



Application Note

Using IEC-Lock Power Cords with IEC Inlets and Filters



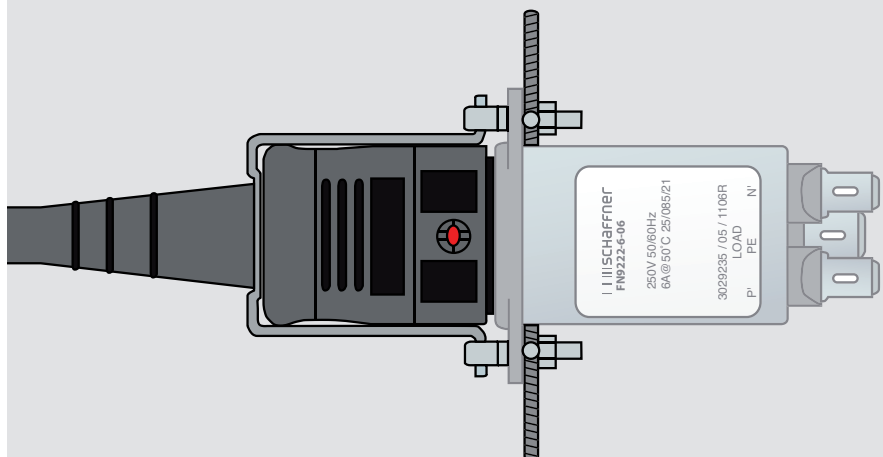
IL (IEC-Lock) power cord series provide a locking system usable for applications with every standard IEC inlet. With IEC-Lock there is an easier solution against accidental disconnection now available compared to earlier constructions with retaining clip.

Industries and applications

Any industry using IEC inlets with the need for a reliable mains connection can benefit from IL power cord series.

- | Data centers
- | Medical devices
- | *In-vitro* diagnostic devices
- | Automatic vending and gaming machines
- | The most diverse (portable) electronic devices
- | High value testing and measurement equipment
- | High value power supplies
- | Office equipment
- | 1-phase industrial equipment
- | Audio, video, broadcasting equipment

Traditional locking systems with retaining clip



“State of the art” solution up to now was the usage of a retaining clip like displayed above. Extra effort was required to install this system to the IEC inlet or filter. If the tensile force exceeds the tensile ultimate strength of the bolt or the clip, it can break.

Mechanical classifications of the bolts

Steel bolts are characterized by their strength classes. The property classes most often used are 5.8, 8.8 (industrial standard) or 10.9. The number before the point is the tensile ultimate strength in N/mm^2 multiplied by 100. The yield point for operating in the plastic region is 10 times the figure before the point multiplied with the figure after the point. For example, a property class 5.8 bolt has a nominal (minimum) tensile ultimate strength of 500 N/mm^2 and a tensile yield strength of 400 N/mm^2 .

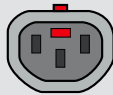
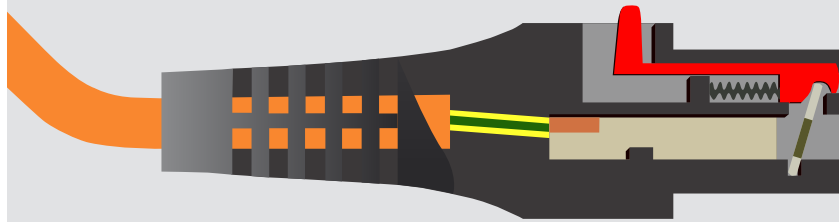
A M3 class 5.8 bolt with a tensile stress area of 5.0 mm^2 can carry a tensile force up to 2000 N (200kg). Bolts made of aluminum alloy have a tensile ultimate strength of about 100 N/mm^2 . Thus a M3 bolt can hold a tensile yield force up to 500 N (50kg).

New innovative locking System: IEC-Lock



IEC-Lock can substitute existing constructions with retaining clips and is suitable for all electronic equipment with IEC inlets or filters where a precaution against accidental disconnection is instrumental to improve the system reliability.

How IEC-Lock works



IEC Plug with integral locking system

IEC-Lock is an integrated locking system which needs no modification of the existing IEC inlet or filter. It locks to the ground pin of any standard IEC inlet.

Important safety considerations

Based on this locking principle designers have to consider that the tensile force is directly affecting the inlet. IEC-Lock can clamp up to a tensile force of at least 200N (20kg). With tensile forces beyond IEC-Lock declamps before severe damage is caused to the equipment or the power cord. Thus designers of electronic equipment have to focus on the mounting of the IEC inlet or filter. To ensure the highest safety level of the system, it is strongly recommended to use IL power cords only in connection with flange mounted inlets and filters, which are bolted together with the equipment panel.

M3 bolts of the lowest property class (4.6) are sufficient having a tensile yield strength of 240 N/mm² and to hold a tensile yield force up to 1200N (120kg) each. So all retaining clip solutions with flange mounted IEC inlets and filters can be substituted by IEC-Lock reducing the construction effort significantly.

Snap-in versions of IEC inlets and filters depend on the maximum allowed tensile yield force of the snap-in assembly. Here the applicable force is far below the flange mount versions described above. Also IEC inlets and filters for rear mounting where the inlet is not directly bolted together with the panel are not permissible.

We do not recommend using IEC-Lock with snap-in IEC inlets and filters!

The plastic inlet of the snap-in filter housing, the complete snap-in filter or the IEC inlet can be pulled out under extreme conditions so that live parts might be touchable and endanger the life of equipment users.

IEC-Lock application recommendation overview

✓ Flange mounting inlets and filters



✗ Snap-in and rear mounting inlets and filters

DO NOT USE!



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