

(B) Type. The device shall be one of the types specified in 430.111(B)(1), (B)(2), or (B)(3).

(1) Air-Break Switch. An air-break switch, operable directly by applying the hand to a lever or handle.

(2) Inverse Time Circuit Breaker. An inverse time circuit breaker operable directly by applying the hand to a lever or handle. The circuit breaker shall be permitted to be both power-operable and manually operable.

(3) Oil Switch. An oil switch used on a circuit whose rating does not exceed 1000 volts or 100 amperes, or by special permission on a circuit exceeding this capacity where under expert supervision. The oil switch shall be permitted to be both power-operable and manually operable.

If used as a controller, a switch or circuit breaker must meet all the requirements for controllers and be protected by branch-circuit short-circuit and ground-fault protective devices (fuses or a circuit breaker), which ensure that all ungrounded conductors will be opened.

If the controller consists of a manually operable air-break switch, an inverse time circuit breaker, or a 100-ampere maximum oil switch (higher rating by special permission), the controller is considered a satisfactory disconnecting means. The intent of 430.111 is to permit omission of an additional device to serve as a disconnecting means.

A separate disconnecting means must be provided if the controller is of the autotransformer. (This switch can be combined in the same enclosure with a motor overload protective device.)

430.112 Motors Served by Single Disconnecting Means. Each motor shall be provided with an individual disconnecting means.

Exception: A single disconnecting means shall be permitted to serve a group of motors under any one of the conditions of (1), (2), and (3). The single disconnecting means shall be rated in accordance with 430.110(C).

- (1) Where a number of motors drive several parts of a single machine or piece of apparatus, such as metal- and wood-working machines, cranes, and hoists.
- (2) Where a group of motors is under the protection of one set of branch-circuit protective devices as permitted by 430.53(A).
- (3) Where a group of motors is in a single room within sight from the location of the disconnecting means.

A single disconnecting means must have a rating equal to the sum of the horsepower or current of each motor in the group. If the sum is over 2 horsepower, a motor circuit switch (horsepower-rated) must be used; thus, for five 2-horsepower motors, the disconnecting means should be a motor-circuit switch rated at not less than 10 horsepower.

Part (1) of the exception indicates that a single disconnecting means may be used where a number of motors drive several parts of a single machine, such as cranes (see 610.31 through

610.33), metal or woodworking machines, steel rolling mill machinery, and so forth. The single disconnecting means for multimotor machinery provides a positive means of simultaneously de-energizing all motor branch circuits, including remote-control circuits, interlocking circuits, limit-switch circuits, and operator control stations.

Part (2) of the exception refers to 430.53(A), which permits a group of motors under the protection of the same branch-circuit device, provided the device is rated not more than 20 amperes on a nominal 120-volt branch circuit, or not over 15 amperes on a branch circuit of 1000 volts, nominal or less. The motors must be rated 1 horsepower or less, and the full-load current for each motor is not permitted to exceed 6 amperes. A single disconnecting means is both practical and economical for a group of such small motors.

Part (3) of the exception covers the common situation in which a group of motors is in one room, such as a pump room, compressor room, or mixer room. It is possible to design the layout of a single disconnecting means with an unobstructed view from each motor. (See the definition of *in sight from* in Article 100.)

These conditions for an individual disconnecting means are like those specified in 430.87, which permits the use of a single controller for a group of motors.

430.113 Energy from More Than One Source. Motor and motor-operated equipment receiving electric energy from more than one source shall be provided with disconnecting means from each source of electric energy immediately adjacent to the equipment served. Each source shall be permitted to have a separate disconnecting means. Where multiple disconnecting means are provided, a permanent warning sign shall be provided on or adjacent to each disconnecting means indicating that multiple sources must be shut off to remove all power to the equipment. The sign at each disconnect shall identify the other specific circuits.

Exception No. 1: Where a motor receives electric energy from more than one source, the disconnecting means for the main power supply to the motor shall not be required to be immediately adjacent to the motor if the motor controller disconnecting means is lockable in accordance with 110.25.

Exception No. 2: A separate disconnecting means shall not be required for a Class 2 remote-control circuit complying with Parts I and II of Article 725, rated not more than 30 volts, and isolated and ungrounded.

Some motors require multiple separate sources of power to operate properly, such as a motor space heater or a speed switch. Synchronous motors commonly use dc power for excitation purposes. Section 430.113 could also apply to circuits that supply power to speed or vibration sensors mounted within or otherwise attached to the motor.

Where the individual sources have multiple disconnecting means, a permanent warning sign is required to warn the user that other power sources are present. Exception No. 2 removes the disconnect requirement only for Class 2 circuits.