1206.3.5.1 Fire-extinguishing systems. Rooms containing *capacitor energy storage systems* shall be equipped with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1. Commodity classifications for specific capacitor technologies shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the *fire code official* is authorized to approve the *automatic sprinkler system* based on full-scale fire and fault condition testing conducted by an *approved* laboratory.

1206.3.5.1.1 Alternative fire-extinguishing systems. *Capacitor energy storage systems* that utilize water-reactive materials shall be protected by an approved alternative *automatic fire-extinguishing system* in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The *fire code official* shall be permitted to approve the system based on full-scale fire and fault condition testing conducted by an *approved* laboratory.

1206.3.5.2 Smoke detection system. An approved *automatic smoke detection system* shall be installed in rooms containing *capacitor energy storage systems* in accordance with Section 907.2.

1206.3.5.3 Ventilation. Where capacitors release flammable gases during normal operating conditions, ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the *International Mechanical Code* and one of the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammability limit.
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 $m^3/(s \cdot m^2)$] of floor area, but not less than 150 cfm (4 m^3/min).

   The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the ceiling for gases having a vapor density less than air.

1206.3.5.3.1 Supervision. Required mechanical ventilation systems for rooms containing *capacitor energy storage systems* shall be supervised by an *approved* central station, proprietary or remote station service, or shall initiate an audible and visible signal at an *approved*, constantly attended on-site location.

1206.3.5.4 Spill control and neutralization. Where capacitors contain liquid electrolyte, *approved* methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing capacitors as follows:

1. For capacitors with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.
2. For capacitors with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

1206.3.6 Testing, maintenance and repair. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing different capacitor technologies into the capacitor energy storage system shall be treated as a new installation and require approval by the *fire code official* before the replacements are introduced into service.

1206.4 Energy storage system in Group R-3 and R-4 occupancies. Energy storage systems in Group R-3 and R-4 occupancies shall be installed and maintained in accordance with this section. The temporary use of an owner or occupant's electric-powered vehicle as an energy storage system shall be in accordance with this section.

***Exception:** Energy storage systems in Group R-3 and R-4 occupancies with a capacity of 3 kWh or less.

1206.4.1 Equipment listings. Energy storage system shall be listed and labeled for residential use in accordance with UL 9540.

Exceptions:

1. Where *approved*, repurposed unlisted battery systems from electric vehicles may be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.
2. Energy storage systems less than 1 kWh.

1206.4.2 Installation. Energy storage system shall be installed in accordance with the manufacturer's instructions and their listing.

1206.4.2.1 Spacing. Individual units shall be separated from each other by at least 3 feet (914 mm) of spacing unless smaller separation distances are documented and approved by the *fire code official* to be adequate based on large-scale fire testing.

1206.4.3 Location. Energy storage systems shall only be installed in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the dwelling unit living space and sleeping units in accordance with Section 406.3.2 of the *International Building Code*.
3. Outdoors on exterior walls in accordance with 1206.4.3.1

*4. Other locations with Fire Marshal approval.

1206.4.3.1 Exterior wall and outdoor installations. Energy storage systems shall be permitted to be installed outdoors on exterior walls of buildings or on the ground where all of the following conditions are met:

1. The maximum energy capacity of individual energy storage system units shall not exceed 20 kWh.

*2. The installation is in accordance with zoning setback requirements.

3. The energy storage system shall be installed in accordance with the manufacturer's instructions and their listing.

4. Individual energy storage system units shall be separated from each other by not less than 3 feet (914 mm).
5. The energy storage system shall be separated from doors, windows, operable openings into buildings, or HVAC inlets by at least 5 feet (1524 mm).

   Exception: Where approved by the *fire code official*, smaller separation distances in Items 4 and 5 may be permitted based on large scale fire testing

1206.4.4 Energy ratings. Individual energy storage systems units shall have a maximum rating of 20 kwh. The aggregate rating structure shall not exceed: *

1. 80 kWh in attached or detached garages and detached accessory structures.
2. 80 kWh on exterior walls.
3. 80 kWh outdoors on the ground.

1206.4.5 Electrical installation. Energy storage system shall be installed in accordance with NFPA 70. Inverters shall be listed and labeled in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

1206.4.6 Fire detection. Rooms and areas within dwellings units, sleeping units and attached garages in which energy storage systems are installed shall be protected by smoke alarms in accordance with Section 907.2.10. A heat detector listed and interconnected to the smoke alarms shall be installed in locations within dwelling units, sleeping units and attached garages where smoke alarms cannot be installed based on their listing.

1206.4.7 Protection from impact. Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code*.

1206.4.8 Ventilation. Indoor installations of energy storage systems that include batteries that produce hydrogen or other flammable gases during charging shall be provided with ventilation in accordance with Section 1206.2.11.3.

1206.4.9 Toxic and highly toxic gas. Energy storage systems that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.