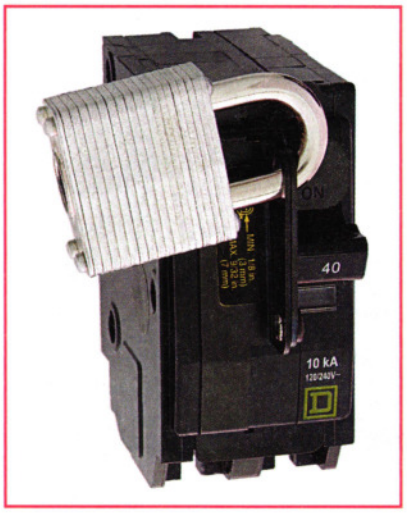

EXHIBIT 440.1 An example of locking hardware (with lock installed) that remains in place with or without the lock installed. *(Courtesy of Schneider Electric)*

Informational Note: See Parts VII and IX of Article 430 for additional requirements.

The references to Parts VII and IX of Article 430 in Informational Note No. 1 are intended to call attention to the additional disconnect location requirements in 430.102, 430.107, and 430.113. The requirement of 440.14 mandates that the equipment disconnecting means be within sight from and readily accessible from the equipment, even if a remote disconnect is capable of being locked in the "open" position, in accordance with the exception to 430.102(B)(2).

This special requirement for air-conditioning and refrigerating equipment covered by Article 440 is more stringent than the requirements in Article 430. It provides protection for service personnel working on equipment located in attics, on roofs, or outside in a remote location where it is difficult to gain access to a remote lockable disconnect.

See also

440.14, Exception No. 1, for conditions where a disconnecting means within sight from the equipment is not required

Part III. Branch-Circuit Short-Circuit and Ground-Fault Protection

440.21 General. Part III specifies devices intended to protect the branch-circuit conductors, control apparatus, and motors in circuits supplying hermetic refrigerant motor-compressors against overcurrent due to short circuits and ground faults. They are in addition to or amendatory of the overcurrent protection requirements found elsewhere in this *Code*.

Where an air conditioner is listed by a qualified electrical testing laboratory with a nameplate that reads "maximum fuse size," the listing restricts the use of the unit to fuse protection only and does not cover its use with circuit breakers. If the air conditioner has been evaluated for both fuses and circuit breakers, it is marked to indicate that both types of protective devices are acceptable. Molded-case circuit breakers, evaluated to UL 489, *Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures*, are certified for group motor protection in accordance with 430.53. The equipment covered by Article 440 quite often consists of hermetic refrigerant motors plus other types of motors, equipment, and controls. If supplemental overcurrent protection is provided within the heating, air-conditioning, and refrigeration (HACR) equipment control panel, the manufacturer will have marked the equipment with specific information on the type of branch-circuit overcurrent protective device that can be used on the line side of the HACR unit in order to provide the necessary level of short-circuit and ground-fault protection for the equipment and controls internal to the HACR unit.

Section 110.3(B) requires listed equipment to be installed and used in accordance with instructions included in the listing. In the case of air-conditioning equipment, it is important to carefully read the nameplate so that the correct type of short-circuit, ground-fault protective device is selected.

The acronym "HACR" as a prefix to circuit breaker may still be found on the nameplates of legacy HACR equipment. This abbreviation indicated that the HACR equipment manufacturer wanted to specify that if circuit breakers were used, only those evaluated for group motor applications were suitable for the branch-circuit short-circuit, and ground-fault protection. However, because UL 489 required all circuit breakers to be evaluated for protection of group installations, the HACR marking on circuit breakers was not required by the product standard. However, because legacy HACR equipment still includes nameplates specifying the specially marked circuit breakers, some circuit breaker manufacturers continue to mark their molded case circuit breakers with "HACR Type," even though it is not required by the product certification standard.

Exhibit 440.2 illustrates three supply circuit configurations in which fuses can be used to protect HACR equipment if such protection is specified on the equipment nameplate.

Current-limiting overcurrent devices, which may reduce the amount of fault current to which the equipment is subjected, can be installed in the branch circuit supplying the equipment.

See also

Article 100 for the definition of *overcurrent protective device, current-limiting (current-limiting overcurrent protective device)* and its commentary explaining short-circuit damage

110.3(B) and **110.10** (and commentary) for the installation and use of listed or labeled equipment and the selection of OCPDs (such as fuses and circuit breakers)

440.22 Application and Selection.

Δ **(A) Rating or Setting for Individual Motor-Compressor.** The motor-compressor branch-circuit short-circuit and ground-fault protective device shall be capable of carrying the starting current of the motor. A protective device having a rating or setting not exceeding 175 percent of the motor-compressor rated-load current or branch-circuit selection current, whichever is greater, shall be permitted.