

## Group Motor Protection

### Group Fusing

430.53 covers the requirements for group motor installations. Two or more motors, or one or more motors and other loads may be protected by the same branch circuit overcurrent protective device if:

- (A) All motors are 1Hp or less, protected at not over 20A at 120V or at 15A at 600V or less, the full load amp rating of each motor does not exceed 6 amps, the device rating marked on the controller is not exceeded, and individual overload protection conforms to 430.32.
- or (B) The circuit for the smallest motor is protected per 430.52; i.e. the branch circuit overcurrent protective device protecting the group meets 430.52 for the circuit with the smallest motor.
- or (C) The complete assembly of properly sized branch circuit overcurrent protective device, controller, and overload devices is tested, listed, and marked for a group installation.

and one of the following:

- (D)(1) the ampacity of conductors to motors are no less than the ampacity of the branch circuit conductors
- or (D)(2) the conductors to motors have at least  $\frac{1}{3}$  the ampacity of the branch circuit conductors, are protected from physical damage and are not more than 25 feet long before being connected to the motor overload device.
- or (D)(3) The tap conductors from the branch circuit overcurrent protective device (OCPD) to each manual motor controller\* marked "Suitable for Tap Conductor Protection in Group Installations" shall have an ampacity of at least  $\frac{1}{10}$ \*\* the amp rating of the branch circuit OCPD. These tap conductors shall be 10 feet or less, enclosed and protected from physical damage; if not, then these conductors shall have an ampacity of at least the same as the branch circuit conductors. The conductor ampacity from the controller to the motor shall be per 430.22.

### Another Approach

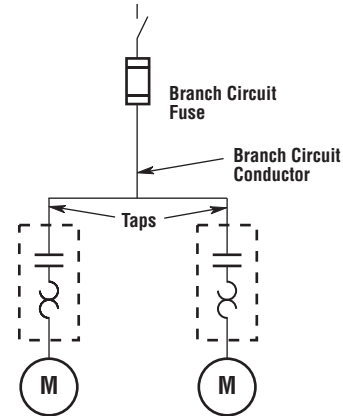
Typically, group motor installations protected by one branch circuit OCPD and group switching are considered for cost savings. However, caution should be taken where a conductor is expected to be protected by an overcurrent protective device significantly greater than the conductor ampacity. The NEC® implies this caution in 430.53(C) FPN, referring back to 110.10. Under short circuit conditions, smaller conductors are difficult to protect, especially by non current-limiting protective devices. Also, group protection sacrifices selective coordination; a fault on one circuit shuts down all the loads on the group circuit. As a better alternative, consider group switching with fuses/fuse holders for each motor or other type load. See page 144 on group switching. Use holders such as OPM-NG, OPM1038SW, OPM1038, CH Series, JT Series or TCFH & TCF.

\* If a manual motor controller is utilized for this application, it must:

1. Be marked "Suitable for Tap Conductor Protection in Group Installations".
2. Be applied within its voltage limitations (slash voltage rating), if applicable.
3. Be protected by a branch circuit protective device that meets all limitations of the manual motor controller listing criteria. For instance, it may be required to be protected by a fuse no greater than a specified amp rating.

\*\* Even though permitted by this section, the branch circuit overcurrent protective device may not be able to provide adequate short-circuit protection for a conductor having an ampacity  $\frac{1}{10}$  the rating of the branch circuit overcurrent protective device. This is especially the case with non current-limiting branch circuit protective devices. It is suggested an engineering conductor protection analysis be conducted for this application (110.10).

Group Motor Installation (Group Fusing) NEC® 430.53



Group Motor Protection

