

reduced-size conductors, the required capacity shall be included in the marked “full-load current.” Where more than one incoming supply circuit is to be provided, the nameplate shall state the preceding information for each circuit.

An industrial machine’s nameplate must provide the short-circuit current rating of the machine’s industrial control panel. That rating is established either as part of the listing of the control enclosure or assembly or, for assemblies that are not listed, by an approved method of determining the short-circuit current rating.

In the absence of product listing, Supplement SB to UL 508A, *Standard for Industrial Control Panels*, is referred to as one example of a method for determining the short-circuit current rating of a control panel or assembly that could be used as a basis for equipment approval.

The second paragraph of 670.3(A) recognizes that the operating characteristics of an industrial machine may permit the use of over-sized or reduced-sized feeder conductors. An example of this is an industrial machine containing motors sized for high torque but, in normal operation, run at close to no-load current values. In this case, it may be appropriate to reduce the full-load current marking on the machine nameplate.

#### See also

**430.26**, which covers feeder demand factors

**(B) Overcurrent Protection.** Where overcurrent protection is provided in accordance with 670.4(C), 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 the highest rated motor plus the sum of the full-load current ratings of all other connected motors and apparatus, based on their duty cycle, that may be in operation at the same time.

Informational Note No. 1: See Table 310.16 through Table 310.20 for ampacity of conductors rated 2000 volts and below.

Informational Note No. 2: See 430.22(E) and 430.26 for duty cycle requirements.

The duty cycle of motors and apparatus must be considered when determining the minimum ampacity of a supply circuit conductor for an industrial machine. Depending on the operating characteristics of the motor, the duty cycle of the apparatus might not always result in reduction of the supply conductor ampacity. Where motors are used in other than a continuous-duty mode of operation, Table 430.22(E) provides percentages by which the full-load current of a given motor is increased or decreased for the purpose of sizing motor circuit conductors. A motor that is loaded continuously under any conditions of use is an example of a continuous-duty application.

**(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 disconnecting means shall not be required to incorporate overcurrent protection.

Informational Note: See NFPA 70E, *Standard for Electrical Safety in the Workplace*, which provides guidance for creating an electrically safe work condition for performing maintenance or other work on the machine.

Regarding the machine disconnecting means, the 2021 edition of NFPA 79, *Electrical Standard for Industrial Machinery*, states, in part: “The center of the grip of the operating handle of a supply circuit disconnecting means, when in its highest position, shall be not more than 2.0 m (6 ft 7 in.) above the servicing level. A permanent operating platform, readily accessible by means of a permanent stair(s) or ladder, shall be considered the servicing level.”

The disconnecting means shall “be provided with a permanent means permitting it to be locked in the off (open) position only (e.g., by padlocks) independent of the enclosure door or enclosure cover position. When so locked, remote as well as local closing into the on position shall be prevented.”

**(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 fuses, the machine shall bear the marking required in 670.3, and the supply conductors shall be considered either as feeders or as taps as covered by 240.21.

The rating or setting of the overcurrent 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-load 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 430.52(C), the procedure specified in 670.4(C) 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(C)(1) for the type of machine supply circuit protective device employed.*

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 430.52 and 430.53, as applicable.