LIVERMORE
CALIFORNIA

Electrical Equipment Installation

Livermore Municipal Code, Chapter 15.08: Amendments to the Electrical Code.

The Livermore Municipal Code refers to the 2005 National Electrical Code; the 2007 California Electrical Code as adopted by the City of Livermore is based on the 2005 National Electrical Code.

Chapter 15.08, Section 15.08.040: NEC Article 90-7, Examination of Equipment for Safety. The 2005 National Electrical Code, Section 90-7 is amended by adding the following paragraphs:

- Industrial machinery, industrial equipment and specialized machinery or equipment shall be installed in accordance with Article 670 of the 2007 California Electrical Code.
- Users of any equipment or machinery are responsible to assure that all equipment and machinery meet Federal and State OSHA standards.

Livermore Code Interpretation for Portable Appliances.

Portable Appliances shall be listed by an approved testing agency. The installation of the appliance and verification of the listing for the appliance is not enforced by the Permit Center. The Building Inspector only inspects up to the electrical receptacle. The owner is responsible for assuring that the appliance is listed and has the required cord and attachment plug to allow connection to the receptacle.

2007 California Electrical Code Articles.

Portable and Non-Portable Appliances shall comply with Article 670, 2007 California Electrical Code with the City of Livermore Municipal Code amending Article 90-7, 2005 NEC.

Article 670-Industrial Machinery

670-1 Scope: This article covers the definition of, the nameplate data for, and the size and overcurrent protection of supply conductors to industrial machinery.

(FPN): For information on the workspace requirements for equipment containing supply conductor terminals, see 110.26. For information on the workspace requirements for machine power and control equipment, see NFPA 79-2002. (Electrical Standard for Industrial Machinery).

670-2. Definitions: Industrial Machinery (Machine). A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling (including fixtures), assemble/disassemble, inspect or test, or package. [The associated electrical equipment including the logic controller(s) and associated software or logic together with the machine actuators and sensors are considered as part of the industrial machine.]

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Industrial Manufacturing System: A systematic array of one or more industrial machines not portable by hand and that includes any associated material handling, manipulating, gauging, measuring, or inspection equipment.

670-3. Machine Nameplate Data: (A) Permanent Nameplate. A permanent nameplate shall be attached to the control equipment enclosure or machine and shall be plainly visible after installation. The nameplate shall include the following information: **1.** Supply voltage, phase, frequency, and full-load current. **2.** Maximum ampere rating of the short circuit and ground-fault protective device. **3.** Ampere rating of the largest motor from the motor nameplate, or load. **4.** Short circuit current rating of the machine industrial control panel based on one of the following: (a) short circuit current rating of a listed and labeled machine control enclosure or assemble. (b) short circuit current rating established utilizing an approved method. **5.** Electrical diagram number(s) or the number of the index to the electrical drawings.

(B) Overcurrent Protection. Where overcurrent protection is provided in accordance with 670-4(B), the machine shall be marked "overcurrent protection provided at machine supply terminals."

670-4. Supply Conductors and Overcurrent Protection: (A) Size. The size of the supply conductor shall be such as to have an ampacity not less than 125 percent of the full-load current rating of all resistance heating loads plus 125 percent of the full-load current rating of highest rated motor plus the sum of the full-load current ratings of all other connected motors and apparatus that may be in operation at the same time. (FPN): See the 0-2000 volt ampacity tables of Article 310 for ampacity of conductors rated 600 volts and below.

(B) Disconnecting Means. A machine shall be considered as an individual unit and therefore shall be provided with disconnecting means. The disconnecting means shall be permitted to be supplied by branch circuits protected by either fuses or circuit breakers. The disconnection means shall not be required to incorporate overcurrent protection.

(C) Overcurrent Protection. Where furnished as part of the machine, overcurrent protection for each supply circuit shall consist of a single circuit breaker or set of fused, the machine shall bear the marking required in 670.3 and the supply conductors shall be considered either as feeders or taps as covered by 240.21.
The rating or setting of the overcurent protective device for the circuit supplying the machine shall not be greater than the sum of the largest rating or setting of the branch-circuit short-circuit and ground-fault protective device provided with the machine, plus 125 percent of the full-load current rating of all resistance heating loads, plus the sum of the full currents of all other motors and apparatus that could be in operation at the same time.

Exception: *Where one or more instantaneous trip circuit breakers or motor short-circuit protectors are used for motor branch-circuit short-circuit and ground-fault protection as permitted by Section 430.52(C), the procedure specified above for determining the maximum rating of the protective device for the circuit supplying the machine shall apply with the following provision. For the purpose of the calculation, each instantaneous trip circuit breaker or motor short-circuit protector shall be assumed to have a rating not exceeding the maximum percentage of motor full-load current permitted by Table 430.52 for the type of machine supply circuit protective device employed.*

Note: Where no branch-circuit short-circuit and ground-fault protective device is provided with the machine, the rating or setting of the overcurrent-protective device shall be based on Article 430.52 and 430.53 as applicable.

Note: The equipment and appliances listed above are not to be confused with any equipment or appliances referred to in the California Mechanical Code. CMC Sec 307 requires Fuel-burning Appliances, Electric Heating Appliances, and Heat Pump Appliances be listed. CMC Section 304.1, requires Heating, Ventilating and Cooling Equipment be listed.