

sized 150 to 300 percent of the motor full-load current (depending on the type of motor).

Section 430.52 could result in a branch-circuit and ground-fault protective device rating higher than the ampacity of the motor circuit conductors.

#### See also

**430.22** and its commentary for sizing motor circuit conductors

The selected rating or setting of the branch-circuit short-circuit and ground-fault protective device should be as low as possible for maximum protection. However, if the rating or setting specified in Table 430.52(C)(1) or permitted by 430.52(C)(1)(a) is not sufficient for the starting current of the motor, a higher rating or setting is allowed per 430.52(C)(1)(b). For example, a higher rating would be allowed for a motor under severe starting conditions in which the motor and its driven machinery require an extended length of time to reach the desired speed.

**(B) All Motors.** The motor branch-circuit short-circuit and ground-fault protective device shall be capable of carrying the starting current of the motor.

#### (C) Rating or Setting.

- Δ **(1) In Accordance with Table 430.52(C)(1).** A protective device that has a rating or setting not exceeding the value calculated according to the values given in Table 430.52(C)(1) shall be used unless otherwise permitted in 430.52(C)(1)(a) or (C)(1)(b).

Class CC fuses are current-limiting fuses that may also be marked as "time delay," which indicates that the fuse has been investigated in accordance with the time-delay requirements of the standard. Class CC fuses are permitted to be sized according to the requirements of non-time-delay-rated fuses because they are fast-acting. Examples of Class CC fuses are shown in Exhibit 430.7.

(a) Where the values as determined by Table 430.52(C)(1) do not correspond to the standard ampere ratings and settings provided in 240.6, the next higher standard rating or setting shall be permitted.

(b) Where the rating specified in Table 430.52(C)(1), or the rating modified by 430.52(C)(1)(a), is not sufficient for the starting current of the motor, any of the following shall apply:

- (1) The rating of a nontime-delay fuse not exceeding 600 amperes or a time-delay Class CC fuse shall be permitted to be increased but shall in no case exceed 400 percent of the full-load current.
- (2) The rating of a time-delay (dual-element) fuse shall be permitted to be increased but shall in no case exceed 225 percent of the full-load current.
- (3) The rating of an inverse time circuit breaker shall be permitted to be increased but shall in no case exceed 400 percent for full-load currents of 100 amperes or less or 300 percent for full-load currents greater than 100 amperes.

Δ **TABLE 430.52(C)(1)** Maximum Rating or Setting of Motor Branch-Circuit Short-Circuit and Ground-Fault Protective Devices

| Type of Motor  | Percentage of Full-Load Current |   |                            |                                   |
|--|---------------------------------|---|----------------------------|-----------------------------------|
|  | Nontime Delay Fuse <sup>1</sup> | Dual Element (Time-Delay) Fuse <sup>1</sup> | Instantaneous-Trip Breaker | Inverse Time Breaker <sup>2</sup> |
| Single-phase motors  | 300                             | 175   | 800                        | 250                               |
| AC polyphase motors other than wound-rotor   | 300                             | 175   | 800                        | 250                               |
| Squirrel cage — other than Design B energy-efficient — and Design B premium efficiency | 300                             | 175   | 800                        | 250                               |
| Design B energy-efficient and Design B premium efficiency                              | 300                             | 175   | 1100                       | 250                               |
| Synchronous <sup>3</sup>   | 300                             | 175   | 800                        | 250                               |
| Wound-rotor  | 150                             | 150   | 800                        | 150                               |
| DC (constant voltage)  | 150                             | 150   | 250                        | 150                               |

Note: See 430.54 for certain exceptions to the values specified.

<sup>1</sup>The values in the Nontime Delay Fuse column apply to time-delay Class CC fuses.

<sup>2</sup>The values given in the last column also cover the ratings of nonadjustable inverse time types of circuit breakers that can be modified as in 430.52(C)(1)(a) and (C)(1)(b).

<sup>3</sup>Synchronous motors of the low-torque, low-speed type (usually 450 rpm or lower), such as those used to drive reciprocating compressors, pumps, and so forth, that start unloaded, do not require a fuse rating or circuit-breaker setting in excess of 200 percent of full-load current.



**EXHIBIT 430.7** Class CC fuses. (Courtesy of Eaton, Bussmann Division)