# Bulletin 64-8-2

## Battery based energy storage systems (ESS) at residential occupancies Rules 64-918 (CE Code 2024 Rule 64-1100), and 64-928 (CE Code 2024 Rule 64-924),

**Issued May 2024**
Supersedes Bulletin 64-8-1

### Scope



### 1) Background

The 2024 Canadian Electrical Code (CE Code) adopts a new section “Installation of energy storage systems at residential occupancies” and modifies several other related Rules. New Rule, 64-1100 provides the requirements for location and separation of ESS installed at residential occupancies either within a dwelling unit or other spaces of the residential occupancy including outdoors. The changes modify the current restrictions for installation of ESS within dwelling units or below grade (including basements of dwelling units) and now permit these installations under specific conditions. Additionally, capacity limitations have been updated.

Rule 64-1100 is applicable to all ESS installed at residential occupancies including those utilizing batteries. Based on new Rule 64-1002 1) ESS utilizing batteries shall be approved and be installed in accordance with the manufacturer’s installation instructions.

**In Ontario, based on this bulletin, for notifications or plan reviews submitted after May 1, 2024, ESA has adopted some of these changes as outlined below.**

### 2) Definitions and clarifications

**Residential Occupancy** is defined in Section 0 and includes but is not limited to occupancies such as dwelling units, hotels, motels and dormitories in addition to apartment and condominium buildings.

The definition “Residential use energy storage system” is revised. It says:

**Residential use energy storage system** — an energy storage system for use in a dwelling unit or residential occupancy that has a capacity not exceeding 20 kWh for any single energy storage unit.

ESS meeting the capacity limitation of 20 kWh for any single energy storage unit is considered to be suitable for residential use.

**Dwelling unit** is considered to be a single dwelling unit, or a dwelling unit both as defined in Section 0.

A single dwelling unit includes one unit of row-housing, duplex, triplex and quadruplex house. Back-to-back townhouses and stacked houses with individual ground level access are considered to be single dwellings.

## 3) Location

Like the current requirements:

- new Rule 64-1100 10) prohibits ESS to be installed in sleeping areas, or rooms opening directly into sleeping areas
- new Rule 64-1100 11) requires a smoke alarm or smoke detector to be installed when an ESS is installed within a dwelling unit. The smoke alarm or detector shall be installed in the room where the ESS is located and shall be installed in accordance with Section 32

Based on Subrule 3) of Rule 64-1100, ESS in a dwelling unit or residential occupancy are permitted to be installed below the lowest level of egress with the conditions listed in Subrule 1) and 2) of Rule 64-1100 for a dedicated room or utility room.

ESS ventilation and clearance requirements shall be in accordance with the manufacturer's installation instructions. If not addressed by the manufacturer's installation instructions, ventilation of battery rooms or areas shall be in accordance with Rules 2-324 and 64-802.

In properties where there are multiple buildings and not all of them are residential, Rule 64-1100 requirements and this bulletin are not applicable to buildings not associated with the dwelling unit, such as a drive shed on a rural property, or a structure build for the sole purpose of housing ESS equipment. Minimum clearance of 3 m from a residential building is required based on the intent of the new Rule 64-926.

### a) ESS at a dwelling unit or a building of residential occupancy

Subrule 1) of Rule 64-1100 provides location requirements for installation of ESS at a building of residential occupancy including within a dwelling unit. It requires ESS to be suitable for residential use and located in:

- in an attached garage;
- in or on an associated detached garage, or other free standing structure;
- on the exterior surface of the building; or

- in a dedicated room or utility room having a door equipped with a self-closing device and enclosed with a minimum construction of
    - ceilings and walls finished with gypsum board; and
    - floors finished with lumber sheathing

Construction requirements are permitted to be met using materials with increased fire resistance ratings to those specified, such as concrete flooring in lieu of lumber sheathed.

Finished walls at a minimum require gypsum board that is complete with joints sealed.

### b) ESS in a building containing multiple dwelling units

Subrule 2) of Rule 64-1100 provides requirements for ESS located in a dedicated room or utility room in a building containing multiple dwelling units. The room may be within one of the dwellings or in a common area of a residential occupancy.

The room is required to have a door equipped with a self-closing device and be enclosed with a minimum construction of

- ceilings and walls finished with gypsum board; and
- floors finished with lumber sheathing

**In addition, the room shall have a fire resistance rating of not less than 1 hour.**

Appendix B Note to Rule 64-1100 2) provides clarification that the fire resistance rating of ceilings, floors, and walls constructed for the purposes of this rule should be verified by a qualified individual in accordance with the requirements of the authority having jurisdiction prior to installation. It also provides examples of wall, floor and ceiling assemblies that provide a 1 h fire resistance rating.

Based on Subrule 4) of Rule 64-1100, batteries forming part of ESS and installed in a building of a residential occupancy containing multiple dwelling units, shall not be located directly beneath an exit required by the National Building Code of Canada.

