

to trip or shall be rated at no more than the following percent of the motor nameplate full-load current rating:

Motors with a marked service factor 1.15 or greater	125%
Motors with a marked temperature rise 40°C or less	125%
All other motors	115%

Modification of this value shall be permitted as provided in 430.32(C). For a multispeed motor, each winding connection shall be considered separately.

Where a separate motor overload device is connected so that it does not carry the total current designated on the motor nameplate, such as for wye-delta starting, the proper percentage of nameplate current applying to the selection or setting of the overload device shall be clearly designated on the equipment, or the manufacturer's selection table shall take this into account.

**Informational Note:** See 460.9 for power factor correction capacitors that are installed on the load side of the motor overload device.

To protect a motor from an overload, the motor nameplate full-load current is used to select the overload protection rather than the full-load current values from Tables 430.248 through 430.250, which are used to select the feeder and branch-circuit wiring.

A continuous-duty motor with a marked service factor of 1.15 or greater or with a marked temperature rise of 40°C or less can carry a 25-percent overload for an extended period without damage to the motor. Motors with a service factor of less than 1.15 or those with a marked temperature rise greater than 40°C might be incapable of withstanding a prolonged overload, where the motor overload protective device opens the circuit if the motor continues to draw 115 percent of its rated full-load current.

A "continuous-duty motor" is not the same as a "continuous load." The duty of a motor is determined by the application of the motor as defined in Article 100 under the five various types of duty.

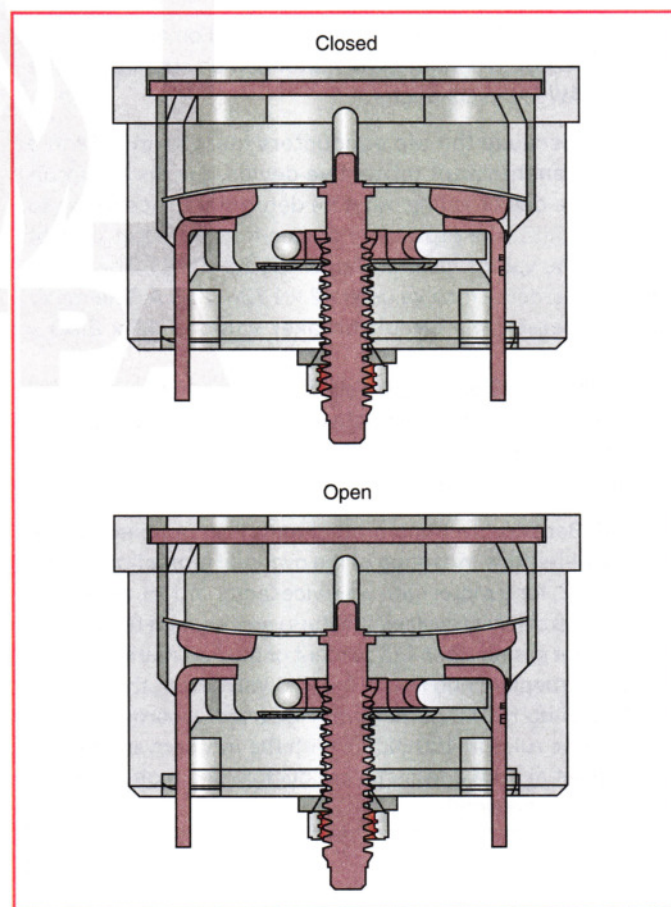
**(2) Thermal Protector or Electronically Protected.** A thermal protector integral with the motor shall be approved for use with the motor it protects on the basis that it will prevent dangerous overheating of the motor due to overload and failure to start. An electronically protected motor shall be approved for use on the basis that it will prevent dangerous overheating due to the failure of the electronic control, overload, or failure to start the motor. The ultimate trip current of a thermally or electronically protected motor shall not exceed the following percentage of motor full-load current given in Table 430.248, Table 430.249, and Table 430.250:

Motor full-load current 9 amperes or less	170%
Motor full-load current from 9.1 to, and including, 20 amperes	156%
Motor full-load current greater than 20 amperes	140%

If the motor current-interrupting device is separate from the motor and its control circuit is operated by a protective device integral with the motor, it shall be arranged so that the opening of the control circuit will result in interruption of current to the motor.

The thermal protector shown in Exhibit 430.6 is located inside the motor housing and is connected in series with the motor winding by a set of normally closed contacts attached to a bimetallic disk. The thermal protector heating coil causes the disk to heat rapidly and snap the contacts open to protect the motor windings. After the circuit opens and the motor has cooled to a normal temperature, the contacts automatically close and restart the motor. Where automatic restart is not desirable, the protective device is designed so that it must be returned to the closed position by a manually controlled reset as required by 430.43.

In lieu of electromechanical protective devices, 430.32(A)(2) also recognizes the use of electronic means to protect a motor and motor circuit conductors from overload (overheating) conditions due to excessive driven machinery loading or failure to start. Electronically protected motors must be marked in accordance with 430.7(A)(16).



**EXHIBIT 430.6** A thermal protector for a motor in which a heat-sensitive snap-action disk opens contacts and protects the motor in which it is mounted against dangerous overheating. (Courtesy of Sensata Technologies)