Δ Part IV. Circuit Conductors

440.31 General. Part IV and adjustments made in accordance with Part III of Article 310 specify ampacities of conductors required to carry the motor current without overheating under the conditions specified, except as modified in 440.6(A), Exception No. 1.

These articles shall not apply to integral conductors of motors, to motor controllers and the like, or to conductors that form an integral part of approved equipment.

Δ **440.32 Single Motor-Compressor.** Branch-circuit conductors supplying a single motor-compressor shall have an ampacity not less than the greater of the following:

(1) 125 percent of the motor-compressor rated-load current
(2) 125 percent of the branch-circuit selection current

For a wye-start, delta-run connected motor-compressor, the selection of branch-circuit conductors between the motor controller and the motor-compressor shall be permitted to be based on 72 percent of either the motor-compressor rated-load current or the branch-circuit selection current, whichever is greater.

Informational Note: The multiplier of 72 percent is obtained by multiplying 58 percent by 1.25 because the individual motor circuit conductors of wye-start, delta-run connected motor-compressors carry 58 percent of the rated-load current.

See also

430.22(C) and its commentary for more information on wye-start, delta-run motors

440.33 Motor-Compressor(s) With or Without Additional Motor Loads. Conductors supplying one or more motor-compressor(s) with or without an additional motor load(s) shall have an ampacity not less than the sum of each of the following:

(1) The sum of the rated-load or branch-circuit selection current, whichever is greater, of all motor-compressor(s)
(2) The sum of the full-load current rating of all other motors
(3) 25 percent of the highest motor-compressor or motor full load current in the group

Exception No. 1: Where the circuitry is interlocked so as to prevent the starting and running of a second motor-compressor or group of motor-compressors, the conductor size shall be determined from the largest motor-compressor or group of motor-compressors that is to be operated at a given time.

Exception No. 2: The branch-circuit conductors for room air conditioners shall be in accordance with Part VII of Article 440.

Branch circuits for listed air-conditioning and refrigerating equipment that have a nameplate marked with the branch-circuit conductor size and branch-circuit short-circuit protective device size are not required to have the branch-circuit conductors sized in accordance with 440.33. The product standard includes the 25-percent increase for the largest motor or compressor in the group plus the other nonmotor or noncompressor load; therefore, the actual nameplate full-load amperes for the complete assembly can be used to size the branch-circuit conductors.

Δ **440.34 Combination Load.** Conductors supplying a motor-compressor load(s) in addition to other load(s) shall have an ampacity sufficient for the other load(s) plus the required ampacity for the motor-compressor load(s). The motor compressor load(s) shall be determined in accordance with 440.32 or 440.33. The other load(s) shall be calculated from branch-circuit, feeder, and service load calculations.

Exception: Where the circuitry is interlocked to prevent simultaneous operation of the motor-compressor(s) and all other loads connected, the conductor size shall be determined from the largest size required for the motor-compressor(s) and other loads to be operated at a given time.

440.35 Multimotor and Combination-Load Equipment. The ampacity of the conductors supplying multimotor and combination-load equipment shall not be less than the minimum circuit ampacity marked on the equipment in accordance with 440.4(B).

Part V. Controllers for Motor-Compressors

440.41 Rating.

(A) Motor-Compressor Controller. A motor-compressor controller shall have both a continuous-duty full-load current rating and a locked-rotor current rating not less than the nameplate rated-load current or branch-circuit selection current, whichever is greater, and locked-rotor current, respectively, of the compressor. In case the motor controller is rated in horsepower but is without one or both of the foregoing current ratings, equivalent currents shall be determined from the ratings as follows. Table 430.248, Table 430.249, and Table 430.250 shall be used to determine the equivalent full-load current rating. Table 430.251(A) and Table 430.251(B) shall be used to determine the equivalent locked-rotor current ratings.

(B) Controller Serving More Than One Load. A controller serving more than one motor-compressor or a motor-compressor and other loads shall have a continuous-duty full-load current rating and a locked-rotor current rating not less than the combined load as determined in accordance with 440.12(B).

Part VI. Motor-Compressor and Branch-Circuit Overload Protection

440.51 General. Part VI specifies devices intended to protect the motor-compressor, the motor-control apparatus, and the branch-circuit conductors against excessive heating due to motor overload and failure to start.