



TECHNICAL SERVICES DEPARTMENT

BULLETIN

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Screw Attachments to Electrical Boxes - Guidelines for Screw Substitution

Electrical boxes are provided with means for securely fastening covers, and in device boxes, for mounting wiring devices, such as snap switches and receptacle outlets.

There are occasions when it is necessary to substitute the screws that are provided with electrical boxes and it may be impractical to obtain replacement or substitute screws from the box manufacturer. Screws can be lost or damaged or longer screws may be needed during renovations. When substituting the screws that are provided with an electrical box for cover mounting or for mounting a luminaire support strap, it is critical to use a high quality machine screw of the appropriate size and 32 threads per inch. **Never use drywall screws!**

Compatibility of the size and threads of the screw with the threaded holes in the box is very important to ensuring expected mechanical security. For sheet steel metallic boxes designed according to NEMA OS1, the threaded holes provide for two threads of engagement with a screw having 32 threads per inch. This threaded joint is relied upon for electrical bonding between a metallic cover or luminaire canopy and the box [See *National Electrical Code*® (*NEC*®) Section 250.8 (A)(5)].

Molded screw bosses in nonmetallic outlet and device boxes are susceptible to cracking or breaking if screws of larger dimensions or alternative threading are used. Also, normal installation temperatures may cause adverse effects on nonmetallic boxes if screws are substituted incorrectly.

The *NEC*® was amended in 2014 with the addition of the text cited below to specifically address identified problems resulting from incorrect screw substitution.

Screws for Cover Mounting

Metallic outlet boxes are typically provided with 6-32 or 8-32 machine screws for mounting the cover into similarly threaded holes in the box. In nonmetallic outlet boxes, threaded screw bosses for 6-32 or 8-32 machine screws or unthreaded bosses intended to accept 6-32 or 8-32 thread

forming machine screws are provided. 6-32 or 8-32 machine screws for cover mounting are provided with the boxes but are uninstalled.

The NEC[®] 314.25 states:

"Screws used for the purpose of attaching covers, or other equipment, to the box shall be either machine screws matching the thread gauge or size that is integral to the box or shall be in accordance with the manufacturer's instructions."

Screws for Wiring Device Mounting

Metallic and nonmetallic device boxes are typically provided with 6-32 threaded holes or molded bosses that accept the mounting screws provided with listed wiring devices such as snap switches and receptacle outlets. Some nonmetallic device boxes have a "quick set" device mounting feature that accepts the same 6-32 device mounting screws.

NEC[®] 404.10 (B) states:

"Screws used for the purpose of attaching a snap switch to a box shall be of the type provided with a listed snap switch, or shall be a machine screw having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions."

NEC[®] 406.5 states:

"Screws used for the purpose of attaching receptacles to a box shall be of the type provided with a listed receptacle, or shall be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions."

Screws for Mounting Other Equipment to an Electrical Box

Metallic and nonmetallic boxes intended to support a luminaire are provided with 8-32 or larger screws. Boxes intended to support a ceiling suspended (paddle) fan are typically provided with 10-32 screws and often locking type washers. The boxes contain either threaded holes or bosses to accept the supplied screws.

For additional information on the design, construction, selection and installation of electrical boxes the latest editions of the following NEMA documents are recommended:

ANSI/NEMA OS 1, Metallic Outlet Boxes

ANSI/NEMA OS 2, Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports

NEMA OS 3, Selection and Installation Guidelines for Electrical Outlet Boxes

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