performed by a third party and can be mandatory depending on the country.
- Specific attention shall be given to cables, connections, earthing, protection devices.
- Communicate a maintenance plan (including requirements from the manufacturer and/or national regulations).
- Provide the maintenance plan with key information visible on the equipment.
- Supply to the client all information and documents necessary to declare the installation to the relevant counterparties.
- Explain to the customer how the system works, and how to ensure its safety (e.g. that the battery should not be covered or used as a shelf).
- Complete the existing inspection report.

ANNEX: CABLE SIZING

The following standards help determine the right cables diameter for electrical installation:

- IEC 60287-3-2:2012 Electric cables - Calculation of the current rating
Part 3-2: Sections on operating conditions - Economic optimization of power cable size
The standard sets out a method for the selection of a cable size taking into account the initial investments and the future costs of energy losses during the anticipated operational life of the cable.
- IEC 60228:2023 Conductors of insulated cables
The standard specifies the nominal cross-sectional areas, in the range 0,5 mm² to 3 500 mm², for conductors in electric power cables and cords of a wide range of types. Requirements for numbers and sizes of wires and resistance values are also included.
- IEC 60364-5-52:2009 Low-voltage electrical installations
Part 5-52: Selection and erection of electrical equipment - Wiring systems
This part deals with the selection and erection of wiring systems.
Part 8-1: Functional aspects - Energy efficiency
This section provides additional requirements, measures and recommendations for the design, erection and verification of all types of low-voltage electrical installation including local production and storage of energy for optimizing the overall efficient use of electricity. It introduces requirements and recommendations for the design of an electrical installation within the framework of an energy efficiency management approach in order to get the best permanent functionally equivalent service for the lowest electrical energy consumption and the most acceptable energy availability and economic balance.