

Section 312.6(B)(2) and Table 312.6(B) provide the requirements for wire-bending space where straight-in wiring or offset is employed at terminals. Table 312.6(A) is used when the conductors do not enter or leave the wall opposite their terminal.

If Table 312.6(A) is used, bending space is measured in the direction in which the wire leaves the terminal. If Table 312.6(B) is used, it is measured in a direction perpendicular to the enclosure wall.

Exhibit 312.1 applies the rules of 312.6(B)(1), 312.6(B)(2), and Tables 312.6(A) and 312.6(B). The tables determine the following required gutter widths, where T stands for the wire-bending space, M stands for the main conductors, N is the neutral conductor, and BC stands for the branch-circuit conductors:

- T_1 is required to be $7\frac{1}{2}$ inches based on conductors M , which are parallel 4/0 conductors.
- T_2 is required to be $1\frac{1}{2}$ inches based on conductors BC_2 , which are 6 AWG.
- T_3 is required to be $4\frac{1}{2}$ inches, based on conductors BC_3 , which are 1 AWG.
- T_4 is required to be 7 inches, based on conductor N , which is 4/0 AWG.

Table 312.6(B), Note 2, permits a reduction in required bending space for removable and lay-in wire terminals. The removable terminal wire connectors can be either the compression type or the set-screw type. However, connectors are required to be of the type intended for a single conductor (single barrel). Removable connectors designed for multiple wires are not permitted to have a reduction in bending space.

A lay-in wire terminal is a pressure wire connector in which part of the connector is removable or swings away so that the stripped end of the conductor can be laid into the fixed portion of the connector. The removable or swing-away portion is then put back in place and the connector tightened down on the conductor.

Exhibit 312.2 illustrates the conditions under which 312.6(B)(2), Exception No. 2, is applicable. The terminal on the left has an offset not greater than 50 percent of bending space, per

condition (2) of Exception No. 2. The terminal on the right is within a 45-degree angle of the enclosure, per condition (1) of Exception No. 2.

(C) Conductors 4 AWG or Larger. Installation shall comply with 300.4(G).

312.7 Space in Enclosures. Cabinets and cutout boxes shall have approved space to accommodate all conductors installed in them without crowding.

312.8 Switch and Overcurrent Device Enclosures. The wiring space within enclosures for switches and overcurrent devices shall be permitted for other wiring and equipment subject to limitations for specific equipment as provided in 312.8(A) and (B).

(A) Splices, Taps, and Feed-Through Conductors. The wiring space of enclosures for switches or overcurrent devices shall be permitted for conductors feeding through, spliced, or tapping off to other enclosures, switches, or overcurrent devices where all of the following conditions are met:

- (1) The total of all conductors installed at any cross section of the wiring space does not exceed 40 percent of the cross-sectional area of that space.
- (2) The total area of all conductors, splices, and taps installed at any cross section of the wiring space does not exceed 75 percent of the cross-sectional area of that space.
- (3) The bending space for conductors 4 AWG and larger complies with 314.28(A)(2).
- (4) A warning label complying with 110.21(B) is applied to the enclosure that identifies the closest disconnecting means for any feed-through conductors.

The following application example shows a volume calculation used for splices, taps, or feed-through conductors.

Application Example

An enclosure having a wiring space of 4 in. wide by 3 in. deep has a 12 in.² cross-sectional area. Thus, the total conductor fill (see Chapter 9, Table 5, for dimensions of conductors) at any cross section cannot exceed 4.8 in.² (40 percent of 12 in.²), and the maximum space for conductors and splices or taps at any cross section cannot exceed 9 in.² (75 percent of 12 in.²).

(B) Power Monitoring or Energy Management Equipment. The wiring space of enclosures for switches or overcurrent devices shall be permitted to contain power monitoring or energy management equipment in accordance with 312.8(B)(1) through (B)(3).

Many new devices are used for power monitoring that are intended to be installed in enclosures containing panelboards, which are often not supplied by the panelboard manufacturer.

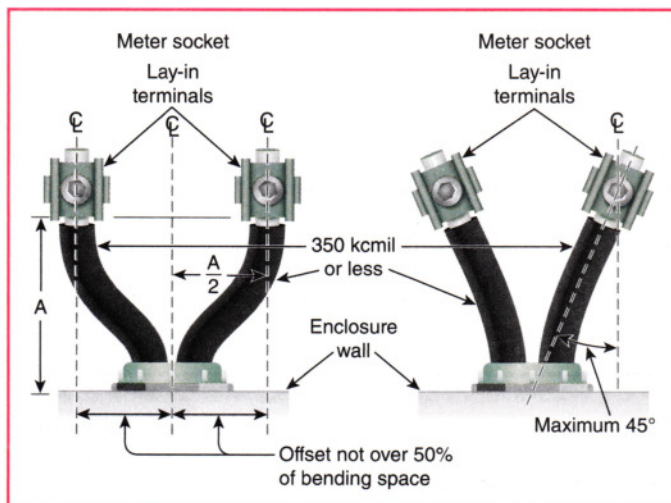


EXHIBIT 312.2 Wiring in a meter socket with lay-in wire terminals.