



EXHIBIT 310.1 One application where the reduced conductor size is applicable to the service-entrance conductors.

the meters. The reduced conductor size permitted is also applicable to the feeder conductors run to Apartment 3 in the exhibit from the service disconnecting means because that feeder carries the entire load.

310.14 Ampacities for Conductors Rated 0 Volts – 2000 Volts.

(A) General.

- Δ (1) **Tables or Engineering Supervision.** Ampacities for conductors shall be permitted to be determined by tables as provided in 310.15 or under engineering supervision as provided in 310.14(B).

Informational Note No. 1: See 210.19, Informational Note, for voltage drop on branch circuits that this section does not take into consideration. See 215.2(A)(2), Informational Note No. 2, for voltage drop on feeders that this section does not take into consideration.

Informational Note No. 2: See NFPA 79-2021, *Electrical Standard for Industrial Machinery*, Table 12.5.1, for the allowable ampacities of Type MTW wire.

- (2) **Selection of Ampacity.** Where more than one ampacity applies for a given circuit length, the lowest value shall be used.

Exception: Where different ampacities apply to portions of a circuit, the higher ampacity shall be permitted to be used if the total portion(s) of the circuit with lower ampacity does not exceed the lesser of 3.0 m (10 ft) or 10 percent of the total circuit.

Informational Note: See 110.14(C) for conductor temperature limitations due to termination provisions.

Calculation Example

Three 500-kcmil THW conductors in RMC are run from a motor control center for 12 ft past a heat-treating furnace to a pump motor located 150 ft from the motor control center. Where run in a 78°F to 86°F ambient temperature, the conductors have an ampacity of 380 A, per Table 310.16. The ambient temperature near the furnace, where the conduit is run, is found to be 113°F, and the length of this part of the run is greater than 10 ft and more than 10 percent of the total length of the run at the 78°F to 86°F ambient temperature. Determine the ampacity of the total run, in accordance with 310.14(A)(2).

Solution

Using the ambient temperature correction factors in Table 310.15(B)(1)(1) for 113°F, calculate the ampacity:

$$0.82 \times 380 \text{ A} = 311.6 \text{ A}$$

which is the ampacity of the total run, in accordance with 310.14(A)(2).

If the run near the furnace at the 113°F ambient temperature was 10 ft or less in length, then the ampacity of the entire run would have been 380 A, according to the exception to 310.14(A)(2). The heat-sinking effect of the run at the lower ambient temperature is sufficient to reduce the conductor temperature near the furnace.

- (3) **Temperature Limitation of Conductors.** No conductor shall be used in such a manner that its operating temperature exceeds that designated for the type of insulated conductor involved. In no case shall conductors be associated together in such a way, with respect to type of circuit, the wiring method employed, or the number of conductors, that the limiting temperature of any conductor is exceeded.

Most terminations are designed for 60°C or 75°C maximum temperatures. The higher-rated ampacities for conductors of 90°C, 105°C, and so forth cannot be used unless the terminals at which the conductors terminate have comparable ratings.

Ambient temperature must be considered in determining the allowable ampacity of conductors. Conductors should have a rating above the anticipated maximum ambient temperature. The operating temperature of conductors should be controlled at or below the conductor rating by coordinating conductor size, number of associated conductors, and ampacity for the conductor rating and ambient temperature. Tables 310.16 through 310.20 have ampacities based on a 30°C or 40°C ambient temperature, as indicated in the table heading. Where the ambient temperature is different, Table 310.15(B)(1)(1) or Table 310.15(B)(1)(2) is used to correct the ampacity. If more than three conductors are installed without spacing to allow the adequate dissipation of heat, the additional adjustment shown in 310.15(C)(1) must also be applied.