## 4) Capacity limitations at a dwelling unit or building of residential occupancy

The capacity limitations in an attached garage, or on the exterior surface of the building have increased, from 40 kWh to 80 kWh.

The capacity limitations in a dedicated room or utility room have not changed, and shall:

- have a storage capacity not exceeding 20 kWh for any single energy storage system, or
- where multiple energy storage systems are installed, have an aggregate capacity not exceeding 40 kWh

The following Table summarizes the capacity limitations at dwelling units or buildings of residential occupancy and highlights the change:

| Area | Maximum stored energy |
|---|---|
| A dedicated room or utility room | 40 kWh |
| Attached garage | ~~40 kWh~~ 80 kWh |
| An associated detached garage, or other free standing structure | 80 kWh |
| On the exterior surface of the building | ~~40 kWh~~ 80 kWh |

Note:
An acceptable tolerance of maximum 5% of the total aggregate storage capacity is permitted.

### 5) Separation requirements

Separation requirements are similar to OESC 2021.

Based on Subrule 7) of Rule 64-1100, batteries forming part of an ESS installed indoors or outdoors shall not be located within 1 m of any window or door, **other than a vehicular access door**, of a dwelling unit or residential occupancy.

Based on Subrule 8) of Rule 64-1100, where multiple ESS are installed, batteries forming part of each system shall be spaced not less than 1 m apart from each other.

Based on Subrule 9) of Rule 64-1100, ESS evaluated to ANSI/CAN/UL9540A are permitted to be installed in accordance with the manufacturer's installation instructions. Based on the Appendix B Note, as part of the ESS certification process to ANSI/CAN/UL 9540, the testing data generated by ANSI/CAN/UL 9540A may be used by the certification body to determine acceptable installation practices such as but not limited to location of the ESS, aggregate capacity limitations, ventilation, and spacing requirements from other ESS.

The intent of this Rule is to recognize where such systems have undergone this testing that the requirements of Subrules 1) through 8) may not be required.

#### a) Separation requirements for ESS based on the installation instructions

**Question 1:**

What are the requirements for acceptance of reduced separation between ESS installed at buildings of residential occupancy?

**Answer 1:**

ESA will accept separation less than 1 m between ESS when specified by the manufacturer and installed in accordance with the installation instructions.

**Rationale 1:**

ESS are required to be approved to ANSI/CAN/UL9540 which currently has three editions. While all editions are acceptable to ESA, the first edition of the standard does not have any requirements for separation between ESS, however, the installation must meet the 1 m minimum identified in both the OESC and this Bulletin.

The second edition of the standard introduced the requirement to space multiple ESS at least 1 m apart. It also recognizes optional large-scale fire testing in accordance with ANSI/CAN/UL 9540A as a means to ensure safety where separation less than 1 m is specified between ESS. In this Bulletin, the additional testing option is recognized by permitting separation to be "as per the manufacturer's installation instructions."

In all editions of the standard, the manufacturer's installation instructions are part of the approval process. Based on the requirements of the second and third edition, where reduced separation is specified, the certification body would be required to review the testing performed and its results and ensure the installation instructions are supported by and in accordance with that optional testing.

**Direction 1:**

- Where reduced separation is specified by the manufacturer's installation instructions and the installation is at a building of residential occupancy, a copy of the ANSI/CAN/UL 9540 2nd or 3rd edition certification and installation instructions must be provided to ensure compliance.

## 6) Working space requirements

Existing Rule 64-928 that provides working space requirements is amended and relocated as Rule 64-924. This Rule is in general section and is also applicable to residential installations.

The Rule explains that working space requirements **within** ESS are permitted to be in accordance with the manufacturer's instructions. For example, for ESS installation in containers or "c-cans", this Rule overrides Rules 2-308, 2-310 and 2-312. Appendix B Note explains that the intent of this rule is to acknowledge that the manufacturer's installation instructions may provide minimum working space requirements in or about equipment forming part of an energy storage system that are different than those required by other rules of this Code.

However, working space requirements around self-contained and multi-unit ESS that have serviceable parts are required to be in accordance with Rules 2-308, 2-310 and 2-312. The minimum size of the room shall include equipment depth plus 1 m in front of the equipment plus a minimum of 2 m height. The required clearance is similar to

clearance around panelboard as shown in OESC Bulletin 2-9-*. Ventilation and clearances shall be in accordance with the manufacturers' installation instructions.

### 7) ESS meeting ANSI/CAN/UL 9540A cell level testing

Based on Appendix B Note to Rule 64-1100 9), ANSI/CAN/UL 9540 requires ESS intended for installation in the habitable or living space of dwelling units to meet the cell level performance criteria of ANSI/CAN/UL 9540A.

At this time, ESA is not aware of any products approved for use in Canada bearing these markings. When approved product becomes available, Rule 64-1100 9) shall apply as written and equipment with appropriate markings shall be permitted to exceed the limitations in Rules 64-1100 1) or 2).