

**430.14 Location of Motors.**

**(A) Ventilation and Maintenance.** Motors shall be located so that adequate ventilation is provided and so that maintenance, such as lubrication of bearings and replacing of brushes, can be readily accomplished.

*Exception: Ventilation shall not be required for submersible types of motors.*

**(B) Open Motors.** Open motors that have commutators or collector rings shall be located or protected so that sparks cannot reach adjacent combustible material.

*Exception: Installation of these motors on wooden floors or supports shall be permitted.*

**430.16 Exposure to Dust Accumulations.** In locations where dust or flying material collects on or in motors in such quantities as to seriously interfere with the ventilation or cooling of motors and thereby cause dangerous temperatures, suitable types of enclosed motors that do not overheat under the prevailing conditions shall be used.

Informational Note: Especially severe conditions may require the use of enclosed pipe-ventilated motors, or enclosure in separate dusttight rooms, properly ventilated from a source of clean air.

**See also**

**502.125** (Class II, Divisions 1 and 2) and **503.125** (Class III, Divisions 1 and 2) for requirements for motors exposed to combustible dust or readily ignitable flying material

**500.5(C)** (Class II locations), **500.5(D)** (Class III locations), and **506.20** (Zones 20, 21, and 22) for classification of locations

**430.17 Highest Rated or Smallest Rated Motor.** In determining compliance with 430.24, 430.53(B), and 430.53(C), the highest rated or smallest rated motor shall be based on the rated full-load current as selected from Table 430.247, Table 430.248, Table 430.249, and Table 430.250.

**430.18 Nominal Voltage of Rectifier Systems.** The nominal value of the ac voltage being rectified shall be used to determine the voltage of a rectifier derived system.

*Exception: The nominal dc voltage of the rectifier shall be used if it exceeds the peak value of the ac voltage being rectified.*

**Part II. Motor Circuit Conductors**

Δ **430.21 General.** Part II specifies ampacities of conductors that are capable of carrying the motor current without overheating under the conditions specified.

Part II shall not apply to motor circuits rated over 1000 volts, nominal.

Informational Note No. 1: See Part XI for motor circuits rated over 1000 volts, nominal.

Informational Note No. 2: See 110.14(C) and 430.9(B) for equipment device terminal requirements.

**430.22 Single Motor.** Conductors that supply a single motor used in a continuous duty application shall have an ampacity of not less than 125 percent of the motor full-load current rating, as determined by 430.6(A)(1), or not less than specified in 430.22(A) through (G).

The requirement that a conductor have an ampacity of at least 125 percent of the motor FLC (full-load current) rating is based on the need to provide for a sustained running current that is greater than the rated full-load current and for protection of the conductors by the motor overload protective device set above the motor full-load current rating.

The ampacity of the motor branch-circuit conductors is based on the full-load current rating values provided in Tables 430.247 through 430.250. Motor nameplate FLA (full-load amperes) generally is not to be used to size branch-circuit conductors.

Exhibit 430.2 illustrates the essential parts of a motor branch circuit. Motor feeder tap conductors are required to terminate in a branch-circuit protective device, and the conductors must be installed in accordance with 430.28.

The branch-circuit short-circuit and ground-fault protective device can be a fuse or a circuit breaker and must be capable of carrying the starting current of the motor without opening the circuit. Motor circuit conductors with an ampacity of 125 percent of the motor full-load current are reasonably protected by motor overload protective devices set to operate at nearly the same current as the ampacity of the conductors. Motor circuit conductors are permitted to be protected by Article 430 in accordance with 240.4(G).

In general, every motor must be provided with overload protective devices intended to protect the motor windings, motor-control apparatus, and motor branch-circuit conductors against excessive heating due to motor overloads and failure to start. Overload in equipment is defined as operation exceeding the normal full-load rating, which, when it persists for a sufficient length of time, causes damage or dangerous overheating. Overload in a motor includes a stalled rotor but does not include fault currents due to short circuits or ground faults.

**See also**

**Table 430.52(C)(1)** for maximum ratings of short-circuit and ground-fault protective devices

**430.44** for conditions under which providing automatic opening of a motor circuit due to overload could be undesirable

**(A) Direct-Current Motor-Rectifier Supplied.** For dc motors operating from a rectified power supply, the conductor ampacity on the input of the rectifier shall not be less than 125 percent of the rated input current to the rectifier. For dc motors operating from a rectified single-phase power supply, the conductors between the field wiring output terminals of the rectifier and the motor shall have an ampacity of not less than the following percentages of the motor full-load current rating: